SPLIT TYPE
ROOM AIR CONDITIONER

Floor / Wall Mounted
/ Cassette type

INVERTER MULTI

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	AG*F09LAC AG*F12LAC	AO*A18LAC2
	AS*A07LBCM AS*A09LBCM AS*A12LBCM AS*A14LBCM	
	AU*F09LAL AU*F12LAL	

Refrigerant
R410A

FUJITSU GENERAL LIMITED

CONTENTS

1. DESCRIPTION OF EACH CONTROL OPERATION

2. TROUBLE SHOOTING

3. REPLACEMENT PARTS

Refrigerant
R410A

Floor / Wall Mounted / Cassette type
INVERTER (MULTI)

1 . DESCRIPTION OF EACH CONTROL OPERATION

1. CAPACITY CONTROL

1-1 COOLING, HEATING, DRY CAPACITY CONTROL

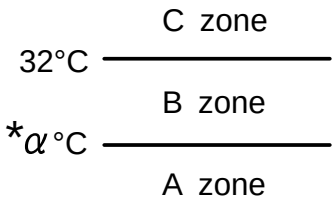
Compressor frequency decides by capacity of an indoor unit, operation number of an indoor unit, set temperature, room temperature and outside temperature.

2. AUTO CHANGEOVER OPERATION

When the air conditioner is set to the AUTO mode by remote control, operation starts in the optimum mode from among the HEATING, COOLING and MONITORING modes. During operation, the optimum mode is automatically switched in accordance with temperature changes. The temperature can be set between 18°C and 30°C in 1 degC steps.

① When operation starts, only the indoor fan is operated for 2 minute. (Air flow mode: Qu)
After 2 minute, depends on the room temperature and outdoor air temperature,
the operation mode is selected in accordance with the table below.

(Fig.1 : Outdoor air temperature zone selection)



*The changing temperature α °C is changed by indoor unit type

AS*F type : 10°C
AU*F type : 0 °C
AG*F type : -10 °C

(Table 1 : Operation mode selection table)

Outdoor temperature :To / Room temperature :TR	A zone	B zone	C zone
TR > Ts +2 degC	Monitoring	Cooling (Automatic Dry)	Cooling (Automatic Dry)
Ts +2 degC ≧TR ≧Ts-2 degC	Monitoring	Monitoring	Monitoring
Ts - 2 degC > TR	Heating	Heating	Monitoring

Ts : Setting temperature
TR: Room temperature

② When COOLING was selected at ①, the same operation as COOLING OPERATION is performed.

③ When HEATING was selected at ①, the same operation as HEATING OPERATION is performed.

④ When the compressor was stopped for 6 consecutive minutes by the temperature control function after the COOLING or HEATING operation mode was selected at ① above, operation is switched to MONITORING and the operation mode is selected again.

3. INDOOR FAN CONTROL

1. Fan speed

(Table 2 : Indoor Fan Speed)

▪ AG*F09LAC

Operation mode	Air flow mode		Speed (rpm)	
			Upper& Lower air flow mode	Upper air flow mode
Cooling Fan	Hi	(Upper/ Lower)	1120 / 950	1230 / ---
	Me	(Upper/ Lower)	960 / 820	1070 / ---
	Lo	(Upper/ Lower)	820 / 700	910 / ---
	Quiet	(Upper/ Lower)	660 / 560	750 / ---
	S-Lo	(Upper/ Lower)	570 / 480	--- / ---
Heating	Hi	(Upper/ Lower)	1120 / 950	1230 / ---
	Me	(Upper/ Lower)	1000 / 850	1090 / ---
	Lo	(Upper/ Lower)	860 / 730	940 / ---
	Quiet	(Upper/ Lower)	660 / 560	750 / ---
	Cold air prevention	(Upper/ Lower)	660 / 560	680 / ---
	S-Lo	(Upper/ Lower)	660 / 560	680 / ---

▪ AG*F12LAC

Operation mode	Air flow mode		Speed (rpm)	
			Upper& Lower air flow mode	Upper air flow mode
Cooling Fan	Hi	(Upper/ Lower)	1240 / 1050	1300 / ---
	Me	(Upper/ Lower)	1050 / 890	1120 / ---
	Lo	(Upper/ Lower)	860 / 730	930 / ---
	Quiet	(Upper/ Lower)	660 / 560	750 / ---
	S-Lo	(Upper/ Lower)	570 / 480	--- / ---
Heating	Hi	(Upper/ Lower)	1240 / 1050	1300 / ---
	Me	(Upper/ Lower)	1080 / 920	1140 / ---
	Lo	(Upper/ Lower)	910 / 770	980 / ---
	Quiet	(Upper/ Lower)	660 / 560	750 / ---
	Cold air prevention	(Upper/ Lower)	660 / 560	680 / ---
	S-Lo	(Upper/ Lower)	660 / 560	680 / ---

▪ AS*A07/09LBCM

Operation mode	Air flow mode	Speed (rpm)
Cooling	Hi	1220
	Me	1100
	Lo	920
	Quiet	680
Heating	Hi	1220
	Me+	1160
	Me	1100
	Lo	980
	Quiet	700
	Cold air prevention	600
Monitoring	S-Lo	480
Dry (Refer Fig 9,10)		X zone : 680 J zone : 650 Y zone : 0⇔480

▪ AS*A12LBCM

Operation mode	Air flow mode	Speed (rpm)
Cooling	Hi	1440
	Me	1200
	Lo	920
	Quiet	680
Heating	Hi	1440
	Me+	1370
	Me	1200
	Lo	980
	Quiet	700
	Cold air prevention	600
Monitoring	S-Lo	480
Dry (Refer Fig 9,10)		X zone : 680 J zone : 650 Y zone : 0⇔480

・AS*A14LBCM

Operation mode	Air flow mode	Speed (rpm)
Cooling	Hi	1500
	Me	1300
	Lo	1020
	Quiet	760
Heating	Hi	1500
	Me+	1440
	Me	1300
	Lo	1080
	Quiet	840
	Cold air prevention	600
Monitoring	S-Lo	480
Dry (Refer Fig 9,10)		X zone : 760 J zone : 730 Y zone : 0⇔480

・AU*F09LAL

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	590
	Me	540
	Lo	490
	Quiet	440
Heating	Hi	590
	Me+	570
	Me	540
	Lo	490
	Quiet	440
	Cold air prevention	400
Dry	Auto	460
Monitoring	S-Lo	300

・AU*F12LAL

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	660
	Me	580
	Lo	520
	Quiet	460
Heating	Hi	650
	Me+	620
	Me	580
	Lo	520
	Quiet	460
	Cold air prevention	400
Dry	Auto	460
Monitoring	S-Lo	300

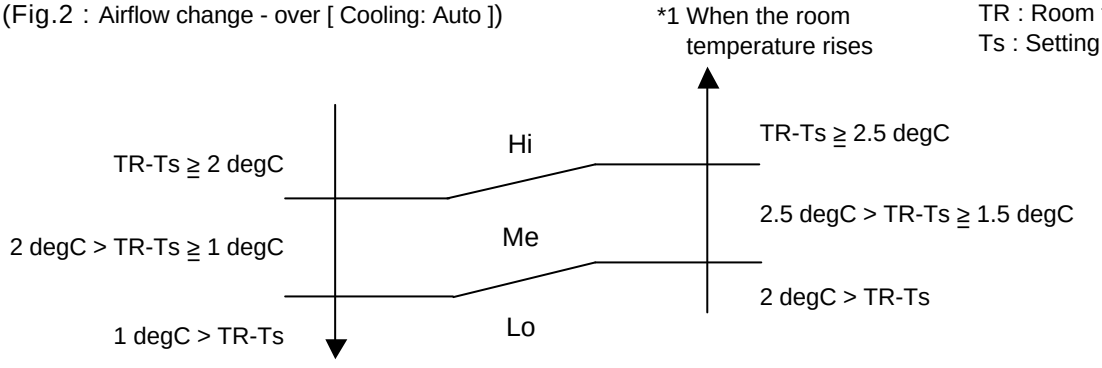
2. FAN OPERATION

The airflow can be switched in 5 steps such as Auto, Quiet, Low, Me, Hi, while the indoor fan only runs.

3. COOLING OPERATION

Switch the airflow [Auto], and the indoor fan motor will run according to a room temperature, as shown in Figure 2.
On the other hand, if switched in [Hi]～[Quiet], the indoor motor will run at a constant airflow of [COOL] operation modes Quiet, Lo, Me, Hi, as shown in Table 2.

(Fig.2 : Airflow change - over [Cooling: Auto])

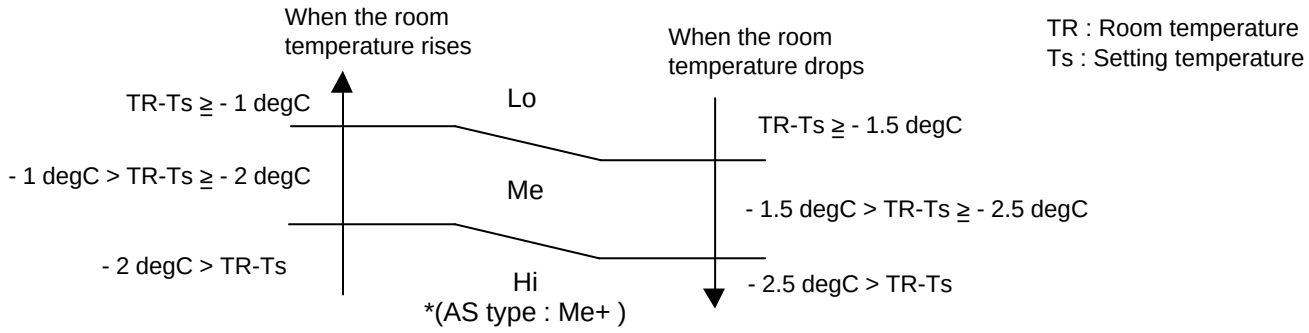


*1 : Contains a condition to the following
① When the operation mode is set to Auto mode at the start of operation.
② When the setting temperature was changed.
③ When the operation mode was changed to COOLING mode.
④ When the airflow mode was changed to Auto mode.

4. HEATING OPERATION

Switch the airflow [Auto], and the indoor fan motor will run according to a room temperature, as shown in Figure 3.
On the other hand, if switched in [Hi] ～ [Quiet], the indoor motor will run at a constant airflow of [HEAT] operation modes Quiet, Lo, Me, Hi, as shown in Table 2.

(Fig.3 : Airflow change - over [Heating : Auto])



The indoor unit that meets the requirement of ① and ② operates by the intermittent operation as shown below.

① The room temperature reaches the set temperature.

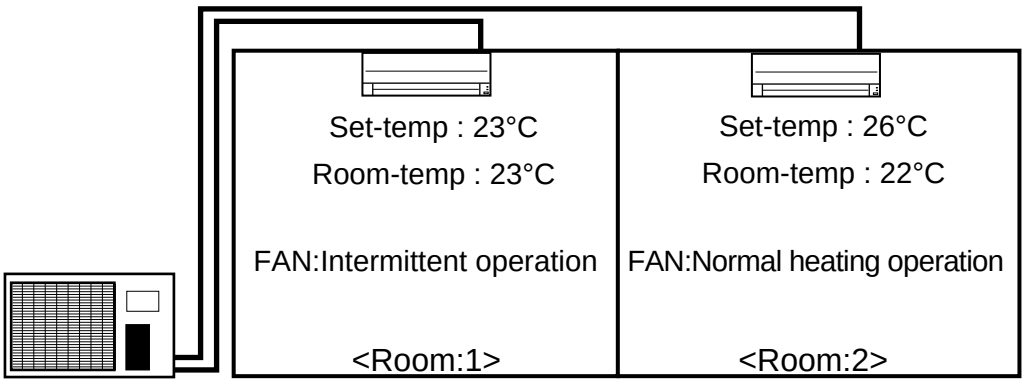
② The compressor is operating.

(Table 3 : Heating Intermittent Operation Table)

Fan operation	Model	ON	OFF
Time (min)	AS*A07/ 09/ 12/ 14LBCM	6	2
	AG*F09/ 12LAC		3
	AU*F09/ 12LAL		
Fan speed (rpm)	AS*A07/ 09/ 12LBCM	700	0
	AS*A14LBCM	840	
	AG*F09/ 12LAC	750	
	AU*F09LAL	490 (#440)	
	AU*F12LAL	490 (#460)	

When the fan speed is selected to "Quiet" by remote controller.

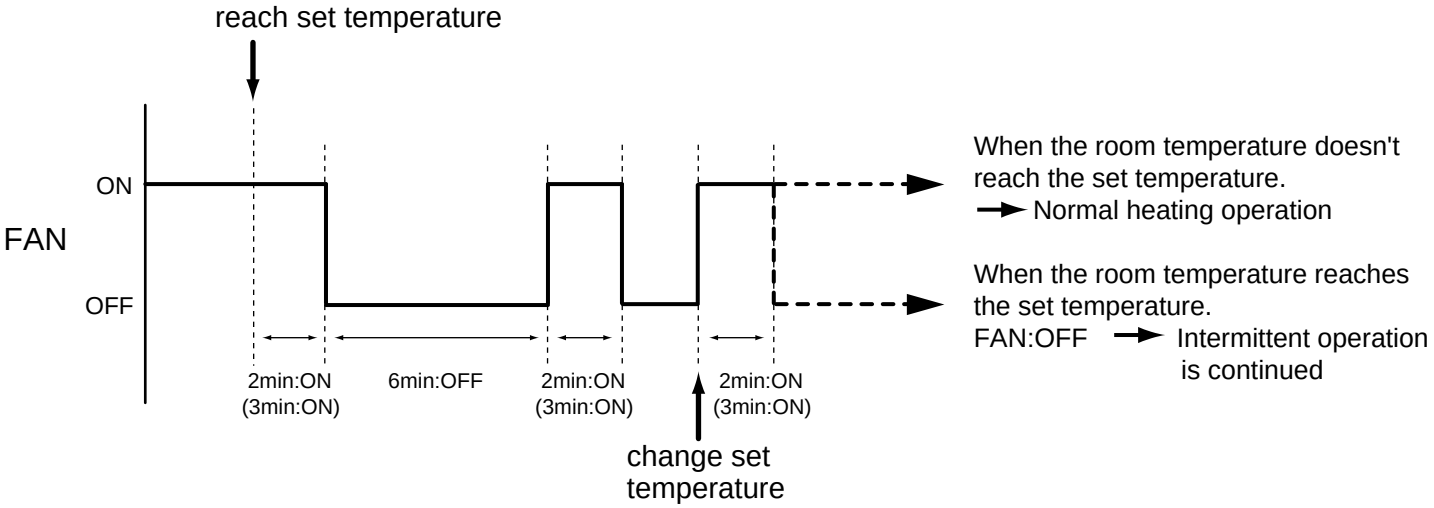
(Fig.4 : Example of Heating Intermittent Operation)



Compressor : operating

During intermittent mode, if the set temperature is changed, the fan operates for 2min or 3min and it is judged whether the room temperature has reached the set room temperature.

(Fig.5 : Heating Intermittent Operation Flow Chart)



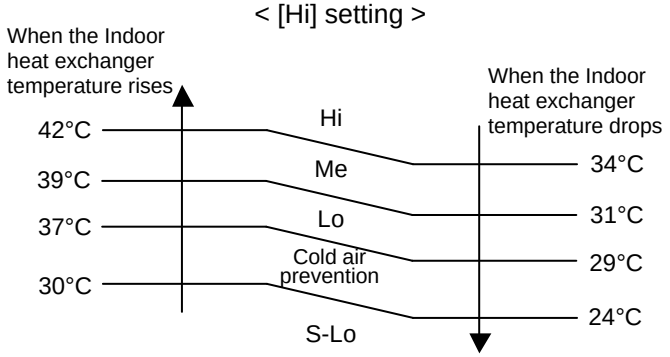
5. COLD AIR PREVENTION CONTROL (Heating mode)

5-1. For AG*F Type

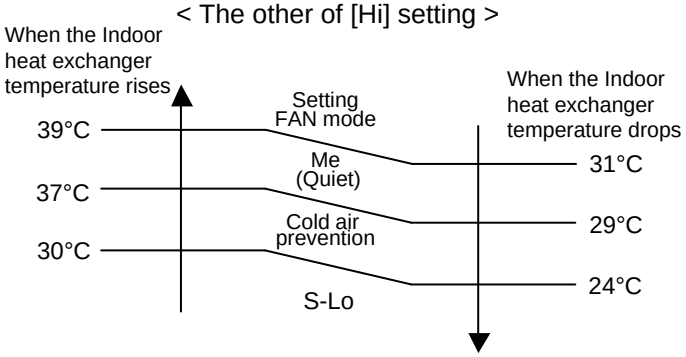
When the compressor operates, the maximum value of the indoor fan speed is set as shown in Figure 6, based on the detected temperature by the indoor heat exchanger sensor on heating mode.
When the compressor does not operate, the indoor fan motor operates [S-Lo] mode.

(Fig.6 : Cold Air Prevention Control)

< [Hi] setting >



< The other of [Hi] setting >

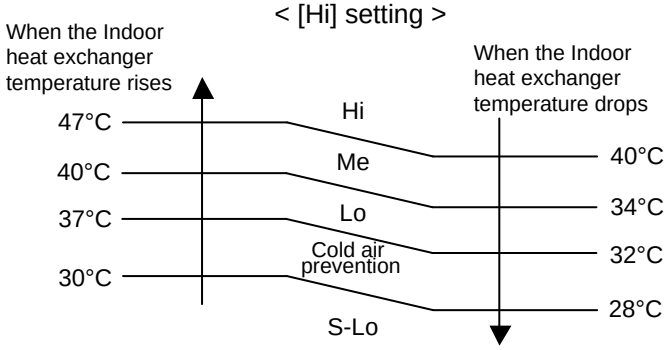


5-2. For AS*A Type

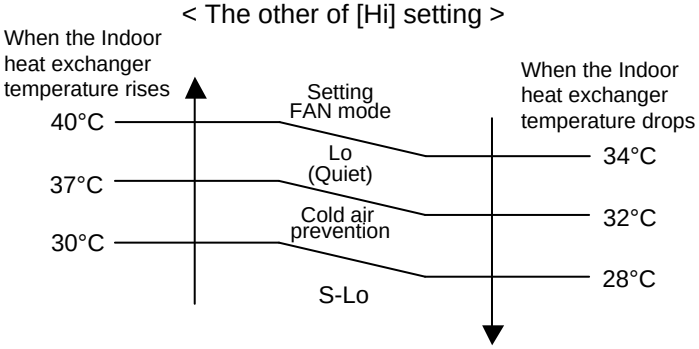
When the compressor operates, the maximum value of the indoor fan speed is set as shown in Figure 7, based on the detected temperature by the indoor heat exchanger sensor on heating mode.
When the compressor does not operate, the indoor fan motor operates [S-Lo] mode.

(Fig.7 : Cold Air Prevention Control)

< [Hi] setting >



< The other of [Hi] setting >

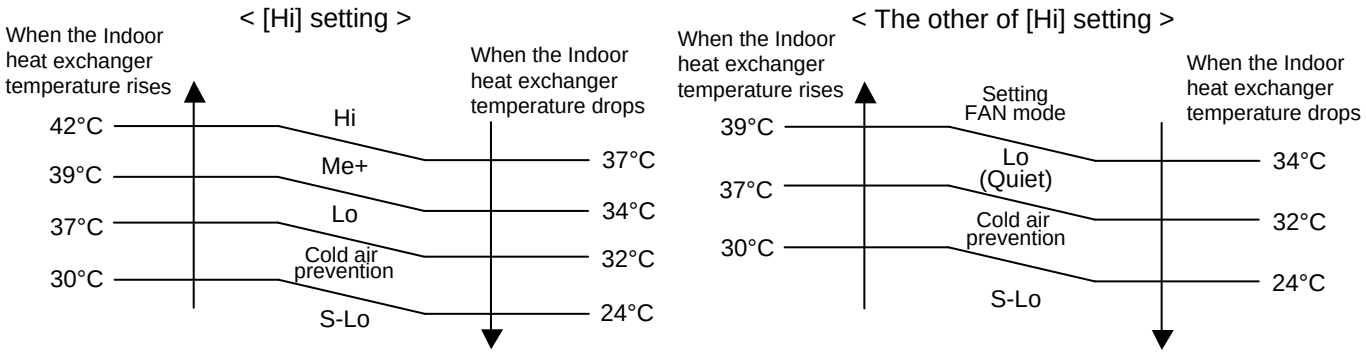


[Cold air prevention 600rpm, S-Lo 480rpm]

5-3. For AU*F Type

When the compressor operates, the maximum value of the indoor fan speed is set as shown in Figure 8, based on the detected temperature by the indoor heat exchanger sensor on heating mode.
When the compressor does not operate, the indoor fan motor operates [S-Lo] mode.

(Fig.8 : Cold Air Prevention Control)

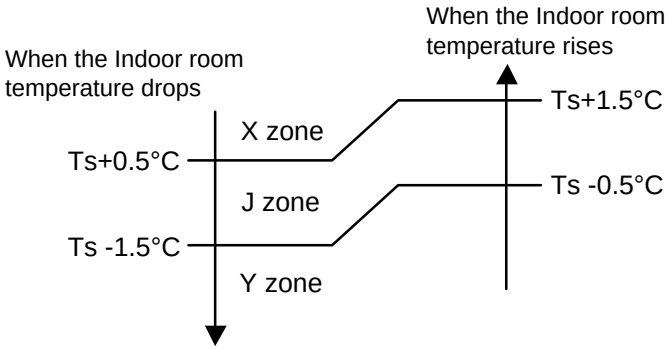


[Cold air prevention 400rpm, S-Lo 300rpm]

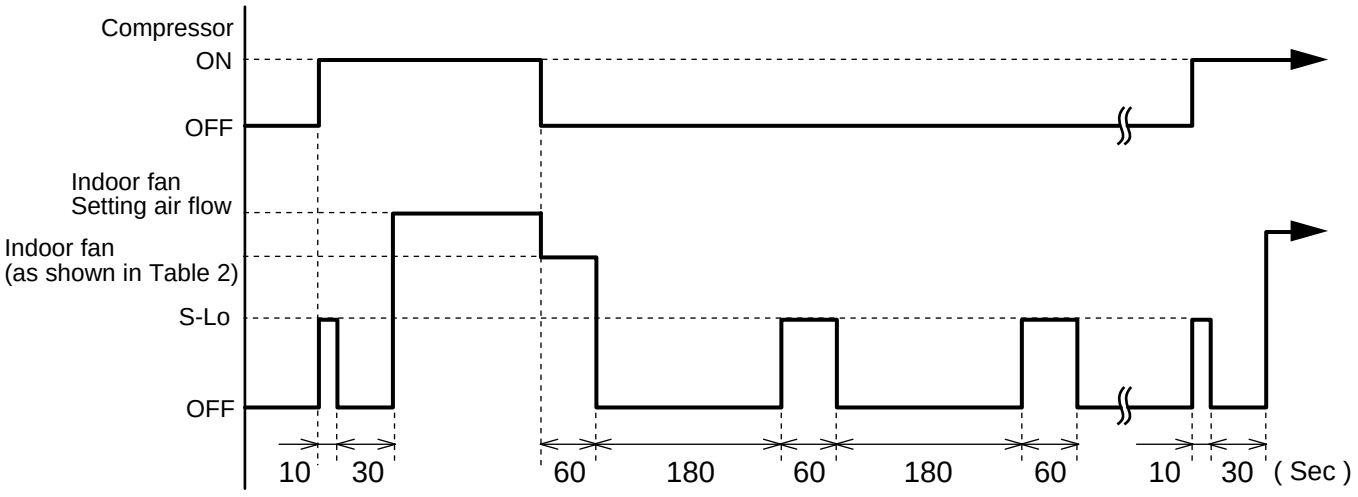
6. DRY OPERATION

Refer to the Table 2.
During the Dry mode operation, the fan speed setting can not be changed.

(Fig.9 : Compressor Control based on Room Temperature)



(Fig.10 : Indoor Fan Control)



4. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

Following table shows the fan speed of the outdoor unit.

(Table 4 : Fan speed of the outdoor unit)

	Cooling	Heating
AO*A18LAC2	900/ 820/ 700/ 410/ 320/ 250/ 200 rpm	900/ 820/ 700/ 410/ 320/ 250 /200 rpm

It runs at 500rpm for 20 seconds after starting up the outdoor fan.

