



UNDERCOUNTER REFRIGERATOR/FREEZER

RTE-SC-S series
FTE-SC-S series

SERVICE MANUAL

CONTENTS

I. GENERAL INFORMATION-----	1
1. SAFETY INSTRUCTIONS-----	1
2. PACKING SPECIFICATIONS-----	4
II. TECHNICAL INFORMATION-----	5
1. WIRING DIAGRAM-----	5
[a] RTE-SC SERIES-----	5
[b] FTE-SC SERIES-----	6
2. REFRIGERATION CIRCUIT-----	7
3. ELECTRONIC CONTROLS-----	8
[a] SET POINT TEMPERATURE-----	8
[b] CABINET TEMPERATURE DIFFERENTIAL-----	8
[c] DEFROST CYCLE-----	8
[d] DEFROST COMPLETION TEMPERATURE-----	8
[e] CLOGGED CONDENSER DETECTION TEMPERATURE-----	8
[f] HIGH PRESSURE ABNORMALITY DETECTION -----	9
[g] TEMPERATURE DISPLAY CYCLE-----	9
[h] COMPRESSOR SOFT START -----	9
[i] CABINET TEMPERATURE AND TEMPERATURE DISPLAY -----	10
[j] RESOLUTION -----	10
[k] CHECKING AND ADJUSTING SET POINT TEMPERATURE-----	11
[l] MANUAL DEFROST-----	11
[m] CANCELLING SOFT START-----	11
[n] CABINET TEMPERATURE CORRECTION-----	12
[o] CONDENSER FAN MOTOR CONTROL -----	13
[p] INTERIOR FAN MOTOR CONTROL -----	14
[q] ANTI-CONDENSATION HEATER SETTING -----	14
[r] MAIN BOARD MODEL SETTING -----	14
[s] DEFROST CANCELLATION CONTROL (Only FTE-SC series) -----	15
[t] DOOR SWITCH -----	15
[u] LED LIGHT AND SWITCH -----	16
4. INVERTER -----	16
[a] INVERTER CONTROL -----	17
[b] NOISE GENERATED BY INVERTER MACHINES -----	19
5. MAINTENANCE MODE -----	19
[a] DISPLAY PANEL -----	19
[b] LIST OF BASIC BUTTON OPERATIONS -----	20
[c] HOW TO CHECK ERROR HISTORY -----	20
[d] HOW TO CHANGE OPERATION SETTING -----	21
[e] OPERATION SETTING CHANGE MODE -----	22
[f] LIST OF OPERATION SETTING CHANGE MODELS -----	22
[g] HOW TO SET MODEL AND INTERNAL TEMPERATURE CORRECTION VALUE WHEN REPLACING BOARD -----	24
[h] HOW TO OPERATE MAINTENANCE MODE -----	25
6. ERROR CODES -----	31
[a] EEPROM WRITE ERROR (EA) -----	31
[b] OPERATION BOARD VERIFY ERROR (Eb) -----	31
[c] OPERATION BOARD COMMUNICATION ERROR (EC) -----	32

[d] EEPROM VERIFY ERROR (Ed) -----	32
[e] CABINET TEMPERATURE TOO HIGH (E1) -----	32
[f] CABINET TEMPERATURE TOO LOW (E2) -----	33
[g] DEFROST CYCLE TOO LONG (E3) -----	33
[h] ABNORMAL PRESSURE (E4) -----	34
[i] INTERIOR THERMISTOR DEFECTIVE (E5) -----	35
[j] CONDENSER FAN MOTOR DEFECTIVE (E6) -----	35
[k] CONDENSER CLOGGED (E7) -----	35
[l] DEFROST THERMISTOR DEFECTIVE (E8) -----	36
[m] CLOG THERMISTOR DEFECTIVE (E9) -----	37
7. TIMING CHART -----	38
[a] START TO CONTROL (RTE-SC series) -----	38
[b] CONTROL TO DEFROST AND TO CONTROL (RTE-SC series) -----	38
[c] START TO CONTROL (FTE-SC series) -----	39
[d] CONTROL TO DEFROST AND TO CONTROL (FTE-SC series) -----	39
III. SERVICE DIAGNOSIS -----	40
1. FLOWCHART -----	40
2. SERVICE DIAGNOSIS -----	42
3. CONTROLLER BOARD -----	44
[a] SERVICING CONTROLLER BOARD -----	44
[b] CHECKING THERMISTOR -----	45
[c] OPERATION BOARD -----	45
[d] COMPRESSOR -----	46
IV. REMOVAL AND REPLACEMENT OF COMPONENTS -----	47
1. REFRIGERATION UNIT -----	47
2. REFRIGERATION CIRCUIT -----	48
[a] REFRIGERANT -----	48
[b] COMPRESSOR -----	51
[c] EVAPORATOR AND DEFROST HEATER -----	53
[d] CONDENSER -----	53
[e] DRYER -----	54
3. FAN MOTORS -----	54
[a] CONDENSER FAN MOTOR -----	54
[b] INTERIOR FAN MOTOR -----	55
4. THERMISTORS -----	55
[a] INTERIOR THERMISTOR -----	55
[b] DEFROST THERMISTOR -----	55
[c] CLOG THERMISTOR -----	55
5. INVERTER BOX -----	56
6. CONTROL BOX -----	57
7. DOOR GASKET -----	60
[a] REMOVAL -----	60
[b] REPLACEMENT -----	60
[c] HOW TO FIX GAP IN DOOR GASKET -----	60
8. DOOR SWITCH AND STOPPER (Custom Specification) -----	61
[a] DOOR SWITCH -----	61
[b] STOPPER -----	61
9. LED LIGHT (Custom Specification) -----	62

Symbol	Meaning
	Keep Dry
	Cabinet Temperature
	Increasing Temperature
	Decreasing Temperature

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 stop operation, keep the site ventilated and put out any fire used in the vicinity.
 - (4) When unbrazing the refrigeration circuit connections, check that the circuit is completely evacuated and that there is no flammable refrigerant in the welding area. The refrigerant may explode gas when coming in contact with an open flame.
 - (5) Do not work 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 other leaks. Be sure to check again for further leaks after recharging the refrigerant.
Leaking refrigerant may catch fire or explode if exposed to open flames.
- (7) Before servicing, check the surface temperature of the refrigeration circuit to prevent a burn.
- (8) When repairing the product, anti-static measures should be taken to prevent static sparks.
- (9) If you bring a refrigerant container for door-to-door service, the refrigerant filled in the refrigerant container should not exceed the specified value.
The container should be stored in the vehicle or at the maintenance site, fixed and placed vertically, and away from heat sources, fire sources, radiation sources, and electrical equipment.

5. Keep the following 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 fires.
- (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

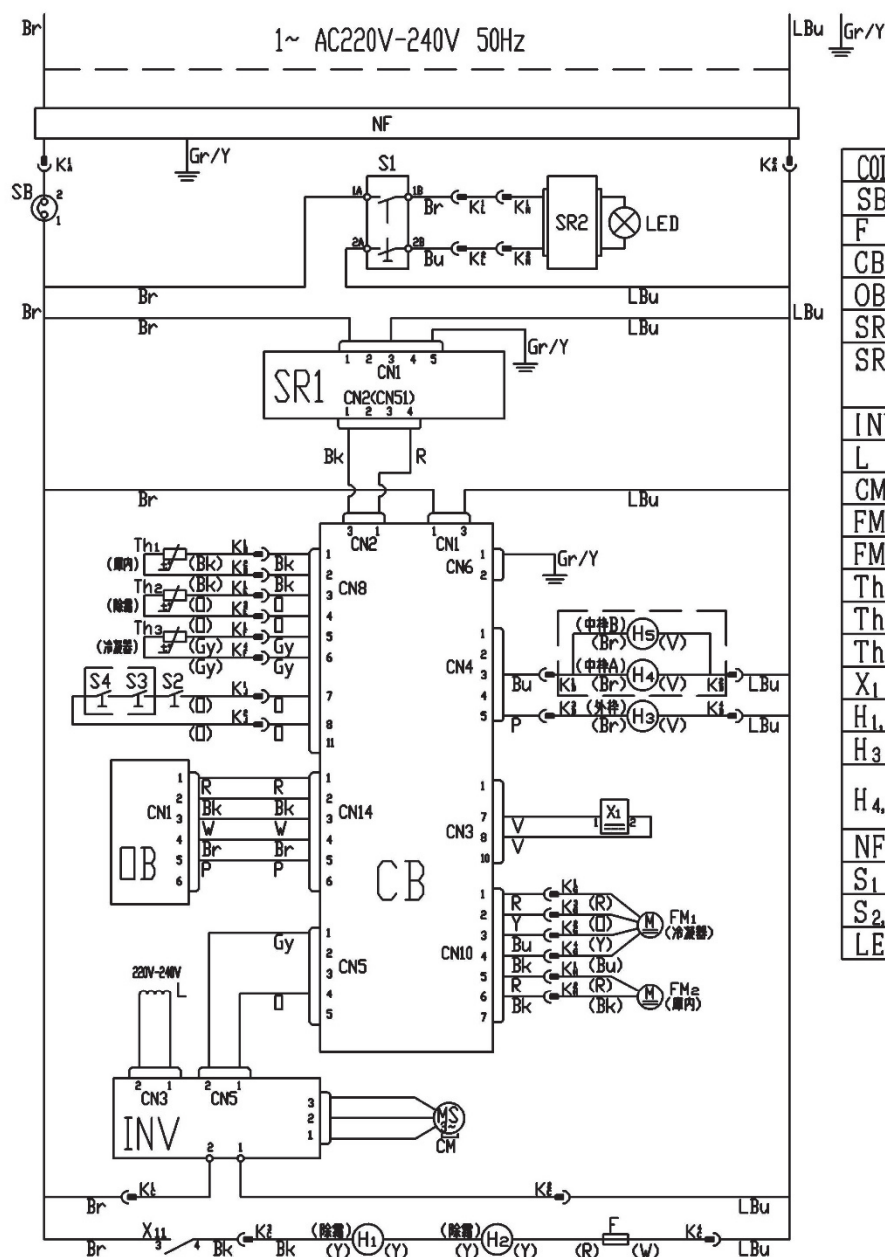
1. After servicing, follow the instructions below:

- (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 vermin resulting in a short circuit between terminals and possible ignition.

2. PACKING SPECIFICATIONS

MODEL	WEIGHT		WIDTH [mm]	DEPTH [mm]	HEIGHT [mm]
	Net [kg]	Gross [kg]			
RTE-96SC-S	66	78	965	680	850
RTE-98SC-S	73	86	965	830	850
RTE-126SC-S	75	90	1265	680	850
RTE-128SC-S	84	100	1265	830	850
RTE-156SC-S	85	103	1565	680	850
RTE-158SC-S	98	118	1565	830	850
RTE-186SC-S	97	118	1865	680	850
RTE-188SC-S	106	130	1865	830	850
FTE-96SC-S	70	82	965	680	850
FTE-98SC-S	77	90	965	830	850
FTE-126SC-S	80	95	1265	680	850
FTE-128SC-S	89	104	1265	830	850
FTE-156SC-S	89	107	1565	680	850
FTE-158SC-S	103	123	1565	830	850
FTE-186SC-S	101	122	1865	680	850
FTE-188SC-S	110	135	1865	830	850

[b] FTE-SC-S SERIES



CODE	NAME
SB	SAFETY BREAKER
F	FUSE 73℃
CB	CONTROL BOARD
OB	OPERATION BOARD
SR1	SWITCHING REGULATOR
SR2	SWITCHING REGULATOR (LED)
INV	INVERTER
L	INDUCTOR
CM	COMPRESSOR
FM1	FAN MOTOR (CONDENSER)
FM2	FAN MOTOR (INTERIOR)
Th1	THERMISTOR (INTERIOR)
Th2	THERMISTOR (DEFROST)
Th3	THERMISTOR (CONDENSER)
X1	RELAY
H1,2	DEFROST HEATER
H3	CORD HEATER (OUTER FRAME)
H4,5	CORD HEATER (CENTER FRAME)
NF	NOISE FILTER
S1	POWER SWITCH (LED)
S2,3,4	DOOR SWITCH (FAN MOTOR)
LED	LED LAMP

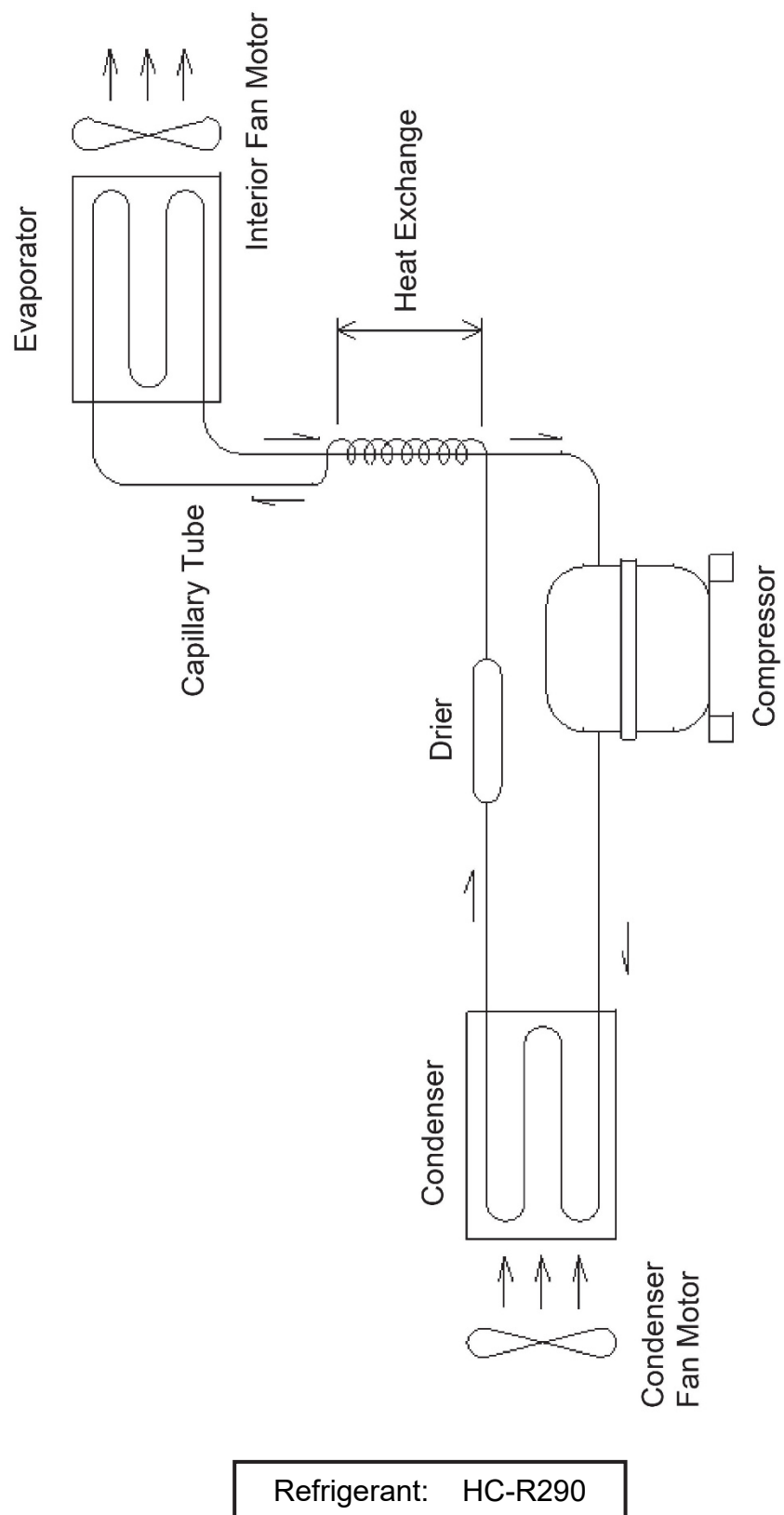
WIRE COLOR CODE

Br	BROWN
LBu	LIGHT BLUE
W	WHITE
P	PINK
R	RED
Bk	BLACK
□	ORANGE
Bu	BLUE
Gr	GREEN
Y	YELLOW
Gy	GRAY
v	VIOLET

□ □ : FOR 2, 3 DOORS MODELS

*WIRE COLOR
 / 
 PRIMARY SECONDARY
 (THIN)

2. REFRIGERATION CIRCUIT



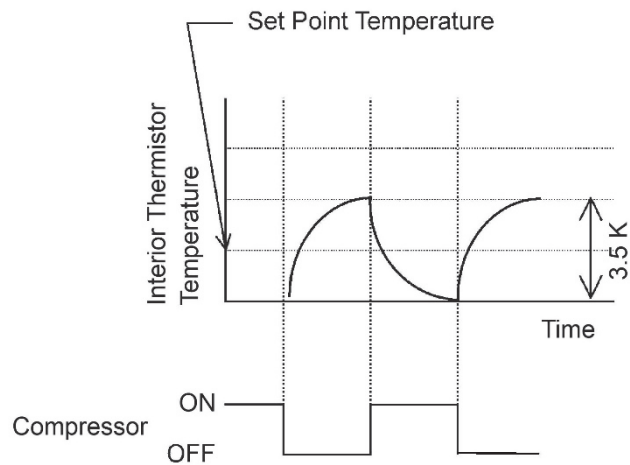
3. ELECTRONIC CONTROLS

[a] SET POINT TEMPERATURE

(Mean temperature between compressor ON and OFF temperatures)

RTE-SC series: -6 to +12°C

FTE-SC series: -25 to -7°C



[b] CABINET TEMPERATURE DIFFERENTIAL

3.5K OFF temperature = Set point temp - 2.0 K

ON temperature = Set point temp + 1.5 K

Note: On the Controller Board only. Actual differential may be larger.

[c] DEFROST CYCLE

Every 6 hours

Note: During a defrost cycle, the Temperature Display Window indicates "dF".

See "7. TIMING CHART" for further details.

If the Defrost Cancellation Control* is activated, the defrost cycle may be up to 18 hours.

*See "[s] DEFROST CANCELLATION CONTROL".

[d] DEFROST COMPLETION TEMPERATURE

RTE-SC series: 7°C

FTE-SC series: 5°C

[e] CLOGGED CONDENSER DETECTION TEMPERATURE

RTE-SC series: 55°C for 2 minutes

FTE-SC series: 58°C for 2 minutes

[f] HIGH PRESSURE ABNORMALITY DETECTION

If a high pressure abnormality is detected under the following conditions, the compressor will be forcibly stopped for 6 minutes.

