HITACHI

SERVICE MANUAL

AIR CONDITIONERS

airCore 700

SINGLE SPLIT

INVERTER SERIES

MODELS

< Indoor Units >

- MESP Duct Type
  - PPIM-B09UFA1DQ
  - PPIM-B12UFA1DQ
  - PPIM-B18UFA1DQ
  - PPIM-B24UFA1DQ
  - PPIM-B30UFA1DQ
  - PPIM-B36UFA1DQ
  - PPIM-B48UFA1DQ
- 4-Way Cassette Type
  - PCI-B18UFA1DQ
  - PCI-B24UFA1DQ
  - PCI-B30UFA1DQ
  - PCI-B36UFA1DQ
  - PCI-B48UFA1DQ
- High-wall Type
  - PPK-B09UFA1DQ
  - PPK-B12UFA1DQ
  - PPK-B18UFA1DQ
  - PPK-B24UFA1DQ
  - PPK-B30UFA1DQ
- Ceiling Suspended Type
  - PPFC-B09UFA1NQ
  - PPFC-B12UFA1NQ
  - PPFC-B18UFA1NQ
  - PPFC-B24UFA1NQ
  - PPFC-B30UFA1NQ
  - PPFC-B36UFA1NQ
  - PPFC-B48UFA1NQ
- 4-Way Mini Cassette Type
  - PCIM-B09UFA1DQ
  - PCIM-B12UFA1DQ
- Air Handlers Type
  - JPE18B3XB2HS1A
  - JPE24B3XC2HS1A
  - JPE30B3XD2HS1A
  - JPE36B3XD2HS1A
  - JPE48C3XG2HS1A

< Outdoor Units >

- PAS-09BUFASDQ1
- PAS-12BUFASDQ1
- PAS-18BUFASDQ1
- PAS-24BUFASDQ1
- PAS-30BUFASDQ1
- PAS-36BUFASDQ1
- PAS-48BUFASDQ1

EN SERVICE MANUAL
Original Instructions

Cooling & Heating

HS2024573C

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● Line-up of Indoor Units

Type	Capacity	Model Names	Type	Capacity	Model Names
MESP Ducted Type	09K	PPIM-B09UFA1DQ	Ceiling Suspended Type	09K	PPFC-B09UFA1DQ
	12K	PPIM-B12UFA1DQ		12K	PPFC-B12UFA1DQ
	18K	PPIM-B18UFA1DQ		18K	PPFC-B18UFA1DQ
	24K	PPIM-B24UFA1DQ		24K	PPFC-B24UFA1DQ
	30K	PPIM-B30UFA1DQ		30K	PPFC-B30UFA1DQ
	36K	PPIM-B36UFA1DQ		36K	PPFC-B36UFA1DQ
	48K	PPIM-B48UFA1DQ		48K	PPFC-B48UFA1DQ
4-Way Cassette Type	18K	PCI-B18UFA1DQ	4-Way Mini Cassette Type	09K	PCIM-B09UFA1DQ
	24K	PCI-B24UFA1DQ		12K	PCIM-B12UFA1DQ
	30K	PCI-B30UFA1DQ	Air Handlers Type	18K	JPE18B3XB2HS1A
	36K	PCI-B36UFA1DQ		24K	JPE24B3XC2HS1A
	48K	PCI-B48UFA1DQ		30K	JPE30B3XD2HS1A
High-wall Type	09K	PPK-B09UFA1DQ		36K	JPE36B3XD2HS1A
	12K	PPK-B12UFA1DQ		48K	JPE48C3XG2HS1A
	18K	PPK-B18UFA1DQ			
	24K	PPK-B24UFA1DQ			
	30K	PPK-B30UFA1DQ			

● Line-up of Outdoor Units

Capacity	Model Names
09K	PAS-09BUFASDQ1
12K	PAS-12BUFASDQ1
18K	PAS-18BUFASDQ1
24K	PAS-24BUFASDQ1
30K	PAS-30BUFASDQ1
36K	PAS-36BUFASDQ1
48K	PAS-48BUFASDQ1

1. Troubleshooting

⚠ WARNING

- Turn OFF all power sources completely before checking the electrical parts.
- When rinsing the indoor unit, remove the electrical parts. If not, it may cause burnout of electrical parts by insulation degradation.

NOTICE

- Before setting dip switches, firstly turn OFF power source and set the position of the dip switches.
- If the switches are set without turning OFF the power source, the switches will not function.

NOTE:

- The "■" mark indicates position of the dip switches. The figures show the setting before shipment.

1.1 Initial Troubleshooting

1.1.1 Checking of Power Source and Electrical Wiring

Check the following items if there is any abnormality in the activation of the air conditioner.

No.	Item	Method
1	The circuit breaker or the fuse is not activated.	Check the secondary voltage of circuit breaker and the continuity of fuse with a tester.
2	The wiring is loosened or misconnected.	Check that the following wiring connection on O.U./I.U. PCBs is not loosened. • The connection for thermistors • The connection for the wired remote controller cable • The connection for power source line Check that the wiring connection on O.U./I.U. PCBs is not loosened or incorrectly connected on the site according to "Electrical Wiring Diagram" of the technical catalog.

I.U.: Indoor Unit
O.U.: Outdoor Unit

NOTES:

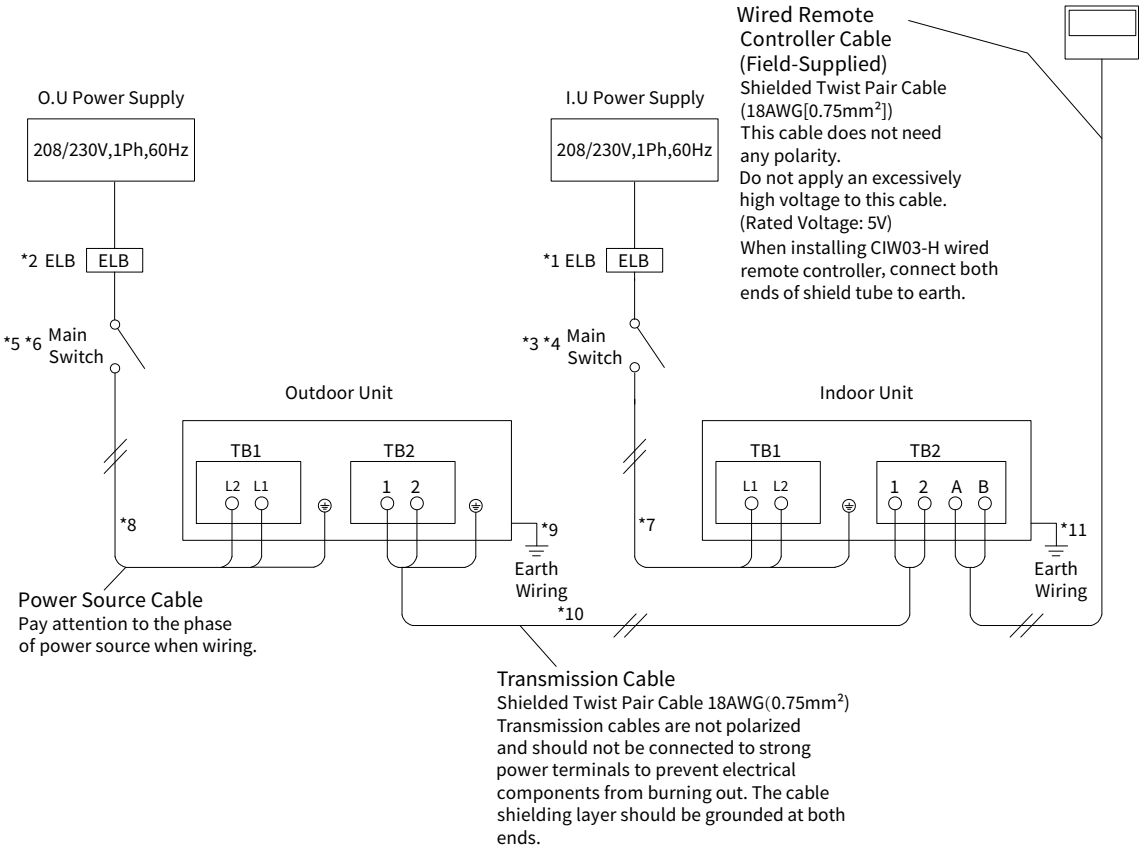
- If the PCB fuse on I.U.&O.U. is blown, please check the cause of the overcurrent and restore the fuse.
- In addition, check the power supply of optional components as the fuse may blow due to a malfunction.

- Check to ensure the correct wiring of the power cord terminals (O.U. and I.U. are powered separately, O.U. power supply terminals “L1” and “L2”, I.U. power supply terminals “L1”, “L2”).
- Check to ensure that the shielded twist pair cable (≥ 18AWG[0.75mm^2]) is used for intermediate wiring to protect noise obstacle at total length of less than 1000m and size complied with local codes.
- Check to ensure that the wirings and the breakers are chosen correctly, as shown in Table 1.1.
- All the field wiring and equipment must comply with local codes.

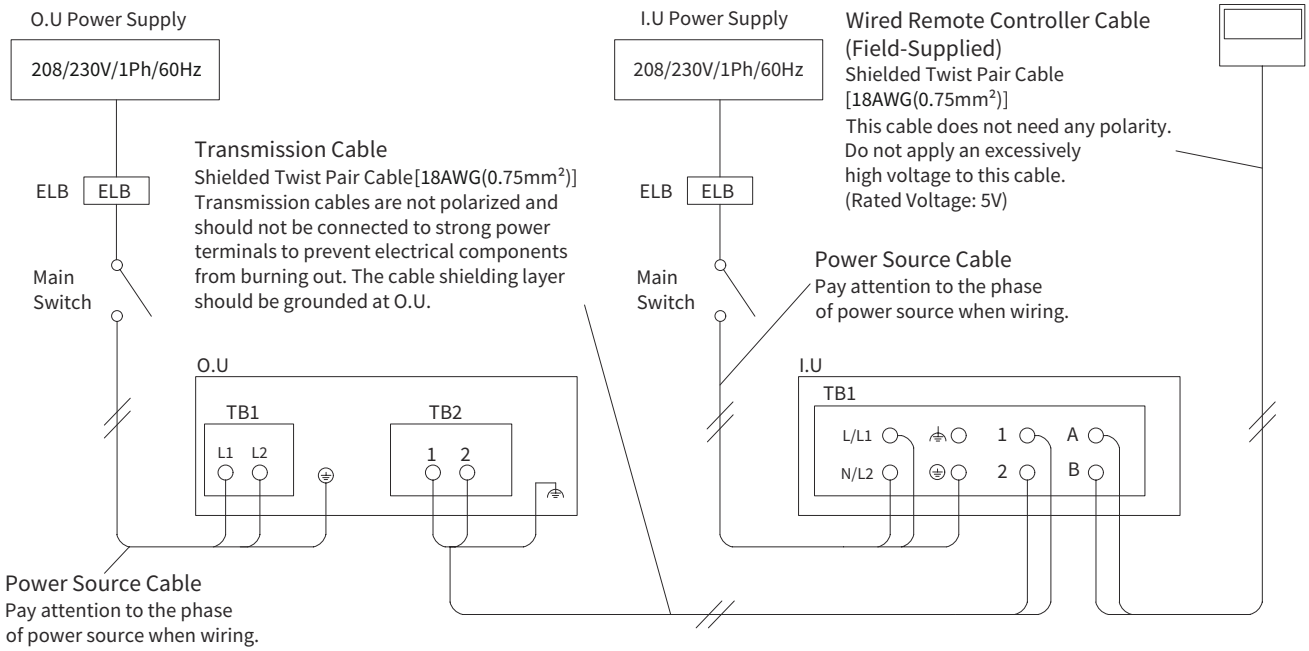
Example for Electrical Wiring Connection

The transmission cable length between the outdoor unit and the indoor unit shall be less than 246ft(75m).

MESP Duct/4-way Cassette/4-way Mini Cassette/Ceiling Suspended/Air Handlers Types



High-wall Type



NOTES:

- If the demand control (ON/OFF) with only time conditions is set, it is recommended to set the time according to the load, not the constant setting time all through the year. The minimum set interval for demand or forcible stoppage should be 30 minutes or more in consideration of the compressor's start-stop frequency and energy-saving.
- When demand control (ON/OFF) is set, it is required to set the optional function setting. Select the setting condition "0" to "1" at the Defrost Control in Demand Mode "F 1".
  Refer to the item 4.5.3 "Function Setting from Outdoor Unit PCB" for detail of setting.

Table 1.1 Recommended Electrical Parts

Power Source	Connecting Power Source to O.U. and I.U. separately	ELB	Main Switch		Power Source Cable	Intermediate Wiring between I.U. and I.U.	Earth Wiring
			Normal Current	Fuse Capacity		Transmission Cable	
Single-Phase Power Supply	Indoor Unit	*1	*3	*4	*7	*10	*11
	Outdoor Unit	*2	*5	*6	*8	*10	*9

ELB: Earth Leakage Breaker
I.U.: Indoor Unit
O.U.: Outdoor Unit

NOTES:

- Install a main switch and an ELB for each system separately. Select the high response type ELB that acts within 0.1 second.
- Separate the control wiring (*10) between the outdoor unit and the indoor unit more than approximately 1-31/32~2-23/64 inch(50~60mm) from power supply wiring (*7 and *8). Do not use a coaxial cable.
- In the case that a conduit tube for field-wiring is not used, fix rubber bushes with adhesive on the panel.

Table 1.2 Recommended Wiring Capacity and Size

Outdoor unit

<table>
<tr><th rowspan="2">Term (measure)
Model</th><th rowspan="2">ELB (A)</th><th rowspan="2">Normal Current of Main Switch (A)</th><th rowspan="2">Fuse Capacity of Main Switch (A)</th><th colspan="3">Wiring Capacity (AWG(mm^2))</th></tr>
<tr><th>Power Source Cable</th><th>Earth Wiring</th><th>Between O.U. and I.U.</th></tr>
<tr><td></td><td>*2</td><td>*5</td><td>*6</td><td>*8</td><td>*9</td><td>*10</td></tr>
<tr><td>PAS-09BUFASDQ1</td><td>12</td><td>20</td><td>15</td><td colspan="2" rowspan="4">14(2.5)</td><td rowspan="6">18(0.75)</td></tr>
<tr><td>PAS-12BUFASDQ1</td><td>12</td><td>20</td><td>15</td></tr>
<tr><td>PAS-18BUFASDQ1</td><td>16</td><td>20</td><td>20</td></tr>
<tr><td>PAS-24BUFASDQ1</td><td>16</td><td>20</td><td>20</td></tr>
<tr><td>PAS-30BUFASDQ1</td><td>20</td><td>25</td><td>25</td><td colspan="2">12(4)</td></tr>
<tr><td>PAS-36BUFASDQ1</td><td>32</td><td>40</td><td>30</td><td colspan="2" rowspan="2">10(6)</td></tr>
<tr><td>PAS-48BUFASDQ1</td><td>32</td><td>40</td><td>35</td><td></td></tr>
</table>

ELB: Earth Leakage Breaker
I.U.: Indoor Unit
O.U.: Outdoor Unit

☐ Field Minimum Wire Sizes for Power Source

Max Running Current (A): REFER TO NAMEPLATE

Model	Power Source	MRC(A)	Power Source Cable Size (AWG(mm²))	Transmission Cable Size (AWG(mm²))
PAS-09BUFASDQ1	208/230V, 1Ph, 60Hz	7.7	14(2.5)	18(0.75)
PAS-12BUFASDQ1		7.7		
PAS-18BUFASDQ1		13.5		
PAS-24BUFASDQ1		16.0		
PAS-30BUFASDQ1		24.2	12(4)	
PAS-36BUFASDQ1		27.9	10(6)	
PAS-48BUFASDQ1		29.1	10(6)	
PPIM-B09UFA1DQ	208/230V, 1Ph, 60Hz	1.09	14(2.5)	18(0.75)
PPIM-B12UFA1DQ		1.23		
PPIM-B18UFA1DQ		1.56		
PPIM-B24UFA1DQ		1.83		
PPIM-B30UFA1DQ		2.12		
PPIM-B36UFA1DQ		2.78		
PPIM-B48UFA1DQ		3.05		
PCI-B18UFA1DQ	208/230V, 1Ph, 60Hz	0.41	14(2.5)	18(0.75)
PCI-B24UFA1DQ		0.51		
PCI-B30UFA1DQ		0.77		
PCI-B36UFA1DQ		1.11		
PCI-B48UFA1DQ		1.11		
PPFC-B09UFA1DQ	208/230V, 1Ph, 60Hz	0.41	14(2.5)	18(0.75)
PPFC-B12UFA1DQ		0.55		
PPFC-B18UFA1DQ		0.66		
PPFC-B24UFA1DQ		0.66		
PPFC-B30UFA1DQ		0.66		
PPFC-B36UFA1DQ		1.03		
PPFC-B48UFA1DQ		1.03		
PCIM-B09UFA1DQ	208/230V, 1Ph, 60Hz	0.52	14(2.5)	18(0.75)
PCIM-B12UFA1DQ		0.67		
PPK-B09UFA1DQ	208/230V, 1Ph, 60Hz	0.26	16(1.5)	18(0.75)
PPK-B12UFA1DQ		0.29		
PPK-B18UFA1DQ		0.45		
PPK-B24UFA1DQ		0.55		
PPK-B30UFA1DQ		0.64		

NOTES:

- Follow local codes and regulations when selecting field wires, and all the above are the minimum wire size.
- For outdoor unit, use the wires which are not lighter than the ordinary polychloroprene sheathed flexible cord. (Cord designation H07RN-F).
- For indoor unit, use the wires which are not lighter than the ordinary tough rubber sheathed flexible cord (code designation H05RR-F) or ordinary polychloroprene sheathed flexible cord (code designation H05RN-F) when get power from outside.
- The wire sizes in the above table are selected at the maximum current of the unit according to UL 60335.
- When transmission cable is longer than 49.2ft(15m), a larger wire size should be selected.
- Install main switch and ELB for each system separately. Select the high response type ELB that is acted within 0.1 second.
- Use a shielded cable for the transmitting circuit and connect it to ground.
- In the case that power cables are connected in series, add maximum current to each unit and select wires below.