5. LOUVER CONTROL

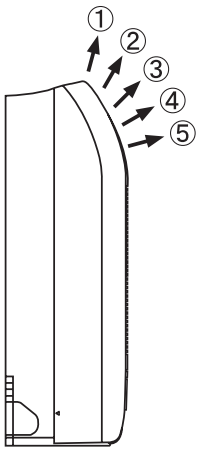
5-1 Floor type

1. VERTICAL LOUVER CONTROL

(Function and Operation Range)

Each time the button is pressed,
the air direction range will change as follows:

① ⇄ ② ⇄ ③ ⇄ ④ ⇄ ⑤



(Air Direction Range)

Use the air direction adjustments within the ranges shown above.

- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
  Cooling / Dry mode : Horizontal flow ①
  Heating mode : Downward flow ④
- When the temperature of the air being blown out is low at the start of heating operation or during defrosting, the airflow direction temporarily becomes ① to prevent cold air being blown onto the body.
- During Monitor operation in AUTO CHANGEOVER mode, the airflow direction automatically becomes ① , and it cannot be adjusted.

1-2. SWING OPERATION

When the swing signal is received from the remote controller, the vertical louver starts to swing.

(Swinging Range)

① ⇔ ⑤

- When the indoor fan is either at S-Lo or Stop mode, the swinging operation is interrupted and the louver stops at the memorized position.

5-2 Wall Mounted type

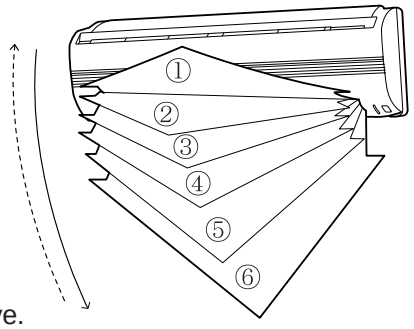
1. VERTICAL LOUVER CONTROL

(Function Range)

Each time the button is pressed, the air direction range will change as follow:

①⇄②⇄③⇄④⇄⑤⇄⑥

(Air Direction Range)



(Operation Range)

Cooling / Dry mode : ①－②－③
Heating mode : ④－⑤－⑥
Fan mode : ①－②－③－④－⑤－⑥

- Use the air direction adjustments within the ranges shown above.
- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
  Cooling / Dry mode : Horizontal flow ①
  Heating mode : Downward flow ⑥
- When the temperature of the air being blown out is low at the start of heating operation or during defrosting, the airflow direction temporarily becomes ⑥ to prevent cold air being blown onto the body.
- During use of the Cooling and Dry modes, do not set the Air Flow Direction Louver in the Heating range (④～⑥) for long period of time, since water vapor many condense near the outlet louvers and drop of water may drip from the air conditioner. During the Cooling and Dry modes, if the Air Flow Direction Louvers are left in the hating range for more than 30 minutes, they will automatically return to position ③.
- During Monitor operation in AUTO CHANGEOVER mode, the airflow direction automatically becomes ①, and it cannot be adjusted.

2. SWING OPERATION

When the swing signal is received from the remote controller, the vertical louver starts to swing.

(Swinging Range)

Cooling mode / Dry mode / Fan mode (①～③) : ① ⇔ ③
Heating mode / Fan mode (④～⑥) : ③ ⇔ ⑥

- When the indoor fan is either at S-lo or Stop mode, the swinging operation is interrupted and the louver stops at the memorized position.

5-3 Compact Cassette type

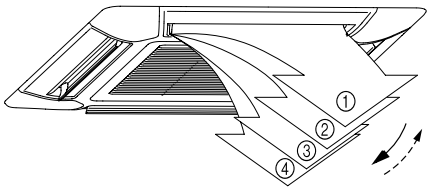
1. VERTICAL LOUVER CONTROL

(Function Range)

Each time the button is pressed, the air direction range will change as follows:

①⇄②⇄③⇄④

(Air Direction Range)



(Operation Range)

During Cooling/Dry mode/Fan mode : ①—②—③—④
During Heating mode : ②—③—④

Use the air direction adjustments within the ranges shown above.

- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
  Cooling / Dry / Fan mode : Horizontal flow ①
  Heating mode : Downward flow ④

- During AUTO mode operation, for the first minute after beginning operation, air-flow will be horizontal ① ; the air direction cannot be adjusted during this period.

1-2. SWING OPERATION

When the swing signal is received from the remote controller, the vertical louver starts to swing. The range of swing depends on the set airflow direction.

(Swinging Range)

The type of operation	Range of swing
Cooling/Dry/Fan	① to ④
Heating	② to ④

- When the indoor fan is either at S-Lo or Stop mode, the swinging operation is interrupted and the louver stops at the memorized position.
  (Stop mode means Operation stop.)

6. COMPRESSOR CONTROL

1. OPERATION FREQUENCY RANGE

The operation frequency of the compressor is different based on the operation mode as shown in the Table 5.

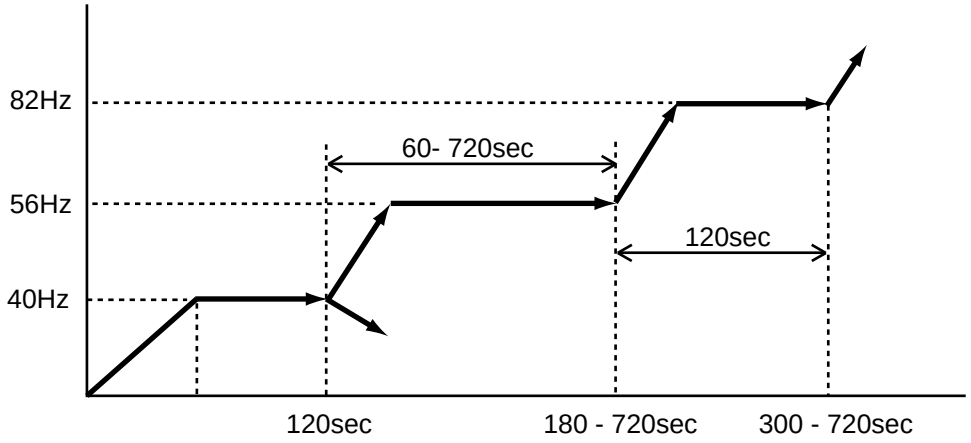
(Table 5 : Compressor Operation Frequency Range)

	Cooling		Heating	
	Min	Max	Min	Max
AO*A18LAC2	15Hz	85Hz	21Hz	130Hz

2. OPERATION FREQUENCY CONTROL AT START UP

The compressor frequency soon after the start-up is controlled as shown in Figure 11.

(Fig.11 : Compressor Control at Start-up)



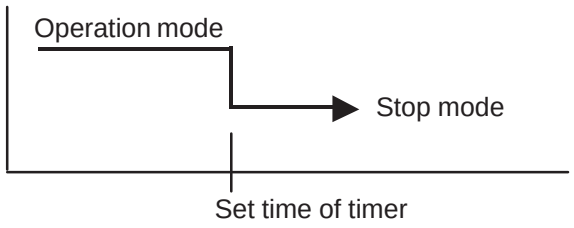
7. TIMER OPERATION CONTROL

7-1 Wireless Remote Controller

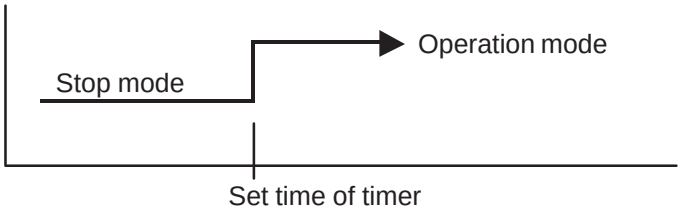
- ON / TIMER
- OFF / TIMER
- PROGRAM TIMER
- SLEEP TIMER

1. ON / OFF TIMER

・OFF timer : When the clock reaches the set time, the air conditioner will be turned off.

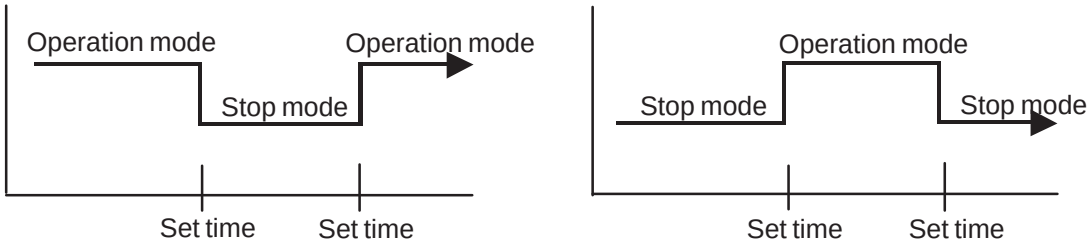


・ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. PROGRAM TIMER

・The program timer allows the OFF timer and ON timer to be used in combination one time.



・Operation will start from the timer setting (either OFF timer or ON timer) whichever is closest to the clock's current timer setting.
The order of operations is indicated by the arrow in the remote control unit's display.

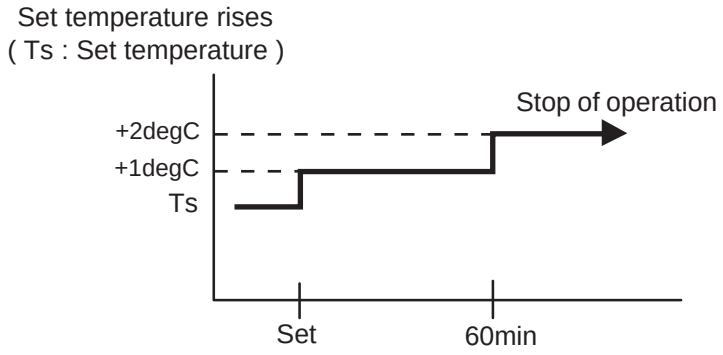
・SLEEP timer operation cannot be combined with ON timer operation.

3. SLEEP TIMER

- If the sleep timer is set, the room temperature is monitored and the operation is stopped automatically. If the operation mode or the set temperature is change after the sleep timer is set, the operation is continued according to the changed setting of the sleep timer from that time ON.

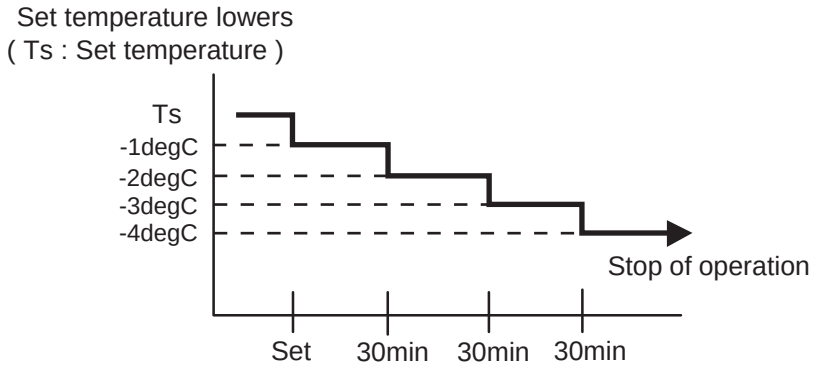
In the cooling operation mode

When the sleep timer is set, the setting temperature is increased 1 degC.
It increases the setting temperature another 1 degC after 1 hour.
After that, the setting temperature is not changed and the operation is stopped at the time of timer setting.



In the heating operation mode

When the sleep timer is set, the setting temperature is decreased 1 degC.
It decreases the setting temperature another 1 degC every 30 minutes.
Upon lowering 4 degC, the setting temperature is not changed and the operation stops at the time of timer setting.

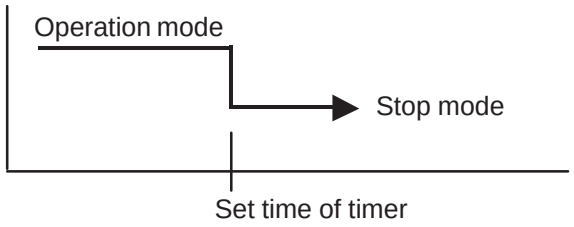


7-2 Wired Remote Controller (OPTION)

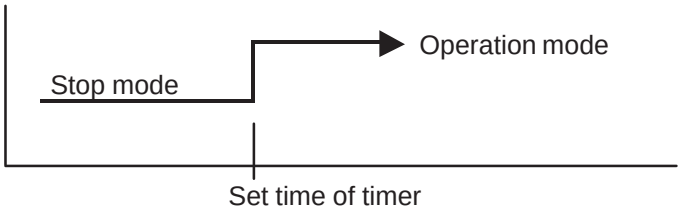
- ON / TIMER
- OFF / TIMER
- WEEKLY TIMER
- TEMPERATURE SET BACK TIMER

1. ON / OFF TIMER

・OFF timer : When the clock reaches the set time, the air conditioner will be turned off.



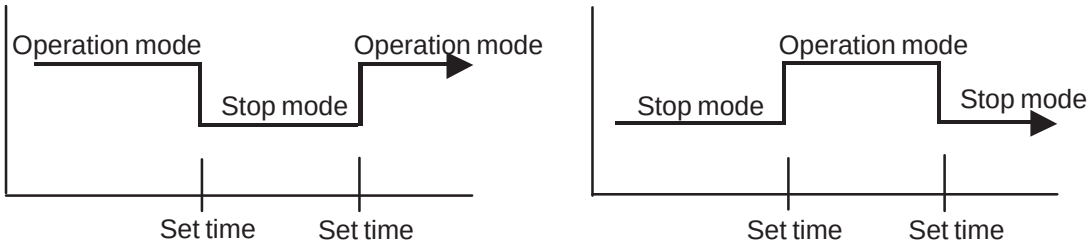
・ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. WEEKLY TIMER

2-1. WEEKLY TIMER

・Use this timer function to set operating time for each day of the week.
・The weekly timer allows up to two ON and OFF time to set up per day.

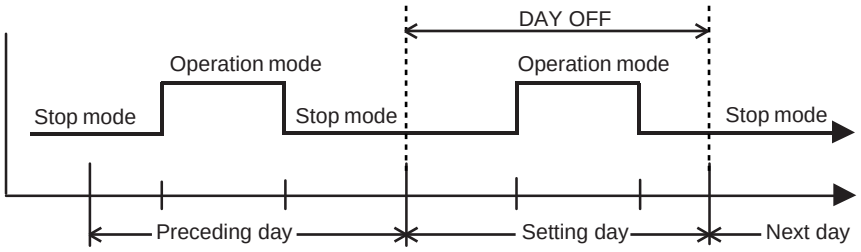


・The operating time can be set in 30 min increments only.
・The OFF time can be carried over to next day.
・The ON timer and the OFF timer functions cannot be set with using the weekly timer. Both ON and OFF time must be set.

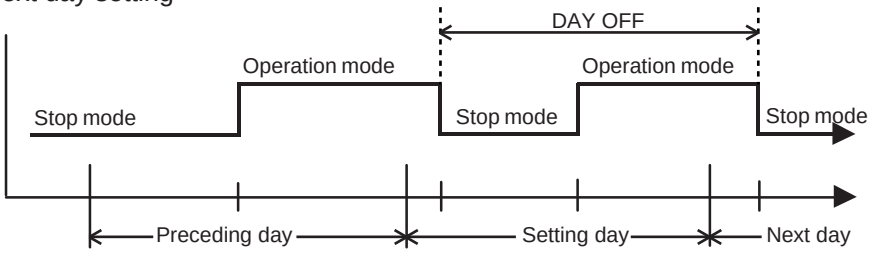
2-2. DAY OFF setting

- The DAY OFF setting is only available for days for which weekly settings already exist.
- If the operating time carries over to the next day (during a next day setting), the effective DAY OFF range will be set as shown below.

- Normal



- Next day setting

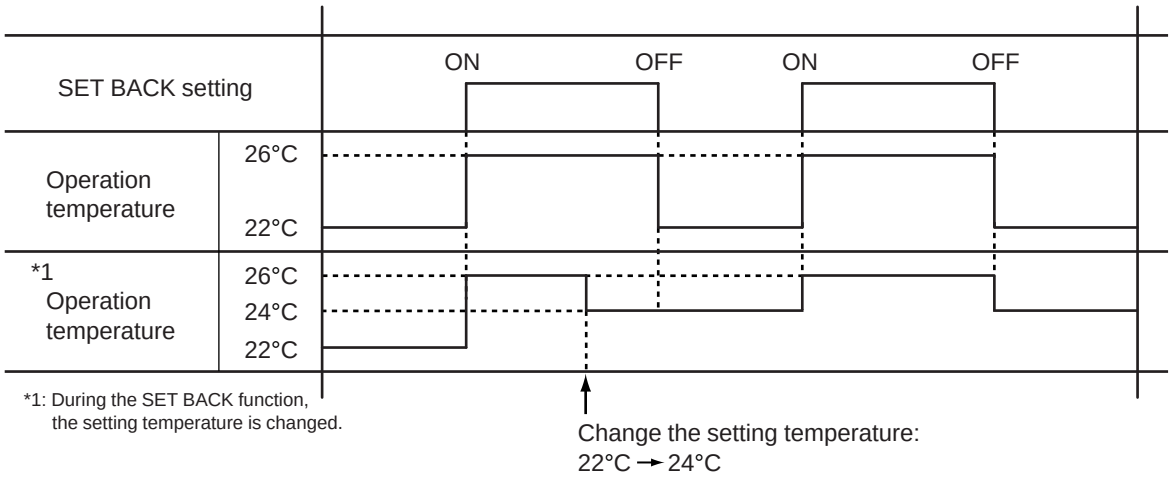


- The DAY OFF setting can only be set one time. The DAY OFF setting is canceled automatically after the set day has passed.

3. TEMPERATURE SET BACK TIMER

- The SET BACK timer only changes the set temperature for 7 days, it cannot be used to start or stop air conditioner operation.
- The SET BACK timer can be set to operate up to two times per day but only one temperature setting can be used.
- During the COOL/DRY mode, the air conditioner will operate at a minimum of 18°C even if the SET BACK temperature is set to 17°C or lower.

Case of SET BACK timer on the Cooling operation.
(Setting temperature :22°C, SET BACK temperature :26°C)



8. ELECTRONIC EXPANSION VALVE CONTROL

The most proper opening of the electronic expansion valve is calculated and controlled under the present operating condition based on the following values.
The compressor frequency, the temperatures detected by the discharge temperature sensor and the outdoor temperature sensor.

* The pulse range of the electronic expansion valve control is between 30 to 480 pulses.
* At the time of supplying the power to the outdoor unit, the initialization of the electronic expansion valve is operated (528 pulses are input to the closing direction).

9. TEST OPERATION CONTROL

- With Wireless Remote Controller (with TEST RUN button)

  Under the condition where the air conditioner runs, press the TEST RUN button, and the test operation control mode will appear.
  During test running, the operation lamp and timer lamp of the air conditioner body twinkle simultaneously.
  Set the test operation mode, and the compressor will continue to run regardless of whether the room temperature sensor detects.
  The test operation mode is released if 60 minutes have passed after setting up the test operation.

- With Wired Remote Controller (without TEST RUN button)

  Under the condition where the air conditioner stops, press the MASTER CONTROL button and the FAN CONTROL button simultaneously for 5 seconds or more, and the test operation control mode will appear.
  During test running, "01" will display on the remote controller display.
  Set the test operation mode, and the compressor will continue to run regardless of whatever the room temperature sensor detects.
  The test operation mode is released if 60 minutes have passed after setting up the test operation.

10. PREVENT TO RESTART FOR 3 MINUTES (3 MINUTES ST)

The compressor won't enter operation status for 3 minutes after the compressor is stopped, even if any operation is given.

11. 4-WAY VALVE EXTENSION SELECT

At the time when the air conditioner is switched from the cooling mode to heating mode, the compressor is stopped, and the 4-way valve is switched in 3 minutes later after the compressor stopped.

12. AUTO RESTART

When the power was interrupted by a power failure, etc. during operation, the operation contents at that time are memorized and when power is recovered, operation is automatically resumed with the memorized operation contents.
When the power is interrupted and recovered during timer operation, timer operation is canceled, but only setting time is memorized.

[Operation contents memorized when the power is interrupted]

- Operation mode
- Set temperature
- Set air flow
- Timer mode and timer time
- Air flow Direction
- Swing
- 10°C HEAT

13. MANUAL AUTO OPERATION (Indoor unit body operation)

If MANUAL AUTO Button is set, the operation is controlled as shown in Table 7.
If the remote control is lost or battery power dissipated, this function will work without the remote control.

(Table 7 : Manual Auto Operation)

OPERATION MODE	Auto changeover
FAN CONT. MODE	Auto
TIMER MODE	Continuous (No timer setting available)
SETTING TEMP.	24°C
SETTING LOUVER	Standard
SWING	OFF

14. COMPRESSOR PREHEATING

When the outdoor heat exchanger temperature is lower than Operation temperature (Refer to Table 8) and the heating operation has been stopped for 3 hours, power is applied to the compressor and the compressor is heated.
(By heating the compressor, warm air is quickly discharged when operation is started.)
When operation was started, and when the outdoor temperature rises to Release temperature or greater, preheating is over.

(Table 8 : Preheating Operation / Release Temperature)

Before 24 hour		After 24 hour	
Operation temperature	Release temperature	Operation temperature	Release temperature
3°C	7°C	0°C	4°C

15. DEFROST OPERATION CONTROL

1. CONDITION OF STARTING THE DEFROST OPERATION

The defrost operation starts when the outdoor heat exchanger temperature sensor detects the temperature lower than the values shown in Table 9.

(Table 9 : Condition of starting Defrost Operation)

Compressor integrating operation :Less than 45min.	Compressor integrating operation :45min and over	
	Less than 6 min. *1 or 10min. *2	After 6 min. *1 or 10min. *2
Does not operate		-8°C *3 -12°C *4 -14°C *5 -16°C *6 -18°C *7

*1. It means contiguous operation time.
*2. Compressor stop time:
Below 20min. → Select 6min.
Above 20min. → Select 10min.
*3. Outdoor temp. > 3°C
*4. 3 ≧ Outdoor temp. > -1°C
*5. -1 ≧ Outdoor temp. > -5°C
*6. -5 ≧ Outdoor temp. > -10°C
*7. Outdoor temp. ≦ -10°C

2. CONDITION OF THE DEFROST OPERATION COMPLETION

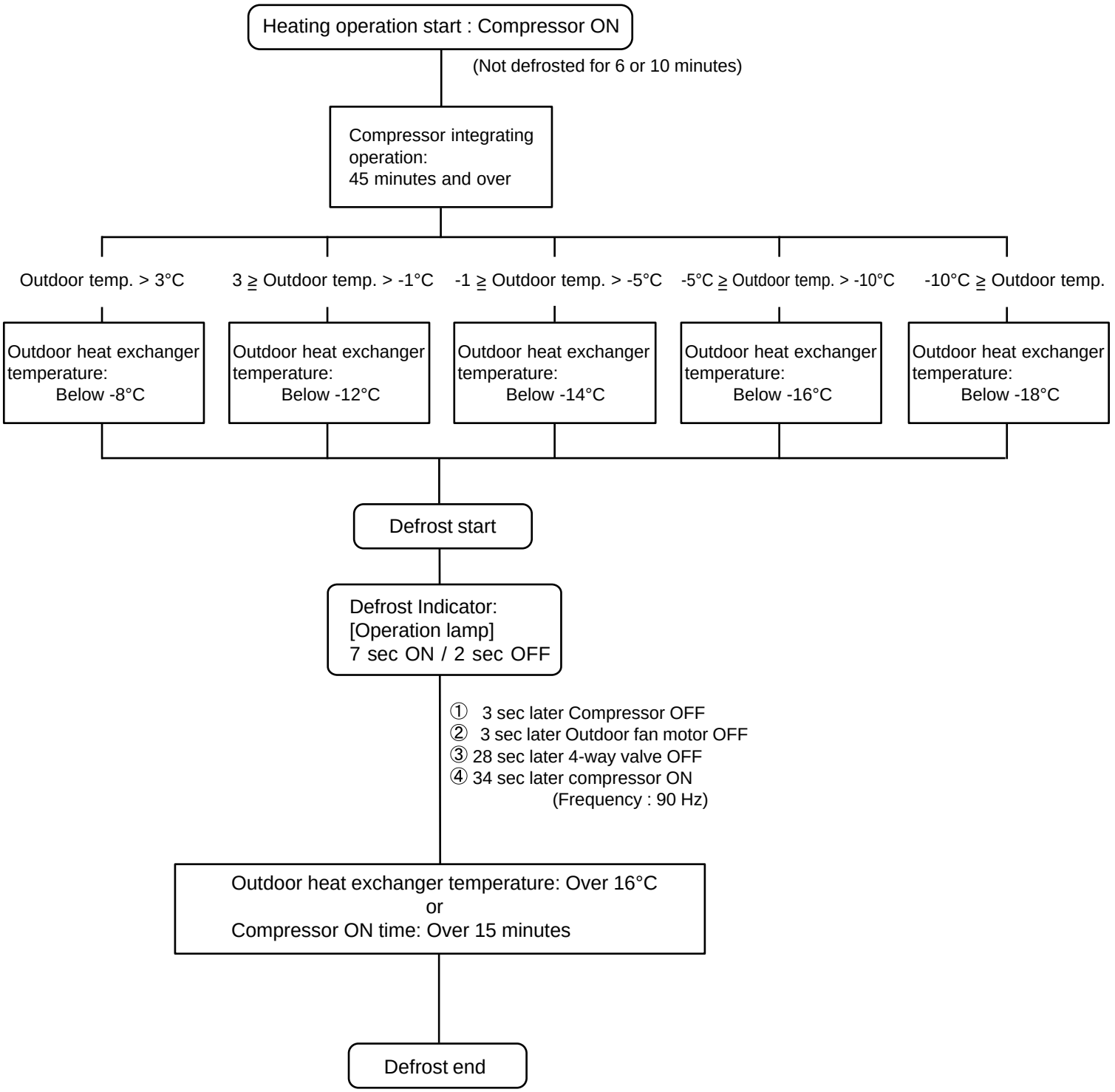
Defrost operation is released when the conditions become as shown in Table 10.

