S/M No. : RU54CDL001

Service Manual

Refrigerator

Model: FRU-54CDLE8NI

✔ **Caution**

: In this Manual, some parts can be changed for improving, their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List) in Service Information Center

DAEWOO ELECTRONICS

FEB. 2008

CONTENTS

1. WARNINGS AND PRECAUTIONS FOR SAFETY

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

1. Be care of an electric shock. Disconnect power cord from wall outlet and wait for more than three minutes before replacing PCB parts.
   Shut off the power whenever replacing and repairing electric components.

2. When connecting power cord, please wait for more than five minutes after power cord was disconnected from the wall outlet.

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

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

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

6. Use standard electrical components when replacing them.

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

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

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

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

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

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

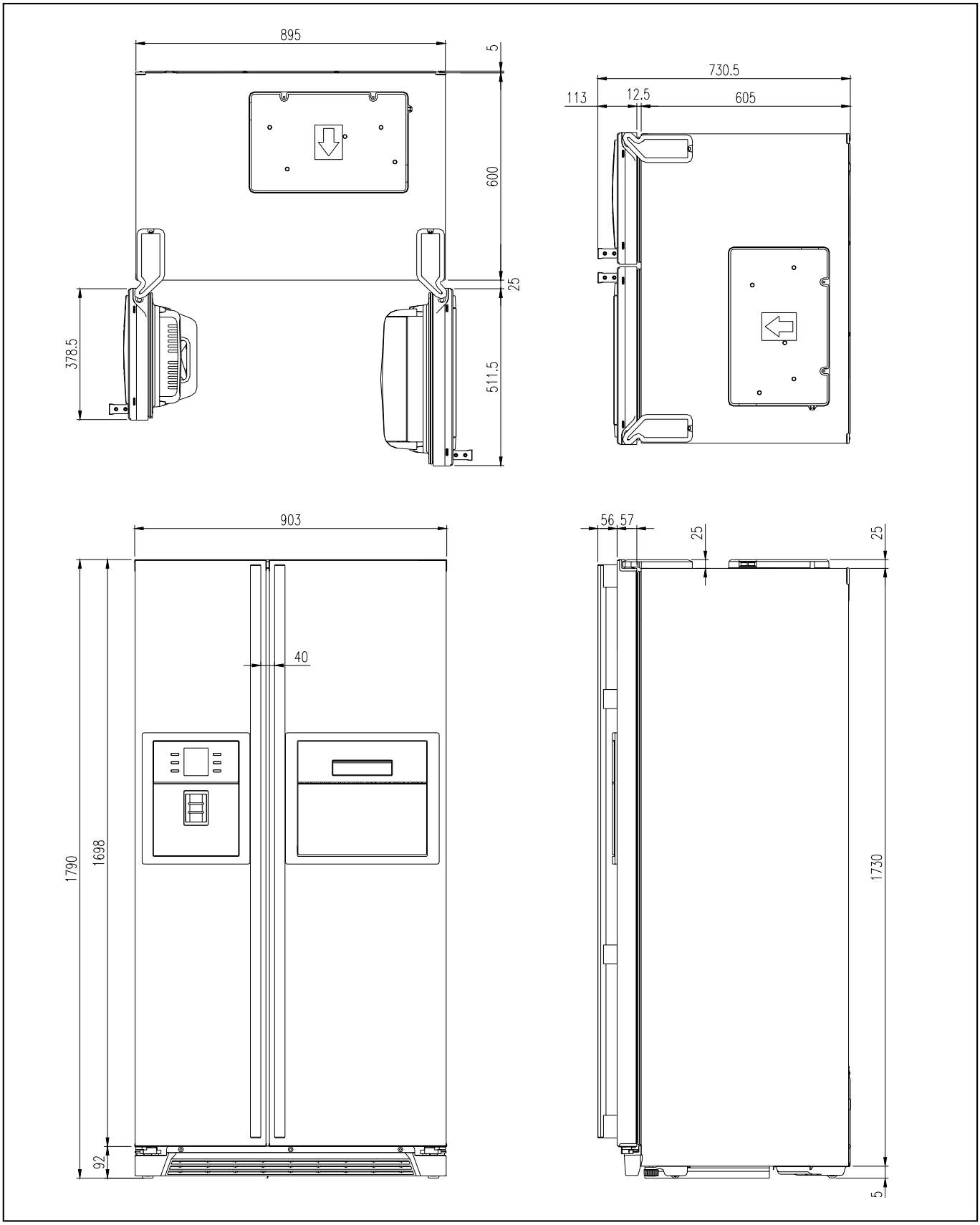
13. Do not put flower vase, cup, cosmetics, chemicals, etc., or container with full of water on the top of the refrigerator.

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

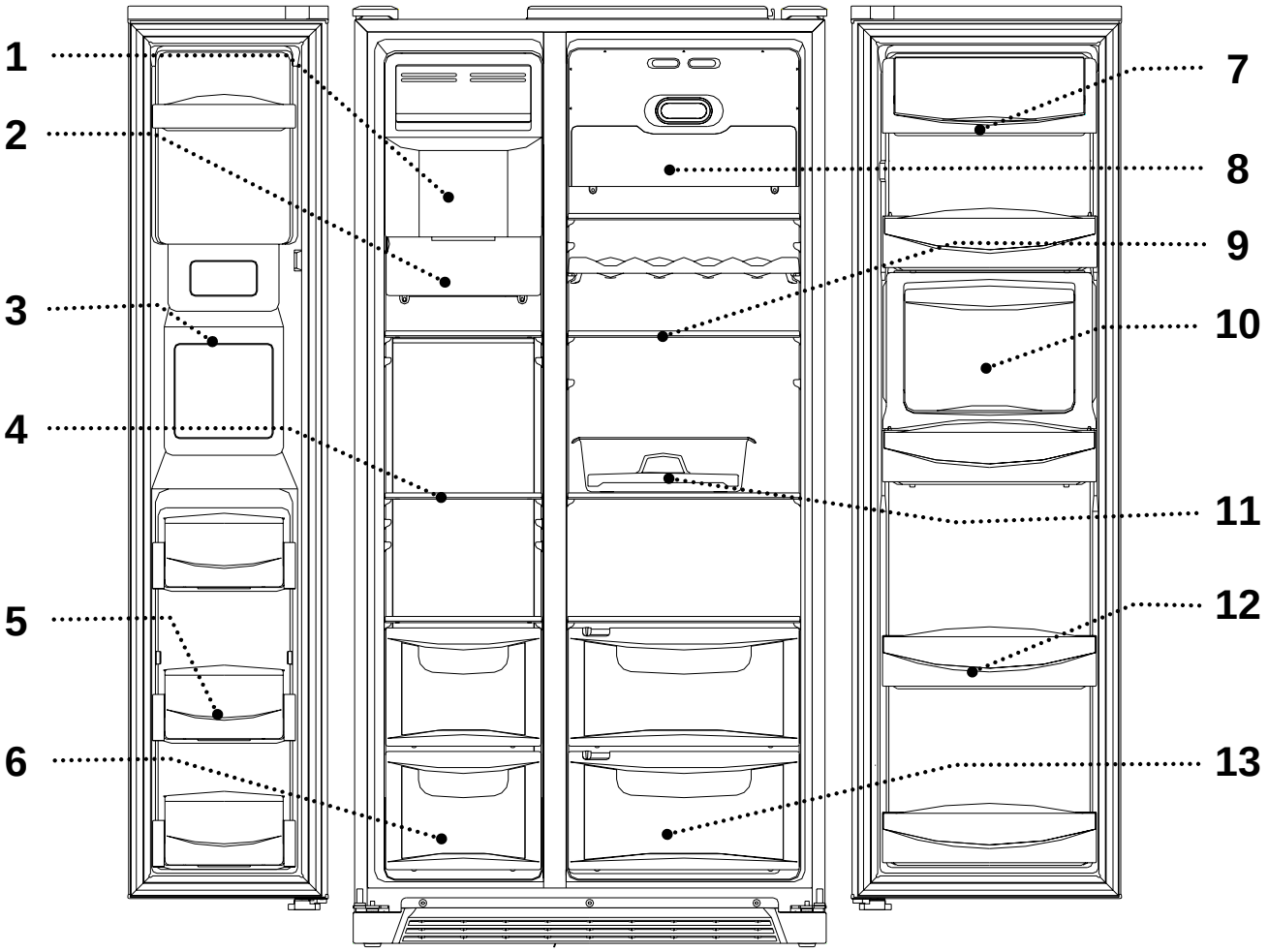
15. When you scrap the refrigerator, please disconnect the door gasket first and scrap it where children are not accessible.

2. EXTERNAL VIEWS

2-1. External Size



2-2. Name of Each Parts



Freezer Compartment	Refrigerator Compartment
1. Ice cubes storage case	7. Dairy pocket
2. Freezer light	8. Refrigerator light
3. Water / Ice dispenser	9. Refrigerator shelf
4. Freezer shelf	10. Homebar pocket
5. Freezer pocket	11. Movable egg case
6. Freezer case	12. Refrigerator pocket
	13. Refrigerator case

3. SPECIFICATION

3-1. Specification

Item			Specification
Model Name			FRN-U20F**I
ISO Gross Volume (Li)		Total	541 Li
		Freezer	184 Li
		Refrigerator	357 Li
ISO Storage Volume (Li)		Total	504 Li
		Freezer	170 Li
		Refrigerator	334 Li
External Dimension (Width × Depth × Height)			903mm × 730.5mm ×1790mm
Rated Voltage			220~240V (50Hz)
Weight			115kg
COOLING CYCLE	Comp	Model	VEGZ 11C
		Motor Type	BLDC Comp
	Inverter	Model	VCC3 – X11
		Input	220 ~ 240V / 50~60Hz
		Output	230V / 53.3 ~ 150Hz
	Refrigerant		R-600a
	Quantity		76g
	Evaporator		Fin Type
	Condenser		Fan Cooling System
	Dryer		Molecular Sieve XH-9
	Capillary Tube		IDΦ0.7 × T0.55 × L2200

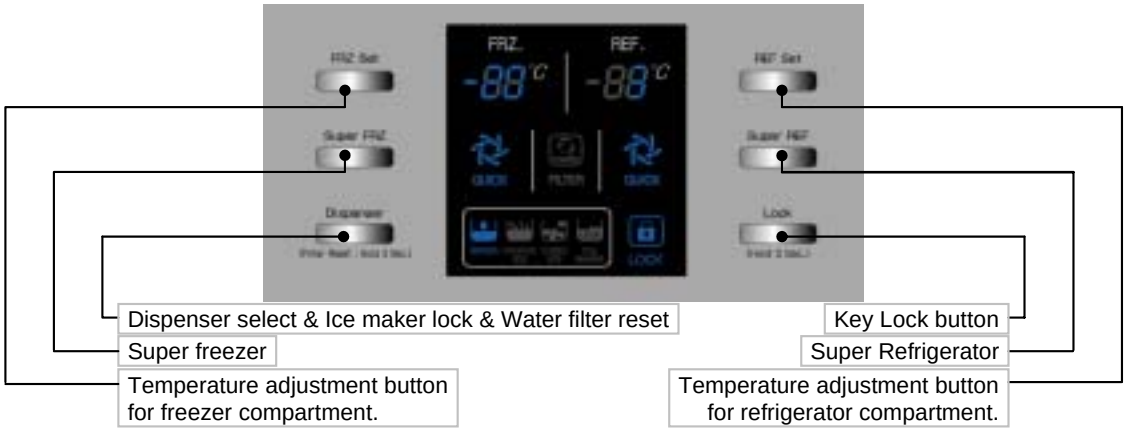
Item		Specification
Model Name		FRN-U20F**I
SENSOR	D-Sensor	PBN-43
	F-Sensor	PBN-38
	R-Sensor	PBN-43
HEATER	Defrost Heater	AC220V / 192W
	Main Duct Heater	AC220V / 7W
	Dispenser Heater	AC220V / 5W
	Water Pipe Heater	AC220V / 5W
	Homebar Heater	AC220V / 10W
ELECTRICAL PARTS	Main Fuse (Power cord)	AC250V 12A
	Fuse Temp (Defrost)	AC250V , 10A , 77℃
	F-Fan Motor	DC13V / 2050±100 rpm
	R-Fan Motor	DC13V / 1850±100 rpm
	Condenser Fan Motor	DC13V / 1100±100 rpm
	F-Lamp	AC230~240V / 25W (1EA)
	R-Lamp	AC230~240V / 25W (2EA)
	Door Switch , F / R	SPF101B-2D / SPF101B-1D

4. MICOM FUNCTIONS

4-1. Display

INPUT	CONTROL OBJECT
Front PCB button FREEZER SET, REFRIGERATOR SET SUPER FREEZER, SUPER REFRIGERATOR DISPENSER SELECT & FILTER RESET KEY LOCK	FCP C-LED

CONTENTS	REMARKS



1. Display control

FCP-LED	Control
88 DISPLAY (SET TEMP.)	Initial mode : Freezer & Refrigerator set→ Medium (-19℃/4℃)
SUPER FREEZER,SUPER REFRIGERATOR ICON	Dial
WATER / CRUSHED ICE / CUBED ICE / ICE MAKER LOCK	Dial
KEY LOCK ICON	Dial
FILTER CHANGE ICON	After six month, LED ON

2. “FRZ Set” button
 1) Temperature control of freezer compartment
 2) Initial power input : “Medium(-19℃)”

 ※Everytime you press the “FRZ set” button, the setting temperature changes in a circulating order of -19℃(Medium) → -20℃ → -21℃ → -22℃ (Max) → -16℃(Min) → -17℃ → -18℃ → -19℃(Medium)

3. “REF Set” button
 1) Temperature control of refrigerator compartment
 2) Initial power input : “Medium (4℃)”

 ※Everytime you press the “REF set” button, the setting temperature changes in a circulating order of 4℃(Medium) → 3℃ → 2℃(coldest) → 6℃(warmest) → 5℃ → 4℃(Medium)

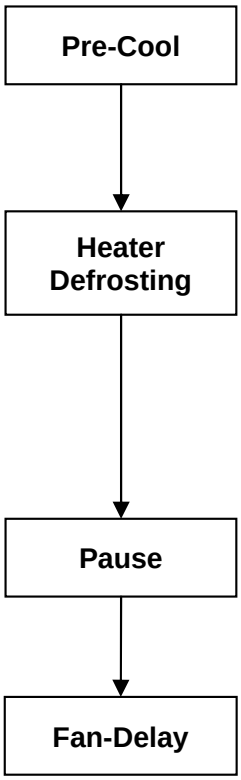
CONTENTS	REMARKS
4. “Super FRZ” button When this button is pressed, the “QUICK” icon of freezer compartment is ON. (Yon can stop this function manually by pressing the button one more time.) 5. “Super REF” button When this button is pressed, the “QUICK” icon of refrigerator compartment is ON. (Yon can stop this function manually by pressing the button one more time.) 6. “Dispenser” button 1) Dispenser select function You can select water, crushed ice or cubed ice by pressing the “Dispenser” button 2) Ice maker lock function If you don’t want to produce ice cubes, press the “Dispenser” button till the “ICE MAKER LOCK” icon is turn on. ● Everytime you press the “Dispenser” button, the icon changes in a circulating order of WATER → CRUSHED ICE → CUBED ICE → ICE MAKER LOCK → WATER ● The dispenser is not to operate while door is left open. 3) Filter reset function ● After 6-months from the power is connected to the refrigerator, the “FILTER CHANGE” icon is light up. ● If you have changed the filter after 6-months of use or want to reset the filter display, press and hold the “Dispenser (Filter Reset)” button 3 seconds or more and the “FILTER CHANGE” icon will be turn off. 6. “Lock” button 1) If you want to lock other buttons, press the “Lock” button and “LOCK” icon will be turn on. No buttons other than “Lock” button will be work. 2) To disable the lock function, press and hold the “Lock” button for 3 seconds or more. ※ The actual inner temperature varies depending on the food status, as the indicated setting temperature is a target temperature, not actual temperature within refrigerator. ※ Refrigeration function is weak in the initial time. Please adjust temperature as above after using refrigerator for minimum2~3 days.	**REFERENCE :** Please wait for 2-3 seconds in order to take final ice or drops of water when taking out cup from the pressing switches after taking ice or water.

4-2. Defrost Mode

INPUT	CONTROL OBJECT
1. Defrosting Cycle	1. Comp 2. F-Fan 3. R-Fan 4. D-Heater

CONTENTS	REMARKS

1. Defrost Mode



Pre-Cool
▶ Compressor runs (to sub-cool the freezer compartment prior to the defrost heater switch on) for 50 minutes or until F-sensor temperature reaches -27℃ whichever comes first.
(Refrigerator compartment is controlled normal condition)

Heater Defrosting
1) Defrost heater is switch on until D-sensor temperature reaches 13℃.
(Compressor, F-Fan, R-Fan is off)
2) Defrost heater on time.
● 30 seconds : Heater is ON regardless of D-sensor temperature the moment when heater is on.
● 30 minutes : In case of "D1" error (D-sensor malfunction)
● 50 minutes : in normal control state, the maximum on time.

Pause
After the defrost heater is switched off, Compressor does not run within 7 minutes.
(F-fan, R-fan, Heater etc. : OFF)

Fan-Delay
After defrost, when the first compressor turn on, F-Fan start to run after 5 minutes from compressor turn on.

2.The defrost mode start with the following conditions

1) Total operation time of compressor becomes : 10, 12, 14, …… , 24 hours.
① Compressor operating rate (If RT-sensor temperature ≤ 35 ℃) : more 85%
② Total door open time : 2 minutes
(Any door, F or R open time is over 2 minutes.)
③ Any error mode (R1, F1, D1, F3, RT/S, Door-switch etc.)

2) Defrosting mode starts unconditionally as long as total comp. work time is 24 hours, even if the above conditions 1) are not satisfied.

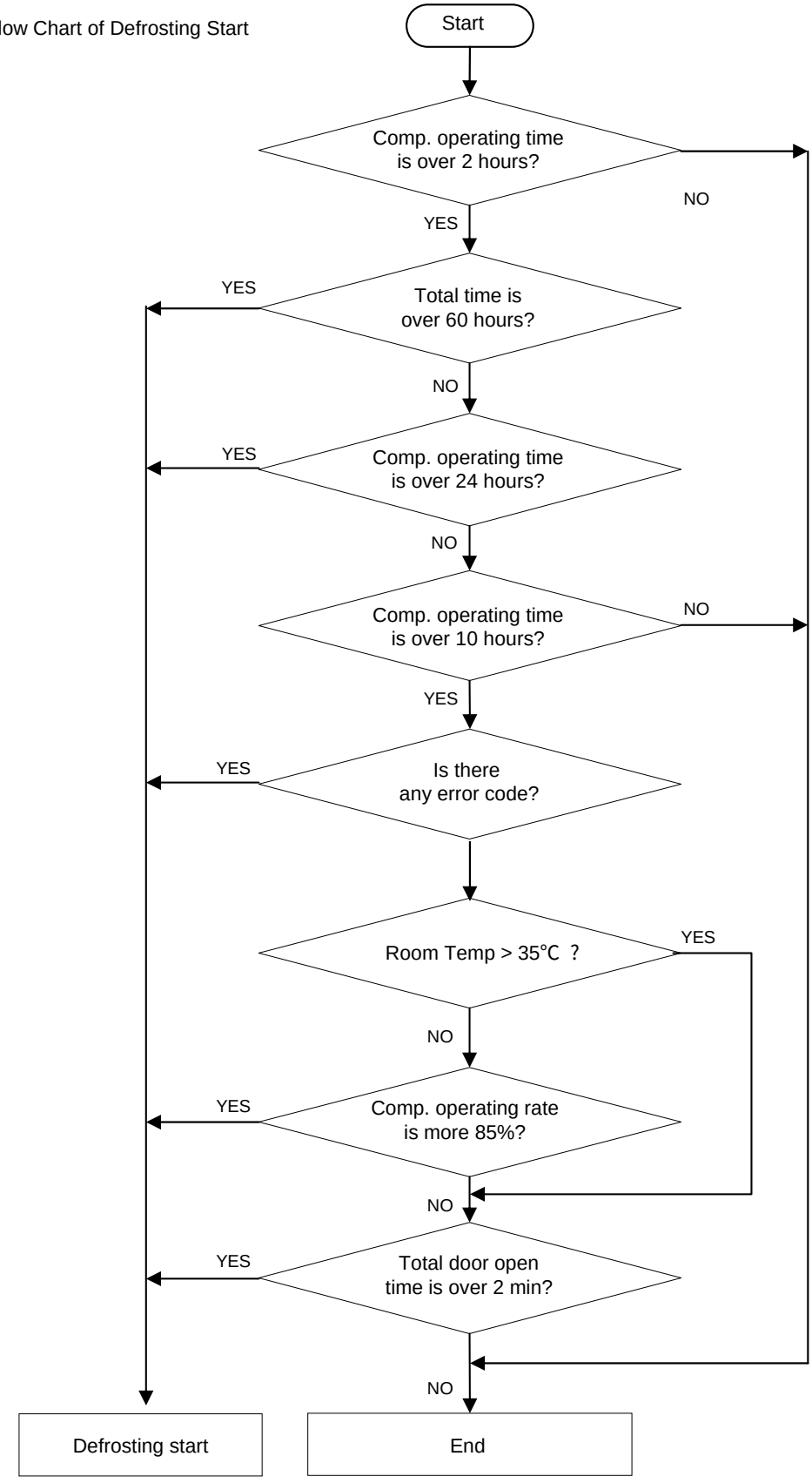
3) Defrosting mode starts immediately as long as total time of [comp. ON + comp. OFF] is over 60 hours, even if the above 1) and 2) conditions are not satisfied.

3. In case of initially power connected (or power reset)

If D-sensor temperature ≤ 3.5℃, defrosting mode starts .

CONTENTS	REMARKS

4. Flow Chart of Defrosting Start



4-3. Forced Defrosting Mode

INPUT	CONTROL OBJECT
1. Defrosting Cycle	1. Comp 2. F-Fan 3. R-Fan 4. D-Heater

CONTENTS

1. A/S Defrosting Mode (Heater defrost → Pause → Fan Delay)

Heater Defrosting

Heater Defrosting
1) Defrost heater is switch on until D-sensor temperature reaches 13℃.
(Compressor, F-Fan, R-Fan is off)
2) Defrost heater on time.
● 30 seconds : Heater is ON regardless of D-sensor temperature the moment when heater is on.
● 30 minutes : In case of "D1" error (D-sensor malfunction)
● 50 minutes : in normal control state, the maximum on time.

Pause

Pause
After the defrost heater is switched off, Compressor does not run within 7 minutes.
(F-fan, R-fan, Heater etc. : OFF)

Fan-Delay

Fan-Delay
After defrost, when the first compressor turn on, F-Fan start to run after 5 minutes from compressor turn on.

2. How to start
1) Under "Lock" condition,
press and hold "FRZ Set" button and press "REF Set" button 5 times simultaneously.

3. How to proceed
1) Skip the pre-cool mode. (Others are same as normal defrosting)
2) Heater is ON for 30 seconds, regardless of D-sensor temp. the moment when the defrost heater is switch on.
(Check of defrosting current)

REMARKS

4-4. Fan Motor Voltage of Control Mode

INPUT	CONTROL OBJECT
1. F-Sensor 2. R-Sensor	1. F-FAN, R-FAN, C-FAN

CONTENTS

1. Fan voltage of control mode

	F-FAN (Freezer compartment)	R-FAN (Refrigerator compartment)	C-FAN (Condenser)
Voltage	13 V	13 V	13 V

※ Refer to the 5-4. (Fan Function)

REMARKS

4-5. Buzzer or Alarm Control

INPUT	CONTROL OBJECT
1. Control (Inner or F-PCB) buttons 2. Door Switch 3. Initial Power Input	Buzzer

CONTENTS	REMARKS
1. Buzzer sounds 3 times after initial power input. 2. Buzzer sounds 1 times, in case of A/S forced defrost mode. 3. Buzzer sounds 1 time, in case of pull down mode. 4. If door is left open, buzzer sounds after every 1 minutes for 5 minutes (Door open alarm)	

4-6. Control of Interior Lights

INPUT	CONTROL OBJECT
1. Refrigerator door switch 2. Freezer door switch 3. Home bar door switch 4. Dispenser switch	Lamp

CONTENTS	REMARKS
1. Control refrigerator compartment lights R-Lights turn ON/OFF by R-door switch ON/OFF (※ For 10 minutes after sensing door open, the lights turn off automatically through door close is not sensed.) 2. Control of freezer compartment lights. F-Light turn ON/OFF by F-door switch ON/OFF (※ For 10 minutes after sensing door open, the lights turn off automatically through door close is not sensed.) 3. R-lights ON/OFF by home bar door switch ON/OFF. (for only model with home bar) R-lights turn ON for 10 minutes after sensing home bar door switch open. 4. Dispenser lamp control (for only model with water/ice dispenser) Dispenser lamp turns ON/OFF by Dispenser switch. Dispenser lamp turns ON for 4 seconds after sensing switch close.	

4-7. Demonstration

INPUT	CONTROL OBJECT
1. “REF Set” & “Dispenser” Button	Comp F/R-Fan Heater

CONTENTS	REMARKS
1. How to start 1) Under “Lock” condition, Press and hold “REF Set” button and press “Dispenser” button 5 times simultaneously. 2. How to control 1) All other electrical components are OFF except for F-Fan & R-Fan 2) Fan Control Door opened → Fan ON Door closed → Fan OFF. 3. How to exit 1) Under “Demonstration” mode, Press and hold “REF Set” button and press “Dispenser” button 5 times simultaneously. 2) or power reset.	

4-8. Temperature compensation (Refrigeration compartment)

INPUT	CONTROL OBJECT
Main PCB	Resistance of R-sensor

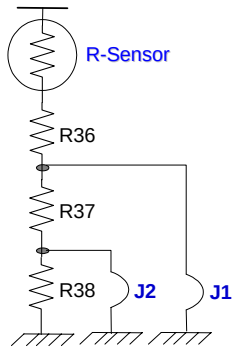
CONTENTS

▶ If the temperature of refrigerator compartment is weak or insufficient, you can compensate the on/off temperature by cutting jump wire of main PCB. (temperature down)

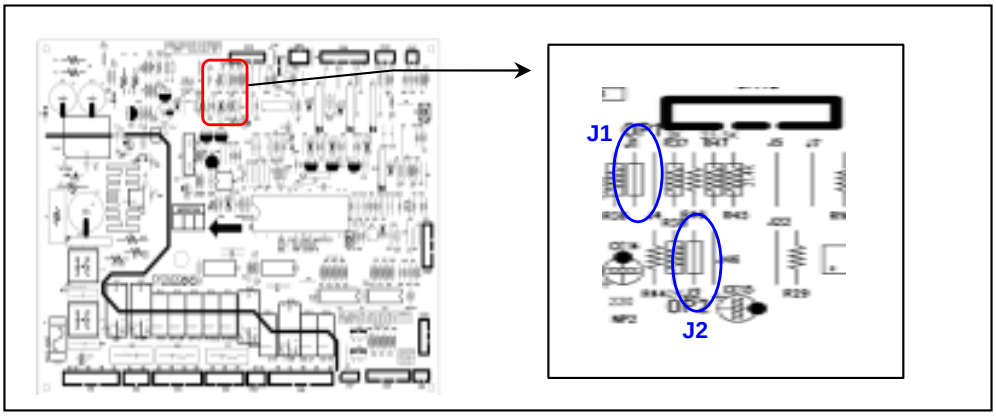
▶ If need to compensate

	Normal condition	Compensation (weak-cool)	
		1.5℃ down	3℃ down
J1	-	cut	cut
J2	-	-	cut
Resistance	R36	R36 + R37	R36 + R37 + R38

▶ Circuit diagram of R-sensor



▶ Location of R-sensor at Main-PCB



REMARKS

※ Refer to the 5-2. (Function of each sensor)

4-9. Error Display

INPUT	CONTROL OBJECT
Temperature Control Buttons	88 Display CLED

CONTENTS	REMARKS

1. How to start
   1) Under “Lock” condition,
      Press and hold “FRZ Set” button and press “press “Super FRZ” button 5 times simultaneously.
   2) The front cCLED displays as the right diagram shows
      ([Ex.] Time Display of 0003 signifies 3 minutes of power on time.)
   3) Everytime you press “FRZ Set” button, the following value is displayed successively.
      ① Refrigerator operating time. (From power is connected)
      ② F-Sensor temperature.
      ③ D-Sensor temperature.
      ④ R-Sensor temperature.
      ⑤ RT-Sensor temperature.
      ⑥ P Factor display (Refer to water supply mode of automatic icemaker)
      ⑦ Filter remaining time until change (First check ; 4,320Hr)
        Refer to Filter Information Reset of CLED of front control panel.
   4) Error is displayed only if there is any ; it is skipped if no error.

2. How to exit
   1) Press “Lock” button 1 time.
   2) It exit automatically in 4 minutes after from the start.

3. All the error Codes are reset if they turn to be normal.

4. Error code

ERROR CODE	CONTENTS
F1	F-sensor : disconnection (“Lo”), short (“Hi”)
r1	R-sensor : disconnection (“Lo”), short (“Hi”)
rt	RT-sensor : disconnection (“Lo”), short (“Hi”)
d1	D-sensor : disconnection (“Lo”), short (“Hi”)
dr	R-Door switch : defective
dF	F-Door switch : defective
dH	Homebar door switch : defective
EI	I-sensor : disconnection (“Lo”), short (“Hi”)
EF	Flow sensor : defective
Et	Horizontal switch : error
Eg	Water supply : error
ES	Micro switch : error
EA	Drop the ice while Et
Eu	Full ice switch : error
C1	Cycle : abnormal or defective
F3	Return after defrosting : abnormal or defective
Co	Full-Down mode display
D2	Forced defrost mode display

CONTENTS	REMARKS

5. Control way of Error (if any)

1) “F1” error

Cause : F-sensor disconnection or short

Check point : Measure the resistance between both terminals after separating CN15 of the Main PCB. (Refer to the 5-2.)