Selection According to UL 60335

Current i (A)	Wire Size (AWG(mm^2))
i ≤ 6	14(2.5)
6 < i ≤ 10	14(2.5)
10 < i ≤ 16	14(2.5)
16 < i ≤ 25	12(4)
25 < i ≤ 32	10(6)
32 < i ≤ 40	6(10)
40 < i ≤ 63	6(16)
63 < i	*1

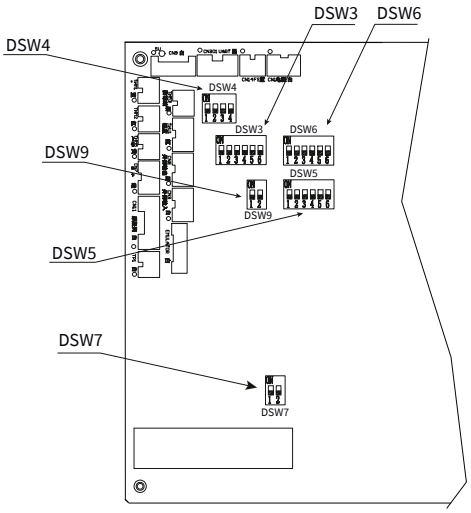
*1: In the case that current exceeds 63A, do not connect cables in series.

1.1.2 Rotary Switch and Dip Switch Setting for Indoor Units

The PCB in the indoor unit is equipped with dip switches and rotary switches. Before testing the unit, set these dip switches according to the following instructions. If these dip switches are not set in the field, the unit cannot be operated.

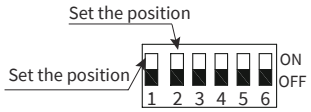
<PPIM Model>

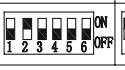
1. Turn OFF all the power supplies to both indoor and outdoor units before DIP switch setting. Otherwise, the setting is invalid.
2. The positions of the DIP switches on the PCB are shown in the figure right. Open the electrical box cover. After the DIP switches are set, attach the electrical box cover again.



3. Unit number setting (DSW6)

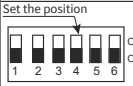
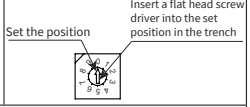
   The indoor unit numbers of all indoor units are not required. The indoor unit numbers are set by the auto-address function. If the indoor unit number setting is required, set the unit numbers of all indoor units respectively and serially by the following setting position.

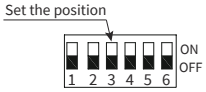
DSW6 (1st , 2nd digit) Unit number setting

Before delivery, the 1st and 2nd digit of DSW6 are set to “0”.

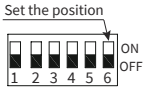
No.1 Unit	No.2 Unit	No.3 Unit	No.4 Unit
			

4. Region identification, human sensor and low air volume setting

DSW6 (4th digit), RSW1(Region Identification)

DSW6 (4th digit)	RSW1 (units digit)	NA
		
Before delivery, DSW6 and RSW1 are set according to the region’s requirement, and the after-sales replacement of PCB needs to be set according to the region’s requirement.		Set No. 4 to OFF  Set to “1”

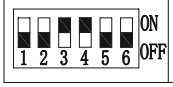
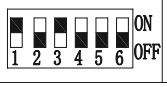
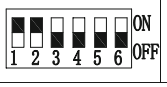
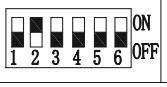
DSW6 (3rd digit) Human sensor setting

Before delivery, the 3rd digit of DSW6 is set to “0”. Set the 3rd digit of DSW6 to “1” when installing human sensor.

DSW6 (6th digit) Low air volume setting

Before delivery, the 6th digit of DSW6 is set to “0”. Set the 6th digit of DSW6 to“1” when setting low air volume.

5. Capacity code setting (DSW3)

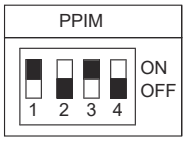
No setting is required as these have been preset at the factory at time of production. These switches have been set according to the capacity of the indoor unit.

DSW3

09K	12K	18K	24K	30K	36K	48K
						

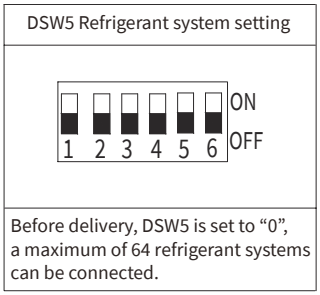
6. Unit type code setting (DSW4)

As this is already set before shipment, no setting is required. This switch is used for setting the unit type code which corresponds to the type of the indoor unit.



7. Refrigerant cycle No. setting (DSW5)

These switches set the refrigerant cycle number and need to be made only when connecting multiple systems together via H-Link (e.g. central control)

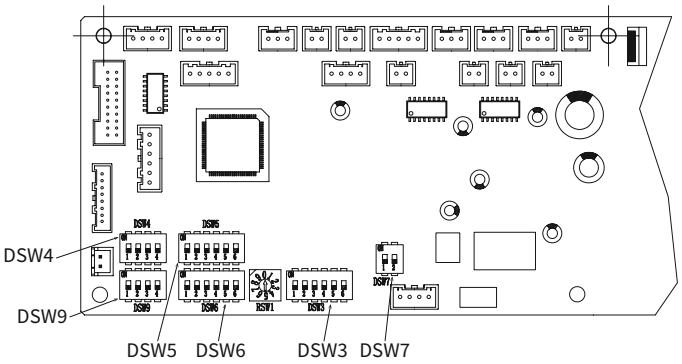


8. Fuse recover (DSW7)

* No setting is required. Setting positions before shipment are all OFF.

<PCI Model>

Quantity and position of dip switches

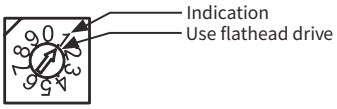


⚠ CAUTION

- Before setting dips switches, firstly turn off power source and set the position of the dips switches. If the switches are set without turning off the power source, the contents of the setting are invalid.

NOTES:

- The mark "■"indicates position of dips switches. Figures show setting before shipment or after selection.
- Indication position of rotatory switches.

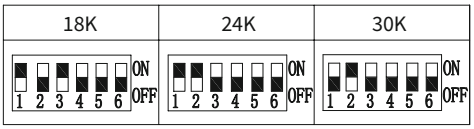


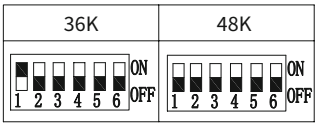
DSW3: capacity code setting

This dip switch is utilized for setting the capacity code which corresponds to the Horse Power of the indoor unit.

Factory setting:

DSW3

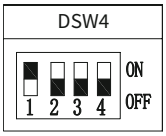




DSW4: unit model code setting

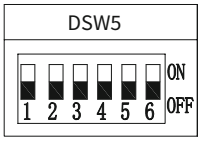
This switch is utilized for setting the model code which corresponds to the indoor unit type.

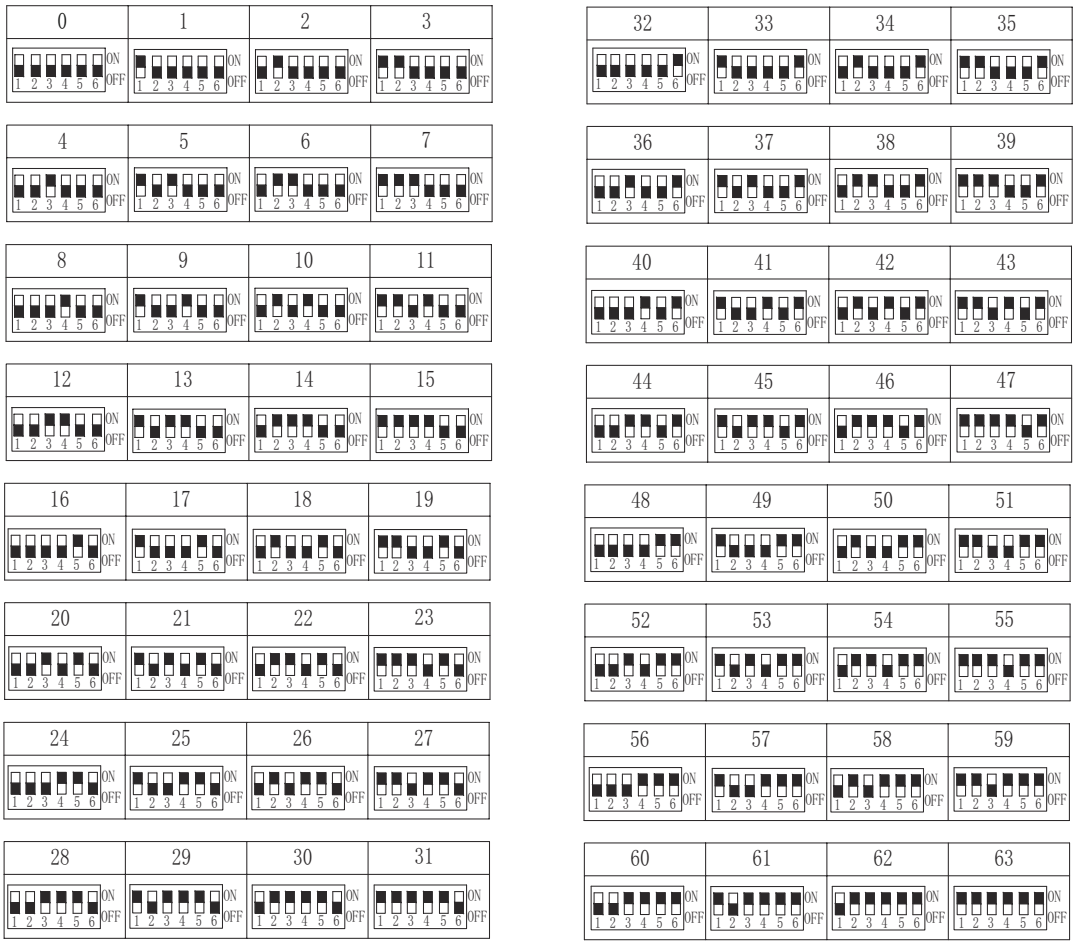
Factory setting:



DSW5: refrigerant cycle No. setting

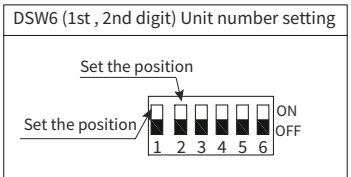
Setting is required
Factory setting:
DSW5 can be set from 0 to 63.

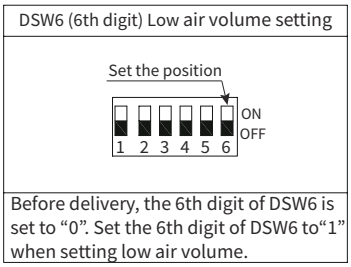


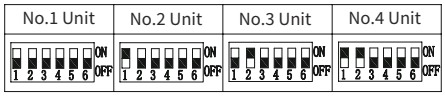


DSW6: unit No. setting, low air volume setting

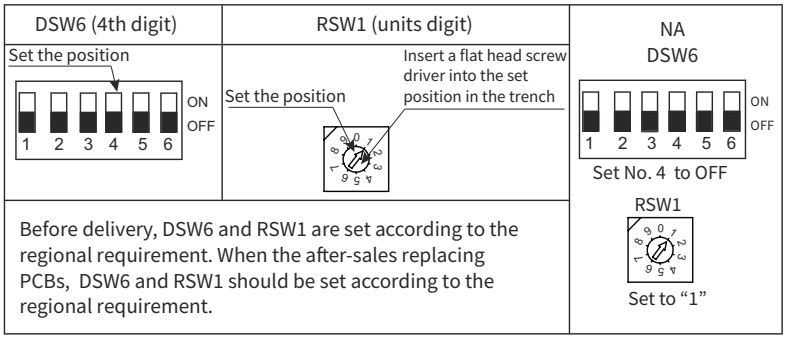
Setting is required.





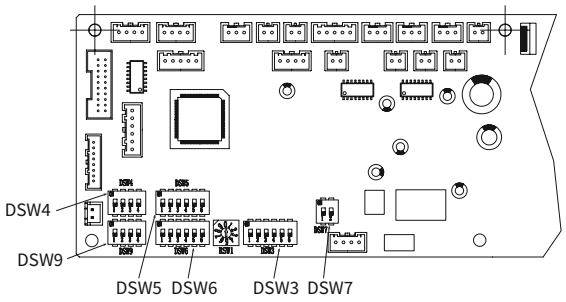


DSW6(4th digit), RWS1: regional identification



<PPFC Model>

(1) Position of Dip Switches

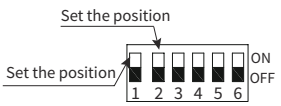


(2) The PCB in the indoor unit is equipped with 1 rotary switch and 6 dip switches. Before testing the unit, set these dip switches according to the following instructions. These dip switches need to be set in order to operate the unit.

(a) Unit No. Setting, Low Air Volume Setting (DSW6)

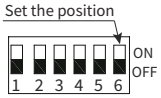
Setting is required.

DSW6 (1st , 2nd digit) Unit number setting

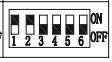


Before delivery, the 1st and 2nd digit of DSW6 are set to "0".

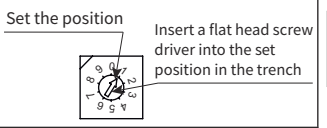
DSW6 (6th digit) Low air volume setting



Before delivery, the 6th digit of DSW6 is set to "0". Set the 6th digit of DSW6 to"1" when setting low air volume.

No.1 Unit	No.2 Unit	No.3 Unit	No.4 Unit
			

(b) Regional Identification(DSW6(4th digit), RWS1)

DSW6 (4th digit)	RSW1 (units digit)	NA DSW6
		

Before delivery, DSW6 and RSW1 are set according to the regional requirement. When the after-sales replacing PCBs, DSW6 and RSW1 should be set according to the regional requirement.

(c) Unit Mode Code Setting (DSW4)

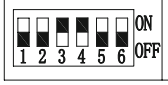
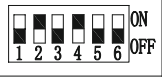
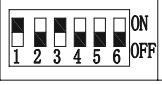
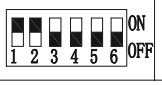
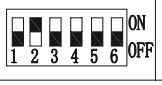
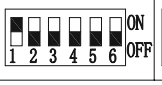
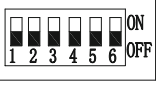
No setting is required.
Setting the model code of the indoor unit.

(d) Capacity Code Setting (DSW3)

This dip switch is utilized for setting the capacity code which corresponds to the Horse Power of the indoor unit.

Factory setting:

DSW3

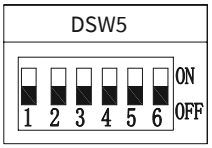
09K	12K	18K	24K	30K	36K	48K
						

(e) Refrigerant Cycle No. Setting (DSW5)

Setting is required.

Factory setting:

DSW5 can be set from 0 to 63.



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	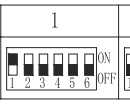	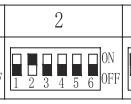	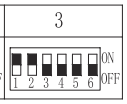
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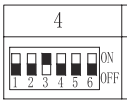		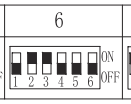	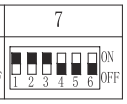
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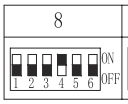		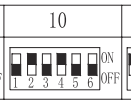	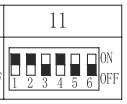
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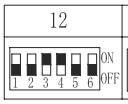	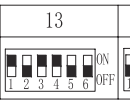	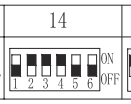	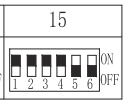
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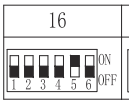	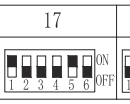	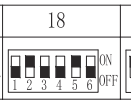	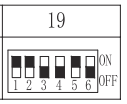
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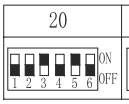	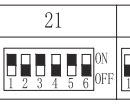	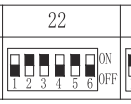	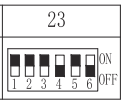
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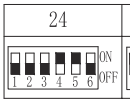	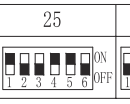	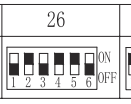	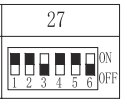
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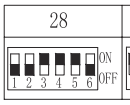	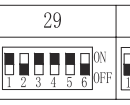	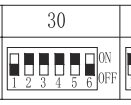	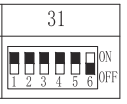

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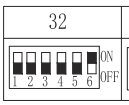	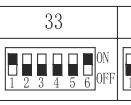	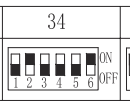	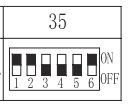
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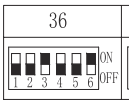	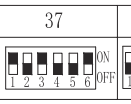	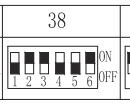	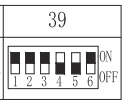
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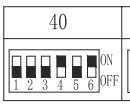		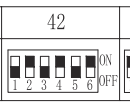	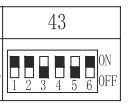
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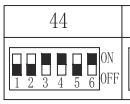	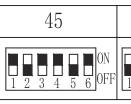	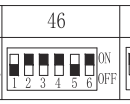	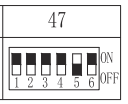
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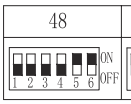
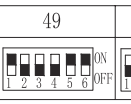
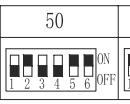
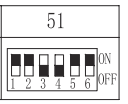
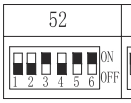
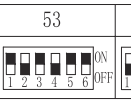
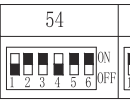
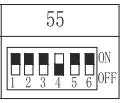
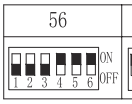
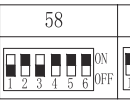
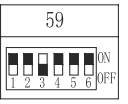
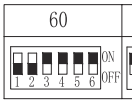
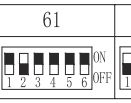
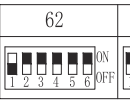
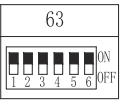
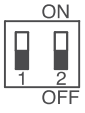
			
52	53	54	55
			
56	57	58	59
			
60	61	62	63
			

(f) Fuse Recover (DSW7)

No setting is required. Setting positions before shipment are all OFF.



