UNDER COUNTER REFRIGERATOR/FREEZER

RFT-126MC
RFT-156MC
RFT-186MC
RFT-128MC
RFT-158MC
RFT-188MC

SERVICE MANUAL

T425-001(111125)

CONTENTS

PAGE

I. GENERAL INFORMATION

1. SAFETY INSTRUCTIONS

The following instructions contain important safety precautions and should be strictly observed. The terms used here are defined as follows:

WARNING: There is a possibility of death or serious injury to the service person and a third party or the user due to improper service operations or defects in serviced products.

CAUTION: There is a possibility of injury to the service person and a third party or the user or damage to their property* due to improper service operations or defects in serviced products.

* The term “damage to their property” here refers to extensive damage to household effects, houses and pets.

WARNING

1. Always ask the user to keep children away from the work area. They may be injured by tools or disassembled products.

2. When there is no need to energize the unit during disassembly or cleaning, be sure to unplug the unit or disconnect the main power supply before servicing the unit to prevent electric shocks.

3. If the unit must be energized for inspection of the electric circuit, use rubber gloves to avoid contact with any live parts resulting in electric shocks.

4. Keep the following in mind when servicing the refrigeration circuit:

   (1) Be sure to recover the refrigerant. Do not discharge it into the atmosphere. It will affect the environment.

   (2) Check for any flames in the vicinity, and ensure good ventilation.

   (3) If the refrigerant should leak in servicing, immediately put out any fire used in the vicinity.

   (4) When unbrazing the refrigeration circuit connections, check that the circuit is completely evacuated. The refrigerant may produce a poisonous gas when coming in contact with an open flame.

   (5) Do not braze in an enclosed room to prevent carbon monoxide poisoning.

(6) In case of a refrigerant leak, locate and repair the leaking part completely before recharging the refrigerant and checking for further leaks. If the leaking part cannot be located, be sure to check again for further leaks after recharging the refrigerant. Leaked refrigerant may produce a poisonous gas when coming in contact with an open flame of a gas cooking stove or a fan heater.

(7) Before servicing, check the surface temperature of the refrigeration circuit to prevent a burn.

5. Keep the following in mind when making electrical connections:

(1) Check for proper earth connections, and repair if necessary to prevent electric shocks.

(2) Always use service parts intended for the applicable model for replacement of defective parts. Use proper tools to secure the wiring. Otherwise abnormal operation or trouble may occur and cause electric leaks or fire.

(3) Check for proper part installations, wiring conditions and soldered or solderless terminal connections to avoid fire, heat or electric shocks.

(4) Be sure to replace damaged or deteriorated power cords and lead wires to prevent fire, heat or electric shocks.

(5) Cut-off lead wires must be bound using closed end connectors or the like, with their closed ends up to avoid entrance of moisture that could lead to electric leaks or fire.

(6) After servicing, always use a megohmmeter (500V DC) to check for the insulation resistance of at least 1 megohm between the live part (attachment plug) and the dead metal part (earth terminal).

(7) Do not service the electrical parts with wet hands to prevent electric shocks.

(8) The capacitors used for the compressor and other components may be under high voltage and should be discharged properly before servicing.

CAUTION

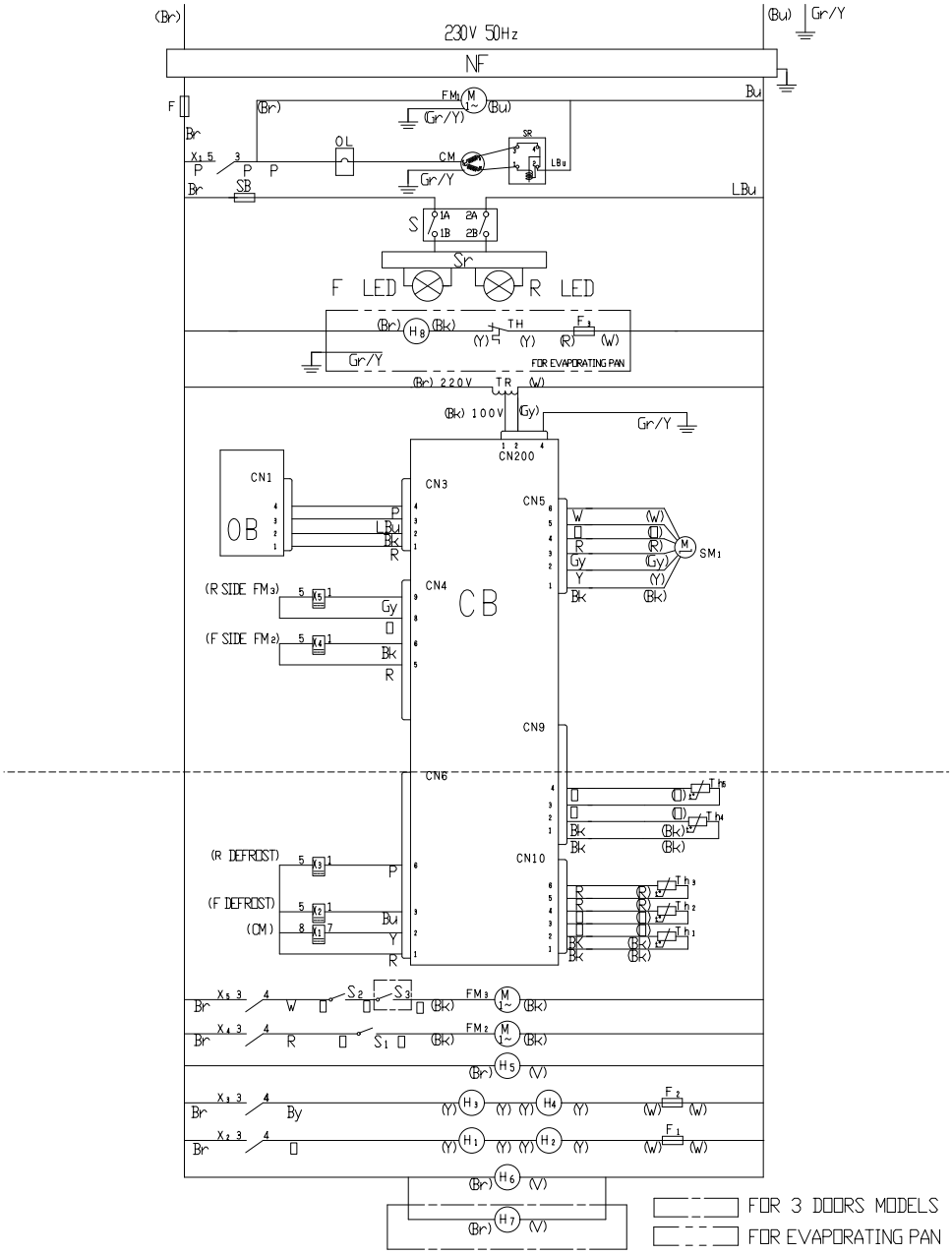
1. After servicing, follow the instructions below:

(1) Always check the unit for proper operation before finishing services.

(2) Be sure to reassemble the parts completely. Loose assembly of such parts as control box cover may cause entrance of vermins resulting in a short circuit between terminals and possible ignition.

II. TECHNICAL INFORMATION

1. WIRING DIAGRAM

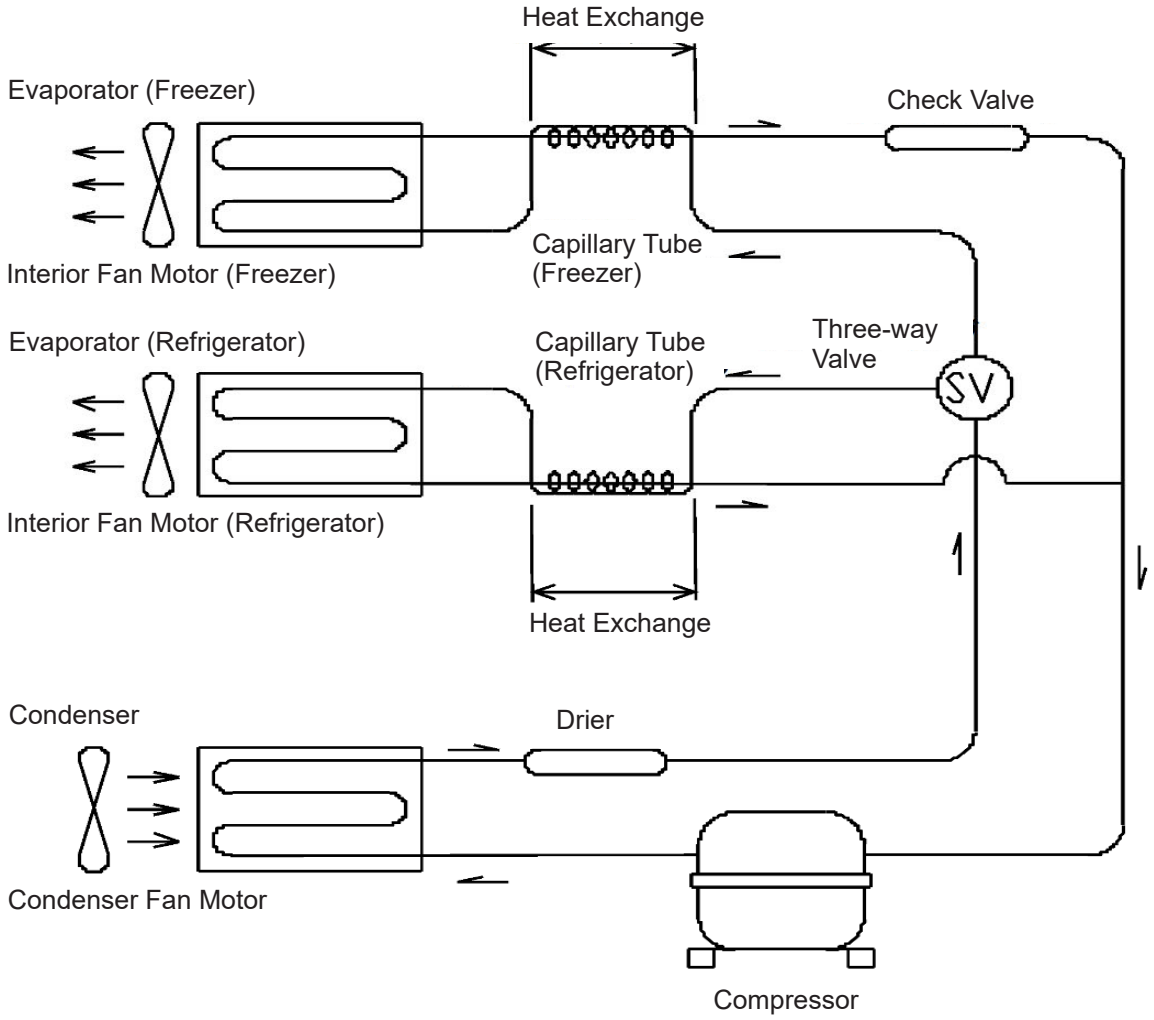


CODE	NAME
F	FUSE
$F_{1,2}$	FUSE 73℃
F_3	FUSE 94℃
CB	CONTROL BOARD
OB	OPERATE BOARD
TR	TRANSFORMER
CM	COMPRESSOR
SR	START RELAY
OL	OVER LOAD PROTEXTOR
SC	START CAPACITOR
FM_1	FAN MOTOR (CONDENSER)
FM_2	FAN MOTOR(INTERIOR) (F SIDE)
FM_3	FAN MOTOR(INTERIOR) (R SIDE)
Th_1	THERMISTOR(INTERIOR) (F SIDE)
Th_2	THERMISTOR(DEFROST) (F SIDE)
Th_3	THERMISTOR (CONDENSER)
Th_4	THERMISTOR(INTERIOR) (R SIDE)

CODE	NAME
Th_5	THERMISTOR(DEFROST) (R SIDE)
TH	THERMISTOR(EVAPORATING PAN)
$H_{1,2}$	DEFROST HEATER (F SIDE)
$H_{3,4}$	DEFROST HEATER (R SIDE)
H_5	CORD HEATIER (OUTER FRAME)
H_6	CORD HEATIER (CENTER FRAME)
H_7	CORD HEATIER (CENTER FRAME)
H_8	CORD HEATIER (EVAPORATING)
SM_1	3-WAY VALVE
X_1	POWER RELAY
$X_{2\sim5}$	RELAY
NF	NOISE FILTER
$S_{1\sim3}$	DOOR SWITCH
SB	SAFTY BREAKER
S	SWITCH (LED LAMP)
Sr	SWITCHING REGULATOR
LED	LED LAMP

2C2316L01B

2. REFRIGERATION CIRCUIT

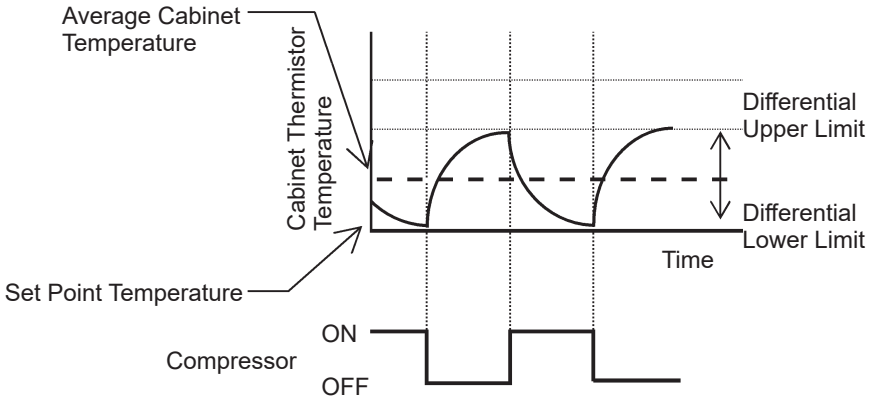


3. ELECTRONIC CONTROLS

3-1. SET POINT TEMPERATURE (COMPRESSOR OFF TEMPERATURE)

The compressor relay output turns on when the compressor starts, and turns off when the cabinet thermistor temperature decreases to the differential lower limit.

Cabinet temperature setting range (Refrigerator): -6 to -12°C
Cabinet temperature setting range (Freezer): -25 to -7°C



3-2. CABINET TEMPERATURE DIFFERENTIAL

	Differential	
	Upper limit [K]	Lower limit [K]
Refrigerator	+1.5	-1.5
Freezer	+1.5	-2.0

Note: The above value is only for reference. The values will be 4 to 6K in the actual unit.

3-3. DEFROST CYCLE

The unit automatically defrosts the evaporator 6 hours after refrigeration starts. During the defrost cycle (from defrost start to display delay), the display shows “dF” and the defrost indicator light stays on. When the defrost completes, the indication and light go off.

3-4. DEFROST TERMINATION TEMPERATURE

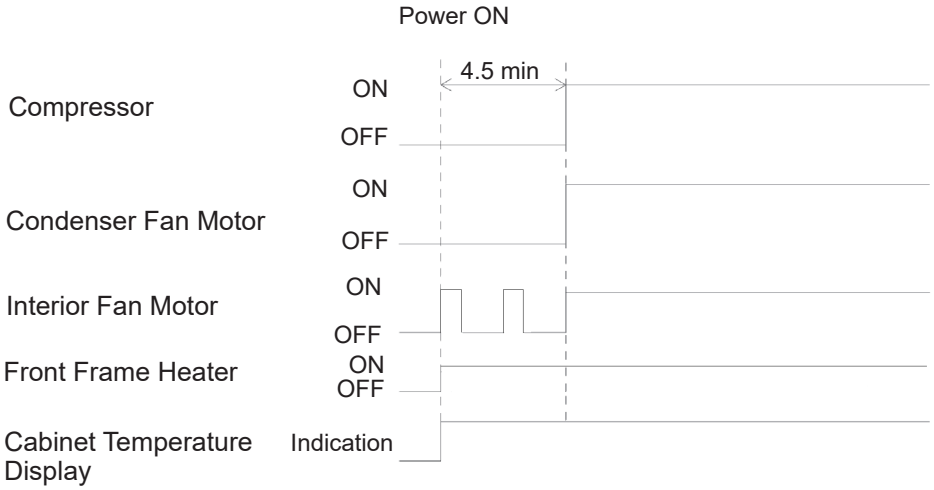
Refrigerator: +5°C
Ffreezer: +5°C

3-5. TEMPERATURE DISPLAY

The digital temperature display renews its cabinet temperature indication every 30 seconds. The display shows the same temperature for 30 seconds even if the actual cabinet temperature changes when the door is opened. During the defrost cycle, the display shows “dF” and the defrost indicator light stays on.