(Table 10 : Defrost Release Condition)

Release Condition
Outdoor heat exchanger temperature sensor value is higher than 16°C or Compressor operation time has passed 15 minutes.

3. Defrost Flow Chart

The defrosting shall proceed by the integrating operation time and outdoor heat exchanger temperature as follows.



16. OFF DEFROST OPERATION CONTROL

When operation stops in the [Heating operation] mode, if frost is adhered to the outdoor unit heat exchanger, the defrost operation will proceed automatically. In this time, if indoor unit operation lamp flashes slowly (7 sec ON / 2 sec OFF), the outdoor unit will allow the heat exchanger to defrost, and then stop.

1. OFF DEFROST OPERATION CONDITION

In heating operation, the outdoor heat exchanger temperature is less than -4°C, and compressor operation integrating time lasts for more than 30 minutes.

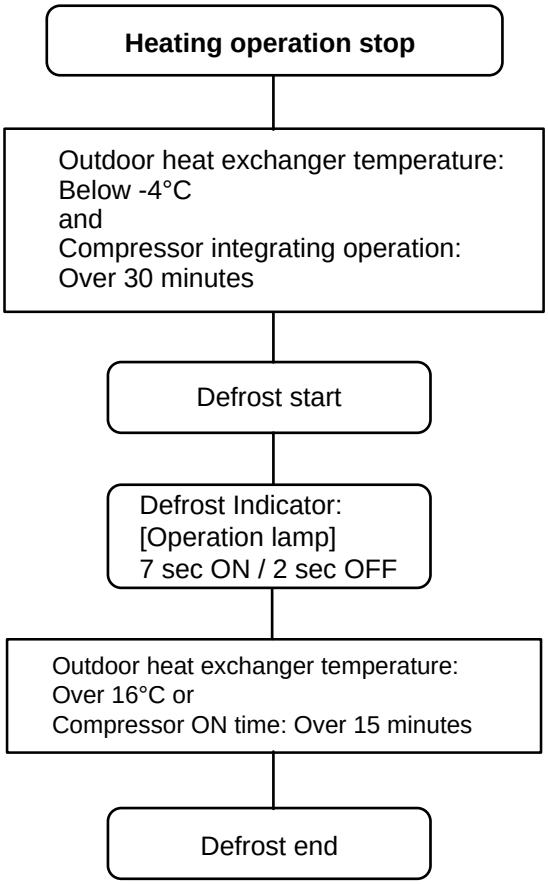
2. OFF DEFROST END CONDITION

OFF defrost operation is released when the conditions become as shown in Table 11.

(Table 11 : OFF Defrost Release Condition)

Release Condition
Outdoor heat exchanger temperature sensor value is higher than 16°C or Compressor operation time has passed 15 minutes.

OFF Defrost Flow Chart



17. 10°C HEAT OPERATION

The 10°C HEAT operation functions by pressing 10°C HEAT button on the remote controller. The 10°C HEAT operation is almost the same operation as below settings.

(Table 12 : 10°C HEAT operation)

mode	HEAT
setting temperature	10°C
fan mode	AUTO

18. VARIOUS PROTECTIONS

1. DISCHARGE GAS TEMPERATURE OVER RISE PREVENTION CONTROL

The discharge gas thermosensor (discharge thermistor : Outdoor side) will detect discharge gas temperature.

(1). When the discharge temperature becomes higher than 110°C , the compressor stops under all conditions.
When the discharge temperature becomes lower than 80°C , the compressor restarts after 3 minutes passed from the compressor stop.
When the compressor stops 2 times by above protection, the outdoor unit doesn't restart. [Permanent stop]

<Release conditions>
1. Power reset after the operation stop
2. After 24 hours passed from the first error detection.

(2). When the discharge temperature becomes higher than 105°C ,the compressor frequency is decreased 20 Hz, and it continues to decrease the frequency for 20 Hz every 120 seconds until the temperature becomes lower than 105°C .
When the discharge temperature becomes lower than 95°C ,the control of the compressor frequency is released.

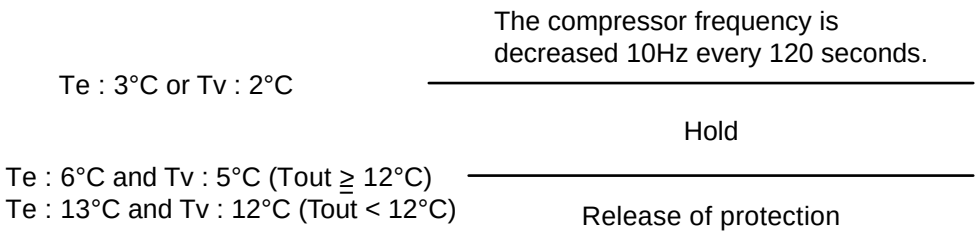
2. CURRENT RELEASE CONTROL

The compressor frequency is controlled so that the outdoor unit input current does not exceeds the current limit value that was set up with the outdoor temperature.
The compressor frequency returns to the designated frequency of the indoor unit at the time when the frequency becomes lower than the release value.

3. ANTI-FREEZING CONTROL (Cooling/ Dry mode)

The compressor frequency decreases on cooling mode when the indoor heat exchanger temperature sensor detects the temperature lower than 3°C or 2-way valve temperature sensor detects the temperature lower than 2°C.

(Fig.11 : Anti-freezing Protection Operation / Release Temperature)



Te : Indoor heat exchange temperature
Tv : 2-way valve temperature
Tout : Outdoor temperature

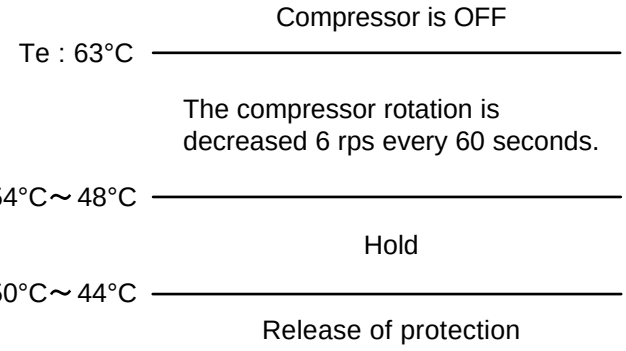
4. COOLING PRESSURE OVER RISE PROTECTION

When the outdoor unit heat exchange sensor temperature rises to 67°C or greater, the compressor is stopped and the error display is indicated.

5. HIGH TEMPERATURE RELEASE CONTROL (HEATING MODE)

On heating mode, the compressor frequency is controlled as following based on the detection value of the indoor and outdoor heat exchanger temperature sensor.

(Fig.12 : Heating Overload Protection Control)



Th : Outdoor heat exchange temperature
Te : Indoor heat exchange temperature

*1

Th≧-9°C	→ Te : 54°C
-9°C > Th≧-11°C	→ Te : 54°C
-11°C > Th≧-13°C	→ Te : 52°C
-13°C > Th≧-15°C	→ Te : 50°C
-15°C > Th	→ Te : 48°C

*2

Th≧-9°C	→ Te : 50°C
-9°C > Th≧-11°C	→ Te : 50°C
-11°C > Th≧-13°C	→ Te : 48°C
-13°C > Th≧-15°C	→ Te : 46°C
-15°C > Th	→ Te : 44°C

6. COMPRESSOR TEMPERATURE PROTECTION

When the compressor temperature sensor detects higher than 110 °C, the compressor is stopped under all conditions.

When the compressor temperature sensor detects lower than 80°C , the compressor restarts after 3 minutes passed from the compressor stop.

When the compressor stops 2 times by above protection, the outdoor unit doesn't restart. [Permanent stop]

<Release conditions>
1. Power reset after the operation stop
2. After 24 hours passed from the first error detection.

19. ECONOMY OPERATION

When economy operation is operated, the room temperature will be little higher than the set-temp under cooling mode and lower than set-temp under heating mode.
Therefore, the economy mode is able to save more energy than other normal mode.

- In case of multi-type air conditioner, the economy operation mode is only available for the set indoor unit.
- If the room is not cooled (or heated) well during economy operation, select normal operation.
- During the monitor period in the AUTO mode, the air conditioner operation will not change to ECONOMY OPERATION even if ECONOMY OPERATION is selected by pressing the ECONOMY button.

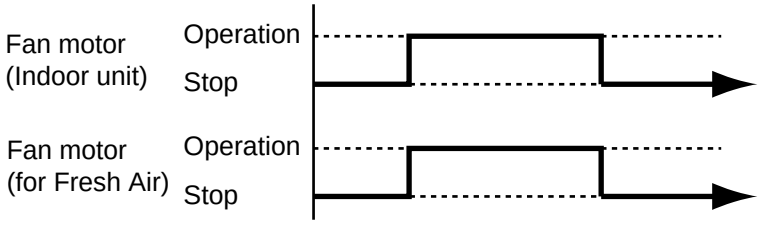
20. FORCED COOLING OPERATION (When using the Wireless RC)

The FORCED COOLING OPERATION starts up when MANUAL / AUTO button is pressed more than 10 seconds.
During the FORCED COOLING OPERATION, it keeps operation regardless of detection value of room temperature sensor.
Operation LED and Timer LED blinks simultaneously while the unit is on the FORCED COOLING OPERATION.
It is released after 60 minutes from starting time.

21. FRESH AIR CONTROL (For AU type)

The fan motor for Fresh Air is operated in synchronization with the indoor fan operation as shown in Figure 13.

(Fig.13 : Fresh Air control)

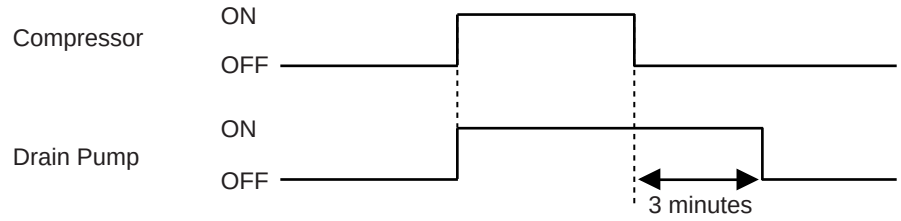


22. DRAIN PUMP OPERATION (For AU type)

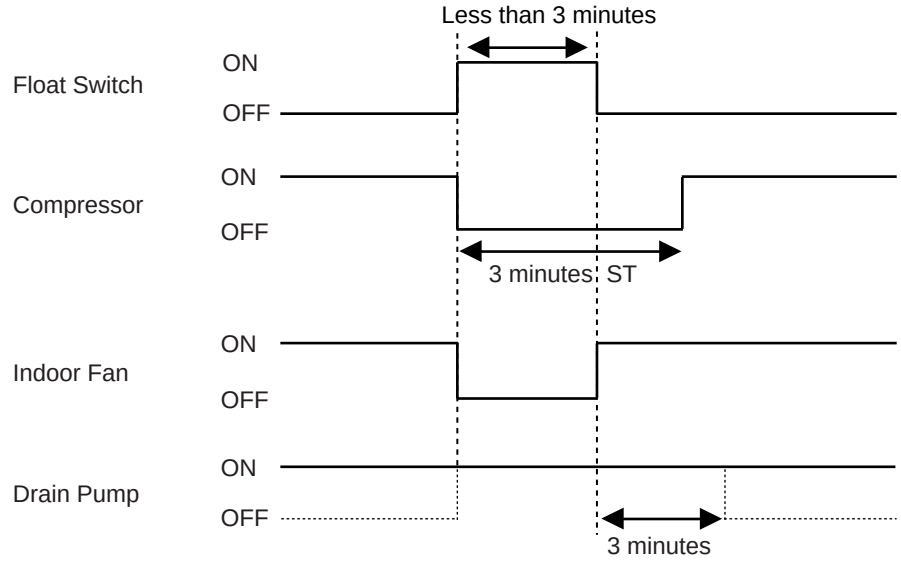
· During COOLING / DRY mode

1. When the compressor starts, the drain pump starts simultaneously.
2. The drain pump operates continuously for 3 minutes after the compressor is turned off.
3. When the compressor stops by the "Anti- freezing protection", the drain pump is turned off in 1 hour after the compressor stops.
4. When the water level in the drain pan rises up and then the float switch functions:
   ① The compressor, indoor and outdoor fan motor operation are stopped.
   ② Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)
   ③ The indoor unit fan motor operates after the float switch is turned off.
5. When the float switch turns ON continuously for 3 minutes, "FAILURE INDICATION" operates. (It is necessary to turn off power for release it.)
6. When the float switch turns OFF less than 3 minutes, the unit starts COOLING operation.

(Fig.14 : Detail of Drain Pump Operation)



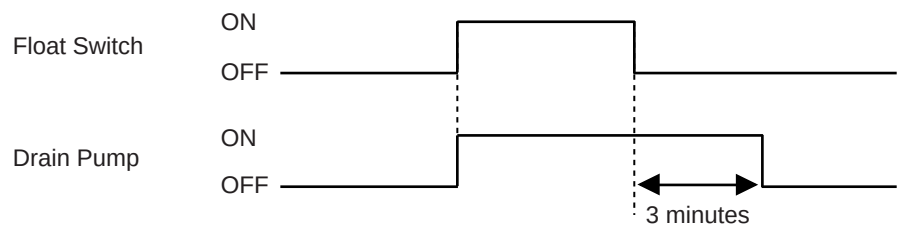
<Float Switch turns OFF less than 3 minutes>



· During HEATING / FAN mode / Stop operation

1.When the water level in the drain pan rises up and then the float switch functions:
① Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)

2. When the float switch turns ON continuously for 3 minutes, "FAILURE INDICATION" operates. Thereafter, even if the float switch turns OFF, the "FAILURE INDICATION" is not released. (It is necessary to turn off power for release it.)



23. FUNCTION SETTING

23-1 Selecting the remote controller signal code

When two or more air conditioners are installed in a room and the remote controller is operating an air conditioner other than the one you wish to set ,
change the signal code of the remote controller to operate only the air conditioner you wish to set (four selections possible).

When you two or more air conditioners are installed in a room,
please contact you retailer to set the individual air conditioner signal codes.

Confirm the setting of the remote controller signal code and the printed circuit boad setting.
If these are not confirmed, the remote controller can not be used to operate for the air conditioner.

Use the following steps to select the signal code of the remote controller.
(Note that the air conditioner can not receive of a signal code if the air conditioner has not been set for the signal code.)

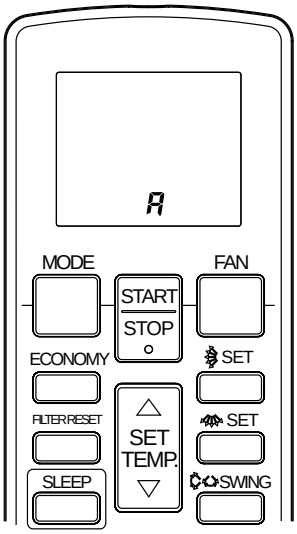
(1) Press the STAR/STOP button until only the clock is displayed on the remote controller display.

(2) Press the MODE button for at least five seconds to display the current signal code. (initially set to A)

(3) Press the SET TEMP. (▲)(▼)button to change the signal code between A→b→c→d

(4) Press the MODE button again to return to clock display. The signal code will be changed.

(Fig.14 : Selecting the Remote Controller Signal Code)



If no buttons are pressed within 30 seconds after the signal code is displayed,
the system returns to the original clock display. In this case, start again from step 1.

The remote controller resets to signal code A when the batteries in the remote controller are replaced.
If you use a signal code other than signal code A, reset the signal code after replacing the batteries.
If you do not know the air conditioner signal code setting, try each of the signal code (A→b→c→d)
until you find the code which operate the air conditioner.

23-2 Setting Other Functions

The following settings are also possible, depending on the operating conditions.

1. Setting the fan off time correction of intermittent operation indoor fan

Set it to "Long" if the room temperature rises too much than the set temperature by installation environment.

(Table 13 : Setting the Fan Off Time Correction)

	Setting Description	Function Number	Setting Value
◆	Standard (6 min)	33	00
	Short (4 min)		01
	Long 1 (8 min)		02
	Long 2 (10 min)		03

(◆····· Factory setting)

2. Auto Restart

(Table 14 : Auto Restart)

	Setting Description	Function Number	Setting Value
◆	Yes	40	00
	No		01

(◆····· Factory setting)

3. Setting the remote controller signal code

Change the indoor unit Signal Code, depending on the remote controllers.

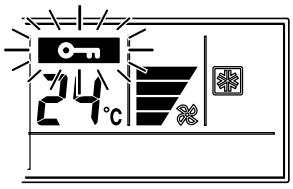
(Table 15 : Setting the Remote Controller Signal Code)

	Setting Description	Function Number	Setting Value
◆	A	44	00
	B		01
	C		02
	D		03

(◆····· Factory setting)

4. Indoor Room Temperature Sensor Switching Function (Only for Wired remote controller)

The following setting is necessary to control by the Wired remote controller sensor.



Set it to "01" after the THERMO SENSOR button is pressed and the lock indication flashes.

(Table 16 : Indoor Room Temperature Sensor Switching Function)

	Setting Description	Function Number	Setting Value
◆	No	42	00
	Yes		01

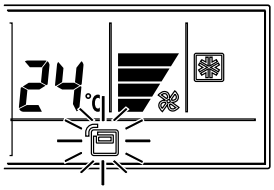
(◆····· Factory setting)

If setting value is "00",
room temperature is controlled by the indoor unit temperature sensor.

If setting value is "01",
room temperature is controlled by either the indoor unit temperature sensor or the remote controller sensor.

5. Change of room temperature control method (Only for Wired remote controller)

It is an effective setting when the room temperature is controlled by remote controller sensor.
(as the diagram below indicates)



If the Indoor unit temperature sensor isn't correctly detected, set it to "01".

*Please note the position where Wired remote controller is set up if you do this setting.
Please do the operation without fail after the setting change, and confirm whether the room temperature can be adjusted normally.
If there is a problem, recommend change to Wired remote controller sensor.

(Table 17 : Change of Room Temperature Control Method)

	Setting Description	Function Number	Setting Value
◆	Standard	48	00
	Only remote controller sensor		01

(◆····· Factory setting)

· If setting value is "00",
room temperature is controlled by either indoor unit temperature sensor or remote controller sensor.

*When the difference of the detected value between the indoor unit temperature sensor and the remote controller sensor becomes great, the room temperature control is returned temporarily to the indoor unit temperature sensor.
It prevents the difference between the room temperature and the set temperature from becoming great too much.

· If setting value is "01",
room temperature is controlled by only the remote controller sensor.

*There is a possibility that the difference between the room temperature and the set temperature becomes great.
Because the room temperature is controlled by only the remote controller sensor.

Refrigerant
R410A

Floor / Wall Mounted / Cassette type
INVERTER (MULTI)

2 . TROUBLE SHOOTING

2. TROUBLESHOOTING

2-1 ERROR DISPLAY

2-1-1 INDOOR UNIT DISPLAY

1. ERROR DISPLAY

The OPERATION, TIMER, 3rd Lamps operate as follows according to the error contents.

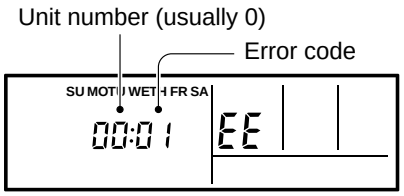
Error contents	Error display			Trouble shooting
	OPERATION Lamp	TIMER Lamp	3rd Lamp	
Serial error (Serial reverse transfer error)	—	2 times ◯ 3 times ◯	—	2
Serial error (Serial forward transfer error)		4 times ◯ 5 times ◯	—	10
Wired remote controller abnormal		8 times ◯	—	1
Indoor room temperature error	2 times ◯	2 times ◯	—	3
Indoor heat exchanger temperature sensor (middle) error		3 times ◯	—	4
Water drain abvnormal		6 times ◯	—	27
Outdoor discharge pipe temperature sensor error	3 times ◯	2 times ◯	—	7
Outdoor heat exchanger temperature sensor (outlet) error		3 times ◯	—	5
Outdoor temperature sensor error		4 times ◯	—	6
Heat sink thermistor (Inverter) error		7 times ◯	—	15
Compressor temperature sensor error		8 times ◯	—	26
2-way valve temperature sensor error		—	2 times ◯	17
3-way valve temperature sensor error		—	3 times ◯	18
Indoor manual auto switch abnormal	4 times ◯	2 times ◯	—	20
IPM protection	5 times ◯	2 times ◯	—	11
CT error		3 times ◯	—	12
Compressor rotor location can not detect (Permanent stop)		5 times ◯	—	13, 16
Outdoor fan error		6 times ◯	—	14
Connected indoor unit abnormal		7 times ◯	—	19
Indoor fan abnormal	6 times ◯	2 times ◯	—	9
Indoor UPPER fan speed error		3 times ◯	—	9
Indoor LOWER fan lock error		—	2 times ◯	9
Indoor LOWER fan speed error		—	3 times ◯	9
Damper error (UPPER & LOWER air flow)		—	4 times ◯	28
Damper error (UPPER air flow)		5 times ◯	—	28
Damper error		—	5 times ◯	29
Discharge temperature error	7 times ◯	2 times ◯	—	21
Excessive high pressure protection on cooling		3 times ◯	—	22
4-way valve abnormal		4 times ◯	—	23
Compressor temperature error / Circulation refrigerant error		6 times ◯	—	24
P.F.C. circuit error	8 times ◯	4 times ◯	—	25
Indoor unit EEPROM error	●	●	●	8

◯ : 0.5s ON / 0.5s OFF (Flash), ● : 0.5s ON / 0.5s OFF (Flash), — : OFF

2-1-2 WIRED REMOTE CONTROLLER DISPLAY (OPTION)

1. SELF - DIAGNOSIS

When "EE" in Temperature Display is displayed, inspection of the air conditioning system is necessary. Please consult authorized service personnel.



en. Self-diagnosis check

Error code	Error contents	Trouble shooting
00	Wired remote controller abnormal	1
01	Serial error (Serial reverse transfer error)	2
02	Indoor room temperature sensor error	3
04	Indoor heat exchanger temperature sensor (middle) error	4
06	Outdoor heat exchanger temperature sensor (outlet) error	5
09	Water drain abnormal	27
0A	Outdoor temperature sensor error	6
0C	Outdoor discharge pipe temperature sensor error	7
0E	Heat sink thermistor (Inverter) error	15
0F	Discharge temperature error	21
11	Indoor unit EEPROM error	8
12	Indoor fan abnormal	9
	Indoor UPPER fan speed error	9
	Indoor LOWER fan lock error	9
	Indoor LOWER fan speed error	9
13	Serial error (Serial forward transfer error)	10
15	Compressor temperature sensor error	26
17	IPM protection	11
18	CT error	12
1A	Compressor rotor location can not detect (Permanent stop)	13, 16
1b	Outdoor fan error	14
1d	2-way valve temperature sensor error	17
1E	3-way valve temperature sensor error	18
1F	Connected indoor unit abnormal	19
20	Indoor manual auto switch abnormal	20
24	Excessive high pressure protection on cooling	22
25	P.F.C. circuit error	25
26	Compressor temperature error / Circulation refrigerant error	24
2C	4-way valve abnormal	23
2E	Damper error (UPPER & LOWER air flow)	28
	Damper error (UPPER air flow)	28
	Damper error	29

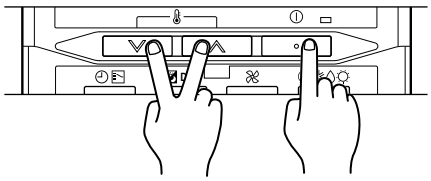
- If “CO” appears in the unit number display, there is a remote controller error. Refer to the installation instruction sheet included with the remote controller.