NOTE:

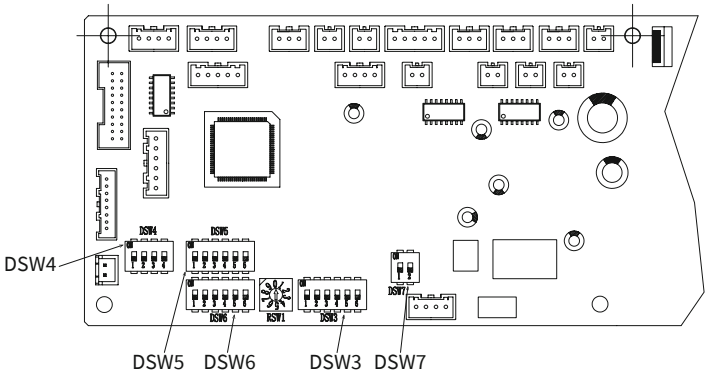
- The "■" mark indicates position of dip switches. Figures show setting before shipment.

⚠ CAUTION

- Before setting dip switches, firstly turn OFF power source and set the position of the dip switches. If the switches are set without turning OFF the power source, the switch settings made are not recognized.

<PCIM Model>

Quantity and position of dip switches

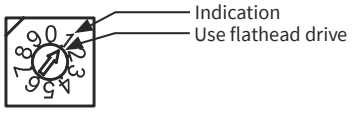


⚠ CAUTION

- Before setting dips switches, firstly turn off power source and set the position of the dips switches. If the switches are set without turning off the power source, the contents of the setting are invalid.

NOTES:

- The mark "■"indicates position of dips switches. Figures show setting before shipment or after selection.
- Indication position of rotatory switches.



DSW3: capacity code setting

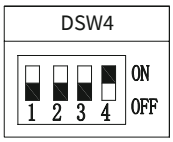
This dip switch is utilized for setting the capacity code which corresponds to the Horse Power of the indoor unit.

Factory setting:

DSW4: unit model code setting

This switch is utilized for setting the model code which corresponds to the indoor unit type.

Factory setting:



DSW5: refrigerant cycle No. setting

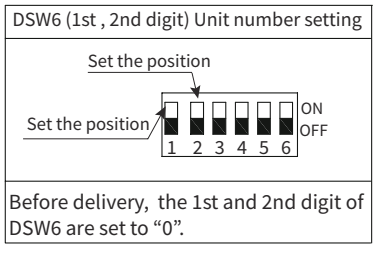
Setting is required

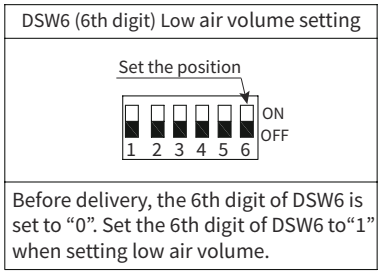
Factory setting:

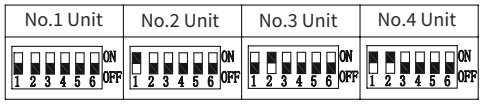
DSW5 can be set from 0 to 63.

DSW6: unit No. setting, low air volume setting

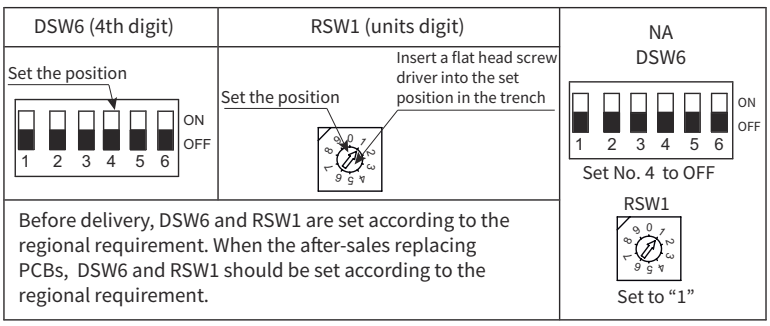
Setting is required.







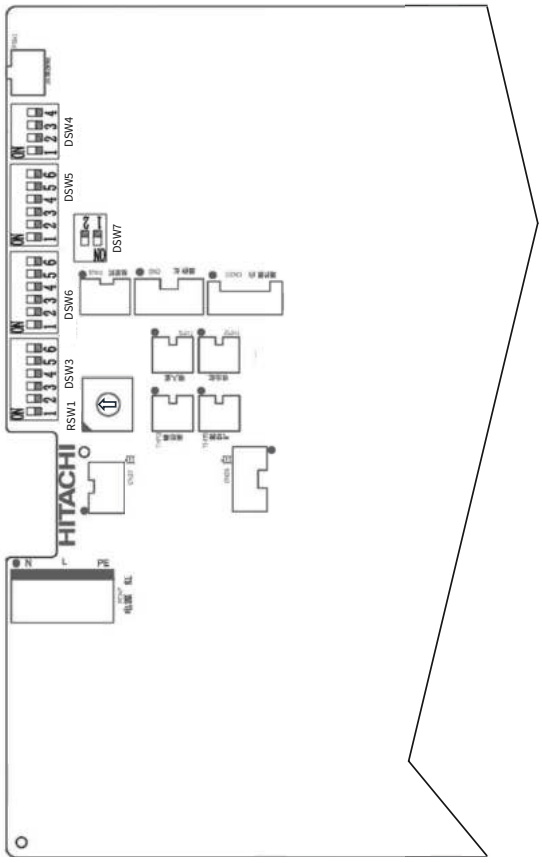
DSW6(4th digit), RWS1: regional identification



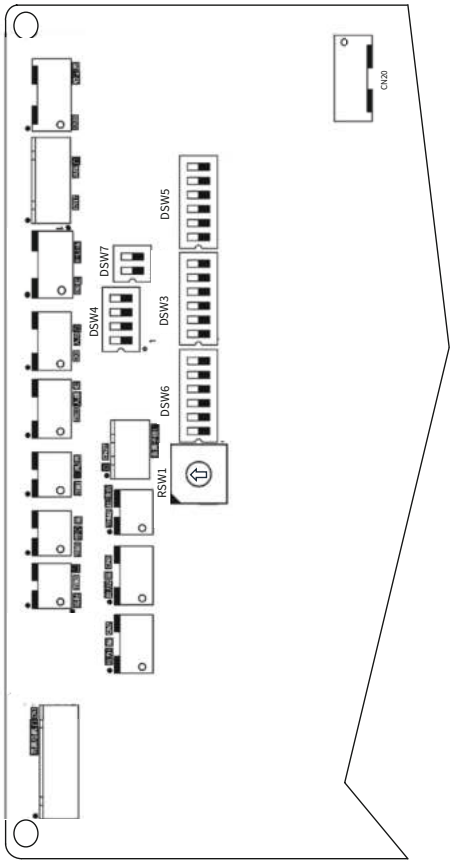
<PPK Model>

1. Turn OFF all the power supplies to both indoor and outdoor units before DIP switch setting. Otherwise, the setting is invalid.
2. The positions of the DIP switches on the PCB are shown in the figure right. Open the electrical box cover. After the DIP switches are set, attach the electrical box cover again.

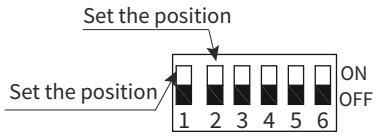
PPK-B09UFA1DQ/PPK-B12UFA1DQ/PPK-B18UFA1DQ

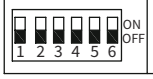
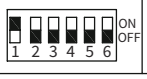
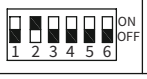
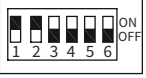


PPK-B24UFA1DQ/PPK-B30UFA1DQ



3. Unit number setting (DSW6)
   The indoor unit numbers of all indoor units are not required. The indoor unit numbers are set by the auto-address function. If the indoor unit number setting is required, set the unit numbers of all indoor units respectively and serially by the following setting position.

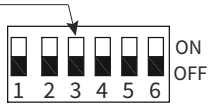
DSW6 (1st , 2nd digit) Unit number setting

Before delivery, the 1st and 2nd digit of DSW6 are set to “0”.

No.1 Unit	No.2 Unit	No.3 Unit	No.4 Unit
			

4. Region identification, human sensor and low air volume setting (DSW6)

DSW6 (4th digit), RSW1(Region Identification)

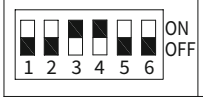
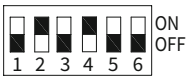
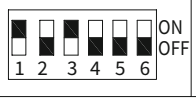
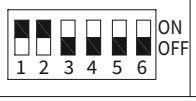
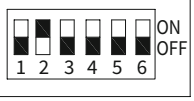
DSW6 (4th digit)	RSW1 (units digit)	NA
Set the position 	Insert a flat head screw driver into the set position in the trench Set the position 	DSW6  Set No. 4 to OFF RSW1  Set to “1”
Before delivery, DSW6 and RSW1 are set according to the region’s requirement, and the after-sales replacement of PCB needs to be set according to the region’s requirement.		

DSW6 (3rd digit) Human sensor setting	DSW6 (6th digit) Low air volume setting
Set the position 	Set the position 
Before delivery, the 3rd digit of DSW6 is set to “0”. Set the 3rd digit of DSW6 to “1” when installing human sensor.	Before delivery, the 6th digit of DSW6 is set to “0”. Set the 6th digit of DSW6 to“1” when setting low air volume.

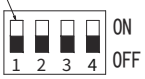
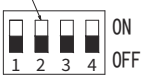
5. Capacity code setting (DSW3)

No setting is required as these have been preset at the factory at time of production. These switches have been set according to the capacity of the indoor unit.

DSW3

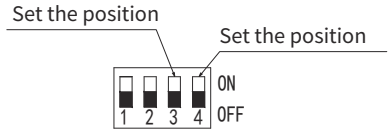
9K	12K	18K	24K	30K
				

6. Anti-condensation setting, Hand-held remote controller/Wired remote controller setting, Differentiation of neighboring units setting (DSW4).

DSW4 (1st digit) Anti-condensation setting	DSW4 (2nd digit) HHRC/WRC setting
Set the position 	Set the position 
Before delivery, the 1st digit of DSW4 is set to “0”. Set the 1st digit of DSW4 to “1” when anti-condensation doesn't work.	Before delivery, the 2nd digit of DSW4 is set to “0”. Set the 2nd digit of DSW4 to “1” when installing the wired remote controller.

In case that indoor units are installed adjacent to each other, the signals of the wireless remote controllers are differentiated in reception.Set the 3rd and 4th of DSW4 by the following setting position.

DSW4 (3rd , 4th digit) Differentiation of neighboring units setting



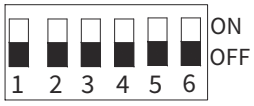
Before delivery, the 3rd and 4th digit of DSW4 are set to “0”.

A Mode	B Mode	C Mode	D Mode
			

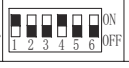
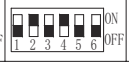
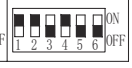
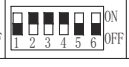
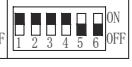
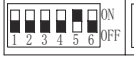
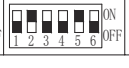
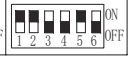
7. Refrigerant cycle No. setting (DSW5)

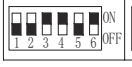
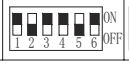
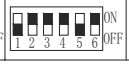
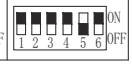
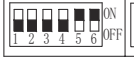
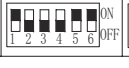
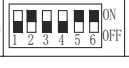
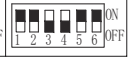
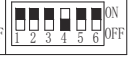
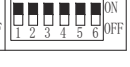
These switches set the refrigerant cycle number and need to be made only when connecting multiple systems together via H-Link (e.g. central control).

DSW5 Refrigerant system setting



Before delivery, DSW5 is set to “0”, a maximum of 64 refrigerant systems can be connected.

0	1	2	3
			
4	5	6	7
			
8	9	10	11
			
12	13	14	15
			
16	17	18	19
			
20	21	22	23
			
24	25	26	27
			
28	29	30	31
			

32	33	34	35
			
36	37	38	39
			
40	41	42	43
			
44	45	46	47
			
48	49	50	51
			
52	53	54	55
			
56	57	58	59
			
60	61	62	63
			

8. Fuse recover (DSW7)

* No setting is required. Setting positions before shipment are all OFF.

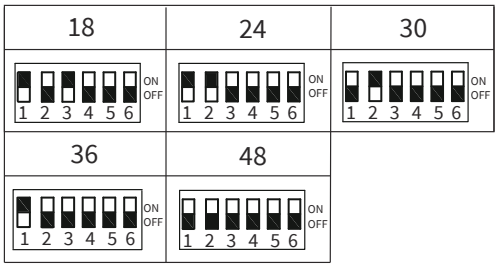
NOTICE

- The "■" mark indicates the positions of DIP switches. The figures show settings before shipment.
- When the unit no. and the refrigerant cycle no. are set, record them to facilitate maintenance and servicing activities in the future.
- Turn OFF all the power supplies of the indoor and outdoor units before DIP switch setting. Otherwise, the setting is invalid.

<JPE Model>

- Main controller - DSW3 capacity setting

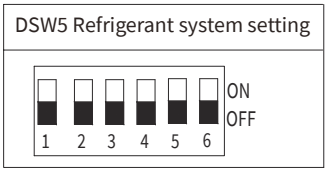
Model number	Dip switch number					
	1	2	3	4	5	6
JPE18B3XB2HS1A	O	X	O	X	X	X
JPE24B3XC2HS1A	O	O	X	X	X	X
JPE30B3XD2HS1A	X	O	X	X	X	X
JPE36B3XD2HS1A	O	X	X	X	X	X
JPE48C3XG2HS1A	X	X	X	X	X	X



Main controller - DSW4 indoor unit type setting

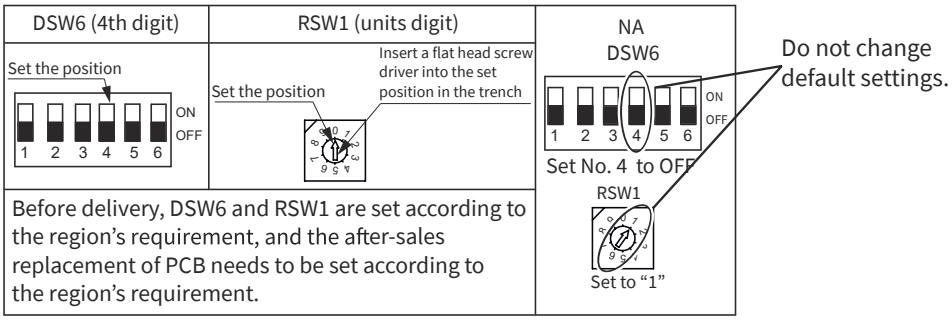
- Main Controller DSW5 Refrigerant Cycle No. setting

  DSW5 is default set to off at '0', a maximum of 64 refrigerant systems can be connected.



- Main controller DSW6 & RSW1 setting

  DSW6 DIP switch 6-4 is default set to off. RSW1 is default set to 1.



- Main controller DSW9 setting

  DSW9 DIP switch default set to off.

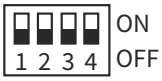
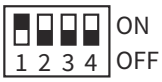
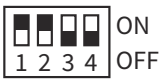
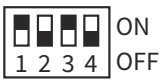
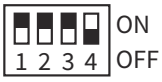
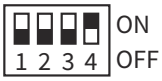
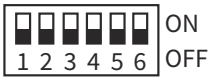
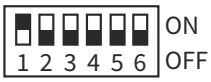
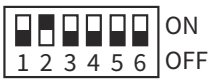
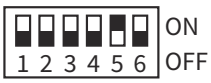
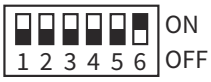
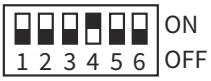
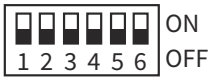
  Install the coil temperature sensor and the return air temperature sensor that are included with the control box kit. (See Installing the coil temperature sensor and Installing the return air temperature sensor sections)

1.1.3 Dip Switch Setting for Outdoor Units

Turn OFF all power source before the setting.

Without turning OFF, the switches do not work and the settings are invalid.

Mark of "■" indicates the position of dip switches. Set the dip switches according to the figure below.