3-6. COMPRESSOR SOFT START

1) Startup



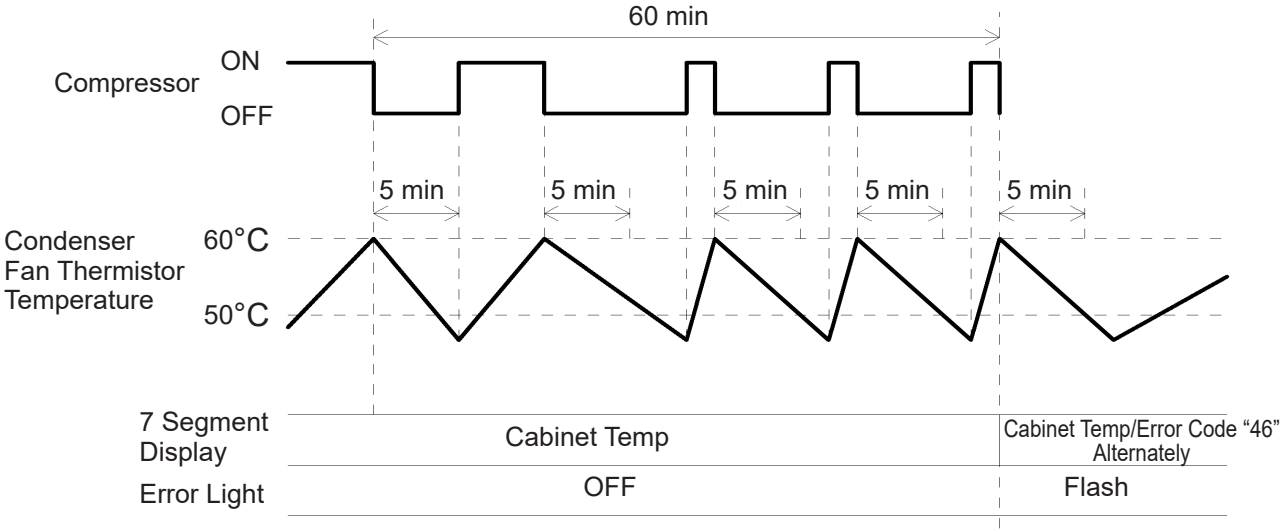
When the power supply is turned on, the display shows the cabinet temperature and the compressor and the condenser fan motor start up with a delay of the set value. This delay is intended to minimize the difference between the high-side and low-side pressures and to reduce the load on the compressor so that it can start easily in case of a short (especially instantaneous) power failure.

2) Normal Control

The compressor will not start until the set period of time (same with the soft start time) has passed. For example, if the compressor is turned off by its thermistor and the door is opened immediately after (causing the cabinet temperature to immediately exceed the restart temperature), the compressor will still not start until 4.5 minutes have passed since its shutdown.

3-7. HIGH PRESSURE SWITCH (FREEZER ONLY)

The compressor stops for 5 minutes if the condenser fan thermistor senses 60°C of high pressure temperature.



3-8. CHECKING CABINET SET TEMPERATURE

Note: See "5. MAINTENANCE MODE" for the operation panel key locations.

Press the set key on the operation panel. The current cabinet temperature indication on the right display goes off and the display flashes the current set temperature. (To show the current set temperature of the left display, press the set key again.) To go back to the current temperature indication, wait for 10 seconds or press the set key again.

3-9. MANUAL DEFROST

To start the manual defrost cycle (off-cycle heater), press and hold the manual defrost key for 5 seconds. The next defrost cycle starts 6 hours after the manual defrost key is pressed. To cancel the defrost cycle halfway, turn off the power supply. Wait for 30 seconds before turning on the unit again.

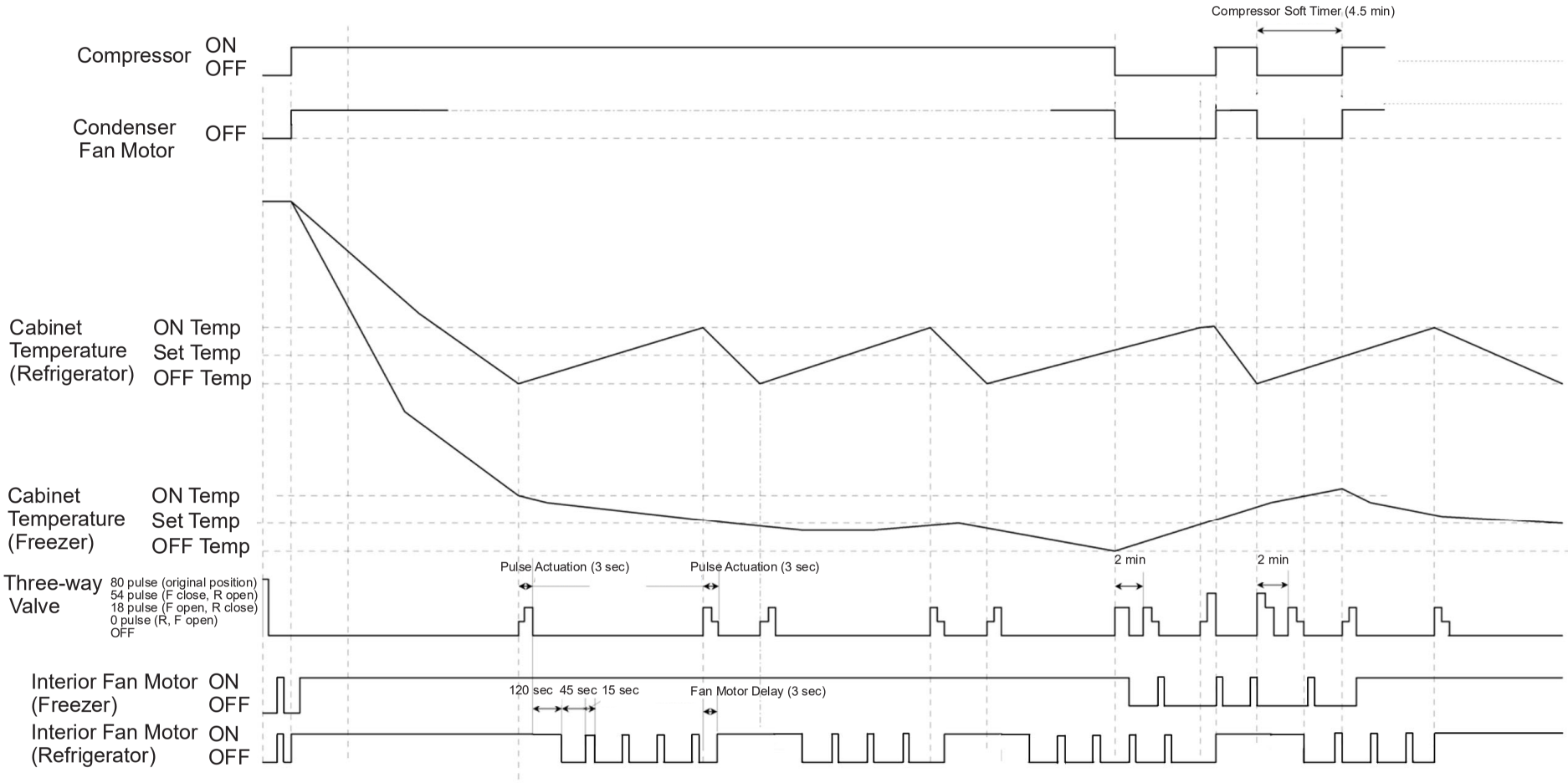
3-10. ERROR CODES

When an error occurs, the display indicates the cabinet temperature and error code alternately every second. The error light lights up along with the error code indication.
For details, see “III. 1. ERROR CODES”.

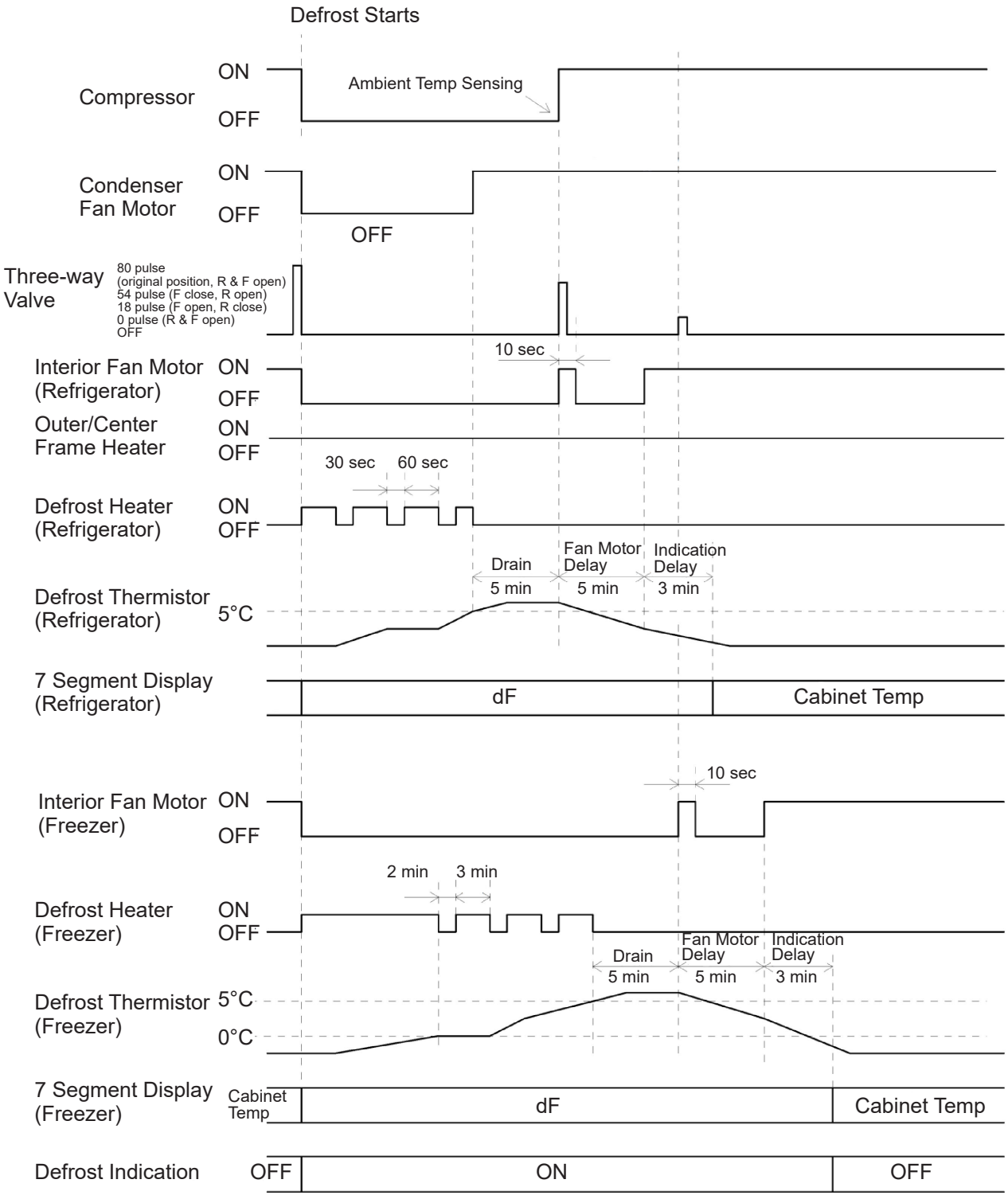
Error code	Item
60, 61	High temperature error
62, 63	Low temperature error
64,65	Defrost error
46	High pressure error
66, 67	Cabinet thermistor error
80	Condenser fan motor error
84, 85	Condenser clogging
68, 69	Defrost thermistor error
47, 48	Condenser fan thermistor error
40, 41	Main control board error
43	Operation board communication error
42	Operation board error
81	Interior fan motor error

4. TIMING CHART

4-1. STARTUP - CONTROL



4-2. DEFROST


Defrost Starts
Compressor
ON
OFF
Ambient Temp Sensing
Condenser Fan Motor
ON
OFF
OFF
Three-way Valve
80 pulse
(original position, R & F open)
54 pulse (F close, R open)
18 pulse (F open, R close)
0 pulse (R & F open)
OFF
10 sec
Interior Fan Motor (Refrigerator)
ON
OFF
Outer/Center Frame Heater
ON
OFF
30 sec
60 sec
Defrost Heater (Refrigerator)
ON
OFF
Drain
5 min
Fan Motor Delay
5 min
Indication Delay
3 min
Defrost Thermistor (Refrigerator)
5°C
7 Segment Display (Refrigerator)
dF
Cabinet Temp
10 sec
Interior Fan Motor (Freezer)
ON
OFF
2 min
3 min
Defrost Heater (Freezer)
ON
OFF
Drain
5 min
Fan Motor Delay
5 min
Indication Delay
3 min
Defrost Thermistor (Freezer)
5°C
0°C
7 Segment Display (Freezer)
Cabinet Temp
dF
Cabinet Temp
Defrost Indication
OFF
ON
OFF

- The defrost cycle starts every 6 hours (factory setting). This time length is adjustable by the control board.

- When the defrost cycle starts, the compressor, condenser fan motor and interior fan motor stop. The defrost heater (glass tube heater) is energized at the same time.

- On the refrigerator side, the defrost heater operates intermittently (ON time: 60 seconds, OFF time: 30 seconds) until the defrost thermistor attached to the evaporator senses 5°C.

- When the defrost thermistor attached to the evaporator senses 0°C on the freezer side, the defrost heater starts operating intermittently (ON time: 3 minutes, OFF time: 2 minutes). This is to reduce the heater-induced thermal effect inside the cabinet.

- When the defrost thermistor senses 3°C on the freezer side, the interior fan motor starts operating intermittently (ON time: 3 seconds, OFF time: 57 seconds). This is to defrost the exhaust duct grill. This intermittent operation continues until the draining completes.

- When the defrost thermistor senses 5°C on both the refrigerator and freezer sides, the defrost heater is de-energized, and the evaporator starts draining.

- When the defrost thermistor senses 5°C on either the refrigerator or freezer side, the condenser fan motor starts rotating. The condenser fan thermistor senses the ambient temperature right before the compressor starts running.

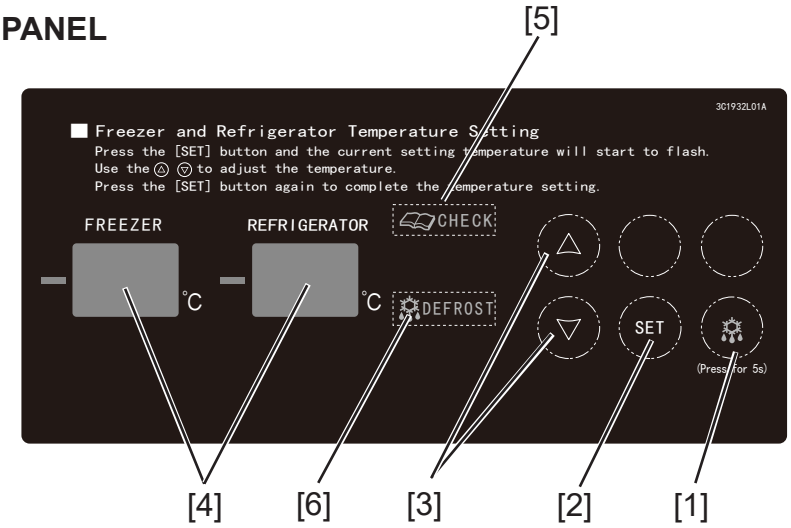
- On both the refrigerator and freezer sides, the interior fan motor rotates for 10 seconds after the draining completes. This is to prevent the fan from locking (water on the fan is removed to prevent frost buildup during the next cooling operation). After that, the interior fan motor stops and restarts.

- When draining of either the refrigerator or freezer side completes, the compressor starts running. On the other side where the defrost cycle has not completed, the defrost continues.

- On both the refrigerator and freezer sides, the refrigeration unit resumes normal control operation after the fan motor delay.

5. MAINTENANCE MODE

5-1. OPERATION PANEL



[1] Manual Defrost Key
Starts the manual defrost cycle.

[2] Set Key
Sets/changes the cabinet temperature.

[3] Up/Down Key
Increases/decreases the set temperature.

* Up key is also used when resetting the error code indication. To reset the error code indication, press and hold the up key for 3 seconds.

[4] Temperature Display
Indicates the cabinet temperature of the refrigerator/freezer.
Indicates “dF” during the defrost cycle.
Flashes error code when an error occurs.

[5] Error Light
Flashes when an error occurs.

[6] Defrost Indicator Light
Lights up during the defrost cycle.

5-2. CHECKING ERROR HISTORY

1) Press and hold the up key and set key for 5 seconds (press the up key first, and then set key). The display on the right indicates the code “F0”.