- 1) The clogging thermistor temperature exceeds the high pressure detection temperature.

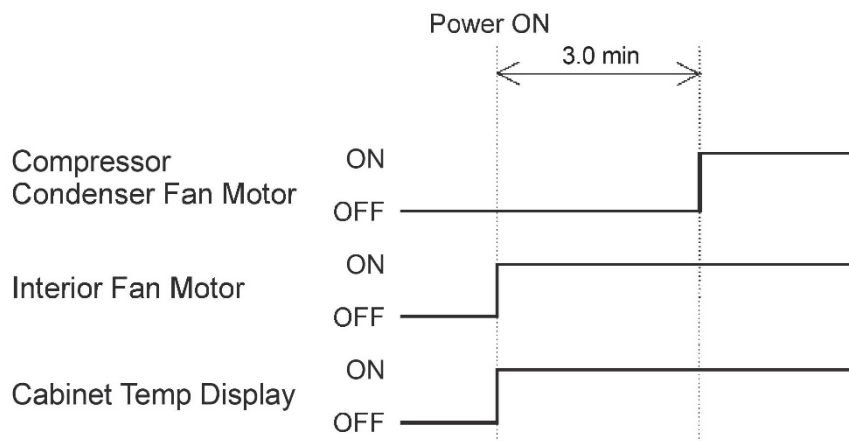
High pressure detection temperature: Refrigerant R290 / 60°C

[g] TEMPERATURE DISPLAY CYCLE

The Temperature Display Window renews its cabinet temperature display every 30 seconds. The display remains the same for 30 seconds even if the actual temperature changes in the meantime. During a defrost cycle, the Temperature Display Window indicates "dF".

[h] COMPRESSOR SOFT START

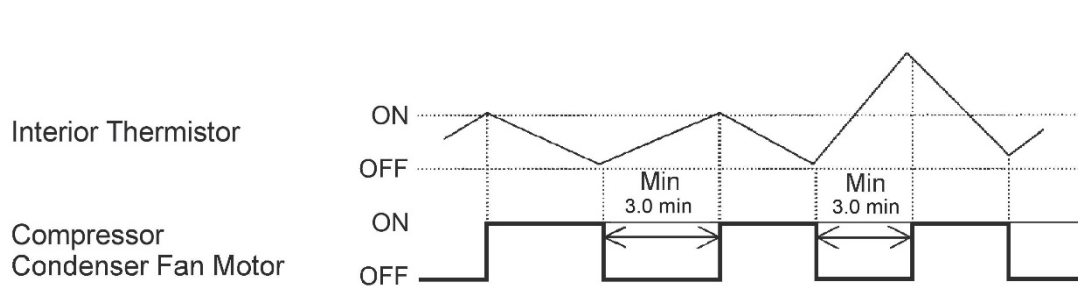
- 1) Startup



When the power supply is turned on, the Interior Fan Motor starts up and the Temperature Display Window shows the cabinet temperature, but the Compressor and Condenser Fan Motor start up with a 3.0 minute delay.

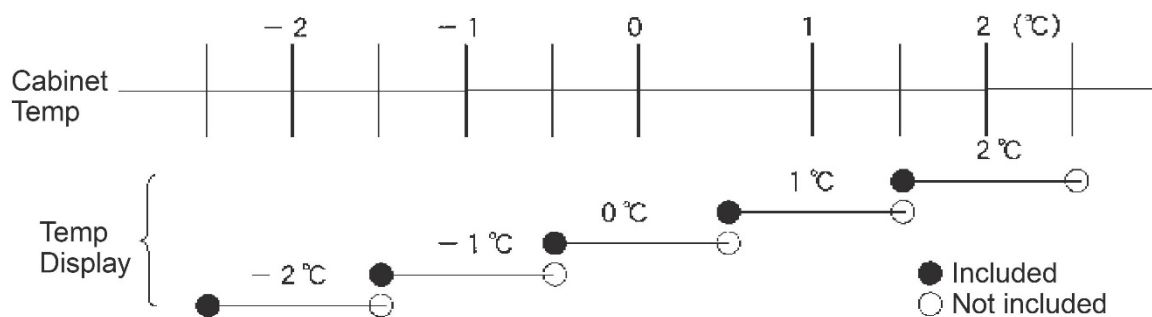
This delay is intended to minimize the difference between the high-side and low-side pressures and to reduce the load on the Compressor so that it can start easily in case of a short (especially instantaneous) power failure.

2) Normal Control



When the Compressor turns off during normal control, it has a mandatory 3.0 minute delay before startup. For example, if the Compressor turns 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 3.0 minutes have passed since its shutdown.

[i] CABINET TEMPERATURE AND TEMPERATURE DISPLAY



[j] RESOLUTION

0.5 K (1 K for temperature setting and display)

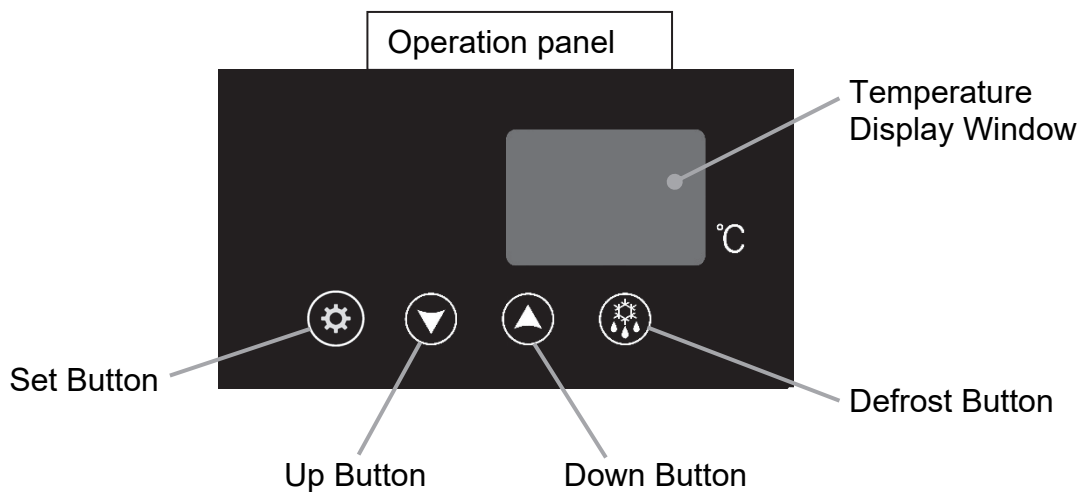
[k] CHECKING AND ADJUSTING SET POINT TEMPERATURE

Press the Set Button to display will flash the set point temperature on the Temperature Display Window.

Note: To restore the internal temperature display, wait 10 seconds or press the Set Button.

While the set point temperature flashes on the Temperature Display Window, press the Up Button (▲) or Down Button (▼) to set the desired temperature. And press the Set Button.

Note: If the Set Button is not pressed after 10 seconds, the setting will not change and the display will return to the internal temperature.



[l] MANUAL DEFROST

To start the manual defrost process, press and hold the Defrost Button for 3 seconds. During defrosting, the Temperature Display Window will display "dF".

Note: The refrigerator/freezer will not start a manual defrost cycle if the Defrost Thermistor senses a temperature of 7°C or more (RTE-SC series) or 5°C or more (FTE-SC series).

[m] CANCELLING SOFT START

To cancel the "Soft Start" (3.0 minutes delay), turn on the power supply while pressing the Set Button. The Compressor and Condenser Fan Motor will start at the same time after 10 second. At this time, the Temperature Display Window shows the data code for 5 second and return to the internal temperature.

Data code: RTE-SC series 05
FTE-SC series 06

Note: If you turn off the power while the compressor is running and then immediately turn it on with the soft start disabled, the high and low pressures cannot be equalized, which can lead to poor compressor start-up. Do not disable the soft start immediately after turning off the power. Wait at least 5 minutes.

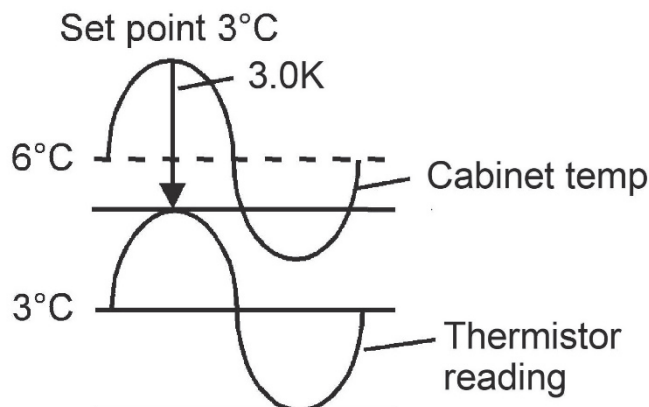
[n] CABINET TEMPERATURE CORRECTION

Any difference between the actual cabinet center temperature and the displayed temperature (Thermistor reading) can be corrected within -5.0 to 5.0 K in 0.5 K steps.

* Note: Some models do not require configuration. In addition, the set values may differ for custom-made specifications.

- 1) Turn on the power while holding down the Up and Down and Set Buttons at the same time from the power-off state. → Display “C0”.
- 2) Press the Up or Down button to switch the display and display “C2”.
* Note: Other than that, please do not change it.
- 3) Press the Set Button to display the correction value.
(e.g. “10” stands for 1.0 K).
- 4) Press the Up or Down button to change the setting.
- 5) Press the Set Button again to display “C2”.
- 6) Turn off the power supply and turn it back on. The cooling cycle begins with the corrected offset.

For example, as shown below, if the average cabinet temperature is 3 K higher than the Thermistor reading, set the offset to 3.0 K.
(standard setting: RTE-SC series 1.0 K, FTE-SC series 0.0 K).
The cabinet temperature will be controlled at 3°C.



[o] CONDENSER FAN MOTOR CONTROL

The rotation speed of the condenser fan motor can be changed in 5 steps depending on the condenser temperature (clogging thermistor temperature). The higher the condensation temperature, the faster it rotates.

1. Temperature conditions

RTE-SC

Clogging thermistor temperature is 37°C or higher: 1 step up

Clogging thermistor temperature is 35°C or lower: 1 step down

FTE-SC

Clogging thermistor temperature is 38°C or higher: 1 step up

Clogging thermistor temperature is 36°C or lower: 1 step down

However, the rotation speed will be maintained for 10 seconds immediately after the change.

2. Clogging temperature conditions

When the high pressure abnormality is detected, the unit will operate in 5(max)-speed.

Note: If the high pressure abnormality occurs, the compressor and condenser fan motor will stop immediately, so the actual operation at 5(max)-speed will be after a 6-minute protective stop after the high pressure abnormality is reported.

3. Condenser fan speed

RTE-SC series:

Model	Speed	Number of Revolutions [r/min]	Pulse/sec [pulse/sec]
Nidec Servo D1550C12B4ZP-56 2 pulse / 1 roll (P03973-01)	Stop	0	0
	1	440	67
	2	735	87
	3	1030	108
	4	1620	149
	5 (Max)	2210	214

FTE-SC series:

Model	Speed	Number of Revolutions [r/min]	Pulse/sec [pulse/sec]
Shinano Kenshi DR-738-602 4 pulse / 1 roll (P07098-01)	Stop	0	0
	1	382	113
	2	566	120
	3	750	127
	4	1000	136
	5 (Max)	1250	145

[p] INTERIOR FAN MOTOR CONTROL

Only the RTE-SC series operates intermittently when the compressor is OFF.
The FTE-SC series operates constantly ON even when the compressor is OFF.

Model	Temperature setting	ON Time	OFF Time
RTE-SC series	0 to +12°C	15 sec.	150 sec.
	-6 to -1°C	15 sec.	90 sec.

[q] ANTI-CONDENSATION HEATER SETTING (OUTER FRAME HEATER, INNER FRAME HEATER)

When shipped, the duty ratio level is set to [0].
If condensation occurs due to the installation environment, you can change the duty ratio level in service mode.

Shipping Settings: level [0]

[RTE-SC, FTE-SC series, Current carrying rate list of outer frame heater]

Level	The ambient temperature – The internal temperature [K]	ON Time [seconds]	OFF Time [seconds]	Energizing Rate [%]
[0]	-	90	90	50
[1]	-	117	63	65
[2]	-	144	36	80
[3]	-	Always ON	-	100

* Heater ON/OFF 1 cycle = 3 minute

[RTE-SC, FTE-SC series, Current carrying rate list of inner frame heater]

Level	The ambient temperature – The internal temperature [K]	ON Time [seconds]	OFF Time [seconds]	Energizing Rate [%]
[0]	-	72	108	40
[1]	-	99	81	55
[2]	-	126	54	70
[3]	-	Always ON	-	100

* Heater ON/OFF 1 cycle = 3 minute

[r] MAIN BOARD MODEL SETTING

When you turn on the power while pressing the Up Button and Down Button,

the model setting number of the main board will be displayed in the temperature display.

Data code: RTE-SC series 05

FTE-SC series 06

Note: After replacing the main board, you must set the correct model. For instructions, see "5. [g] HOW TO SET MODEL AND INTERNAL TEMPERATURE CORRECTION VALUE WHEN REPLACING BOARD".

[s] DEFROST CANCELLATION CONTROL (Only FTE-SC series)

If all of the following conditions are met, the automatic defrost that occurs every 6 hours will be canceled. It will be canceled up to two times in a row, so the defrost cycle may be up to 18 hours.

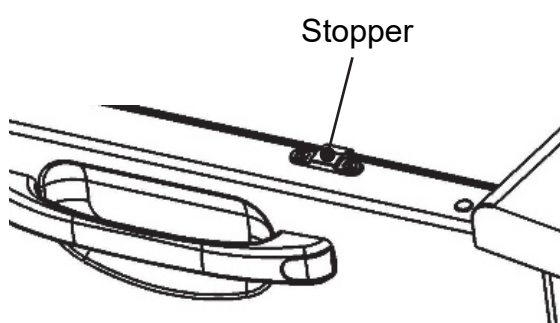
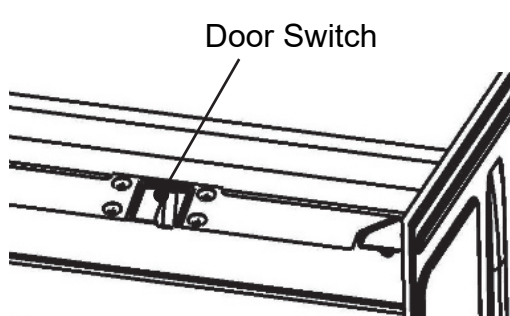
1. Ambient temperature 25°C or higher.
2. Cabinet temperature setting: -25°C or higher.
3. The cabinet temperature has never exceeded the balance temperature +1K.
4. The last two defrosts have not been cancelled consecutively.

[t] DOOR SWITCH

Some models are equipped with a door switch inside the top panel of the door. If the appliance has a door switch, the interior fan motor will stop when the door is opened. When the door is closed, the interior fan motor will start again 10 seconds later.

Note: Do not forcefully open or close the door.

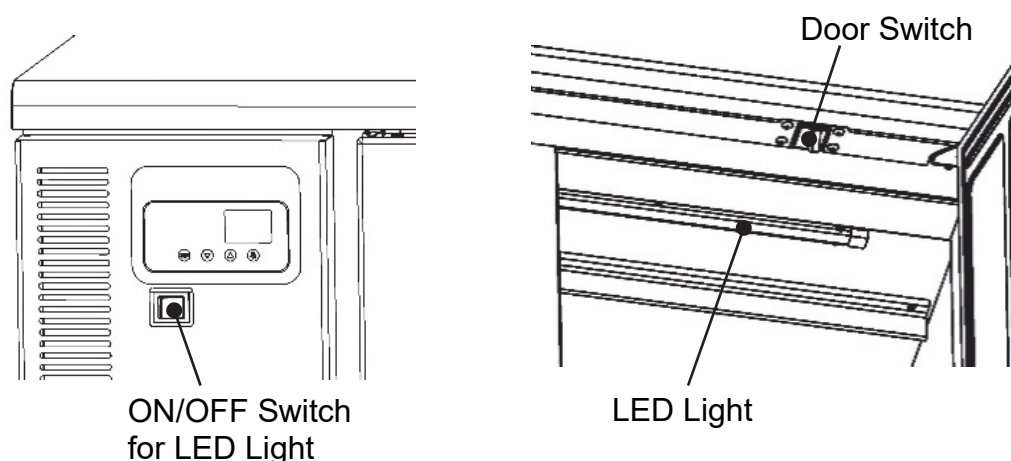
The impact may cause damage to or malfunction of the door switch.



[u] LED LIGHT AND SWITCH

Some models are equipped with an LED light on the ceiling inside the cabinet and an ON/OFF switch on the front panel. Use the LED lights when necessary.

Note: Be careful not to hit the LED light with stored items to prevent damage or malfunction.



4. INVERTER

Item	Part No.	Name	Specification	Used Model
Compressor	P07005-01	VENT403U-513903044 (Embraco)	For Inverter R290, 230V 40-150Hz 197.1W	RTE-SC
	P06828-01	FMFT406U-513805028 (Embraco)	For Inverter R290, 230V 46-150Hz 473.7W	FTE-SC
Inverter Board (Inverter Box with Inductors)	P07006A01 (P07006-01 + P06832-01)	Inverter: 519609013 (CF03B02 M0.0 0BA03) Inductors: 193504021 (3A/8.0mHV) (Embraco)	For VENT403U 220-240V 50-60Hz 3.8A 400W	RTE-SC
	P06831A01 (P06831-01 + P06832-01)	Inverter: 519308522 (VCC3 2456 T8 A 0Q) Inductors: 193504021 (3A/8.0mHV) (Embraco)	For FMFT406U 220-240V 48-62Hz 3.3A 320W	FTE-SC
Controller Board (Mainboard)	P05426-04	HK036-04 (Katata Electric Co., Ltd.)	-	RTE-SC FTE-SC
Operation Board	P06503-01	HK045-01 (Katata Electric Co., Ltd.)	-	RTE-SC FTE-SC
Switching Regulator	C05928-01	CUS30-12 (TDK-Lambda)	-	RTE-SC FTE-SC
Protector (Circuit Breaker)	440972-01	W28XQ1A-10 (ASAHIKIKEN KOGYO)	AC250V, 10A	RTE-SC FTE-SC

[a] INVERTER CONTROL

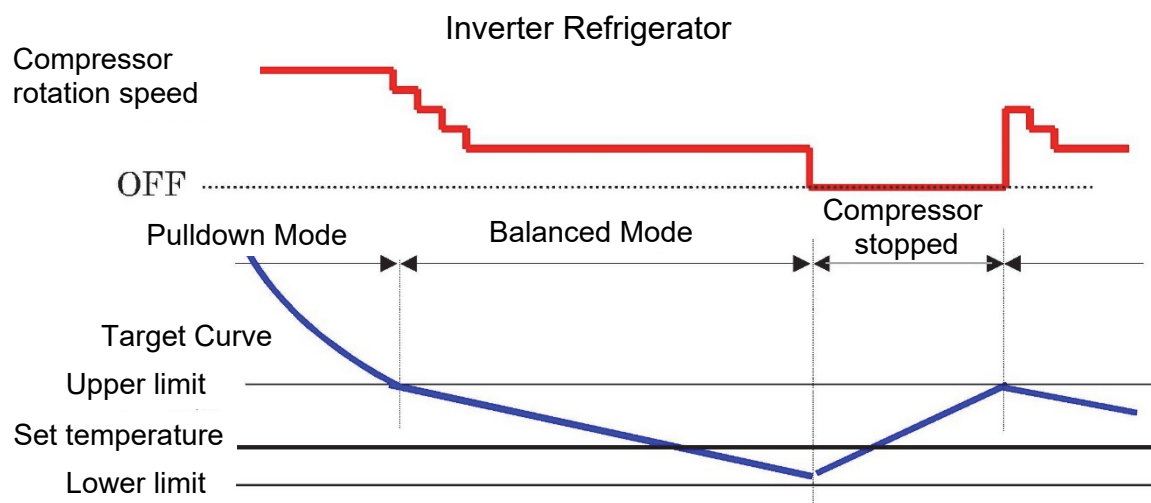
The rotation speed of the inverter compressor is 6 speeds.