DSW1	DSW2	DSW4	DSW5
Test Operation	Ref. Piping Length / Optional Function Setting	Refrigerant System Setting	End Terminal Resistance Setting
 Factory Setting  Cooling  Heating  Cooling for Intermediate Season  Heating for Intermediate Season  Forced Stop of Compressor	 Factory Setting  Piping Length ≤ 5m  Piping Length ≥ 30m  Optional Function Setting  External Input / Output Setting Mode  Cooling Only Setting	 Factory Setting	 Factory Setting

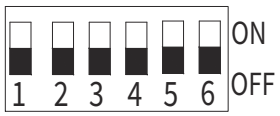
- **Setting for Transmitting**
  It is required to set the outdoor unit Nos., refrigerant cycle Nos. and end terminal resistance for this H-LINK or H-LINK II system.

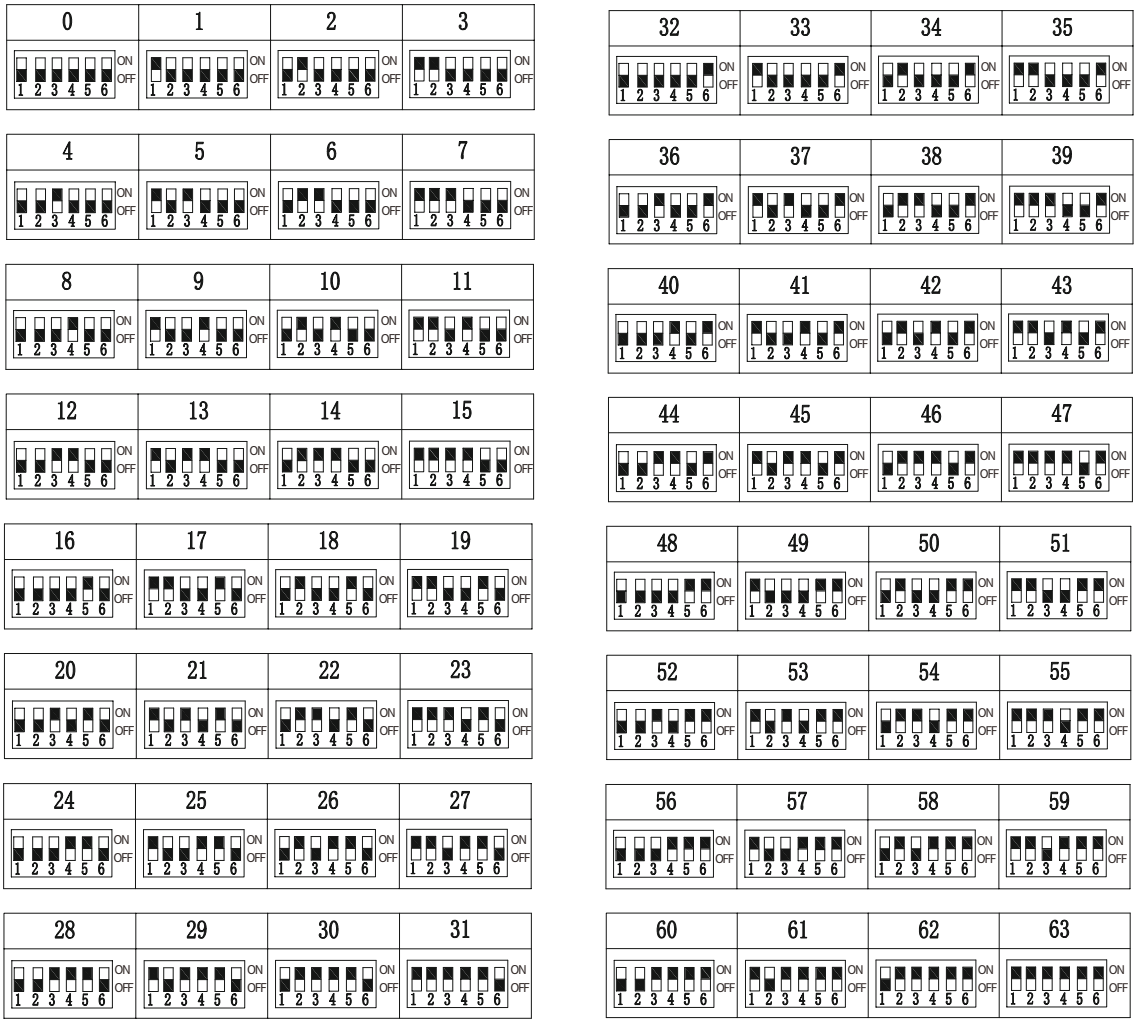
- **Setting of Refrigerant Cycle No.**
  In the same refrigerant cycle, set the same refrigerant cycle No. for the outdoor unit and the indoor units as shown below.
  As for setting indoor unit refrigerant cycle No., set the DSW5 on the indoor unit PCB.

Maximum in setting refrigerant cycle No. is 63.

Ref. Cycle No. Setting	10 digit 
Outdoor Unit	DSW4
Indoor Unit (H-LINK II)	DSW5

- **Outdoor Unit Refrigerant No.**

DSW4 Refrigerant system setting

Before delivery, DSW4 is set to “0”, refrigerant system No. is the same with IDU refrigerant system No.



1.1.4 Failure of Power Supply to Indoor Unit and Wired Remote Controller

- Lights and LCD are not Indicated.
- Not Operated
  If fuses are melted or a breaker is activated, investigate the cause of over current and take necessary action.

Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Power Failure or Power is Not ON		Measure voltage with voltmeter.	Supply power.
Melted Fuse or Activation of Breaker at Power Source	Short Circuit Supplied between Wires	Check for any uncovered part of wires.	Remove cause of short circuit and replace fuse.
	Short Circuit of Wires to Earth	Measure insulation resistance.	Remove cause of short circuit and replace fuse.
	Failure of Indoor Unit Fan Motor	Measure resistance between wires and insulation resistance.	Replace fan motor if faulty.
Melted Fuse at Control Circuit	Short Circuit Supplied between Wires	Check for any uncovered part of wires.	Remove cause of short circuit and replace fuse.
	Short Circuit of Control Circuit to Earth	Measure insulation resistance.	Remove cause of short circuit and replace fuse.
Failure of Transformer at Indoor Unit Side		Measure voltage at secondary side.	Replace PCB.
Disconnection or Contact Failure of Remote Control Cable		Check cables and connection.	Replace or repair them.
Contact Failure at Connectors of Wired Remote Controller	Contact Failure or Incorrect Connection of Indoor Unit PCB	Check connectors.	Correctly connect them.
	Contact Failure or Incorrect Connection of PCB in Wired Remote Controller		
Failure of Wired Remote Controller		Check it in self-checking mode *1).	Replace wired remote controller if faulty.
Failure of Each PCB	Disconnected Wire to Each PCB	Check connectors.	Correctly connect wires.
	Failure of Each PCB	Check each PCB in I.U./O.U. PCB check mode *2).	Replace PCB if faulty.
Incorrect Wiring Connection		Take action according to the procedure indicated in "TEST RUN CHECK".	

*1): Refer to Item 4.2.
*2): Refer to Item 4.2.

1.1.5 Transmission Failure between Wired Remote Controller and Indoor Unit

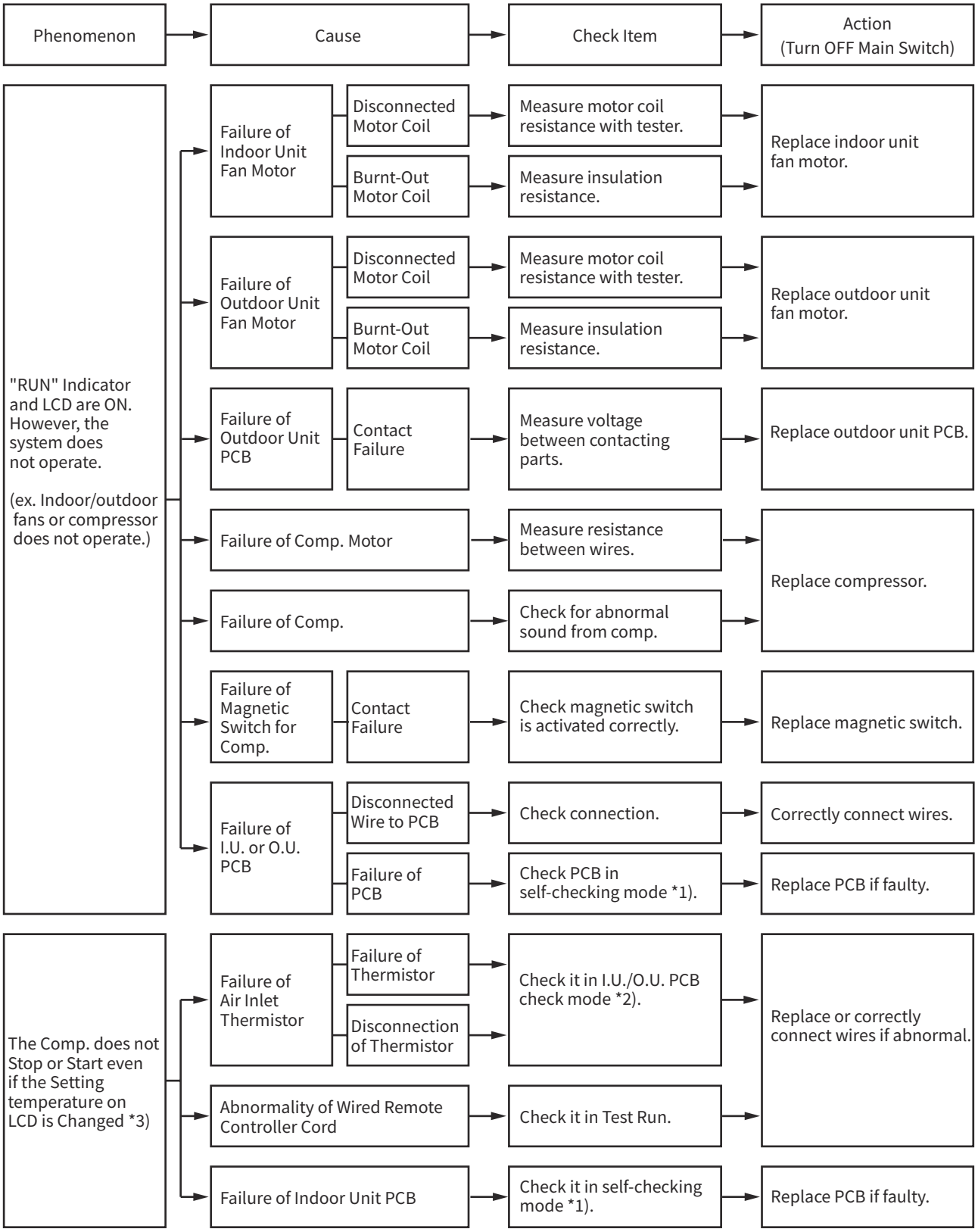
- "RUN" Lamp on Wired Remote Controller: Flashing every 2 seconds

Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Disconnection or Contact Failure of Remote Control Cable		Check cables and connection.	Replace or repair them.
Failure of Wired Remote Controller		Check it in self-checking mode *1).	Replace it if faulty.
Failure of PCB (in Indoor Unit and Wired Remote Controller)	Disconnected Wire to PCB	Check connectors.	Correctly connect wires.
	Failure of PCB	Check it in I.U./O.U. PCB check mode *2).	Replace PCB if faulty.

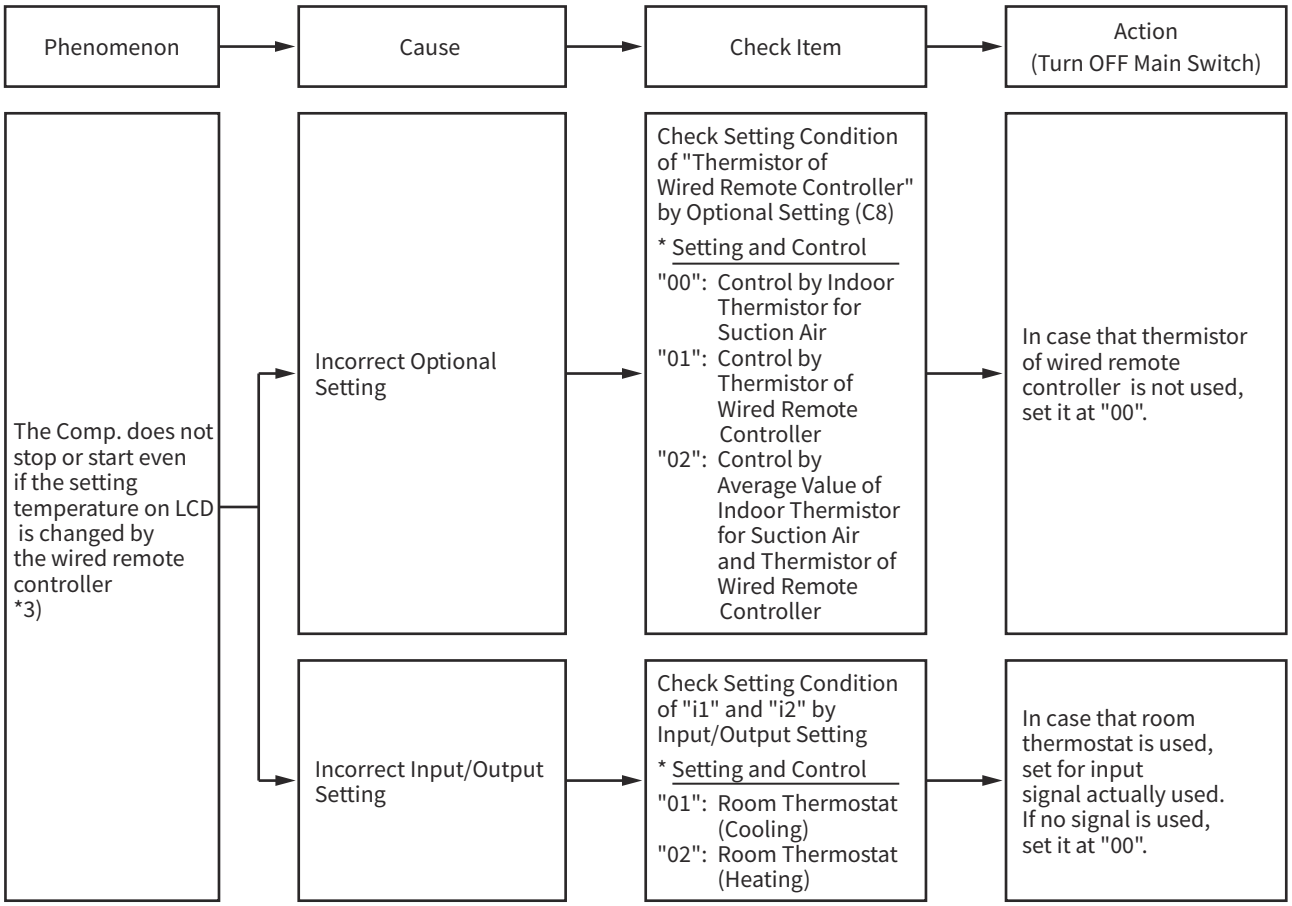
*1): Refer to Item 4.2.
*2): Refer to Item 4.2.

1.1.6 Abnormalities of Devices

- In the case that no abnormality (Alarm Code) is displayed on the Wired Remote Controller, and normal operation is not available, take necessary action according to the procedures mentioned below.

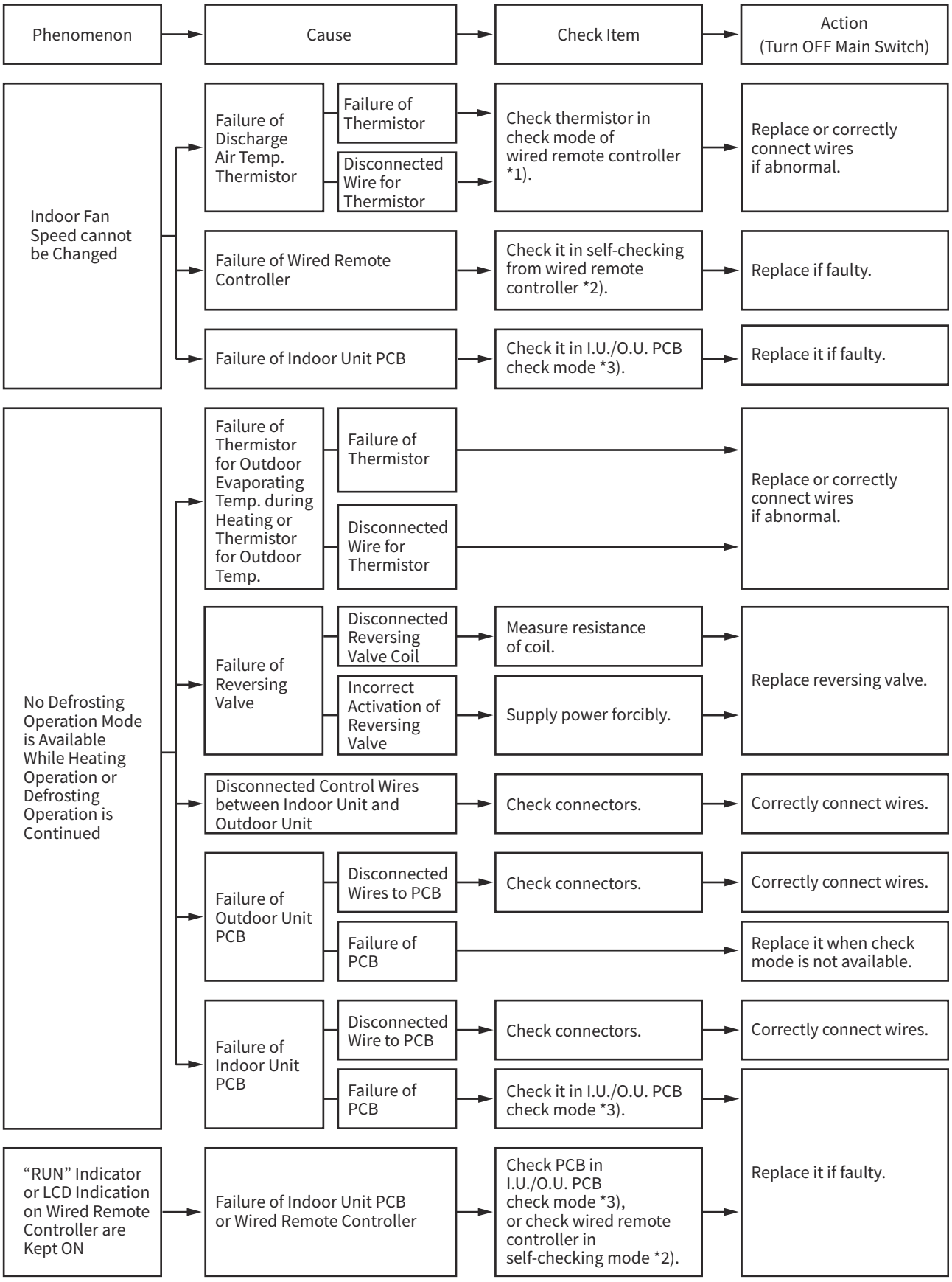


(1.1.6 Abnormalities of Devices)