If F-sensor is disconnected or shorted , change the F-sensor in the freezer compartment.

How to reset : If F-sensor is normal, the error is terminated automatically.

2) “R1” error

Cause : R-sensor disconnection or short

Check point : Measure the resistance between both terminals after separating CN14 of the Main PCB. (Refer to the 5-2.)

If R-sensor is disconnected or shorted , change the F-sensor in the refrigerator compartment.

How to reset : If F-sensor is normal, the error is terminated automatically.

3) “rt” error

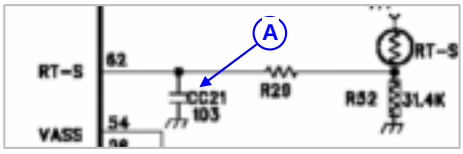
Cause : RT-sensor disconnection or short (full down)

Check point : Measure the voltage of “A” part on the Main PCB.

If the voltage is 0.5V~4.5V, it is normal.

If the voltage is 0V (short) or 5V (disconnected), change the RT-sensor on the Main PCB

How to reset : If F-sensor is normal, the error is terminated automatically.



4) “d1” error

Cause : D-sensor disconnection or short (full down)

Check point : Measure the resistance between both terminals after separating CN15 of the Main PCB. (Refer to the 5-2.)

If D-sensor is disconnected or shorted , change the D-sensor on the evaporator.

How to reset : If D-sensor is normal, the error is terminated automatically.

5) Door error (“dF” “dR” “dH” on display)

Cause : in case it senses that door is open for more than 1 hour.

Check point : F/R door is opened or not.

6) “C1” error

Cause : in case comp. works for over 3 hours when D-sensor temp. is over -5℃

Check point : Refrigerant leakage.

7) “F3” error

Cause : in case defrosting return is done by time limit of 50 min

Check point : Measure the resistance between both terminals of the defrost heater. (Assembled with evaporator)

If the resistance is ∞Ω (disconnected) or 0Ω (short) change the

8) “d2” mode (A/S forced defrosting mode)

Push “REFRIGERATOR SET” button 5 times while pushing “FREEZER SET” button simultaneously.

Control : A/S forced defrosting control (Pre-cool is deleted)

If D-sensor temp. is over 13℃, the mode is terminated automatically.

Refer to the 4-3. .

CONTENTS	REMARKS
9) “EI”ERROR Cause : I-SENSOR disconnection / short Check point : Measure the resistance between both terminals after separating CN11 of the Main PCB. (Refer to the 5-2.) If F-sensor is disconnected or shorted , change the I-sensor in the automatic ice maker. 10) “EF” ERROR Cause : When Flow-sensor ERROR (There is no Pulse during some time) The number of pulse signal is below 10 by 1 sec during water supply. Check point : Water supply line 11) “Eg” ERROR Cause : I-sensor temp (5min after water supply) doesn’t go up. Check the I-sensor or water supply line. 12) “ES” error (MICRO switch error) Cause : When it senses 1min continuously Check the MICRO switch of the dispenser. 13) “Ea” error Cause : Malfunction of ice drop motor. Check the motor by pushing test switch. 14) “Eu” error Cause : Switch (which senses if the ice is full or not) is in error. Control : When dropping the ice, the motor just rotates 90 degree. Termination : When the switch is in normal. 15)“EA“ ERROR Cause : When sensing Ice dropping by time 3 times in level sensor SW Error. Control : Stop of Ice Maker Termination : With normal level switch. Re-input of power or push if icemaker test switch. 16)“Et” ERROR Cause : Level switch error (No pulse is sensed for some time) Control : By time (Supply mode is skipped) Termination : Normal condition. * When all ERROR CODE is normal, the Refrigerator reset	

4-10. Summary of Function

CONTENTS	REMARKS

1. All the modes are started “Lock” condition (except “FILTER CHANGE” mode)

2. Element A/S Function

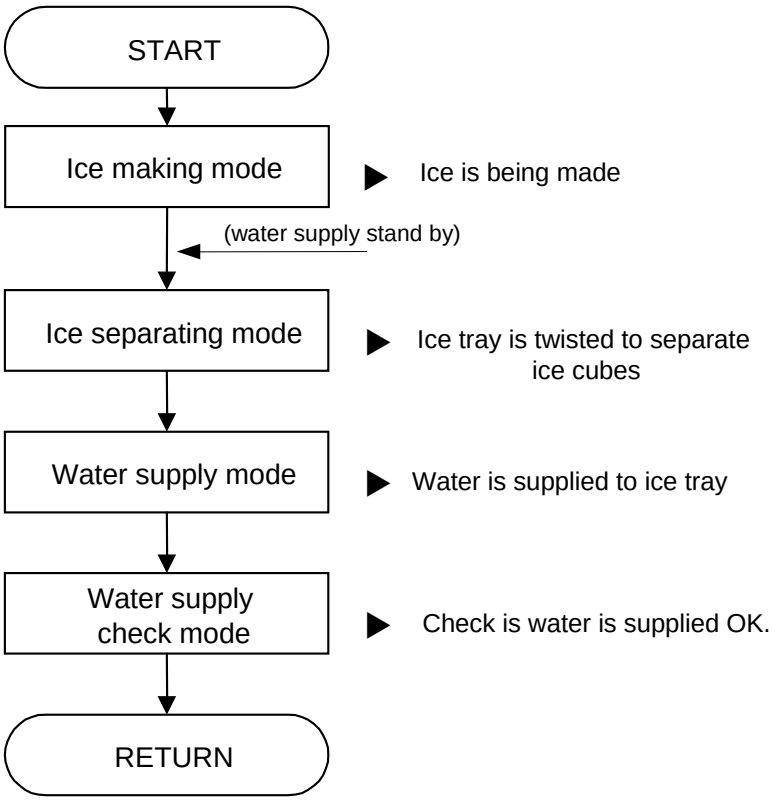
Forced Defrosting	“FRZ Set” + “REF Set” 5 times
Reset water filter	Press and hold “Dispenser” button for 3 seconds
Demonstration function	“REF Set” + “Dispenser” 5 times
Pull-Down	“REF Set” + “FRZ Set” + “Dispenser” 5 times
Error display	“FRZ Set”+ “Super FRZ” 5 times
EEPROM clear	“Dispenser” + “Super FRZ” 5 times
Ice maker test	“Dispenser” + “Super REF” 5 times

4-11. Automatic Icemaker

INPUT	CONTROL OBJECT
Full ice sensing switch Ice Maker Lock Sensors	Ice separating motor

CONTENTS	REMARKS

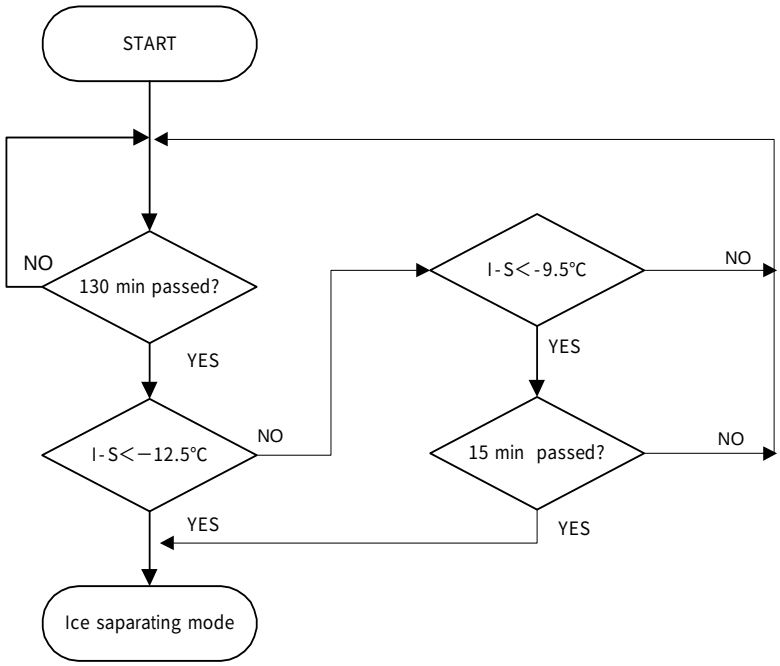
1. Flow of ice making



1) Press TEST switch under the Icemaker for more than 1 second and test starts.
   * Test mode starts from ice separating mode.
   * In case test switch has an error of short, test is done only once.
2) With the initial power input, Ice tray turns to be horizontal and ice making mode starts.
3) Control of water hose heater
   * Heater is always ON if RT-sensor has an error or RT is below 15 degree.
   * Heater is always ON for 60 minutes (max. Limit time) if Flow-sensor has an error
4) Water supply stand-by
   Condition : if ice is sensed full
   Operation : proceeds to Ice making mode (Ice separating and water supply Modes stop)
5) Crusher Function
   It stops operation when freezer door is open
   It operates if freezer door is closed.

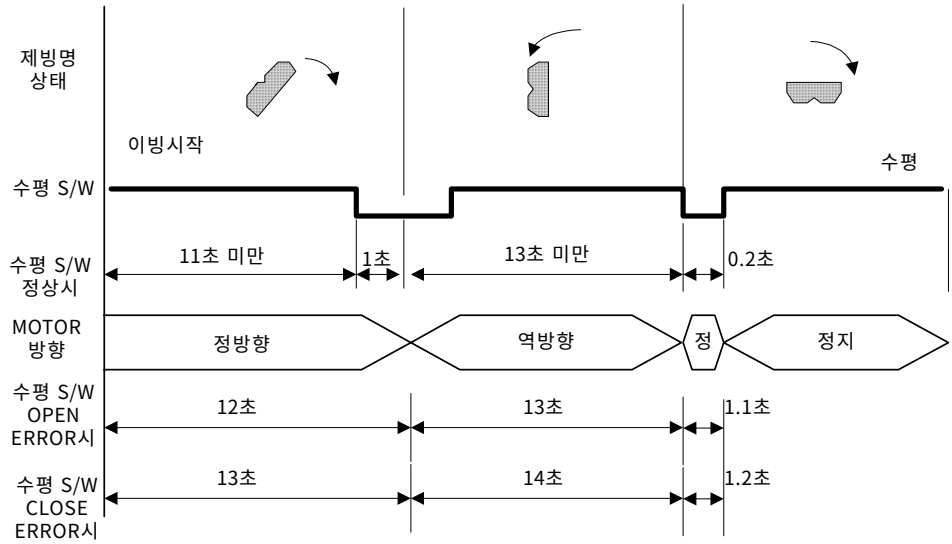
CONTENTS	REMARKS

2. Ice making mode



1) Ice making stops if ice-sensor is below -12.5℃ after 130 minutes.
2) Ice making also stops if ice-sensor is below -9.5℃ for 15 minutes, though ice-sensor is not below -12.5℃ after 130 minutes.
3) In case of ice sensor, ice making stops after 4.8 hours.

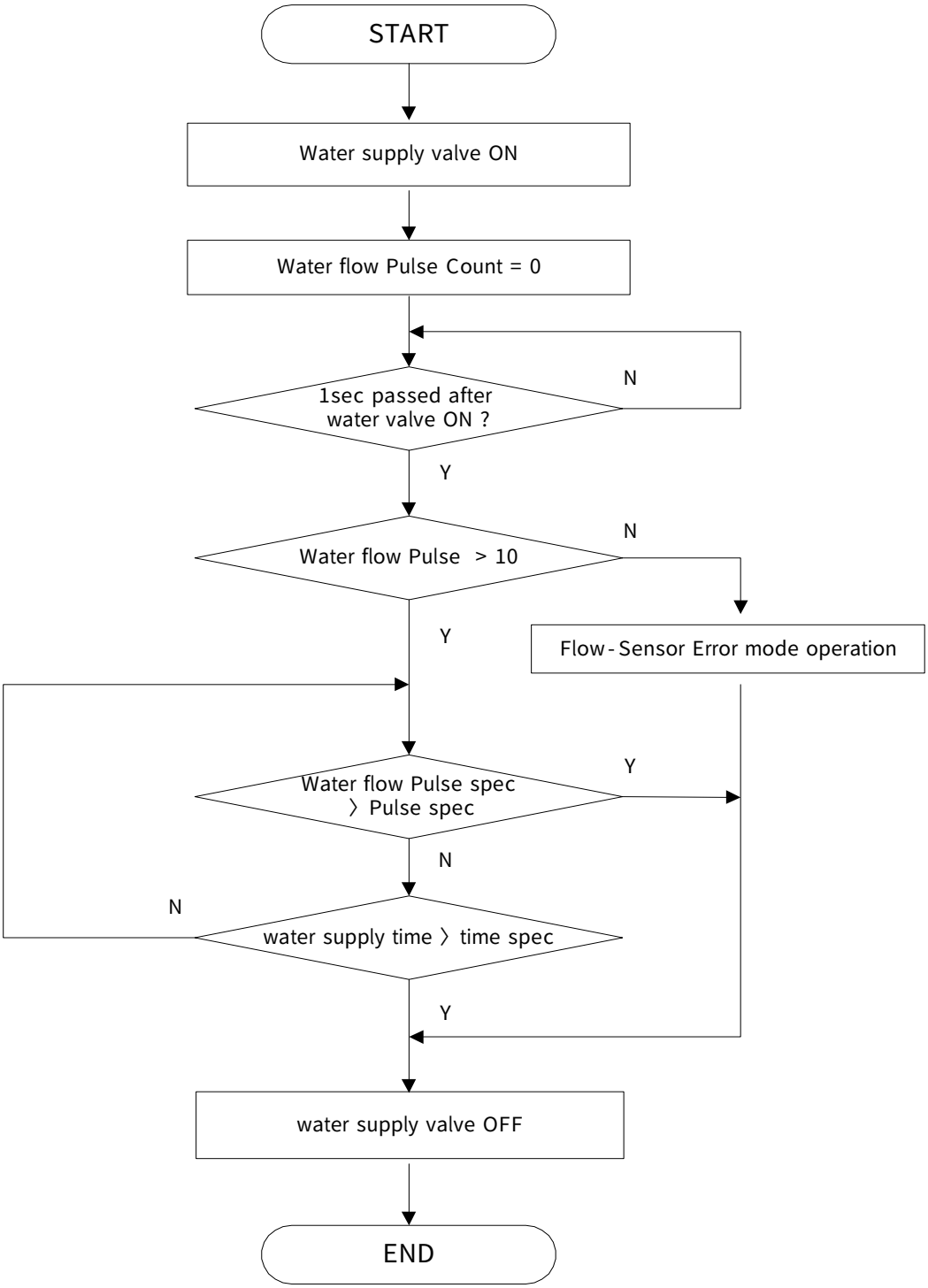
3. Ice separating (drop) mode



1) Time of each zone used to verify level switch error
2) The rotation of motor is sensed at each zone
3) In case of level switch error, ice separation is done by time.
4) If ice separating motor has error, the mode stop.

CONTENTS	REMARKS

4. Water supply mode



CONTENTS	REMARKS
1) Water supply valve is open when water supply mode starts after separation of ices. 2) Water is supplied by time in case sensor has error. 3) Factor valve is variable which can be useful in AS action ① Water flow pulse is set to 238 if flow sensor is in normal condition. (If water is supplied by time, maximum water supply time 165 seconds) ② In case water flow sensor has error, water time is 5.5 seconds. 5. Water supply check mode 5 minutes after water supply the status can be checked by RT-sensor and increase of temp. Ice sensor.	

RT-S	9℃↓	~15℃	~21℃	~31℃	~41℃	41℃↑
I-S	-10℃	-9℃	-8℃	-7℃	-6℃	-5℃

4-12. Dispenser Control Function

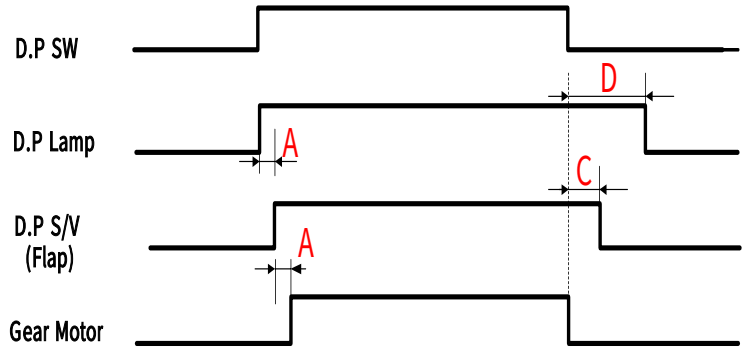
INPUT	CONTROL OBJECT
Dispenser switch “Dispenser” button ICE MAKER LOCK Button Freezer Door Switch	Dispenser Lamp Crusher Motor Flap Solenoid Crusher Solenoid Dispenser Water Valve

CONTENTS	REMARKS
1) Initial mode : water (Mode change : Water → Crushed ice → Cubed ice →Ice maker Lock) - Selected icon LED turns ON and others are OFF. 2) Display ① Water icon turns ON as default mode ② The ICON of each mode turns ON by pressing its button. (If display switch makes error during operation of a mode, its ICON turns OFF) ③ When Icemaker Lock ICON turns ON. - ICE MAKER LOCK ICON turns ON - If it is in the mode of Cubed Ice or Crushed Ice, the mode is changed to Water and Water ICON turns ON	

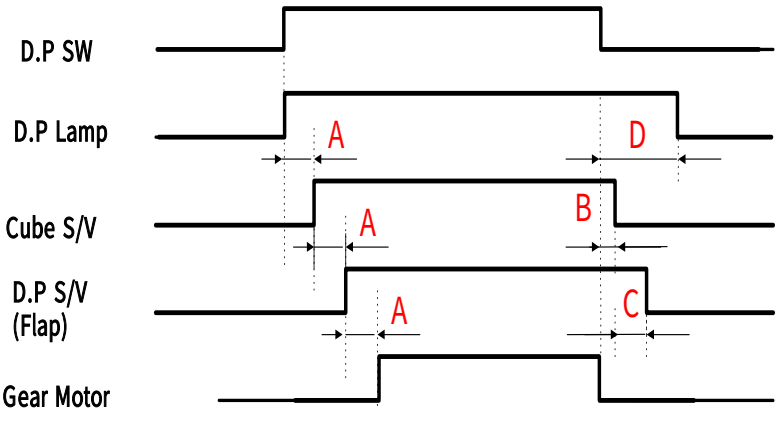
CONTENTS	REMARKS

3) Control Flow & Timing Chart

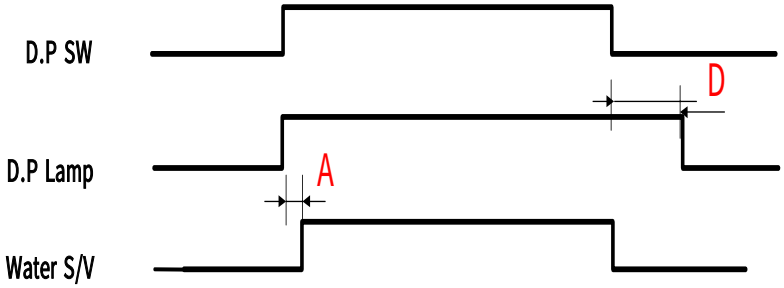
① Crushed Ice



② Cubed Ice



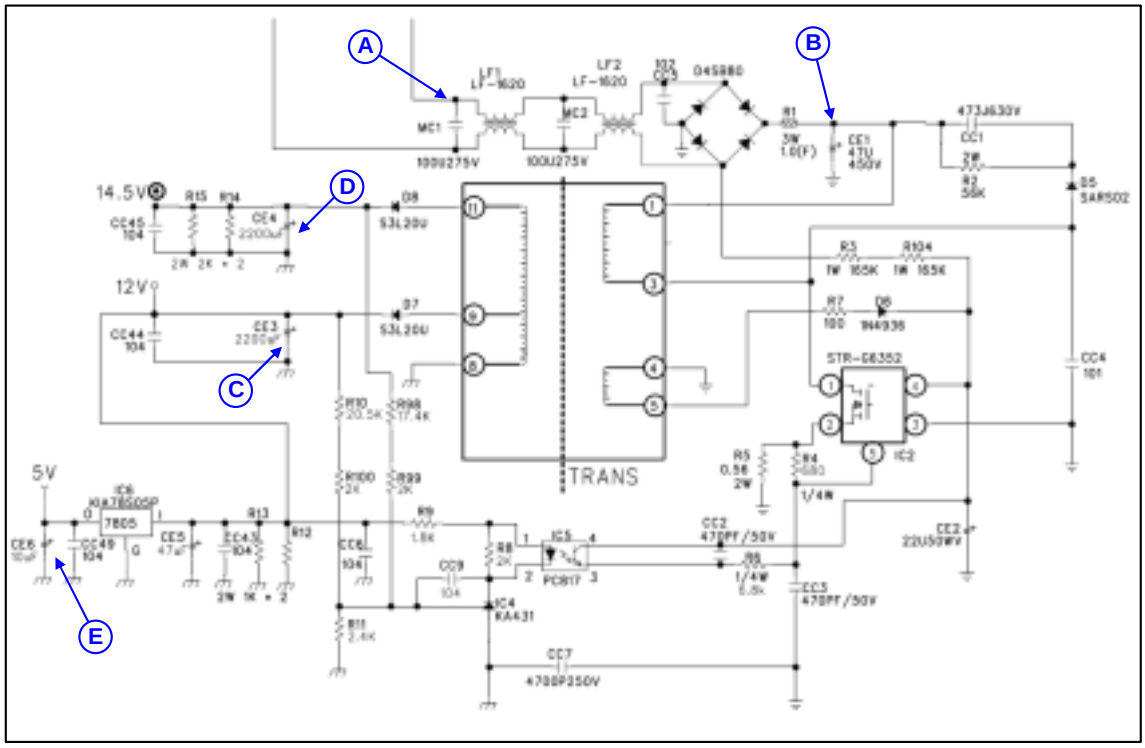
③ Water



Delay time : A = 500ms, B = 500ms, C = 2.0s, D = 5.0s

5. CIRCUIT OPERATION

5-1. Power Circuit Diagram



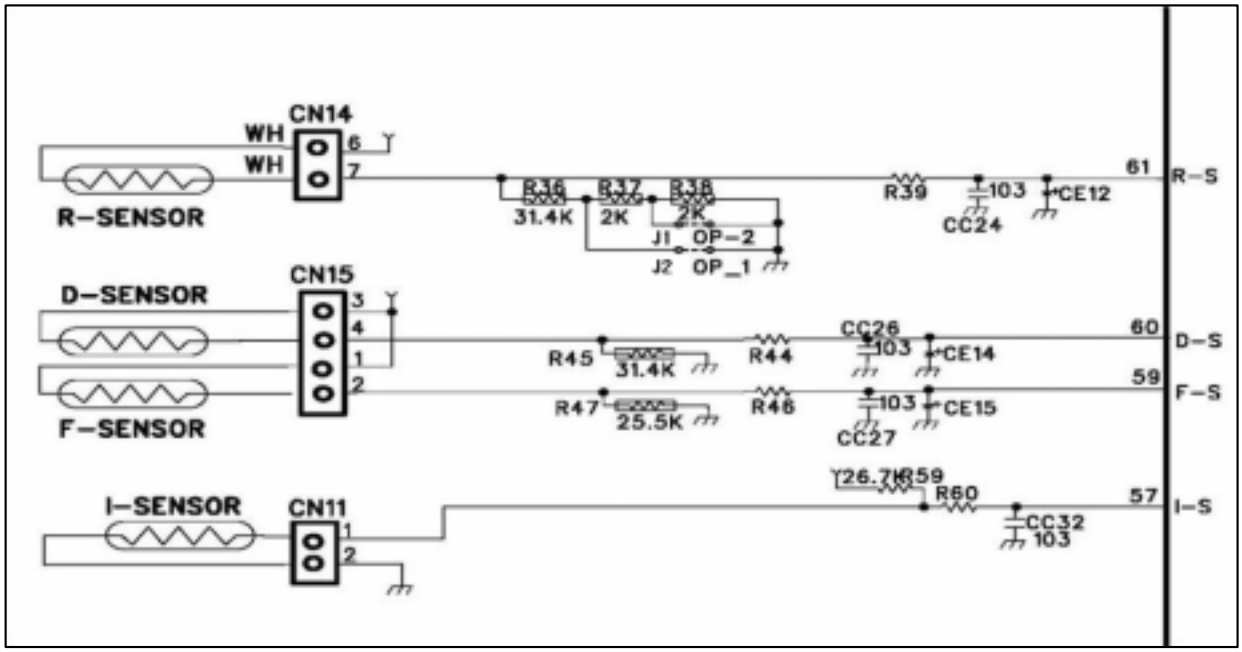
※ Voltage of every part

Parts	A	B	C	D	E
	MC1	CE1	CE3	CE4	CE6
Voltage	230Vac	310Vdc	12Vdc	14.5Vdc	5Vdc

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

5-2. Function of Each Sensor

CONTENTS	REMARKS



[F-sensor (A)]

1) It senses the temperature of freezer compartment and control Comp., F-fan ON/OFF
2) How it works;

Working Point	Low ON	Mid OFF	High OFF
Working Temp.	-11℃	-16℃	-19℃
Resistance	9.32kΩ	15.19kΩ	15.58kΩ
Sensing Voltage	3.24V	2.93V	2.73V

[R-sensor (B)]

1) It senses the temperature of refrigerator compartment and control R-fan ON/OFF
2) How it works;

Working Point	Low ON	Mid OFF	High OFF
Working Temp.	7.7℃	5.2℃	3.2℃
Resistance	23.33kΩ	24.05kΩ	24.76kΩ
Sensing Voltage	2.96V	2.83V	2.72V

[D-sensor (C)]

1) It senses return point of defrosting heater.
2) How it works;

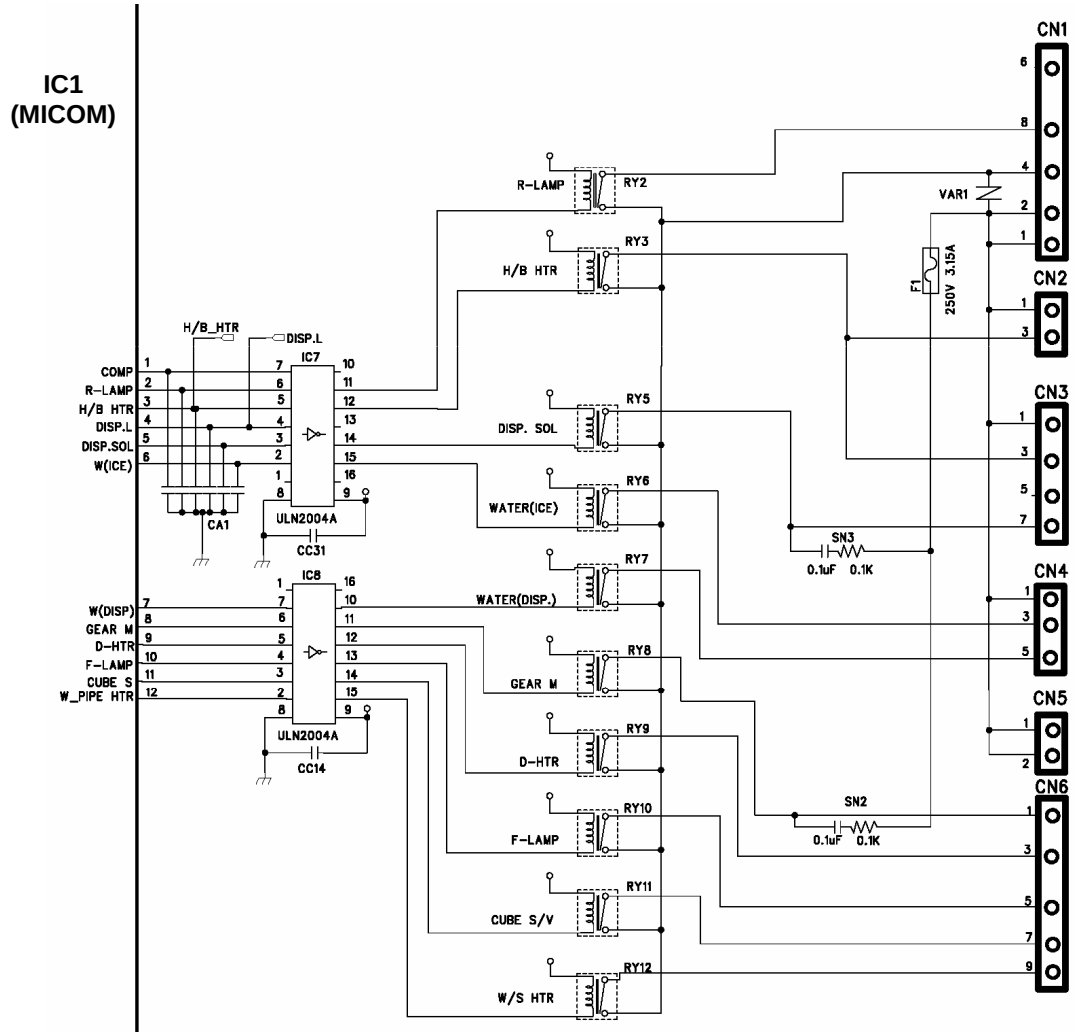
Working Point	Return point of defrosting heater
Working Temp.	13℃
Resistance	22.56kΩ
Sensing Voltage	3.08V