2) Use the up/down key until the display indicates “F6”.

3) Press the set key. Error history flashes in order of occurrence. When there is no error history, the display indicates “--”.

   Note: For a particular error of the refrigerator/freezer, the error history flashes in the corresponding display. For a general error, the error history flashes in the display on the right.

4) Press the set key. The display returns to the “F6” indication.

5) Press and hold the up key and set key for 5 seconds, or wait for 1 minute without pressing any keys. The display returns to the current cabinet temperature indication.

* To reset an individual error history, press and hold the up key for 5 seconds while the desired error history is flashing in the display.

* When using the up/down key to select “F6”, do not press any other keys. The setting may be changed, causing a malfunction of the unit. Wait for 1 minute if any other key is pressed. The display goes back to the current cabinet temperature indication.

* If the same error occurs repeatedly in a row, the error code is stored only once.

  e.g.: If errors occur in the order of 84, 84, 84, 46, and 84, the error history will show “84, 46, 84”.

5-3. SETTING CHANGE

Adjustable settings are as follows:

[1] Cabinet temperature
[2] Automatic defrost cycle frequency
[3] High temperature sensing time
[4] Low temperature sensing time
[5] Error history
[6] Buzzer output
[7] Defrost backup timer
[8] Interior fan rotating speed

The default settings other than “[1] Cabinet temperature” satisfy the unit specifications. Unless necessary, do not adjust the settings. A change may cause unexpected operation of the unit.

[1] Cabinet temperature

1) Press the set key. The digital temperature display on the right flashes the current set temperature.

   * To show the current set temperature on the display on the left, press the set key again. The display on the left flashes the current set temperature.

2) While the set temperature is flashing, press the up/down key to adjust the temperature setting.

3) Press the set key. The temperature on the right is set, and the display on the left flashes. Adjust the temperature setting and press the set key to set.

Note: No settings will be stored unless the set key is pressed after the adjustment.

[2] - [8]

1) Press and hold the up key and set key for 5 seconds. The display on the right indicates the code “F0”.

2) Use the up/down key until the display indicates the desired setting code (F0 - FE).

3) Press the set key. The current set value flashes in the display on the right.

   * To show the current set temperature on the display on the left, press the set key again. The display on the left flashes the current set temperature.

   Note: For “F6”, see “5-2. CHECKING ERROR HISTORY”.

4) Use the up/down key to adjust the set value. If unsure about the settings, reset the value to the default.

5) Press the set key.

6) Press and hold the up key and set key for 5 seconds, or wait for 1 minute without pressing any keys. The display returns to the current cabinet temperature indication.

Code	Item	Setting range
F0	Automatic defrost cycle frequency	1 to 12 hour(s), increment: 1 hour * Low defrost frequency may cause too much frost, resulting in poor cooling performance. * Set value is indicated and adjustable in display on right.
F3	Error code 60, 61 (high temperature sensing time)	0: Immediate occurrence (no error history) -> For remote inspection. Setting returns to previous setting after inspection. 1: 1 hour 2: 2 hours (default setting) 3: 3 hours * Set value of refrigerator/freezer is indicated and adjustable in corresponding display.
F4	Error code 62, 63 (low temperature sensing time)	0: Immediate occurrence (no error history) -> For remote inspection. Setting returns to previous setting after inspection. 1: 1 hour (default setting) * Set value of refrigerator/freezer is indicated and adjustable in corresponding display.
F6	Error history (error reset)	40 to 86 * Error history is displayed every 0.5 seconds for 1 second. A maximum of 8 errors are stored for each cabinet.
Fb	Buzzer output (external output)	AL: Buzzer sounds when any error occurs (default setting) 1, 2: Buzzer sounds only when errors of 60, 61, 62 or 63 occur * Set value is indicated and adjustable in display on right.
FC	Defrost backup timer * Time until forced shutdown when the defrost heater remains energized for an extended period.	---: No backup (no error of 64 or 65) 1 - 14: 1 - 14 x 10 minutes, increment: 10 minutes * Long duration until backup (or no backup) may cause fuse to blow out when defrost heater remains energized for a long time. * Set value of refrigerator/freezer is indicated and adjustable in corresponding display.
FE	Interior fan rotating speed	AU: normal operation (default setting)

5-4. CORRECTION TEMPERATURE SETTING

1) Press the up, down and set keys together, and turn on the unit. The display on the right indicates the code “C1”.

2) Use the up/down key until the display indicates “C2”. Do not change any other settings.

3) Press the set key. The display on the right flashes the correction value, and the display on the left indicates the correction value.

4) Use the up/down key to adjust the value. To adjust the value on the left, press the set key while the display on the right is flashing.

5) Press the set key. The display indicates “C2”.

6) Press and hold the set key while the display is indicating “C2”, or press and hold the set key while the display is indicating the set value. The display flashes “rc”.

7) Press ant hold the set key while the display is flashing “rc”. The display flashes “oF”.

8) Turn off the power supply to complete the setting.

[Default setting value]

	Refrigerator	Freezer
C1	5	5
C2	10	15
C3	12	-7
C4	-6	-25
C5	15	15
C6	15	20
C7	0	0
C8	27	27
C9	8	8

[Correction value C2]

Cabinet temperature correction value (K)				Displayed value (temperature indication)			
Refrigerator	1.0K	Freezer	1.5K	Refrigerator	10	Freezer	15

5-5. MAINTENANCE MODE

5-5-1. Checking current operation

1) Press and hold the down key and set key for 5 seconds. The display on the right indicates the code “tr” (cabinet thermistor sensing temperature).

2) Use the up/down key until the display indicates the desired setting code.

3) Press the set key. The display indicates the current operation.

4) Press and hold the down key and set key for 5 seconds. The display returns to the current cabinet temperature.

5-5-2. Current operation

[a] Thermistor temperature (code: tr, td, tc and tA)

The display indicates the thermistor sensing temperature (°C).

Code	Item	Description
tr	Cabinet thermistor	Temperature of the refrigerator/freezer cabinet is indicated in the corresponding display.
td	Defrost thermistor	Temperature of the refrigerator/freezer cabinet is indicated in the corresponding display.
tc	Condenser fan thermistor	Temperature is indicated in the display on the right.
tA	Ambient temperature	Temperature is indicated in the display on the right. Ambient temperature is sensed by condenser fan thermistor after defrost cycle.

[b] Current operation (code: cn)

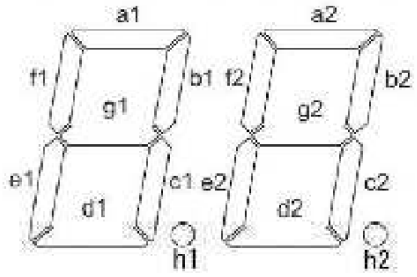
The display indicates the current operation status.

Er: Unit stopped for error
En: Ready for start-up
PL: Pull down
dC: Forced cooling
FC: Rapid cooling
bL: Balance
ST: Refrigeration stopped
rF: High pressure error
SE: Fail-safe operation
d.S: Defrost starts
d.H: Heater defrost
d.0: Off-cycle defrost
d.o: Off-cycle defrost (accumulated)
d.d: Drain
d.F: Fan delay

[c] Port output (code: oP)

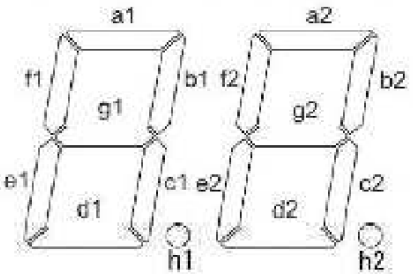
The display indicates if there is output from the main control board.

Display on the left	Display on the right
a1: --- b1: --- c1: --- d1: --- e1: --- f1: --- g1: --- h1: --- a2: Center frame heater b2: Outer frame heater c2: Interior fan motor A operation d2: Interior fan motor A rotation speed (low: ON, high: OFF) e2: Interior fan motor B operation f2: Interior fan motor B rotation speed (low: ON, high: OFF) g2: Condenser fan motor operation h2: ---	a1: Three-way valve A phase b1: Three-way valve B phase c1: Three-way valve A- phase d1: Three-way valve B- phase e1: Buzzer f1: --- g1: --- h1: --- a2: Compressor relay b2: Defrost heater (main) c2: --- d2: --- e2: Defrost heater (sub) f2: --- h2: Interior lamp output



[d] Input (code: iP)

The display indicates if there is input to the main control board.

Display on the left (unit B)	Display on the right (unit A)
a1: --- b1: --- c1: --- d1: --- e1: --- f1: --- g1: --- h1: --- a2: Operation _ up switch b2: Operation _ down switch c2: Operation _ frame heater switch d2: Operation _ setting switch e2: Operation _ wall switch f2: Operation _ defrost switch g2: --- h2: ---  	a1: Gas sensor MAL (contact closed = ON = normal, contact open = OFF = abnormal or not in use) b1: Gas sensor GAS (contact closed = ON = normal, contact open = OFF = abnormal or not in use) c1: --- d1: --- e1: Reed switch (unit A) (contact closed = ON, contact open = OFF) f1: Reed switch (unit B) (contact closed = ON, contact open = OFF) g1: --- h1: Interior lamp switch (contact closed = ON, contact open = OFF) a2: --- b2: --- c2: Condenser fan motor FG pulse d2: --- e2: --- f2: --- g2: --- h2: ---

[e] Compressor high pressure (code: cc)

The display on the right indicates the detection of clogging and high pressure based on the operation status of the pressure switch (minus part of the display lights up), compressor and condenser fan thermistor.

First digit: Compressor state
0: Waiting for OFF time
2: Stop for high pressure
3: Waiting for cabinet temperature to reach ON temperature
4. ---
5. Speed at start-up (frequency at start-up)
6: Normal (0x to 6x speed)

Last digit: Pressure state
0: Normal
1: Clogging detected
2: High pressure sensed

III. SERVICE DIAGNOSIS

1. ERROR CODES

[a] INDICATION PRIORITY

High <---------- Low
41 > 40 > 42 > 43 > 66 > 67 > 68 > 69 > 47 > 48 > 46 > 85 > 64 > 65 > 60 > 61 > 62 > 63

[b] HIGH TEMPERATURE ERROR

[Description]

Code	Problem	Possible cause
60	Condenser fan thermistor temperature stays lower than ambient temperature +3K at defrost for high temperature sensing time.	Compressor, control board or relay error * Compressor stops.
61	Other than above.	Refrigerant leak (three-way valve) Cabinet thermistor or condenser fan thermistor error Door opened too often or gap between door and unit Excessive load Ambient temperature too high Defrost error * Compressor runs but cabinet will not cool for some reason.

- If the cabinet temperature is higher than the set temperature +10K for 120 minutes of the high temperature sensing time (adjustable in the service mode), and a problem stated in the table above occurs, the display indicates the code “60” or “61”.

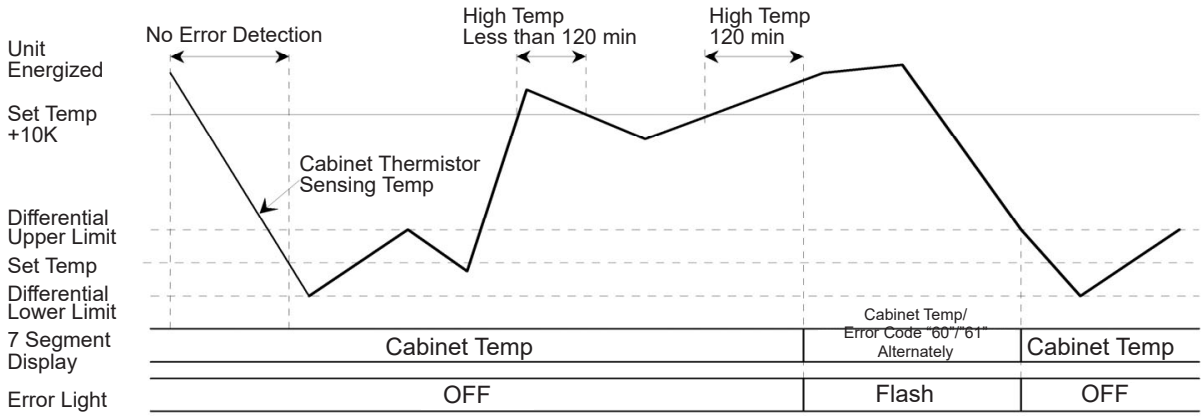
- The high temperature sensing timer resets if the cabinet temperature decreases to the set temperature +10K before the high temperature sensing time is up.

* The error detection starts when the cabinet temperature reaches the set value after the unit is energized.

* During the defrost cycle, the timer and detection stop.

* No error history is stored if the set value of the high temperature sensing time is 0. After an error occurs, the high temperature sensing time returns to the previous set value.

[Timing chart]



[Reset]

- Automatically resets when the cabinet thermistor temperature decreases to the upper limit of the differential.

- Press and hold the up key for 3 seconds.

- Turn off the power supply.

[Indication]

The error light flashes and the display corresponding to the refrigerator/freezer with an error indicates the cabinet temperature and error code alternately. When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature. The error light goes off when errors on both the refrigerator and freezer are cleared.

[c] LOW TEMPERATURE ERROR

[Description]

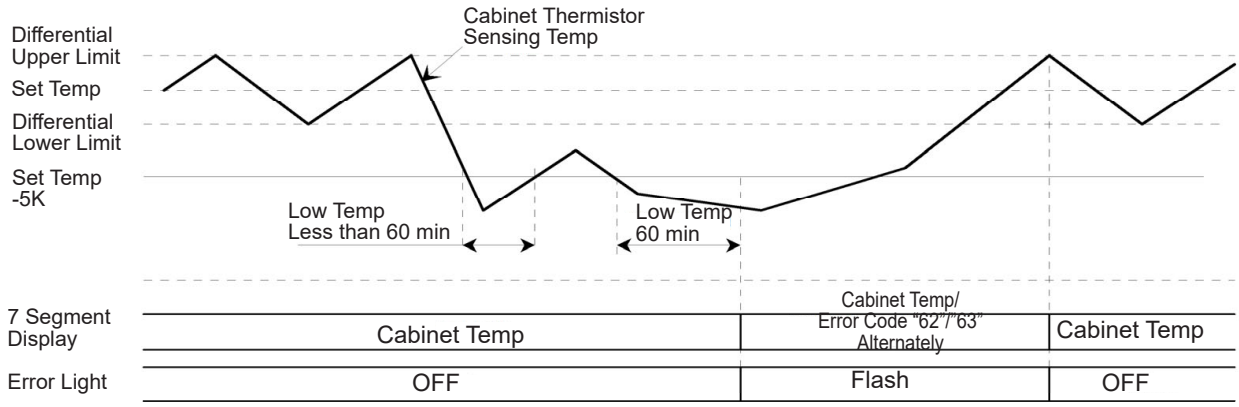
Code	Problem	Possible cause
62	Condenser fan thermistor temperature stays lower than ambient temperature +3K at defrost for low temperature sensing time.	Cabinet thermistor error Ambient temperature too low * Compressor stops and cabinet excessively cools for some reason.
63	Other than above.	Refrigerant circuit (three-way valve), control board or relay error * Compressor will not stop and continue running for some reason.

- If the cabinet temperature is lower than the set temperature -5K for 60 minutes of the low temperature sensing time (adjustable in the service mode), and a problem stated in the table above occurs, the display indicates the code “62” or “63”.

- The low temperature sensing timer resets if the cabinet temperature reaches the set temperature -5K before the low temperature sensing time is up.

* No error history is stored if the set value of the low temperature sensing time is 0. After an error occurs, the low temperature sensing time returns to the previous set value.

[Timing chart]



[Reset]

- Automatically resets when the cabinet thermistor temperature reaches the upper limit of the differential.

- Press and hold the up key for 3 seconds.

- Turn off the power supply.

[Indication]

The error light flashes and the display corresponding to the refrigerator/freezer with an error indicates the cabinet temperature and error code alternately. When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature. The error light goes off when errors on both the refrigerator and freezer are cleared.

[d] DEFROST ERROR

[Description]

Code	Problem	Possible cause
64	Defrost thermistor temperature is 2°C or less when backup time is up. (Defrost heater stops)	Defrost heater, thermal fuse, relay or control board error * Defrost heater is de-energized.
65	Other than above	Defrost thermistor error Frost (door opened too often) * Defrost heater is energized but error occurs for some reason.

- The backup timer starts counting down from 60 minutes when defrost cycle starts.