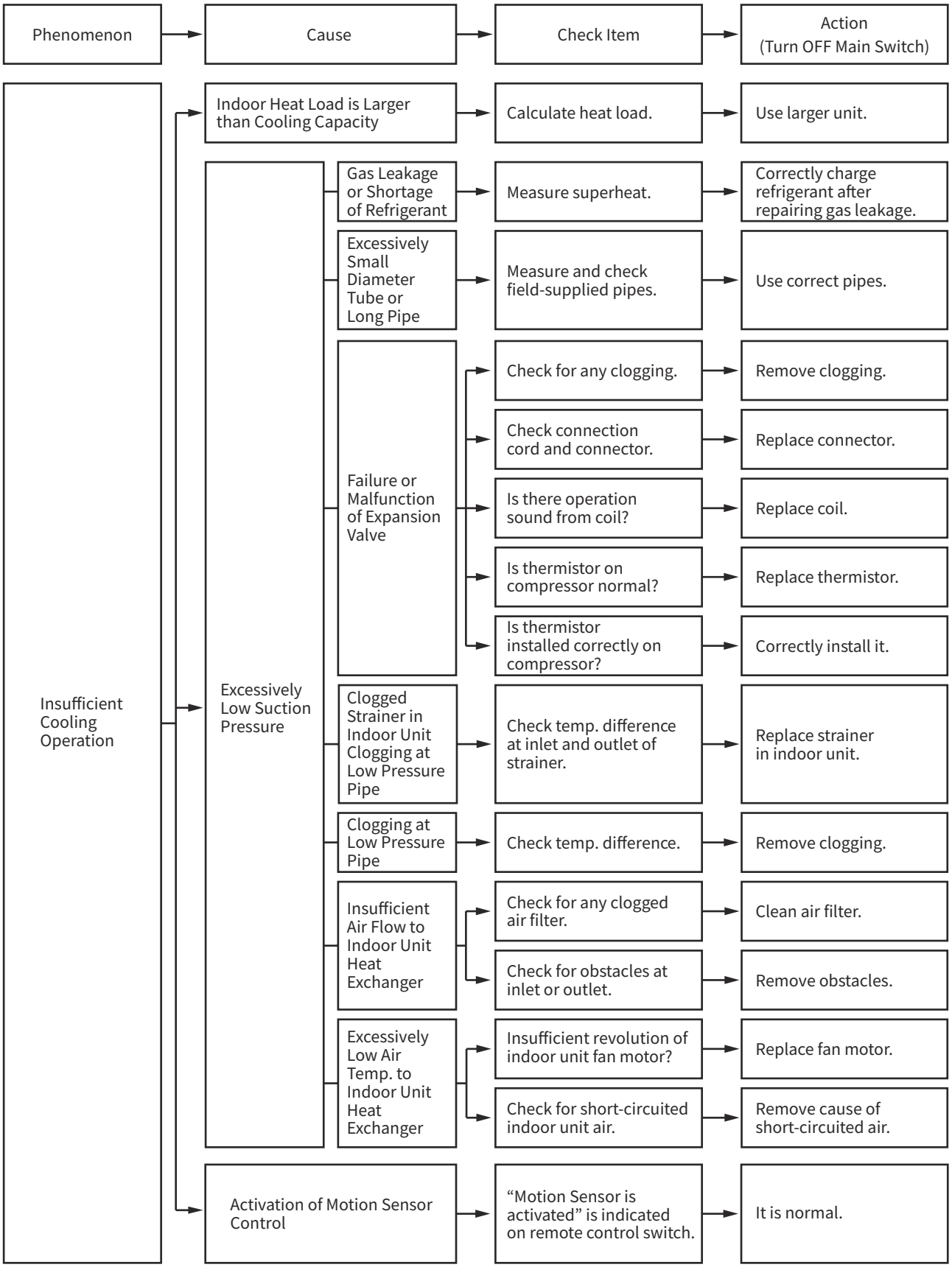
*1): Refer to Item 4.2.
*2): Refer to Item 4.2.
*3): Even if controllers are normal, the compressor does not operate under the following conditions.
* Indoor Air Temp. is lower than 69.8°F(21°C) or Outdoor Air Temp. is lower than 0°F(-18°C) during cooling operation.
* Indoor Air Temp. is higher than 80.6°F(27°C) or Outdoor Air Temp. is higher than 75°F(24°C) during heating operation.
* Outdoor Air Temp. is lower than -13°F(-25°C) during heating operation.
* When a cooling (or heating) operation signal is given to the outdoor unit and a different mode as heating (or cooling) operation signal is given to indoor units.
* When an emergency stop signal is given to outdoor unit.

(1.1.6 Abnormalities of Devices)

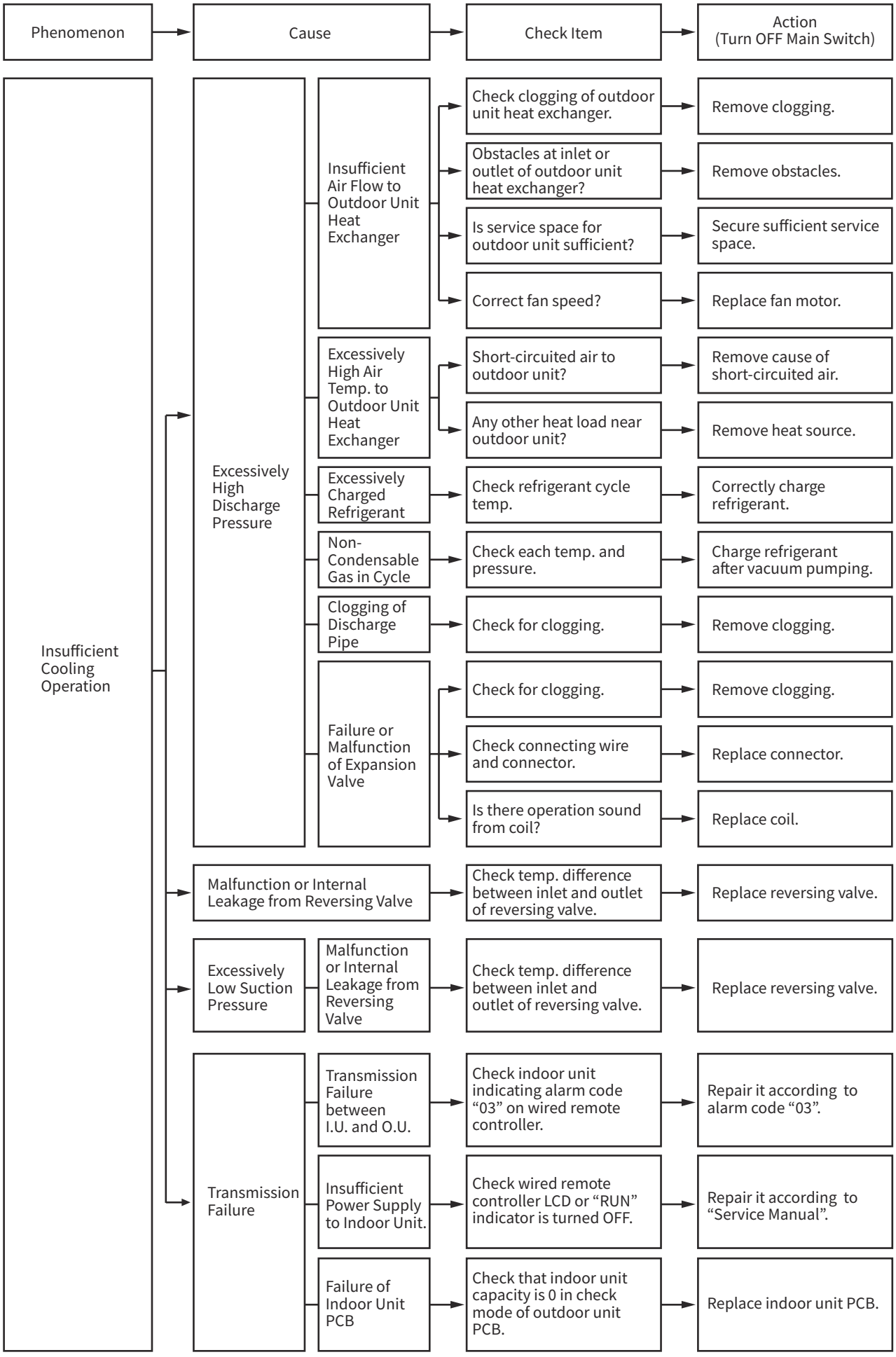


*1): Refer to Item 4.2.
*2): Refer to Item 4.2.
*3): Refer to Item 4.2.

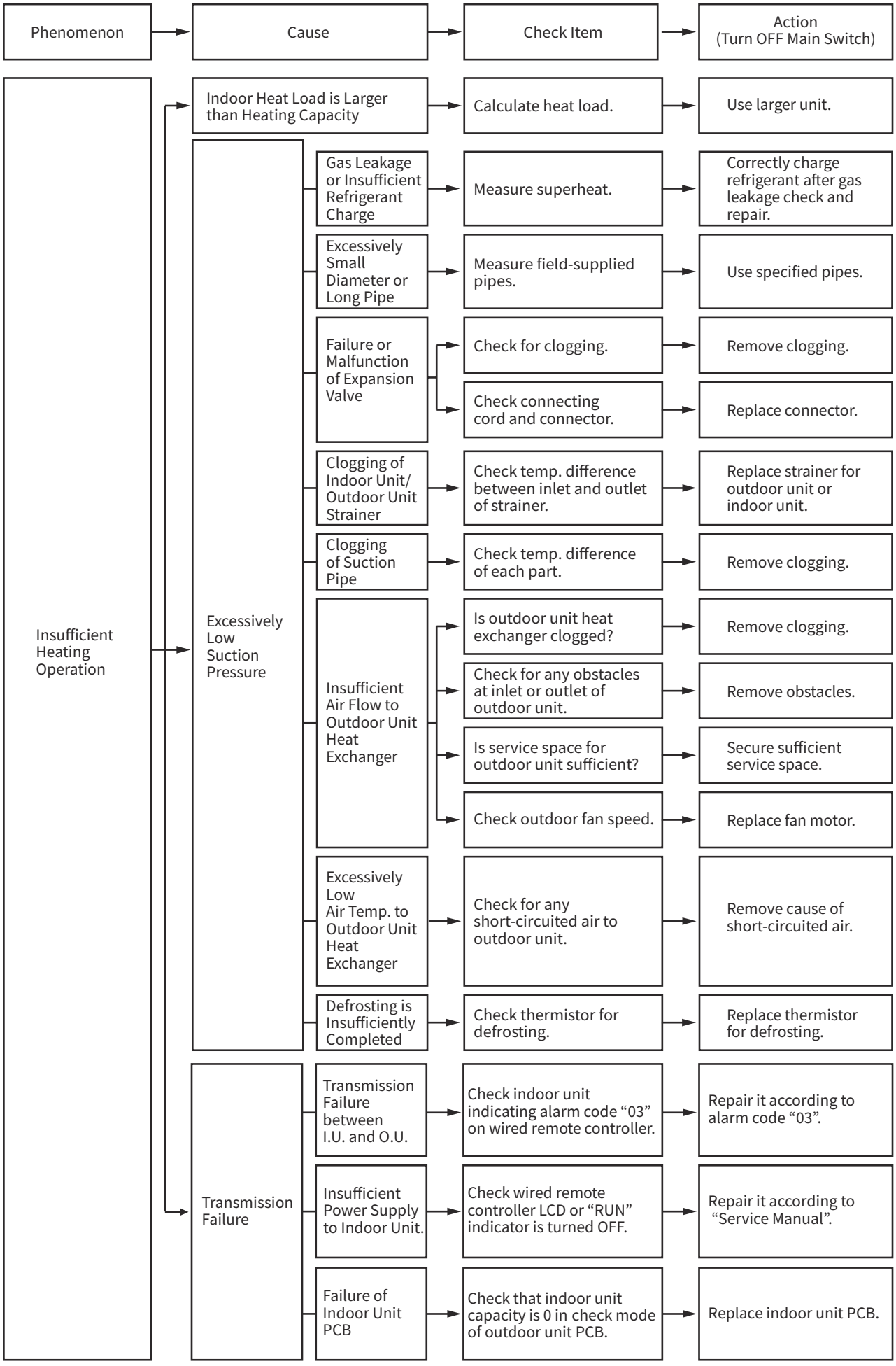
(1.1.6 Abnormalities of Devices)



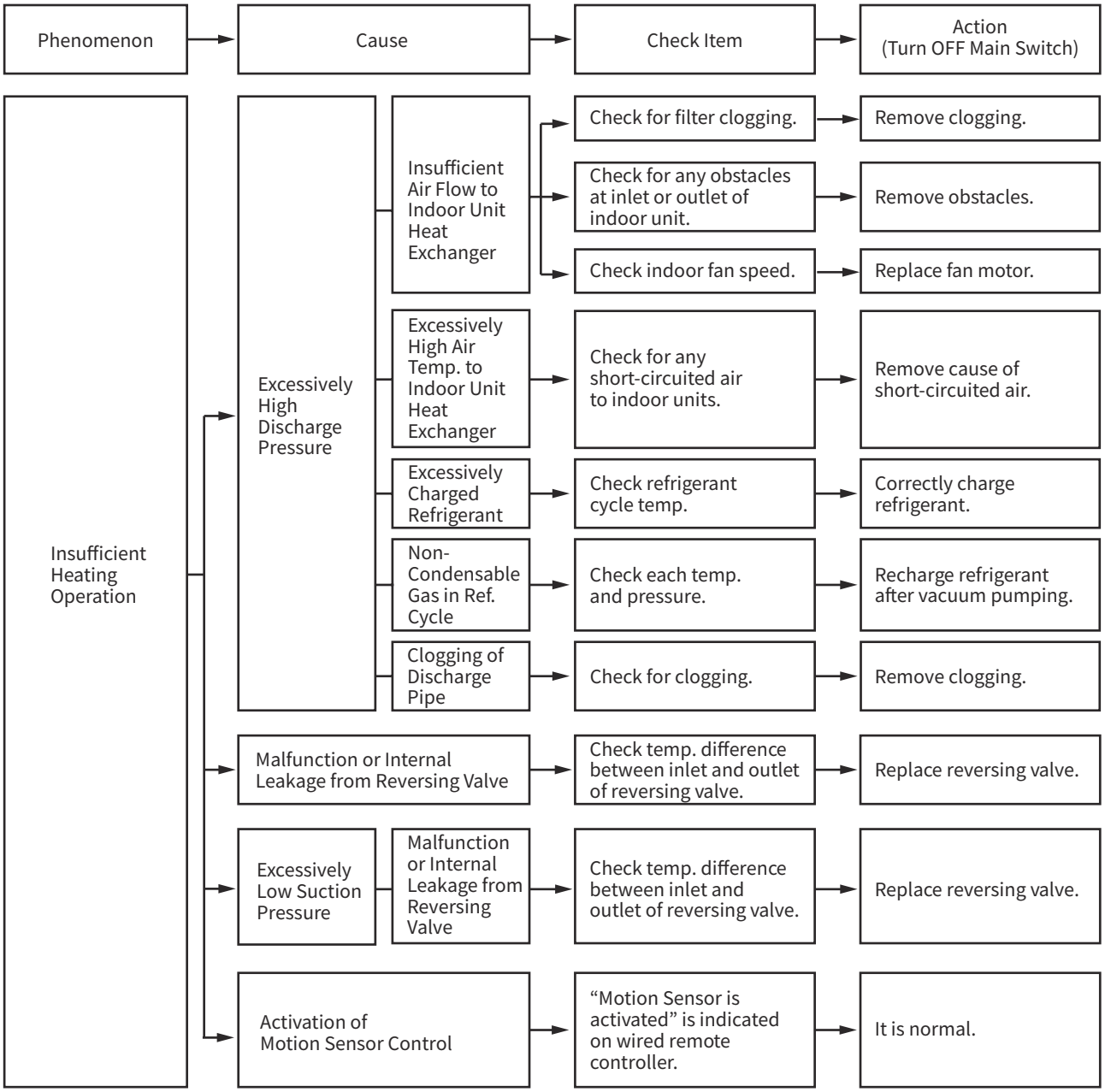
(1.1.6 Abnormalities of Devices)



(1.1.6 Abnormalities of Devices)



(1.1.6 Abnormalities of Devices)



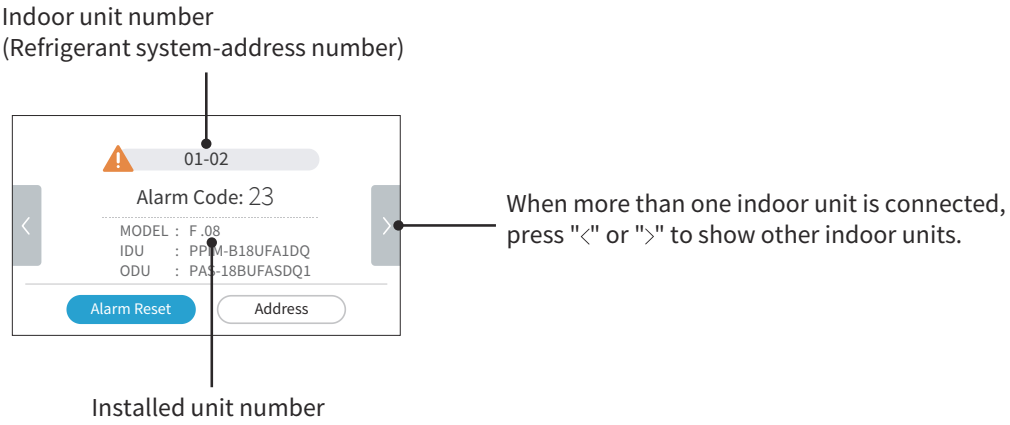
(1.1.6 Abnormalities of Devices)

Phenomenon	Cause		Check Item	Action (Turn OFF Main Switch)
Cooling or Heating Operation with Abnormal Sound	Foreign Particles Inside Fan Casing		Check it by viewing.	Remove foreign particles.
	Indoor Unit Fan Runner Contacts Casing		Check it by viewing.	Adjust position of fan runner.
	Outdoor Unit Propeller Fan Contacts Shroud		Check it by viewing.	Adjust position of propeller fan.
	Abnormal Sound from Compressor	Failure of Installation	Check each part is tightly fixed.	Tightly fix it.
		Liquid Ref. Compression	Check expansion valve opening.	Ensure superheat.
		Wear or Breakage of Internal Comp. Parts	Is there any abnormal sound from inside of compressor	Replace compressor.
	Hamming Sound from Magnetic Conductor		Check surface of contacts.	Replace magnetic conductor.
	Abnormal Vibration of Cabinets		Check each fixing screw.	Tightly fix it.
Outdoor Fan does Not Operate even when Compressor is Operating	Obstacles at Outdoor Fan		Check obstacles.	Remove obstacles.
	Preparatory State for Heating Operation		Wait for switching of reversing valve. (1 to 3 minutes)	In case that reversing valve is not switched, check for insufficient refrigerant.
Indoor Fan does Not Operate even when Compressor is Operating	Disconnected Wire for Indoor Fan		Check wires.	Correctly connect wires.