* In case temperature of refrigerator compartment is weak or insufficient,
though comp. and R-fan operate in normal way;
1) Cut J1 on the M-PCB, then temp. is lowered 1.5℃ than [Mid OFF point]
2) Cut J1 and J2 on the M-PCB, then the temp, is lowered 3 ℃

5-3. Relay Function

CONTENTS	REMARKS

1. Circuit Diagram

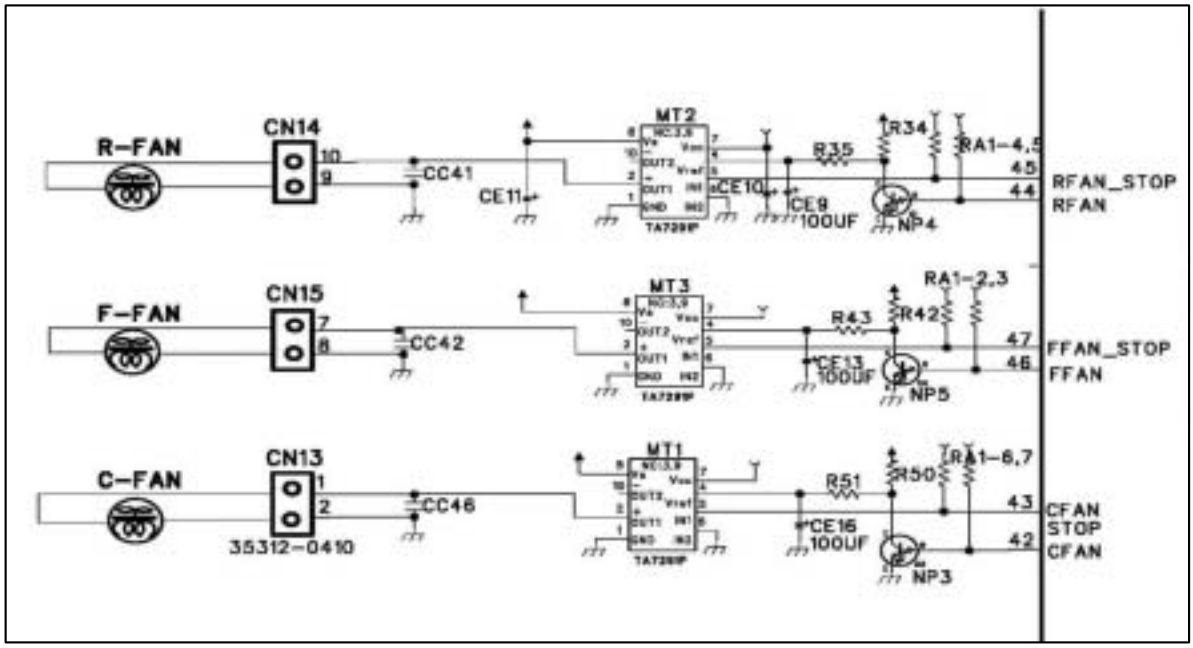


2. How it works;

Control	Control Mode Method	ON Condition				OFF Condition			
		MICOM Port		IC ULN2004 Output pin		MICOM Port		IC ULN2004 Output pin	
-	-	#1	5.0V	IC7	#10 0.7V	#1	0V	IC7	#10 12V
R-Lamp	Relay 2	#2	5.0V		#11 0.7V	#2	0V		#11 12V
H/B Heater	Relay 3	#3	5.0V		#12 0.7V	#3	0V		#12 12V
-	-	#4	5.0V		#13 0.7V	#4	0V		#13 12V
Dispenser-Solenoid	Relay 5	#5	5.0V		#14 0.7V	#5	0V		#14 12V
Water valve (Ice)	Relay 6	#6	5.0V		#15 0.7V	#6	0V		#15 12V
Water valve (Dispenser)	Relay 7	#7	5.0V	IC8	#10 0.7V	#7	0V	IC8	#10 12V
Geared-Motor	Relay 8	#8	5.0V		#11 0.7V	#8	0V		#11 12V
Defrost-Heater	Relay 9	#9	5.0V		#12 0.7V	#9	0V		#12 12V
F-Lamp	Relay 10	#10	5.0V		#13 0.7V	#10	0V		#13 12V
Cube-Solenoid	Relay 11	#11	5.0V		#14 0.7V	#11	0V		#14 12V
Water Pipe Heater	Relay 12	#12	5.0V		#15 0.7V	#12	0V		#15 12V

5-4. Fan Function

1. Circuit Diagram



2. Explanation for the operation

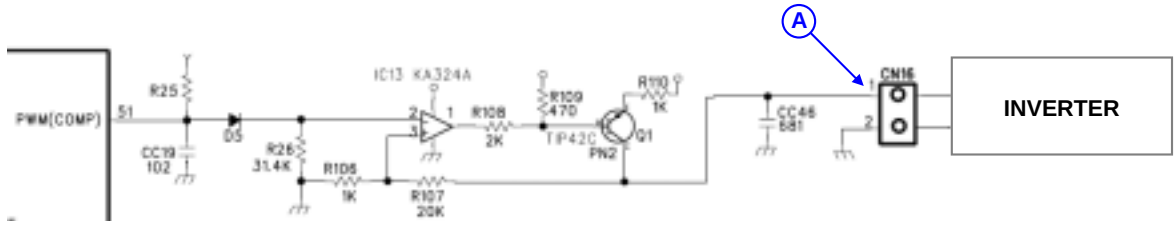
* TA7291P is the drive IC for the only DC motor, and used for control of the fan motor
* One input and output is used for the control of the fan motor

Input	Output	Remark
Motor IC No.5 Pin (R:MT2/F:MT3/C:MT1)	Motor IC No.2 Pin (R:MT2/F:MT3/C:MT1)	
High	High	13V
Low	Low	Stop

- Vref is the reference voltage for the adjustment of the output voltage by the voltage distribution of Vs (Maximum output voltage), and the output voltage applied to the fan is determined by the PWM control using the software.

5-5. Compressor speed control

1. Circuit Diagram

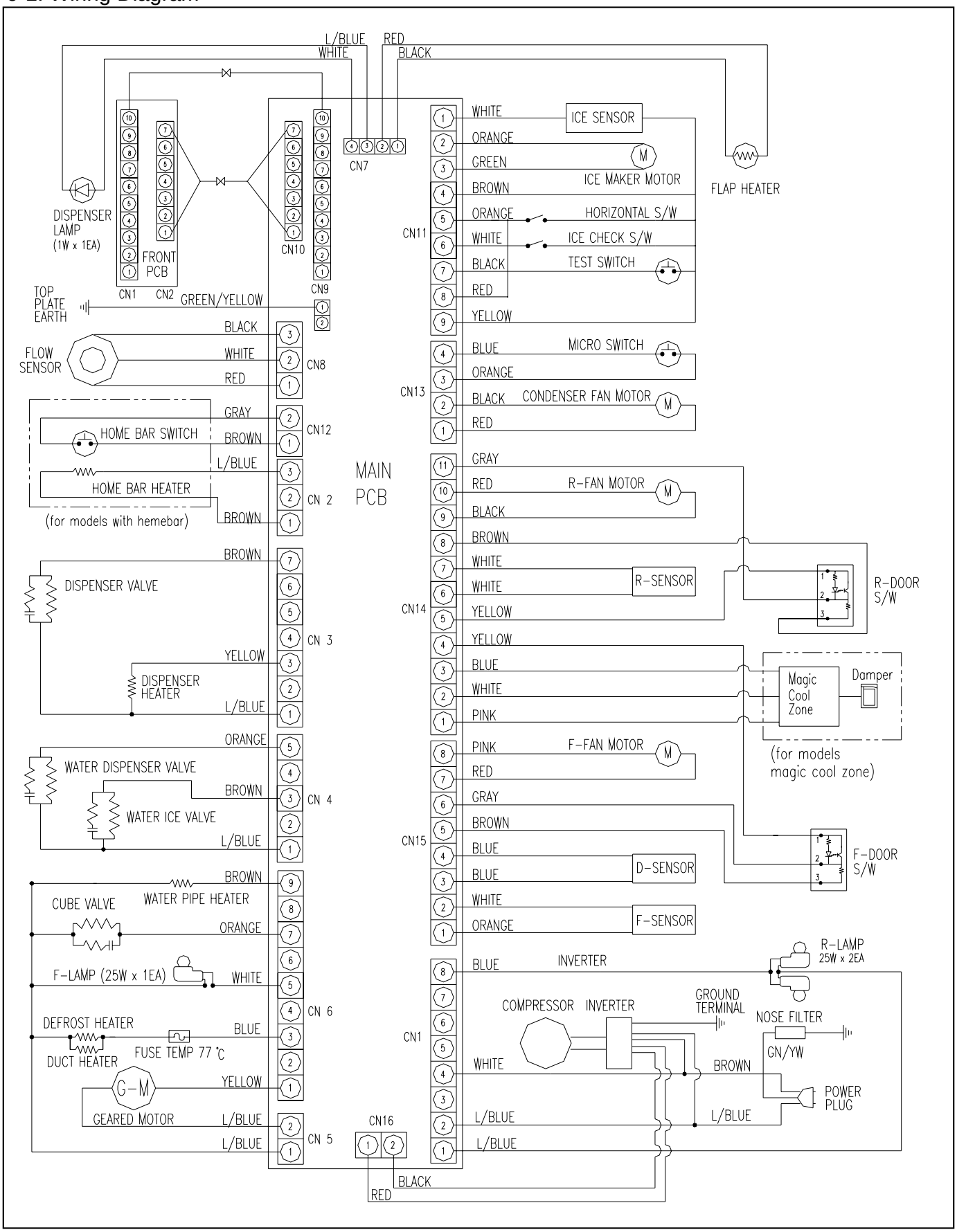


2. Measure the Frequency Output Signal from Main-PCB.

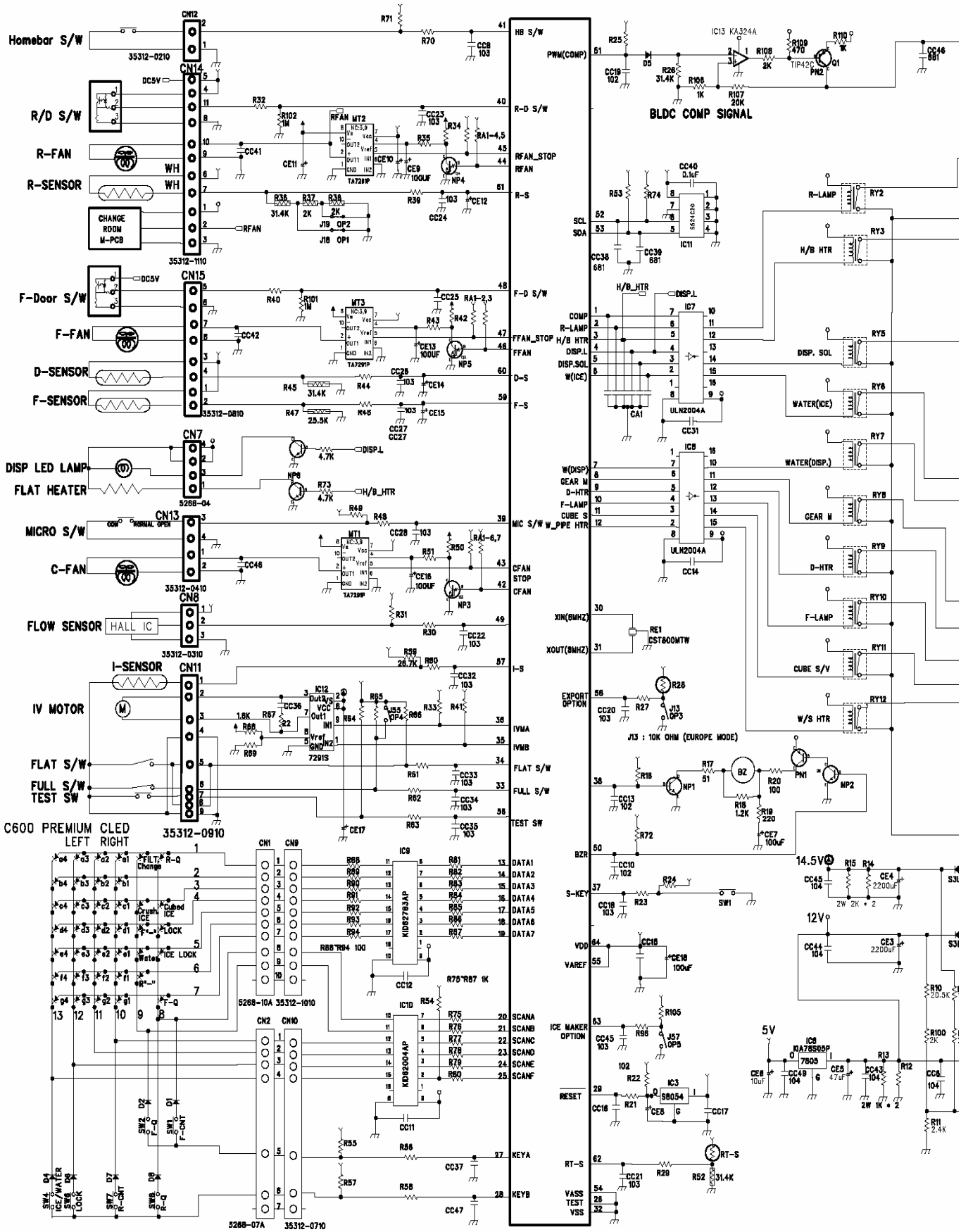
Condition	Frequency Output Signal (CN 16 of Main-PCB)	Signal Image
Normal operation (RT-Sensor 35℃↑)	122 Hz	
Normal operation (RT-Sensor 35℃↓)	85 Hz	
Initial Power connected Super FRZ Super REF Weak-Cool	122 Hz	

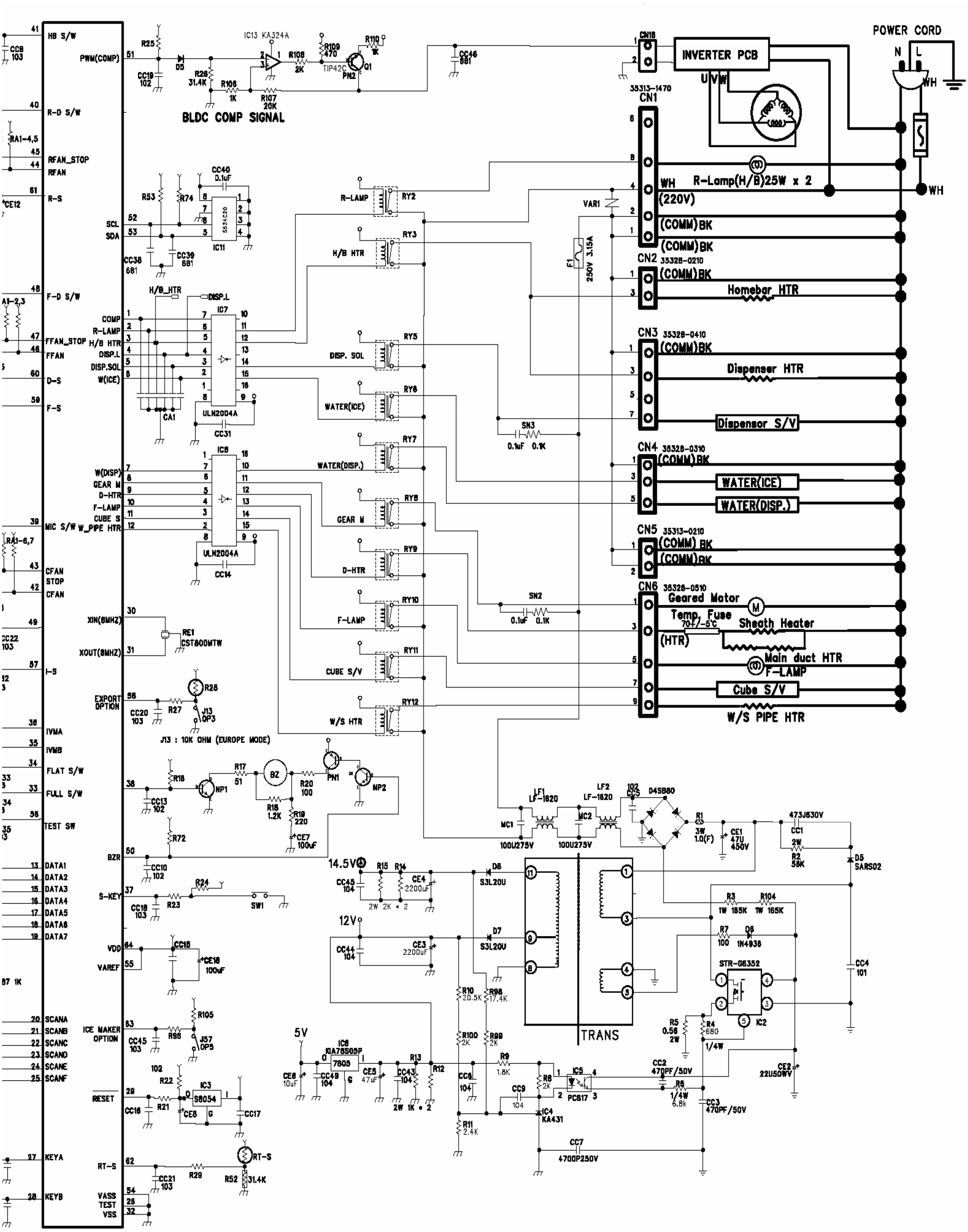
6. DIAGRAM

6-1. Wiring Diagram



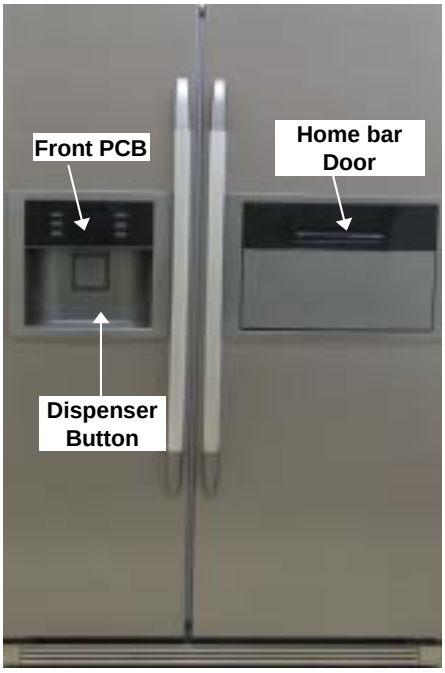
6-2. Circuit Diagram of Main PCB



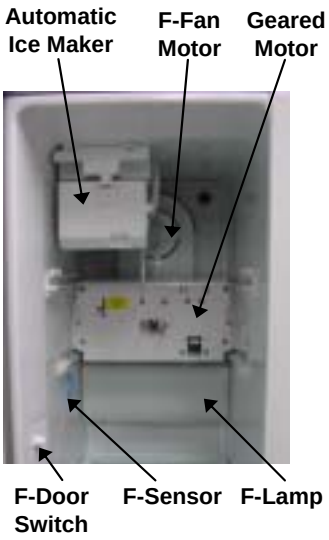

POWER CORD
INVERTER PCB
BLDC COMP SIGNAL
IC13 KA324A
TIP42C
CN16
35313-1470
CN1
R-Lamp(H/B)25W x 2
(220V)
(COMM)BK
VAR1
250V 3.15A
CN2 35328-0210
Homebar HTR
CN3 35328-0410
Dispenser HTR
Dispensor S/V
CN4 35328-0310
WATER(ICE)
WATER(DISP.)
CN5 35313-0210
CN6 35328-0510
Geared Motor
Temp. Fuse
Sheath Heater
(HTR)
Main duct HTR
F-LAMP
Cube S/V
W/S PIPE HTR
R-LAMP
H/B HTR
DISP. SOL
WATER(ICE)
WATER(DISP.)
GEAR M
D-HTR
F-LAMP
CUBE S/V
W/S HTR
ULN2004A
J13 : 10K OHM (EUROPE MODE)
EXPORT OPTION
ICE MAKER OPTION
RESET
LF1 LF-1620
LF2 LF-1620
D4SB60
STR-G6352
TRANS
KA431
PC817
S80S4
KIA78S05P
HB S/W
PWM(COMP)
R-D S/W
RFAN_STOP
RFAN
R-S
F-D S/W
FFAN_STOP
FFAN
D-S
F-S
MIC S/W
CFAN STOP
CFAN
I-S
IVMA
IVMB
FLAT S/W
FULL S/W
TEST SW
DATA1
DATA2
DATA3
DATA4
DATA5
DATA6
DATA7
SCANA
SCANB
SCANC
SCAND
SCANE
SCANF
KEYA
KEYB
XIN(8MHZ)
XOUT(8MHZ)
CST800MTW
S-KEY
VDD
VAREF
BZR
RT-S
VASS
TEST
VSS
14.5V
12V
5V

7. COMPONENT LOCATION

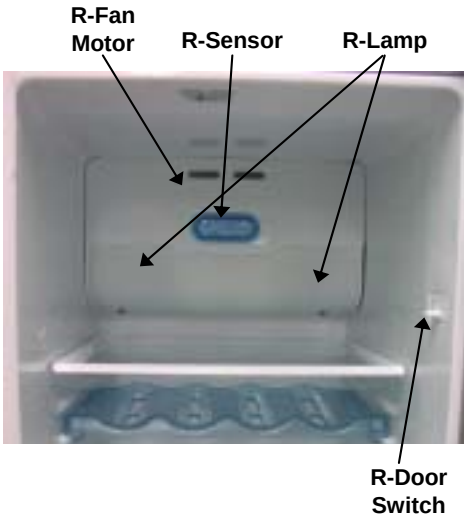
7-1. Front View



7-2. Inner View

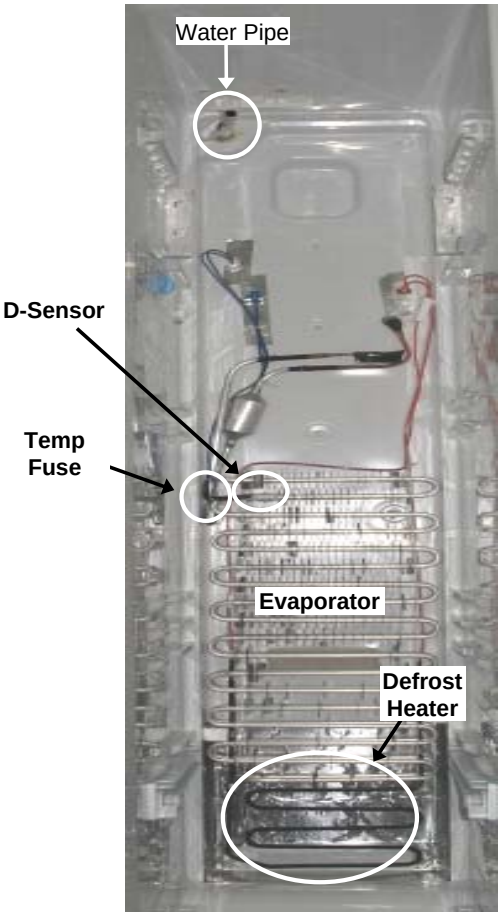


Freezer Compartment

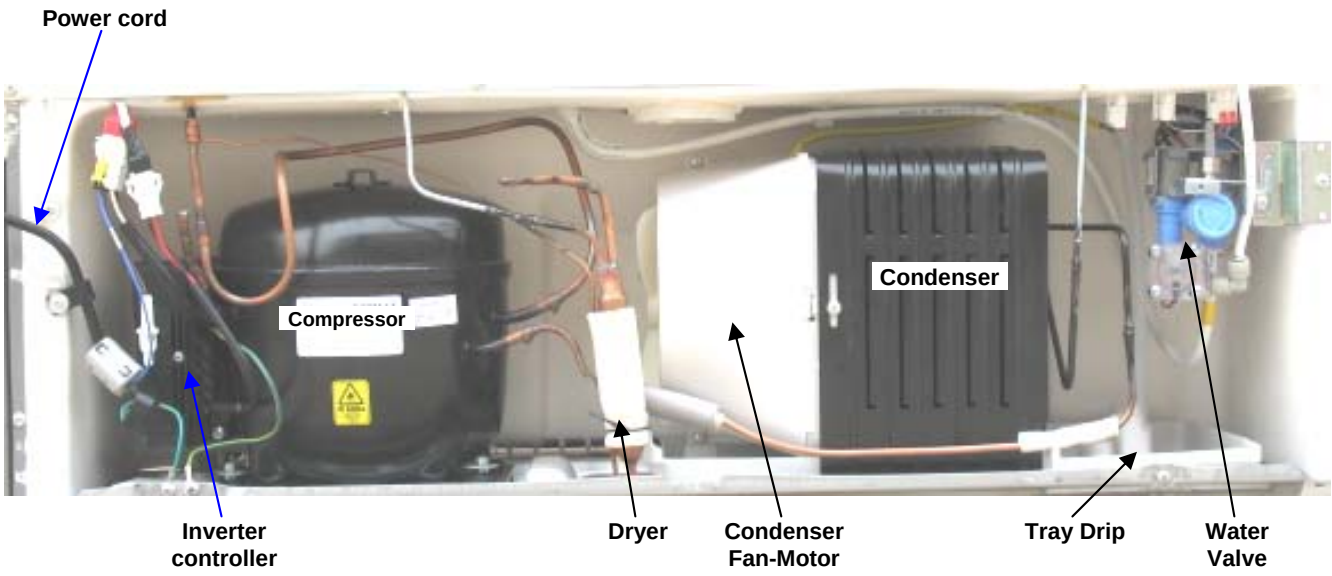


Refrigerator Compartment

7-3. Evaporator



7-4. Machine Compartment



8. HOW TO CHECK EACH PARTS

8-1. Hose Ice Maker Tube Assembly

1) Disassembling Procedure

NO	DISASSEMBLING PROCEDURE	NO	DISASSEMBLING PROCEDURE
1	 ▷Pull forward Ice Storage Case	5	 ▷Remove 2 screws at the Cove Guide Cab W/Tube A.
2	 ▷Remove 2 screws.	6	 ▷Disassemble Cover Guide Cab W/Tube A
3	 ▷Pull forward Ice Maker.	7	 ▷Pull forward Hose Ice Maker Tube As.
4	 ▷Remove Water Hose Heater's 2P housing.	8	 ▷Check Hose Ice Maker Tube As.

2) How to check Hose Ice Maker Tube As.

How to check	CRITERION
 ▷Measure the resistance of two wire	▷Good: 9680Ω(±8%) (8900 ~ 10456Ω) ▷If defective, change

8-2. Bracket Geared Motor Assembly

1) Disassembling Procedure

NO	DISASSEMBLING PROCEDURE	NO	DISASSEMBLING PROCEDURE
1	 ▷Remove 2 screws.	4	 ▷Pull forward Bracket Geared Motor.
2	 ▷Unscrew (4 points).	5	 Unscrew (red 4 screws). Unscrew (blue 4 screws).
3	 ▷Separate 6 pin housing of Bracket Geared Motor from the top connector.	6	 ▷Check Solenoid Valve and Geared Motor.

2) How to Check Hose Ice Maker Tube Assembly

PARTS	SPEC.	HOW TO CHECK	CRITERION
Geared Motor	▷SPEC. NAME :DAG-6502DEC ▷VOLTAGE :220/240V,50Hz	 ▷Check resistance value of 2 terminals with a Multi Tester.	▷GOOD : 11.3Ω(±10%) (10.8 ~ 12.7Ω) ▷DEFECTIVE ; Change the Geared Motor.
Cube Sol Valve	▷SPEC. NAME :Cube SN8 ▷VOLTAGE :220/240V,50Hz	 ▷Check resistance value of 2 terminals with a Multi Tester.	▷GOOD : 145Ω(±8%) (133 ~ 156Ω) ▷DEFECTIVE ; Change the Cube Sol Valve.

8-3. Dispenser Micro Switch

1) Disassembling Procedure

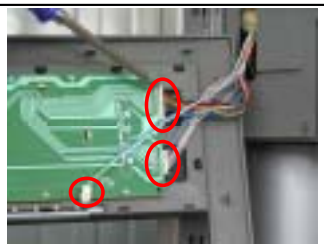
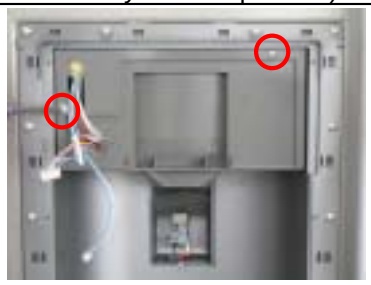
NO	DISASSEMBLING PROCEDURE	NO	DISASSEMBLING PROCEDURE
1	 ▷ Insert (-) screw driver into bottom hole of dispenser button guide. Pull up forward to remove the guide. (Be careful not to damage guide surface.)	3	 ▷Separate wire connectors from Micro Switch.
2	 ▷ Remove Micro switch.	4	 ▷Check Micro Switch.

2) How to Check Micro Switch

PARTS	HOW TO CHECK	CRITERION
SPEC. NAME : VP333A-OD-8 VOLTAGE :125V,3A	 ▷Check both terminals (red circle) with a Multi Tester (Tester Mode : Resistance (Ω).	▷GOOD : Tact Switch (Blue Circle) / Terminals (Red circle) / Tester Result (Resistance Mode) ON (Close) / Connected / Some Value OFF (Open) / Disconnected / No value (0) ▷DEFECTIVE : Change Micro Switch.