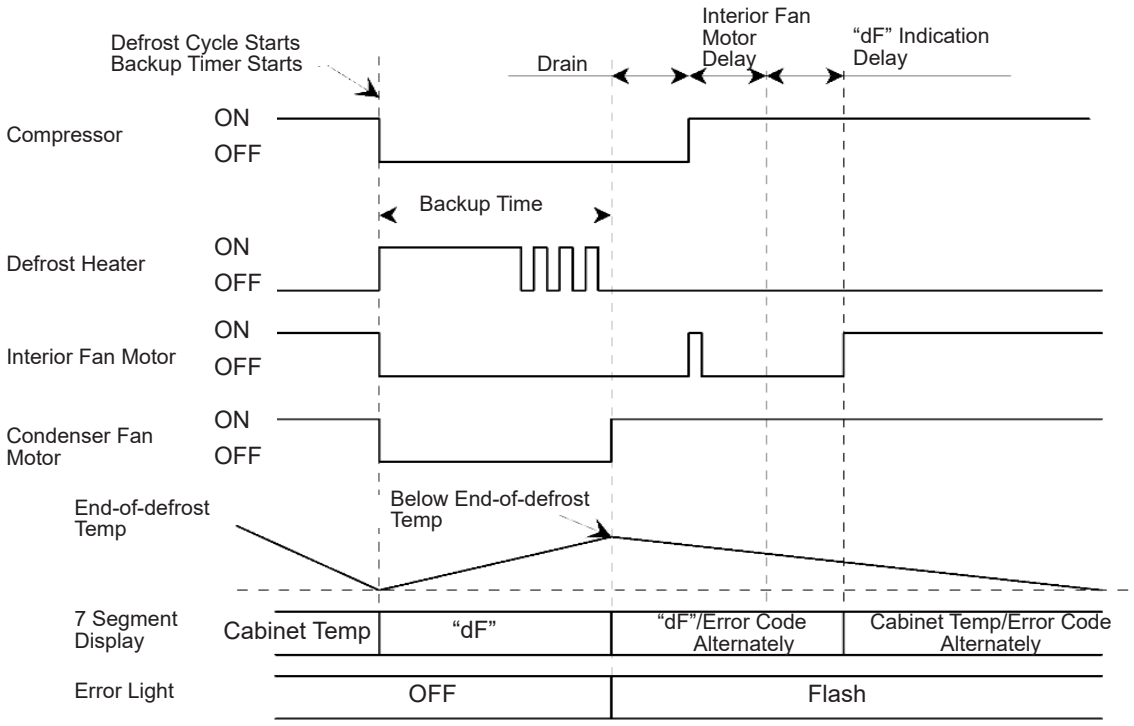
- If the defrost thermistor does not sense end-of-defrost temperature or a problem stated in the table above occurs, the display indicates the code “64” or “65”.

- If the defrost error “64” or “65 occur, the defrost heater is de-energized, and the operation moves on to the next step.

  Display indicates “64” or “65” -> Defrost heater de-energized -> Drain
  -> Fan motor delay -> “dF” indication delay -> Cooling operation

  The next defrost cycle starts from “drain” with the defrost heater de-energized.

[Timing chart]



[Reset]

- Press and hold the up key for 3 seconds.

- Turn off the power supply.

[Indication]

The error light flashes and the display corresponding to the refrigerator/freezer with an error indicates the cabinet temperature and error code alternately. When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature.

[e] HIGH PRESSURE ERROR

[Description]

Code	Problem	Possible cause
46	---	Condenser fan thermistor or condenser fan motor error Clogged condenser Ambient temperature too high

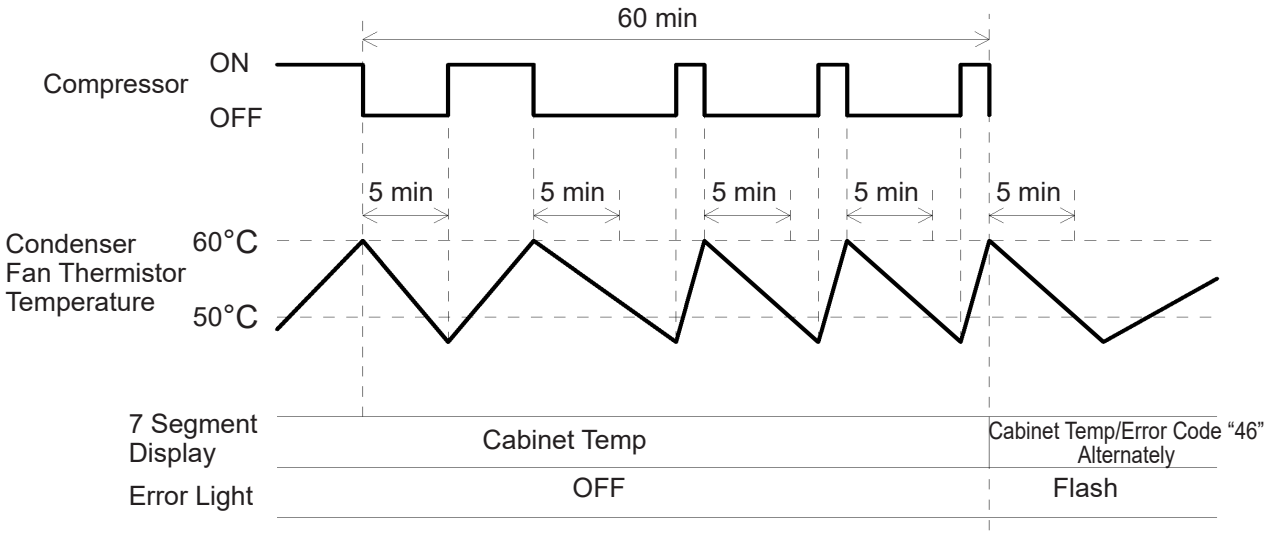
- If the condenser fan thermistor temperature is above 50°C or more, the compressor stops for 5 minutes. After this initial sensing, the pressure error timer starts counting down from 60 minutes.

- The compressor restarts after 5 minutes if the condenser fan thermistor temperature is below 50°C. The compressor will not start until the condenser fan thermistor temperature decreases to 50°C.

- The compressor will stop again if high pressure error is detected.

- If the pressure error is detected for the fifth time and the pressure error timer has not completed, the display indicates “46”. If the pressure error timer has completed, the display will not indicate “46”.

[Timing chart]



[Reset]

- Press and hold the up key for 3 seconds.

- Turn off the power supply.

[Indication]

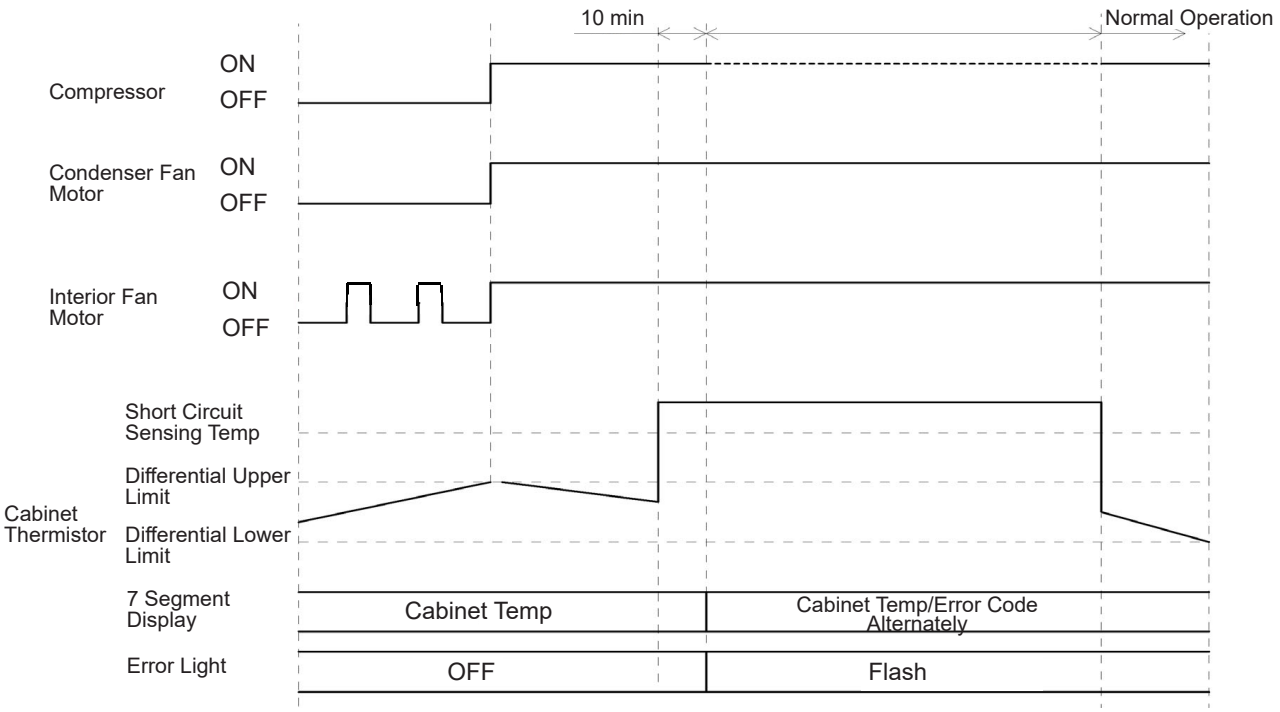
The error light flashes and the display on the right indicates the cabinet temperature and error code alternately. When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature.

[f] CABINET THERMISTOR ERROR

[Description]

Code	Problem	Possible cause
66	Cabinet thermistor temperature is above 70°C for 10 minutes or more.	Short circuit Wiring or control board error
67	Cabinet thermistor temperature is below -60°C.	Open circuit Wiring or control board error

[Timing chart]



This timing chart shows the operation when the cabinet thermistor is shorted. When the cabinet thermistor is shorted, the display indicates the cabinet temperature (70°C to 99°C).

In case of open circuit, the error code is indicated immediately. Then the same operation as the timing chart above is performed.

[Reset]

The unit automatically returns to normal operation after the cause of the error is removed. The error code indication and error light will not reset.

Note: The cabinet thermistor error significantly affects stored food. To ensure food safety and prevent food poisoning, the error code remains indicated even after the error is resolved, prompting a service person to inspect the unit.
For the other thermistor errors, the error code indication will reset after an error is resolved since customers can take care of stored food as long as the cabinet temperature is indicated in the display.

[Indication]

The error light flashes and the display on the right indicates the cabinet temperature and error code alternately. When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature.

[g] DEFROST THERMISTOR ERROR

[Description]

Code	Problem	Possible cause
68	Defrost thermistor temperature is above 70°C for 10 minutes or more.	Short circuit Wiring or control board error
69	Defrost thermistor is below -60°C.	Open circuit Wiring or control board error

[Reset]

The unit automatically returns to normal operation after the cause of the error is removed. The error code indication and error light will not reset.

[Indication]

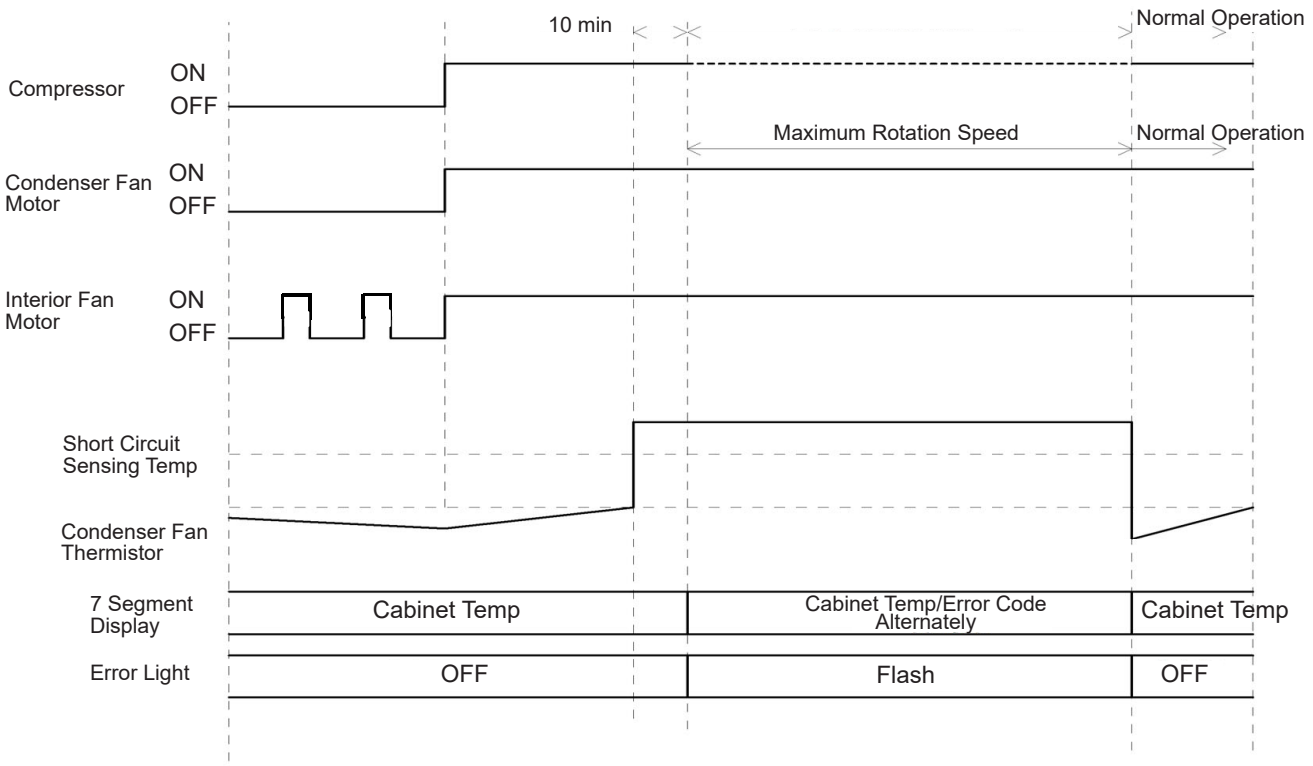
The error light flashes and the display on the right indicates the cabinet temperature and error code alternately. When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature.

[h] CONDENSER FAN THERMISTOR ERROR

[Description]

Code	Problem	Possible cause
47	Condenser fan thermistor temperature is above 95°C for 10 minutes or more.	Short circuit Wiring or control board error
48	Condenser fan thermistor temperature is below -30°C or less.	Open circuit Wiring or control board error

[Timing chart]



This timing chart shows the operation when the condenser fan thermistor is shorted. In case of open circuit, the error code is indicated immediately. Then the same operation as the timing chart above is performed.

[Reset]

The unit automatically returns to normal operation after the cause of the error is removed. The error code indication and error light will not reset.

[Indication]

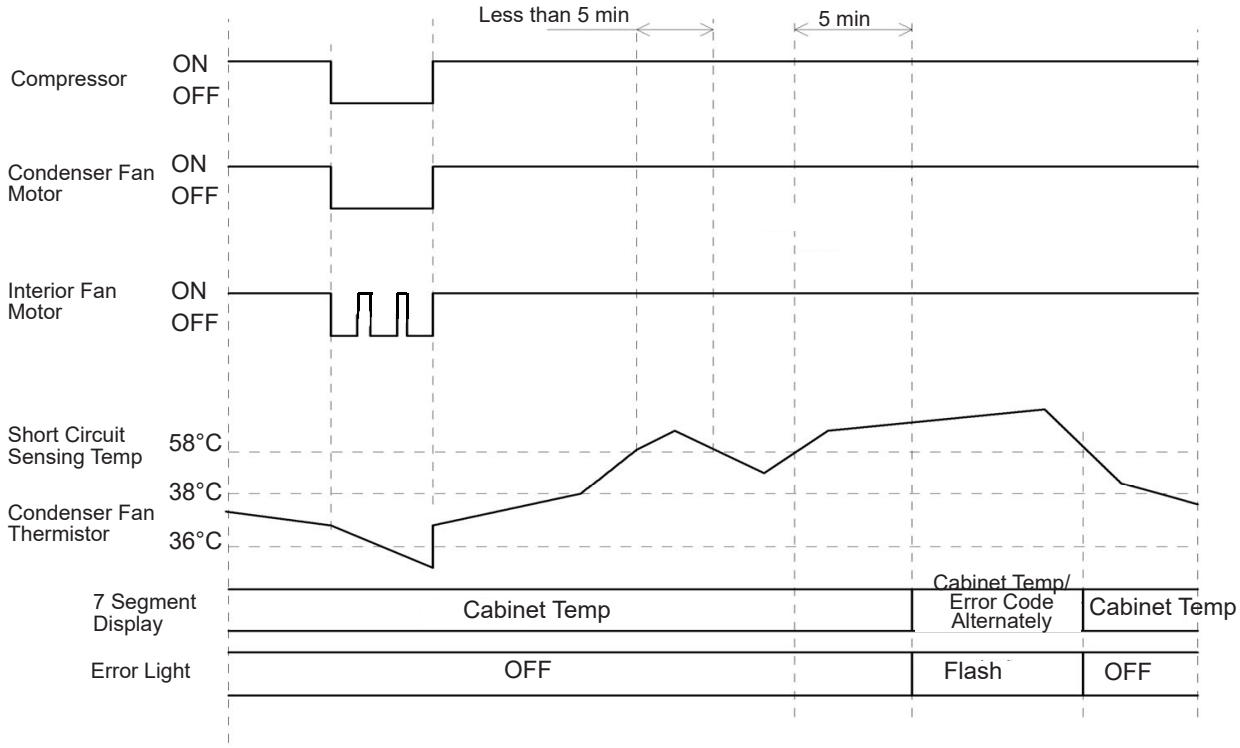
The error light flashes and the display indicates the cabinet temperature and error code alternately. When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature.