(1.1.6 Abnormality of Device (Motion Sensor))

Phenomenon	Cause / Check Item	Action (Turn OFF Main Switch)
"Motion Sensor is activated" is NOT Indicated on Wired Remote Controller LCD.	Check connection of connector.	Connect it securely.
Operation Stops though Someone is Present.	Check reaction rate (Check Mode 1: q1) (Reaction rate is always 0%: abnormal)	Replace motion sensor.
	Check connection of connector.	Connect it securely.
Operation Continues though No One is Present.	Check reaction rate (Check Mode 1: q1) (Reaction rate is always 100%: abnormal)	Replace motion sensor.
	Check heat source (a moving object whose temperature is different from atmosphere).	Remove it.
	Check connection of connector.	Connect it securely.

1.2 Troubleshooting Procedure



- The RUN indicator flashes.
- The indoor unit number, alarm code, model code, and the connected number of indoor units are displayed on the screen.

1.2.1 Alarm Code Table

Code	Category	Content of Abnormality	Leading Cause
01	Indoor Unit	Activation of Protection Device (Float Switch)	Activation of Float Switch (High Water Level in Drain Pan, Abnormal Drain Pipe, Float Switch or Drain Pan)
02	Outdoor Unit	Activation of Protection Device (Pressure Switch-High)	Activation of PSH (Pipe Clogging, Excessive Refrigerant, Insert Gas Mixing, Fan Motor Locking at Cooling Operation)
03	Transmission	Transmission Failure between Indoor and Outdoor	Incorrect Wiring, Loose Terminals, Disconnected Wire, Blowout of Fuse, Outdoor Unit Power OFF
04		Transmission Failure between Inverter PCB and Outdoor PCB	Inverter PCB - Outdoor PCB Transmission Failure (Loose Connector, Wire Breaking, Blowout of Fuse)
06	Voltage	Abnormal Inverter Voltage	Abnormal Inverter Board, Fan Controller, DM, CB
07	Cycle	Decrease in Discharge Gas Superheat	Excessive Refrigerant Charge, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Opened Position (Disconnected Connector)
08		Excessively High Discharge Gas Temperature at Top of Compressor Chamber	Shortage of Refrigerant, Leaking, Pipe Clogging
11	Sensor on Indoor Unit	Abnormal Inlet Air Thermistor	Incorrect Wiring, Disconnected Wire, Wire Breaking, Short Circuit
13		Abnormal Temperature Sensor in Indoor Tube	
19	Fan Motor on Indoor Unit	Activation of Protection Device for Indoor Fan Motor	Fan Motor Overheat, Lockup
20	Sensor on Outdoor Unit	Abnormal Compressor Thermistor	Incorrect Wiring, Disconnected Wire, Wire Breaking, Short Circuit
22		Abnormal Outdoor Air Thermistor	
24		Abnormal Heat Exchanger Liquid Side Temperature (Te) Thermistor	Incorrect Wiring, Disconnected Wire, Wire Breaking, Short Circuit, Fan Motor Locking at Heating Operation
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit	Incorrect Capacity Code Setting of Combination Excessive or Insufficient Indoor Unit Total Capacity Code
35		Incorrect Setting of Indoor Unit No.	Duplication of Indoor Unit No. in same Ref. Group, The number of the indoor unit is out of range.
36		Incorrect of Indoor Unit Combination	Outdoor unit and indoor unit are different tier, brand exception combination.

(1.2.1 Alarm Code Table)

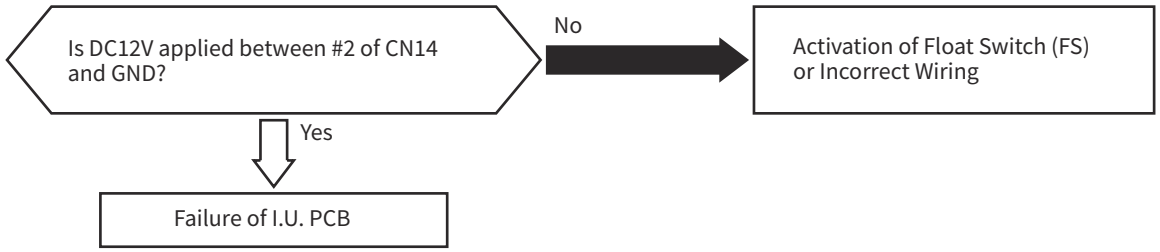
Code	Category	Content of Abnormality	Leading Cause
47	Protection Device	Activation to Protect System from Excessively Low Suction Pressure (Protection from Vacuum Operation)	Insufficient Refrigerant, Refrigerant Piping, Clogging, Expansion Valve Locking at Open Position (Loose Connector), O.U. Fan Motor Locking at Heating Operation
48		Activation of Overcurrent Protection	Excessive Refrigerant, Heat Exchanger Clogging, Increasing Pressure by Abnormality of Cycle Portions, Abnormal Compressor (Overload, Locking, Overcurrent)
51	Inverter	Abnormal Current Sensor for Inverter	Current Transformer Wiring Error, Abnormal Outdoor Board or Inverter Board
53		Activation of Transistor Module Protection Device	Abnormal Inverter (Overload, Overcurrent, Abnormal Rotation, Activation Failure), Compressor Failure
54		Abnormal Inverter Fin Temperature	Fin Thermistor Failure, Heat Exchanger Clogging. Fan Motor Failure
55		Inverter Failure	Inverter PCB Failure
57	Outdoor Fan	Abnormal Fan Motor	Disconnected Transition Wiring for Fan Motor, Abnormal Fan Motor or Terminal for Inverter, Incorrect Wiring
58	Outdoor Unit	Activation of Protection Device (Pressure Switch-Low)	Activation of PSL(Refrigerant leakage, internal blockage of the system, and Pressure Switch-Low wiring breakage)
b0	Indoor Unit Model Setting	Incorrect Setting of Indoor Models and Capacity	No Setting of Unit Model, Incorrect Setting of Unit Model
b1	Outdoor Unit No. Setting	Incorrect Setting of Unit and Refrigerant Cycle Number	Over 64 number is set for address or refrigerant Cycle.
b3	System	Incorrect Combination of Indoor Unit and Remote Control Switch	Indoor unit, remote control switch not match
EE	Compressor	Compressor Protection Alarm	This alarm code appears when the following alarms occurs three times within 6 hours. 02, 07, 08, 47

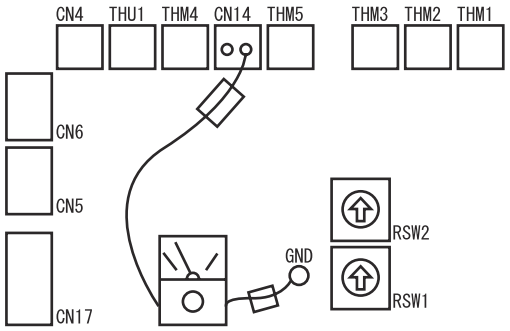
1.2.2 Troubleshooting by Alarm Code

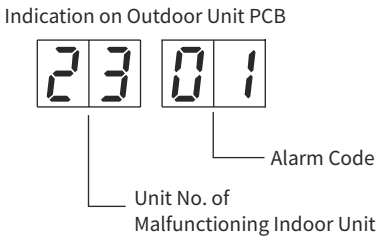
Alarm Code 01	Activation of Protection Device (Float Switch) in Indoor Unit

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when the contact between #1 and #2 of CN14 is opened for over 120 seconds during the cooling, dry, fan or heating operation.





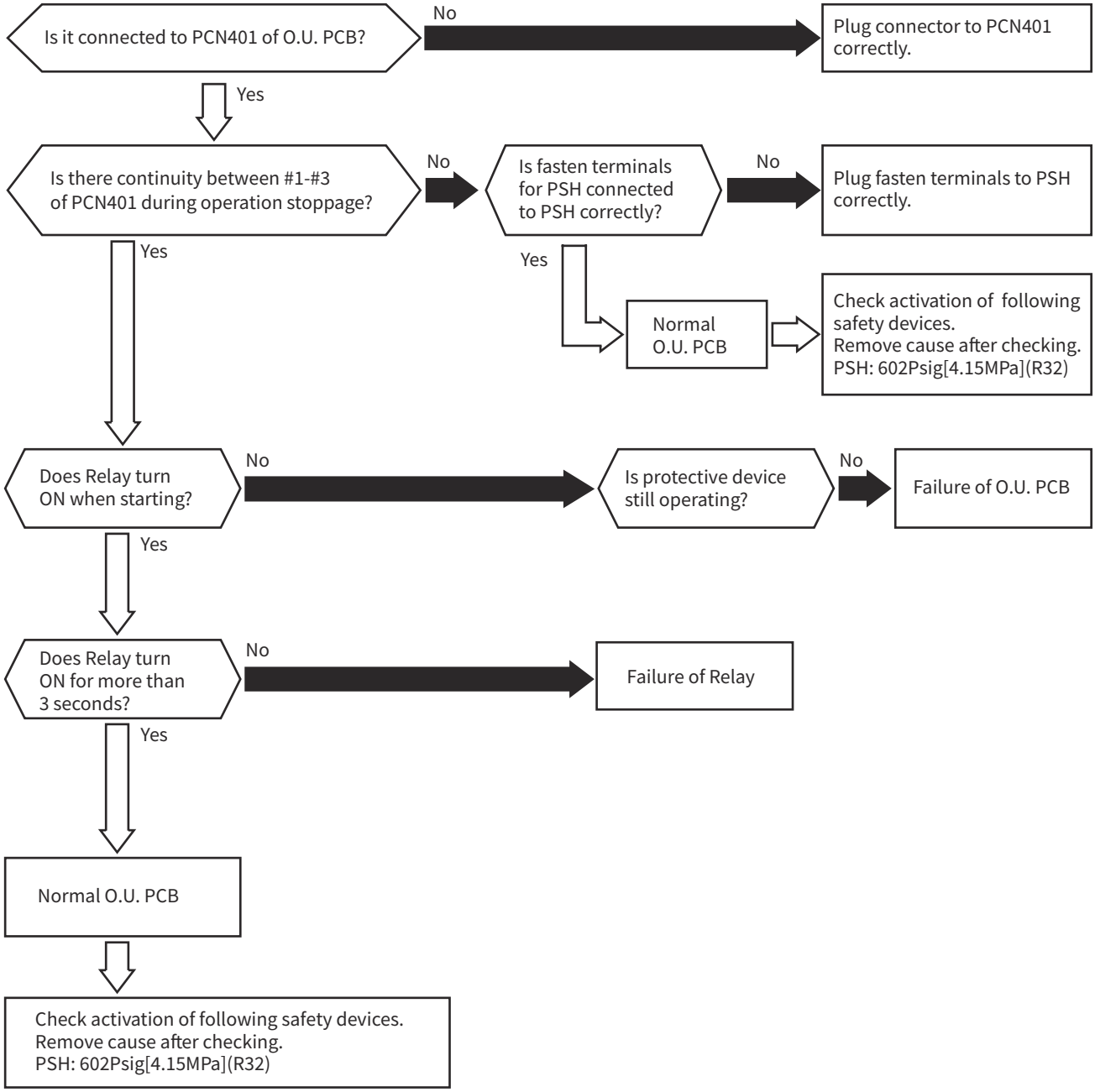


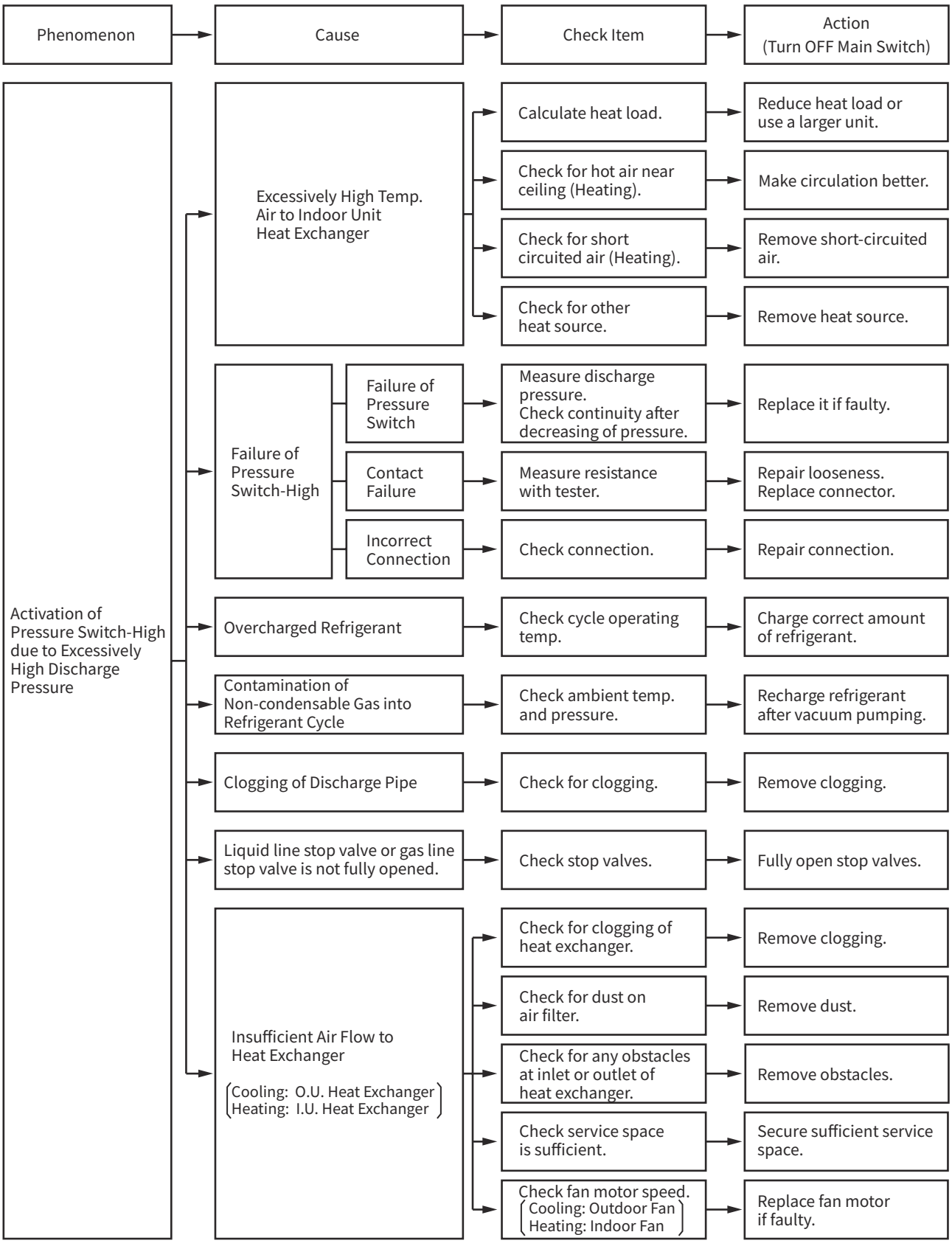
Phenomenon	Cause		Check Item	Action (Turn OFF Main Switch)
Activation of Float Switch	High Drain Level	Clogging of Drainage Up-Slope Drain Piping	Check drain pan. Check drainage by pouring water.	Remove foreign particles clogging drainage.
	Failure of Float Switch	Failure	Check continuity when drain level is low.	Replace float switch if faulty.
		Contact Failure	Measure resistance with tester.	Repair looseness and replace connector.
		Incorrect Connection	Check connection.	Repair connection.
Failure of Indoor Unit PCB			Check PCB in self-checking mode.	Replace it if faulty.