The higher the speed, the greater the cooling capacity, but the higher the power consumption. On the other hand, the lower the rpm, the smaller the cooling capacity, but the lower the power consumption.

The rotation speed of the inverter compressor is determined on the main board along the cooling target curve according to the temperature inside the chamber.

In addition, the rotation speed is controlled according to the temperature inside the cabinet and the condensation temperature.

Target Curve



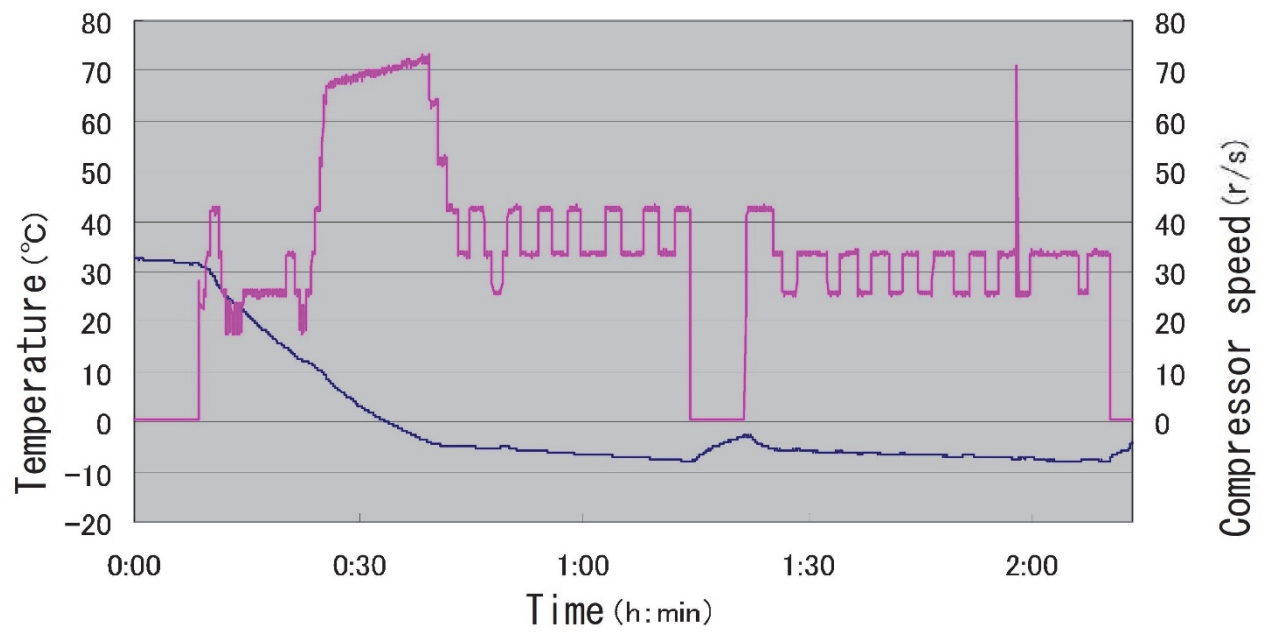
In order for the thermistor temperature inside the chamber to follow the target curve (pull-down curve), the compressor speed is adjusted for cooling.

The compressor is operated ON/OFF depending on the temperature of the thermistor in the chamber. Within the upper limit of the set temperature, the rotation speed is reduced and the operation is performed.

Pull-down characteristics and compressor speed

Example)

Model: RT-150SNF-E Pull down 100V 50Hz



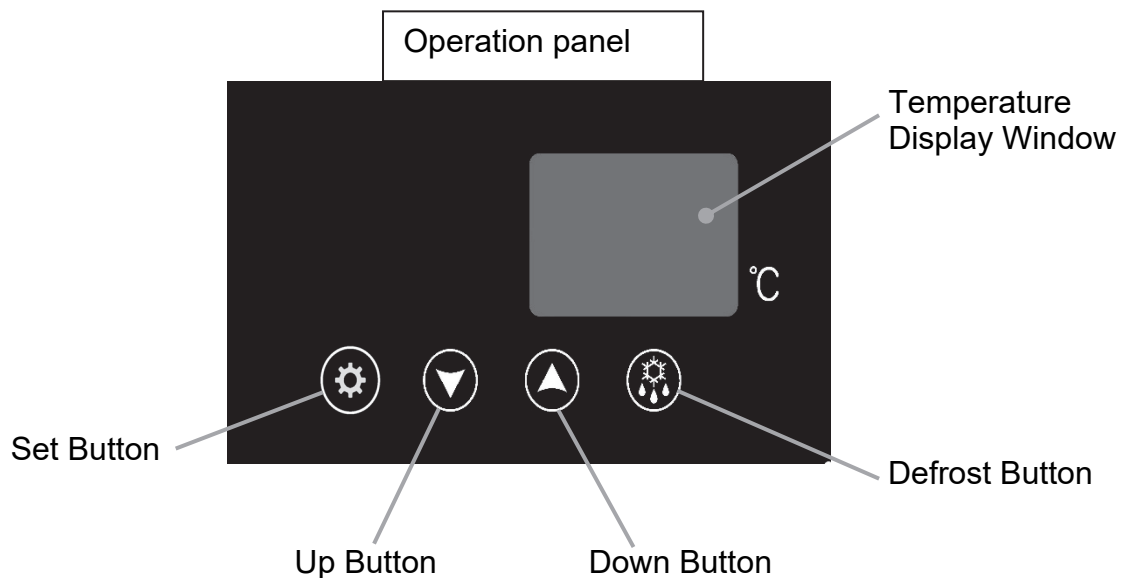
[b] NOISE GENERATED BY INVERTER MACHINES

Due to the nature of inverter machines, when the inverter board converts DC voltage to pseudo-AC voltage, the contacts are turned on and off at high speed, resulting in radiated noise (noise). The inverter control of this unit is designed to comply with the Electrical Appliance and Material Safety Act, but depending on the usage conditions, there may be disturbances in the reception of nearby TVs and radios. In that case, please take the following measures to see how it goes.

1. Make sure that the machine is grounded.
2. Television and radio should be kept as far away from the unit as possible.
3. Indoor antennas, telephones, cable broadcasting signal lines, etc. should be installed as far away from the unit as possible.
(If possible, do not use an indoor antenna)
4. Do not take electricity from the same outlet as the refrigerator.

5. MAINTENANCE MODE

[a] DISPLAY PANEL



[b] LIST OF BASIC BUTTON OPERATIONS

Situation	Button	How to press	Behavior
Always	Set Button	Short	Flashing display of the temperature setting inside the cabinet
Always	Press the Setting Button, press the Up or Down Button, and then press the Set Button again	Short	Changing the temperature setting inside the cabinet
Always	Defrost Button	Long (3 seconds)	Manual Defrost
When the error is on	Up Button	Long (3 seconds)	Clearing the error display (There is an unbreakable error)

[C] HOW TO CHECK ERROR HISTORY

1) HOW TO CHECK THE ERROR HISTORY

1. Press and hold the two buttons, the Up Button and the Set Button, at the same time for 5 seconds. (Press the Up Button first) → display is "F0"
2. Use the UP and DOWN Buttons to display "F6".
3. Press the Set Button. → error history flashes in the order in which they occurred. When there is no error, it is displayed, "—".
The error history flashes on the temperature display.
4. Press the Set Button. → Return to "F6" display.
5. Do the same as in 1. → Return to the temperature display in the cabinet.
(Even if you do nothing for 1 minute, the temperature display inside the cabinet will return.)

2) HOW TO CLEAR THE ERROR HISTORY

1. Perform operations up to 1~3. of 1).
2. Press and hold the Up button for 5 seconds. → "—" flashes.
3. Perform operations up to 4~5. of 1).

3) NOTES ON CHECKING THE ERROR HISTORY

There are several types of displays from F0 ~ FF before the display is set to F6, but do not accidentally press other buttons at this time. The basic settings may change and malfunction. If you accidentally perform other operations, leave it for 1 minute and it will return to the temperature display inside the cabinet. The error history remembers only the type of error that occurred. When the same error occurs consecutively, there is only one history.

[d] HOW TO CHANGE OPERATION SETTING

Settings that can be changed

1. Cabinet temperature setting
2. Conductivity distribution setting for the front frame
3. Soft-start release
4. Automatic defrost interval ---[F0]
5. Time of alert of "E1" error (high-temperature) ---[F3]
6. Time of alert of "E2" error (low-temperature) ---[F4]
7. Whether the interior fan motor operates intermittently during defrosting ---[F5]
8. Error history check (Clear History) ---[F6]
9. Fixed inverter speed ---[F7]
10. Setting the Defrost Cancel ---[FA]
11. Buzzer output (external output) ---[Fb]
12. Setting the Defrost Backup Timer ---[FC]
13. Choosing Condenser Fan Control ---[FF]

Except for 1. and 2., the default settings are set to meet the specifications.
Don't change it unless you have to.

1. Changing the temperature setting inside the cabinet

When the Set Button is pressed, the digital temperature display switches from the cabinet temperature to the cabinet set temperature, and the current set temperature flashes. From the flashing display state, use the UP Button or DOWN Button to adjust the temperature you want to set, and then press the Set Button again.

Note: After adjusting the temperature to be set, the temperature setting inside the cabinet will not be changed unless the Set Button is pressed.

2. Changing the conductivity distribution setting of the front frame heater

Press and hold the Set Button for 3 seconds to enter the user setting mode, and use the Up and Down Buttons to "U1" on the display.

When you press the Set Button again, you will enter edit mode, and the current setting value will be flashed on the Temperature Display Window. You can change the energization level within the range of (RTE-SC series: 0~3), (FTE-SC series: 0~3) with the Up and Down Buttons. Press the Set Button again to confirm the setting and return to "U1" on the display.

After returning to "U1" on the display, press the Up and Down Buttons to "UE" on the display, press the Set Button again to set the user settings and so, exit this mode return to the temperature inside the cabinet on display.

Shipping Settings: level [0]

3. Soft-start release (when you want the compressor to start immediately)

Turn on the power while holding down the Set Button. → After 10 seconds, the compressor starts.

When the power is turned on, it is activated only once.

Note: If the power is turned off during compressor operation and immediately started up with the above operation, the compressor is likely to fail to start because the high and low pressures cannot be equalized.

Do not release the soft start immediately after turning off the power.

Please leave it for at least 5 minutes.

[e] OPERATION SETTING CHANGE MODE

4 - 13 are performed in the operation setting change mode shown below.

Checking and clearing the error history is also part of this operation.

1. Press and hold the two buttons, the Up button and the Set Button, at the same time for 5 seconds. (Press the up button first) → display is F0
2. Use the UP or DOWN buttons to match the number you want to set from F0~FF in the list below.
3. Press the Set Button. → The current setting flashes.
Note) F6: Separate operation for error history only.
4. Press the UP or DOWN Button to match the value you want to set.
If you do not know the settings, please match the initial settings of each item.
5. End editing: Press the Set Button.
6. Do the same as in 1. → Return to the temperature display in the cabinet and complete the setting.

[f] LIST OF OPERATION SETTING CHANGE MODE (Service Mode)

Number indication	Substance	Flashing indication when the Set Button is pressed
F0	Automatic defrost interval	--: No automatic defrost 3: 3 hours 6: 6 hours (default setting) 8: 8 hours 12: 12 hours 24: 24 hours * If the defrost time is long, there will be more frosting, which may cause poor cooling.
F3	"E1" error (High temperature	0: Immediate notification (not recorded in history)

	abnormality) Time to Alert	→ For checking remote alarms. After checking, it will return to the original settings. 1: 1 hour 2: 2 hours (default setting) 3: 3 hours
F4	“E2” error (Low temperature abnormality) Time to Alert	0: Immediate notification (not recorded in history) → For checking remote alarms. After checking, it will return to the original settings. 1: 1 hour (default setting)
F5	Whether the interior fan motor operates intermittently during defrosting	oF: Do not on: Do
F6	Error history check (Clear History)	(1) Press the Set Button. Display errors from E1~ED. (Displayed every 0.5 seconds for 1 second. Up to 8 pieces per room.) (2) Press and hold the Up Button. (5 seconds or more) The error history is cleared. (3) Press the Set Button. Return to number display “F6”.
F7	Fixed inverter speed	--: 0~6 speed variable operation (default setting) 0~6: Fixed rotation speed * If it is fixed, sufficient cooling capacity may not be obtained, such as during busy times.
FA	Defrost Cancel establishment	on: Defrost cancel (default setting for FTE-SC) oF: Defrost do not cancel (default setting for RTE-SC)
Fb	Buzzer output (external output)	AL: Buzzer occurs on all errors (default setting) 12: Buzzer occurs only for E1, E2 errors
FC	Defrost Backup Timer (Time until the defrost heater is forcibly turned off when the energization becomes long)	--: No time limit (No E3 errors) 4: 24 minutes (4×6 minutes) 7: 40 minutes (7×6 minutes) 10: 60 minutes (10×6 minutes) 13: 80 minutes (13×6 minutes) 17: 100 minutes (17×6 minutes) 20: 120 minutes (20×6 minutes) * If the backup time is long (no backup), there is a risk that the heater fuse will blow when the defrost heater is energized for a long time.
FF	Condenser Fan Control	AU: Speed switching possible (default setting) FL: High-speed driving

[g] HOW TO SET MODEL AND INTERNAL TEMPERATURE CORRECTION VALUE WHEN REPLACING BOARD

When replacing the main board, it is necessary to change the model setting and the temperature compensation value inside the cabinet.

- Since the model of the main board for supplying parts is not set, if it is used as it is, it will malfunction and correct cooling will not be possible. Be sure to set the model.

< How to set up model >

1. Turn off the power.
2. Turn on the power while holding down the UP and DOWN Buttons at the same time. → initial display is "--"
Note: The display is "--", but it is not the model setting that is remembered.
3. Use the UP and DOWN Buttons to match the number of the model you want to set. → display is the model setting number.
4. Press and hold the Set Button for at least 3 seconds. → indication flashes "rc"
5. Press and hold the Set Button again for at least 3 seconds. → indication flashes "oF"
6. Turn off the power. → End of setting

< How to check settings >

1. Turn on the power while holding down the Set Button.
2. After the display part is fully lit, the model display number is displayed.
(This operation will start after 10 seconds for the compressor.)

List of model setting numbers

product		Model setting number
RTE-SC	Undercounter Refrigerator Inverter	05
FTE-SC	Undercounter Freezer Inverter	06

< How to set the internal temperature correction value >

* Note: Some models do not require configuration. In addition, the set values may differ for custom-made specifications.

1. Turn on the power while holding down the Up and Down and Set Button at the same time from the power-off state. → Display "C0".
2. Press the Up or Down Button to switch the display and display "C2". Other than that, please do not change it.
3. Press the Set Button to display the correction value.
4. Press the Up or Down Button to change the setting.
5. Press the Set Button again to display "C2".
6. Turn off the power. → Setup Completed.

[h] HOW TO OPERATE MAINTENANCE MODE

It is used to check the operating status of the refrigerator and is useful for fault diagnosis.

There is no operation to change the setting value, and it will be "display only"

< How to check the driving status >

1. Press and hold the Down Button and the Set Button at the same time for at least 5 seconds. (Press the Down Button first.)
→ Display is "tr" (Temperature detected by thermistor inside the cabinet.)
2. Use the Up or Down Buttons to match the number you want to set from "tr" ~ "ad" in the list below.
3. Press the Set Button. → Current driving status is displayed.
4. Perform the operation in 1. → Return to the temperature display in the cabinet.