[i] CONDENSER CLOGGING

[Description]

Code	Problem	Possible cause
85	Condenser fan thermistor temperature is above 55°C for 5 minutes or more.	Condenser fan thermistor error Clogged air filter Ambient temperature too high

[Timing chart]



[Reset]

- Automatically resets when the condenser fan thermistor temperature decreases to the set temperature .

[Indication]

The error light flashes and the display on the right indicates the cabinet temperature and error code alternately. When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature.

[j] EEPROM ERROR

[Description]

Code	Problem	Possible cause
41	---	Control board error

- When an abnormal value is detected in the EEPROM writing process, the displays indicate the error code.

[Reset]

Turn off the power supply.

[Indication]

The error light flashes and the both displays on the right and left indicate the cabinet temperature and error code alternately.

[k] Setting error

[Description]

Code	Problem	Possible cause
40	---	Control board error

- When an error on the control board memory is detected, the unit stops and the displays indicate the error code.

[Reset]

Turn off the power supply.

[Indication]

The error light flashes and the both displays on the right and left indicate the error code.

[l] OPERATION BOARD ERROR

[Description]

Code	Problem	Possible cause
42	ROM checksum error (independent error)	Operation board error

[Reset]

The unit automatically returns to normal operation after the cause of the error is removed.

[Indication]

The error light flashes and the display on the right flashes the error code.

* When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature.

Note: When the ROM checksum error occurs, communication between the operation board and main control board stops. The operation board can indicate the error code “42”, but the main control board recognizes the error as the communication error “43”. The error history of “43” is stored in the main control board.
Since it is not a main control board defect, all other operations except those of the operation board function normally.

[m] OPERATION BOARD COMMUNICATION ERROR

[Description]

Code	Problem	Possible cause
43	Operation board communication stops for a period of time.	Control board or wiring error

[Reset]

The unit automatically returns to normal operation after the cause of the error is removed.

[Indication]

Depending on errors, the error light flashes and the display on the right indicates the cabinet temperature and error code alternately or flashes the error code. The cabinet temperature indication will not be updated because there is no communication. The display indicates the cabinet temperature sensed before the error occurs. Since it is not a main control board defect, all other operations except for operation indication function normally.
When the error light is on, the display indicates the error code. When the error light is off, the display indicates the cabinet temperature.

2. SERVICE DIAGNOSIS

Problem			Possible cause * Numbers corresponding to "3. 3-1. Component diagnosis".	
No refrigeration	Compressor will not start	No temperature indication	(1) Fuse	Blown out
			(2) Main control board	Failed 12V DC output to operation board
			(3) Operation board	Open circuit, connector unplugged
		Error code "40"/"41"	(2) Main control board	Defective
		Error code/ history "60"/"61" or no error code indication	(5) Cabinet thermistor	Abnormal resistance, bad contact
			(6) Condenser fan thermistor	Abnormal resistance, bad contact
			(4) Relay	Defective output
			(8) Compressor	Open circuit, defective electric parts
	Compressor starts and stops immediately	Error code/ history "46" (high pressure)	Ambient temperature too high	
			Condensing capacity insufficient	Heat source in vicinity, poor ventilation
			Air filter	Dirty
			(12) Condenser fan motor	Locked, open circuit
			(4) Relay	Failed output to condenser fan motor
			(6) Condenser fan thermistor	Abnormal resistance, bad contact
		Error code/ history "60"/"61" or no error code indication	Same possible causes as error code/history "46"	
			Door opened too often	
			(5) Cabinet thermistor	Improper location
			(8) Compressor	Locked

Problem			Possible cause * Numbers corresponding to "3. 3-1. Component diagnosis".	
No refrigeration	Compressor runs with no refrigeration	Error code/ history "84"/"85" (condensing temperature increased)	Ambient temperature too high	
			Condensing capacity insufficient	Heat source in vicinity, poor ventilation
			Air filter	Dirty
			(12) Condenser fan motor	Locked, open circuit
			(4) Relay	Failed output to condenser fan motor
		Error code/ history "68"/"69"	(7) Defrost thermistor	Abnormal resistance, bad contact
		Error code/ history "64"/"65" (frost built up on evaporator)	(7) Defrost thermistor	Abnormal resistance
			(14) Defrost heater	Open circuit, defective
			(4) Relay	Failed output to defrost heater
			(15) Thermal fuse	Blown out
		Error code "42"	(3) Operation board	Defective
		No error indication	Cabinet overloaded	
			Door gap	
			(5) Cabinet thermistor	Improper location
			(13) Interior fan motor	Open circuit, defective
			(2) Main control board	Failed 12V DC output to interior fan motor
			(17) Clogged refrigeration circuit	Clogged capillary tube or drier
			(10) Refrigerant leak	
			See "3. 3-2. Three-way valve diagnosis"	
			(8) Compressor	Defective

Problem			Possible cause * Numbers corresponding to "3. 3-1. Component diagnosis".	
Poor refrigeration	Slow refrigeration	Set point is not reached	See "Compressor runs with no refrigeration" above	
	Normal temperature indication with poor refrigeration	---	Cabinet overloaded	
			Hot items in cabinet	
			(13) Interior fan motor	Open circuit, defective
			(2) Main control board	Failed 12V DC output to interior fan motor
			(5) Cabinet thermistor	Abnormal resistance, bad contact, improper location
			(2) Main control board	Defective
		Frost built up on evaporator	Defrost frequency	Too low
			(7) Defrost thermistor	Abnormal resistance
			(14) Defrost heater	Open circuit, defective
			(4) Relay	Failed output to defrost heater
			(15) Thermal fuse	Blown out
		Frost built up on duct	Frost on intake and exhaust ducts (intake duct blocked with frost)	
Excessive refrigeration	Compressor runs continuously	Error code/ history "66"/"67"	(5) Cabinet thermistor	Open or short circuit
		High temperature indication	(5) Cabinet thermistor	Improper location
		Normal temperature indication	(5) Cabinet thermistor	Abnormal resistance
			See "3. 3-2. Three-way valve diagnosis"	
			(2) Main control board	Defective
	Compressor stops	No error code indication	Cold air outlet loaded	
			Cold air inlet blocked	
			Ambient temperature too low	
Abnormal noise	---		(8) Compressor	
			(12) Condenser fan motor	
			(13) Interior fan motor	
Condensation	Front frame heater de-energized		Open circuit	
			Duty ratio too high	
Water leak from bottom	Drain water not evaporated		(20)Evaporation pan heater	Open circuit
			(15) Thermal fuse	Blown out
			Drain pipe damage (direct drainage model)	
			Drain pipe not properly connected (direct drainage model)	

3. COMPONENT DIAGNOSIS

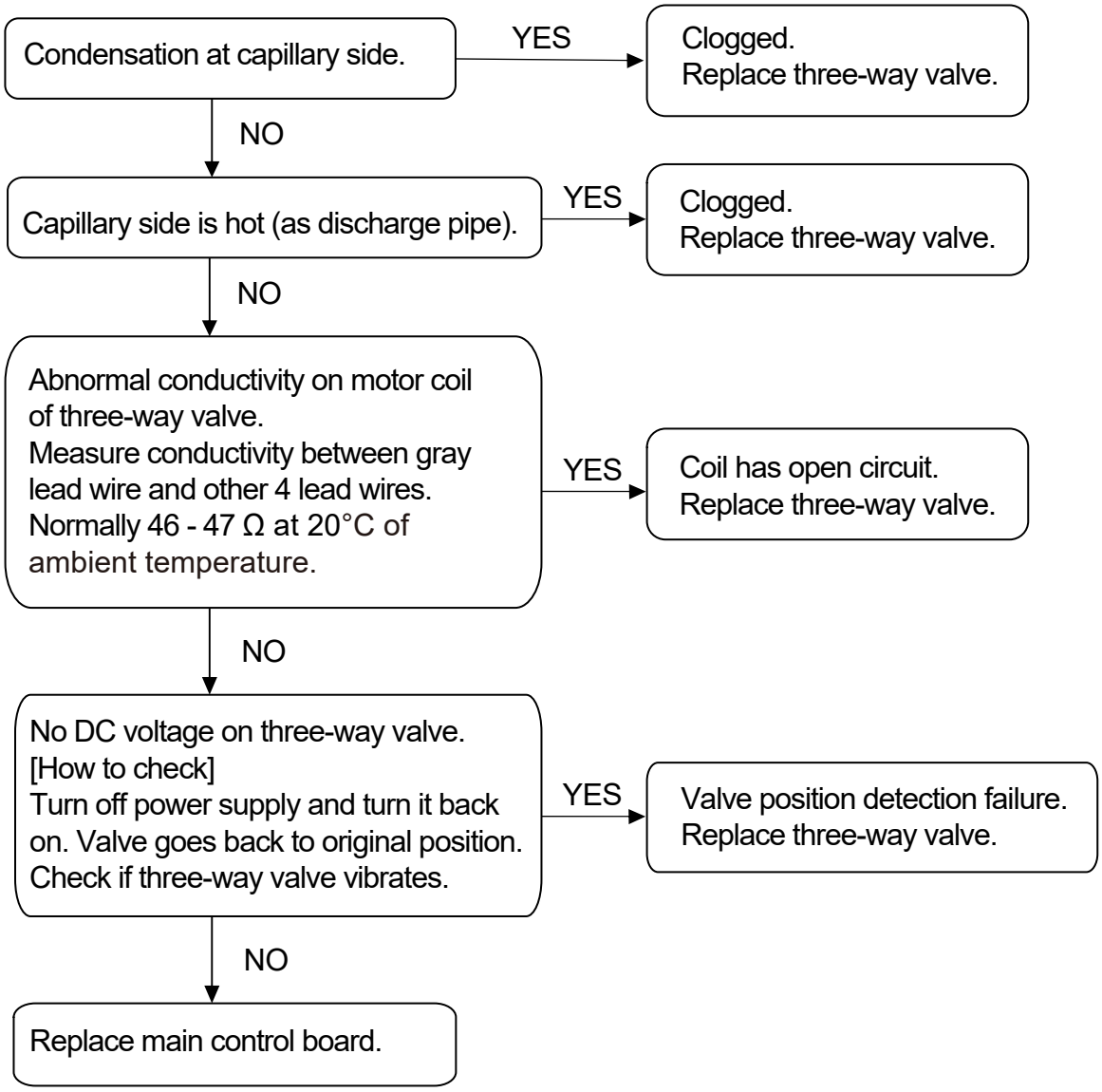
3-1. COMPONENT DIAGNOSIS

No.	Component	Problem	Remedy
(1)	Fuse	Fuse blown out	Replace Inspect power supply
(2)	Main control board	Open circuit, connectors/pins disconnected	Repair or replace
		Failed input/output (operation board, relay, interior fan motor, condenser fan motor) See wiring diagram	Check and correct against wiring diagram
		Connectors/pins on control board disconnected	Correct
(3)	Operation board	Connectors/pins disconnected	Correct
		Dust or dirt on connectors	Clean
		7 segment display partially/totally off Electronic parts defective/burnt out Ambient temperature sensor damaged (front frame heater continuously energized)	Replace
(4)	Relay	Connectors/pins disconnected	Correct
		Dust or dirt on connectors	Clean
		Open circuit	Repair
		Failed output See wiring diagram and timing chart	Replace
		Abnormal noise	Replace
(5)	Cabinet thermistor	Improper location (thermistor comes off or switched with defrost thermistor)	Correct
		Incorrect temperature indication	Immerse in ice-cold water to check resistance (5 - 6.5 kΩ) Replace if necessary
		Short circuit “99” shown in display	Remove dust/moisture from connector Replace
		Open circuit “-73” shown in display	Replace
(6)	Condenser fan thermistor	Abnormal resistance	Immerse in ice-cold water to check resistance (150-180kΩ) Replace if necessary
		Short circuit	Remove dust/moisture from connector Replace
		Open circuit	Replace

No.	Component	Problem	Remedy
(7)	Defrost thermistor	Improper location (thermistor comes off or switched with cabinet thermistor)	Correct
		Abnormal resistance	Immerse in ice-cold water to check resistance (5 - 6.5 kΩ) Replace if necessary
		Short circuit	Remove dust/moisture from connector Replace
		Open circuit	Replace
(8)	Compressor	Abnormal winding resistance Resistance between terminals (at 25°C) normally: EMX3140U:24.2 Ω (start) 7.4 Ω (run)	Replace
		Abnormal insulation resistance (normally 1 MΩ or more at 500V)	Replace
		Abnormal noise	Replace
		Insufficient compression (discharge pipe temperature too low)	If there is no refrigerant leak, replace
		Electrical parts defective - Run/start capacitor ruptured or deformed - Capacitor defective Check resistance between terminals Gradually reduces: No problem 0 Ω from start: Defective - Current relay Loose terminal, no conductivity, damaged - Overload relay defective Loose terminal, no conductivity, damaged	Replace
(9)	Motor protector Overload relay	No conductivity	Correct
		Defective	Replace
		Compressor line disconnected	Correct
		Loose terminal	Replace
(10)	Refrigerant leak	Discharge pipe temperature too low, or suction pipe temperature too high	Locate leakage and replace (Replace drier at same time)
(11)	Reactor	No conductivity	Replace
(12)	Condenser fan motor	Open circuit	Repair
		Locked (not rotating with voltage)	Replace
		Abnormal noise	Replace
(13)	Interior fan motor	Open circuit	Repair
		Locked (not rotating with voltage)	Replace
		Abnormal noise	Replace

No.	Component	Problem	Remedy
(14)	Defrost heater	Open circuit	Repair
		Abnormal conductivity	Replace
		Abnormal insulation resistance (normally 1 MΩ or more at 500V)	Replace
(15)	Thermal fuse (defrost heater)	Abnormal conductivity	Replace
		Relay contact sticking	Replace relay
(16)	Three-way valve	Open circuit	Repair
		Miswiring See wiring diagram	Repair
		See “3. 3-2. Three-way valve diagnosis“ * To replace three-way valve, recover refrigerant from high pressure side. When valve position is abnormal, high pressure side circuit may be closed.	
(17)	Clogged refrigeration circuit	Discharge pressure too high, or suction pressure too low (in vacuum state)	Replace capillary tube or expansion valve
(18)	Air filter Air-cooled condenser	Clogged	Clean
		Dirty fins	Clean
(19)	Drain hose	Without trap structure, without hose	Connect drain hose with trap structure
(20)	Evaporation pan heater	Open circuit	Correct or replace
		Conductivity	Correct or replace

3-2. THREE-WAY VALVE DIAGNOSIS



4. CONTROL BOARD

4-1. MAIN CONTROL BOARD

[a] SERVICING CONTROL BOARD

1) When receiving a service call, ask the user to turn off the power supply and turn it back on after 30 seconds. This will reset the control board, and in some cases normal operation will resume.

2) Keep the following in mind when servicing the control board:

* Check that the unit has been earthed properly. If not, the control board will not work properly.

* To get static free, always touch the metal part of the unit (earth) before servicing. Electrostatic discharge will cause damage to the control board. Also, keep things that produce static electricity (e.g. plastic bag or product) away from the control board.

* The control board is connected to a commercial power supply. Before servicing, turn off the power supply. If servicing with the unit energized is necessary to check operating voltage or the like, wear insulated gloves.

* The control board has a capacitor charged with high voltage. To prevent electric shock, do not touch the control board for at least 30 seconds after turning off the power supply.

* Some parts may be hot right after operation. Handle with care.

* Some electric parts may rupture depending on fault conditions. Approach the unit with caution when it is energized.

* To prevent defects caused by contamination on the electric parts, securely close the control box lid.

* When measuring the input/output voltage, do not disconnect the connector at the output side. The capacitor may remain charged and could spark when the connector is connected.