Alarm Code 07	Activation of Protection Device (Pressure Switch-High) in Outdoor Unit

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when the protection device (Pressure Switch-High: PSH) is activated during the compressor operation (Y52C: ON).




Phenomenon
Cause
Check Item
Action
(Turn OFF Main Switch)
Activation of Pressure Switch-High due to Excessively High Discharge Pressure
Excessively High Temp. Air to Indoor Unit Heat Exchanger
Calculate heat load.
Reduce heat load or use a larger unit.
Check for hot air near ceiling (Heating).
Make circulation better.
Check for short circuited air (Heating).
Remove short-circuited air.
Check for other heat source.
Remove heat source.
Failure of Pressure Switch-High
Failure of Pressure Switch
Measure discharge pressure. Check continuity after decreasing of pressure.
Replace it if faulty.
Contact Failure
Measure resistance with tester.
Repair looseness. Replace connector.
Incorrect Connection
Check connection.
Repair connection.
Overcharged Refrigerant
Check cycle operating temp.
Charge correct amount of refrigerant.
Contamination of Non-condensable Gas into Refrigerant Cycle
Check ambient temp. and pressure.
Recharge refrigerant after vacuum pumping.
Clogging of Discharge Pipe
Check for clogging.
Remove clogging.
Liquid line stop valve or gas line stop valve is not fully opened.
Check stop valves.
Fully open stop valves.
Insufficient Air Flow to Heat Exchanger
(Cooling: O.U. Heat Exchanger
Heating: I.U. Heat Exchanger)
Check for clogging of heat exchanger.
Remove clogging.
Check for dust on air filter.
Remove dust.
Check for any obstacles at inlet or outlet of heat exchanger.
Remove obstacles.
Check service space is sufficient.
Secure sufficient service space.
Check fan motor speed.
(Cooling: Outdoor Fan
Heating: Indoor Fan)
Replace fan motor if faulty.

Alarm Code 03	Transmission Failure between Indoor Unit and Outdoor Unit

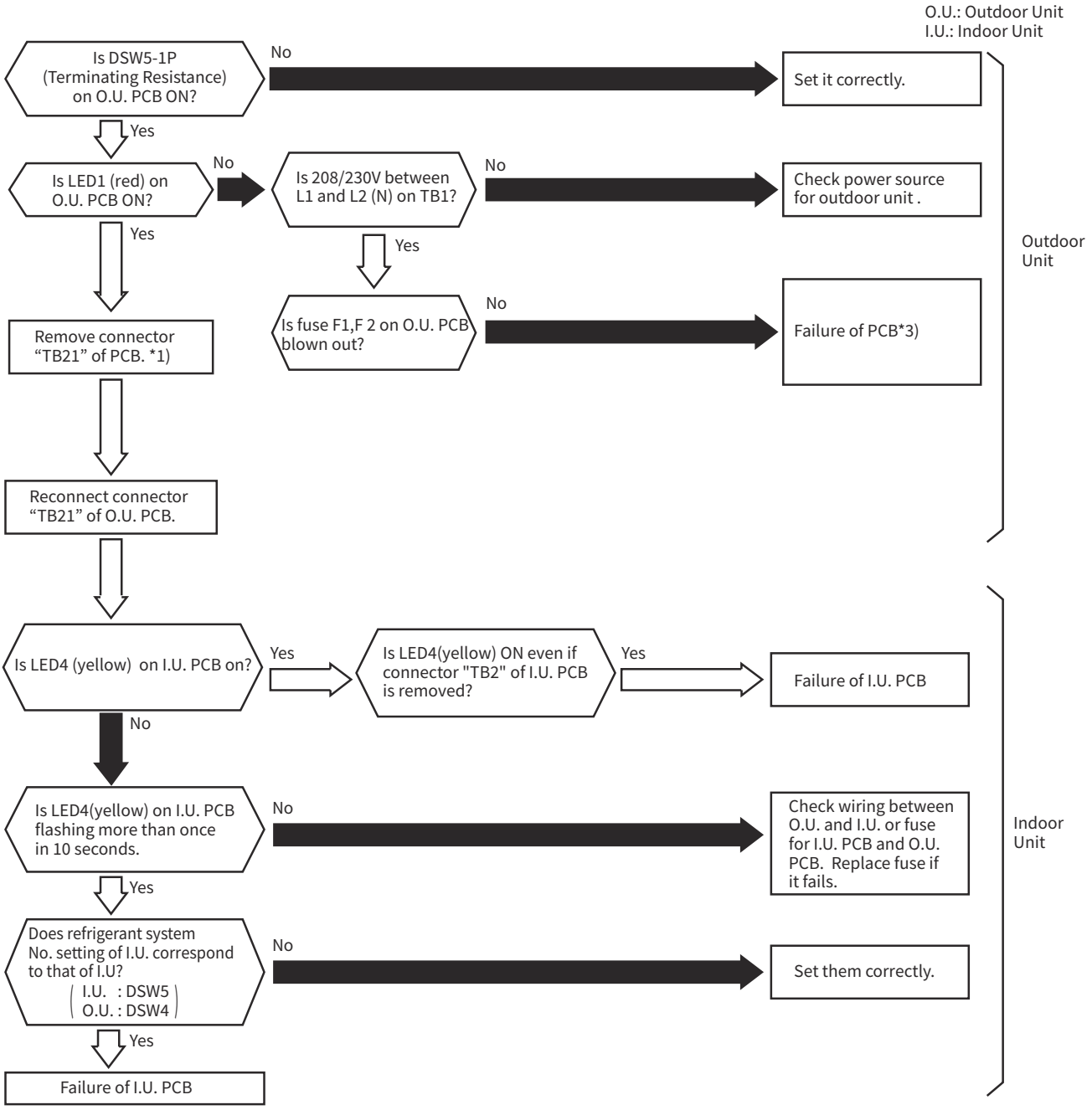
- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ When fuses are melted, or the circuit breakers are activated, check the cause of overcurrent and take necessary action.

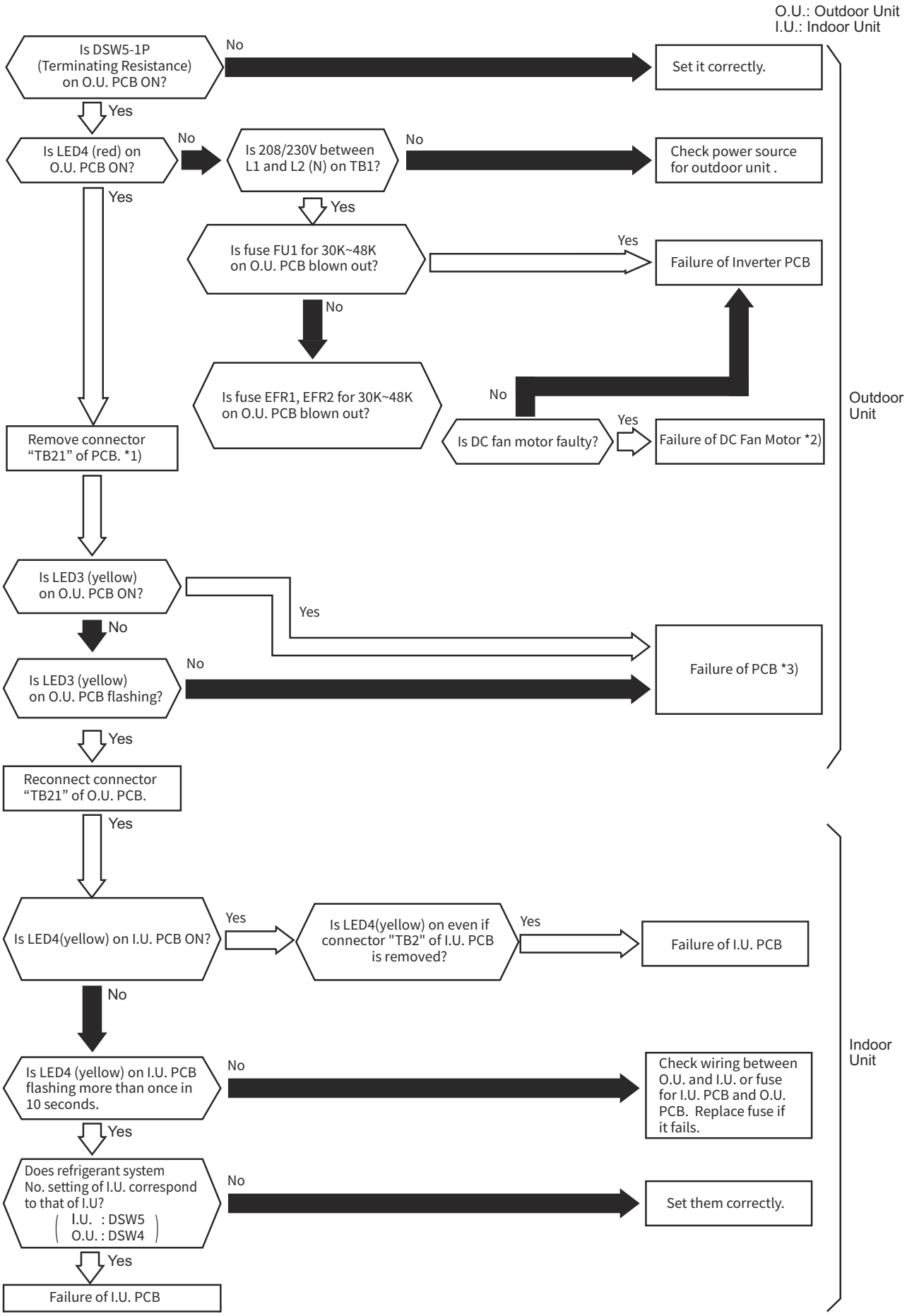
★ This alarm code is displayed when an abnormal condition continues for 3 minutes after normal transmission between indoor units and outdoor units, and also the abnormal condition continues for 30 seconds even after the micro-computer is automatically reset. If transmission failure occurs from the beginning, the alarm code is displayed after 30 seconds from start up.

★ This alarm code may be displayed when the inverter or the fan motor is malfunction and the outdoor unit cannot secure the power source (No indication on the 7-segment display of outdoor unit PCB).
In this case, surely check the inverter fan motor and the continuity of fuse on the circuit.

<09K~24K>


O.U.: Outdoor Unit
I.U.: Indoor Unit
Is DSW5-1P (Terminating Resistance) on O.U. PCB ON?
No
Set it correctly.
Yes
Is LED1 (red) on O.U. PCB ON?
No
Is 208/230V between L1 and L2 (N) on TB1?
No
Check power source for outdoor unit .
Yes
Yes
Is fuse F1,F 2 on O.U. PCB blown out?
No
Failure of PCB*3)
Remove connector "TB21" of PCB. *1)
Reconnect connector "TB21" of O.U. PCB.
Outdoor Unit
Is LED4 (yellow) on I.U. PCB on?
Yes
Is LED4(yellow) ON even if connector "TB2" of I.U. PCB is removed?
Yes
Failure of I.U. PCB
No
Is LED4(yellow) on I.U. PCB flashing more than once in 10 seconds.
No
Check wiring between O.U. and I.U. or fuse for I.U. PCB and O.U. PCB. Replace fuse if it fails.
Yes
Does refrigerant system No. setting of I.U. correspond to that of I.U?
(I.U. : DSW5
O.U. : DSW4)
No
Set them correctly.
Yes
Failure of I.U. PCB
Indoor Unit

<30K~48K>


O.U.: Outdoor Unit
I.U.: Indoor Unit
Is DSW5-1P (Terminating Resistance) on O.U. PCB ON?
No
Set it correctly.
Yes
Is LED4 (red) on O.U. PCB ON?
No
Is 208/230V between L1 and L2 (N) on TB1?
No
Check power source for outdoor unit .
Yes
Yes
Is fuse FU1 for 30K~48K on O.U. PCB blown out?
Yes
Failure of Inverter PCB
No
Is fuse EFR1, EFR2 for 30K~48K on O.U. PCB blown out?
No
Is DC fan motor faulty?
Yes
Failure of DC Fan Motor *2)
Remove connector "TB21" of PCB. *1)
Is LED3 (yellow) on O.U. PCB ON?
Yes
No
Is LED3 (yellow) on O.U. PCB flashing?
No
Failure of PCB *3)
Yes
Reconnect connector "TB21" of O.U. PCB.
Outdoor Unit
Yes
Is LED4(yellow) on I.U. PCB ON?
Yes
Is LED4(yellow) on even if connector "TB2" of I.U. PCB is removed?
Yes
Failure of I.U. PCB
No
Is LED4 (yellow) on I.U. PCB flashing more than once in 10 seconds.
No
Check wiring between O.U. and I.U. or fuse for I.U. PCB and O.U. PCB. Replace fuse if it fails.
Yes
Does refrigerant system No. setting of I.U. correspond to that of I.U?
(I.U. : DSW5
O.U. : DSW4)
No
Set them correctly.
Yes
Failure of I.U. PCB
Indoor Unit

TROUBLESHOOTING

Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Power Failure of No Power Supply		Measure voltage with tester.	Supply power.
Melted Fuse for Power Source or Activation of Outdoor Unit Breaker	Short Circuit between Wires	Check for breakage of insulation.	Remove cause of short circuit. Replace fuse and/or I.U./O.U. PCB if faulty.
	Ground Fault	Measure insulation resistance.	Remove cause of short circuit to ground. Replace fuse and/or I.U./O.U. PCB if faulty.
Melted Fuse for DC Power Supply (Outdoor Unit) 18~24K: F1 on O.U.PCB 30~48K : FU1, EFR1, EFR2 on O.U.PCB	Short Circuit between Wires	Check for breakage of insulation.	Remove cause of short circuit and replace fuse.
	Ground Fault of DC Fan Power Supply Line	Measure insulation resistance.	Remove cause of short circuit and replace fuse.
	Failure of Outdoor Unit Fan Motor	Measure resistance between wires and insulation resistance.	Replace fan motor and fuse.
	Incorrect Power Supply Circuit of O.U. PCB	Check O.U. PCB output. *3)	Replace fuse.
Incorrect Power Supply Circuit of O.U. PCB		Measure O.U. PCB output. *3)	Replace O.U. PCB.
Disconnected Wires, Contact Failure or Incorrect Connection	Between Outdoor Unit and Indoor Unit	Check continuity of wires. Check for looseness of connection screws. Check terminal Nos.	Replace or repair wires, tighten screws or correct wires.
	Power Source Wiring for Outdoor Unit		
Failure of O.U. and I.U.PCB	Disconnected Wires to I.U./O.U. PCB	Check connection.	Correctly connect wires.
	Failure of I.U./O.U.PCB		Replace it if faulty.
Incorrect Wiring	Disconnected Wire Contact Failure	Check continuity and looseness of connection screws.	Replace wires, repair and tighten screws.
	Incorrect Wiring	Check terminal Nos.	Correctly connect wires.

*1): In the case that the end terminal resistance (DSW5-1) is set to OFF for H-LINK connection, set the end terminal resistance to ON when TB21 is disconnected. Set the end terminal resistance to OFF when TB21 is reconnected.

*2): Refer to the item 1.2.3 “Checking Method for Outdoor Unit PCB (PCB1)” about troubleshooting.

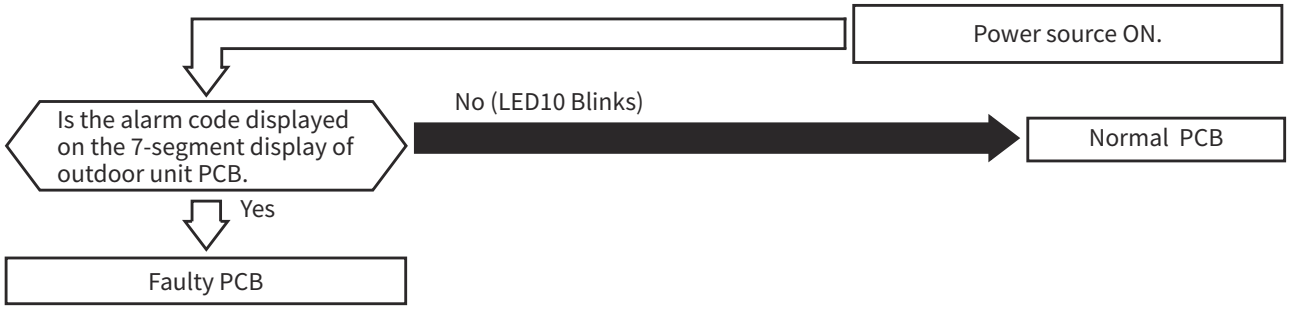
*3): Surely perform the troubleshooting of DC fan motor.
If DC fan motor fails, the normal inverter PCB may be damaged.