8-4. Dispenser Solenoid Valve

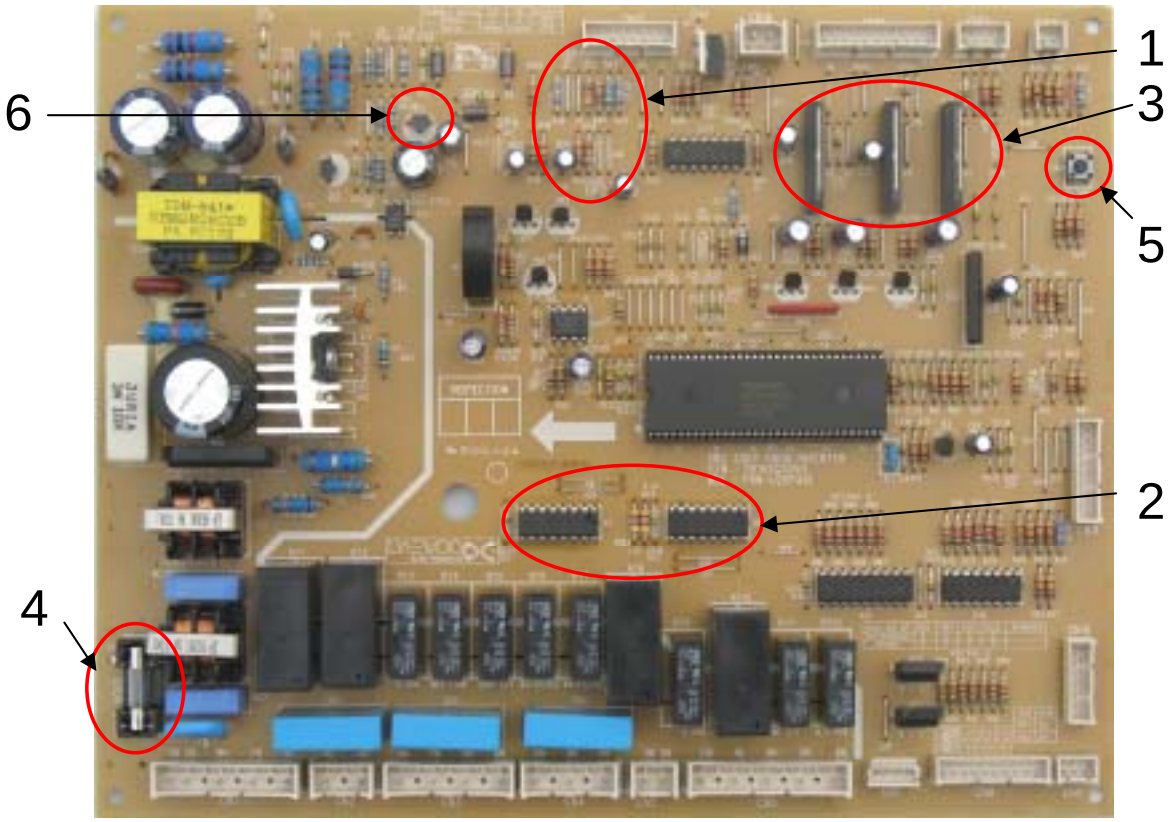
1) Disassembling Procedure

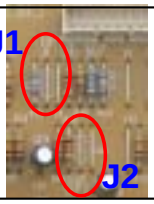
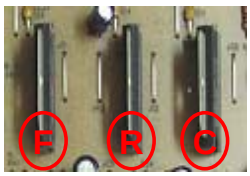
NO	DISASSEMBLING PROCEDURE	NO	DISASSEMBLING PROCEDURE
1	 ▷ Insert (-) screw driver into bottom left groove of Cover Dispenser Box. Pull forward with a snap.(Be careful not to damage cover and door surface.)	4	  ▷Separate 2 terminals from Sol Valve and 2P Housings from Cover Ice Flap.
2	 ▷ Separate 2 housings of 10P / 7P from Front PCB. (Do not hold only wires to pull out.)	5	 ▷Unscrew (3 points) to remove Sol Valve.
3	 ▷Unscrew (2 points) to remove Box Dispenser Shut.	6	 ▷Unscrew (1 point) to remove Cover Ice Flap.

2) How to Check Micro Switch

PARTS	SPEC.	HOW TO CHECK	CRITERION
Dispenser Sol Valve	▷SPEC. NAME :SOL2003-01B ▷VOLTAGE :220/240V,50Hz	 ▷Check resistance value of both terminals with a tester.	▷ Good : 215Ω(±10%) (193 ~ 236Ω) ▷DEFECTIVE : 0 Change Sol Valve.
Flap Heater Assembly	▷VOLTAGE :DC 12V,1.5W	 ▷Check resistance value of both terminals with a tester.	▷GOOD : 96Ω(±8%) (88 ~ 104Ω) ▷DEFECTIVE ; Change Flap Heater AS.

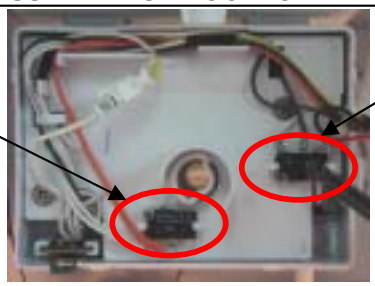
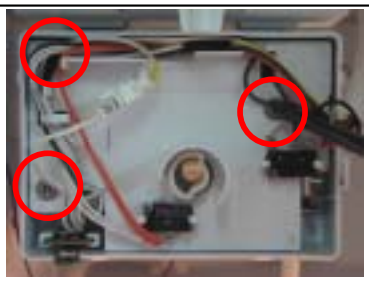
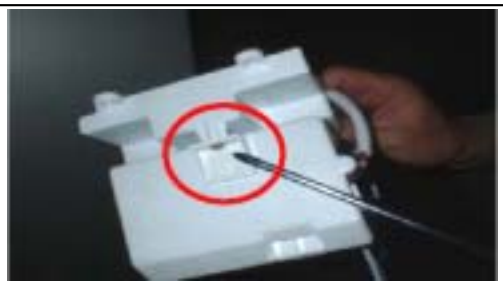
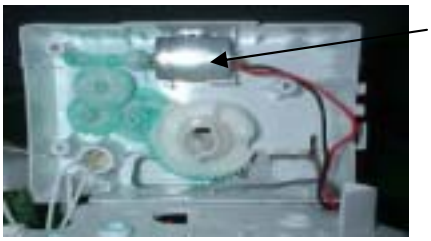
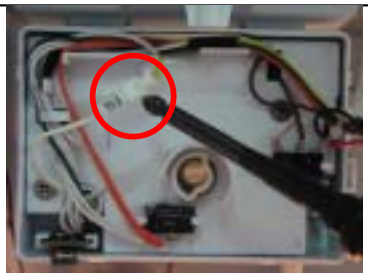
8-5. Main PCB



NO	ITEM	CHECK POINT	REMARK
1	Compensation of Weak Refrigeration →Making R-temp cooler	 * Used when making R-temp. down to compensate for weak refrigeration without changing FCP temp. setting. ▷Cutting of J1 : down by 1.5 ℃ ▷Cutting of J1 & J2 : down by 3℃	
2	Relay Power Controller	* To check normal voltage of each electrical devices to & from Mi-com. ▷Check input & output voltage of MICOM and IC7, 8.	
3	Fan Power Controller	 * To check input & output voltage of Fan  ▷#2 : Input ▷#5 : Output	
4	Electric Current Fuse	* To check when each device does not work (250V,3.15A)	
5	Time Shortening Switch	* To shorten time in PCB checkup (Pressing 1 time is regarded as 1 minute has passed.)	
6	Regurator IC(5V)	* To check voltage of MICOM and IC Voltage check of IC#6 (Input :12V,Output : 5V)	

8-6. Ice Maker

1) Disassembling Procedure

NO	DISASSEMBLING PROCEDURE	NO	DISASSEMBLING PROCEDURE
1	 ▷ Remove 2 screws on top front of ice maker.	6	 ▷Remove full ice sensing switch and level switch.
2	 ▷ Pull forward ice maker.	7	 ▷Unscrew (3 points) Plate Gear Fixture.
3	 ▷Unscrew Fixture of Frame Ice Maker.	8	 ▷ Check if ice dropping motor is normal.
4	 ▷Separate Ice Maker Assembly from Frame Ice Maker.	9	 ▷Remove 2 pin housing (ice sensor)
5	 ▷ Separate Cover I/M (A) from Cover I/M (B) with a (-) screw driver.	10	 ▷ Remove I-sensor (ice sensor) from Case Icing assembly.

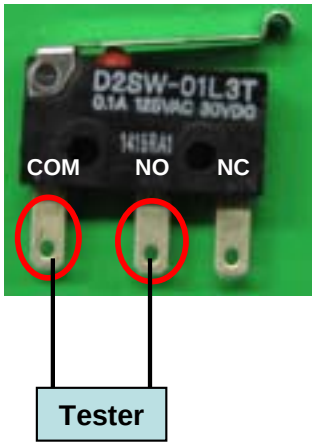
* Follow the reverse order when assembling.

2) How to Check Ice Maker

<table>
<tr><th>PARTS</th><th>HOW TO CHECK</th><th>CRITERION</th></tr>
<tr><td>Ice dropping motor</td><td> 
▷ Check resistance between 2 wires with tester.</td><td>▷ GOOD : RS-360RH-14250
: 6 ~ 14Ω

▷ DEFECTIVE :
Change the motor.</td></tr>
<tr><td>I-Sensor
(Ice Sensor)</td><td> 
▷ Check resistance between 2 terminals with tester.</td><td>▷ GOOD : 4.4 ~ 50kΩ
(It depends on ambient temperature)

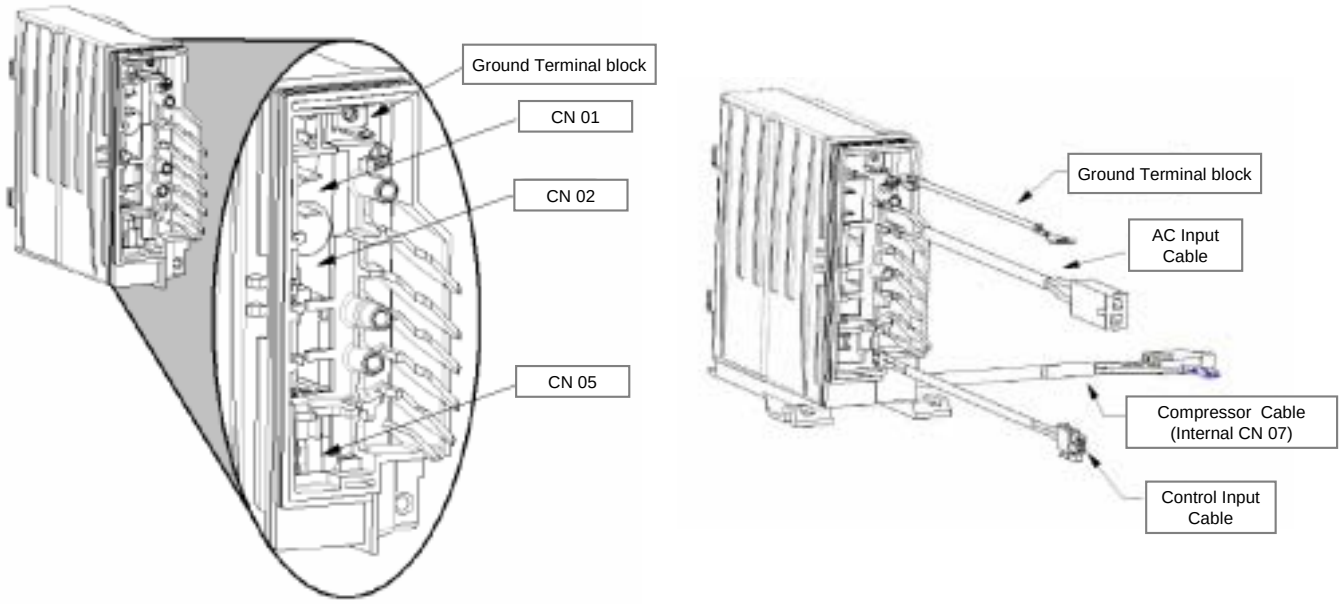
▷ DEFECTIVE :
Change the sensor.</td></tr>
<tr><td>Full ice
sensing switch

Level Switch</td><td> 

▷ Check the resistance between 2 terminals (COM ~ NO) with tester.</td><td>▷ GOOD :
<table>
<tr><th>Tact Switch (Lever)</th><th>Terminals (COM~NO)</th><th>Tester Result (Resistance Mode)</th></tr>
<tr><td>Push</td><td>Connected (Close)</td><td>0Ω</td></tr>
<tr><td>Normal</td><td>Disconnected (Open)</td><td>∞Ω</td></tr>
</table>
▷ DEFECTIVE :
Change the switch.</td></tr>
</table>

8-7. Inverter

8-7-1. Connections & Cables



CONNECTION	DESCRIPTION	PIN	DESCRIPTION	
CN 01	**AC Input Connection** The AC power supply must be connected on this connection.	N	Neutral	
		P	Phase (Live)	
CN 02	**Auxiliary AC Connection** It provides an auxiliary AC power connection that supplies energy for other devices, like a lamp or other facilities.	N	Neutral	Not applied
		N	Neutral	
		P	Phase	
Ground Terminal Block	**EMI & Safety Ground Connection** External Ground Terminal Block.	-	-	
CN 05	**Control Input Connection** The Inverter has different types of control signal, depending on the mode. (This refrigerator use the frequency signal mode)	GND	Ground	
		IN	Data In	
CN 07	**Compressor Connection (internal)** It is internal on Inverter Box. It is connected to the compressor using the compressor cable. This connection provides the power supply to the compressor.	-	-	

8-7-2. Inverter Control Mode

1) Frequency Mode

Controls the compressor speed through a frequency signal sent to the Inverter.

The frequency signal is a digital square wave, with 0 to +5V voltage amplitude and defined range as described ahead.

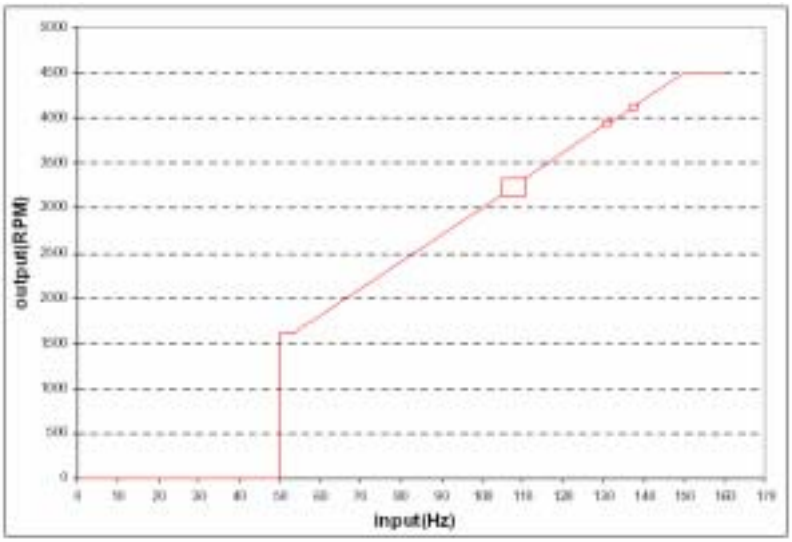
The duty cycle must be from 30% to 70%.

< Frequency signal >

2) Compressor speed

Compressor speed will follow the frequency signal, according to the relation described bellow.

Input Signal (Hz)	Comp Speed (rpm)
0 to 50	0
50.1 to 53.3	1,600
53.4 to 150	**30 x Hz**
105 to 111	hysteresis
130 to 132	hysteresis
136.6 to 138.6	hysteresis
> 150	4,500



< Relation between Inverter frequency and compressor rotation >

3) In this refrigerator, input frequency signals are used as below.

Condition		Input Frequency	Comp Speed
Ambient Temperature	Other conditions		
≥ 35℃	-	122 Hz	3660 rpm
< 35℃	Normal condition	85 Hz	2550 rpm
	Initial Power connected Weak-Cool Super FRZ Super REF	122 Hz	3660 rpm

4) Troubleshooting

▶ No Start

PROBLEM	ACTION
No Compressor Trial	
Compressor disconnected from the Inverter	Verify the Compressor Cable connection.
No AC power supply ; or wrong voltage/wrong Terminals connected to the Inverter.	Verify the AC Input Cable connection and measure the AC Input voltage.
No control signal input or bad connection.	Verify the Control Input Cable connection and measure the signal from the Main-PCB.
Blown fuse (due to previous major failure).	Return the unit to manufacturer, replacing it by a new one.
Open compressor motor winding.	Measure winding for open circuit between all pair of pins on the hermetic terminal. If one winding is open, replace it by a new one.
Compressor with locked rotor. (due to mechanical damage).	Replace compressor by a new one and test for confirmation.
Dropped, damaged, burnt Inverter.	Replace by a new one and test for confirmation.
Inverter on Waiting Time after failed start.	Wait the necessary time or reset the Inverter disconnecting it from the AC power supply. The reset time is about 15s.
Demagnetized rotor (only if compressor was previously connected directly to the AC power supply).	Replace compressor by a new one and test for confirmation.
Compressor positions rotor, But fails to start	
Unequaled pressures between discharge and suction pressures in the refrigerating system.	Allow the Inverter to equalize pressure between suction and discharge sides.
Open compressor motor winding.	Measure winding for open circuit between all pair of pins on the hermetic terminal. If one winding is open, replace it by a new one.
Too low AC voltage supplied to the Inverter.	Measure AC voltage to confirm; correct the voltage or change the Inverter to the correct voltage range (115V or 220V model).
Demagnetized rotor (only if compressor was previously connected directly to the AC power supply).	Replace compressor by a new one and test for confirmation.

▶ Malfunction during operation

PROBLEM	ACTION
Compressor does not run at the speed selected by the Inverter.	Too high compression load, with compressor being subjected to a stall condition. (lower suction and/or discharge pressures for correction).
	Too low AC voltage. Check the AC voltage supplied to the Inverter and set it to the required level or change the Inverter to the correct voltage range. (115V or 220V model).
	No or incorrect control signal. (check if the correct control signal is arriving at the control Input Connection).

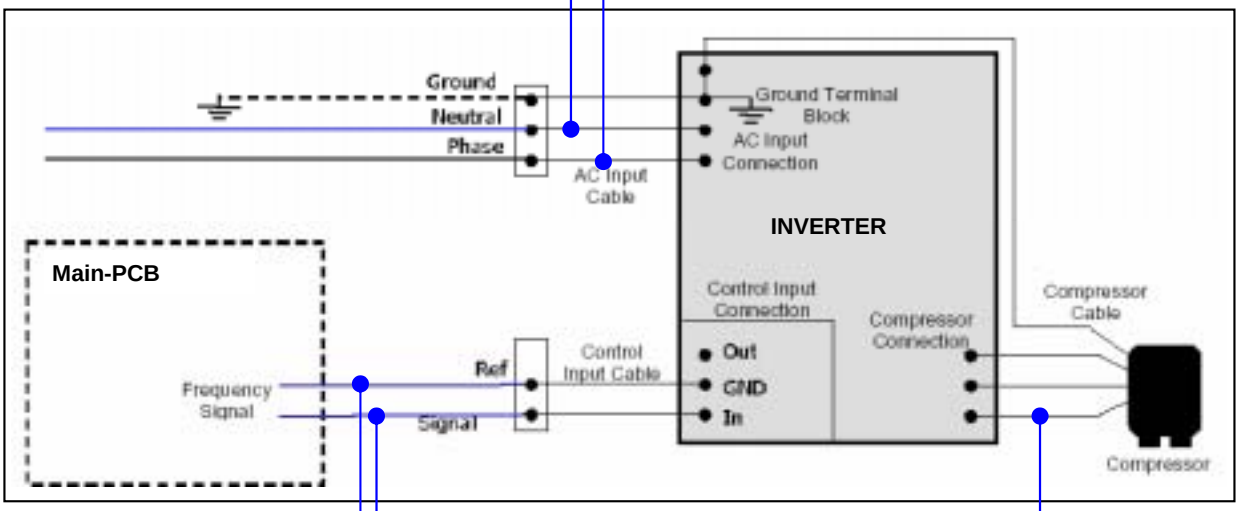
5) Frequency mode connection & Check point

The main-PCB is connected to the Inverter through the Control Input Connection, using the Control Input Cable.
Frequency signal to the IN pin and the 0V to the GND pin (see below Figure)

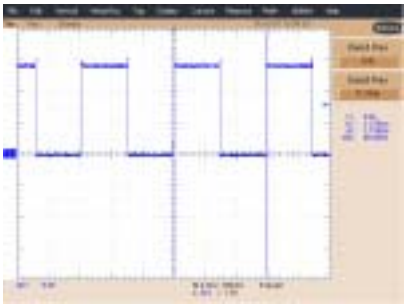
▶ **Inverter AC Input & Input & Output Signal**

① AC Input

Measure the AC input voltage with multi tester



② Input Signal

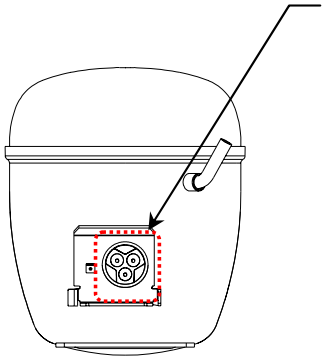


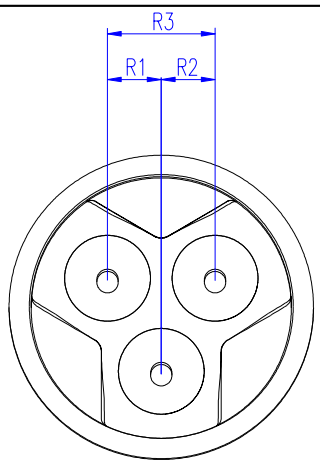
Measure the input signal frequency with Oscilloscope (Hz).

③ Output Signal

Measure the output signal frequency with Oscilloscope (Hz).

▶ **Compressor Motor Winding**



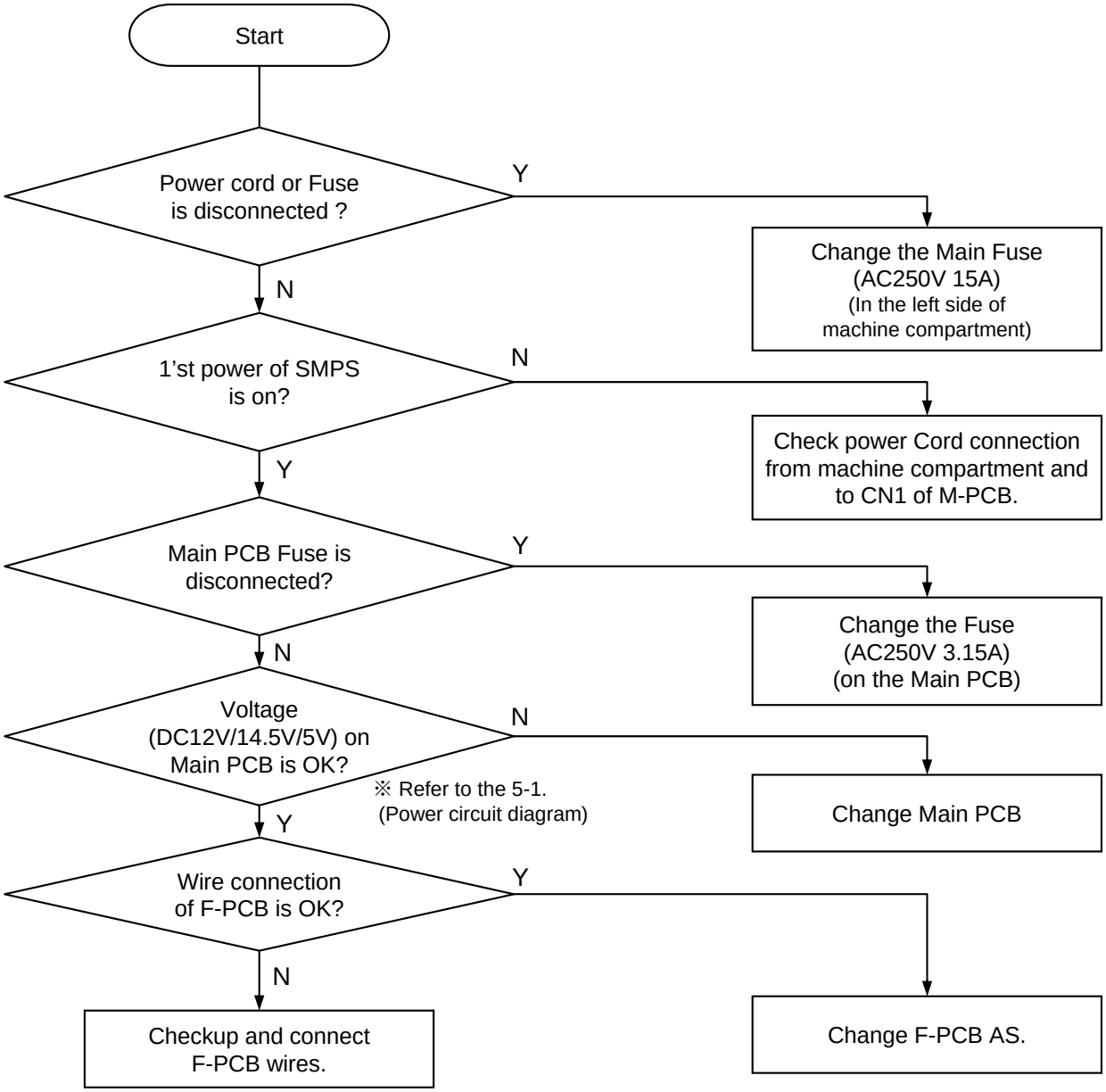


Measure winding for open circuit between all pair of pins on the hermetic terminal.

1) **R1 R2 R3**
⇒ Compressor Motor Winding is OK.
2) **R1 ≠ R2 ≠ R3**
⇒ Compressor Motor Winding is OPEN.

9. TROUBLE DIAGNOSIS

9-1. Faulty Start (F/R lights OFF , F-PCB Power OFF)



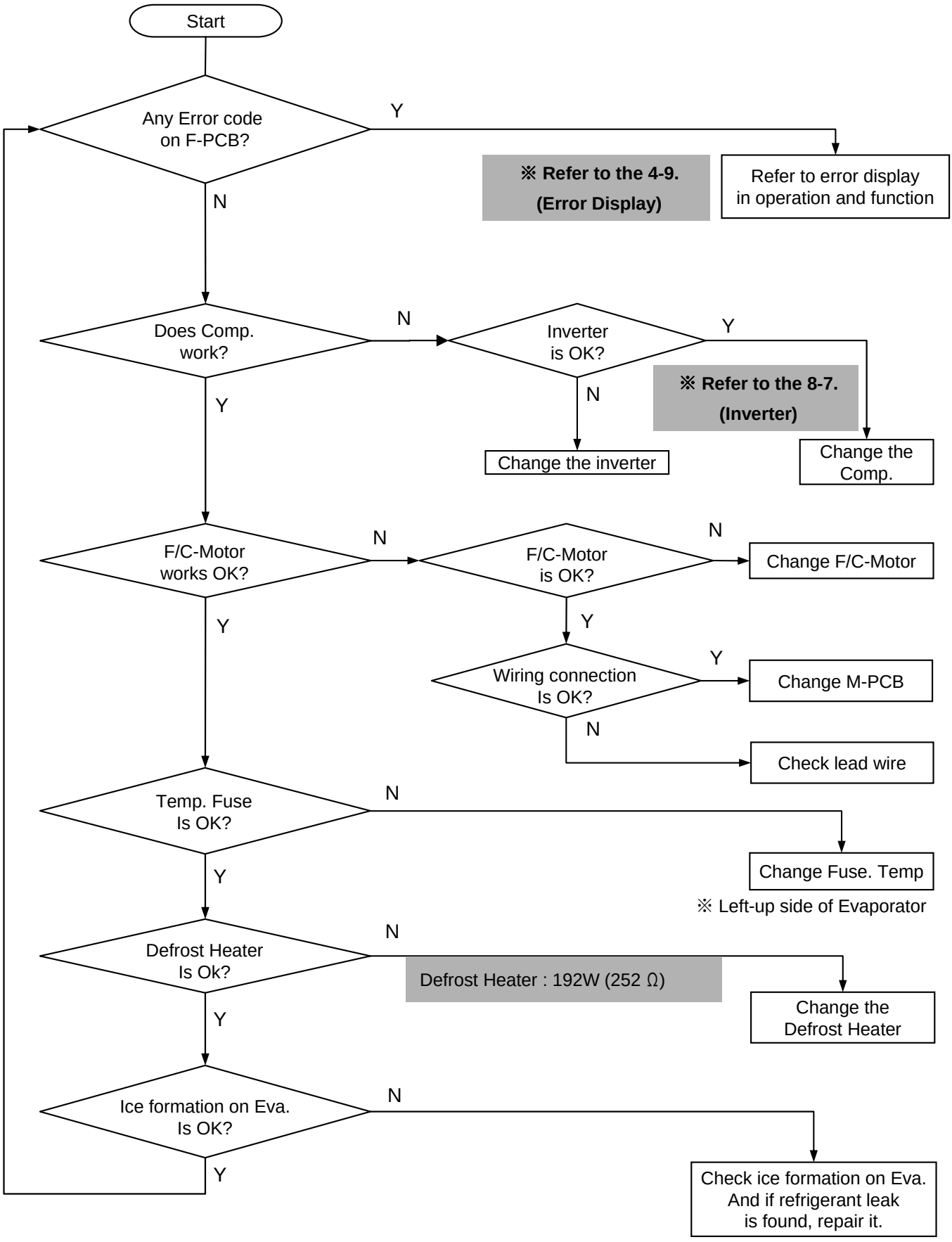
※ How to replace Front PCB

<Backside of Front PCB>

1) Insert a flat tip driver into the left down groove of panel frame and snap it out smoothly.
2) Separate 3 connector from Front PCB. (Do not hold only wires to pull out.)
3) Unscrew (7 points) to remove Front PCB.
   * Follow the reverse order when assembling.