< Maintenance mode display contents >

Index	Item	Display Content
tr	Interior thermistor	Interior thermistor temperature
td	Defrost thermistor	Defrost thermistor temperature
tc	Clog thermistor	Clog thermistor temperature
tA	Ambient temperature thermistor	Ambient temperature thermistor
cn	Driving Situation	"0" : S_WAIT
		"1" : FATAL_ERROR
		"2" : INTO_CONTROL
		"3" : S_START
		"4" : ZONE_JUDGE_INIT
		"5" : ZONE_JUDGE
		"6" : R__INIT
		"7" : OUT_OF_CONTROL__
		"8" : S_PULL_DOWN
		"9" : S_FORCE_DOWN
		"10" : S_STOP
		"11" : S_BALANCE
		"12" : R__
		"13" : S_ZONE
		"14" : S_PULL_DOWN_
		"15" : DOOR_CTRL_INIT
		"16" : DOOR_CTRL
		"17" : R___INIT
		"18" : OUT_OF_CONTROL___
		"19" : DOOR_CLOSE
		"20" : DOOR_OPEN
		"21" : R____
		"22" : DOOR_OPEN_CLOSE
		"23" : COMP_TM_CTRL_INIT

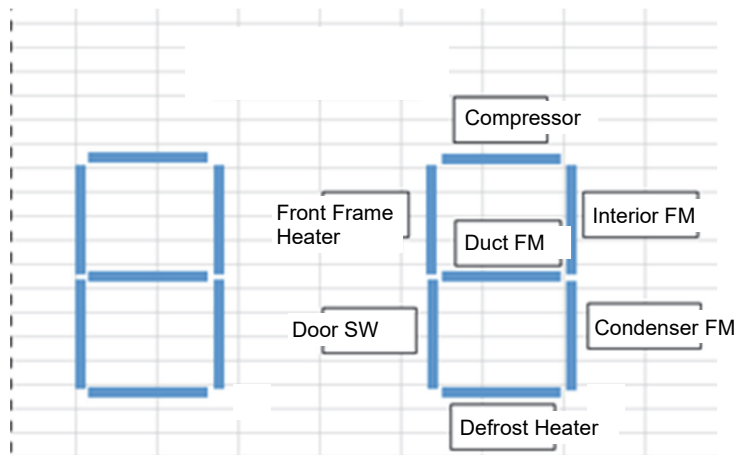
		"24" : COMP_TM_CTRL
		"25" : R__INIT
		"26" : OUT_OF_CONTROL_
		"27" : OFF_TIME_NG
		"28" : OFF_TIME_OK
		"29" : ON_TIME_NG
		"30" : ON_TIME_OK
		"31" : R_
		"32" : COMP_OFF
		"33" : COMP_ON
		"34" : COOLING_DEF_INIT
		"35" : COOLING_DEF
		"36" : R_INIT
		"37" : OUT_OF_CONTROL
		"38" : COOLING_NG
		"39" : COOLING_EXPECTED
		"40" : COOLING_UDON_STOP
		"41" : ROOM_FAN_ON
		"42" : INTERVAL_OFF
		"43" : INTERVAL_ON
		"44" : COMP_SPEED_CONTROL
		"45" : DEF_DELAY
		"46" : DEF_HEATER
		"47" : DEF_DRAIN
		"48" : FAN_DELAY_WAIT
		"49" : FAN_DELAY_HIGH_PRESSURE_RELEASE
		"50" : FAN_DELAY_HIGH_PRESSURE
		"51" : FAN_DELAY_NORMAL
		"52" : DEF_FINISH
		"53" : R
		"54" : COOLING_CONTROL
		"55" : COOLING_OK
		"56" : COOLING_ROOM_SENSOR_ERROR
		"57" : COOLING_NORMAL
		"58" : COOLING_COMP_OFF
		"59" : COOLING_COMP_ON
		"60" : DEFROST_CONTROL
		"61" : ROOM_FAN_INTERVAL
		"62" : DEF_FAN_DELAY
oP	Port Output	Left a bit:
		Left b bit:
		Left c bit:
		Left d bit:
		Left e bit:
		Left f bit:
		Left g bit:
		Right a bit: Compressor A

		Right b bit: Fan A in the cabinet
		Right c bit: condenser fan A
		Right d bit: Defrost heater A
		Right e bit: Door SW A
		Right f bit: Frame heater
		Right g bit: Duct Fan
		Left a bit:
		Left b bit:
		Left c bit:
		Left d bit:
		Left e bit:
		Left f bit:
		Left g bit:
		Right a bit: Compressor B
		Right b bit: Fan B inside the cabinet
		Right c bit: condenser fan B
		Right d bit: Defrost heater B
		Right e bit: Door SW B
		Right f bit:
		Right g bit:
iP	Port Input	Left a bit:
		Left b bit:
		Left c bit:
		Left d bit:
		Left e bit:
		Left f bit:
		Left g bit:
		Right a bit: SW up
		Right b bit: SW down
		Right c bit: Set SW
		Right d bit: Manual defrost SW
		Right e bit: Door SW A
		Right f bit: Door SW B
		Right g bit:
cc	High pressure condition (clogging sensor state)	"0" : S_WAIT
		"1" : S_START
		"2" : COND_SENSOR_CTRL_INIT
		"3" : COND_SENSOR_CTRL
		"4" : R_INIT
		"5" : OUT_OF_CONTROL
		"6" : OPEN
		"7" : SHORT_DELAY
		"8" : SHORT_CONFIRM
		"9" : HIGH_PRESSURE
		"10" : COND_CLOG_DELAY
		"11" : COND_CLOG_CONFIRM
		"12" : NORMAL

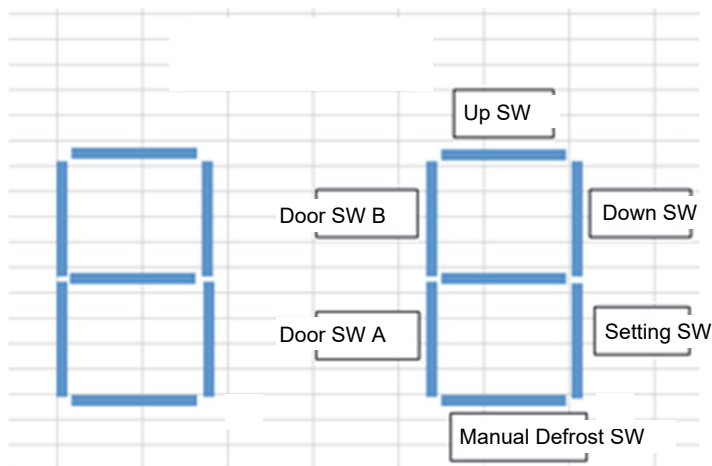
		"13" : R
		"14" : INTO_CONTROL
		"15" : COND_SENSOR_NG
		"16" : SHORT
		"17" : COND_SENSOR_OK
		"18" : COND_CLOG
		"19" : HIGH_PRESSURE_STOP_CTRL_INIT
		"20" : HIGH_PRESSURE_STOP_CTRL
		"21" : R_INIT
		"22" : NOT_HIGH_PRESSURE_STOP
		"23" : HIGH_PRESSURE_STOPPING
		"24" : R_
		Off: Not a high-pressure shutdown
		Lighting: High pressure stop
		Clogging sensor control status (*Same as 7seg on A side)
		Off: Not a high-pressure shutdown
		Lighting: High pressure stop
Fq	Current Inverter Frequency	Current Inverter Frequency
		Current Inverter Frequency
cF	Condenser Fan Status	Current rotation speed rpm/100
		Current rotation speed rpm/100
id	Model settings	Top 2 digits of the version (lit for 2 seconds)
		↓ (Off for 0.5 seconds)
		Lower 2 digits of the version (lit up for 2 seconds)
		↓ (Off for 0.5 seconds)
		Top 2 digits of checksum (lit for 2 seconds)
		↓ (Off for 0.5 seconds)
		Lower 2 digits of checksum (lit for 2 seconds)
		↓ (Off for 0.5 seconds)
		End of display
ad	Defrost Cancellation Conditions	Left a bit:
		Left b bit:
		Left c bit:
		Left d bit:
		Left e bit:
		Left f bit:
		Left g bit:
		Right a bit: Automatic defrosting?
		Right b bit: Ambient temperature above 25°C?
		Right c bit: Is the ambient temperature sensor open/short-circuited?
		Right d bit: Is the cabinet temperature setting -25°C or higher?
		Right e bit: Once the balance area is in, isn't it missing?
		Right f bit: Haven't you canceled two in a row in the last minute?
		Right g bit: Compressor operation rate less than 45%? (Refrigerated only)
		Left a bit:
		Left b bit:
		Left c bit:

		Left d bit:
		Left e bit:
		Left f bit:
		Left g bit:
		Right a bit: Automatic defrosting?
		Right b bit: Ambient temperature above 25°C?
		Right c bit: Is the ambient temperature sensor open/short-circuited?
		Right d bit: Is the cabinet temperature setting -25°C or higher?
		Right e bit: Once the balance area is in, isn't it missing?
		Right f bit: Haven't you canceled two in a row in the last minute?
		Right g bit: Compressor operation rate less than 45%? (Refrigerated only)

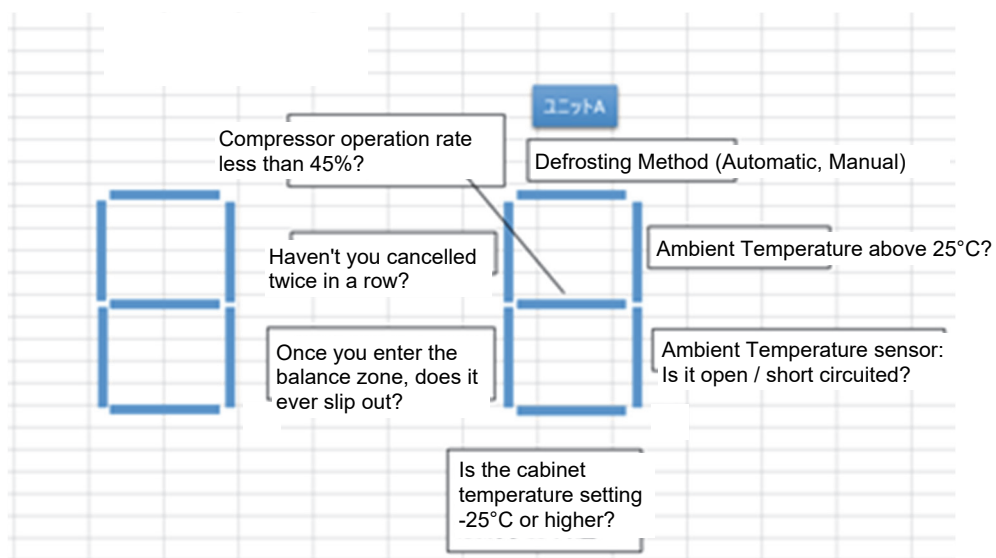
7-segment display of port output "oP"



7-segment display of port output "IP"



7-segment display of the defrost cancellation condition "ad"



6. ERROR CODES

In case of trouble, the Temperature Display Window will alternately flash every second between one of the following error codes and the cabinet temperature or “dF” during a defrost cycle. The error codes are displayed in the following order of priority:

Priority	Code	Error
1	EA	EEPROM Write Error
2	Ed	EEPROM Verify Error
3	Eb	Operation Board Verify Error
4	EC	Operation Board Communication Error
5	E5	Interior Thermistor Defective
6	E8	Defrost Thermistor Defective
7	E9	Clog Thermistor Defective
8	E6	Condenser Fan Motor Defective
9	E4	Abnormal Pressure
10	E7	Condenser Clogged
11	E3	Defrost Cycle Too Long
12	E1	Cabinet Temperature Too High
13	E2	Cabinet Temperature Too Low

[a] EEPROM WRITE ERROR (EA)

When the values written on EEPROM (IC3) differ from those retrieved for verification, “EA” will be displayed.

The “EA” display will not reset until the power supply is turned off.

The EEPROM (IC3) may be defective. Replace the Controller Board.

[b] OPERATION BOARD VERIFY ERROR (Eb)

“Eb” is displayed if the ROM checksum of the Operation Board is abnormal. The Operation Board may be defective. Replace the Operation Board.

Note: In this case, "Eb" will be displayed on the 7-segment display, but "EC" will be stored in the error history on the controller side.

[c] OPERATION BOARD COMMUNICATION ERROR (EC)

"EC" is displayed when communication between the operation board and controller board is interrupted for a certain period of time.

The device will periodically attempt to restore communication and will automatically be released when communication is restored.

[d] EEPROM VERIFY ERROR (Ed)

When every value retrieved from EEPROM (IC3) for verification differs from the memory setting of the Controller Board, "Ed" will be displayed.

The "Ed" display will automatically reset when retrieved values have been verified. The EEPROM (IC3) may be defective. Replace the Controller Board.

[e] CABINET TEMPERATURE TOO HIGH (E1)

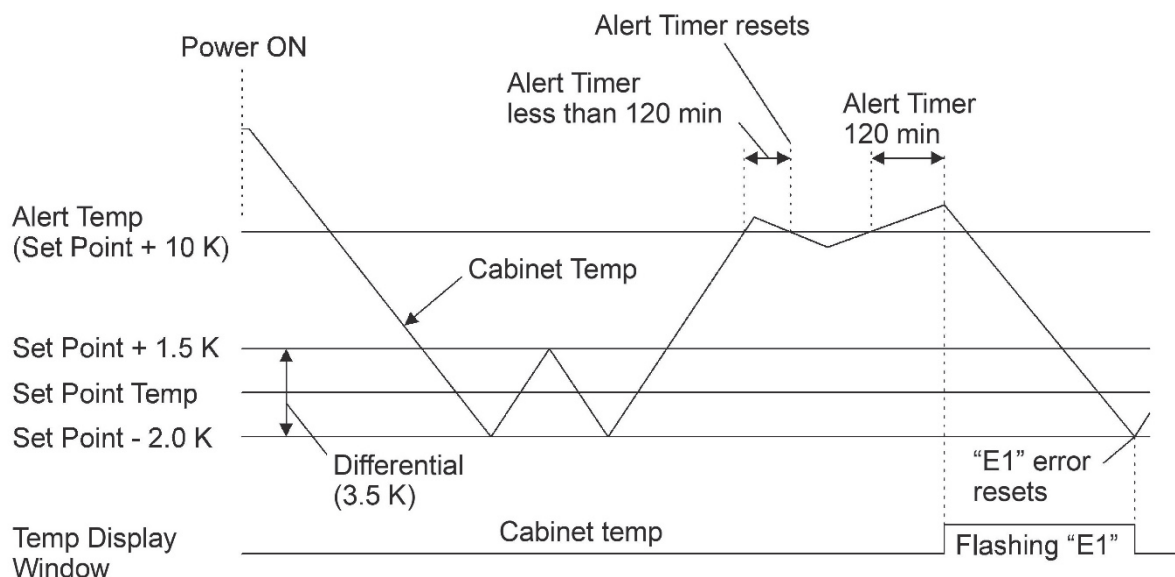
When the cabinet temperature rises to the alert temperature (10K above the set point), the High Temperature Alert Timer will start counting down from 120 minutes. When the Timer counts down to zero, "E1" will be displayed. If the cabinet temperature drops below the alert temperature before the Timer counts down to zero, the Timer will reset and "E1" will not be displayed.

When the power supply is turned on, this function will not work until the cabinet temperature drops below the Compressor OFF temperature. This function is available even during a defrost cycle.

The "E1" display will automatically reset when the cabinet temperature drops below the Compressor OFF temperature.

The cause may be:

- 1) The Doors are opened too frequently or left open.
- 2) The Interior Thermistor (black) is defective.
- 3) The Compressor is defective or gas is leaking.



[f] CABINET TEMPERATURE TOO LOW (E2)

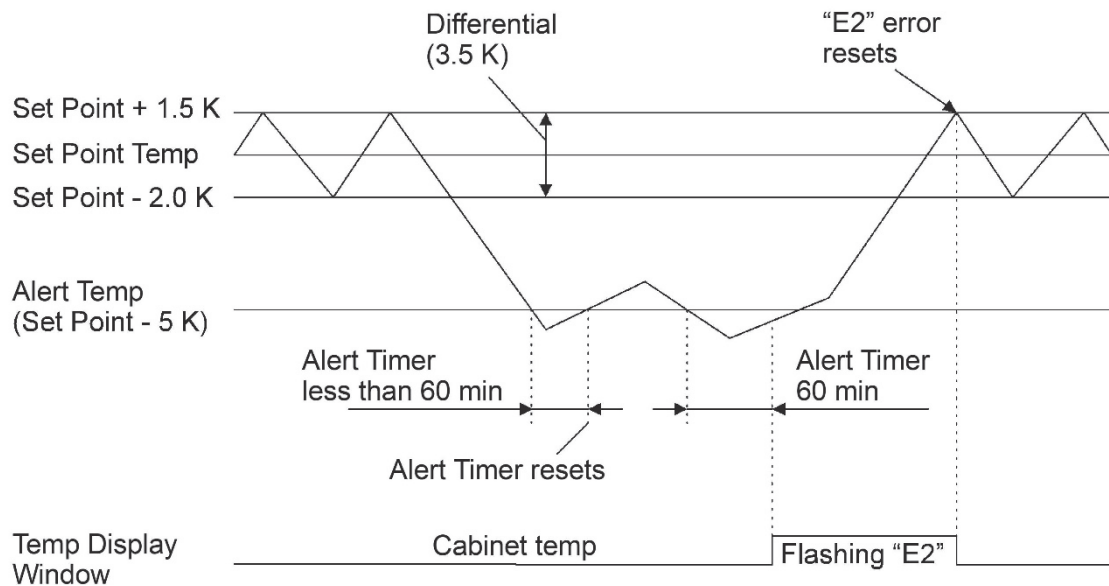
When the cabinet temperature drops to the alert temperature (5K below the set point), the Low Temperature Alert Timer will start counting down from 60 minutes. When the Timer counts down to zero, “E2” will be displayed. If the cabinet temperature rises above the alert temperature before the Timer counts down to zero, the Timer will reset and “E2” will not be displayed.

When the power supply is turned on, the Timer will start counting if the cabinet temperature is below the alert temperature (5 K below the set point). This function is available even during a defrost cycle.

The “E2” display will automatically reset when the cabinet temperature rises above the Compressor ON temperature.

The cause may be:

- 1) The ambient temperature is too low, or a large amount of frozen food is stored inside.
- 2) The Interior Thermistor (black) is defective.



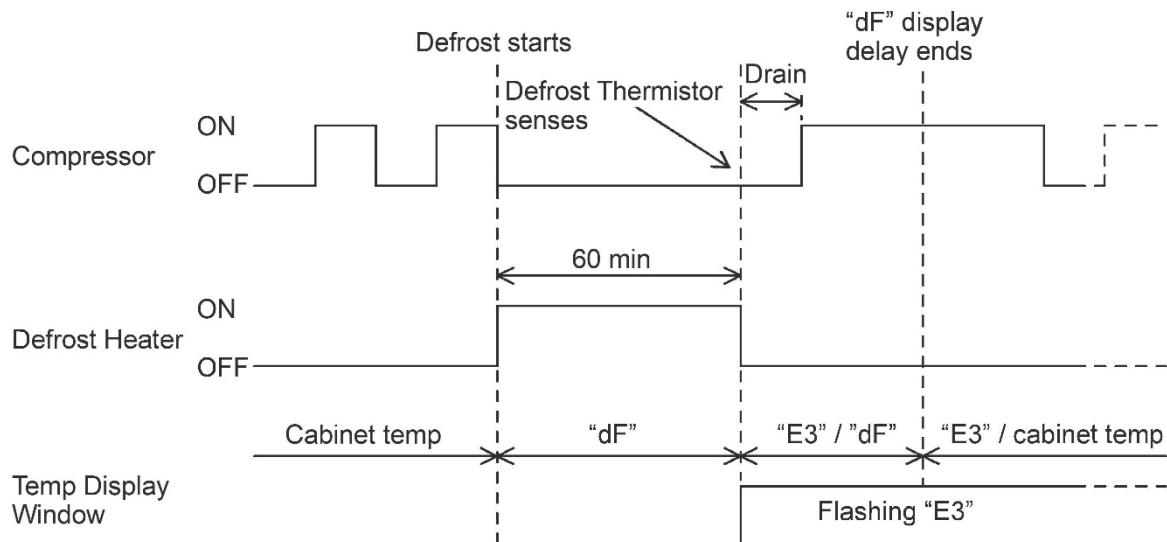
[g] DEFROST CYCLE TOO LONG (E3)

When the Defrost Thermistor does not turn off after 60 minutes have passed since the defrost cycle starts, “E3” will be displayed. In this case, the refrigerator/freezer will proceed to the next process: (1) Defrost cycle terminated, (2) Drain, (3) Fan Motor delay, (4) “dF” display delay, (5) Cooling cycle.