* Do not touch the electronic parts on the control board or the back of the control board.

* The control board and thermistor can be replaced separately.

* Handle the control board by the edges only. Do not touch the electronic parts and wiring.

* Do not drop the control board on the floor. The control board is fragile.

* Put the control board on a flat surface and prevent damage to the electronic parts and devices.

* To prevent damage, do not pull the thermistor and pressure switch wires with thin insulations.

* To prevent disconnection, do not pull the connectors. After servicing, check that the connectors are fixed properly.

* The thermistor is provided with single-wire leads. Do not bend or stretch them. (About 400mm from the wire end and the connection point with the lead wire.)

* Do not pinch or weigh down the thermistor and thermistor leads. The insulations may be damaged, resulting in a short circuit.

* Keep the thermistor's wires at least 30mm away from the high voltage (220V AC) wires.

[b] CHECKING THERMISTOR

1) Disconnect the thermistor from the control box.

2) Put ice and water in a glass or other container to make 0°C water. Immerse the thermistor bulb in the water for 5 minutes (at the center of the container).

3) Use the Ω range of the tester to measure the resistance between the thermistors.

4) If the measured resistance is not within the value below, replace the thermistor.

Cabinet thermistor, defrost thermistor: 5 - 6.5kΩ (standard: 6kΩ)
Condenser fan thermistor: 150 - 180kΩ (standard: 162kΩ)

4-2. OPERATION BOARD

1) When receiving a service call, ask the user to turn off the power supply and turn it back on after 30 seconds, while watching the unit. This will reset the operation board, and in some cases normal operation will resume.

2) Keep the following in mind when servicing the operation board:

* Check that the unit has been earthed properly. If not, the operation board will not work properly.

* To get static free, always touch the metal part of the unit (earth) before servicing. Electrostatic discharge will cause damage to the operation board. Also, keep things that produce static electricity (e.g. plastic bag or product) away from the operation board.

* Do not touch the electronic parts on the operation board or the back of the control board.

* Handle the operation board by the edges only. Do not touch the electronic parts and wiring.

* Do not drop the operation board on the floor. The operation board is fragile.

* Put the operation board on a flat surface and prevent damage to the electronic parts and devices.

* To prevent disconnection, do not pull the connectors. After servicing, check that the connectors are fixed properly.

IV. REMOVAL AND REPLACEMENT OF COMPONENTS

WARNING

Always unplug the unit or turn off the main power supply before replacing components.

1. REFRIGERATION CIRCUIT

[a] REFRIGERANT

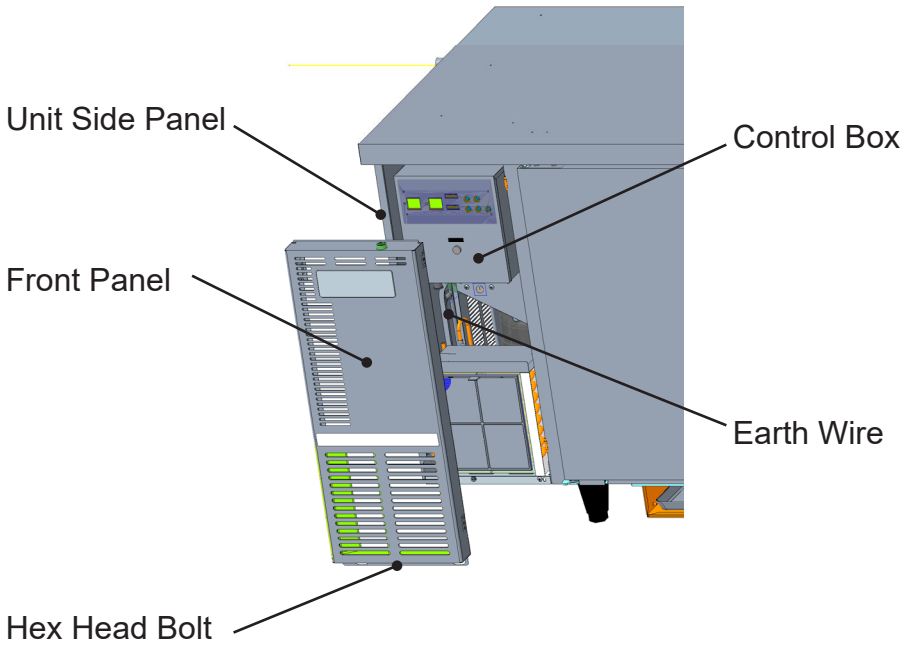
The refrigerant R290 used in this machine, also known as propane, is a colorless and odorless gas.
It is non-toxic, but flammable and explosive, and belongs to the category of hydrocarbon refrigerants.

[b] COMPRESSOR

1) Remove the hexagon head bolt at the bottom of the front panel, and take off the front panel.

2) Recover the refrigerant from the access valve, and store it in a proper container, if required by an applicable law.

3) Remove the screws securing the condenser to the refrigeration unit base and the shroud (condenser cover) to the cabinet, and pull out the condenser about 200 mm to the front.



4) Remove the hexagon head bolts with washers securing the condenser fan motor bracket to the base, and remove the condenser fan motor assembly.

5) Remove the screw securing the unit side panel, and take off the side panel.

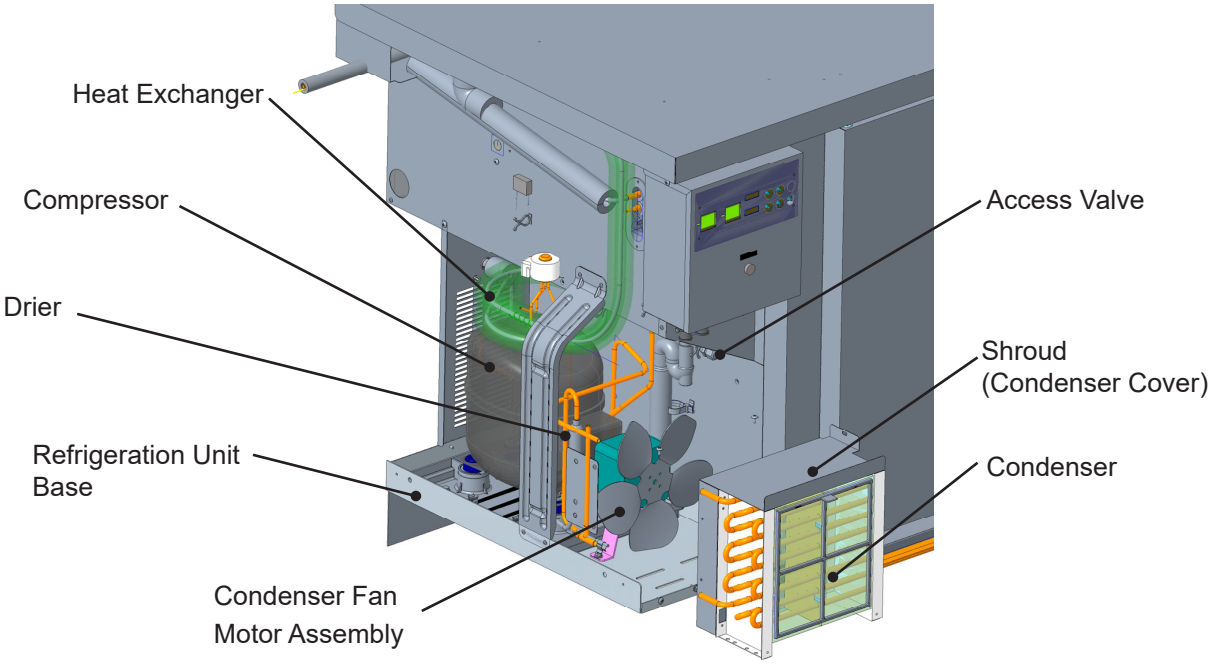
6) Remove the terminal cover enclosing the compressor electrical parts.

7) Remove the overload relay and start relay.

8) Disconnect the discharge and suction pipes using brazing equipment.

9) Remove the bolts securing the compressor.

10) To replace the removed parts, reverse the above removal procedure.



Note: 1. To recharge the refrigerant, install a stop valve in the access line.

2. Evacuation time must be at least 1 hour.

3. Use a lock ring tool to connect the pipelines. if welding is required for the refrigeration circuit, nitrogen should be used to purge the refrigeration system. Additionally, before welding, a dedicated leak detector for specific flammable refrigerants must be used to check for leaks, ensuring that there is no refrigerant present in the refrigeration system or the surrounding environment.

4. Check for gas leaks, remove flux and oxide film, and apply anti-corrosion treatment.

5. Since the refrigerant used in this model is R290, during maintenance, windows should be kept open as much as possible, and operations should be avoided in confined or small spaces..

[c] CONDENSER

1) Pull out the condenser according to steps 1) through 3) of “[b] COMPRESSOR”.

2) Remove the screws securing the shroud to the condenser, and disconnect the shroud.

3) Use a pipe cutting device to disconnect the condenser from the refrigeration circuit.

4) To replace the removed parts, reverse the above removal procedure.

Note: 1. See Notes 1 - 5 for “[b] Compressor”.

2.When reinstalling the copper pipe, use a lock ring for connection.
If welding is required for the refrigeration circuit, nitrogen should be used to purge the refrigeration system. Before welding, use a dedicated leak detector for specific flammable refrigerants to check for leaks, ensuring no refrigerant exists in the refrigeration system or the surrounding environment. You can refer to the “[b] Compressor Replacement Procedure”.

[d] DRIER

1) Pull out the condenser according to steps 1) through 3) of “[b] Compressor”.

2) Remove the wire tie securing the drier to the shroud.

3) Use a pipe cutting device to disconnect the condenser from the refrigeration circuit.

4) To replace the removed parts, reverse the above removal procedure.

Note: 1. See Notes 1 - 5 for “[b] Compressor”.

2. After brazing, wait for the drier to cool down before securing it to the shroud.

3. When reinstalling the copper pipe, connect it using a lock ring. If welding is required for the refrigeration circuit, nitrogen should be used to purge the refrigeration system. Before welding, use a dedicated leak detector for specific flammable refrigerants to check for leaks, ensuring no refrigerant is present in the refrigeration system or the surrounding environment.

[e] EVAPORATOR (FREEZER)

1) Remove the front panel.

2) Unscrew the top and bottom of the control box to remove the control box.

3) Remove the unit side panel.

4) Recover the refrigerant from the access valve, and store it in a proper container, if required by an applicable law.

5) Disconnect the evaporator from the heat exchanger (first from the suction pipe and then from the capillary tube) using a pipe cutting device.

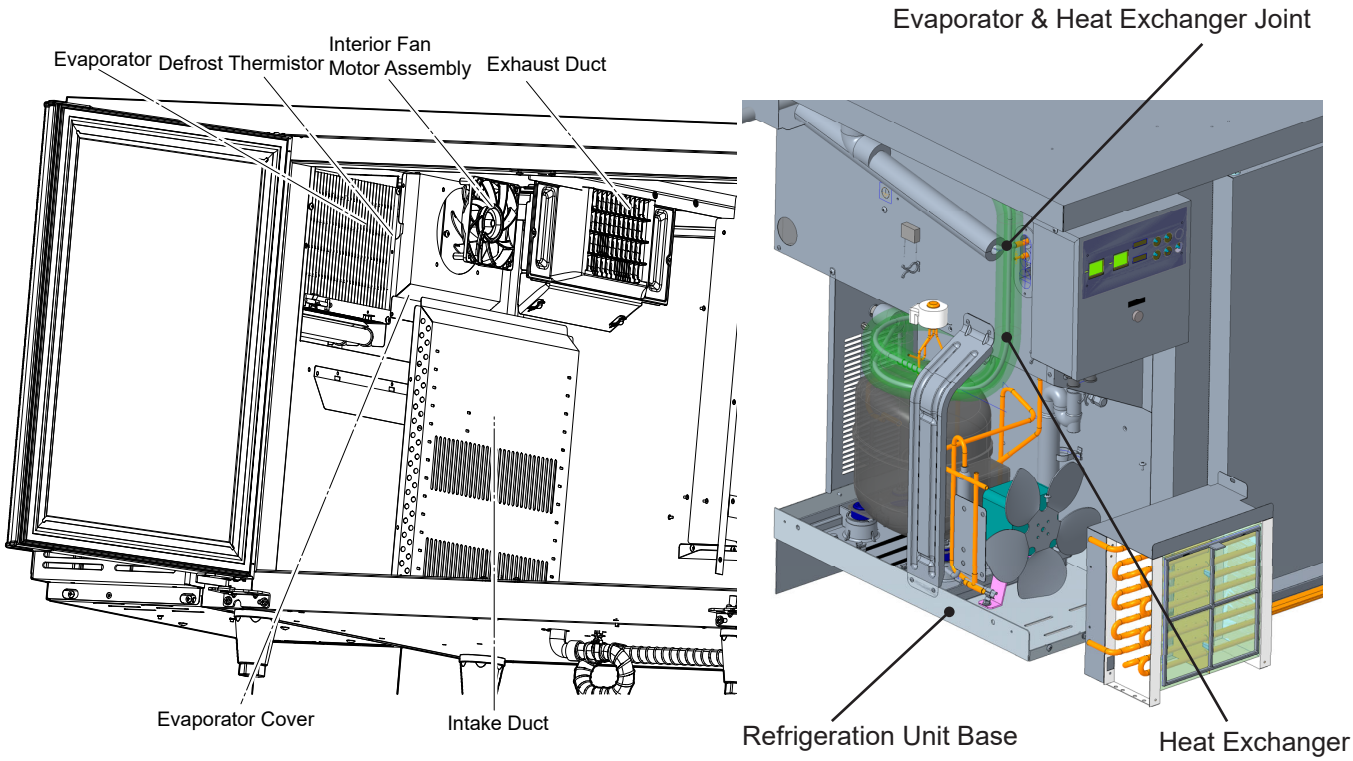
6) Remove the intake and exhaust ducts from inside the cabinet.

7) Remove the interior fan motor assembly.

8) Remove the evaporator cover (and the heater cover with the heater bracket).

9) Remove the defrost thermistor from the evaporator.

10) To replace the removed parts, reverse the above removal procedure.



Note: 1. See Notes 1 - 5 for “[b] Compressor”.

2. Be sure to replace the defrost thermistor in its correct position.

3. After servicing, use putty to seal the pipe through-hole in the cabinet.

4. When reinstalling the copper pipe, connect it using a lock ring. if welding is required for the refrigeration circuit, nitrogen should be used to purge the refrigeration system. Before welding, use a dedicated leak detector for specific flammable refrigerants to check for leaks, ensuring no refrigerant is present in the refrigeration system or the surrounding environment.

[f] EVAPORATOR (REFRIGERATOR)

1) Remove the front panel.

2) Remove the control box.

3) Remove the unit side panel.

4) Recover the refrigerant from the access valve.

5) Remove the duct from the refrigerator cabinet.

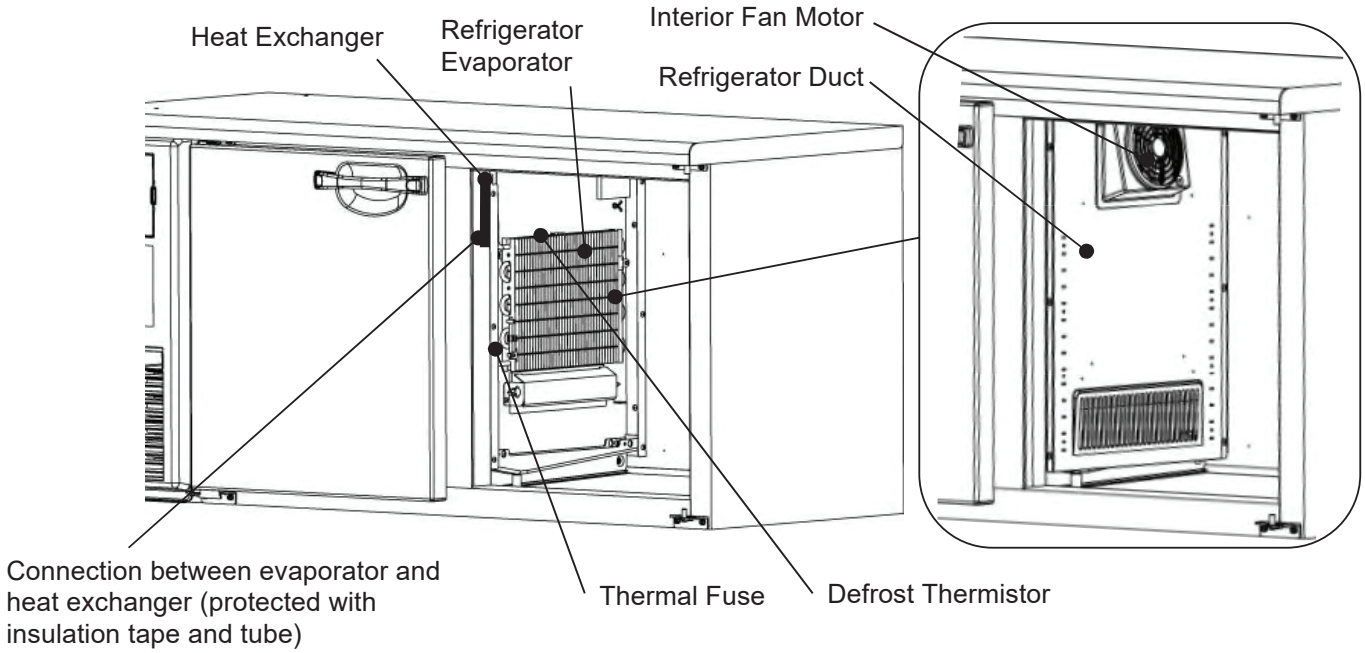
6) Remove the defrost thermistor and thermal fuse with the brackets.