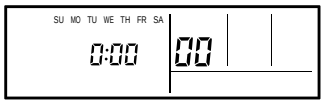
2. ERROR CODE HISTORY DISPLAY

Up to 16 memorized error codes may be displayed for the indoor unit connected to the remote controller.

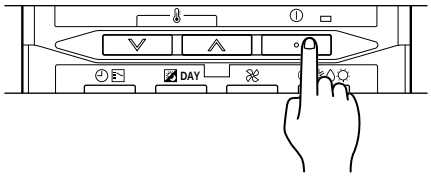
1. Stop the air conditioner operation.

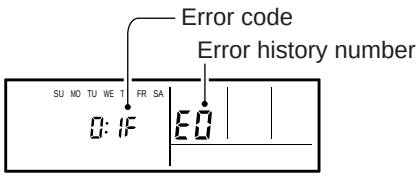
2. Press the SET TEMPERATURE buttons ⋁, ⋀ and the START/STOP button ⏻ simultaneously for 5 seconds or more to start the self-diagnosis.



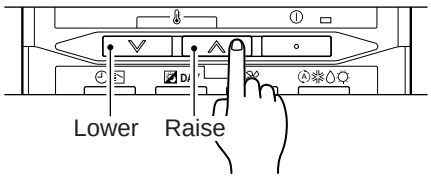


3. Press the START/STOP button.





4. Press the SET TEMPERATURE button to select the error history number.



0 ↔ 1 ↔ 2 ↔ 3 ↔ 4 ↔ 5 ↔ 6 ↔ 7
F ↔ E ↔ d ↔ c ↔ b ↔ A ↔ 9 ↔ 8

5. Press the SET TEMPERATURE buttons ⋁, ⋀ and START/STOP button ⏻ simultaneously for 5 seconds or more or there is no key input for 20 seconds to stop the display.

2-2 TROUBLE SHOOTING WITH ERROR CODE

Trouble shooting 1 **INDOOR UNIT Error Method:** **Wired Remote Controller Abnormal**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit controller PCB circuit Wired Remote Controller (Option)	When the indoor unit cannot receive the signal from Wired Remote Controller more than 10seconds after power ON, or the indoor unit cannot receive the signal more than 1minute during normal operation.

Forecast of Cause:

1. Terminal connection abnormal 2. Wired Remote Controller failure 3. Controller PCB failure

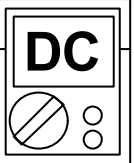
Check Point 1 : Check the connection of terminal

After turning off the power, check & correct the followings.

- Check the connection of terminal between remote controller and Indoor unit, and check if there is a disconnection of the cable.

OK

Check Point 2 : Check Remote Control and Controller PCB



- Check Voltage at Connector of Remote Controller of Controller PCB. (Power supply to Remote Controller)
  >> If it is DC12V, Remote Controller is failure. (Controller PCB is normal) >> Replace Remote Controller
  >> If it is DC 0V, Controller PCB is failure. (Check Remote Controller once again) >> Replace Controller PCB

▶ **Upon correcting the removed connector or mis-wiring, reset the power.**

Trouble shooting 2 **OUTDOOR UNIT Error Method:** **Serial Reverse Transfer Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit	When the indoor unit cannot receive the serial signal from Outdoor unit more than 10 seconds.

Forecast of Cause:

1. Connection failure 2. External cause 3. Inverter PCB failure

Check Point 1-1 : Reset the power and operate

- Does Error indication show again?

NO

YES

Check Point 2 : Check Connection

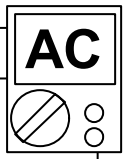
- Check any loose or removed connection line of Indoor unit and Outdoor unit.
  >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
- Check connection between Outdoor Unit Inverter PCB.
  (If there is loose connector or open cable)

Check Point 1-2:
Check external cause such as noise

- Check the complete insulation of the grounding.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).

OK

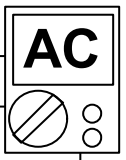
Check Point 3 : Check the voltage of power supply



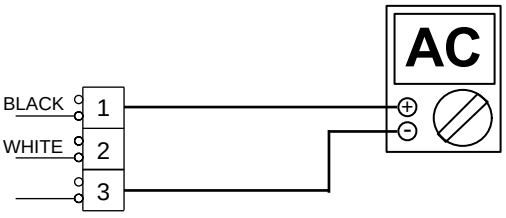
- Check the voltage of power supply
  >> Check if AC198 - 264V appears at Outdoor Unit Terminal 1 - 2.

OK

Check Point 4 : Check Serial Signal (Reverse Transfer Signal)



- Check Serial Signal (Reverse Transfer Signal)
  >> Check if Indicated value swings between AC70V and AC130V at Outdoor Unit Terminal 1 - 3.
  >> If it is abnormal, replace Inverter PCB.



Trouble shooting 3 **INDOOR UNIT Error Method:** **Indoor Room Temperature Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Room Temperature Thermistor	When Room Temperature Thermistor open or short-circuit is detected at power ON.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Controller PCB failure

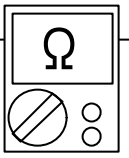
Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)

Temperature	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
Resistance Value (kΩ)	33.6	25.9	20.2	15.8	12.5	10.0	8.04	6.51

Temperature	40°C	45°C	50°C
Resistance Value (kΩ)	5.30	4.35	3.59

▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Controller PCB (DC5.0V)

Make sure circuit diagram of indoor unit and check terminal voltage at Thermistor (DC5.0V)

▶ **If the voltage does not appear, replace Controller PCB.**

Trouble shooting 4 **INDOOR UNIT Error Method:** **Indoor Heat Exchanger Temperature Sensor (Middle) Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Heat Exchanger Temperature Thermistor	When Heat Exchanger Temperature Thermistor open or short-circuit is detected at power ON.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Controller PCB failure

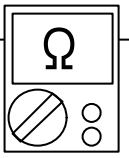
Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)

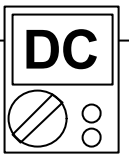
Temperature	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
Resistance Value (kΩ)	176	134	103	80.3	62.9	49.7	39.6	31.7

Temperature	40°C	45°C	50°C
Resistance Value (kΩ)	25.6	20.8	17.1

▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Controller PCB (DC5.0V)



Make sure circuit diagram of indoor unit and check terminal voltage at Thermistor (DC5.0V)

▶ **If the voltage does not appear, replace Controller PCB.**

Trouble shooting 5 **OUTDOOR UNIT Error Method:** **Outdoor Heat Exchanger Temperature Sensor (outlet) Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit Heat Exchanger Temperature Thermistor	When Heat Exchanger Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Inverter PCB failure

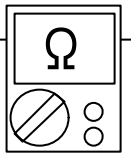
Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)

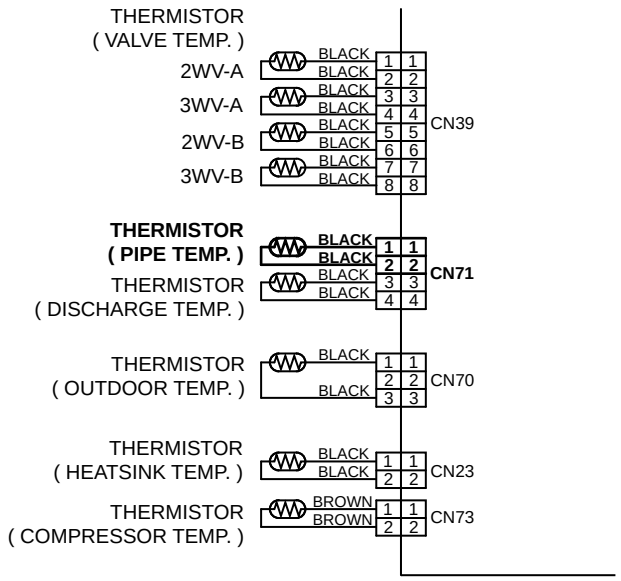
Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C
Resistance Value (kΩ)	27.8	21.0	16.1	12.4	9.63	7.56	5.98	4.77	3.84

▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Inverter PCB (DC5.0V)

Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)



▶ **If the voltage does not appear, replace Inverter PCB.**

Trouble shooting 6 **OUTDOOR UNIT Error Method:** **Outdoor Temperature Sensor Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit Outdoor Temperature Thermistor	When Outdoor Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Inverter PCB failure

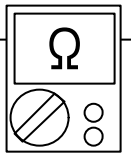
Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)

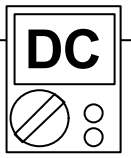
Temperature	-20°C	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C
Resistance Value (kΩ)	115	62.3	46.6	35.2	26.9	20.7	16.1	12.6

Temperature	30°C	40°C	50°C	60°C	70°C
Resistance Value (kΩ)	7.97	5.18	3.45	2.36	1.65

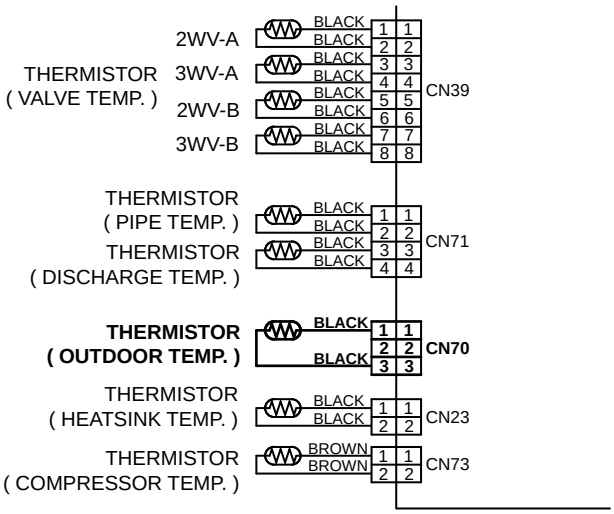
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Inverter PCB (DC5.0V)



Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)



▶ **If the voltage does not appear, replace Inverter PCB.**

Trouble shooting 7 **OUTDOOR UNIT Error Method:** **Outdoor Discharge Pipe Temperature Sensor Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit Discharge Pipe Temperature Thermistor	When Discharge Pipe Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Inverter PCB failure

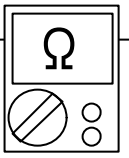
Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)

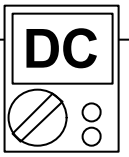
Temperature	0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C	60°C
Resistance Value (kΩ)	169	130	101	79.1	62.5	40.0	26.3	17.8	12.3

Temperature	70°C	80°C	90°C	100°C	120°C
Resistance Value (kΩ)	8.69	6.27	4.60	3.43	2.00

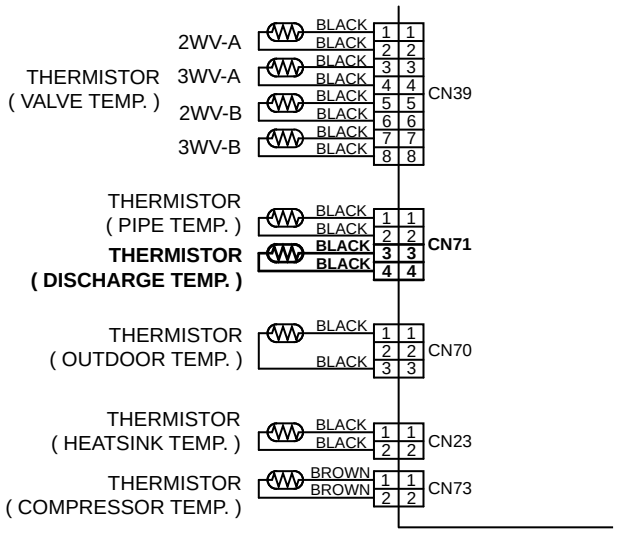
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Inverter PCB (DC5.0V)



Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)



▶ **If the voltage does not appear, replace Inverter PCB.**

Trouble shooting 8 **INDOOR UNIT Error Method:** **Indoor EEPROM Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB circuit	When the model information being read from EEPROM has an apparent error.

Forecast of Cause:

1. External cause 2. Defective connection of electric components 3. Controller PCB failure

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO → Check Point 1-2 :
Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop : Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit.
- Noise : Check if there is any equipment causing harmonic wave near electric line.(Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

YES ↓

Check Point 2 :
Check Indoor Unit electric components

- Check all connectors. (loose connector or incorrect wiring)
- Check any shortage or corrosion on PCB.

↓

Check Point 3 : Replace Controller PCB

▶ **Change Controller PCB.**

Note : EEPROM

EEPROM(Electronically Erasable and Programmable Read Only Memory) is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically.
To change the contents, it uses higher voltage than normal, and it can not change a partial contents. (Rewriting shall be done upon erasing the all contents.)
There is a limit in a number of rewriting.

Trouble shooting 9 **INDOOR UNIT Error Method:** **Indoor Fan Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Indoor UPPER Fan Motor Indoor LOWER Fan Motor	When the condition that actual frequency of Indoor Fan is below 1/3 of target frequency is continued more than 56 seconds. Or the condition of fan speed is 0rpm is continued more than 56 seconds.

Forecast of Cause:

1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Control PCB failure

Check Point 1 : Check rotation of Fan

- Rotate the fan by hand when operation is off.
  (Check if fan is caught, dropped off or locked motor)
  >>If Fan or Bearing is abnormal, replace it.

OK

Check Point 2 : Check ambient temp. around motor

- Check excessively high temperature around the motor.
  (If there is any surrounding equipment that causes heat)
  >>Upon the temperature coming down, restart operation.

OK

Check Point 3 : Replace Controller PCB

▶ **If Check Point 1,2 do not improve the symptom, change Controller PCB.**

Trouble shooting 10 **INDOOR UNIT Error Method:** **Serial Error** **(Serial Forward Transfer Error)**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit	When the outdoor unit cannot receive the serial signal from Indoor unit more than 10seconds.

Forecast of Cause:

1. Connection failure 2. External cause 3. Controller PCB failure

Check Point 1-1 : Reset the power

- Does Error indication reappear?

NO

YES

Check Point 2 : Check Connection

- Check any loose or removed connection line of Indoor unit and Outdoor unit.

  >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.

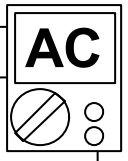
- Check connection between Indoor Unit Controller PCB. (If there is loose connector or open cable)

Check Point 1-2:
Check external cause such as noise

- Check the complete insulation of the grounding.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).

OK

Check Point 3 : Check the voltage of power supply

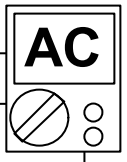


- Check the voltage of power supply

  >> Check if AC198 - 264V appears at Outdoor Unit Terminal 1 - 2.

OK

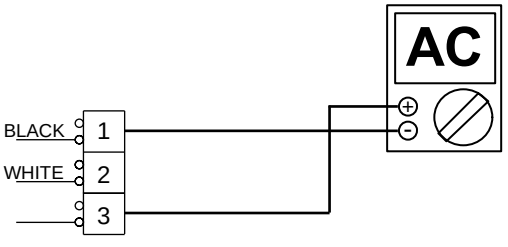
Check Point 4 : Check Serial Signal (Forward Transfer Signal)



- Check Serial Signal (Forward Transfer Signal)

  >> Check if Indicated value swings between AC70V and AC130V at Outdoor Unit Terminal 1 - 3.

  >> If it is abnormal, Controller PCB is failure. >> Replace Controller PCB



Trouble shooting 11 **OUTDOOR UNIT Error Method:** **IPM Protection**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit Compressor	① When more than normal operating current to IPM in Inverter PCB flows, the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ② repeats 5 times, the compressor stops permanently.

Forecast of Cause :

1. Defective connection of electric components
2. Outdoor Fan Operation failure
3. Outdoor Heat Exchanger clogged
4. Compressor failure
5. Inverter PCB failure

Check Point 1 : Check connections of Outdoor Unit Electrical Components

- Check if the terminal connection is loose.
- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Check Outdoor Fan, Heat Exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of Outdoor Heat Exchanger?
- Is the Fan rotating by hand when operation is off ?
  >> If the Fan Motor is locked, replace it.
- Check Outdoor Fan Motor. (Refer to Trouble shooting 14)
  >> If the Fan Motor is failure, replace it.

OK

Check Point 3 : Check Compressor

- Check Compressor. **(PARTS INFORMATION 2)**

OK

Check Point 4 : Replace Inverter PCB

▶ **If Check Point 1, 2, 3 do not improve the symptom, change Inverter PCB.**

Trouble shooting 12 **OUTDOOR UNIT Error Method:** CT error	**Indicate or Display:** Refer to error code table.

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit (Input current sensor unit)	When Input Current Sensor has detected lower than 0A while Inverter Compressor is operating at higher than 60Hz, after 1minute upon starting the Compressor. (Except during the defrost operation)

Forecast of Cause :

1. Defective connection of electric components 2. External cause 3. Inverter PCB failure

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO

YES

Check Point 2 :
Check connections of Outdoor Unit Electrical Components

- Check if the terminal connection is loose.
- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 1-2 :
Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop : Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit.
- Noise : Check if there is any equipment causing harmonic wave near electric line.(Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

Check Point 3 : Replace Inverter PCB

▶ **If Check Point 1, 2 do not improve the symptom, change Inverter PCB.**

Trouble shooting 13 **OUTDOOR UNIT Error Method:** **Compressor rotor location cannot detect (Permanent Stop)**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit	① While running the compressor, if the detected rotor location is out of phase with actual rotor location more than 105 degrees, the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ②repeats 5 times, the compressor stops permanently.

Forecast of Cause :

1. Defective connection of electric components 2. Inverter PCB failure

Check Point 1 : Check connection of around the Compressor components

For Compressor Terminal, Inverter PCB

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.
  (Refer to PARTS INFORMATION 2)

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Replace Inverter PCB

▶ **If Check Point 1 do not improve the symptom, change Inverter PCB.**

Trouble shooting 14 **OUTDOOR UNIT Error Method:** **Outdoor Unit Fan Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit Outdoor Fan Motor	① When outdoor fan rotation speed is less than 100rpm in 20 seconds after fan motor starts, fan motor stops. ② After fan motor restarts, if the same operation within 60sec is repeated 3 times in a row, compressor and fan motor stops. ③ If ① and ② repeats 5 times in a row, compressor and fan motor stops permanently.

Forecast of Cause:

1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Inverter PCB failure

Check Point 1 : Check rotation of Fan

- Rotate the fan by hand when operation is off.
  (Check if fan is caught, dropped off or locked motor)
  >>If Fan or Bearing is abnormal, replace it.

OK

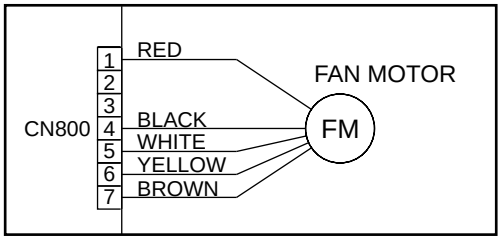
Check Point 2 : Check ambient temp. around motor

- Check excessively high temperature around the motor.
  (If there is any surrounding equipment that causes heat)
  >>Upon the temperature coming down, restart operation.

OK

Check Point 3 : Check Output Voltage of Inverter PCB

- Check outdoor unit circuit diagram and the voltage.
  (Measure at Inverter PCB side connector)



Read wire	DC voltage
Red - Black	300～400V
White - Black	15±1.5V

▶ **If the voltage is not correct, replace Inverter PCB.**

Trouble shooting 15 **OUTDOOR UNIT Error Method:** **Heat Sink Thermistor (Inverter) Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit Heat Sink Temperature Thermistor	When Heat Sink Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Inverter PCB failure

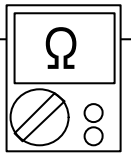
Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)

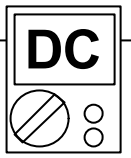
Temperature	0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C
Resistance Value (kΩ)	15.8	12.2	9.5	7.5	5.9	3.78	2.50	1.69

Temperature	60°C	70°C	80°C	90°C	100°C
Resistance Value (kΩ)	1.17	0.83	0.60	0.44	0.33

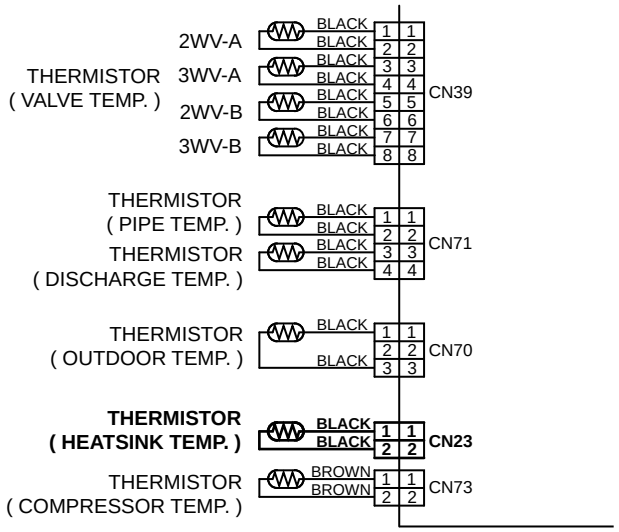
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Inverter PCB (DC5.0V)



Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)



▶ **If the voltage does not appear, replace Inverter PCB.**

Trouble shooting 16 **OUTDOOR UNIT Error Method:** **Compressor Start-up Error (Permanent Stop)**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit	① On start-up of the compressor location detection, start-up duty is raised by every 0.2 % up to maimum 20 %. ② Location detection is repeated up to 50 times. If the 50th start-up try fails, 3 minutes ST is done and above location detection start-up starts again. ③ If ① and ②repeats 3 times, the compressor stops permanently.

Forecast of Cause :

1. Defective connection of electric components 2. Inverter PCB failure

Check Point 1 : Check connection of around the Compressor components

For Compressor Terminal, Inverter PCB

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.
  (Refer to PARTS INFORMATION 2)

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Replace Inverter PCB

▶ **If Check Point 1 do not improve the symptom, replace Inverter PCB.**

Trouble shooting 17 **OUTDOOR UNIT Error Method:** **2-way Valve Temperature Sensor Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit 2-way valve Temperature Thermistor	When 2-way valve Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Inverter PCB failure

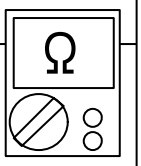
Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)

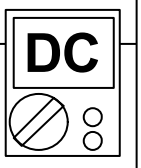
Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	30°C
Resistance Value (kΩ)	312	233	176	134	103	80.3	62.9	39.6

Temperature	40°C	50°C	60°C	70°C	80°C
Resistance Value (kΩ)	25.6	17.1	11.6	8.12	5.78

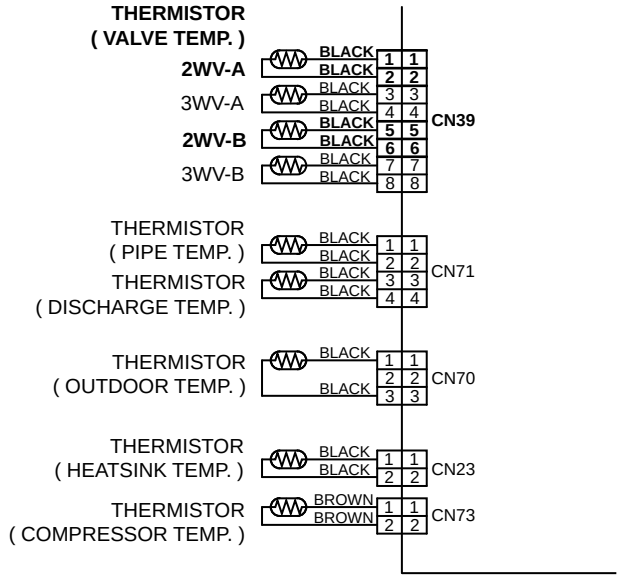
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Inverter PCB (DC5.0V)



Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)



▶ **If the voltage does not appear, replace Inverter PCB.**

Trouble shooting 18 **OUTDOOR UNIT Error Method:** **3-way Valve Temperature Sensor Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit 3-way valve Temperature Thermistor	When 3-way valve Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2.Thermistor failure 3. Inverter PCB failure

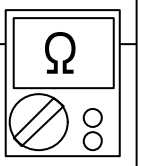
Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)

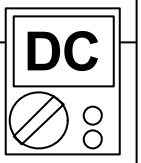
Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	30°C
Resistance Value (kΩ)	312	233	176	134	103	80.3	62.9	39.6

Temperature	40°C	50°C	60°C	70°C	80°C
Resistance Value (kΩ)	25.6	17.1	11.6	8.12	5.78

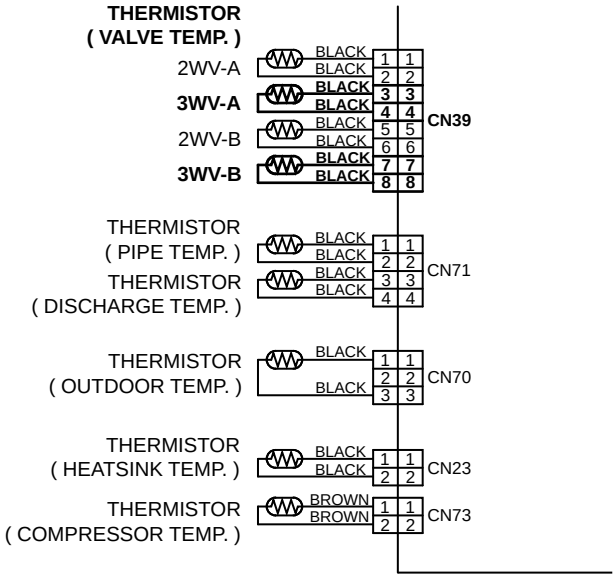
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Inverter PCB (DC5.0V)



Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)



▶ **If the voltage does not appear, replace Inverter PCB.**

Trouble shooting 19 **OUTDOOR UNIT Error Method:** **Connected Indoor Unit Abnormal**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit	When the total capacity of the connected indoor units exceed the connectable range of the total capacity.