Press and hold the top button for 3 seconds to perform error reset.

The cause may be:

- 1) The Defrost Heater is defective.
- 2) The Thermal Fuse is blown.
- 3) The Defrost Thermistor (orange) is defective.
- 4) A large amount of moist food is stored inside.



[h] ABNORMAL PRESSURE (E4)

When the Clog Thermistor senses a temperature above 60°C (RTE/FTE series), the refrigerator/freezer will detect an abnormal pressure to stop the Compressor for 6 minutes. At the first detection, the Pressure Alert Timer will start counting down from 60 minutes.

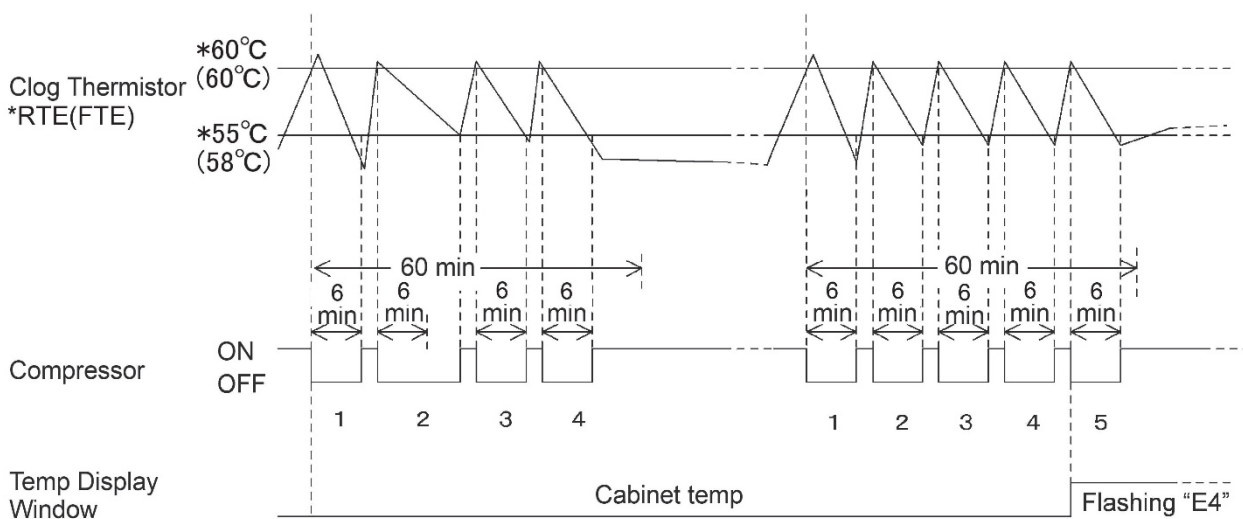
The Compressor will restart after the 6 minute interruption, if the Clog Thermistor senses a temperature below 55°C (RTE series) or 58°C (FTE series). The Compressor will not restart until the above conditions are satisfied. If an abnormal pressure is still detected, the Compressor will stop again.

If an abnormal pressure is detected five times before the Timer counts down to zero, "E4" will be displayed. If the Timer has already counted down by then, "E4" will not be displayed. This function is available even during a defrost cycle.

Press and hold the top button for 3 seconds to perform error reset.

The cause may be:

- 1) The Condenser Fan Motor is locked or defective.
- 2) The Condenser Filter is clogged with dirt or dust.



[i] INTERIOR THERMISTOR DEFECTIVE (E5)

When the Interior Thermistor senses a temperature below -60°C (open circuit) or above 70°C for 10 minutes (short circuit), "E5" will be displayed.

The Interior Thermistor may be defective. Replace the Interior Thermistor.

Also, press and hold the top button for 3 seconds to perform error reset.

[j] CONDENSER FAN MOTOR DEFECTIVE (E6)

"E6" is displayed when the Condenser Fan Motor is rotating but the number of rotations is 0 for 30 seconds.

The Condenser Fan Motor may be defective. Replace the Condenser Fan Motor.

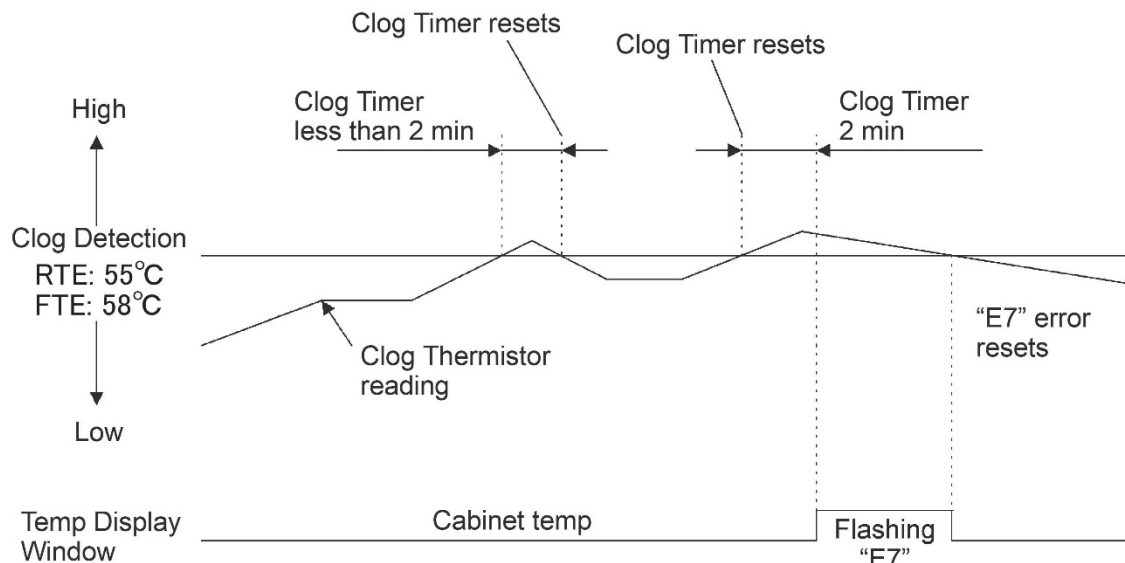
[k] CONDENSER CLOGGED (E7)

When the Clog Thermistor senses a temperature above 55°C (RTE series) or 58°C (FTE series) for 2 minutes, “E7” will be displayed.

The “E7” display will automatically reset when the Clog Thermistor senses a temperature below the above point.

The cause may be:

- 1) The Condenser Fan Motor is locked or defective.
- 2) The Condenser Filter is clogged with dirt or dust.



[I] DEFROST THERMISTOR DEFECTIVE (E8)

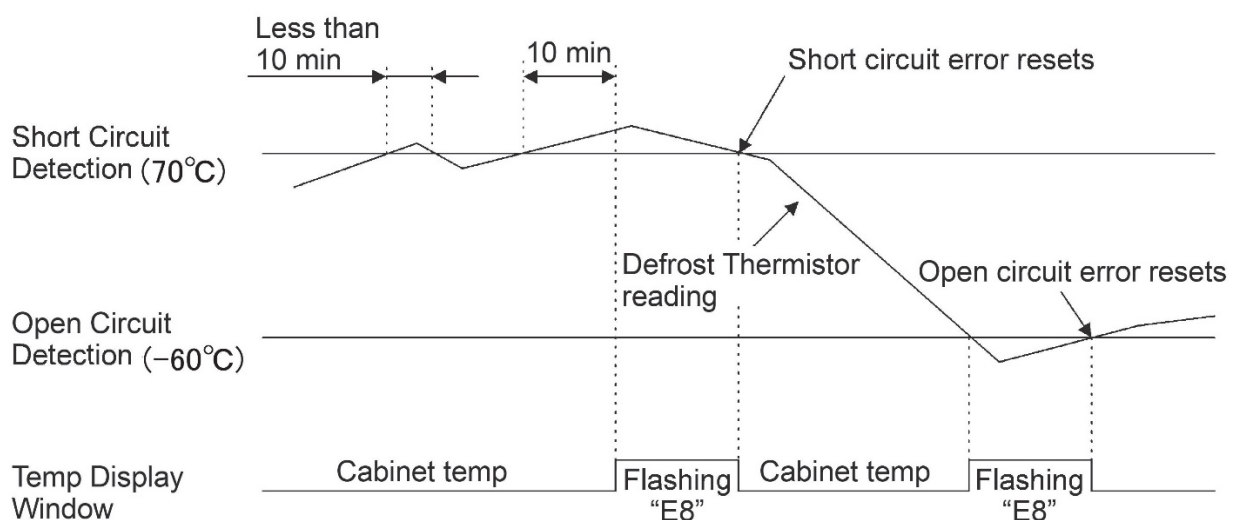
When the Defrost Thermistor senses a temperature below -60°C (open circuit) or above 70°C for 10 minutes (short circuit), "E8" will be displayed.

This function is not available during a defrost, drain or Fan Motor delay process.

In case of an open circuit, the "E8" display will automatically reset when the temperature rises above -60°C . In case of a short circuit, the "E8" display will automatically reset when the temperature drops below 70°C .

The cause may be:

- 1) The Defrost Thermistor (orange) is defective.



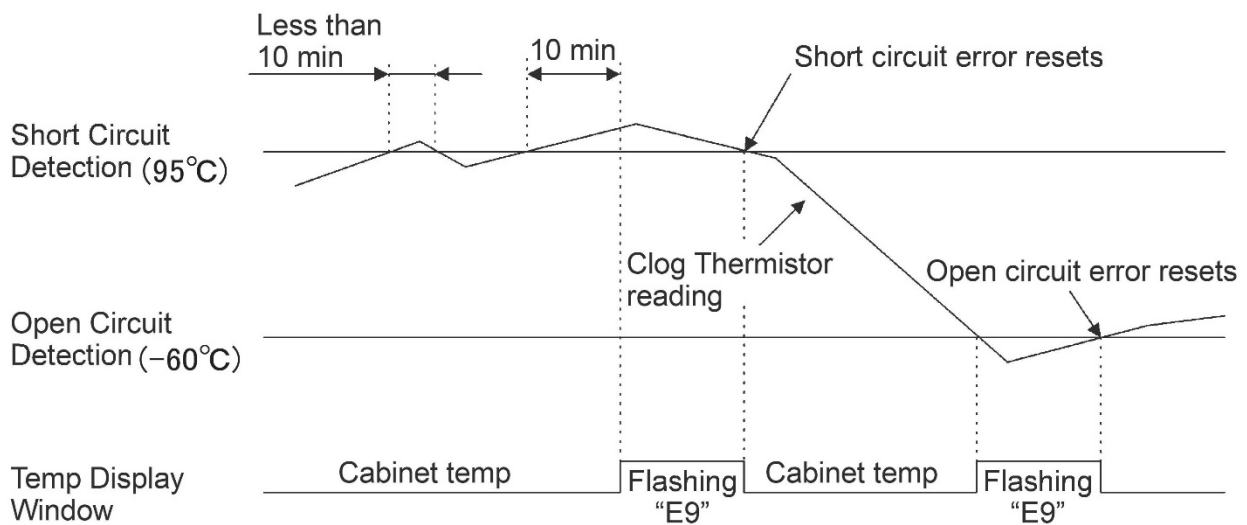
[m] CLOG THERMISTOR DEFECTIVE (E9)

When the Clog Thermistor senses a temperature below -60°C (open circuit) or above 95°C for 10 minutes (short circuit), "E9" will be displayed.

In case of an open circuit, the "E9" display will automatically reset when the temperature rises above -60°C . In case of a short circuit, the "E9" display will automatically reset when the temperature drops below 95°C .

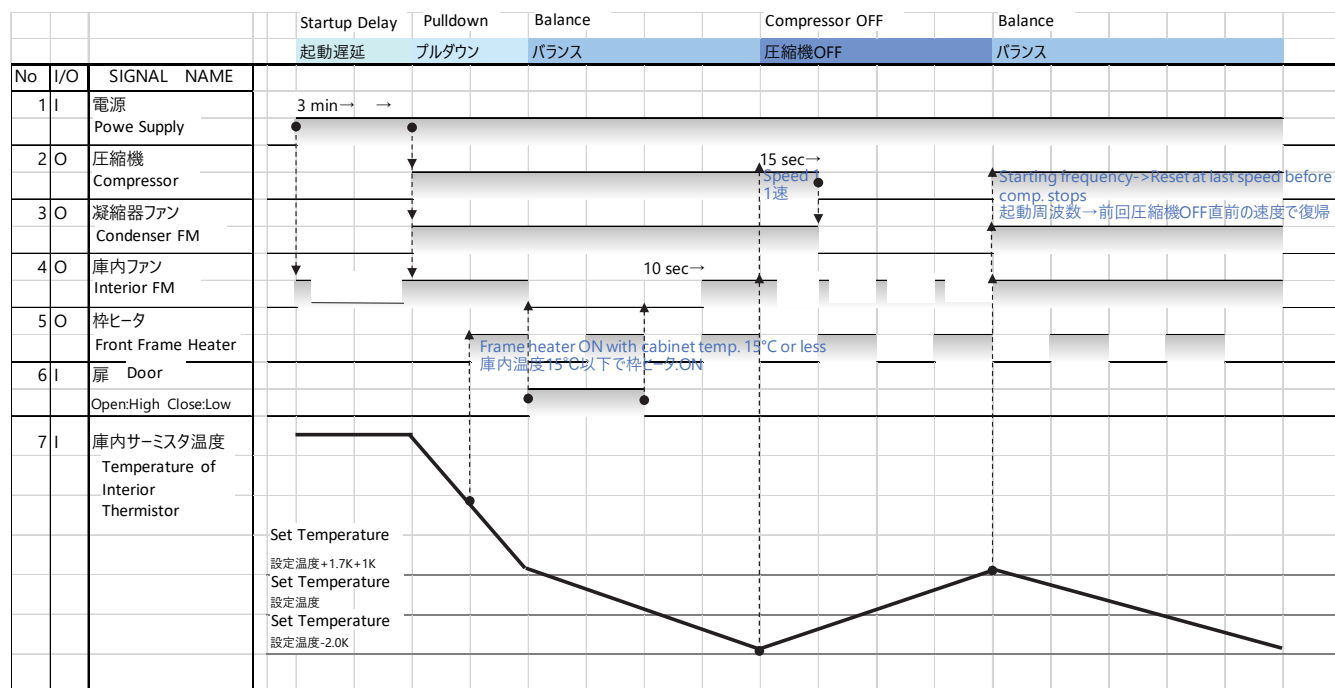
The cause may be:

- 1) The Clog Thermistor (gray) is defective.