7) Remove the insulation tube and tape covering the connection between the evaporator and heat exchanger so that the brazed part is exposed.

8) Disconnect the evaporator from the heat exchanger (first from the suction pipe and then from the capillary tube) using a pipe cutting device.

9) Remove the evaporator.

10) To replace the removed parts, reverse the above removal procedure.



Note: 1. See Notes 1 - 5 for “[b] Compressor”.

2. Be sure to replace the defrost thermistor and thermal fuse in their correct position.

3. When connecting or disconnecting the evaporator from the heat exchanger, use a pipe cutting device to disconnect the evaporator from the heat exchanger.

4. When reinstalling the copper pipe, connect it using a lock ring. If welding is required for the refrigeration circuit, nitrogen should be used to purge the refrigeration system. Before welding, use a dedicated leak detector for specific flammable refrigerants to check for leaks, ensuring no refrigerant is present in the refrigeration system or the surrounding environment.

5. After servicing, seal and protect the evaporator and heat exchanger connection with insulation tape and tube. Exposure of this part may cause refrigerant leak.

2. ELECTRICAL PARTS

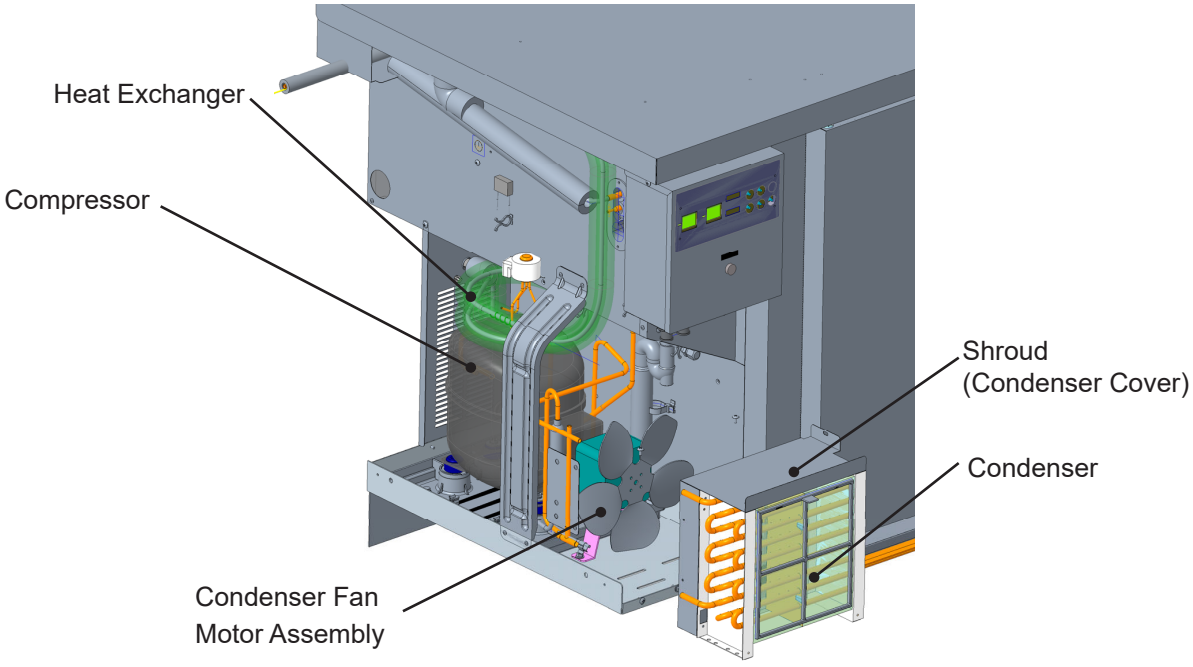
[a] CONDENSER FAN MOTOR (FREEZER)

1) Pull out the condenser and condenser fan motor assembly according to step 1) through 4) of “[b] Compressor”.

2) Disconnect the condenser fan motor leads.

3) Remove the screws securing the condenser fan motor to the bracket, and take off the condenser fan motor.

4) To replace the removed parts, reverse the above removal procedure.



[b] INTERIOR FAN MOTOR (FREEZER)

1) Remove the front panel.

2) Disconnect the interior fan motor leads.

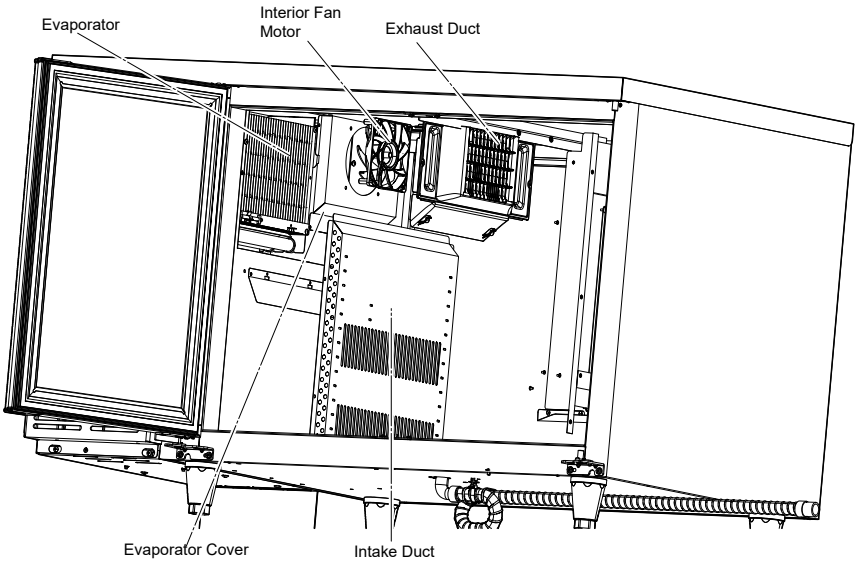
3) Remove the intake and exhaust ducts from inside the cabinet.

4) Remove the insulations in the wire through-hole from inside and outside the cabinet.

5) Remove the interior fan motor assembly.

6) Remove the screws securing the interior fan motor to the bracket, and take off the interior fan motor.

7) To replace the removed parts, reverse the above removal procedure.



Note: 1. After servicing, insert new insulations into the wire through-hole from inside and outside the cabinet. Do not reuse the removed insulations.

2. Be sure to install the interior fan motor in the proper direction as shown above.

[c] INTERIOR FAN MOTOR (REFRIGERATOR)

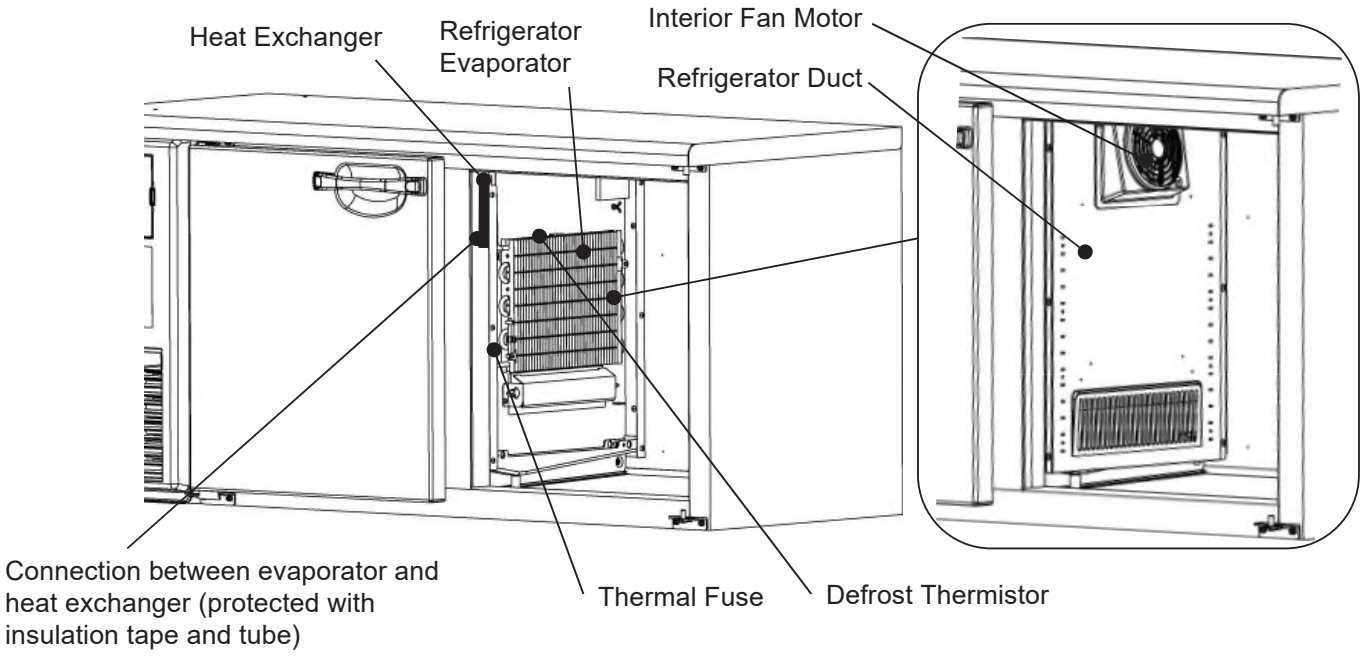
1) Remove the duct from the refrigerator cabinet.

2) Remove the interior fan motor assembly.

3) Remove the top panel.

4) Disconnect the connector on the fan motor leads located at the top front of the unit. Remove the putty from the lead wire outlet, and pull the connector through into the cabinet.

5) To replace the removed parts, reverse the above removal procedure.



[d] DEFROST HEATER, THERMAL FUSE(FREEZER)

1) Remove the front panel.

2) Disconnect the defrost heater or thermal fuse leads.

3) Remove the intake duct and exhaust duct from inside the cabinet.

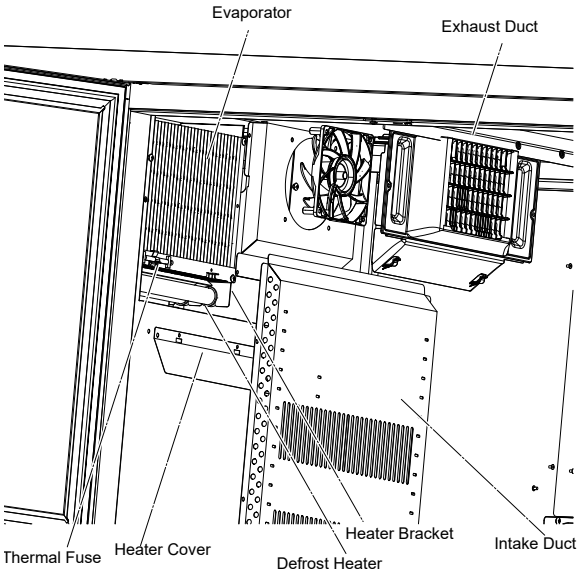
4) Remove the insulations in the wire through-hole from inside and outside the cabinet.

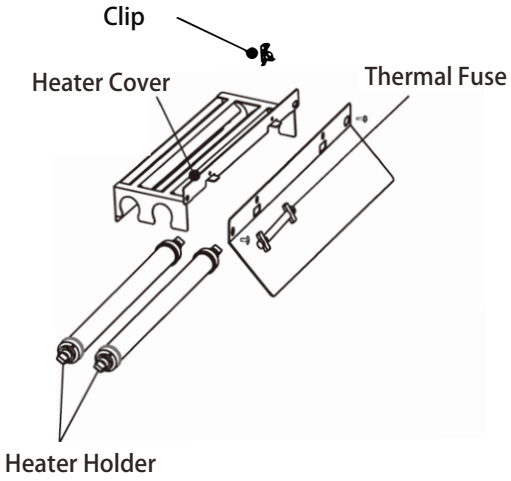
5) Remove the defrost heater and thermal fuse with the brackets from the evaporator.

6) Bend the heater holder on the heater cover to remove the defrost heater from the heater cover. Take off the clip to remove the thermal fuse.

7) Pull the leads out of the wire through-hole to remove the defrost heater or thermal fuse.

8) To replace the removed parts, reverse the above removal procedure.





Note: 1. After servicing, insert new insulations into the wire through-hole from inside and outside the cabinet. Do not reuse the removed insulations.

2. The A-FIT MC RFT model uses two defrosting heaters on both the refrigeration side and the freezer side,so mark the end of the heater wire to prevent miswiring.

[e] DEFROST HEATER, THERMAL FUSE(REFRIGERATOR)

1) Remove the top panel.

2) Disconnect the defrost heater or thermal fuse leads.

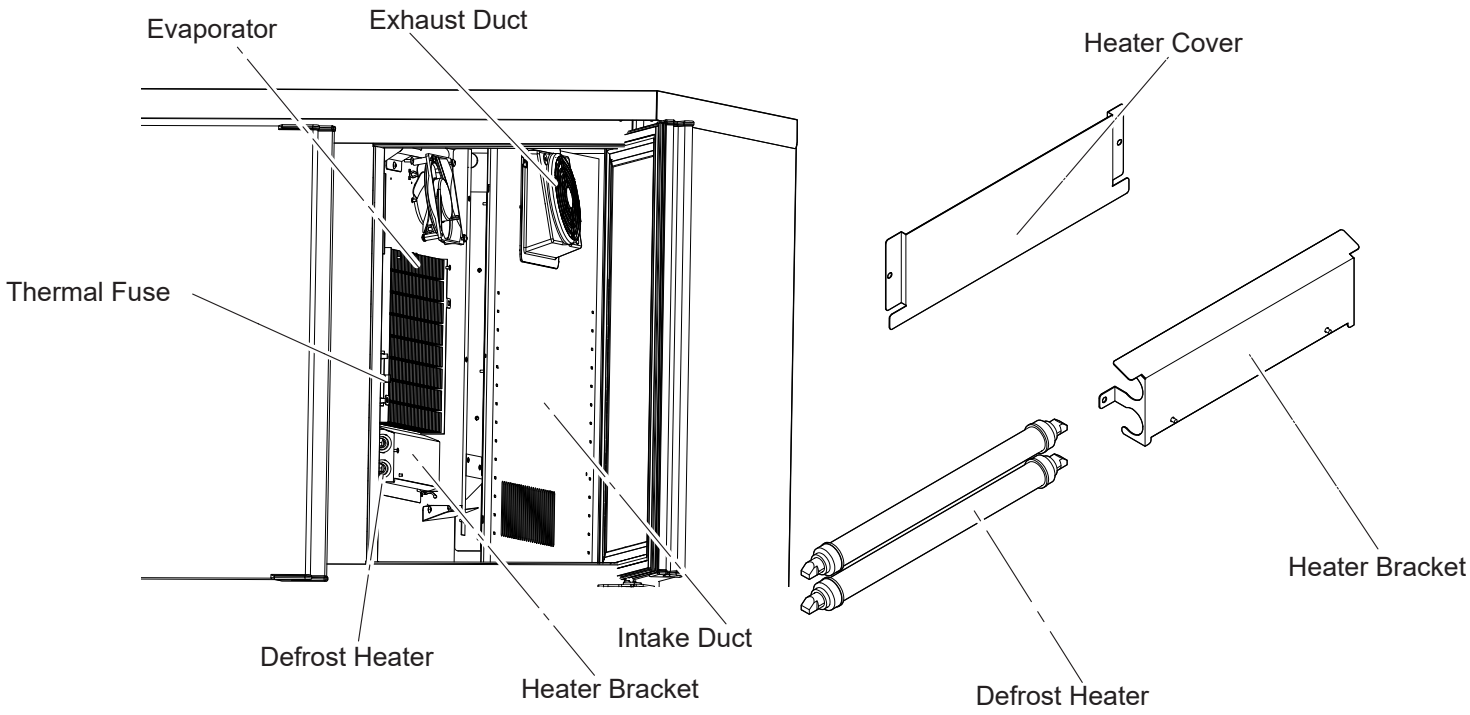
3) Remove exhaust duct from inside the cabinet.