Forecast of Cause :

1. The selection of connected indoor unit is incorrect 2.Inverter PCB failure

Check Point 1 : Check the total capacity of indoor unit

- Check the total capacity of the connected indoor units.

>>If abnormal condition is found, correct it by referring to Installation Manual or Data & Technical Manual.

OK

Check Point 2 : Replace Inverter PCB

▶ **If Check Point 1 do not improve the symptom, change Inverter PCB.**

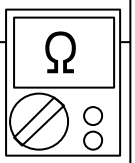
Trouble shooting 20 **INDOOR UNIT Error Method:** **Indoor Manual Auto Switch Abnormal**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Manual auto switch	When the Manual auto switch becomes ON for 60 consecutive seconds.

Forecast of Cause :

1. Manual auto switch failure 2.Controller PCB failure

Check Point 1 : Check the Manual auto switch



- Check if Manual auto switch is kept pressed.
- Check ON/OFF switching operation by using a meter.

>>If Manual auto switch is detective, replace it.

OK

Check Point 2 : Replace Controller PCB

▶ **If Check Point 1 do not improve the symptom, change Controller PCB.**

Trouble shooting 21 **OUTDOOR UNIT Error Method:** **Discharge Temperature error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit Discharge Pipe Temperature Thermistor	When the discharge temperature becomes higher than 110°C, the compressor stops.

Forecast of Cause :

1. Valve is close 2. EEV failure 3. Gas Leak, less 4. Discharge Thermistor failure
5. Outdoor Fan Operation failure 6. Outdoor Heat Exchanger clogged

< Cooling mode >

Check Point 1 : Check if Gas Valve is open

- If it is not open, open it and check the operation.

OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
  (Refer to PARTS INFORMATION 3)

>>If EEV or Strainer is defective, replace it.

OK

Check Point 3 : Check if gas leak or less gas

- Measure Gas pressure, if there is a leak, correct it.

>>If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

Check Point 4 : Check Discharge Thermistor

- Isn't it fallen off the holder?
- Is there a cable pinched?

>> Check characteristics of thermistor (Refer to Trouble shooting 7), If defective, replace the thermistor

OK

Check Point 5 : Check Outdoor FAN, Heat Exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of Outdoor Heat Exchanger?
- Is the Fan rotating? (Check by hand and if it is locked, replace the motor)
- Check Outdoor Fan Motor.

>>If the Fan Motor is defective, replace it.

< Heating mode >

Check Point 1 : Check if Liquid Valve is open

- If it is not open, open it and check the operation.

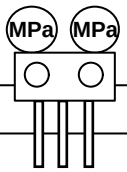
OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
  (Refer to PARTS INFORMATION 3)

>>If EEV or Strainer is defective, replace it.

OK



Trouble shooting 22 **OUTDOOR UNIT Error Method:** **Excessive High Pressure Protection on Cooling**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit Outdoor Fan Motor Heat Exchanger Temp. Thermistor Outdoor unit Electronic Expansion Valve	Excessive high pressure protection on cooling mode has been activated.

Forecast of Cause :

1. Defective connection of electric components 2. Outdoor Fan Operation failure
3. Outdoor Heat Exchanger clogged 4. Thermistor failure 5. EEV failure 6. Inverter PCB failure

Check Point 1 : Check connections of Outdoor Unit Electrical Components

- Check if the terminal connection is loose.
- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Check Outdoor Fan, Heat Exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of Outdoor Heat Exchanger?
- Is the Fan rotating by hand when operation is off ?

>> If the Fan Motor is locked, replace it.

OK

Check Point 3 : Check Outdoor Fan

- Check Outdoor Fan Motor. (Refer to Trouble shooting 14)

>> If the Fan Motor is failure, replace it.

OK

Check Point 4 : Check Thermistor

- Check Thermistor. (Refer to Trouble shooting 4)

>> If the Thermistor is failure, replace it.

OK

Check Point 5 : Check Electronic Expansion Valve

- Check EEV. **(PARTS INFORMATION 3)**

OK

Check Point 6 : Replace Inverter PCB

▶ **If Check Point 1～5 do not improve the symptom, change Inverter PCB.**

Trouble shooting 23 **OUTDOOR UNIT Error Method:** **4-way valve Abnormal**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit 4-way valve	When the indoor heat exchanger temperature is compared with the indoor temperature, and either following condition is detected continuously two times, the compressor stops. Cooling or Dry operation [Indoor heat exchanger temp.] - [Indoor temp.] < -10degC Heating operation [Indoor heat exchanger temp.] - [Indoor temp.] > +10degC the compressor stops permanently.

Forecast of Cause :

1. Connector connection failure 2. Thermistor failure 3. Coil failure 4. 4-way valve failure
5. Inverter PCB failure

Check Point 1 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if thermistor cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Check thermistor

- Isn't it fallen off the holder?
- Is there a cable pinched?

>> Check characteristics of thermistor,
If defective, replace the thermistor

OK

Check Point 3 : Check the solenoid coil and 4-way valve

[Solenoid coil]
- Remove CN30 from PCB and check the resistance value of coil.
  Resistance value is about 1.4kΩ

>>If it is Open or abnormal resistance value, replace Solenoid Coil.

[4-way valve]
- Check each piping temperature,
  and the location of the valve by the temperature difference.

>>If the value location is not proper, replace 4-way valve.

OK

Check Point 4 : Replace Inverter PCB

▶ **If Check Point 1- 3 do not improve the symptom, replace Inverter PCB.**

Trouble shooting 24 **OUTDOOR UNIT Error Method:** **Compressor Temperature Error / Circulation Refrigerant Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Heat Exchanger Temperature Thermistor Room Temperature Thermistor	If the following condition is detected, the compressor stops running. - When the compressor runs for 20 minutes. - When the difference between the "Indoor Heat Excanger Temperature" and "Room Temperature" is within 4 deg C. (cooling operation only)

Forecast of Cause :

1. Valve is close 2. EEV failure 3. Gas Leak, less 4. Outdoor Fan Operation failure
5. Outdoor Heat Exchanger clogged

< Cooling mode >

Check Point 1 : Check if Gas Valve is open

- If it is not open, open it and check the operation.

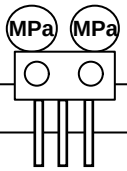
OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
  (Refer to PARTS INFORMATION 3)

>>If EEV or Strainer is defective, replace it.

OK



Check Point 3 : Check if gas leak or less gas

- Measure Gas pressure, if there is a leak, correct it.

>>If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

Check Point 4 : Check Outdoor FAN, Heat Exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of Outdoor Heat Exchanger?
- Is the Fan rotating? (Check by hand and if it is locked, replace the motor)
- Check Outdoor Fan Motor.

>>If the Fan Motor is defective, replace it.

Trouble shooting 25 **OUTDOOR UNIT Error Method:** **P.F.C. Circuit Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Inverter PCB Circuit	When inverter output DC voltage is higher than 415V for over 3 seconds, the compressor stops. If the same operation is repeated 5 times, the compressor stops permanently.

Forecast of Cause :

1. External cause 2. Connector connection failure 3. Inverter PCB failure

Check Point 1 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop : Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit.
- Noise : Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

OK

Check Point 2 : Check connection of Connector

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open.

>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 3 : Replace Inverter PCB

▶ **If Check Point 1, 2 do not improve the symptom, change Inverter PCB.**

Trouble shooting 26 **OUTDOOR UNIT Error Method:** **Compressor Temperature Sensor Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Main PCB Compressor Temperature Thermistor	When Compressor Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of connector

- Check if connector is removed.
- Check if connector is erroneous connection.
- Check if thermistor cable is open.

>> Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	0	5	10	15	20	30	40	50
Resistance value (kΩ)	168	130	101	79	63	40	26.3	17.8

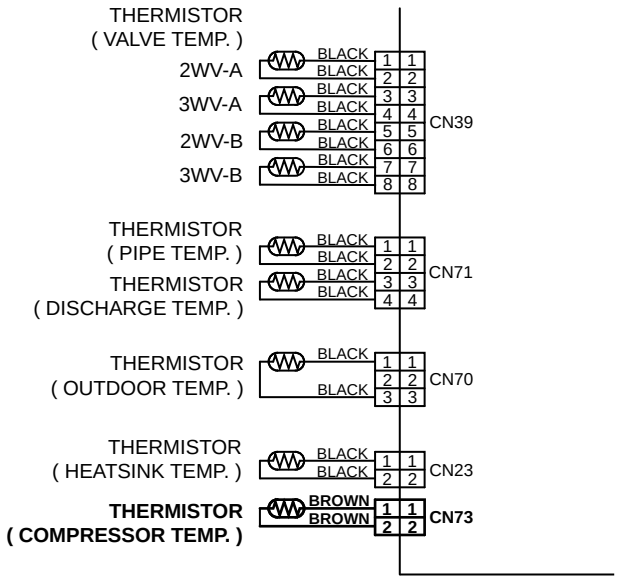
Temperature (°C)	60	70	80	90	100	120
Resistance value (kΩ)	12.3	8.7	6.3	4.6	3.4	2.0

▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Main PCB (DC5.0V)

Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC5.0V)



▶ **If the voltage does not appear, replace Main PCB.**

Trouble shooting 27 **INDOOR UNIT Error Method:** **Water Drain Abnormal**	**Indicate or Display:** **Refer to error code table.**

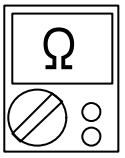
Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Circuit Float Switch	When Float Switch is ON for more than 3 minutes.

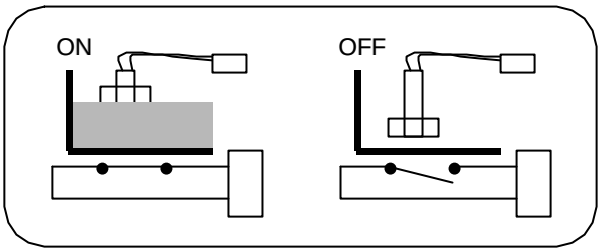
Forecast of Cause :

1. Float Switch failure 2. Shorted connector/ wire 3. Controller PCB failure

Check Point 1 : Check Float Switch

- Check operation of float switch. (any blocking by dust, etc.)
- Remove Float switch and check ON/OFF switching operation by using a meter.
  >>If Float switch is detective, replace it.





OK

Check Point 2 : Check Connector (CN9) / Wire

- Check loose contact of CN9 /shorted wire (pinched wire).
  >>Replace Float switch if the wire is abnormal

OK

Check Point 3 : Replace Controller PCB

▶ **If Check Point 1 & 2 do not improve the symptom, change Controller PCB.**

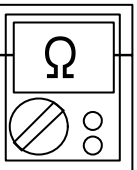
Trouble shooting 28 **INDOOR UNIT Error Method:** **Damper Error** **(Upper & Lower Air Flow)** **(Upper Air Flow)**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Circuit Limit switch Damper	When damper opening recovery operation repeats 6 times.

Forecast of Cause :

1. Limit switch failure
2. Shorted connector/ wire
3. Damper failure
4. Controller PCB failure

Check Point 1 : Check Limit switch



- Check operation of limit switch. (any blocking by dust, etc.)
- Remove Limit switch and check ON/OFF switching operation by using a meter.

>>If Limit switch is detective, replace it.

OK

Check Point 2 : Check Connector (CN18) / Wire

- Check loose contact of CN18 /shorted wire (pinched wire).

>>Replace Limit switch if the wire is abnormal

OK

Check Point 3 : Check Damper

- Check the obstruction of damper movement.
- Check the damper movement.

>>Replace Damper if the damper is abnormal

OK

Check Point 4 : Replace Controller PCB

▶ **If Check Point 1～3 do not improve the symptom, change Controller PCB.**

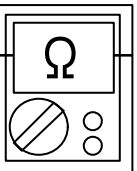
Trouble shooting 29 **INDOOR UNIT Error Method:** **Damper Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Circuit Limit switch	When close detecting sw and open detecting sw operates simultaneously.

Forecast of Cause :

1. Limit switch failure 2. Shorted connector/ wire 3. Controller PCB failure

Check Point 1 : Check Limit switch



- Check operation of limit switch. (any blocking by dust, etc.)
- Remove Limit switch and check ON/OFF switching operation by using a meter.

>>If Limit switch is detective, replace it.

OK

Check Point 2 : Check Connector (CN18) / Wire

- Check loose contact of CN18 /shorted wire (pinched wire).

>>Replace Limit switch if the wire is abnormal

OK

Check Point 3 : Replace Controller PCB

▶ **If Check Point 1 & 2 do not improve the symptom, change Controller PCB.**

2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 30

Indoor Unit - No Power

Forecast of Cause:

1. Power Supply failure 2. External cause
3. Electrical Components defective

Check Point 1 : Check Installation Condition

- Isn't the breaker down?
- Check loose or removed connection cable.

>>If abnormal condition is found, correct it by referring to Installation Manual or Data & Technical Manual.

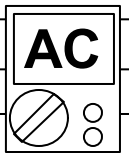
OK

Check Point 2 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components



- Check Voltage of power supply.

>> Check AC198 - 264V appears at Indoor Unit Terminal 1 - 2 (Power Supply).

NO

Outdoor unit Check F101 (Indoor supply line fuse)

YES

- Check Varistor (VA1) in Controller PCB.

>> If Varistor is defective, there is a possibility of an abnormal power supply. Check the correct power supply and replace Varistor.

OK

▶ If the symptom does not change by above Check3, replace Controller PCB and Indoor Unit Terminal.

Trouble shooting 31

Outdoor Unit - No Power

Forecast of Cause:

1. Power Supply failure 2. External cause
3. Electrical Components defective

Check Point 1 : Check Installation Condition

- Isn't the breaker down?
- Check loose or removed connection cable.

>>If abnormal condition is found, correct it by referring to Installation Manual or Data & Technical Manual.

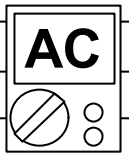
OK

Check Point 2 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line.
  (Neon bulb or electric equipment that may cause harmonic wave)
  Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components



- Check the voltage of power supply.

>> Check if AC198 - 264V appears at Outdoor Unit Terminal L - N.

NO

YES

- Check Fuse (F201) in Inverter PCB.

>> If Fuse is open, check loose terminal, and replace Fuse.

- Check Varistor in Inverter PCB (VA1, VA2).

>> If Varistor is defective, there is a possibility of an abnormal power supply. Check the correct power supply and replace Varistor. Upon checking the normal power supply, replace Varistor.

YES

▶ **If the symptom does not change by above Check 3, replace Inverter PCB.**

Trouble shooting 32

No Operation (Power is ON)

Forecast of Cause:

1. Setting/ Connection failure 2. External cause
3. Electrical Component defective

Check Point 1 : Check indoor and outdoor installation condition

- Indoor Unit - Check incorrect wiring between Indoor Unit - Remote Control, or terminals between Indoor Units. Or, check if there is an open cable connection.
- Are these Indoor Unit, Outdoor Unit, and Remote Control suitable model numbers to connect?

>> If there is some abnormal condition, correct it by referring to Installation manual and Data & Technical Manual.

OK

Turn off Power and check/ correct followings.

- Is there loose or removed communication line of Indoor Unit and Outdoor Unit?

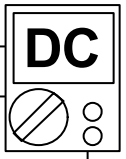
OK

Check Point 2 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop ----- Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply circuit.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line.
  (Neon bulb or electric equipment that may cause harmonic wave)
  Check the complete insulation of grounding.

OK

Check Point 3 : Check Electrical Components at Indoor and Outdoor



- Check Voltage at CN17 of Controller PCB. (Power supply to Remote Control)

>> If it is DC12V, Remote Control(Option) is failure. (Controller PCB is normal) >> Replace Remote Control(Option)
>> If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB

>> If the symptom does not change by above Check 1, 2, 3, replace Inverter PCB of Outdoor unit.

Trouble shooting 33

No Cooling / No Heating

Forecast of Cause:

1. Indoor Unit error 2. Outdoor Unit error
3. Effect by Surrounding environment
4. Connection Pipe / Connection Wire failure 5. Refrigeration cycle failure

Check Point 1 : Check Indoor Unit

- Does Indoor Unit FAN run on HIGH FAN?
- Is Air Filter dirty?
- Is Heat Exchanger clogged?
- Check if Energy save function is operated.

OK

Check Point 2 : Check Outdoor Unit Operation

- Check if Outdoor Unit is operating
  (If not, refer to Trouble shooting 26)
- Check any objects that obstruct the air flow route.
- Check clogged Heat Exchanger.
- Is the Valve open?

OK

Check Point 3 : Check Site Condition

- Is capacity of Indoor Unit fitted to Room size?
- Any windows open? Or direct sunlight ?

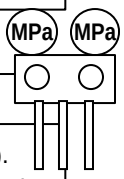
OK

Check Point 4 :
Check Indoor/ Outdoor Installation Condition

- Check connection pipe
  (specified pipe length & Pipe diameter?)
- Check any loose or removed communication line.

>> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.

OK



Check Point 5 : Check Refrigeration Cycle

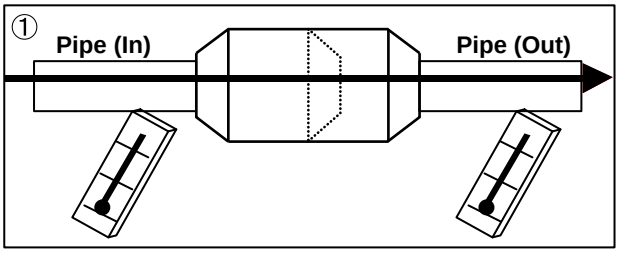
- Check if Strainer is clogged (Refer to the figure at right).
- Measure Gas Pressure and if there is a leakage, correct it.

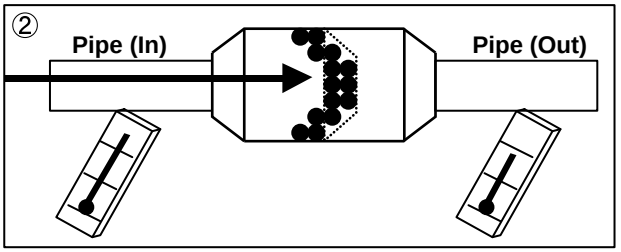
>> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.

- Check EEV (PARTS INFORMATION 3)
- Check Compressor (PARTS INFORMATION 1,2)

Attention

Strainer normally does not have temperature difference between inlet and outlet as shown in ① , but if there is a difference like shown in ② , there is a possibility of inside clogged. In this case, replace Strainer.





Trouble shooting 34

Abnormal Noise

Forecast of Cause :

1. Abnormal installation(Indoor/ Outdoor) 2. Fan failure(Indoor/ Outdoor)
3. Compressor failure (Outdoor)

Diagnosis method when Abnormal Noise is occurred

- Abnormal noise is coming from Indoor Unit. (Check and correct followings)
  - Is Main Unit installed in stable condition?
  - Is the installation of Air suction grille and front panel normal?

OK

  - Is Fan broken or deformed?
  - Is the screw of Fan loose?
  - Is there any object which obstruct the Fan rotation?

- Abnormal noise is coming from Outdoor Unit. (Check and correct followings)
  - Is Main Unit installed in stable condition?
  - Is Fan Guard installed normally?

OK

  - Is Fan broken or deformed?
  - Is the screw of Fan loose?
  - Is there any object which obstruct the Fan rotation?

OK

  - Check if vibration noise by loose bolt or contact noise of piping is happening.

OK

  - Is Compressor locked? >> Check Compressor (PARTS INFORMATION 1,2)

Trouble shooting 32

Water Leaking

Forecast of Cause:

1. Erroneous installation 2. Drain hose failure

Diagnosis method when water leak occurs

- Is Main Unit installed in stable condition?
- Is Main Unit broken or deformed at the time of transportation or maintenance?

OK

- Is Drain Hose connection loose?
- Is there a trap in Drain Hose?
- Is Drain Hose clogged?

OK

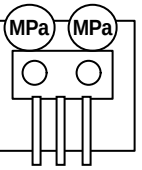
- Is Fan rotating? >> Check Fan Motor

Diagnosis method when water is spitting out.

- Is the filter clogged?

OK

- Check Gas Pressure and correct it if there was a gas leak.



2-4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

Diagnosis method of Compressor (If Outdoor Unit LED displays Error, refer to Trouble shooting)

Does not start up

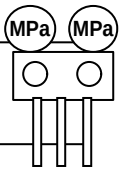
- Is there open or loose connection cable?
- Check Inverter PCB, connection of Compressor,and winding resistance. (Refer to the next page).

>> If there is no failure, the defect of Compressor is considered (Locked compressor due to clogged dirt or less oil)

Replace Compressor

Stops soon after starting up

- Is there open or loose connection cable?
- Is Gas Pipe Valve open? (Low Pressure is too low)
- Check if Refrigerant is leaking. (Recharge Refrigerant)



- Check if Strainer is clogged. (PARTS INFORMATION 3)
- Check Main PCB, connection of Compressor,and winding resistance. (Refer to the next page).

>> If there is no failure, the defect of Compressor can be considered. (Compression part broken or valve defective.)

Replace Compressor

Abnormal noise

- Check if vibration noise by loose bolt or contact noise of piping is happening.

▶Defective Compressor can be considered. (due to inside dirt clogging or broken component)

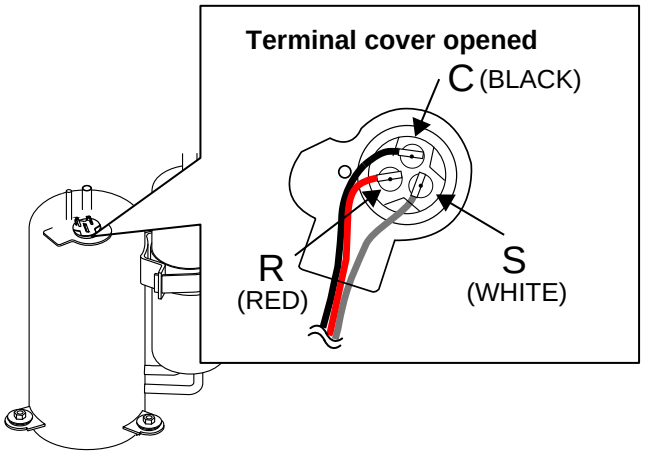
Replace Compressor

SERVICE PARTS INFORMATION 2

Inverter Compressor

Check Point 1 : Check Connection

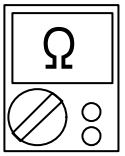
・Check terminal connection of Compressor
(loose or incorrect wiring)

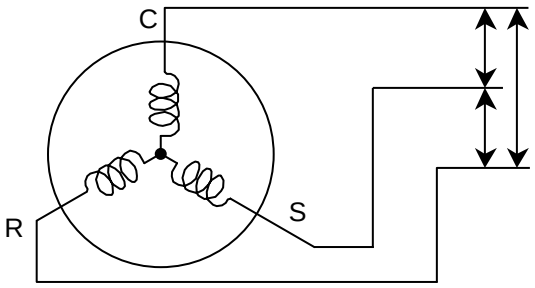


Check Point 2 : Check Winding Resistance

・Check winding resistance of each terminal

▶**If the resistance value is 0Ω or infinite, replace Compressor.**





Resistance Value : 0.67 Ω
(at 25°C)

Check Point 3 : Replace Inverter PCB

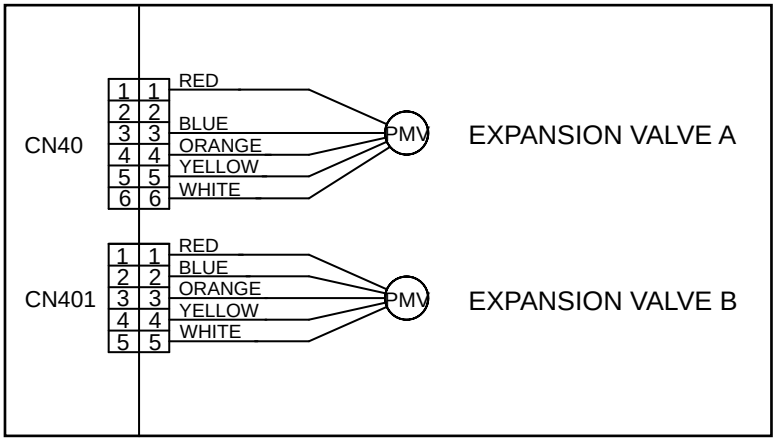
▶**If the symptom does not change with above Check 1, 2, replace Inverter PCB.**

SERVICE PARTS INFORMATION 3

Outdoor unit Electronic Expansion Valve
(EEV)

Check Point 1 : Check Connections

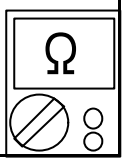
・Check connection of connector
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV

・Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	**46**Ω ± **4**Ω at 20°C
Yellow - Red	
Orange - Red	
Blue - Red	

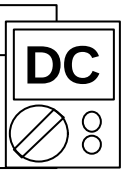


▶ **If Resistance value is abnormal, replace EEV.**

Check Point 3 : Check Voltage from Inverter PCB.