9-2. Freezer Compartment

9-2-1. Freezing failure . (Foods are not frozen / cold.)

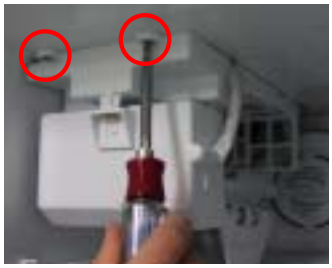


Removing and replacing Freezer parts

(1)

1) Remove foods.
2) Remove Ice Bucket, shelves and cases in Freezer compartment.

(2)



* Remove 2 screws of Ice Maker.

(3)

* Remove the Housing of Ice Maker AS. (Right side)

(4)

* Remove 4 screws of Geared Motor.

(5)

* Remove the Housing of Geared Motor AS. (Center)

Removing and replacing Freezer parts

(6)

* Remove light cover screws.

(7)

* Pull down smoothly the bottom of light cover to remove.

(8)

* Remove the screw of bracket F-Lamp.

(9)

* Remove the left housing.

(10)

* Pull out smoothly the bracket F-Lamp AS. to remove.

(11)

* Hold the end of F-Fan cover and pull forward slowly.

(12)

* Remove the screw cap on the F-Louver A with a flat tip driver.

(13)

* Remove 3 screws of F-Louver A.

(14)

* Hold the end of F-Louver A and pull forward slowly.

(15)

* Remove the housing.

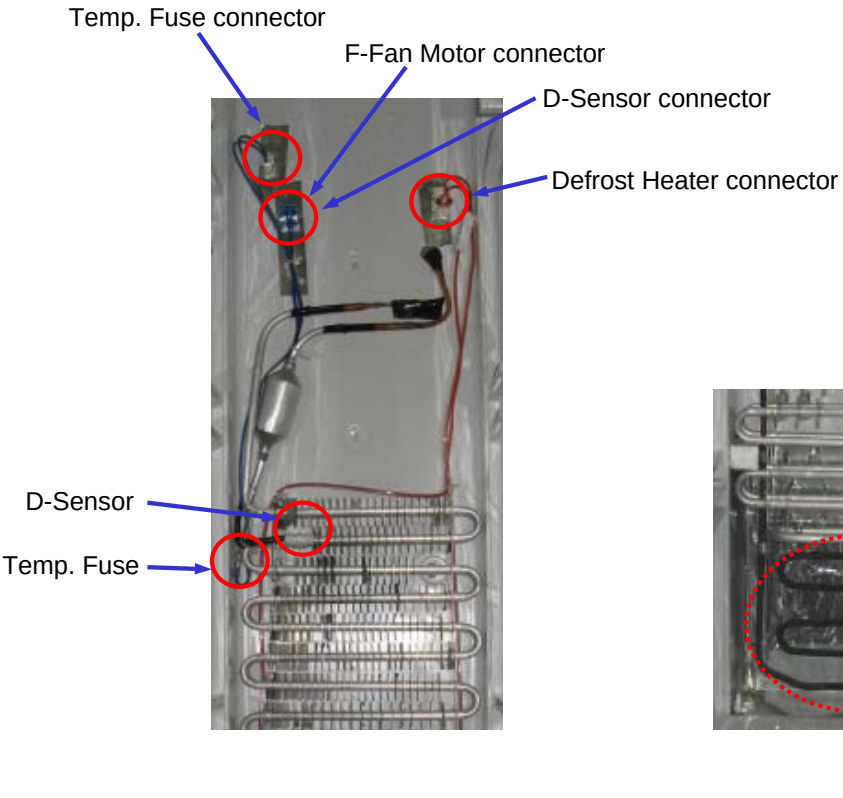
(16)

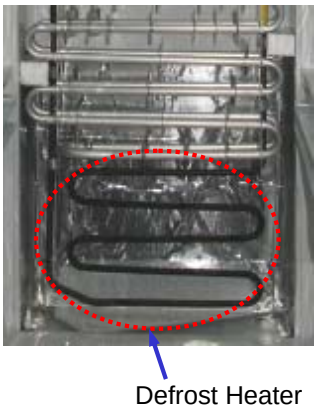
* Remove the screw of F-Return cover and pull out cover.

(17

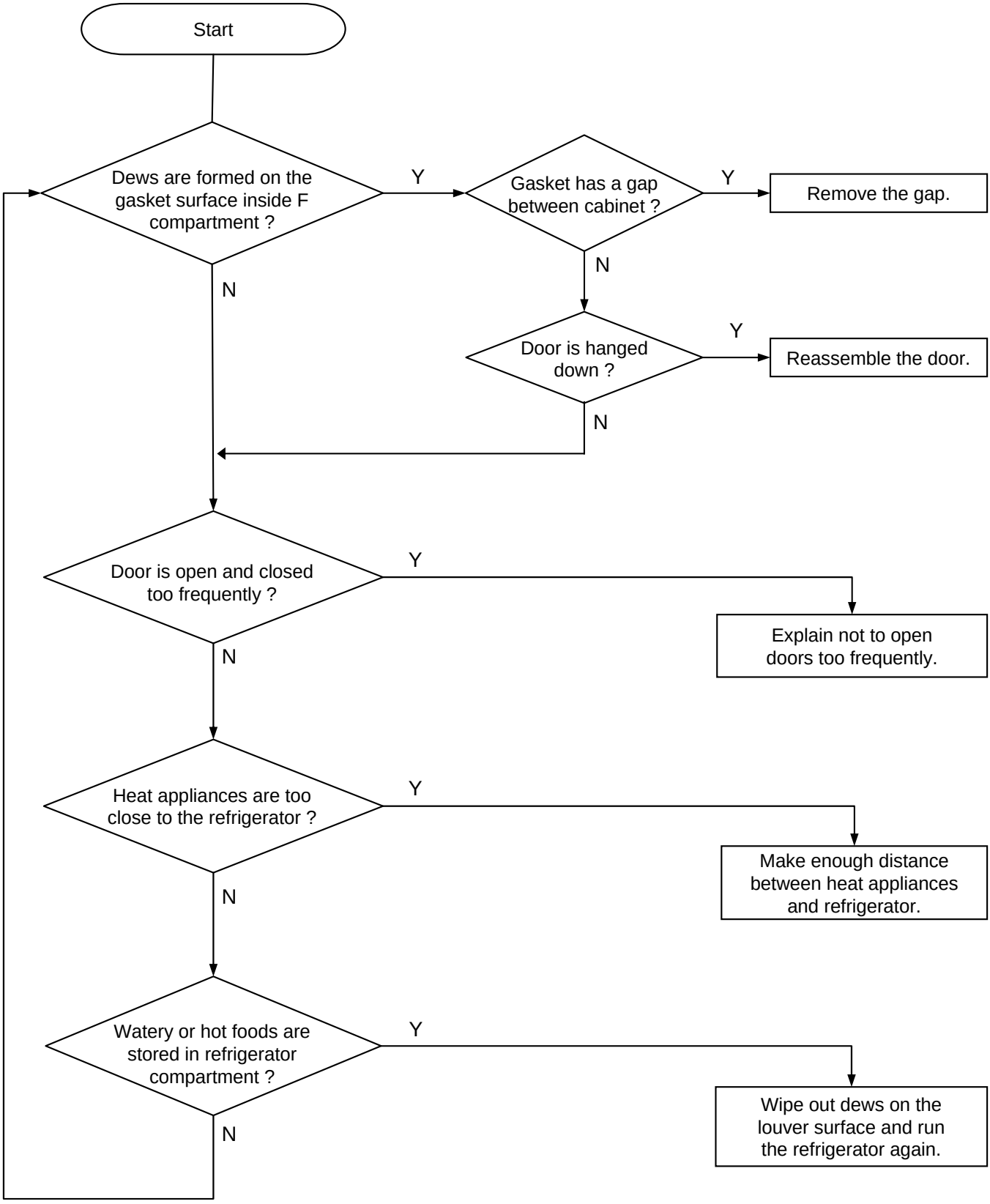
* Hold the end of F-Louver B and pull forward slowly.

Removing and replacing Freezer parts

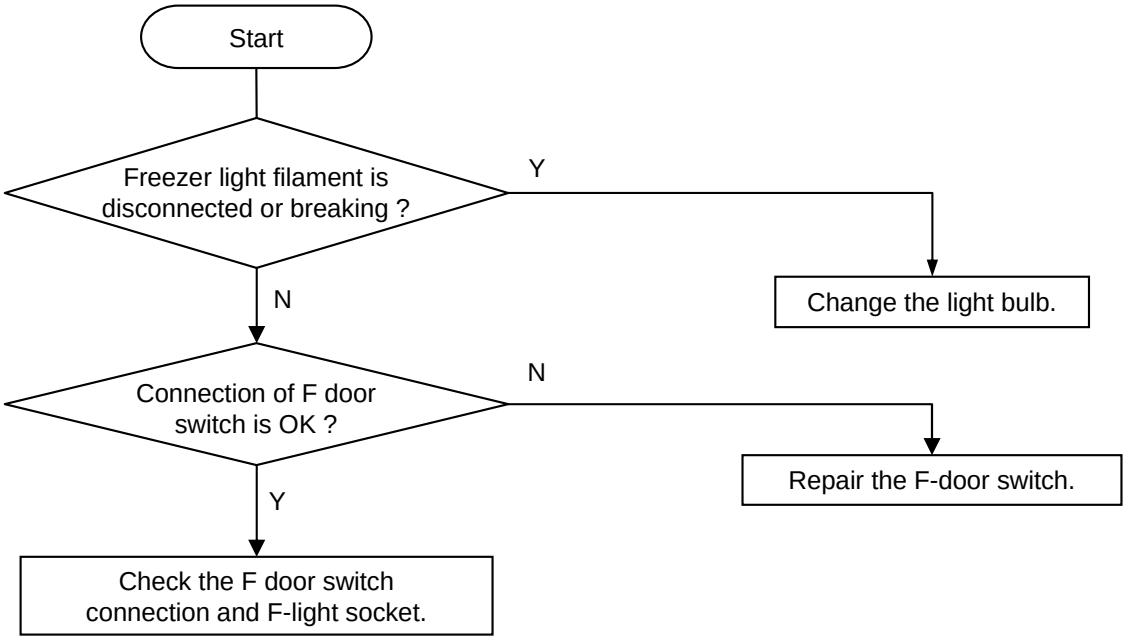




9-2-2. Ice Formation on F-Louver



9-2-3. Disconnection / breaking of Freezer Lights Wires



Change of F Lights

* Remove 2 screws of light cover.

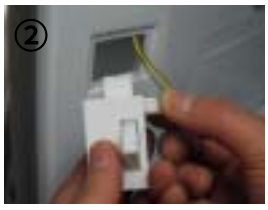
* Hold the bottom of light cover and pull forward to remove.

* Change the light bulb. (AC240V 25W)

※ Follow the reverse order of disassembling after changing the light.

Change of F Door Switch

* Insert a flat tip screw driver Into a gap of door switch to pull forward.



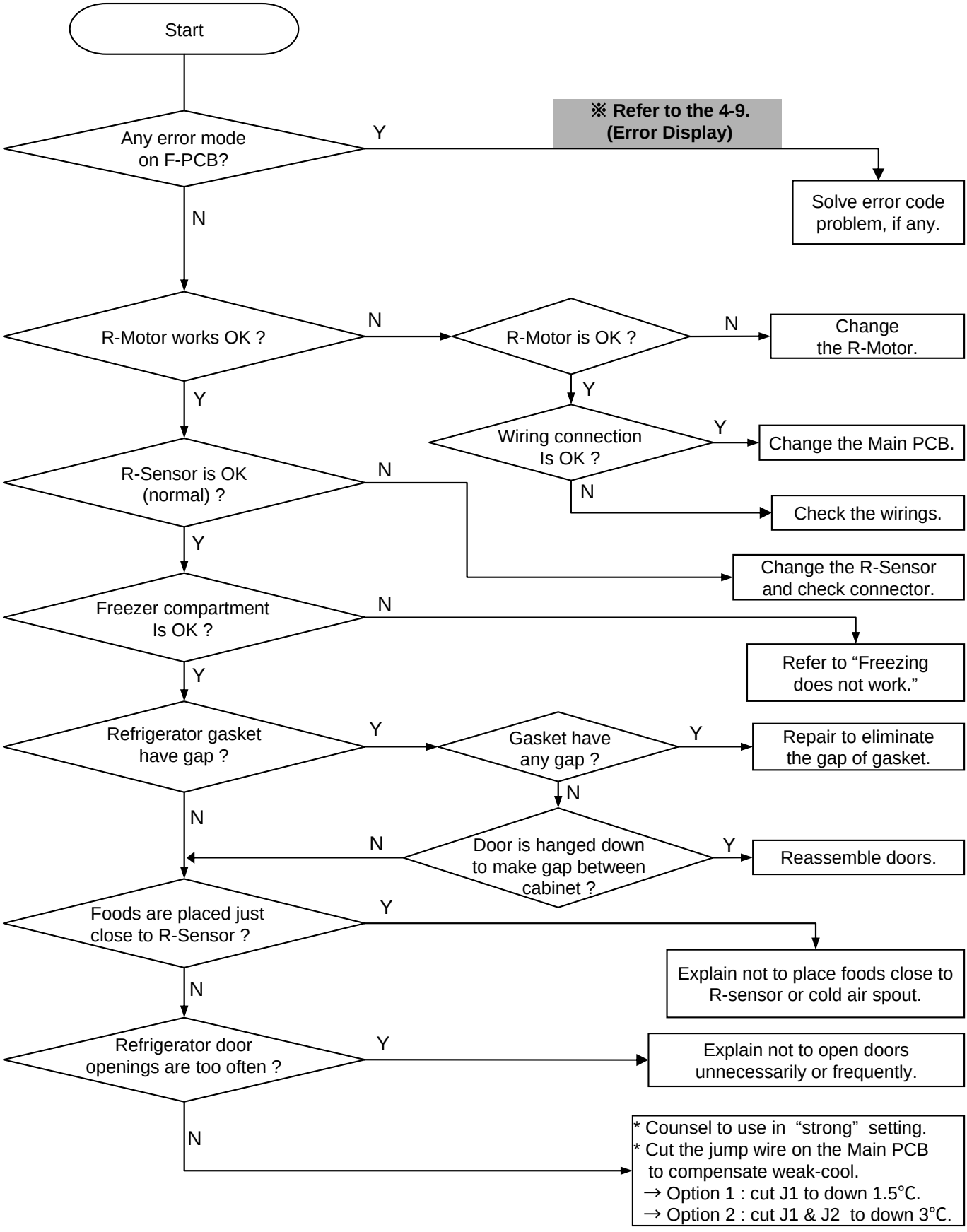
* Disconnect the housing and change the switch for a new one.

※ Be careful when changing the switch. F and R door switch are different in type and shape.

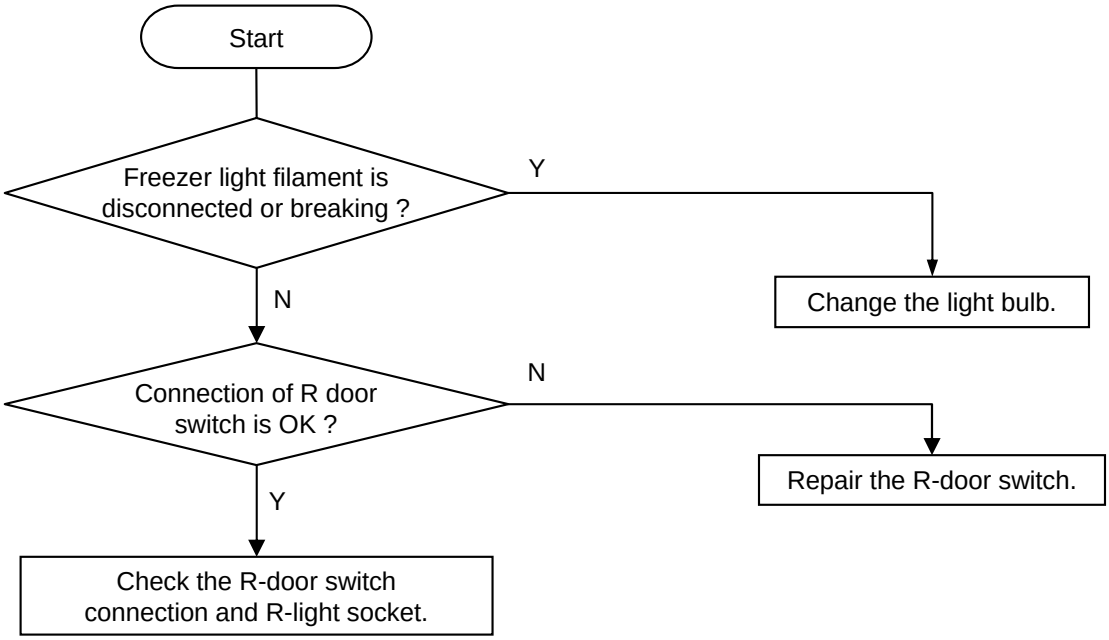
※ Follow the reverse order of disassembling after changing the switch.

9-3. Refrigerator Compartment

9-3-1. Refrigeration failure (Foods does not get cool or cold soon.)



9-3-2. Disconnection / Breaking of Refrigerator Lights Wires



Change of F Lights

* Remove screws of light cover.

▼

* Hold the bottom of cover and pull forward to remove.

▼

* Change the light bulbs. (AC240V 25W)

※ Follow the reverse order of disassembling after changing the light.

Change of F Door Switch

* Insert a flat tip screw driver into a gap of door switch to pull forward.

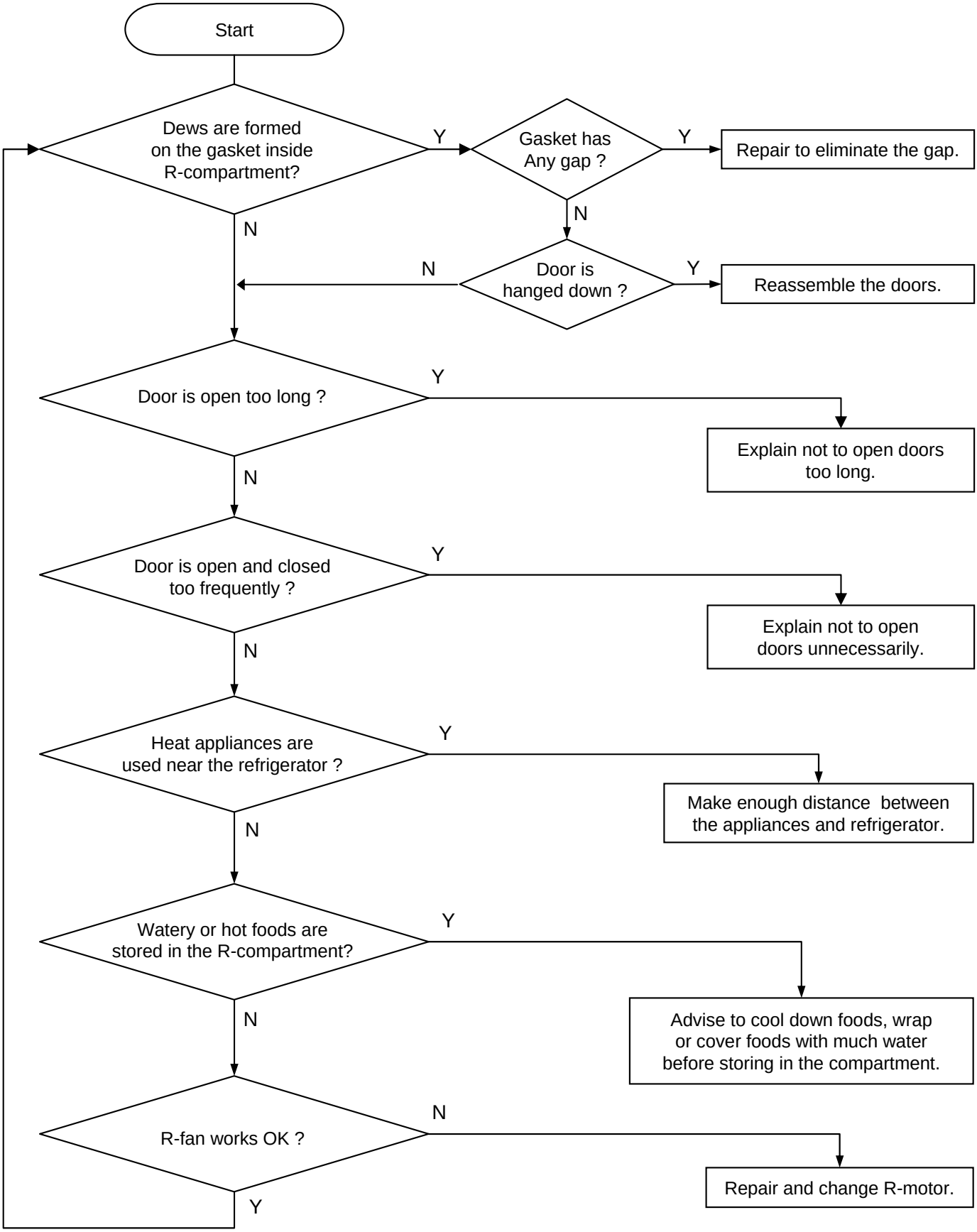
▼

* Disconnect the housing and change the switch for a new one.

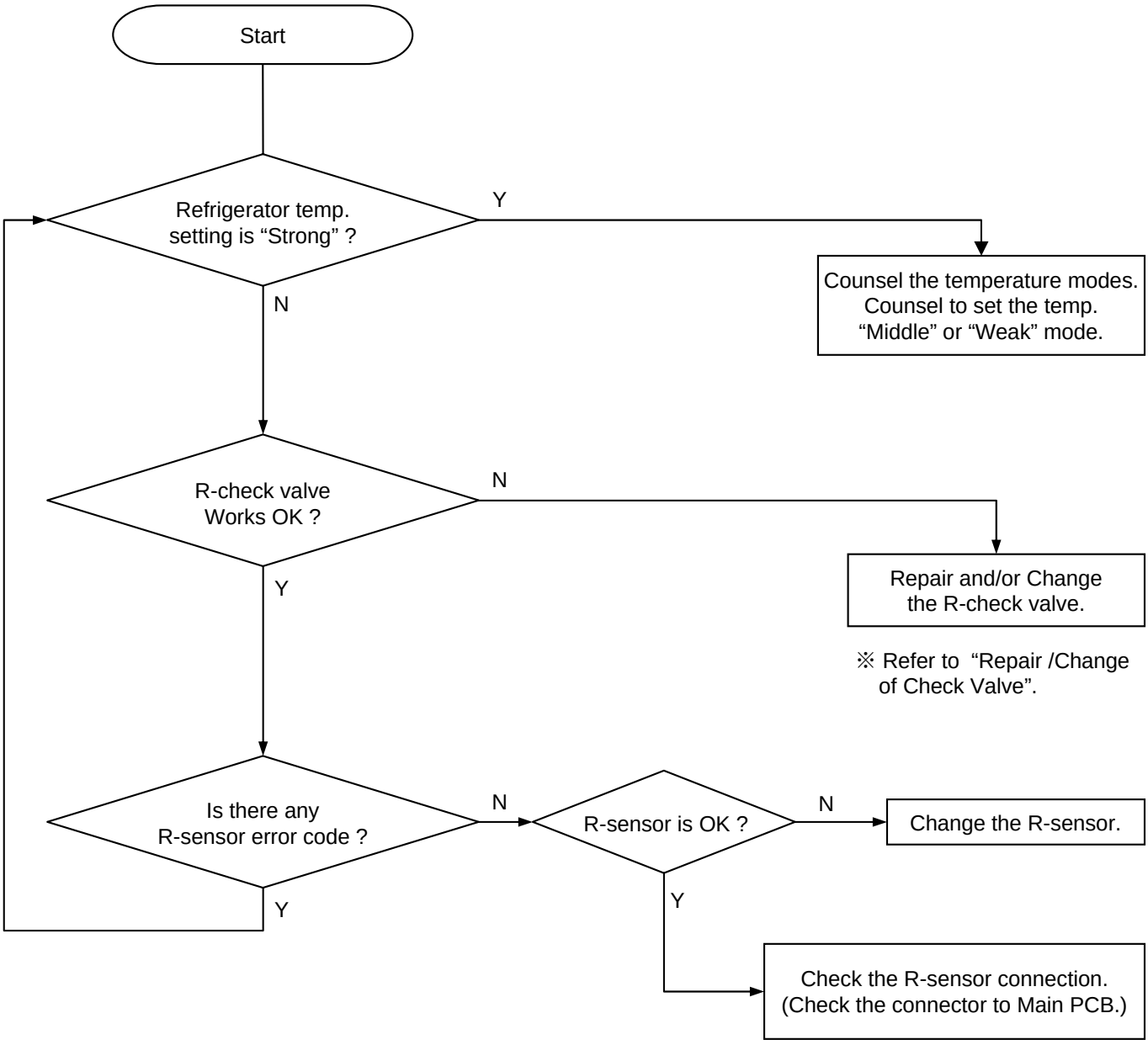
※ Be careful when changing the switch. F and R door switch are different in type and shape.

※ Follow the reverse order of disassembling after changing the switch.

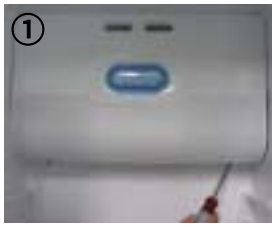
9-3-3. Dews on Refrigerator Compartment



9-3-4. Super-cooling of Vegetable Case



Removing of Check Valve



* Remove screws of light cover.

▼

* Hold the bottom of cover and pull forward to remove.

▼

* Disconnect light housing.

▼

* Remove screws with a (+)screw driver.

* Hold the bottom and right of damper to pull down to remove.

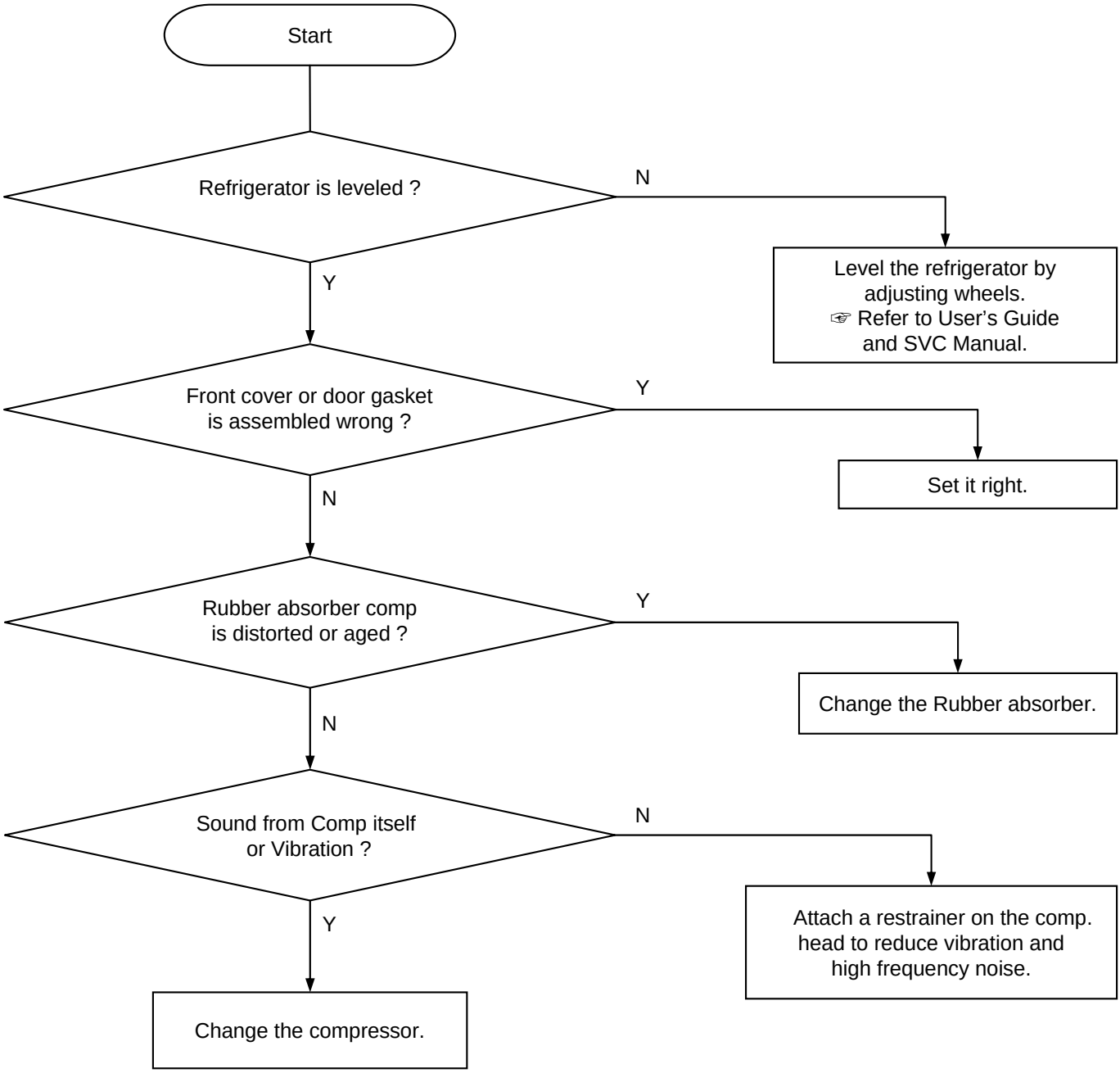
▼

* Lift up a piece of Check Valve Flap and insert a finger to the valve frame to hold out.