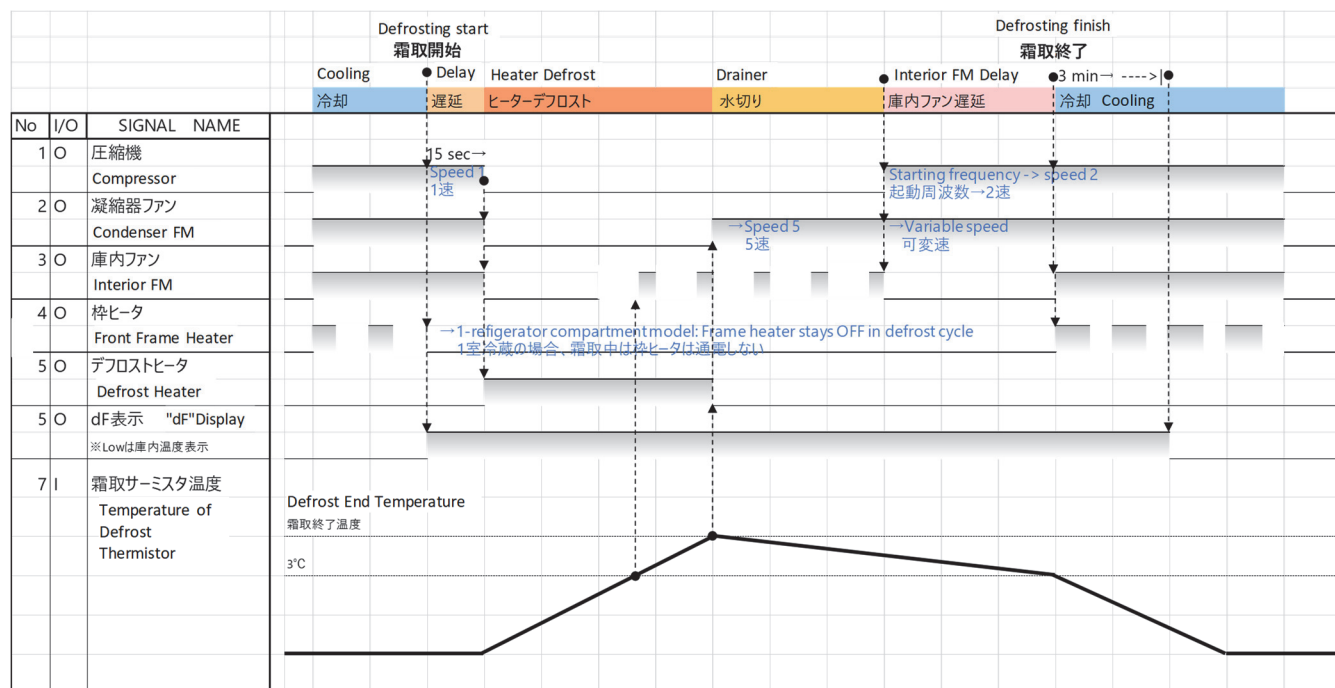


7. TIMING CHART

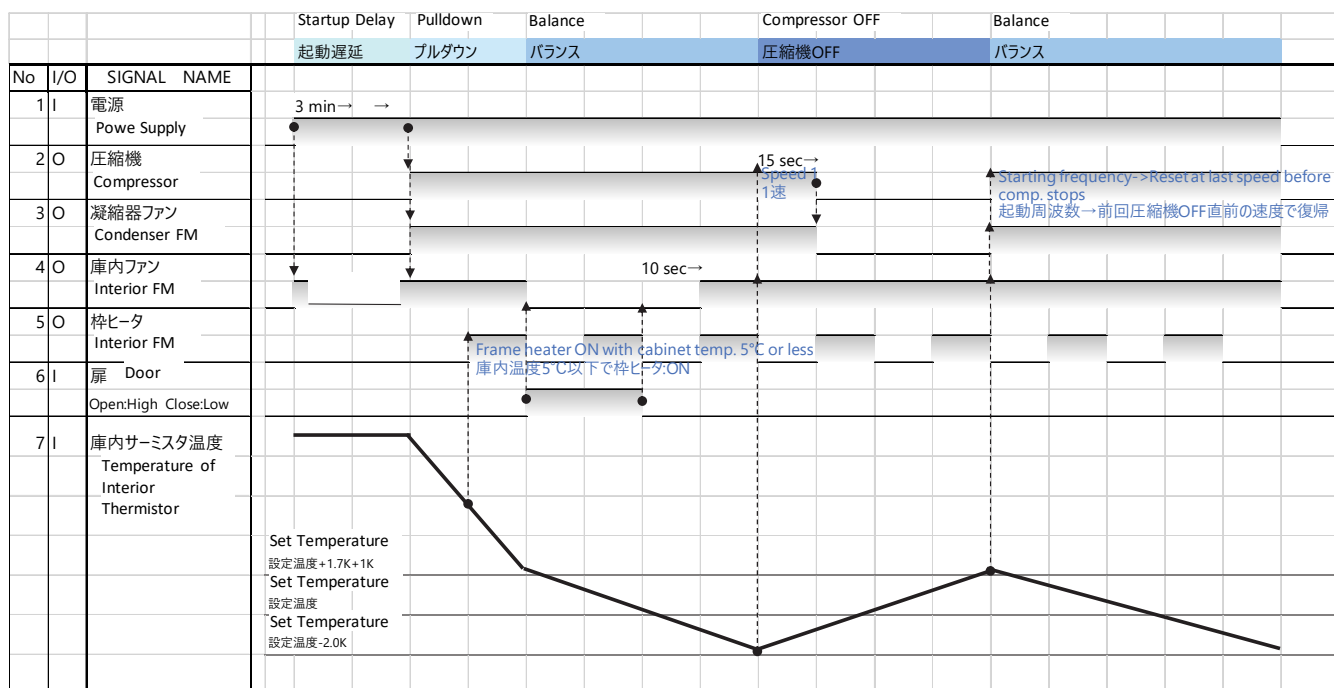
[a] START TO CONTROL (RTE-SC series)



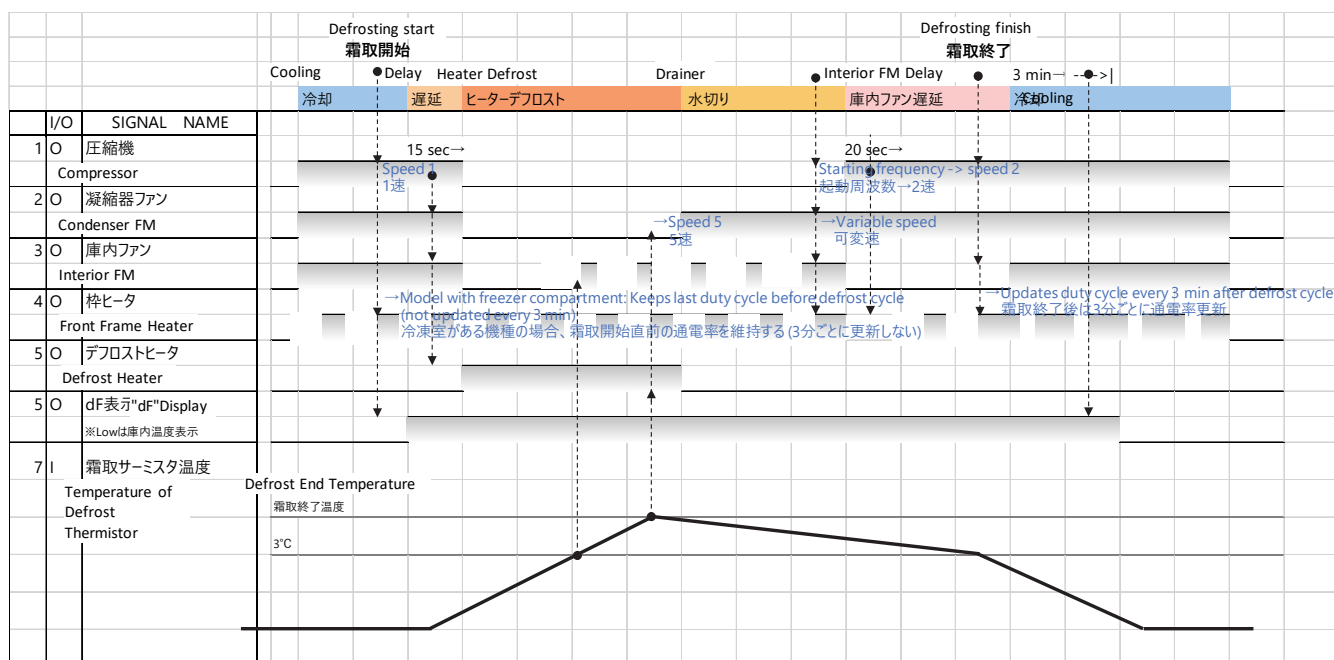
[b] CONTROL TO DEFROST AND TO CONTROL (RTE-SC series)



[a] START TO CONTROL (FTE-SC series)



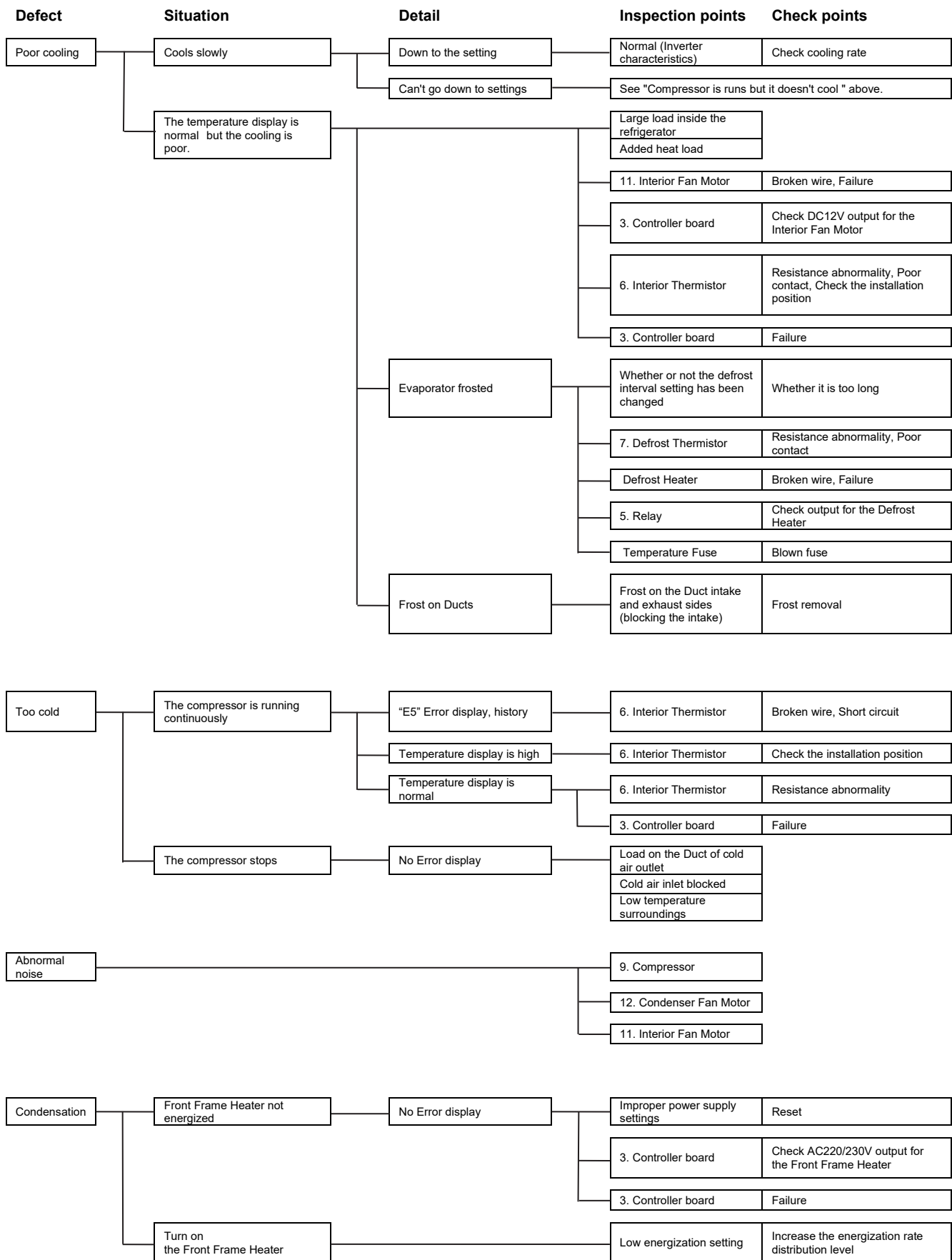
[b] CONTROL TO DEFROST AND TO CONTROL (FTE-SC series)



III. SERVICE DIAGNOSIS

1. FLOWCHART

Defect	Situation	Detail	Inspection points	Check points
Not cold	Compressor does not start	No temperature display	1. Protector	Electric leakage, Blown fuse
			3. Controller board	Check DC12V output for the Operation Board
			4. Operation board	Disconnection, Connector insertion failure
		"EA", "Ed" Error display	3. Controller board	Failure
		"E1" Error display, history or no display	5. Relay	Output check
			6. Interior Thermistor	Resistance abnormality, Poor contact
			8. Clog Thermistor	Resistance abnormality, Poor contact
			9. Compressor	Winding breakage, Electrical component failure
	The compressor starts but stops immediately	"E4" Error display, history (High pressure detection)	High temperature surroundings	
			Insufficient condensation capacity	Surrounding heat sources
			Air Filter	Dirt
			12. Condenser Fan Motor	Lock, Broken wire
		"E1" Error display, history or no display	5. Relay	Check output to Condenser Fan Motor
			8. Clog Thermistor	Resistance abnormality, Poor contact
			Same confirmation as "E4" above	
			Door opens and closes frequently	
			6. Interior Thermistor	Check the installation position
			9. Compressor	Lock etc.
	The compressor runs but it doesn't cool	"E7" Error display, history (Increase in condensing temperature)	High temperature surroundings	
			Insufficient condensation capacity	Surrounding heat sources
			Air Filter	Dirt
			12. Condenser Fan Motor	Lock, Broken wire
			5. Relay	Check output to Condenser Fan Motor
		"E8" Error display, history	7. Defrost Thermistor	Resistance abnormality, Poor contact
		"E3" Error display, history (Frost on the evaporator)	7. Defrost Thermistor	Resistance abnormality
			Defrost Heater	Broken wire, Failure
			5. Relay	Check output to Defrost Heater
			Temperature Fuse	Blown fuse
		"Eb" Error display, history	4. Operation board	Failure
		No Error display	Large load inside the refrigerator	
			Door gap	
			6. Interior Thermistor	Check the installation position
			11. Interior Fan Motor	Broken wire, Failure
			3. Controller board	Check DC12V output for the Interior Fan Motor
			Refrigeration circuit clogged	Capillary Tube, Dryer
			16. Refrigerant Leak	
			9. Compressor	Failure



2. SERVICE DIAGNOSIS

Chart	Item	Possible Cause / Check	Remedy
1	Protector	The protector is activated	Identifying electrical leakage and short circuit locations
		Water on the protector	Allow to dry. or replace.
		The Protector failure	Replace.
2	Switching Regulator	Broken wiring, connector disconnected or pin removal	Repair, replace
		Dust and dirt on the Connector.	Removal
		Electronic component failure or burnout.	Replace
		Check for voltage of 220 – 240V AC (primary) and 12V DC (secondary).	Replace.
3	Controller board	Broken wiring, connector disconnected or pin removal	Repair, replace
		Dust and dirt on the Connector.	Removal
		Electronic component failure or burnout.	Replace
4	Operation board	Broken wiring, connector disconnected or pin removal	Repair, replace
		Dust and dirt on the Connector.	Removal
		Electronic component failure or burnout.	Replace
		The 7-segment display and operation display are missing or disappear.	Replace
5	Relay	Broken wiring, connector disconnected or pin removal	Repair, replace
		Dust and dirt on the Connector.	Removal
		Check the output to each load. Refer to the wiring diagram and timing chart.	Replace
		Abnormal noise	Replace
6	Interior Thermistor	Check the installation position. It's out of place.	Repair
		The temperature display is incorrect.	Check the resistance by placing it in ice water. If abnormal, replace it.
		Short circuit in wiring. Temperature display is over "70°C".	Replace
		Open circuit in wiring. Temperature display is below "-60°C".	Replace
7	Defrost Thermistor	Check the installation position. It's out of place.	Repair
		Resistance Abnormal	Check the resistance by placing it in ice water. If abnormal, replace it.

		Short circuit in wiring. Temperature display is over "70°C".	Replace
		Open circuit in wiring. Temperature display is below "-60°C".	Replace
8	Clog Thermistor	Check the installation position. It's out of place.	Repair
		Resistance Abnormal	Check the resistance by placing it in ice water. If abnormal, replace it.
		Short circuit in wiring. Temperature display is over "95°C".	Replace
		Open circuit in wiring. Temperature display is below "-60°C".	Replace
9	Compressor		
10	Inverter Board (Inverter Box with Inductors)	Broken wiring, connector disconnected or pin removal	Repair, replace
		Dust and dirt on the Connector.	Removal
		Electronic component failure or burnout.	Replace
11	Interior Fan Motor	Broken wiring	Repair
		Locked (voltage present but no rotation)	Replace
		Abnormal noise	Replace
12	Condenser Fan Motor	Broken wiring	Repair
		Locked (voltage present but no rotation)	Replace
		Abnormal noise	Replace
13	Air Filter	Clogged.	Clean
14	Air-Cooled Condenser	Dirty fins.	Clean
		No temperature difference between inlet and outlet copper tubes.	Clean or wash
15	Supply Voltage	Check for $\pm 6\%$ of rated voltage.	Increase power supply capacity.
			Plug into a separate power receptacle.
16	Refrigerant Leak	Compressor discharge pipe will not heat up.	Repair and recharge. Note: Low-side leak requires drying after welding. Replace Drier also.
		Compressor suction pipe will not cool down.	
		Check with leak detector.	
17	Clogged Refrigeration Circuit	In service mode, run the engine at a constant speed (4th gear), • High pressure: High • Low pressure: low Clogged with moisture or dust.	Replace Capillary Tube and Drier.

3. CONTROLLER BOARD

[a] SERVICING CONTROLLER BOARD

- 1) When receiving a service call, ask the user to turn off the power supply and turn it back on, while watching the unit. This will reset the controller, and in some cases normal operation will resume.
- 2) Keep the following in mind when servicing the Controller Board:
 - * Check that the unit has been earthed properly. If not, the Controller Board will not work properly.
 - * To get static free, always touch the cabinet (earth) before servicing. Electrostatic discharge will cause severe damage to the Controller Board. Also, keep it away from vinyl, plastic or other electrostatically charged products.
 - * The Controller Board is connected to a commercial power source. Always turn off the power before carrying out repairs.
 - * Part of the output is high voltage. Always turn off the power before carrying out repairs. If you have to work with the power on, such as when checking the operating voltage, please wear insulated gloves.
 - * This board contains capacitors charged with high voltage. To avoid the risk of electric shock, turn off the power and do not touch the board for at least 30 seconds.
 - * Some components may be hot immediately after operation, so handle with care.
 - * Depending on the nature of the malfunction, parts may explode. Do not carelessly approach the board when power is applied.
 - * Be sure to close the Control Box lid securely to prevent malfunctions caused by contamination of the power supply.
 - * Keep the communication line between the Controller Board and the Inverter Board as far away as possible from the power supply and compressor lead wires.
 - * The Controller Board and thermistor can be replaced separately.
 - * As a rule, handle the board by holding both ends. When doing so, never apply force to the components or wires.
 - * Do not touch the reverse side of the Controller Board and tiny electronic devices on it.
 - * Do not drop the Controller Board on the floor.
 - * Do not short circuit the Relay output terminal coming from the Controller Board.

- * To protect the pattern from damage, place the Controller Board on a flat surface.
 - * The Thermistor leads have a thin coating and are potentially breakable. Do not tension the leads.
 - * The connectors must not be subjected to tension to prevent disconnection or breakage. After servicing the Controller Board, check for disconnected connectors.
 - * The Thermistor is provided with single-wire leads. Do not bend or stretch them (about 400 mm from the end and at lead connections).
 - * Do not pinch or weigh down the Thermistor and Thermistor leads. The coatings may be broken, resulting in a short circuit.
 - * Keep the Thermistor leads at least 30 mm away from high voltage (100V AC or more) wires, especially fluorescent wires.
- 3) The main board supplied as a part is not configured, so if used as is, it may cause malfunctions and breakdowns. Please be sure to configure the model settings. Please see “5. [g] HOW TO SET MODEL AND INTERNAL TEMPERATURE CORRECTION VALUE WHEN REPLACING BOARD” for the setting method.