・Remove Connector and check Voltage (DC12V)

▶ **If it does not appear, replace Inverter PCB.**



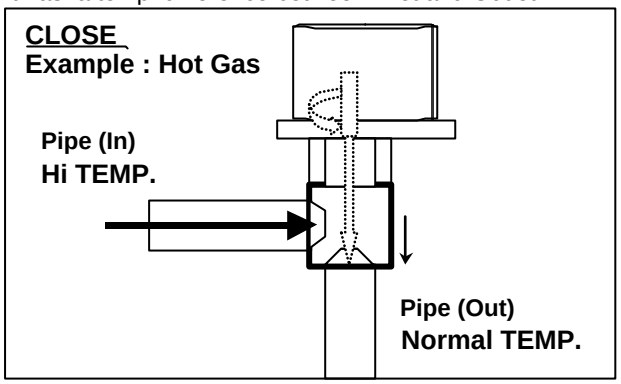
Check Point 4 : Check Noise at start up

・Turn on Power and check operation noise.

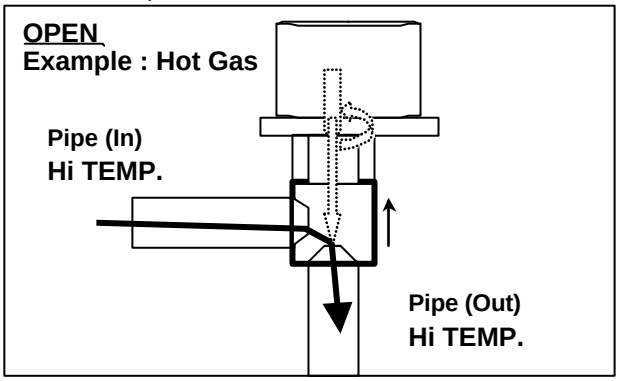
▶ **If an abnormal noise does not show, replace Inverter PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

When Valve is closed,
it has a temp. difference between Inlet and Outlet.

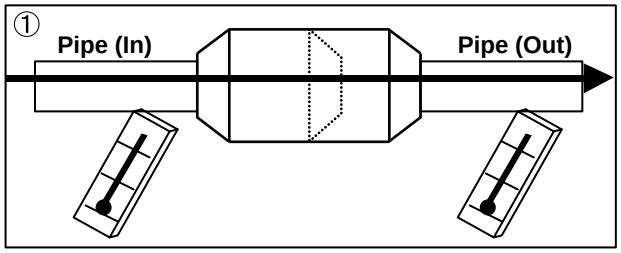


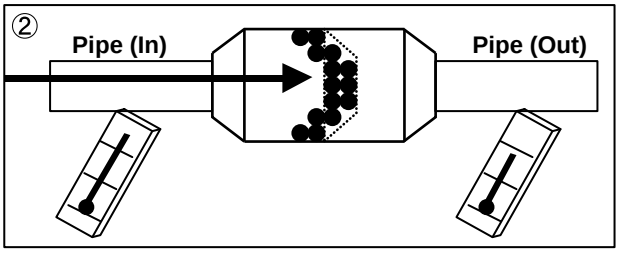
If it is open,
it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

Strainer normally does not have temperature difference between inlet and outlet as shown in ①,
but if there is a difference as shown in ②, there is a possibility of inside clogged. In this case, replace Strainer.



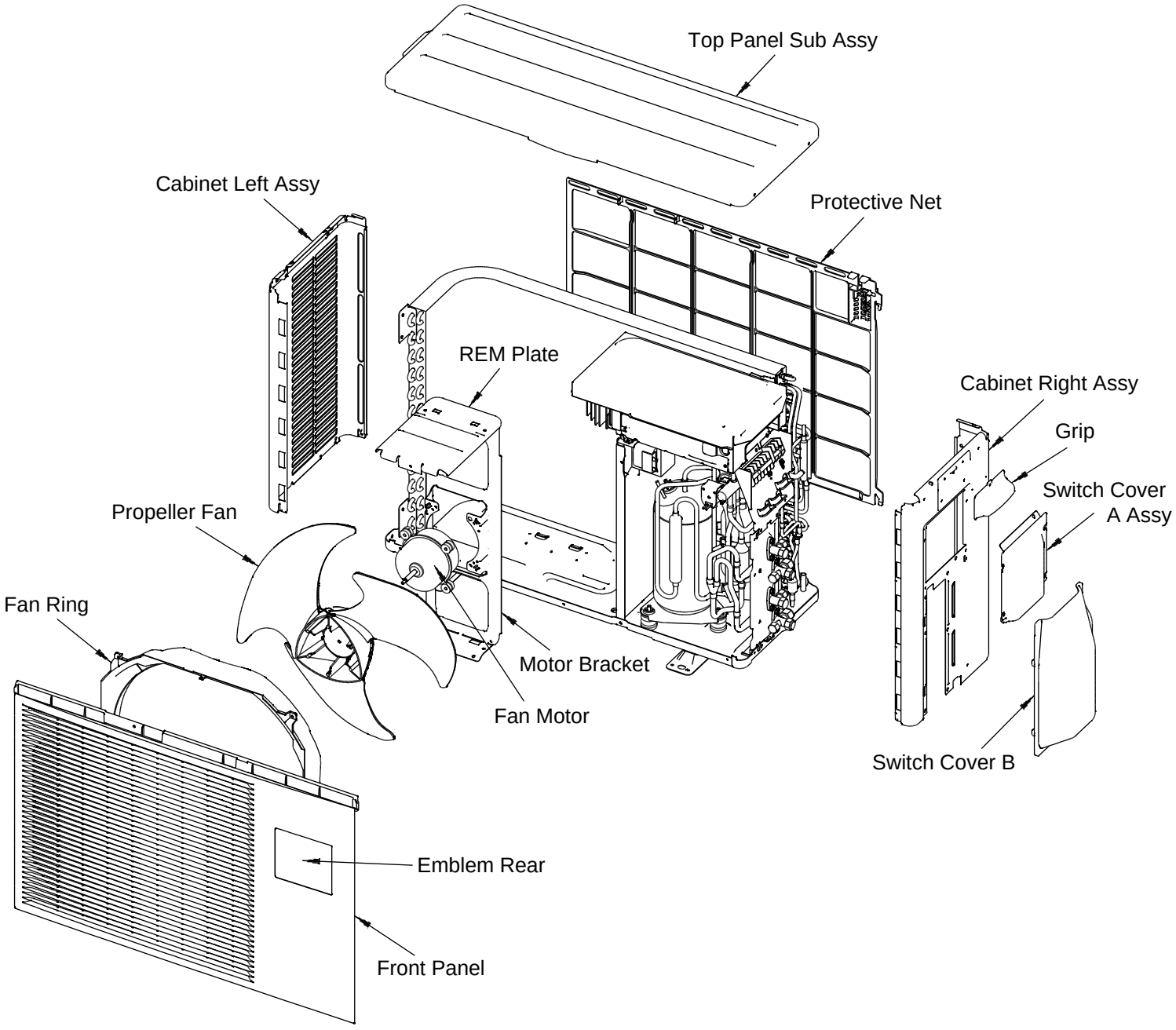


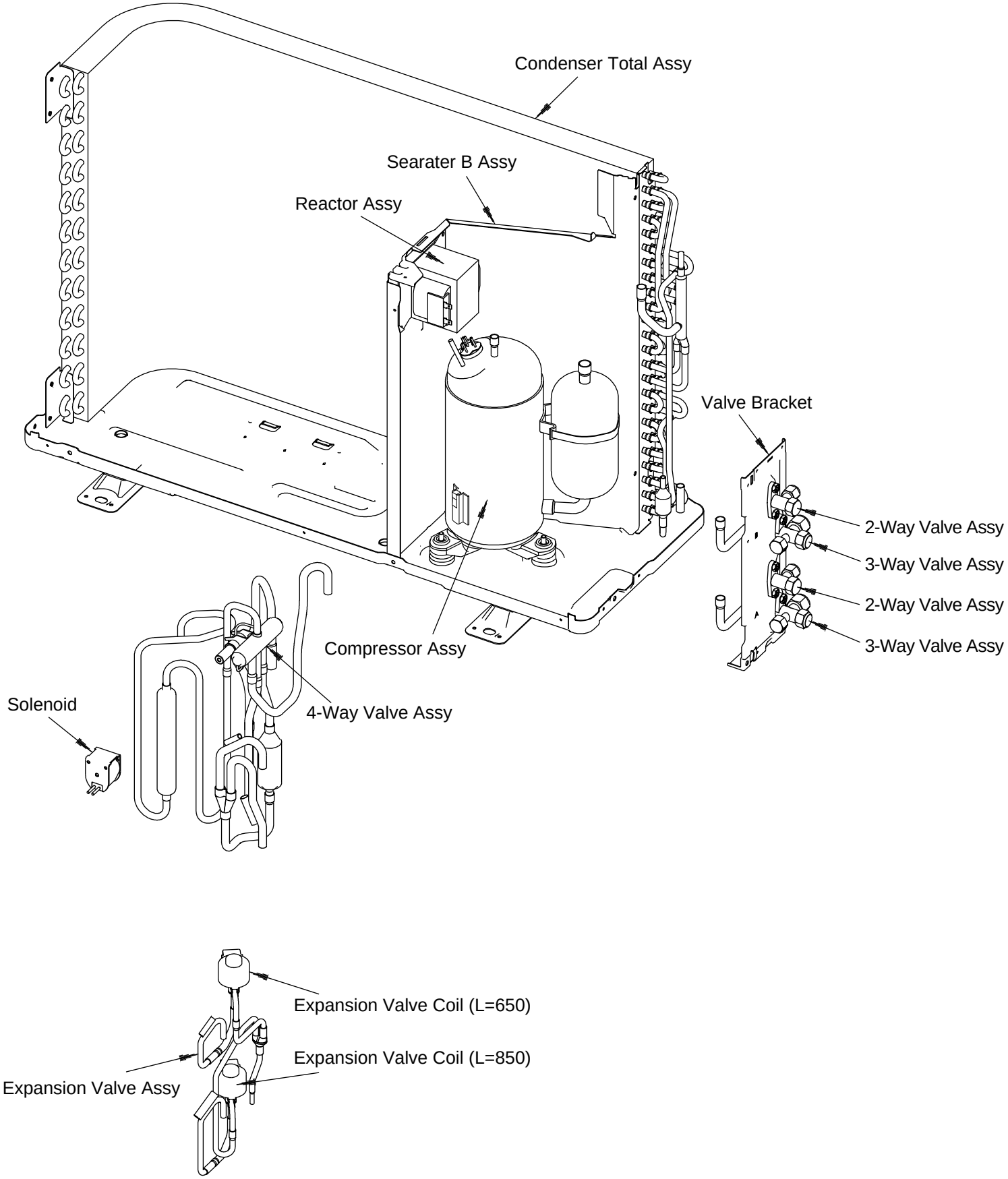
Refrigerant
R410A

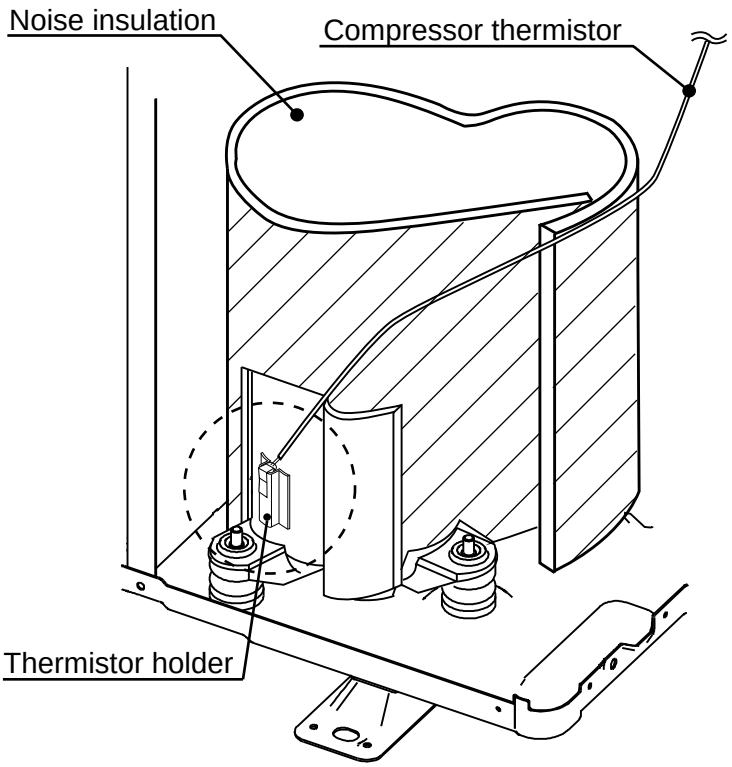
Floor / Wall Mounted / Cassete type
INVERTER (MULTI)

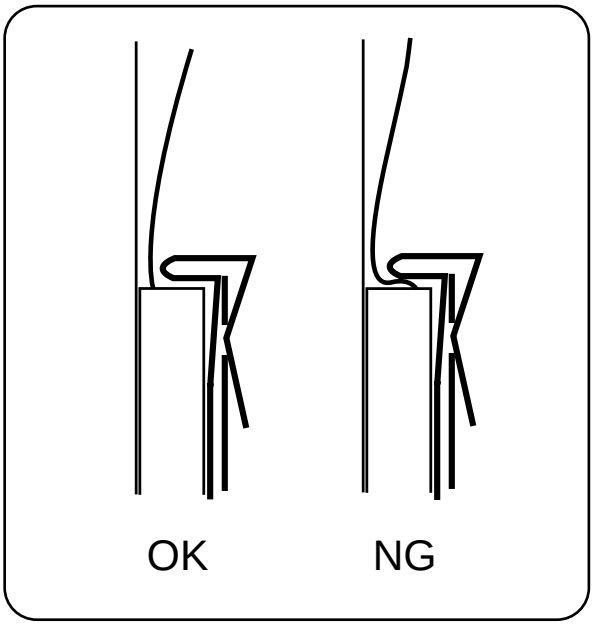
3 . REPLACEMENT PARTS

3. REPLACEMENT PARTS

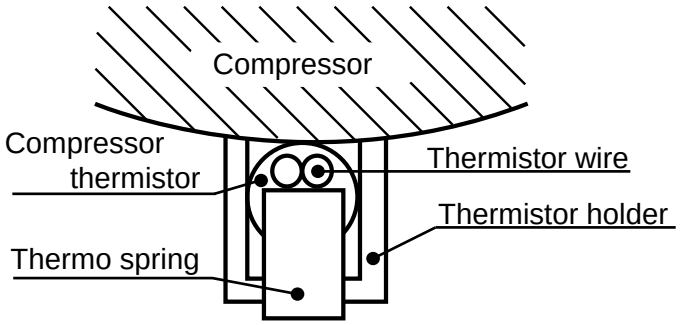


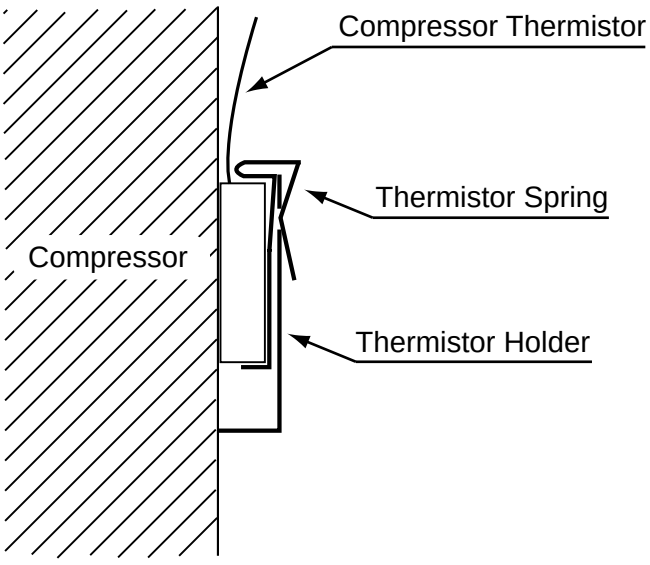

Condenser Total Assy
Searater B Assy
Reactor Assy
Valve Bracket
2-Way Valve Assy
3-Way Valve Assy
2-Way Valve Assy
3-Way Valve Assy
Compressor Assy
Solenoid
4-Way Valve Assy
Expansion Valve Coil (L=650)
Expansion Valve Coil (L=850)
Expansion Valve Assy