▼

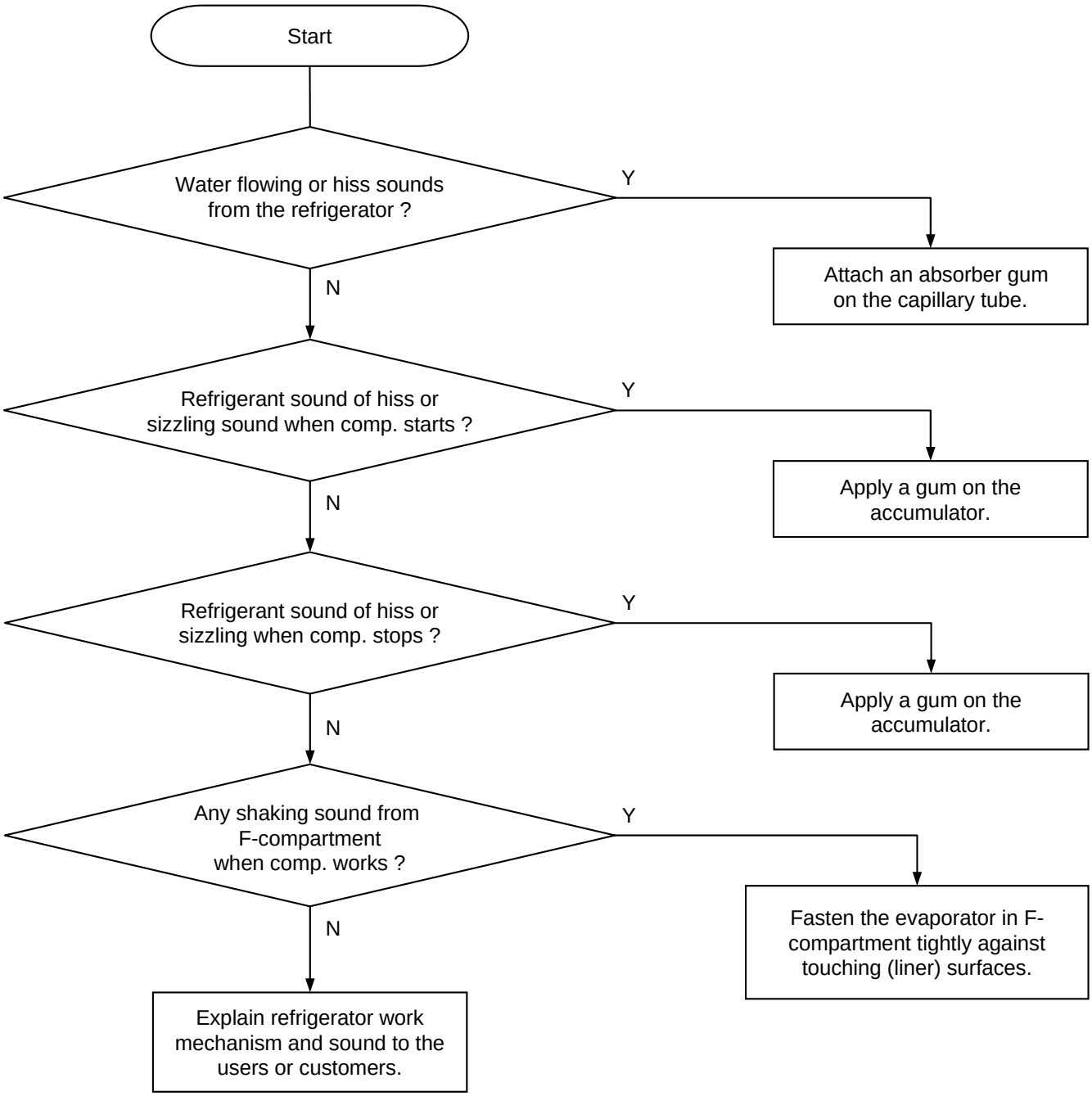
9-4. Operation Noise of Refrigerator

9-4-1. Comp. operation Noise



Remarks
● Compressor sound is somewhat normal because it works like a heart to circulate the refrigerant in the pipes during the refrigerator operation. ● Rattling or metallic touch sound of motor, piston of comp. can be heard when it starts or stops.

9-4-2. Refrigerant Flow Sound

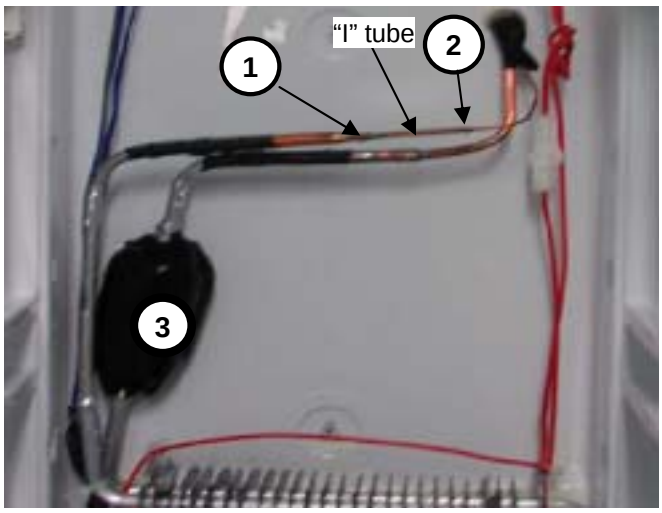


Remarks

● Water flowing sound, hiss or sizzling sound can make while refrigerant in the pipes is changing from liquid to gas state when comp. starts or stops.
It is normal to the refrigerator.

Troubleshooting of Evaporator Sound

1. Hiss Sound from Capillary Tube



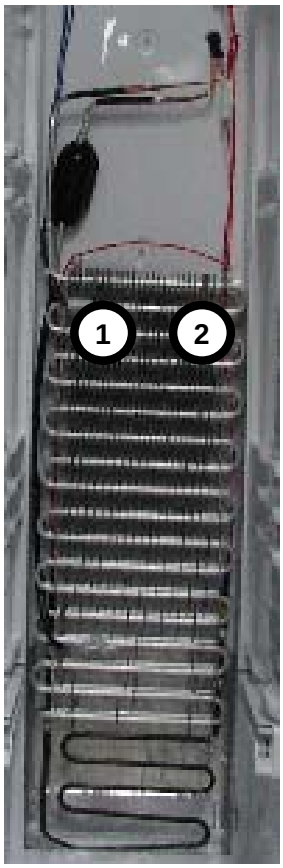
1) "I" tube is used to connect the capillary tube and evaporator. (2 welding points : ①, ②)

2) When such a sound is made, attach a absorber on the tube including 2 welding points.

2. Sizzling Sound from Accumulator

Attach a absorber on point ③ (accumulator).

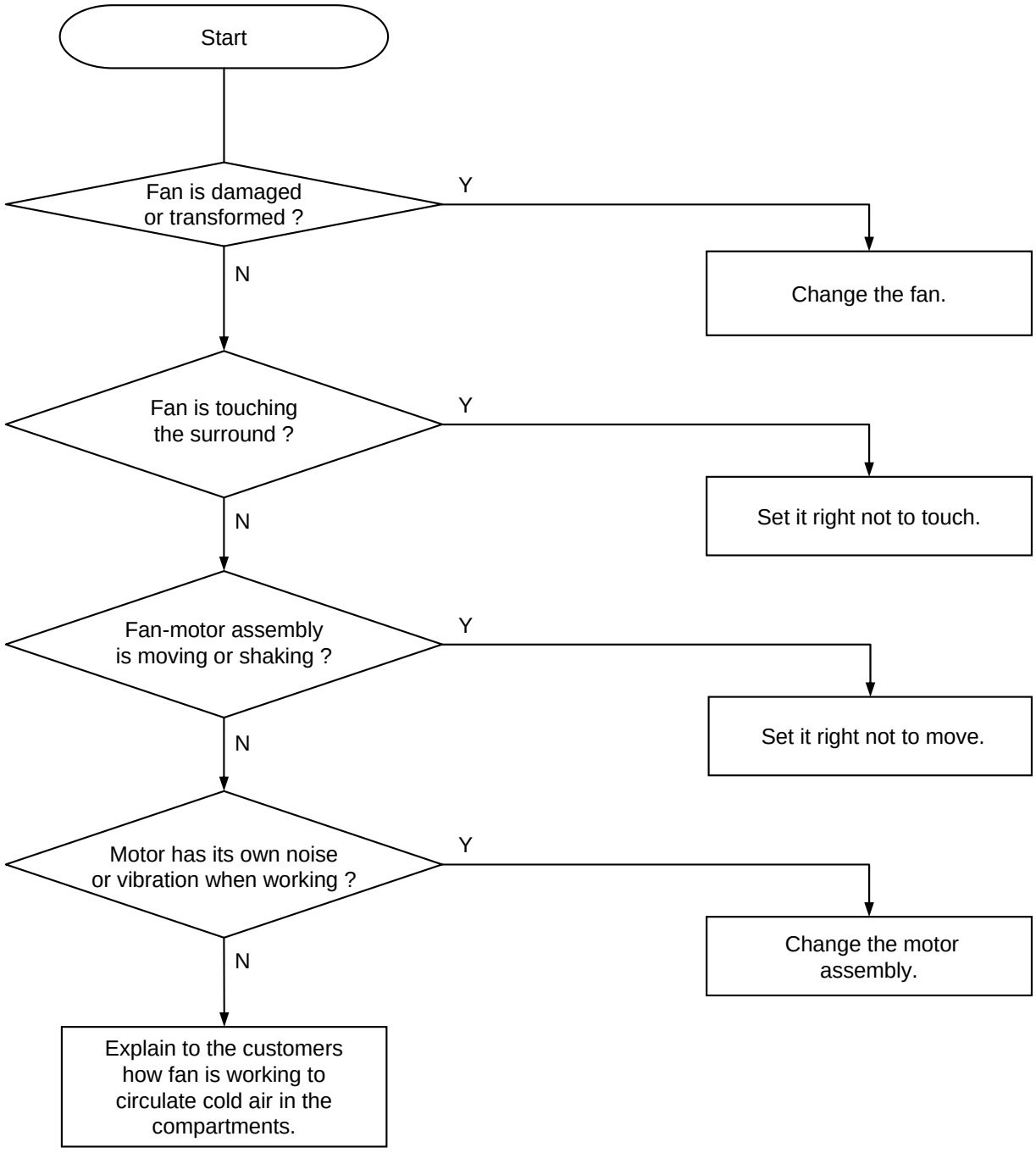
3. Shaking or trembling Sound of Evaporator



1) Check whether evaporator is fastened tight with the fasteners of ①, ②.

2) Insert a soft spacer (EPS) between left and right wall. Evaporator not to be shaken or trembled during refrigerator operation.

9-4-3. Fan Noise



Remarks
● The fan is sending out cold air to circulate it through the compartments. When the air is touching the surface of louver or liner wall, such sound can make.

Troubleshooting of Fan Noise

1. Fixing or Fastening of Fan Motor

1) Check if fan motor frame of the assembly is fastened tightly with screws to the liner wall. Unless it is tight, vibration of shaking can make.

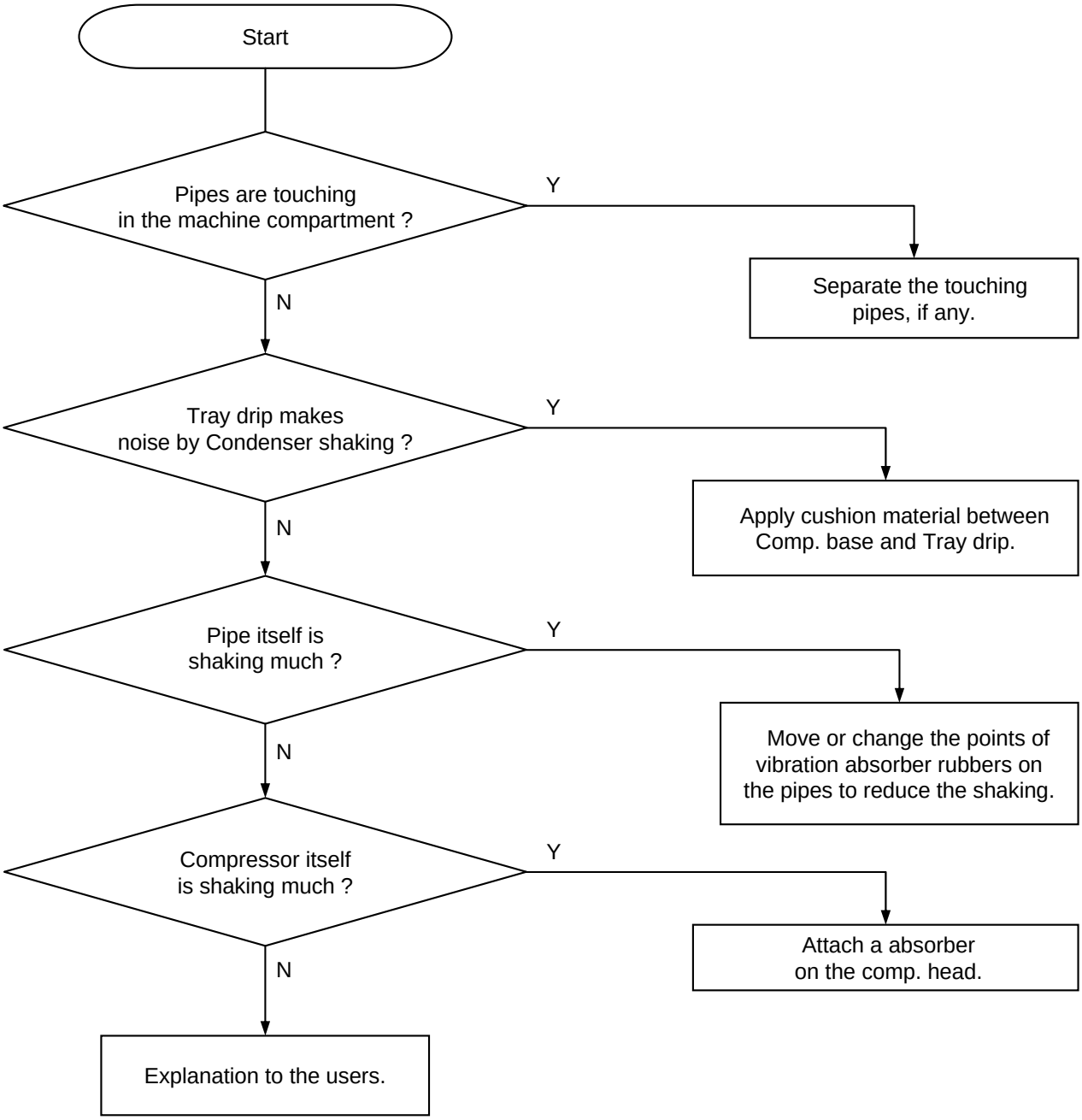
2) Check if fan motor and fan are hanged down. Fan working sound can be louder if they are not set right.

2. Any Touch Sound from Fan

1) Check if sealing sponge on the insulator touches the fan.
If so, set it again not to touch it.

2) If any damage on the insulator around the fan rotation is found, set the fan motor assembly right not to touch it.

9-4-4. Pipe Noise

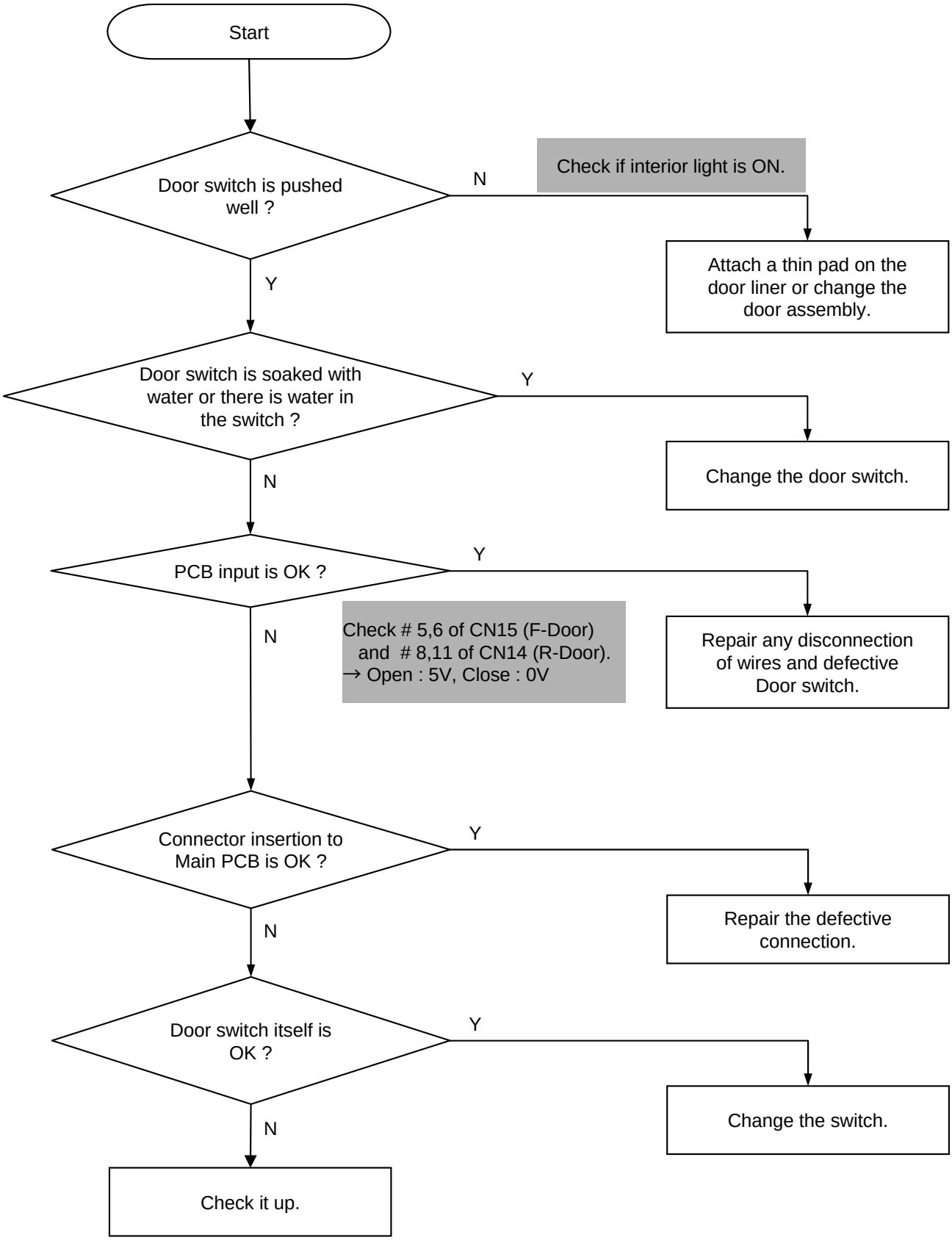


Remarks

- Refrigerant is erupting rapidly from the compressor to circulate pipes, so pipe shaking noise can make to some degree.
- In case compressor vibration is sent to a pipe directly, apply vibration absorber rubbers to welding points of the pipe and comp. or to a much bent point on the pipe.

9-5. Door

9-5-1. Door Opening Alarm Continues though the door is closed.

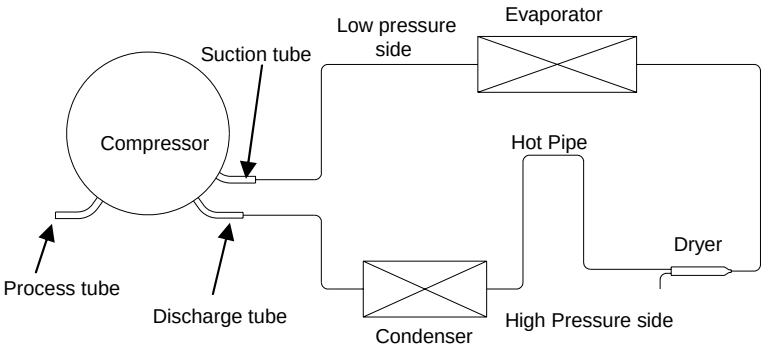


10. COOLING CYCLE HEAVY REPAIR

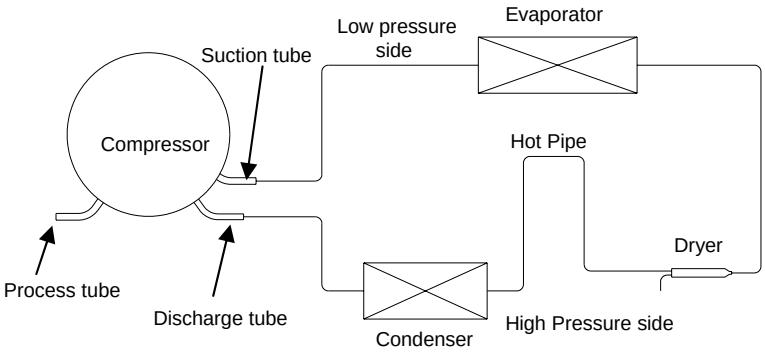
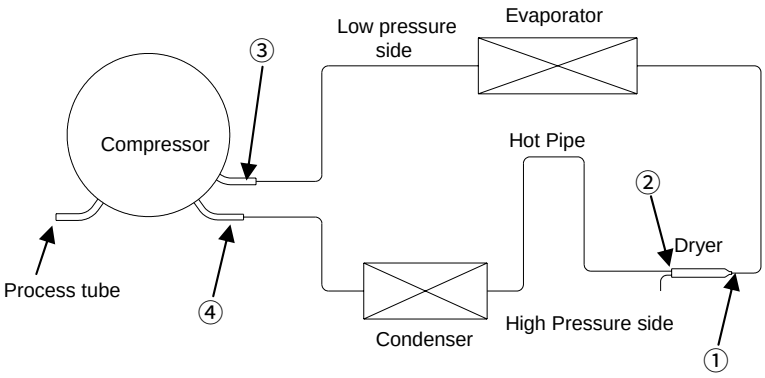
10-1. Summary of Heavy Repair

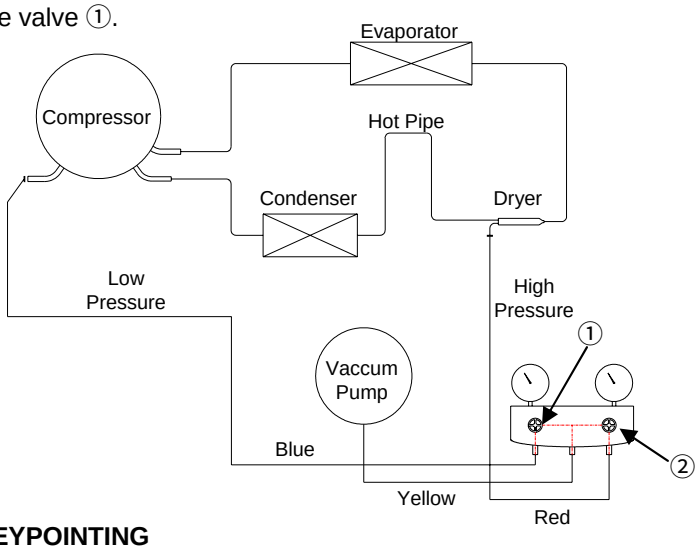
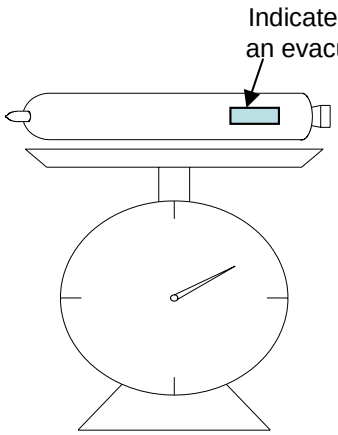
Process	Contents	Tools
Remove refrigerant Residuals	* Cut charging pipe ends (Comp. & Dryer) and discharge refrigerant from drier and compressor.	* Nipper, side cutters
Parts replacement and welding	* Confirm refrigerant (R-134a or R-600a) and oil for compressor and drier. * Confirm N2 sealing and packing conditions before use. Use good one for welding and assembly. * Weld under nitrogen gas atmosphere. * Repair in a clean and dry place.	* Pipe Cutter, Gas welder, N2 gas
Vacuum	* Evacuate for more than forty minutes after connecting manifold gauge hose and vacuum pump to high (drier) and low (compressor) pressure sides.	* Vacuum pump , Manifold gauge.
Refrigerant charging and charging inlet welding	* Weigh and control the bombe in a vacuum conditions with electronic scales and charge through compressor inlet (Process tube). * Charge while refrigerator operates). * Weld carefully after inlet pinching.	* Bombe (mass cylinder), refrigerant manifold gauge, electronic scales, punching off flier, gas welding machine
Check refrigerant leak and cooling capacity	* Check leak at weld joints. Note :Do not use soapy water for check. * Check cooling capacity → Check condenser manually to see if warm. → Check hot pipe manually to see if warm. → Check frost formation on the whole surface of the evaporator.	* Electronic Leak Detector, Driver.
Compressor compartment and tools arrangement	* Remove flux from the silver weld joints with soft brusher wet rag. (Flux may be the cause of corrosion and leaks.) *Clean tools and store them in a clean tool box or in their place.	* Copper brush, Rag, Tool box
Transportation and installation	* Installation should be conducted in accordance with the standard installation procedure. (Leave space of more than 5 cm from the wall for compressor compartment cooling fan mounted model.)	

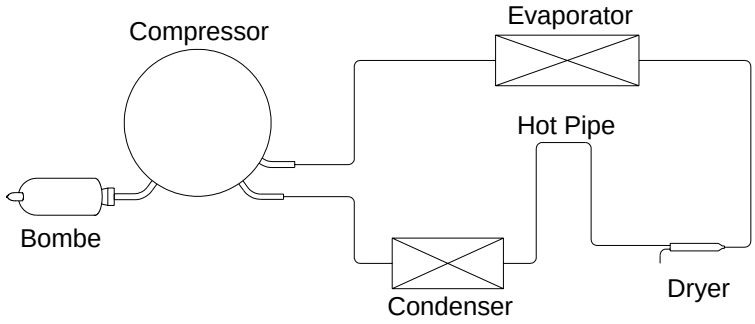
10-2. Precautions During Heavy Repair

Items	Precautions
Use of tools.	1) Use special parts and tools for R-134a or R-600a
Removal of retained refrigerant.	1) Remove retained refrigerant more than 5 minutes after turning off a refrigerator. (If not, oil will leak inside.) 2) Remove retained refrigerant by cutting first high pressure side (drier part) with a nipper and then cut low pressure side. (If the order is not observed, oil leak will happen.) 
Replacement of drier.	1) Be sure to replace drier when repairing pipes and injecting refrigerant.
Nitrogen blowing welding.	1) Weld under nitrogen atmosphere in order to prevent oxidation inside a pipe. (Nitrogen pressure : 0.1~0.2 kg/cm2.)
Others.	1) Nitrogen only should be used when cleaning inside of cycle pipes inside and sealing. 2) Check leakage with an electronic leakage tester. 3) Be sure to use a pipe cutter when cutting pipes. 4) Be careful not the water let intrude into the inside of the cycle.

10-3. Practical Work for Heavy Repair

Items	Precautions
1. Removal of residual refrigerant.	1) Remove residual refrigerant more than 5 minutes later after turning off the refrigerator. (If not, compressor oil may leak inside.) 2) Remove retained refrigerant slowly by cutting first high pressure side (drier part) with a nipper and then cut low pressure side. 
2. Nitrogen blowing welding.	 *** When replacing a drier:** Weld ①and② parts by blowing nitrogen (0.1~0.2kg/cm2) to high pressure side after assembling a drier. *** When replacing a compressor:** Weld ③and④ parts by blowing nitrogen to the low pressure side. Note) For other parts, nitrogen blowing is not necessary because it does not produce oxidized scales inside pipe because of its short welding time. **※ KEYPOINTING** Welding without nitrogen blowing produces oxidized scales inside a pipe, Which affect on performance and reliability of a product.