[b] CHECKING THERMISTOR

- 1) Disconnect the Thermistor connector from the Controller Board.
- 2) Fill a glass with ice water at a temperature of 0°C. Soak the Thermistor Bulb in the water (at the center of the glass) for 5 minutes.
- 3) Measure the resistance of the Thermistor by the ohm scale of a tester.
- 4) Replace the Thermistor if the resistance is not within the following range:
 Interior, Dfrost Thermistor: 5 – 6.5 kΩ (standard: 6 kΩ)
 Clog Thermistor: 150 - 180 kΩ (standard: 162 kΩ)

[c] OPERATION BOARD

- 1) When receiving a service call, ask the user to turn off the power supply and turn it back on, while watching the unit. This will reset the controller, 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 cabinet (earth) before servicing. Electrostatic discharge will cause severe damage to the Operation Board. Also, keep it away from vinyl, plastic or other electrostatically charged products.
- * The Operation Board is connected to a commercial power source. Always turn off the power before carrying out repairs.
- * As a rule, handle the board by holding both ends. When doing so, never apply force to the components or wires.
- * Do not touch the reverse side of the Operation Board and tiny electronic devices on it.
- * Do not drop the Operation Board on the floor.
- * To protect the pattern from damage, place the Operation Board on a flat surface.
- * The connectors must not be subjected to tension to prevent disconnection or breakage. After servicing the Operation Board, check for disconnected connectors.

[d] COMPRESSOR

- 1) Be sure to check the compressor model before repairing.
 The terminal cover can be difficult to remove. If using tools, work with caution to avoid injury.
 After completing the work, please reattach the butyl tape affixed to the top of the terminal cover in the same way as it was before you peeled it off.
- 2) Keep the following in mind when servicing the Compressor:
 - * This is the compressor for inverter use only, so please connect it to the Inverter Board (Inverter Box) that is compatible with the compressor. Do not use anything that is accidentally connected directly to commercial power.
 - * With an emphasis on energy saving, the refrigerant entering through the suction pipe is more likely to enter the cylinder directly than in conventional compressors. This makes it easier to compress the liquid than conventional products. When repairing, be sure to fill the refrigerant in gas form and be careful not to overfill it.
 - * When charging refrigerant, check the type of refrigerant.
 RTE-SC, FTE-SC SERIES: R290

IV. REMOVAL AND REPLACEMENT OF COMPONENTS

WARNING

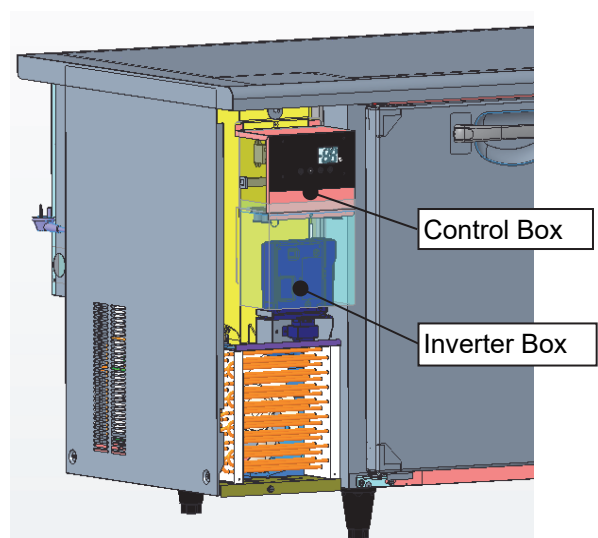
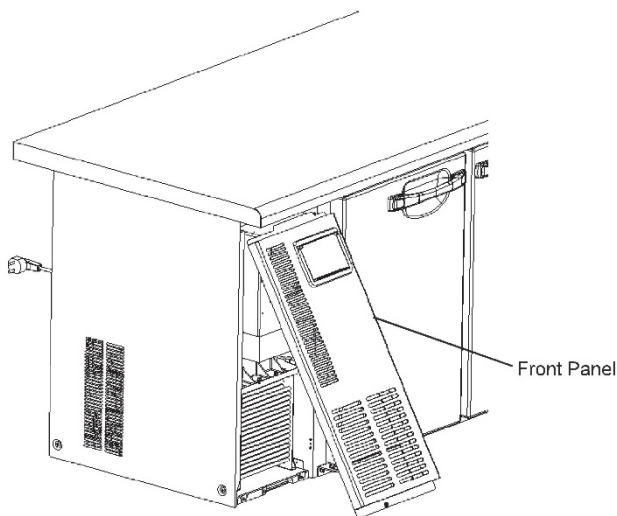
Always unplug the refrigerator/freezer before replacing components.

1. REFRIGERATION UNIT

- 1) Remove the pan head screw with washers (stainless steel M5x16) at the bottom of the Front Panel.
- 2) Slide the Front Panel down, remove the insertion point of the Inner Top Panel, and completely remove the Front Panel.
- 3) Remove the Inverter Box AY from under the Control Box by unscrewing the fixing two screws.
- 4) Disconnect the connectors under the Control Box.
- 5) Remove the two Hexagon Nuts (stainless steel M6) and Washer on the Evaporator Box Panel.
- 6) Pull out the Refrigeration Unit Base. Be careful not to damage the Refrigeration Circuit and not to spill drain water from the Refrigeration Unit Base.
- 7) To replace the removed parts, reverse the above removal procedure.

Note:

1. When pulling out or pushing in the Refrigeration Unit Base, do not let the refrigeration circuit touch the cabinet to prevent gas leaks from the welded parts.
2. Keep the external wiring away from the Fan Motor or Discharge Pipe.
3. Some drain water may remain in the Refrigeration Unit Base. When pulling out the Refrigeration Unit Base, be careful not to spill drain water and wet the floor.



2. REFRIGERATION CIRCUIT

[a] REFRIGERANT

This product uses a flammable refrigerant. There are rules that must be followed when servicing products that use flammable refrigerants, so please make sure you understand the rules before servicing.

(The following related items are excerpted from GL-21)

*If refrigerant is leaking, do not simply recharge it, but find and repair the leak. After that, recharge the specified amount of refrigerant and check that there are no leaks. It is prohibited to use the product by only recharging it. This may cause a large amount of refrigerant to leak indoors, and if the leaked refrigerant comes into contact with an open flame such as a gas stove or fan heater, it may ignite or explode. (Please note that if the amount of refrigerant exceeds 150g, it will not comply with the standards.)

The Japan Refrigeration and Air Conditioning Industry Association Service Guidelines excerpted from JRA GL-21

5.1 Common points

Contractors involved in transportation, storage, installation, maintenance, equipment removal, and inspection must comply with the following items when transporting, storing, installing, maintaining, removing, and inspecting equipment. To comply with these items, they must participate in training sessions held by manufacturers or related organizations to ensure that each item is followed.

- a) In order to prevent ignition in the event of a refrigerant leak, it is desirable to remove as many ignition sources as possible from near the equipment. It should be noted that ignition sources include sources other than obvious ignition sources such as open flames.
- b) If a refrigerant leaks during work, the work must be stopped immediately and the area must be ventilated. Open a door or window, or if there are no doors or windows, operate the ventilation system to prevent the refrigerant from stagnating.
- c) As general rule, open flames are strictly prohibited, and it is preferable not to use any sources of ignition during work, but if they should be used, first check for refrigerant leaks.
- d) Work must be carried out by knowledgeable personnel who have received the following work training on flammable refrigerants.
 - 1) Education regarding ignition sources
 - 1.1) Risks of smoking
 - 1.2) Education regarding potential sources of ignition
 - 1.3) If refrigerant escapes when using a burner or power tools, the burner must be immediately turned off and any power tools that could be a source of ignition must be stopped.

- 2) When working, it must be confirmed in advance that there is a fire extinguisher in the immediate vicinity of the work area. If there is no fire extinguisher in the immediate vicinity of the work area, a bucket of water or a rag soaked in water must be carried to immediately extinguish the fire in case of a fire.
- 3) It must be confirmed that the earth wiring is installed as specified by the manufacturer for built-in refrigeration and freezing equipment.

5.5 Matters to be observed during maintenance

Contractors involved in maintenance must observe the following in addition to 5.1 when performing maintenance.

- a) When performing maintenance, they must wear gloves that can prevent static electricity, such as work gloves.
- b) When using an electric screwdriver, do not use an electric screwdriver driven by a brush motor.
Note: An electric screwdriver driven by a brush motor can be an ignition source.
- c) When performing maintenance, they must always carry an explosion-proof portable leak detector or a portable leak detector that is approved for use with the flammable refrigerant to be detected, and must keep it in operation before and during work to confirm that the refrigerant is not leaking. Taking into consideration the work time, care must be taken to ensure that the battery of the portable leak detector does not run out during work. If refrigerant leaks during work, they must immediately stop work and do not resume work until the refrigerant concentration has sufficiently decreased.

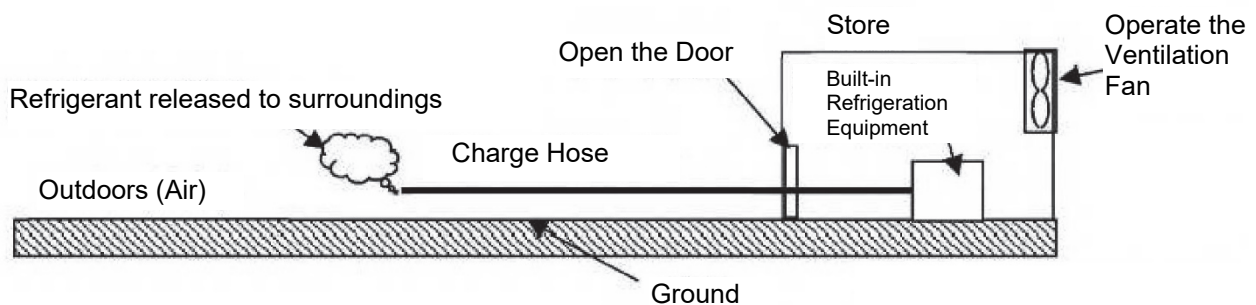
When replacing parts that require the refrigeration circuit to be opened, first remove any flammable refrigerant in the refrigeration circuit and disconnect the piping of the part in question by following the procedure below.

- 1) Open windows and doors, and operate devices that create air currents such as ventilation fans or circulators **to ensure that the work space is well ventilated.**
- 2) Activate an explosion-proof portable leak detector. ***Place it below knee level.**
- 3) When working in a small, enclosed space equivalent to the inside of a 3.3 m² prefabricated refrigerator, turn off the power to all equipment in the room that could be a source of ignition. If the power cannot be turned off, move the product or freezing unit outside and work there.
- 4) Prepare a fire extinguisher, a bucket of water, a wet rag, etc. in case the flammable refrigerant ignites.

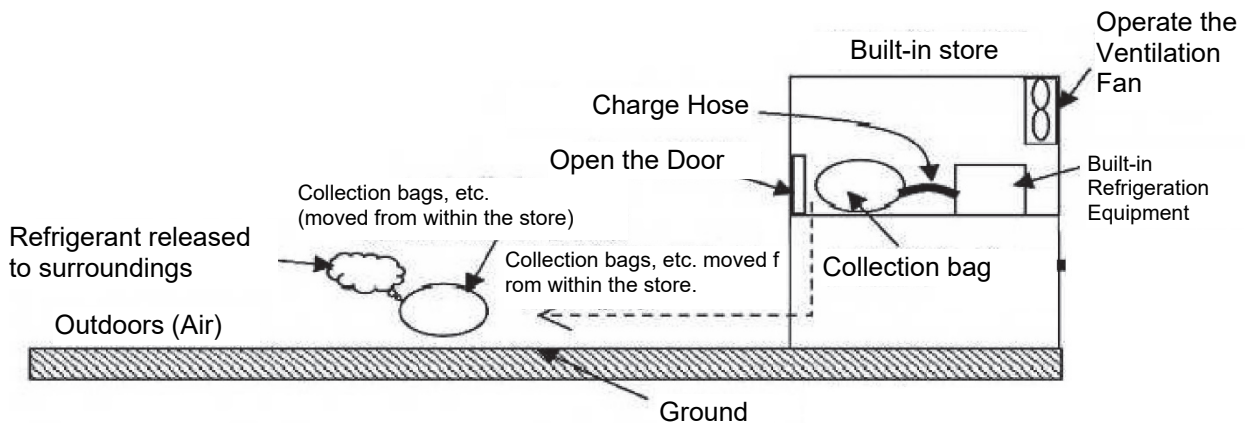
- 5) Unplug the product.
- 6) When releasing into the atmosphere, make sure that there are no ignition sources, **such as those listed below, within a 2 m radius of the center of the installed equipment**, and extinguish any that are found. Or take other measures such as turning off the power.
(Examples of ignition sources: open flames, electric screwdrivers driven by brush motors, relays in refrigerators, etc.)
- 7) Release the refrigerant gas from the low-pressure charge port into the atmosphere using one of the following methods.

- a) Extend the charge hose outdoors and release it into the atmosphere.

***At this time, make sure there are no ignition sources within a 2 m radius.**



- b) Transfer the refrigerant to a refrigerant recovery bag and release the refrigerant in the recovery bag into the atmosphere outdoors.

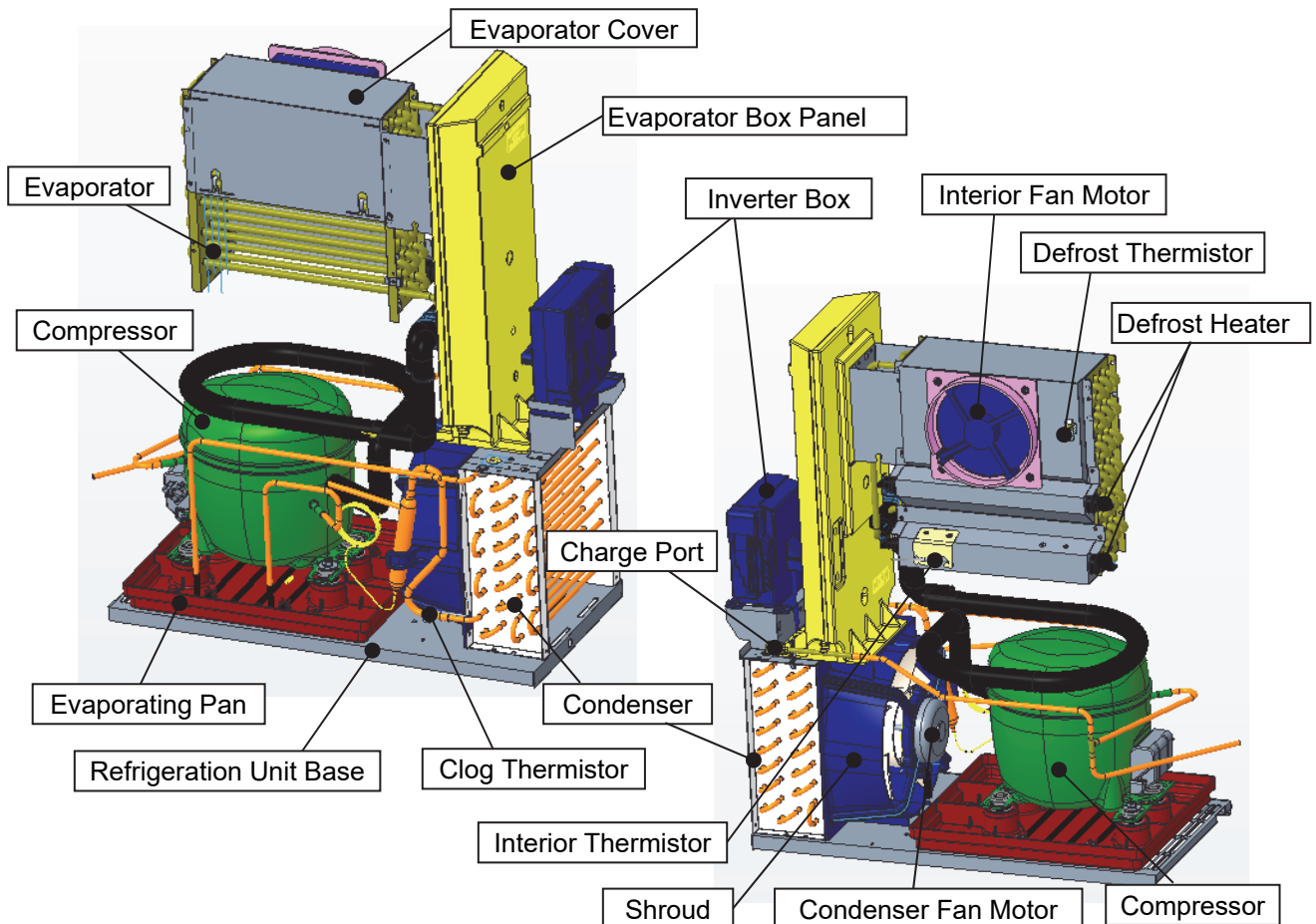


- 8) Use an explosion-proof vacuum pump designed specifically for HC refrigerants to create a vacuum.
(To eliminate any residual flammable refrigerant in the circuit)
- 9) Fill with nitrogen gas once and then release it.
(To eliminate any residual flammable refrigerant in the circuit)

- 10) Cut the refrigeration piping of the part to be replaced with a pipe cutter.
If unavoidable, use a burner to remove the piping. When using a burner, be careful as there is a possibility that residual flammable refrigerant may ignite when the piping is removed.

[b] COMPRESSOR

- 1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".
- 2) Use a screwdriver to remove the clamp from the Terminal Cover enclosing the Compressor's electrical parts.
- 3) Remove the connection parts to the Terminal Pin.
- 4) Remove refrigerant gas from the Charge Port.
- 5) Remove the high and low pressure pipes using a tube cutter.
- 6) Remove the bolts securing the Compressor.
- 7) To replace the removed parts, reverse the above removal procedure.