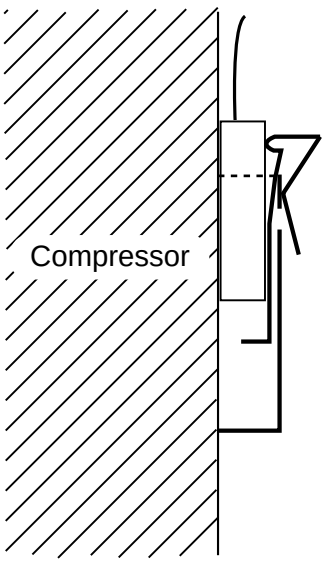


Section view

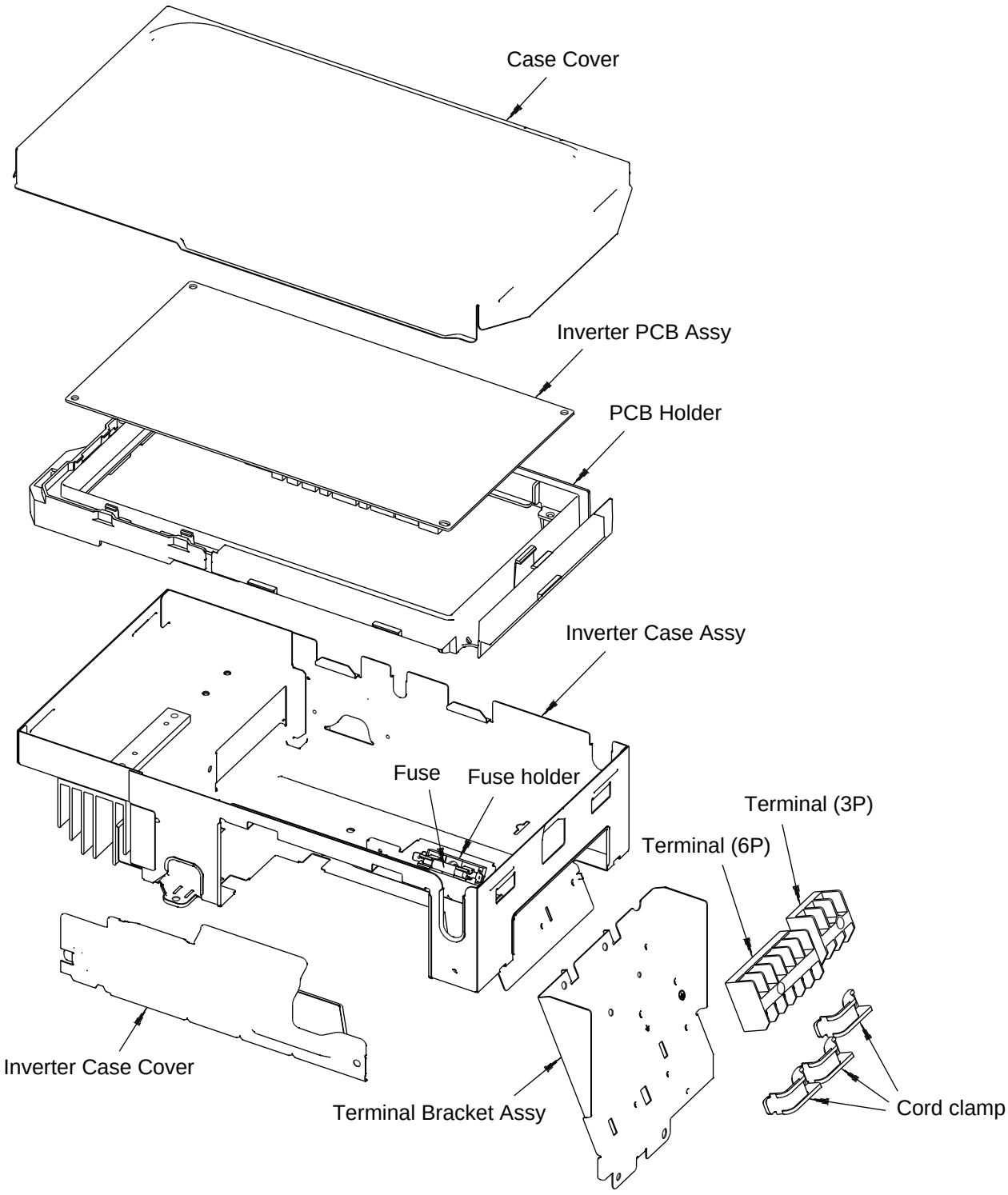


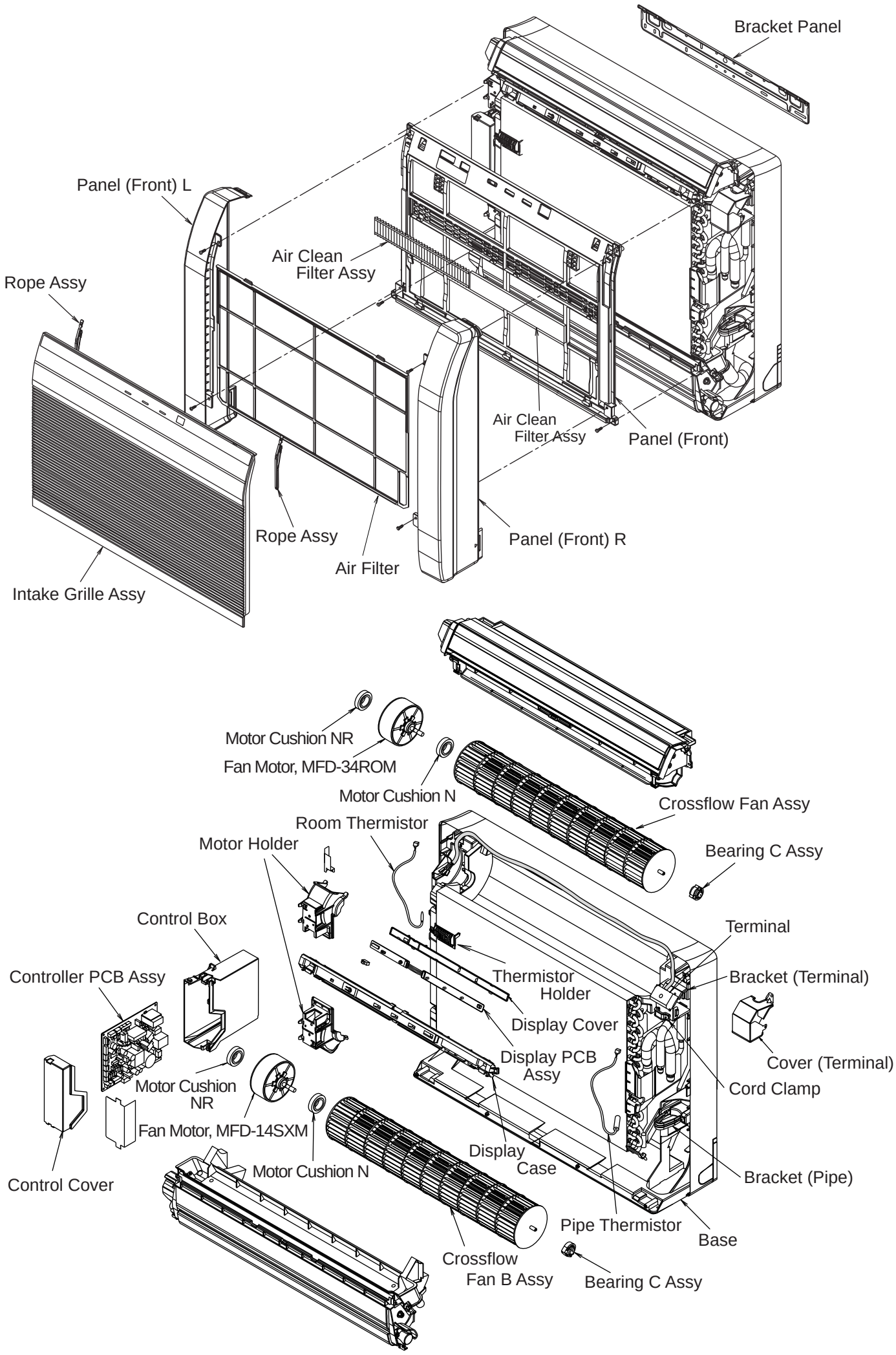


OK

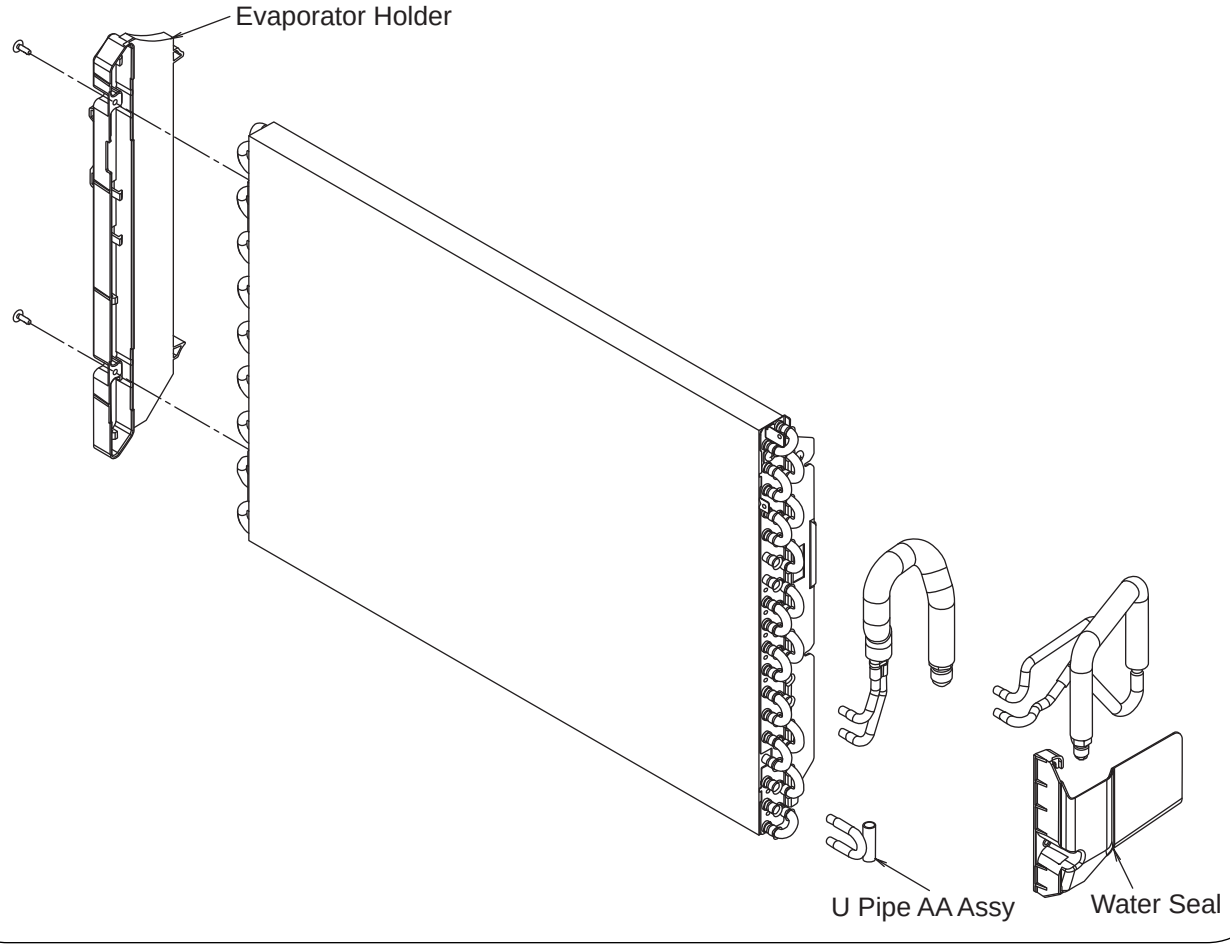


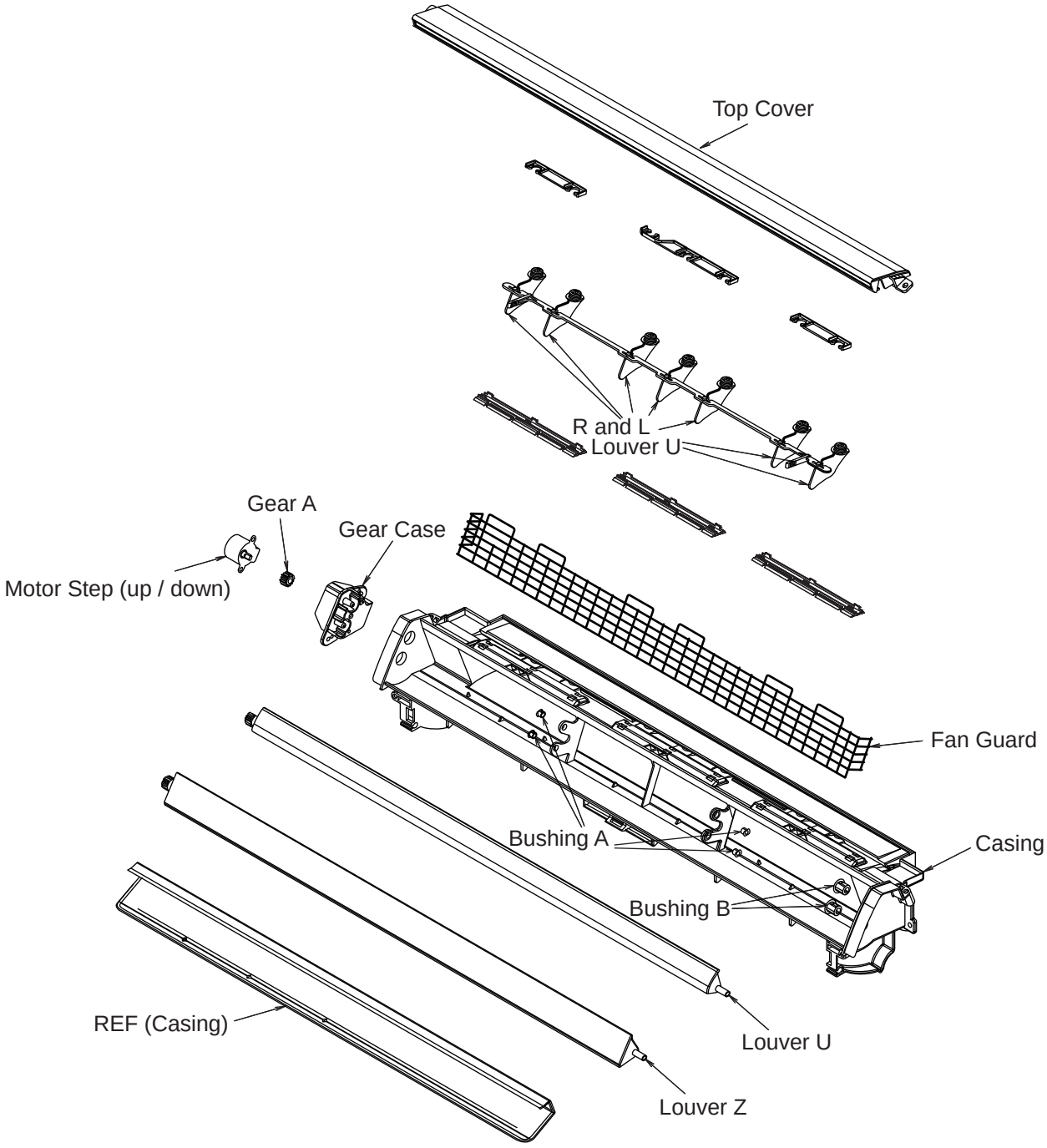
NG

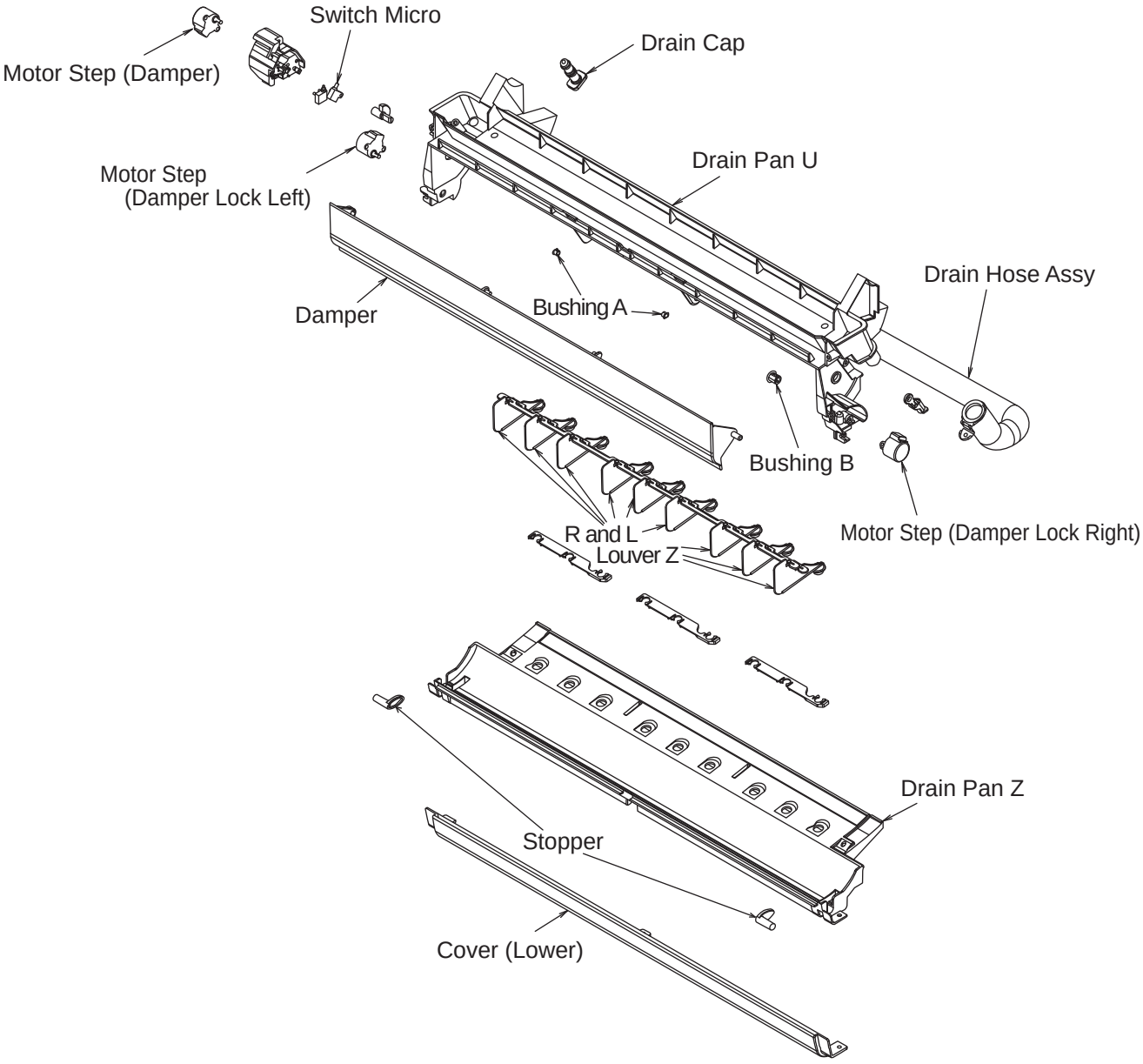

Case Cover
Inverter PCB Assy
PCB Holder
Inverter Case Assy
Fuse
Fuse holder
Terminal (3P)
Terminal (6P)
Inverter Case Cover
Terminal Bracket Assy
Cord clamp

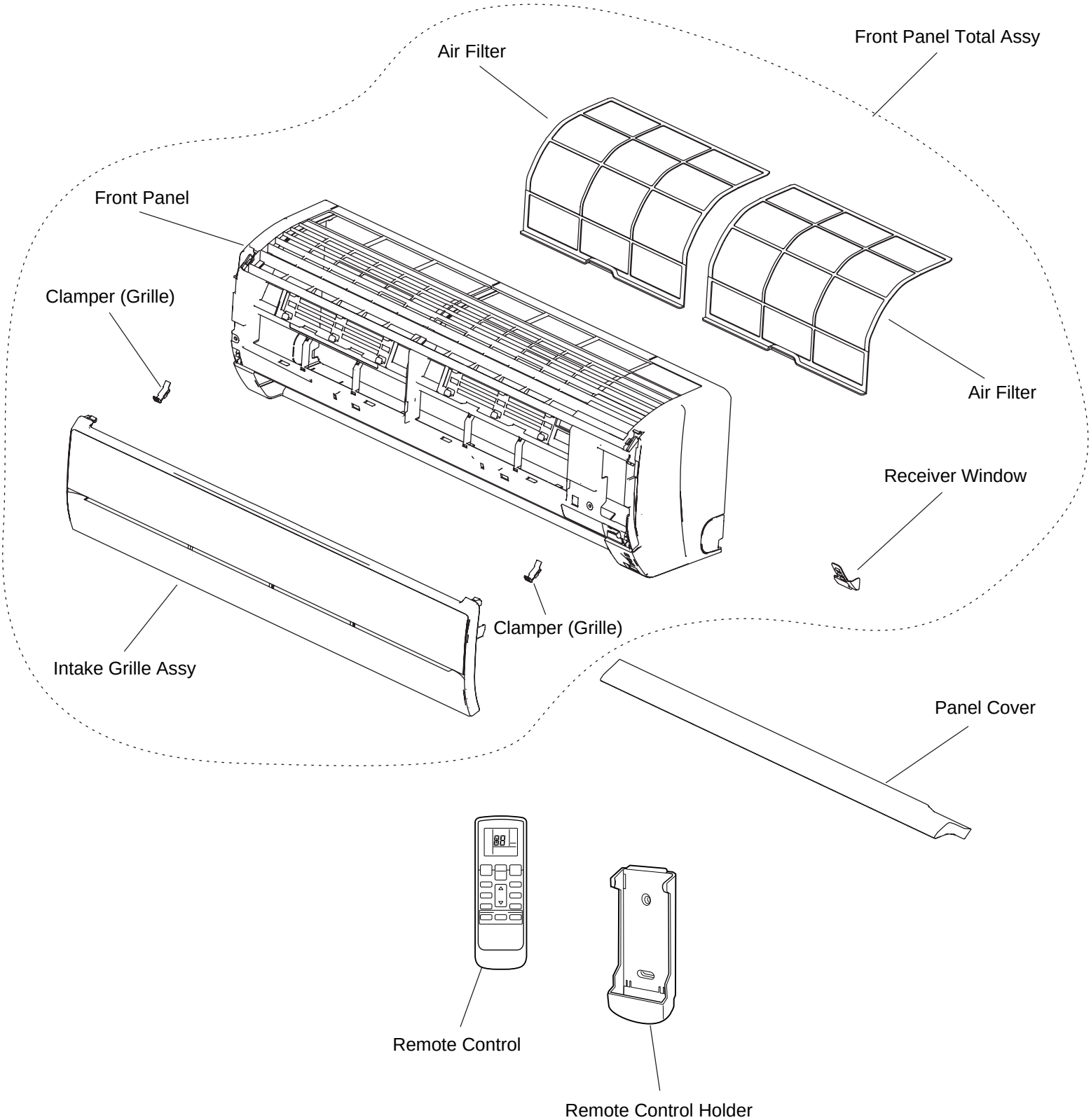

Bracket Panel
Panel (Front) L
Air Clean
Filter Assy
Rope Assy
Air Clean
Filter Assy
Panel (Front)
Rope Assy
Air Filter
Panel (Front) R
Intake Grille Assy
Motor Cushion NR
Fan Motor, MFD-34ROM
Motor Cushion N
Crossflow Fan Assy
Room Thermistor
Motor Holder
Bearing C Assy
Control Box
Terminal
Controller PCB Assy
Thermistor
Holder
Bracket (Terminal)
Display Cover
Display PCB
Assy
Cover (Terminal)
Cord Clamp
Motor Cushion
NR
Fan Motor, MFD-14SXM
Control Cover
Motor Cushion N
Display
Case
Bracket (Pipe)
Pipe Thermistor
Base
Crossflow
Fan B Assy
Bearing C Assy