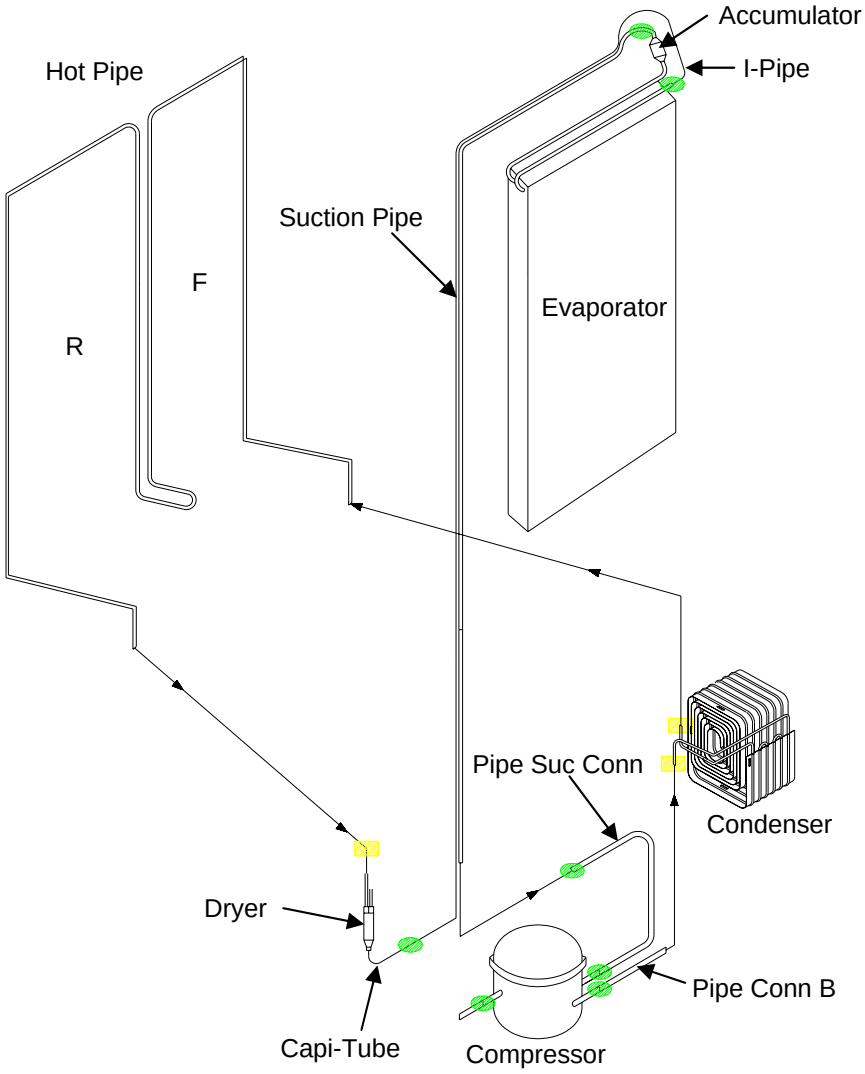
Items	Precautions
3.Vacuum degassing.	*** Pipe Connection** Connect a red hose to the high pressure side and a blue hose to the low pressure side. *** Vacuum Sequence** Open ①,② valves and evacuate for 40 minutes. Close valve ①.  **※ KEYPOINTING** 1) If power is applied during vacuum degassing, vacuum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

Items	Precautions
4.Refrigerant charging.	4) Refrigerant Charging Charge refrigerant while operating a compressor as shown above. 5) Pinch a charging pipe with a pinch-off plier after completion of charging. 6) Braze the end of a pinched charging pipe with copper brazer and take a gas leakage test on the welded parts. 
5. Gas-leakage test	* Take a leakage test on the welded or suspicious area with an electronic leakage tester.
6. Pipe arrangement in each cycle	* Check each pipe is placed in its original place before closing a cover back-M/C after completion of work.

10-4. Standard Regulations for Heavy Repair

1) Observe the safety precautions for gas handling.
2) Use JIG (or wet towel) in order to prevent electric wires from burning during welding.
(In order to prevent insulation break and accident.)
3) The inner case shall be melted and insulation material (polyurethane) shall be burnt if not cared during welding inner case parts.
4) The copper pipe shall be oxidized by overheating if not cared during welding.
5) Not allow the aluminum pipes to contact to copper pipes. (In order to prevent corrosion.)
6) Make sure that the inner diameter should not be distorted while cutting a capillary tube.
7) Be sure that a suction pipe and a filling tube should not be substituted each other during welding.
(High efficiency pump.)

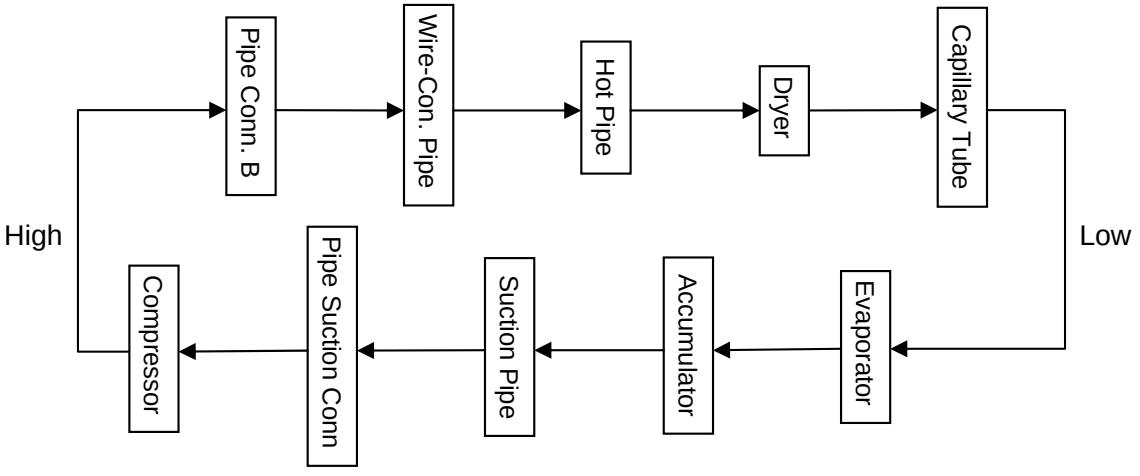
10-5. Brazing Reference Drawings.



▶ Welding Point

●	Copper Welding (Ag 5%)	7 Points
■	Silver Welding (Ag 35%)	3 Points

▶ Flow of Refrigeration Cycle

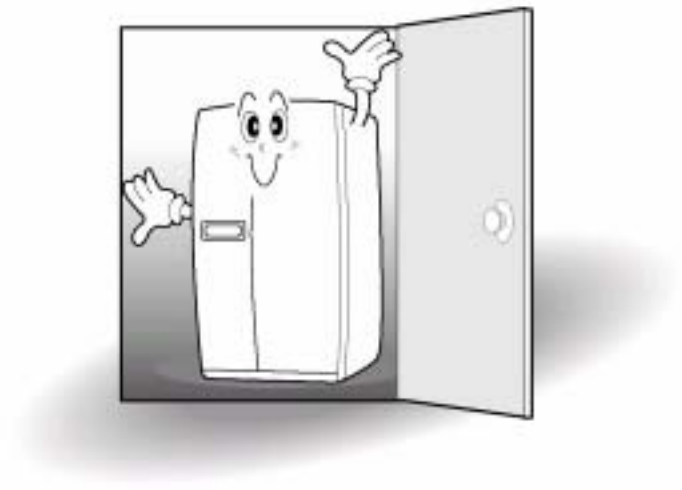


11. INSTALLATION GUIDE

11-1. Installation Preparation

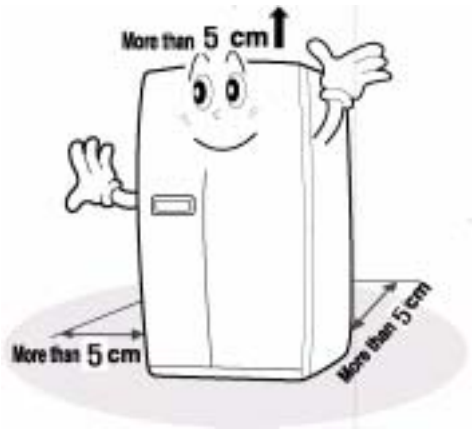
Check if the refrigerator can pass a doorway or enter a door first.

Dimensions(including Door Handles)
(Width*Depth*Height) 903mm X 730.5mm X 1790mm



Find a suitable place to install

Sufficient space from refrigerator back to the ※wall for free air ventilation



※Avoid direct sunlight.

Note

Once the installation place is ready follow the installation instructions.
If surround temperature of refrigerator is low (below 10°C)),
foods can be frozen or the refrigerator can work in abnormal way.

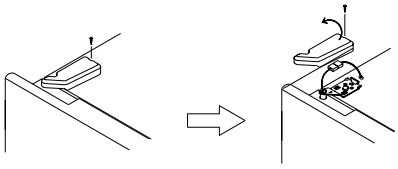
11-2. If the refrigerator can not enter the door

Removing Freezer Door

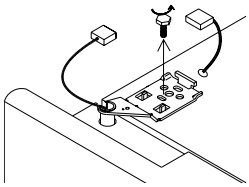
※Remove front bottom cover first, if it is attached.

1 Remove front bottom cover first, Pull out the left collar of the coupling first, then hold the coupling and pull out the left water tube.

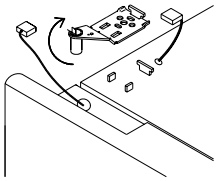
2 Unscrew top hinge cover with a screw driver.
Remove the hinge cover.



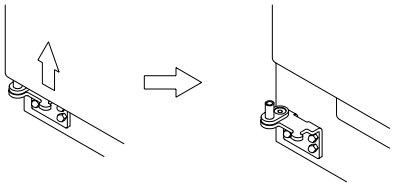
3 Turn top hinge bolt counterclockwise .
Disconnect the harness wires.



4 Lift up the front of hinge to remove.
(After the hinge is removed the door can fall down forward.
Be careful !)

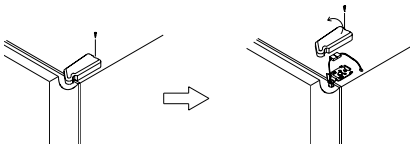


5 Be careful not to damage the water line when removing the door.

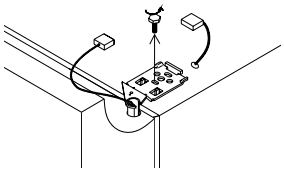


Removing Refrigerator Door

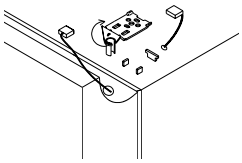
1 Unscrew top hinge cover with a screw driver.
Remove the hinge cover.



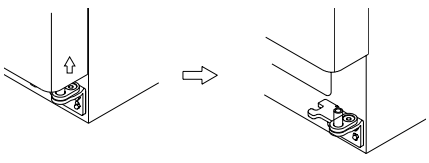
2 Turn top hinge fastener counterclockwise.
Disconnect harness wires.



3 Lift up the front of hinge to remove.
(After the hinge is removed the door can fall down forward.
Be careful !)

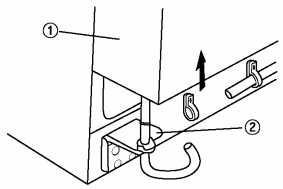


4 Lift the door straight up to remove.

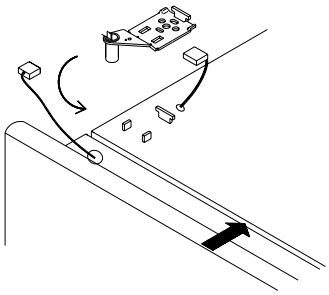


Replacing Freezer Door

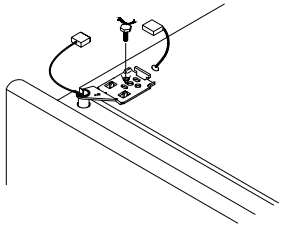
1 Insert the water tube into the hole Of the bottom hinge pin first, then Insert the bottom of freezer door Into the bottom hinge pin.



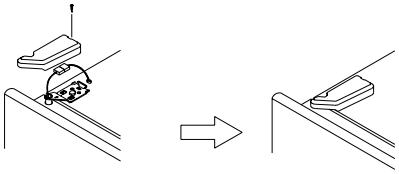
2 Insert the bottom hole of freezer door straight to the bottom hinge pin.



3 Let the top of door close to the cabinet and insert the top hinge pin to the top hole of freezer door.
(Insert the back of hinge to the groove of protrusion first, then front to the top hole of door.)



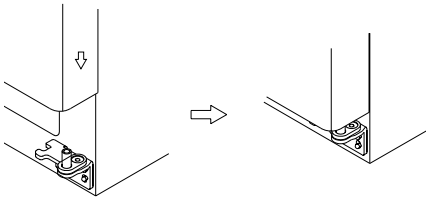
4 Turn the hinge fastener tightly to The end.
Connect harness wire and screw ground wire.



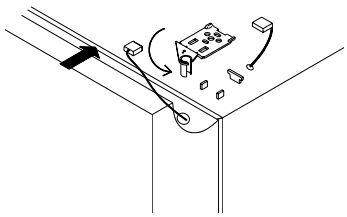
5 Insert the water tube far into the coupling.

Replacing Refrigerator Door

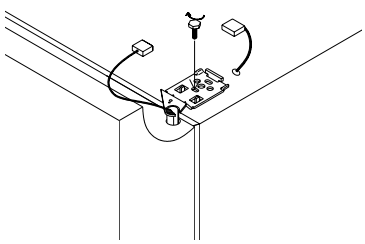
1 Insert the bottom hole of refrigerator door straight to the bottom hinge pin.



2 Let the top of door close to the cabinet and insert the top hinge pin to the top hole of refrigerator door.
(Insert the back of hinge to the groove of protrusion first, then front to the top hole of door.)



3 Turn the hinge fastener tightly to the end.
Connect harness wirings and screw ground wire.
Click and screw the top hinge cover.

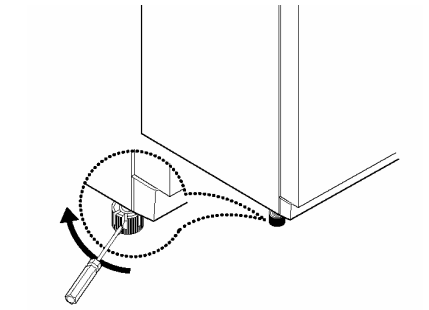


11-3. Refrigerator Leveling & Door Adjustment

※Refrigerator must be level in order to maintain optimal performance and desirable front appearance.
(If the floor beneath the refrigerator is uneven, freezer and refrigerator doors look unbalanced.)

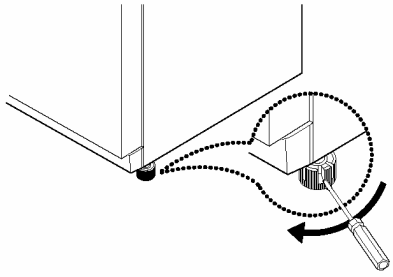
In case freezer door is lower than refrigerator door

Insert a screw driver (flat tip) into a groove of the left wheel (bottom of freezer) and turn it clockwise until the door is balanced.
(clockwise to raise freezer door ; counterclockwise to lower)



In case refrigerator door is lower than refrigerator door

Insert a screw driver (flat tip) into a groove of the right wheel (bottom of refrigerator) and turn it clockwise until the door is balanced.
(clockwise to raise refrigerator door ; counterclockwise to lower)



Caution The front of refrigerator needs to be higher just a little than the back for easy door closing, but if the wheel is raised too much for door balance, i.e. front of refrigerator is too higher than the back, it can be difficult to open the door.

11-4. Water Line Installation

How to install Water Line

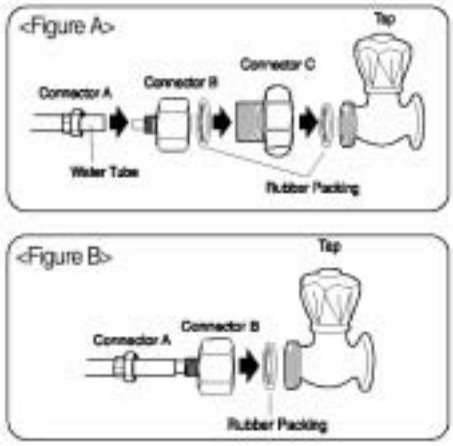
1.The water pressure should be 3kgf/cm2 or more to run the automatic icemaker.
※Checkup your tap water pressure ; if a cup of 180cc is full within 10 seconds, the pressure is OK.
2.When installing the water tubes, ensure they are not close to Any hot surface.
3.The water filter only “filters” water ; it does not eliminate any bacteria or microbes.
4.If the water pressure is not so high to run the icemaker, call the local plumber to get an additional water pressure pump.
5.The filter life depends on the amount of use. We recommend you replace the filter at least once every 6 months.
※When attaching the filter, place it for easy access (removing & replacing)
6.After installation of refrigerator and water line system, select “WATER” on your control panel and press it for 2~3 minutes to supply water into the water tank and dispense water.
7.Use sealing tape to every connection of pipes/tubes to ensure there is no water leak.
8.The water tube should be connected to the cold water line.

Installation Procedure

1. Join connector to water tap

1)First lock the main tap water valve.
Check if connector B and C has its own rubber packing ring in it.
2)Join Connector C to the water tap, then Connector B to connector C with a wrench or spanner.
3)Insert water pipe into Connector-B and join Connector-A with a wrench or spanner.
4)In case Connector-C does not fit water tap join Connector-B directly to the tap. (See Figure B.)
※If no connector fits water tap, call your local service.
5)Unlock main tap water valve, open tap water and check if any water leaks on each joins.

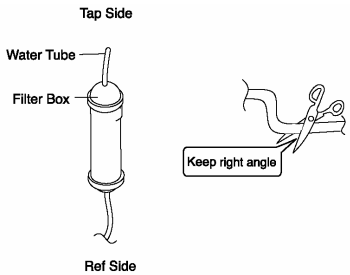
Place the rubber washer inside the tap connector and screw onto the water tap.



2. Get ready to install water line

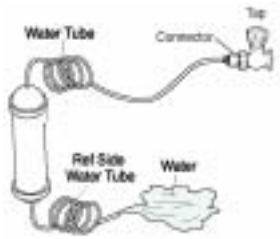
1) Measure an approximate distance between the filter and the Water Tube and cut the tube off filter vertically.
2) Connect the tubes to the filter as the figure shows.

Leave a sufficient distance when cutting the tubes.



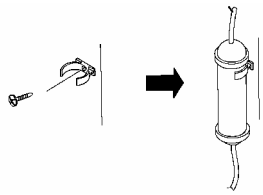
3. Remove any substance from filter

1) Open the main tap water valve and check if water comes out of the Water Tube.
2) Check if the Water Valve is open in case water does not come out.
3) Leave the valve open until clean water is coming out.
※Initial water may contain some substances out of filter (manufacturing process).



4. Attach the filter box

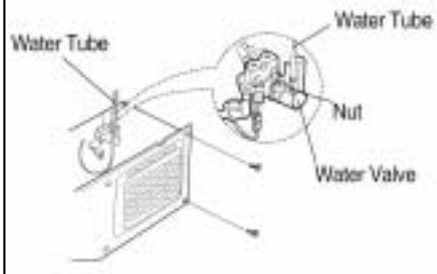
1)Screw and fasten the filter holder to the left/right side of the back of refrigerator.
※In case the holder is not fastened well, remove the back paper of the tape on the filter holder and attach it.
2)Insert the filter box into the holder.



5. Connect water tube

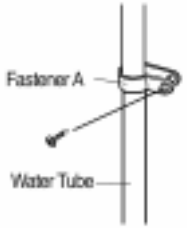
1)Remove the rear cover at the bottom back of the refrigerator.
2)Insert the fastening ring into the Water tube.
(Be careful to follow the direction of the nut.)
3)Insert the Water Tube into the top of Water Valve, turn the nut clockwise to fasten it. (The Water valve is to the right of the motor.)
4)Check for any bent tubes or water leaks; if so, re-check installation procedure.
5)Replace the rear cover. (The Water Tube should be placed between the groove of the refrigerator back and motor cover.)

Set the tube upright as the figure shows.



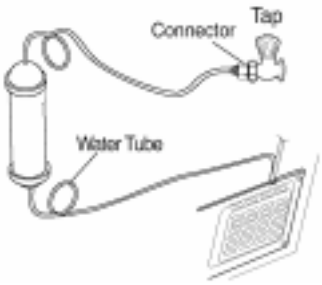
6. Fasten water tube

1) Fasten the Water Tube with the [Fastener A] .
2) Check if the tube is bent or squeezed. If so, set it right to prevent any water leak.

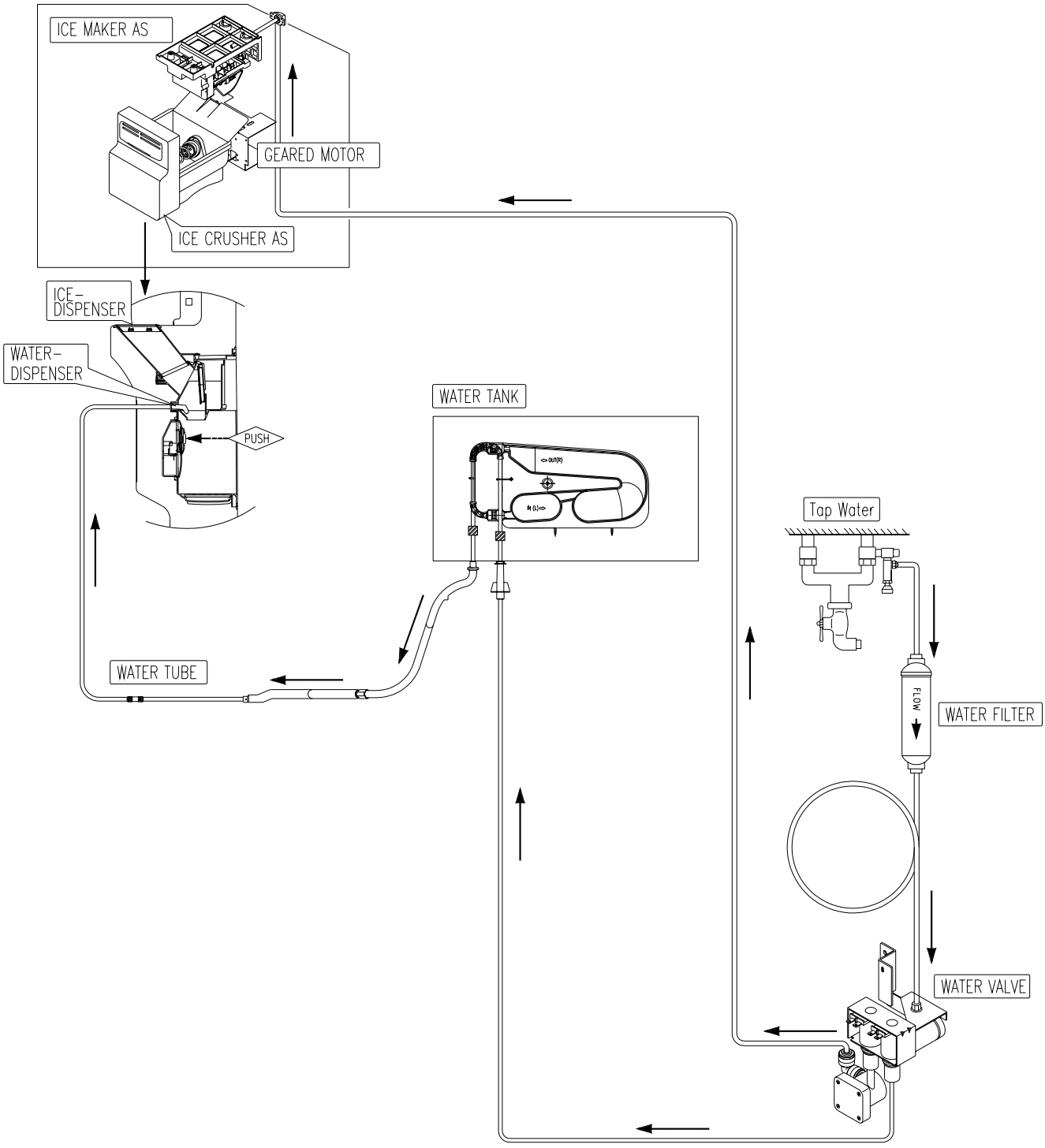


7. After installation

1) Plug the refrigerator, press the [WATER] button on the control panel for 2~3 minutes to remove any air (bubble) in the pipes and drain out the initial water.
2) Check the water leak again through the water supply system (tubes, connectors and pipes) Rearrange the tubes again and do not move the refrigerator.