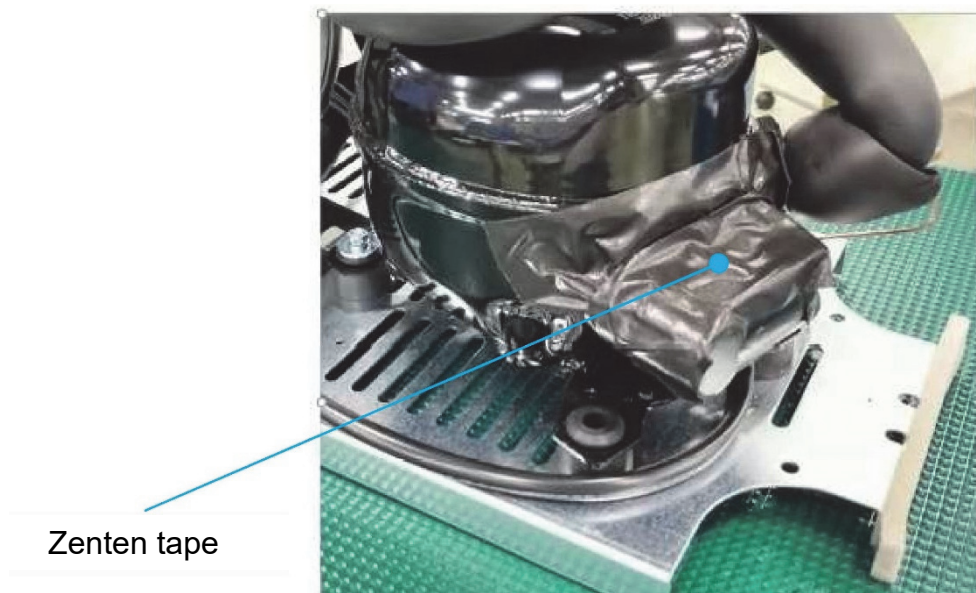


Note:

1. This is the compressor for inverter use only, so please connect it to the Inverter Board (Inverter Box) that is compatible with the compressor. Do not use anything that is accidentally connected directly to commercial power.
2. When welding is required for the refrigeration circuit, nitrogen should be used to clean the refrigeration system. And before welding, use a flammable refrigerant leak detector for leakage testing. Ensure that there is no refrigerant present in the refrigeration system and the surrounding environment.
3. With an emphasis on energy saving, the refrigerant entering through the suction pipe is more likely to enter the cylinder directly than in conventional compressors. This makes it easier to compress the liquid than conventional products. When repairing, be sure to fill the refrigerant in gas form and be careful not to overfill it.
4. The refrigerant is R290.
5. Evacuation time must be at least 1 hour.
6. After brazing, inspect the brazed area for gas leaks, remove any flux or oxide film adhering to the surface and apply anti-rust treatment.
7. When brazing, protect the burner flame from resin parts such as the wind tunnel (Shroud) and electrical parts with a wet towel or similar to avoid hitting them.
8. The terminal cover may be difficult to remove. If using tools, be careful of your surroundings and work carefully to avoid injury.
9. After replacing parts, the butyl tape attached to the top of the terminal cover should be attached in the same position as before it was removed.
(To prevent water intrusion) If the adhesive strength has decreased, obtain and use Zenten tape from the following.

Zenten tape: EX-2: SPHJ00050

Model name: Nitto Denko Zenten tape



[c] EVAPORATOR AND DEFROST HEATER

- 1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".
- 2) Remove refrigerant gas from the Charge Port.
- 3) Remove the Clip and the Defrost Thermistor in the Evaporator.
- 4) Remove the tapping screw (stainless steel 4x8) securing the Interior Thermistor Plate located under the Interior Fan Motor on the Evaporator Cover.
- 5) Remove the two tapping screws (stainless steel 4x16) and U-Band securing the refrigeration circuit inside the Evaporator Box Panel.
- 6) Disconnect the Glass Tube Heater and Interior Fan Motor leads, and remove the Clip and Thermal Fuse.
- 7) Remove the four tapping screws (stainless steel 4x8) securing the Heater Cover.
- 8) Remove the six tapping screws (stainless steel 4x8) securing the Evaporator, Evaporator Cover, and Evaporator Bracket.
- 9) Disconnect the Evaporator from the refrigeration circuit using a tube cutter.
- 10) To replace the removed parts, reverse the above removal procedure.

Note:

1. See Notes 1 - 7 for "[b] COMPRESSOR".
2. The Glass Tube Heater must be fit to the U-notches at the side of the Heater Cover.

[d] CONDENSER

- 1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".
- 2) Remove refrigerant gas from the Charge Port.
- 3) Remove the Evaporator Box Panel from the Shroud on top of the Condenser by unscrewing the two bolts with washers (5x10).
- 4) Remove the Shroud from the Condenser by unscrewing the four tapping screws (stainless steel 4x8).
- 5) Remove the two screws (stainless steel 4x16) securing the Condenser.
- 6) Disconnect the Condenser from the refrigeration circuit using a tube cutter.

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

Note:

1. See Notes 1 - 7 for "[b] COMPRESSOR".

[e] DRYER

1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".

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

3) Disconnect the Dryer from the refrigeration circuit using a tube cutter.
Use a wet towel to protect any flammable materials from burner flame.

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

Note:

1. See Notes 1 - 7 for "[b] COMPRESSOR".
2. To prevent clogging of the capillary tube, be sure to firmly insert the capillary tube all the way into position before welding.
3. Install the Dryer so that its outlet side is lower than its inlet side.

3. FAN MOTORS

[a] CONDENSER FAN MOTOR

1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".

2) Disconnect the Condenser Fan Motor leads.

3) Remove the Condenser Fan Motor with the Shroud by unscrewing the two tapping Screws. (stainless steel 4x8)

4) Take the Condenser Fan Motor off the Shroud.

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

Note:

1. The nuts securing the Fan Motor must be turned clockwise to loosen and counterclockwise to tighten.

[b] INTERIOR FAN MOTOR

- 1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".
- 2) Disconnect the Interior Fan Motor leads.
- 3) Remove the Interior Fan Motor with the Shroud from the Evaporator Cover by unscrewing the four machine screws with washers (stainless steel 4x30).
- 4) To replace the removed parts, reverse the above removal procedure.

4. THERMISTORS

[a] INTERIOR THERMISTOR

- 1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".
- 2) Cut the cable tie to remove the Interior Thermistor from the Thermistor Plate located under the Interior Fan Motor on the Evaporator Cover.
- 3) To replace the removed parts, reverse the above removal procedure.

[b] DEFROST THERMISTOR

- 1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".
- 2) Remove the Clip and Defrost Thermistor in the Evaporator.
- 3) To replace the removed parts, reverse the above removal procedure.

[c] CLOG THERMISTOR

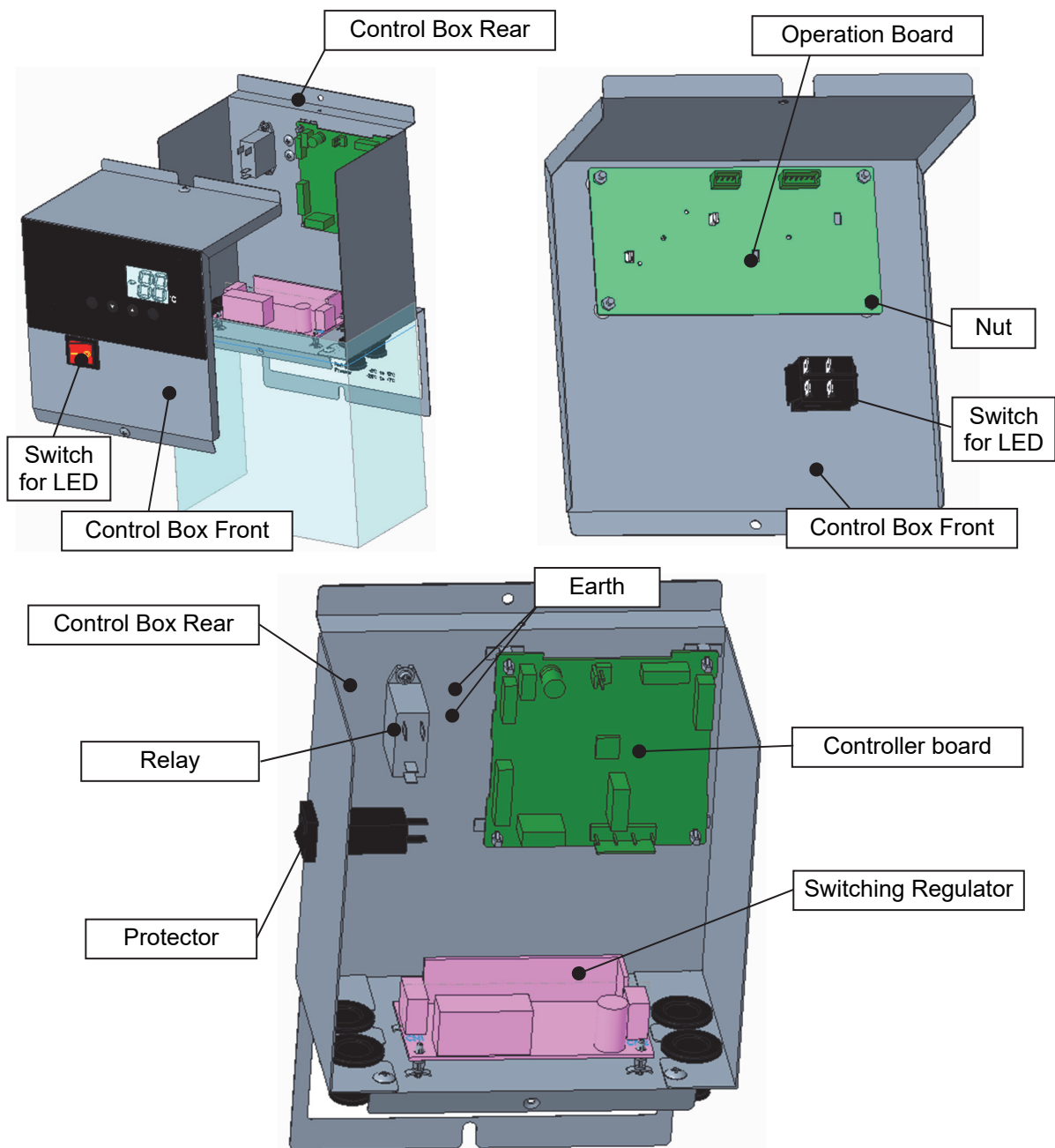
- 1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".
- 2) Remove the Clip and Clog Thermistor's element from the Condenser Outlet Pipe.
- 3) Cut the cable tie to disconnect the Thermistor leads.
- 4) To replace the removed parts, reverse the above removal procedure.

5. INVERTER BOX

- 1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of "1. REFRIGERATION UNIT".
- 2) Disconnect the Inverter Box leads.
- 3) Remove the Inverter Box from the Bracket unscrewing the two tapping screws.
(stainless steel 4x8)
- 4) To replace the removed parts, reverse the above removal procedure.

6. CONTROL BOX

- 1) Pull out the Refrigeration Unit Base according to steps 1) through 4) of “1. REFRIGERATION UNIT”.
- 2) Remove the Control Box from the Refrigeration Unit by unscrewing the two tapping screws. (stainless steel 4x16)
- 3) Open the Control Box with by unscrewing the two tapping screws. (stainless steel 4x8) And replace any defective parts.
- 4) To replace the removed parts, reverse the above removal procedure.



Note:

1. When a service call is made, have the user turn off the power, wait 30 seconds, then turn it back on and observe the situation for a while. This is because if the microcontroller is malfunctioning for some reason, turning the power off may return it to normal.
2. Make sure that the refrigerator body is securely earthed. If it is not earthed, the microcontroller may malfunction.
3. Before repairing, touch the refrigerator body (earthed) to discharge static electricity from your body. Static electricity may destroy the IC. Also, do not bring plastic bags, resin products, or other statically charged objects near the circuit board.
4. Do not touch the back of the controller board or the electronic components.
5. It is acceptable to replace the controller board and thermistor separately.
6. As a general rule, handle the board by holding both ends. When doing so, never apply force to the components or wires.
7. Never drop the controller board. Dropping it will break it.
8. Place the controller board on a flat surface and be careful not to scratch or cut the patterns.
9. Do not apply tension to thermistor and other wires as the insulation is thin and the wires may break.
10. Do not apply tension to connectors as this may cause the connector to come loose or the wires to break at the crimped parts. After servicing is completed, check that the connectors have not come loose.
11. The thermistor wire is solid wire, so do not bend or stretch it. (The part about 400 mm from the tip and the connection part of the lead wire)
12. Do not crush the thermistor and the wire part of the thermistor, as the insulation will break and cause a short circuit.
13. Some parts may be hot immediately after operation, so handle with care.
14. The output has high voltage parts. Be sure to turn off the power before carrying out repairs. If you have to work with the power on, such as checking the operating voltage, wear insulated gloves.
15. Be sure to place a sheet (for heat dissipation) between the ICs before fastening them with screws.
16. Depending on the nature of the failure, parts may explode. Do not carelessly approach the controller when it is energized.

17. Electromagnetic waves emitted from the wiring may cause it to malfunction. After repairs, the wiring inside the controller box should be returned to the same state as when it was shipped from the factory.
18. Incorrect settings may cause the compressor to not operate, or in the worst case, may result in breakdown. When replacing the board, always check that the compressor and settings match.
Set the model. See "5-[g] HOW TO SET MODEL AND INTERNAL TEMPERATURE CORRECTION VALUE WHEN REPLACING BOARD".

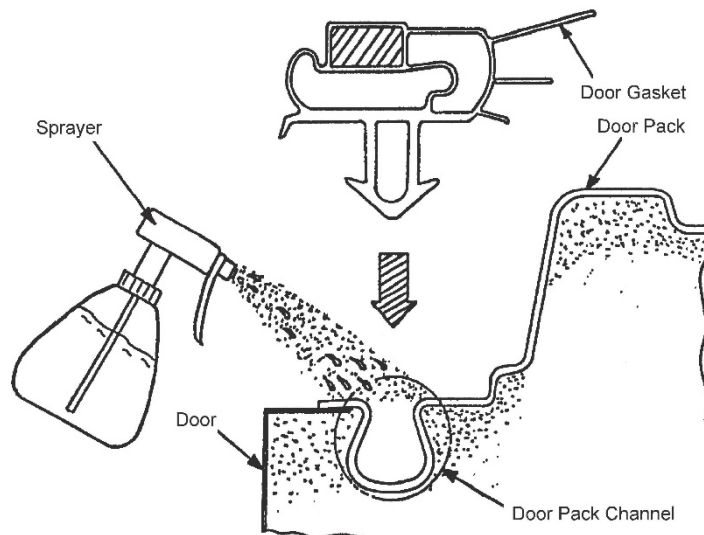
7. DOOR GASKET

[a] REMOVAL

- 1) Open the Door.
- 2) Detach the Door Gasket from the Door Pack.

[b] REPLACEMENT

- 1) Spray water on the Door Pack Channel with a sprayer.
 - 2) Fit the four corners of the Door Gasket into those of the Door Pack 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.

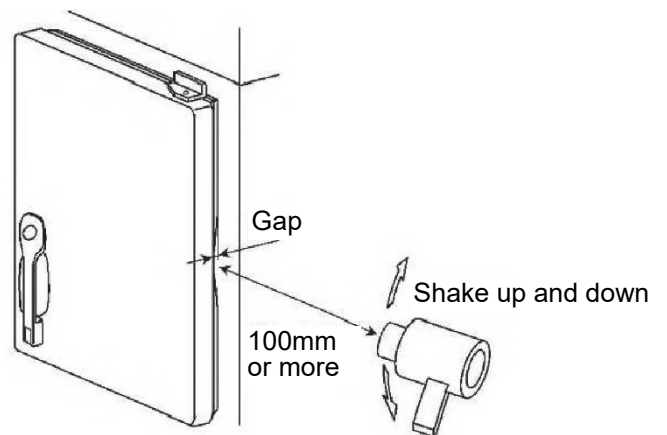


[c] HOW TO FIX GAP IN DOOR GASKET

When replacing a new door or door gasket, a gap may appear between the body and the door gasket. In this case, you can fix it by gently warming it with a hair dryer.

- Make sure to place the hair dryer at least 100mm away from the gasket.
- Shake the hair dryer up and down to heat the entire gap.

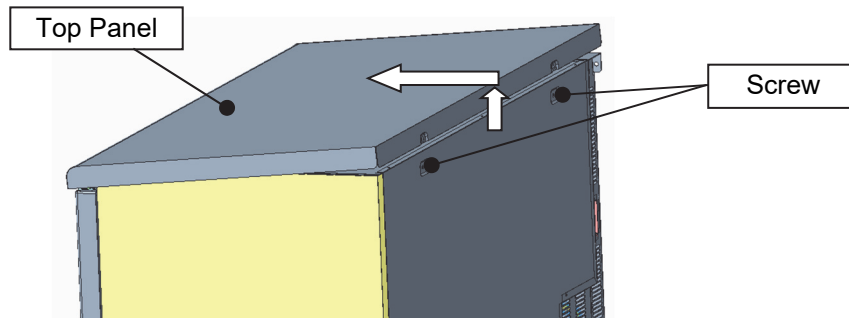
Note: If you place the hair dryer too close or heat only a part of it, the gasket may melt, so please proceed with care.



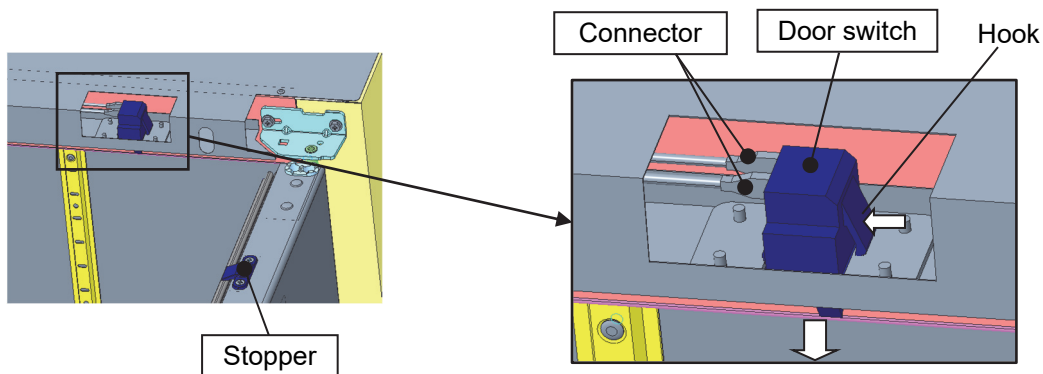
8. DOOR SWITCH AND STOPPER (Custom Specification)

[a] DOOR SWITCH

- 1) Remove the two screws on the back side that fix the Top Panel.
- 2) Lift the back side and slide it to the front to remove the Top Panel.



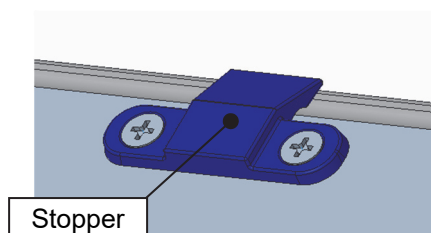
- 3) Remove the Door Switch connector, press in the hook of the Door Switch and slide it downward.



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

[b] STOPPER

- 1) Open the Door.
- 2) Remove the screws that secure the Stopper on the Door top and replace the Stopper.
- 3) To replace the removed parts, reverse the above removal procedure.



9. LED LIGHT (Custom Specification)

- 1) Open the Door.
- 2) Remove the screws that secure the LED light on the ceiling inside the refrigerator and replace the LED light.
- 3) To replace the removed parts, reverse the above removal procedure.