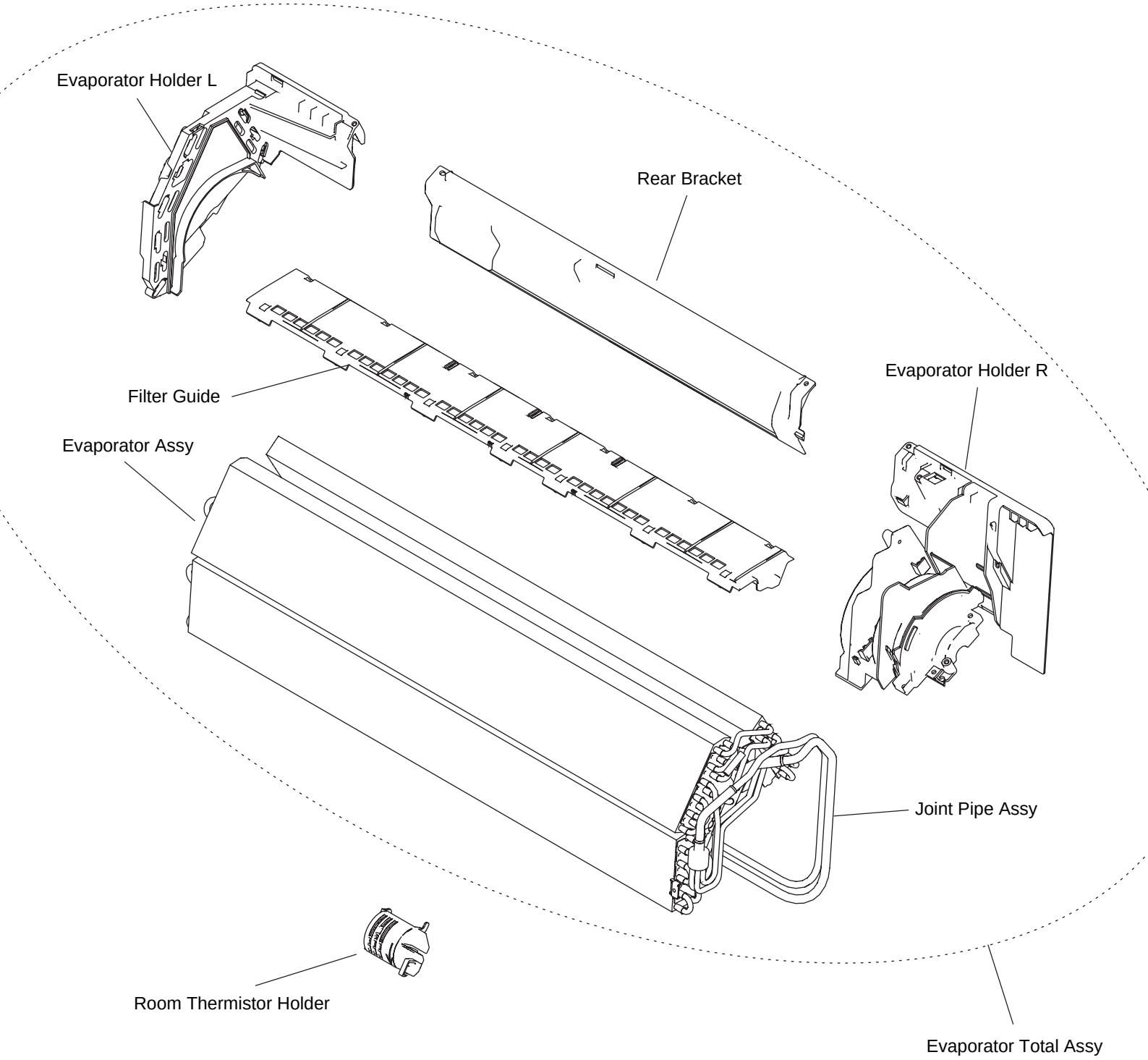
Evaporator Total Assy

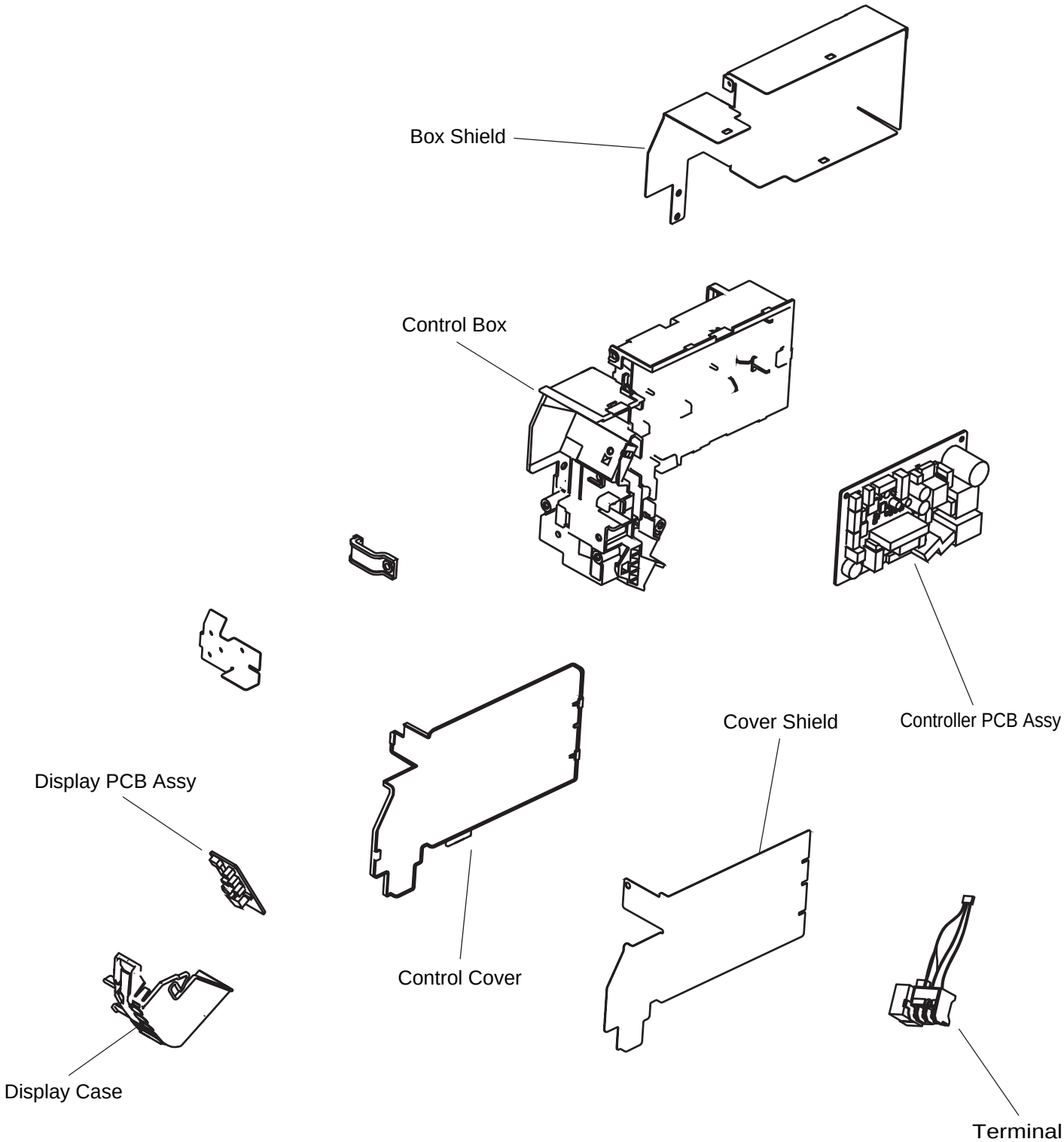


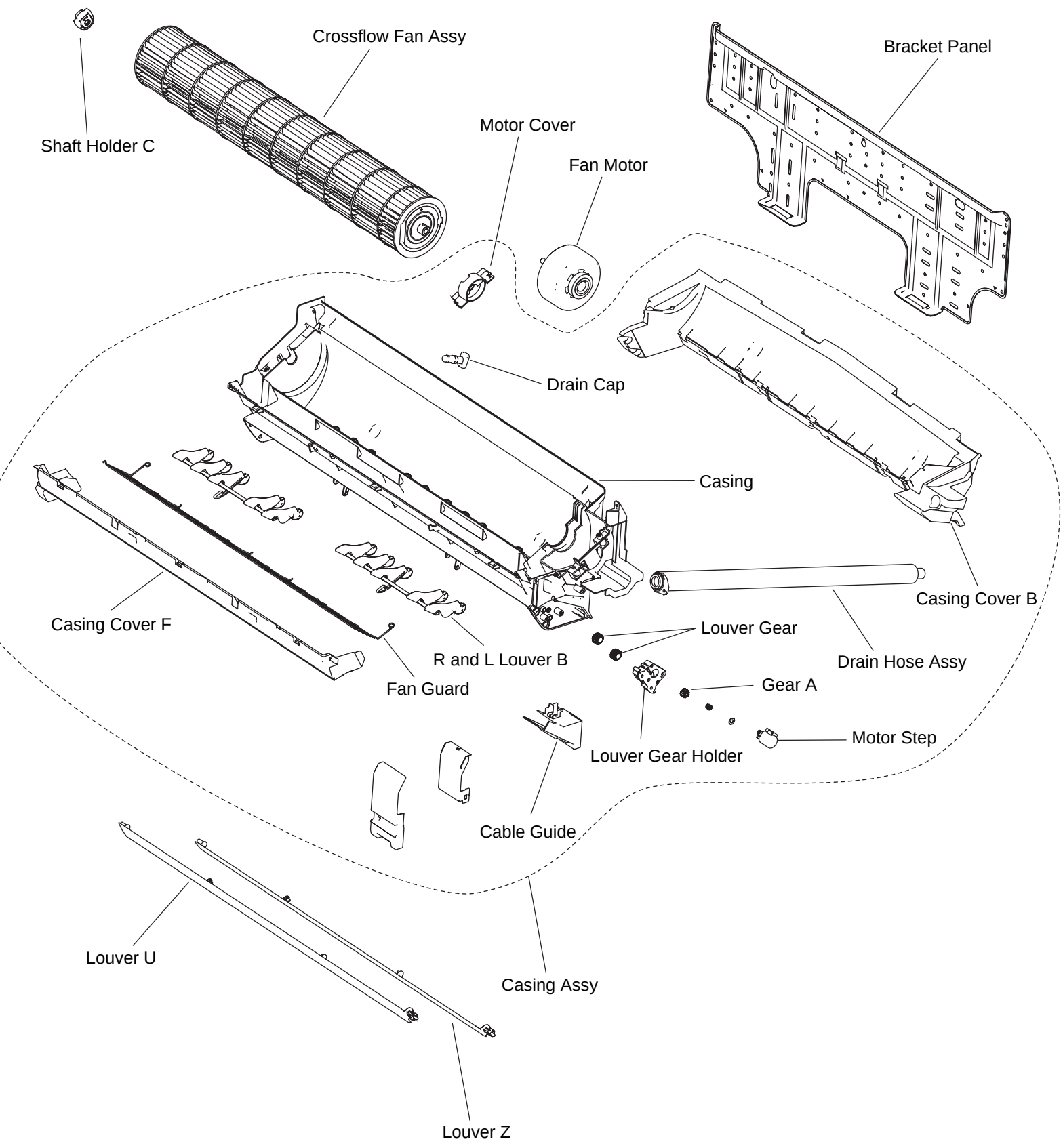

Top Cover
R and L
Louver U
Gear A
Gear Case
Motor Step (up / down)
Fan Guard
Bushing A
Casing
Bushing B
REF (Casing)
Louver U
Louver Z

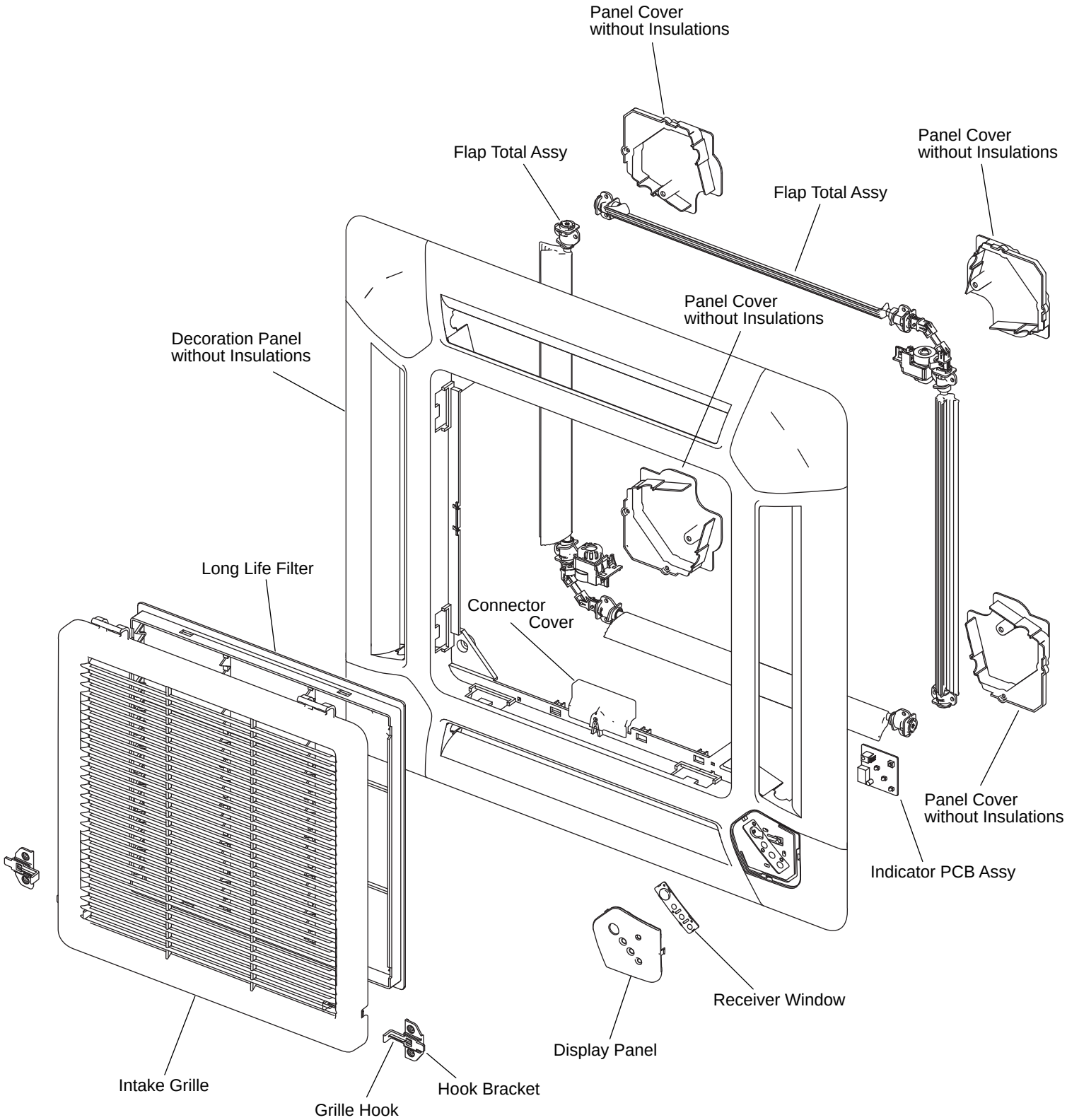

Motor Step (Damper)
Switch Micro
Drain Cap
Motor Step
(Damper Lock Left)
Drain Pan U
Drain Hose Assy
Damper
Bushing A
Bushing B
Motor Step (Damper Lock Right)
R and L
Louver Z
Drain Pan Z
Stopper
Cover (Lower)

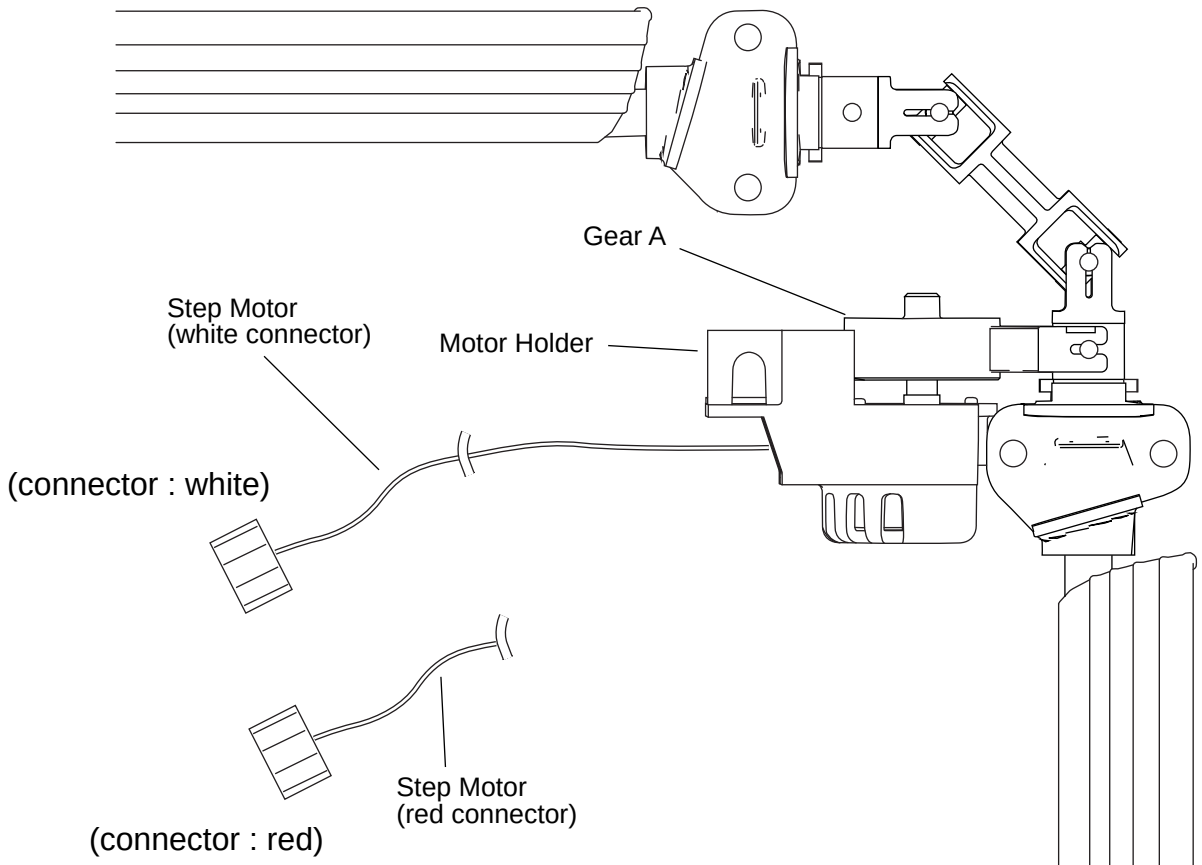

Front Panel Total Assy
Air Filter
Front Panel
Clamper (Grille)
Air Filter
Receiver Window
Clamper (Grille)
Intake Grille Assy
Panel Cover
Remote Control
Remote Control Holder

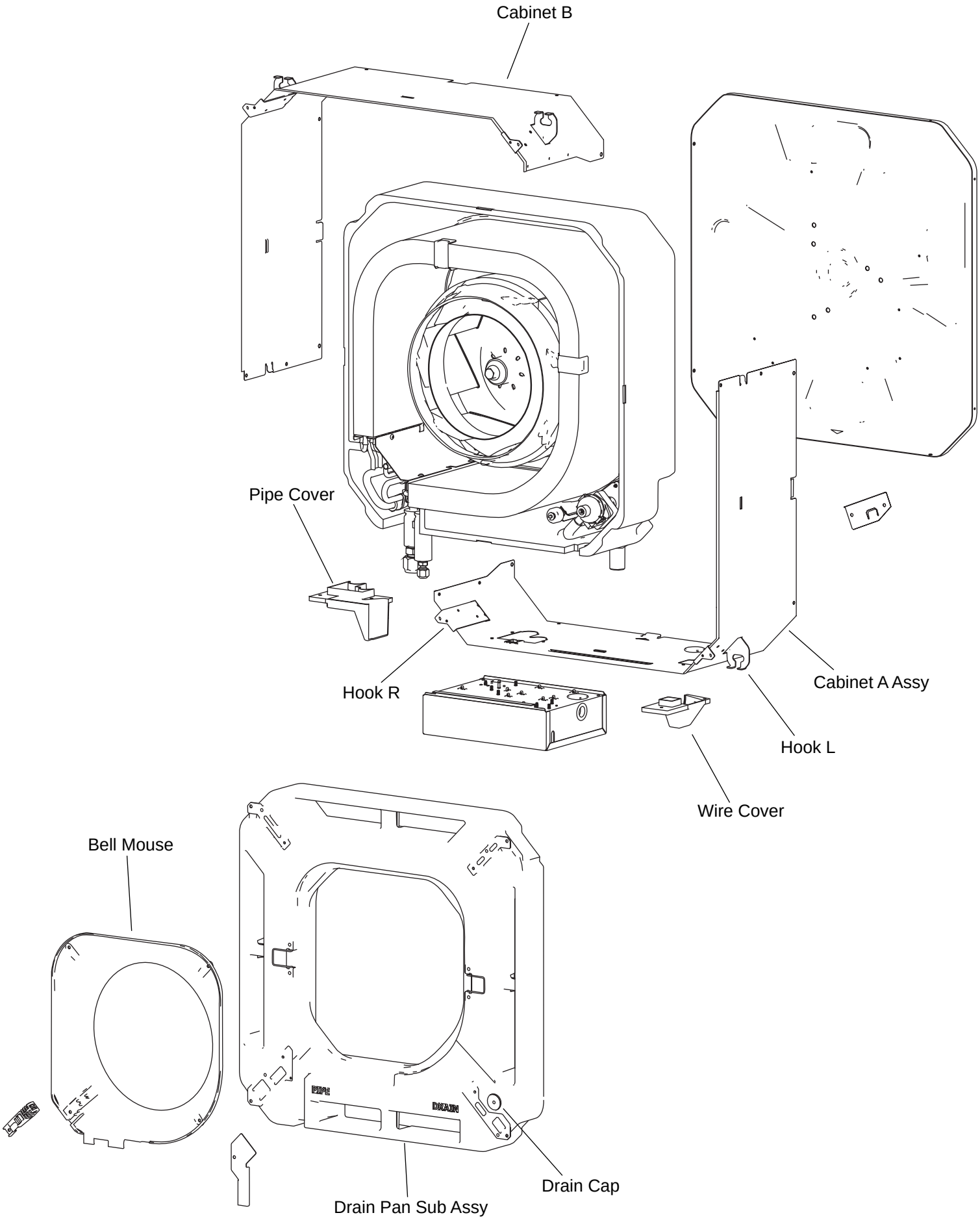

Evaporator Holder L
Rear Bracket
Filter Guide
Evaporator Holder R
Evaporator Assy
Joint Pipe Assy
Room Thermistor Holder
Evaporator Total Assy

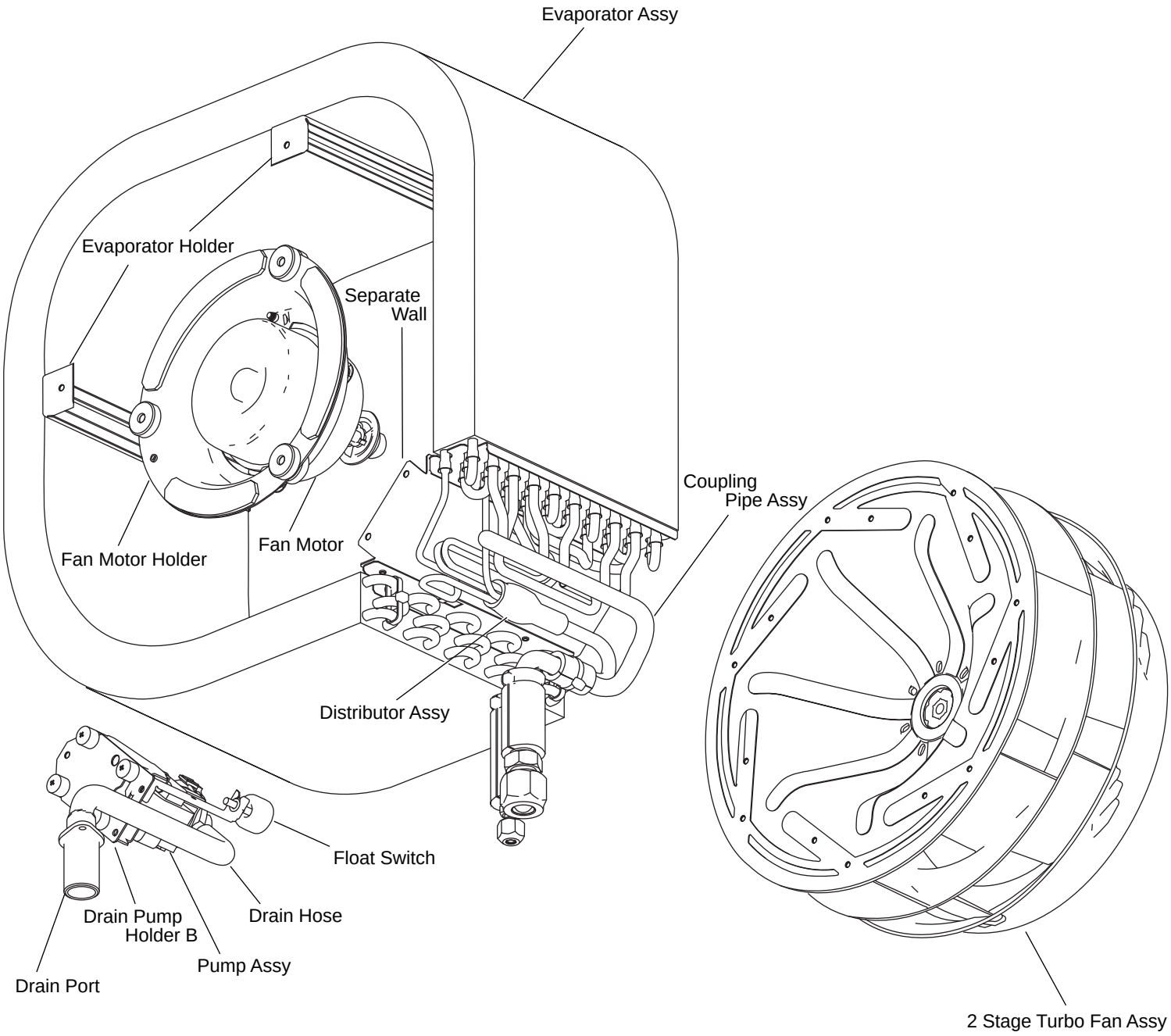

Box Shield
Control Box
Controller PCB Assy
Cover Shield
Display PCB Assy
Control Cover
Display Case
Terminal

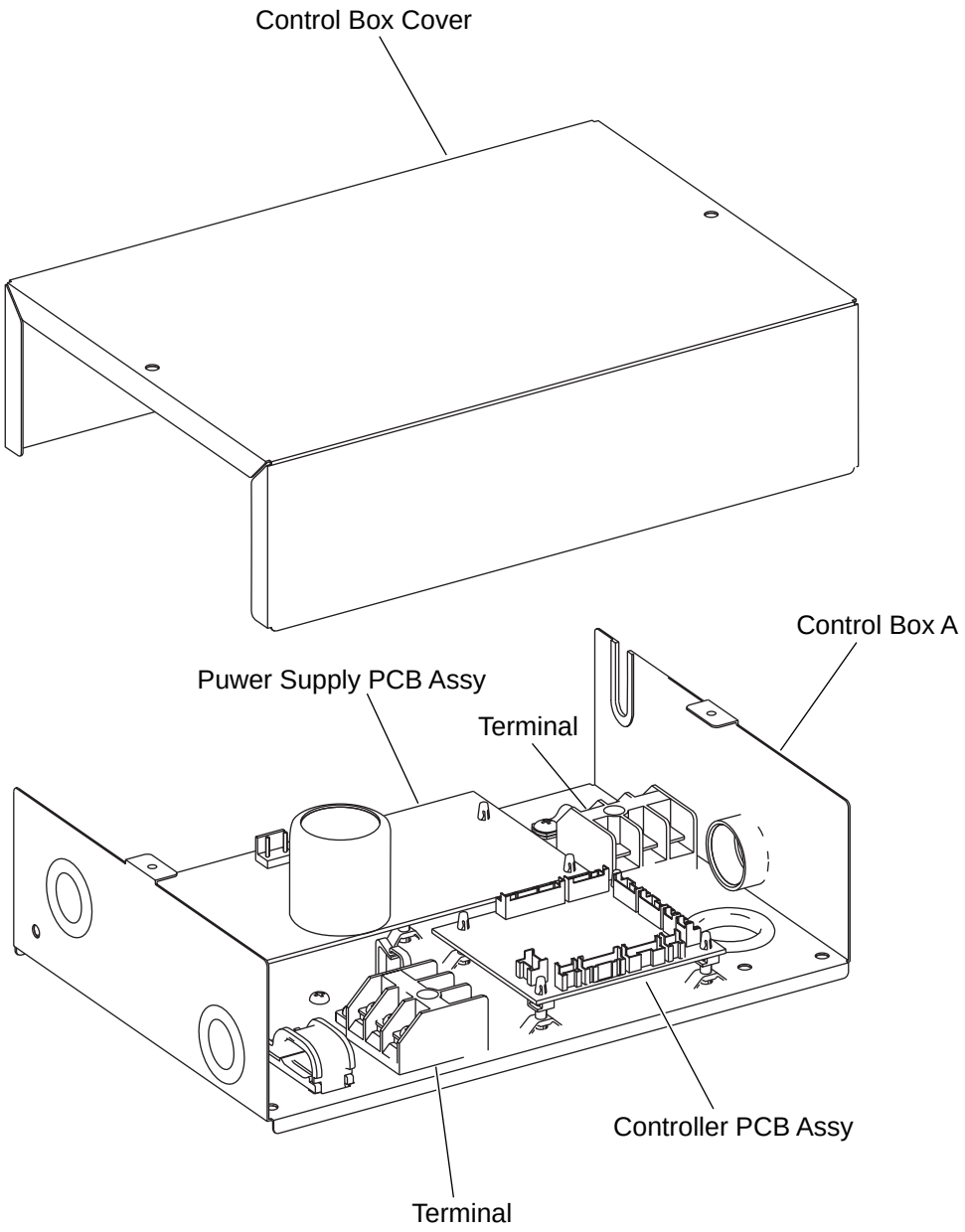

Shaft Holder C
Crossflow Fan Assy
Motor Cover
Fan Motor
Bracket Panel
Drain Cap
Casing
Casing Cover B
Casing Cover F
Louver Gear
Drain Hose Assy
R and L Louver B
Fan Guard
Gear A
Motor Step
Louver Gear Holder
Cable Guide
Louver U
Casing Assy
Louver Z

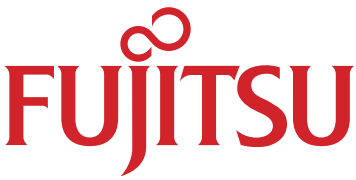

Panel Cover
without Insulations
Flap Total Assy
Flap Total Assy
Panel Cover
without Insulations
Panel Cover
without Insulations
Decoration Panel
without Insulations
Long Life Filter
Connector
Cover
Panel Cover
without Insulations
Indicator PCB Assy
Receiver Window
Display Panel
Intake Grille
Grille Hook
Hook Bracket


Gear A
Step Motor
(white connector)
Motor Holder
(connector : white)
Step Motor
(red connector)
(connector : red)


Cabinet B
Pipe Cover
Hook R
Cabinet A Assy
Hook L
Wire Cover
Bell Mouse
PIPE
DRAIN
Drain Cap
Drain Pan Sub Assy


Evaporator Assy
Evaporator Holder
Separate
Wall
Fan Motor Holder
Fan Motor
Coupling
Pipe Assy
Distributor Assy
Float Switch
Drain Pump
Holder B
Drain Hose
Pump Assy
Drain Port
2 Stage Turbo Fan Assy


Control Box Cover
Control Box A
Puwer Supply PCB Assy
Terminal
Controller PCB Assy
Terminal



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