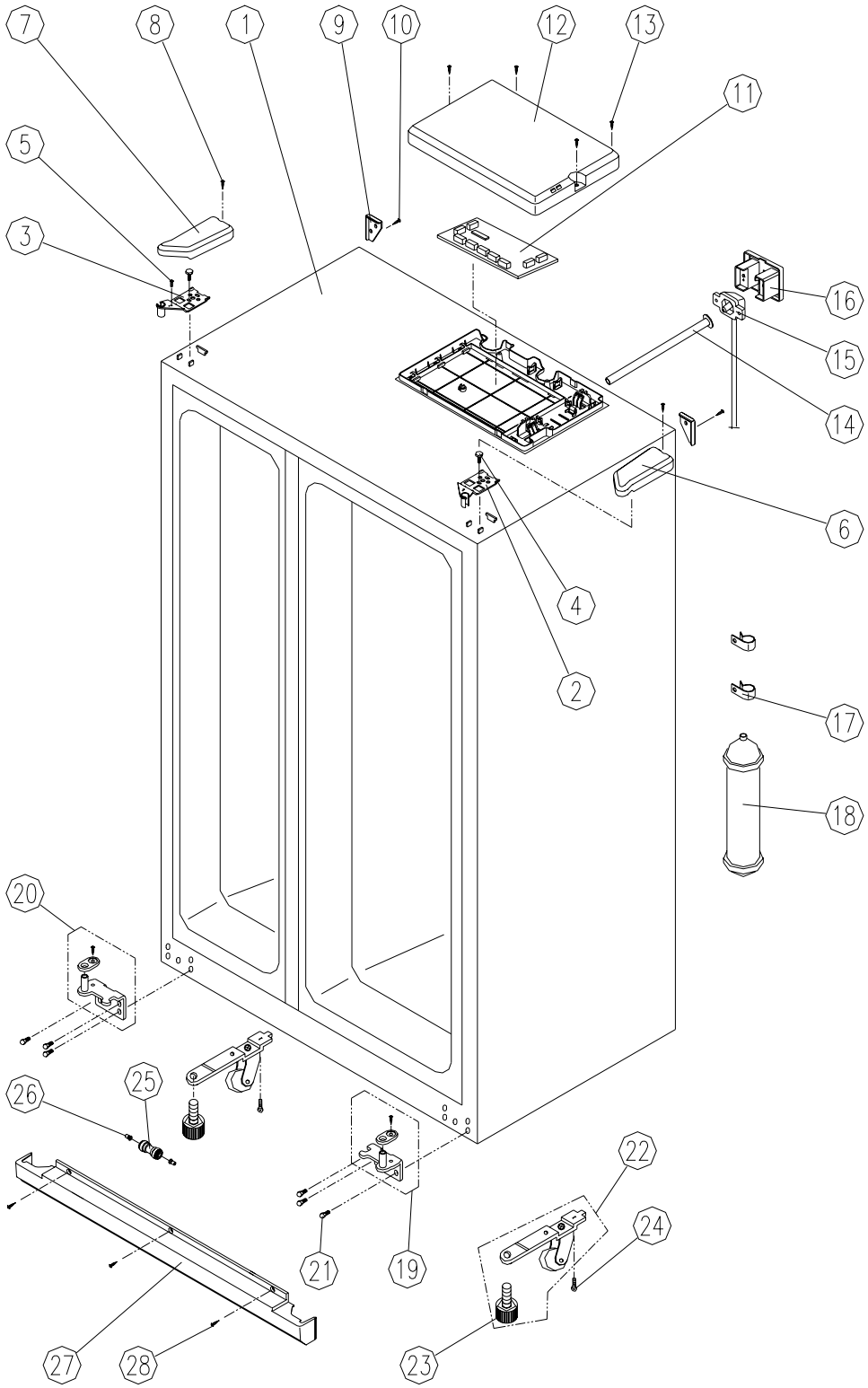
11-5. Dispenser Water Flow



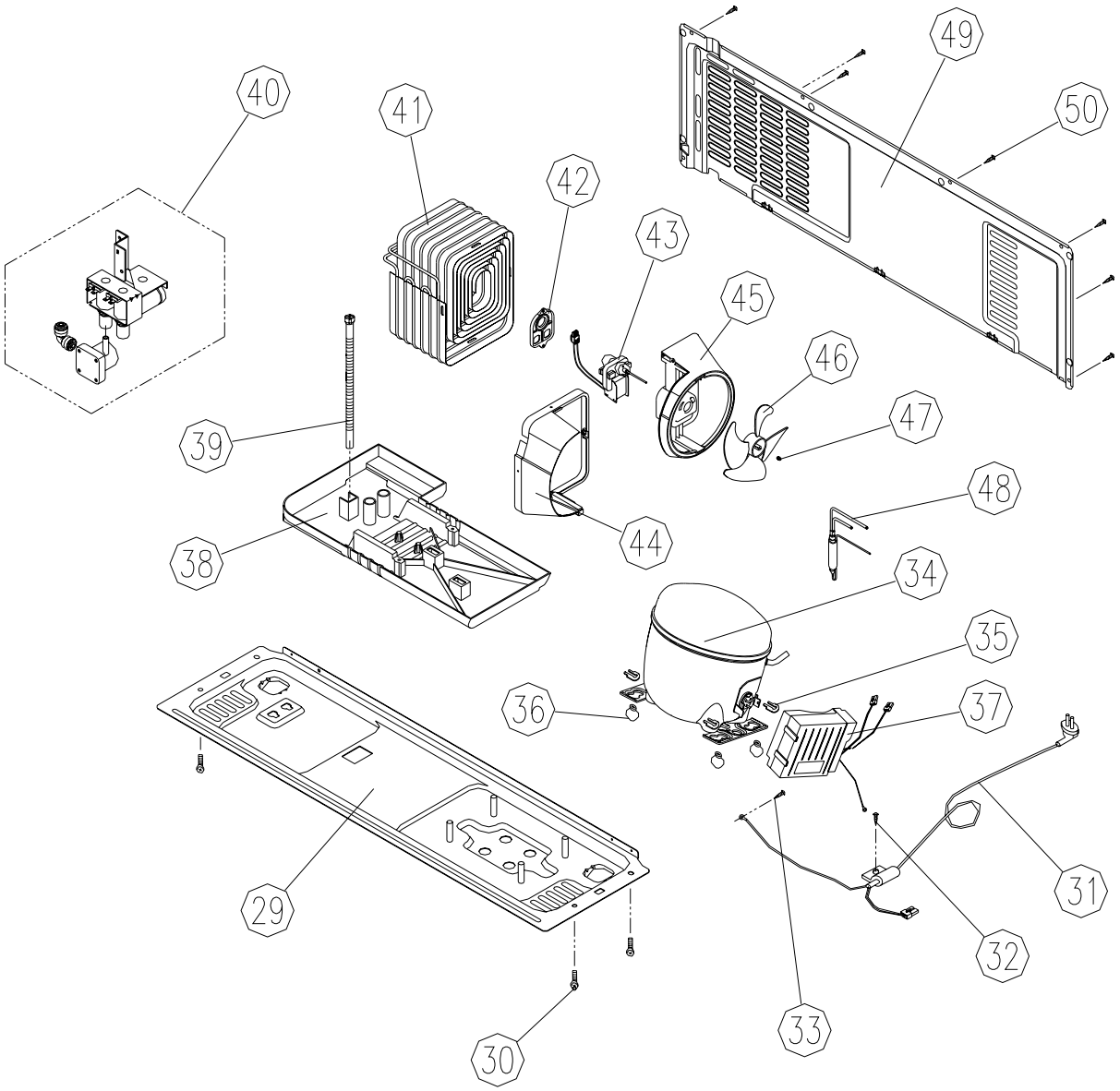
12. EXPLODED VIEW & PARTS LIST

12-1. Exploded view

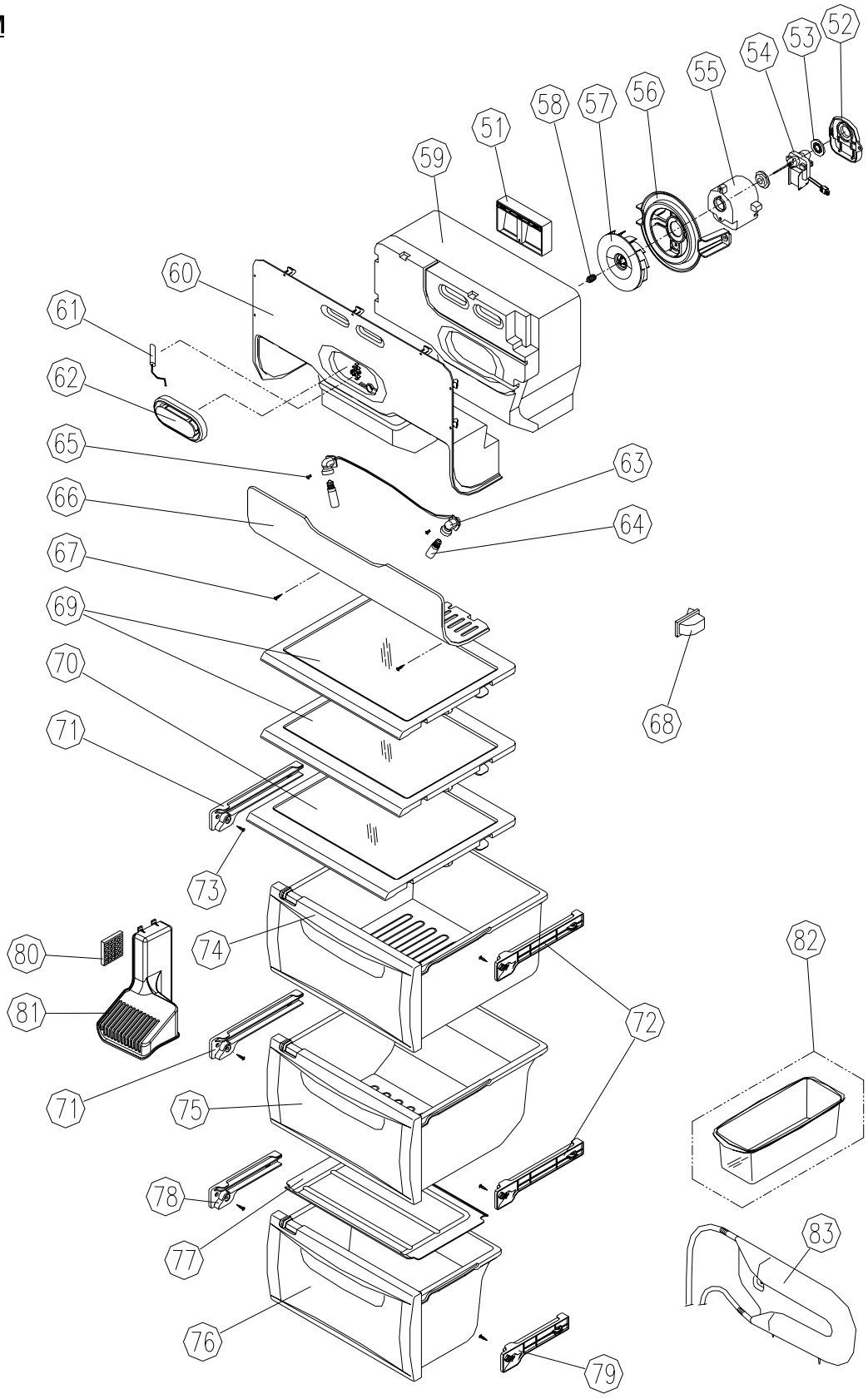
CABINET



MECH ROOM



R ROOM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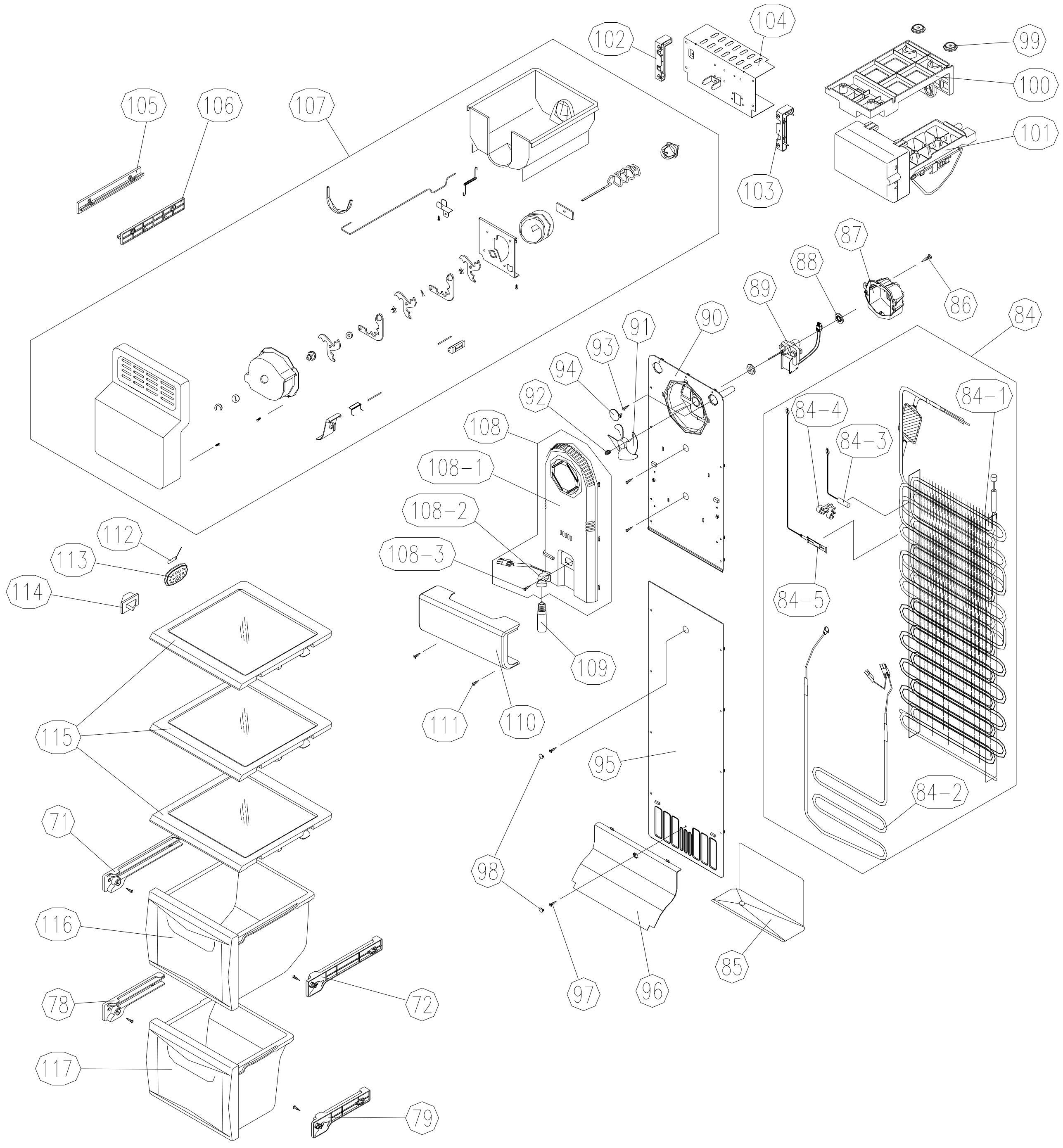
F ROOM



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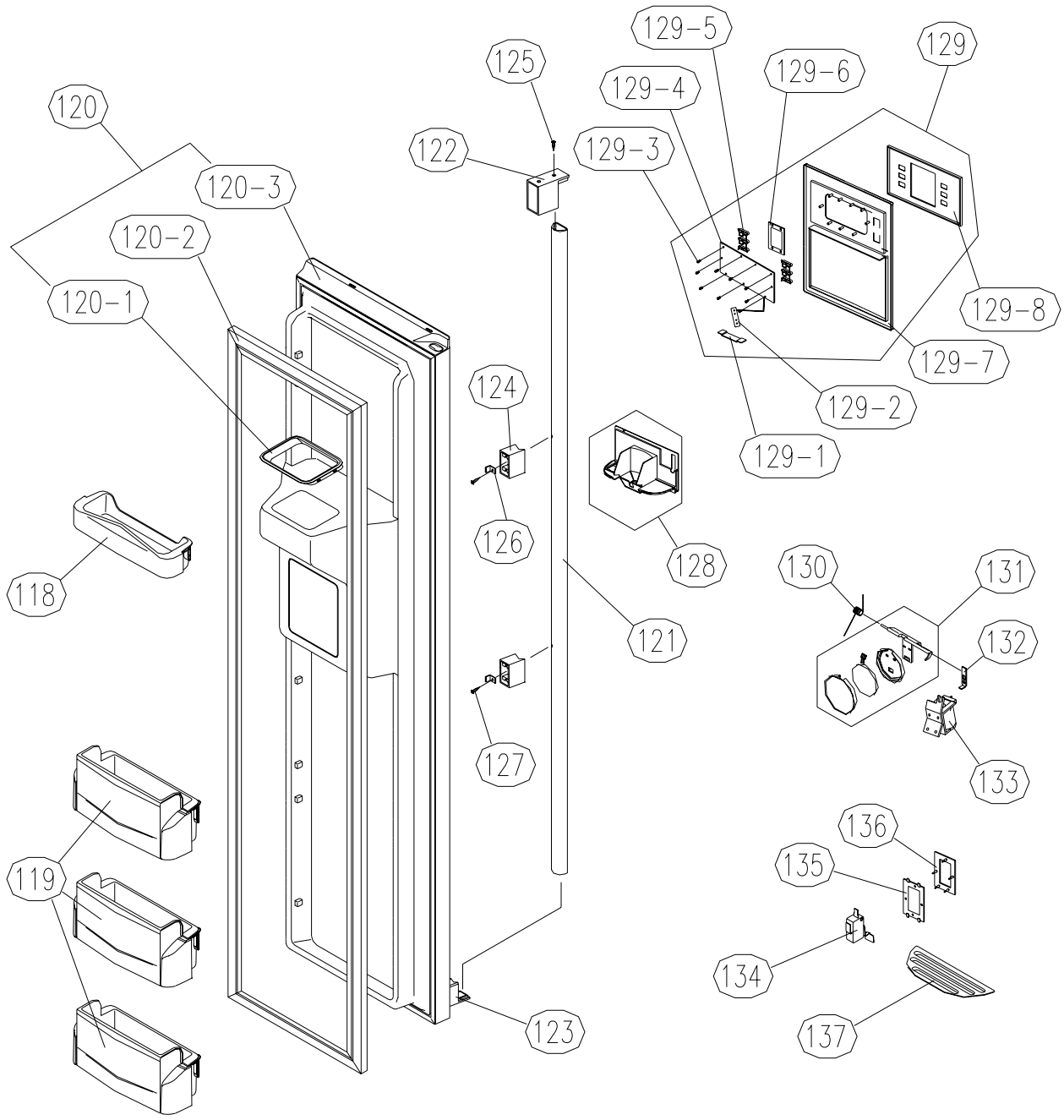
F DOOR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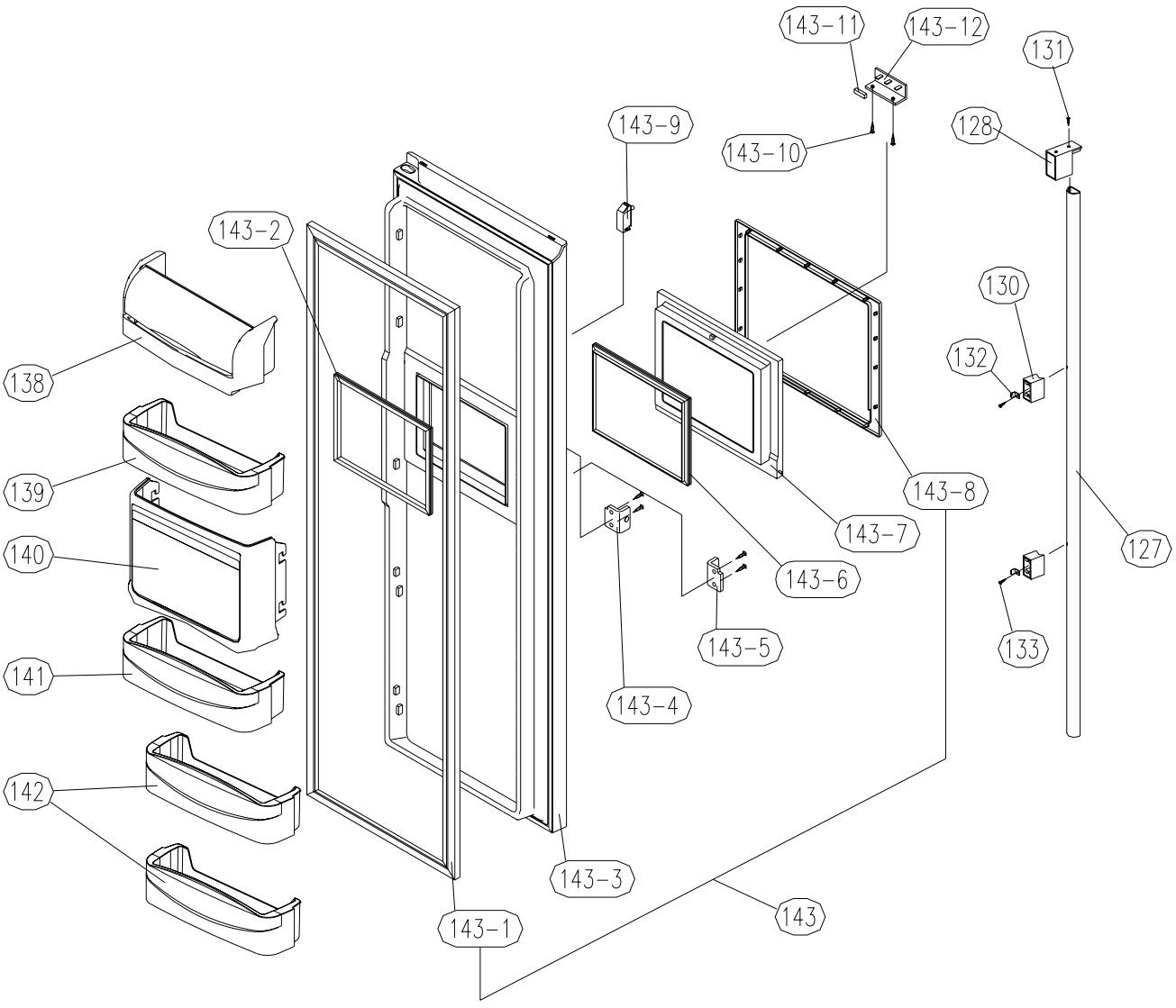
R DOOR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12-2. Parts list

NO	PART CODE	PART NAME	Q'ty	SPECIFICATION	REMARK
1	3000057710	ASSY CAB URT	1	FRU-541D	
2	3012924400	HINGE *T *R AS	1	PO T3.0+PAINT	
3	3012924300	HINGE *T *L AS	1	PO T3.0+PAINT	
4	3016042300	SPECIAL *T HI BOLT	2	6X13 SWCH18A	
5	7051401065	SCREW MACHINE	1	PAN 4X10 SW BSNI	
6	3011446200	COVER *T HI *R	1	PP	
7	3011446100	COVER *T HI *L	1	PP	
8	7112401211	SCREW TAPPING	2	T1 TRS 4X12 MFZN	
9	3010968400	CAP CAB COVER	2	PP	
10	7112401211	SCREW TAPPING	2	T1 TRS 4X12 MFZN	
11	30143G3060	PCB MAIN AS	1	FRN-U20FAVI	
12	3011446001	COVER M/PCB BOX	1	PP(FB-72)	
13	7112401211	SCREW TAPPING	4	T1 TRS 4X12 MFZN	
14	3013224800	HOSE ICE MAKER TUBE AS	1	FRU-541D	
15	3012519210	GUIDE CAB W/TUBE A AS	1	FRU-541D	
16	3011444100	COVER GUIDE CAB W/T A	1	HIPS	
17	3011202000	CLAMP WATER TUBE A	2	PA-66, 5N	
18	3019974800	S/PAER FILTER WATER AS	1	FR-S660CW	
19	3012924003	HINGE *U *R AS	1	P/O T5.0 + PAINT	
20	3012923902	HINGE *U *L AS	1	P/O T5.0 + PAINT	
21	3016001240	SPECIAL BOLT *T	6	6X22 SWCH22A(YL)	
22	3010658001	BRACKET ADJ FOOT AS	2	SPCC T2.6 +ZN 도금	
23	3012105100	FOOT ADJ AS	2	PP	
24	3016001240	SPECIAL BOLT *T	2	6X22 SWCH22A(YL)	
25	3013064200	HOLDER TUBE A	1	A5UC5	
26	3012019500	FIXTURE TUBE FIT B	2	PP	
27	3011447200	COVER CAB BRKT	1	PP	
28	7142401511	SCREW TAPPING	3	T2 TRS 4X16 MFZN	
29	3010340400	BASE COMP AS	1	FRU-571I	
30	3016003300	SPEICAL BOLT	4	T2 M6.5X20	
31	3011346701	CORD POWER	1	AC 250V 16A(VDE)	
32	3016008900	SPECIAL SCREW	1	T1 TRS 4X12 MFZN	
33	7S422X4081	SPECIAL SCREW	2	TT3 TRS 4X8 SE MFZN	
34	3956111M50	COMPRESSOR	1	VEGZ11C 220-240V 50-60HZ	
35	3016002500	SPECIAL WASHER	3	SK-5, T0.8	
36	3010101600	RUBBER ABSORBER COMP	4	NBR	
37	3010566500	BOX INVERTER AS	1	FRN-U20FAV1	
38	3011181300	CASE VAPORI AS	1	PP	
39	3013201710	HOSE DRN B	1	PE FRB-5970NB	

NO	PART CODE	PART NAME	Q'ty	SPECIFICATION	REMARK
40	3015402300	VALVE WATER AS	1	FR-S660CW	
41	3014461510	PIPE WICON AS	1	TSW OD4.76XT0.7	
42	3012021700	FIXTURE MOTR	1	PP	
43	3015916100	MOTOR C FAN AS	1	D4612AAA22	
44	3018500300	M/BELL B	1	PP	
45	3018500200	M/BELL A	1	PP	
46	3011834700	FAN	1	ABS OD3.17XD150	
47	3011200500	CLAMP FAN	1	SUS 304	
48	3016808100	DRYER AS	1	C1220T-M OD19.05XL135	
49	3011497000	COVER MACH ROOM AS	1	SBHG T0.35	
50	7112401211	SPECIAL SCREW	7	T1 4X12.7 MFZN(WH)	
51	3012205001	FRAME CHECK VALVE AS	1	FR-S580CG	
52	3012023700	FIXTURE MOTOR S3	1	PP(NATURAL)	
53	3010107100	ABSORBER MOTOR	2	NBR	
54	3015916000	MOTOR R FAN AS	1	D4612AAA20	
55	3012023900	FIXTURE MOTOR S2	1	PP(NATURAL)	
56	3012023800	FIXTURE MOTOR S1	1	PP(NATURAL)	
57	3011835400	FAN R	1	ABS OD3.17XD110	
58	3011200510	CLAMP FAN	1	SUS 304	
59	3013357300	INSU DAMP AS	1	F-PS	
60	3011445200	COVER DAMP	1	HIPS	
61	3014807100	SENSOR R AS	1	PBN-43B	
62	3011445780	COVER R SENSOR	1	ABS	
63	3017906500	SOCKET R LAMP AS	1	FRU-571I	
64	3013602500	LAMP	2	AC 240V 25W(S)	
65	7121300811	SCREW TAPPING	2	T2S PAN 3X8	
66	3015510800	WINDOW R LAMP	1	MIPS	
67	7112401211	SCREW TAPPING	2	T1 TRS 4*12 MFZN	
68	3018128600	SWITCH LAMP *R	1	SPF101B-1D	
69	3017842821	SHELF INMOLDING R A AS	2	FRAME+PRINTED GLASS(T3.2)	
70	3017842921	SHELF INMOLDING R B AS	1	FRAME+PRINTED GLASS(T3.2)	
71	3012514511	GUIDE CASE A *L AS	3	FR-S580EG(HIPS)	
72	3012514611	GUDIE CASE A *R AS	3	FR-S580EG(HIPS)	
73	7122401411	SCREW TAPPING	10	T2S TRS 4X14 MFZN	
74	3011109260	CASE VEGETB A AS	1	FRU-54AD	
75	3011114680	CASE VEGETB B AS	1	FRU-54AD	
76	3011114780	CASE VEGETB C AS	1	FRU-54AD	
77	3011446700	COVER VEGETB CASE B	1	GPPS	
78	3012529711	GUIDE CASE C *L AS	2	FRU-571I(HIPS)	

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79	3012529811	GUIDE CASE C *R AS	2	FRU-571I(HIPS)	
80	3018701800	DEO ANTI AS	1	W40XT5XL40	
81	3011445900	COVER RETURN DUCT	1	PP	
82	3011171310	CASE EGG AS	1	CASE+VINYL	
83	3018201000	TANK WATER AS	1	FRU-541D	
84	3017053500	EVA AS	1	FRU-571I(HTR 220V/192W)	
84-1	3017053600	EVA SAS	1	FRU-571I	
84-2	3012818300	HEATER SHEATH AS	1	AC220V/ 192W	
84-3	3014806900	SENSOR D AS	1	PBN-43	
84-4	3012023600	FIXTURE D SENS	1	PP	
84-5	3017202010	FUSE TEMP AS	1	AC 250V 77C 10A	
85	3012529000	GUIDE DRN	1	GA	
86	7122401211	SCREW TAPPING	1	T2S TRS 4X12 MFZN	
87	3010107100	FIXTURE MOTOR A	1	HIPS	
88	3010107100	ABSORBER MOTOR	2	NBR	
89	3015915900	MOTOR F FAN	1	D4612AAA21	
90	3018921300	LOUVER F A	1	ABS	
91	3011834500	FAN	1	ABS OD3.17XD130	
92	3011200510	CLAMP FAN	1	SUS 304	
93	7122401411	SCREW TAPPING	3	T2S TRS 4X14 MFZN	
94	3010924600	CAP F LOUVER	1	HIPS T2.3	
95	3018921501	LOUVER F B AS	1	FRU-571I	
96	3011443200	COVER F RETURN	1	HIPS	
97	7122401411	SCREW TAPPING	1	T2S TRS 4X14 MFZN	
98	3010968600	CAP F LOUVER B	2	HIPS	
99	3012013200	FIXTURE C	2	PP	
100	3012205600	FRAME ICE MAKER	1	HIPS	
101	3000025920	ASSY ICE MAKER	1	FRU-541D(R600A)	
102	3012517800	GUIDE G/MOTR BRKT *L	1	ABS	
103	3012517900	GUIDE G/MOTR BRKT *R	1	ABS	
104	3010658120	BRACKET G/MOTR AS	1	220~240/50(MOLD/DW)	
105	3012520510	GUIDE ICE CRUSHER *L	1	ABS	
106	3012517710	GUIDE ICE CRUSHER *R	1	ABS	
107	3011115202	CASE I/CRUSHER AS	1	FRU-541D	
108	3001401760	COVER F FAN AS	1	FRU-541/547/549/54B	
108-1	3011443360	COVER F FAN	1	HIPS/DISP(NO-PLATE F LAMP)	
108-2	3017906610	SOCKET F LAMP AS	1	FR-S570FRB	
108-3	7173300811	SCREW TAPPTITE	1	TT2 BIN 3X8 MFZN	
109	3013602500	LAMP F/R	1	AC 240V 25W(S)	

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110	3015510700	WINDOW F LAMP	1	MIPS	
111	7112401211	SCREW TAPPING	1	T1 TRS 4X12 MFZN	
112	3014807000	SENSOR F AS	1	PT-38	
113	3011442600	COVER F SENS	1	ABS	
114	3018128500	SWITCH LAMP *L	1	SPF101B-2D	
115	3017842600	SHELF F AS	3	FRAME+PRINTED GLASS+FIXTURE	
116	3011114880	CASE F A AS	1	FRU-54AD	
117	3011114980	CASE F B AS	1	FRU-54AD	
118	3019026700	POCKET F *T	1	HIPS	
119	3019027450	POCKET F AS	3	FRU-54AD	
120	3000079710	ASSY F DR	1	FRU-54CF	
120-1	3010964601	CAP ICE PATH FRAME	1	PP(FRS-551F)	
120-2	3012318830	GASKET F DR AS	1	PVC+MAGNET	
120-3	3000078610	ASSY F DR URT	1	FRU-54CD(LONG-BAR)	
121	3012645200	HANDLE	2	AL T1.5	
122	3015311300	SUPPORT HNDL *T	2	ABS+APRAY	
123	3015311500	SUPPORT HNDL *U	2	ABS+SPRAY	
124	3015311400	SUPPORT HNDL *M	4	ABS+SPRAY	
125	3016040200	SPECIAL SCREW FRAME	2	4x14, S18C	
126	3010636900	BRACKET SUPORT *M	4	FR-S580CGM	
127	7122401211	SCREW TAPPING	4	T2S TRS 4x12 MFZN	
128	3010563100	BOX DISPNS I/SHUT	1	ABS,FRU-54AF	
129	3001413800	COVER DISPNS BOX AS	1	FRU-54AD	
129-1	3015513200	WINDOW DISPNS LAMP	1	MIPS	
129-2	30143G2460	PCB LAMP LED AS	1	FRU-54AD	
129-3	7173300611	SCREW TAPPITE	7	TT2 BIN 3X6 MFZN	
129-4	30143G2160	PCB FRONT AS	1	FRU-54AD	
129-5	3016306200	BUTTON CONTL	2	ABS+AL COATING	
129-6	3015512900	WINDOW F PCB	1	ABS	
129-7	3001411300	COVER DISPNS BOX SAS	1	ABS+SPRAY	
129-8	3014239900	PANEL F PCB SAS	1	ABS+SPRAY	
130	3015102200	SPRING ICE D LEVR	1	SUS	
131	3011495300	COVER ICE FLAP AS	1	FRU-541D	
132	3012019700	FIXTURE I/SHUT LUVR	1	FR-S650CD	
133	3015403000	VALVE SOL DISP	1	AC230V 50HZ	
134	3018125800	SWITCH MICRO	1	VP333A-2D	
135	3012223700	FRAME DISPNS BUTN	1	ABS	
136	3016306300	BUTTON DISPNS	1	SILICON	
137	3012406900	GRILL DISPENSER	1	ABS	

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138	3019027530	POCKET DAIRY AS	1	FRU-54AD	
139	3019027230	POCKET R *M AS	1	FRU-54AD	
140	3011187020	CASE H/BAR AS	1	FRU-54AF	
141	3019027720	POCKET R H/BAR AS	1	FRU-54AF	
145	3019027330	POCKET R *S AS	2	FRU-54AD	
146	3000079810	ASSY R DR	1	FRU-54CF	
146-1	3012318930	GASKET R DR AS	1	PVC+MAGNET	
146-2	3012321300	GASKET R H/BAR A AS	1	PPV	
146-3	3000077110	ASSY R DR URT	1	FRU-54CF(LONG-BAR)	
146-4	3015204500	STOPPER H/BAR DR *R	1	PO T4.0	
146-5	3015204400	STOPPER H/BAR DR *L	1	PO T4.0	
146-6	3012321400	GASKET H/BAR A AS	1	PVC	
146-7	3011782600	DOOR H/BAR URT AS	1	FRU-54AF	
146-8	3001411400	COVER H/BAR FRAME SAS	1	ABS+SPRAY	
146-9	3018125600	SWITCH H/BAR DR AS	1	SP101B-2D1(T)	
146-10	7115041208	SCREW TAPPING	2	T1 FLT 4X12 SUS	
146-11	3017501500	MAGNET H/BAR DR AS	1	FRU-54AF	
146-12	3001413700	COVER MAGNET	1	ABS, T2.4	