4) Remove the defrost heater and thermal fuse with the brackets from the evaporator.

5) Remove the fuse clip and take out the fuse.

6) Pull the leads out of the wire through-hole to remove the defrost heater or thermal fuse.

7) To replace the removed parts, reverse the above removal procedure.



Note: 1. After servicing, insert new insulations into the wire through-hole from inside and outside the cabinet. Do not reuse the removed insulations.

2. The A-FIT MC RFT model uses two defrosting heaters on both the refrigeration side and the freezer side,so mark the end of the heater wire to prevent miswiring.

[f] CABINET THERMISTOR, DEFROST THERMISTOR (FREEZER)

1) Remove the front panel.

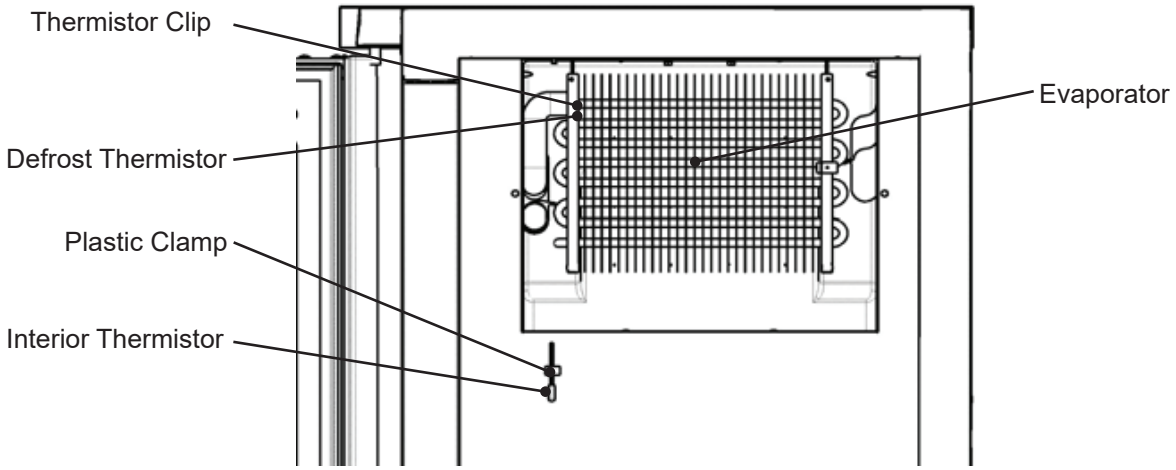
2) Disconnect the interior thermistor or defrost thermistor leads.

3) Remove the intake duct and exhaust duct from inside the cabinet.

4) Remove the insulations in the wire through-hole from inside and outside the cabinet.

5) Open the plastic clamp to remove the interior thermistor. Pull the thermistor clip off the evaporator to remove the defrost thermistor.

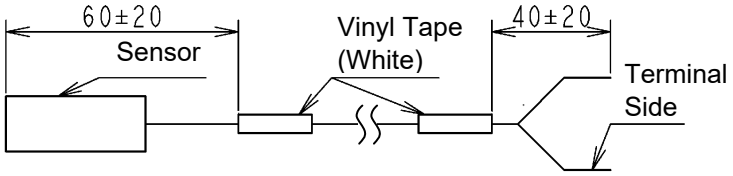
6) To replace the removed parts, reverse the above removal procedure.



Note: 1. After servicing, insert new insulations into the wire through-hole from inside and outside the cabinet. Do not reuse the removed insulations.

2. Be careful not to contact the interior thermistor bulb on the cabinet interior wall.

3. Route the defrost thermistor leads through the U-channel at the evaporator top out of the evaporator reed pipe side.



4. If the defrost thermistor color is not white, wind white vinyl tape around the thermistor as shown below for indication.

[g] CABINET THERMISTOR, DEFROST THERMISTOR (REFRIGERATOR)

1) Remove the duct from the refrigerator cabinet.

2) Open the plastic clamp to remove the cabinet thermistor. Pull the thermistor clip off the evaporator to remove the defrost thermistor.

3) Remove the top panel.

4) Disconnect the connectors on the thermistor leads at the top front of the unit. Remove the insulations in the wire through-hole from inside and outside the cabinet to pull the connectors into the cabinet.

5) To replace the removed parts, reverse the above removal procedure.

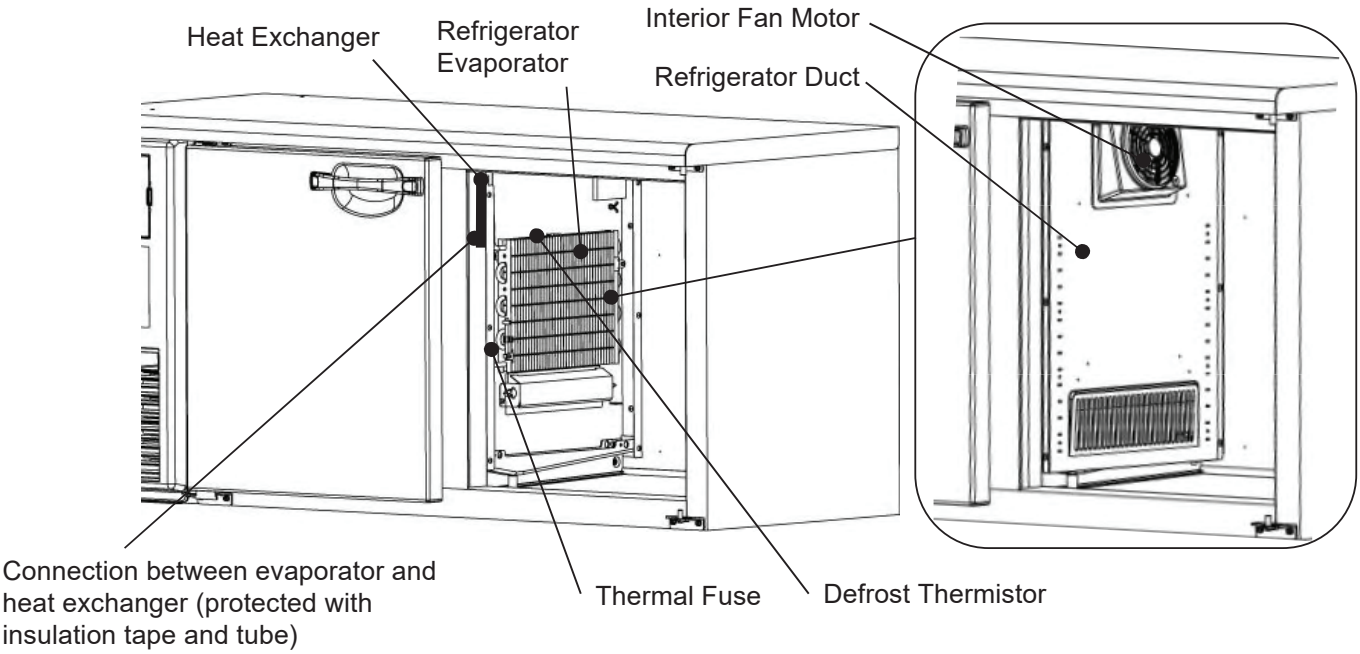
Note: 1. Use protective materials on the wire through-hole edges to protect lead wires.

2. After servicing, use putty to tightly seal the wire through-hole in the cabinet.

3. Make sure to route and fix the defrost thermistor leads as they were to avoid contact with the interior fan motor.

4. After connecting the connectors, cover them with a bag. Put putty around the bag opening and secure it with a cable tie to avoid entrance of moisture.

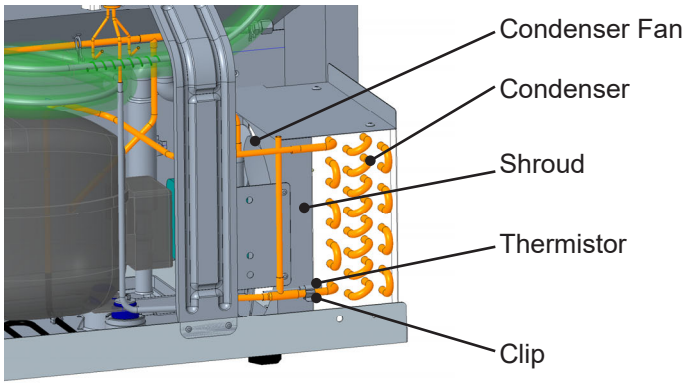
5. Be careful not to contact the interior thermistor bulb on the cabinet interior wall.



[h] CONDENSER FAN THERMISTOR

1) Disconnect the connector on the thermistor leads and remove the clip and thermistor.

2) To replace the removed parts, reverse the above removal procedure.



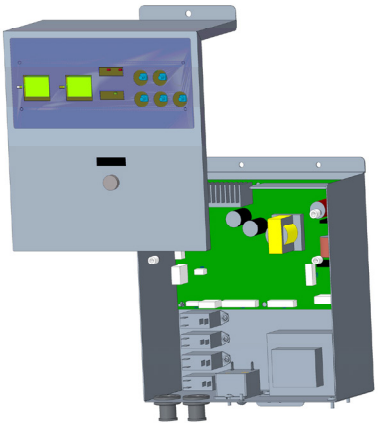
[i] ELECTRICAL PARTS IN CONTROL BOX

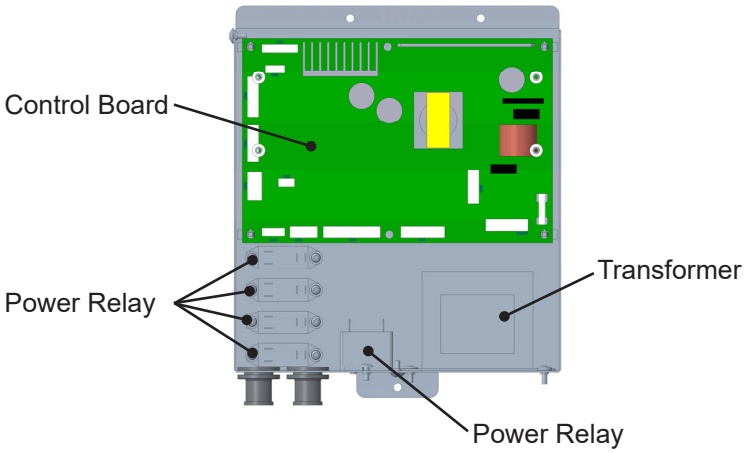
1) Remove the front panel.

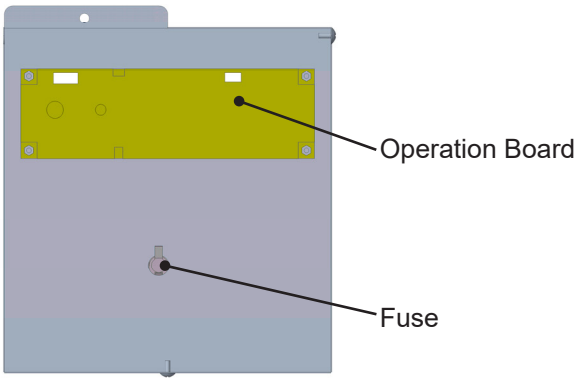
2) Unscrew the top and bottom of the control box to remove the control box.

3) Remove the control box lid and disconnect the connectors of operation board and fuse holder.
4) Replace the defective parts.

5) To replace the removed parts, reverse the above procedure.







[j] FUSE

1) Open the window panel.

2) Apply a flat head screwdriver to the slot on the fuse holder and turn it counterclockwise.

3) Remove the fuse from the fuse holder.

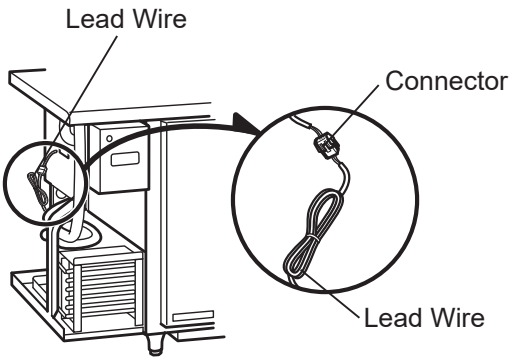
4) To replace the removed parts, reverse the above procedure.

[k] FORCED DRAIN WATER EVAPORATION PAN (FOR EVAPORATION PAN MODELS)

1) Remove the front panel.

2) Remove the side panel of the refrigeration unit.

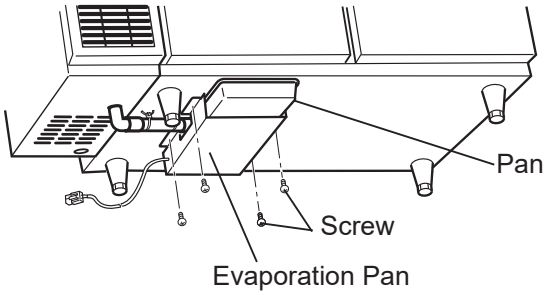
3) Disconnect the connector at the end of the evaporation pan lead wire.



4) Put the evaporation pan lead wire and connector through the wire hole to the outside of the machine compartment.

5) Remove the four screws at the bottom of the unit to take off the evaporation pan.

6) To replace the removed parts, reverse the above removal procedure.



3. DOOR GASKET

[a] REMOVAL

1) Open the door.

2) Detach the door gasket from the door liner.

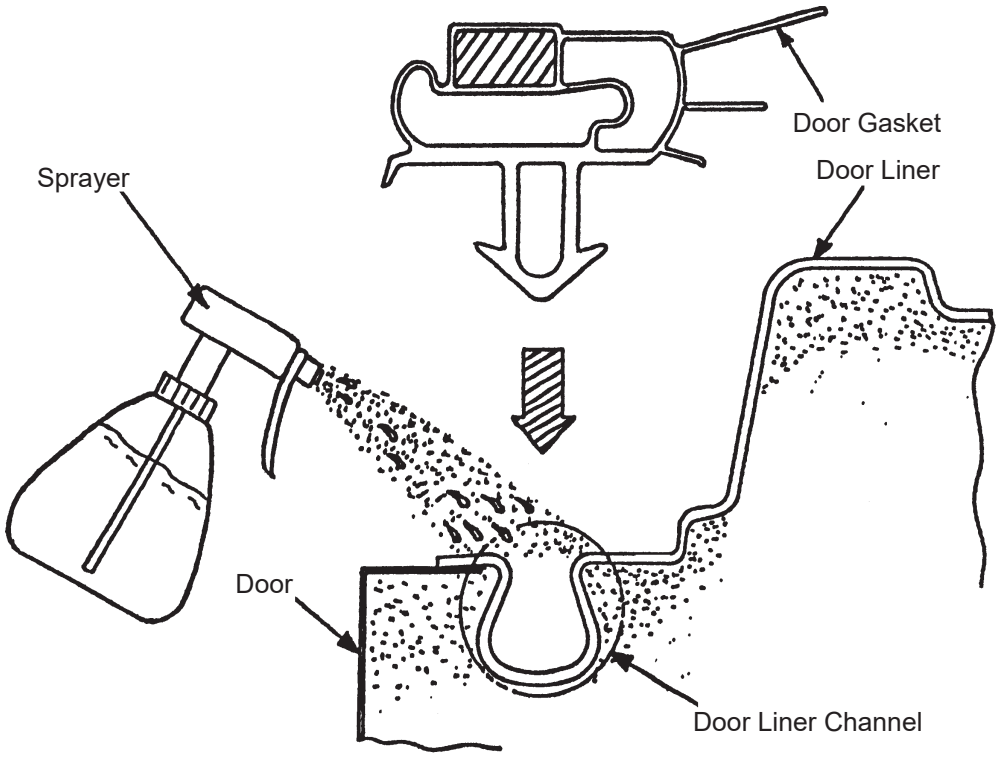
[b] REPLACEMENT

1) Spray water on the door liner channel with a sprayer.

2) Fit the four corners of the door gasket into those of the door liner channel.

3) Push in each part of the door gasket from both sides.

Note: After fitting the door gasket, check every part for tightness and security.



Replacement of the door or door gasket may cause a gap between the cabinet and the gasket. To correct this gap, slightly heat the gasket with a drier. To avoid melting the gasket:

1) Keep the drier at least 100 mm away from the gasket.

2) Move the drier up and down to heat the entire gap.

Note: If the drier is too close or heats a particular part intensively, the gasket may melt.