Alarm Code 04	Transmission Failure between Inverter PCB and Outdoor Unit PCB

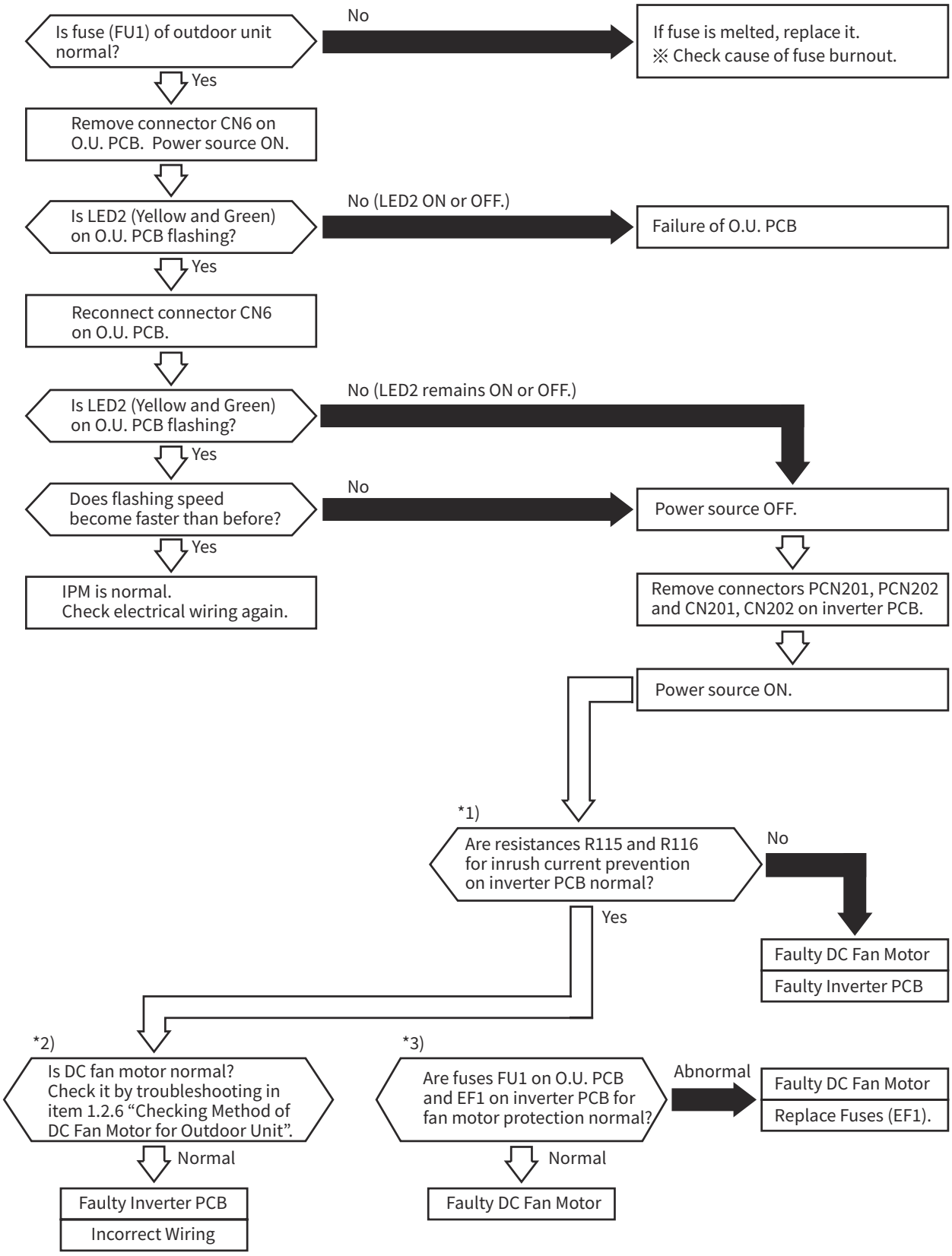
- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed after the operation is stopped when the transmission failure occurs between the inverter PCB and the outdoor unit PCB.

<09K~24K>



<30K~48K>



*1): Surely perform the troubleshooting of the resistance for inrush current prevention (R115/R116) on inverter PCB. If the resistance for inrush current prevention (R115/R116) fails, the transmission failure occurs.

*2): Surely perform the troubleshooting of DC fan motor.
If the DC fan motor fails, the normal inverter PCB may be damaged.

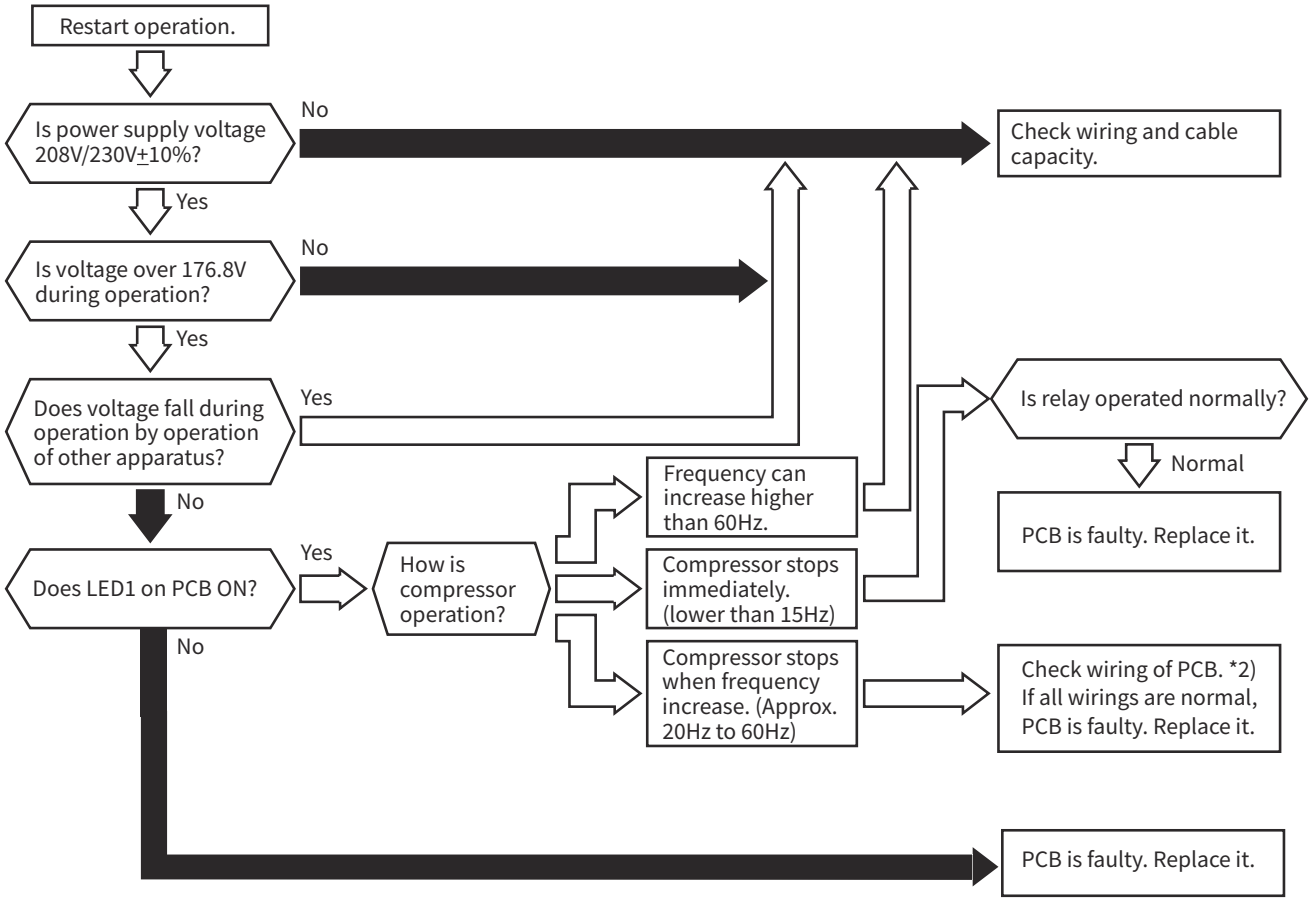
*3): Perform the troubleshooting of the fuses “FU1” on O.U. PCB and “EF1” on inverter PCB for fan motor protection. If the fuses for fan motor protection fail, DC fan motor is not operated normally.

Alarm Code 06	Abnormal Inverter Voltage (Insufficient Inverter Voltage or Overvoltage)

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ When either insufficient voltage or overvoltage is detected between the terminal #1 - #3 of PCN202 (P-N Line) for the DC fan motor power supply on the inverter PCB 3 times in 30 minutes, the operation stops and this alarm code is displayed. If this occurs less than 3 times in 30 minutes, the operation is automatically retried.

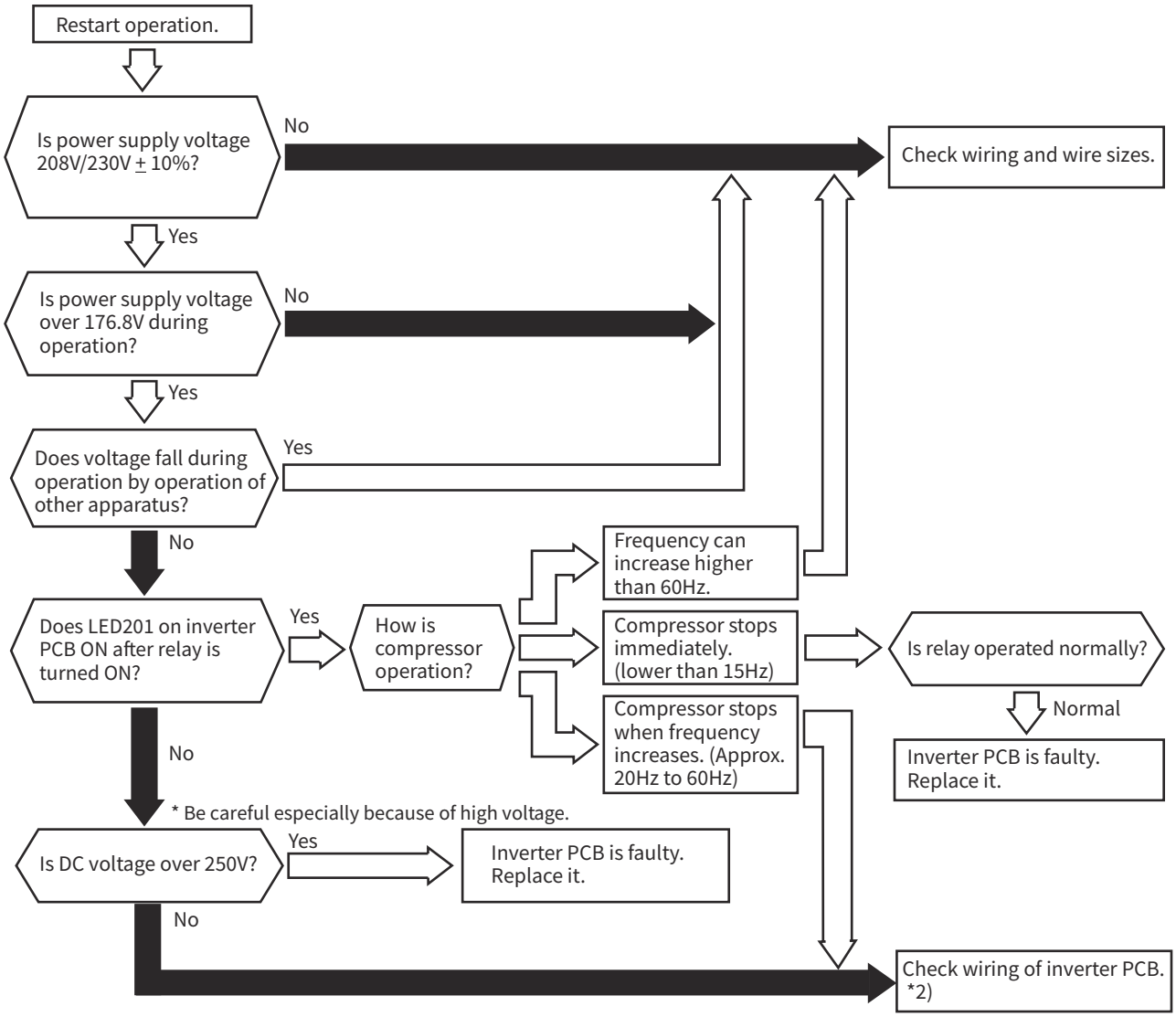
< 09K~24K >



*1): If there is high residual voltage, make sure to perform high voltage discharge according to the item 1.2.4 (2) “Checking Method for Rectifier Circuit”.

*2): For maintenance, check the wiring connection according to the item 1.2.4 (3) “Checking Method for Inverter Module”.

< 30K~48K >



*1): If there is high residual voltage, make sure to perform high voltage discharge according to the item 1.2.4 (2) “Checking Method for Rectifier Circuit”.

*2): For maintenance, check the wiring connection according to the item 1.2.4 (3) “Checking Method for Inverter Module”.

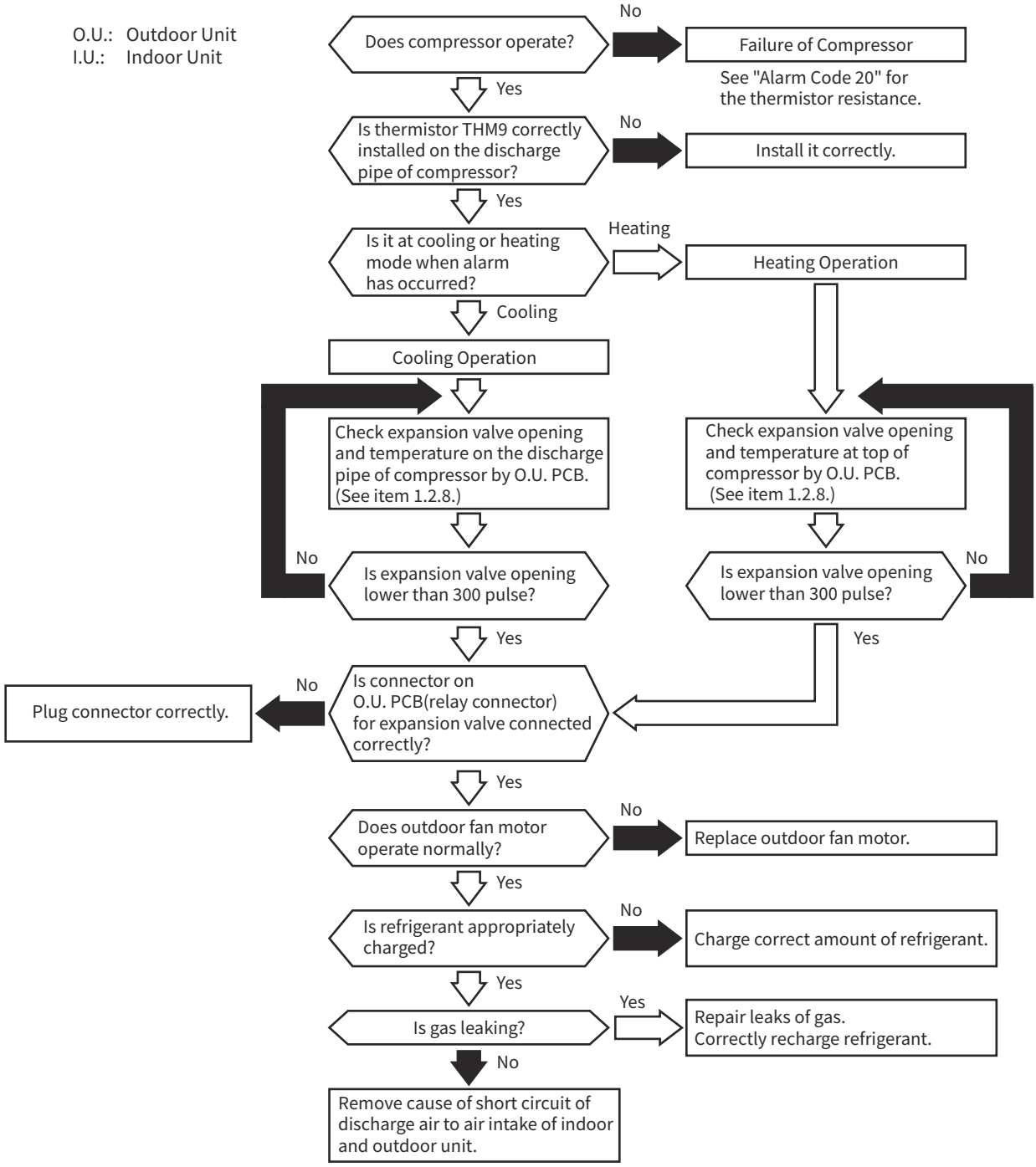
Alarm Code 07	Decrease in Discharge Gas Superheat

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ If the discharge temperature of the compressor is below the estimated condensing temperature for 30 minutes during operation, the compressor stops and then the operation is automatically retried after 3 minutes. If this occurs again twice in the next 120 minutes, this alarm code is displayed.

★ This alarm code is displayed when an abnormality cannot be detected by the step-out detection, caused by locking of compressor shaft.

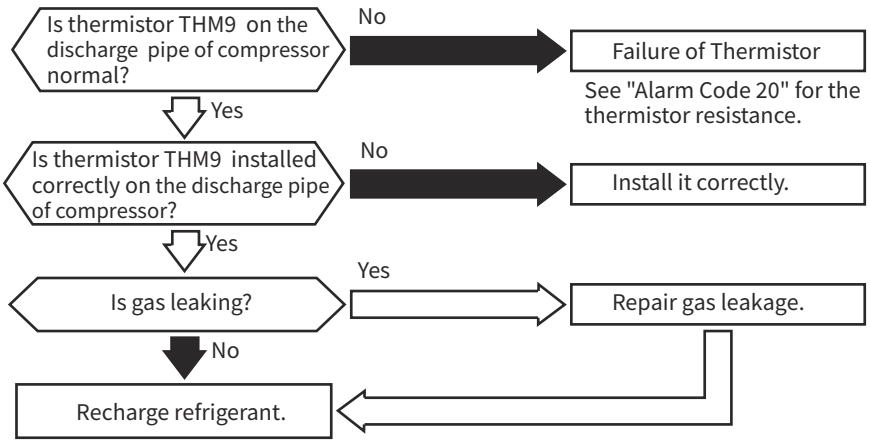
O.U.: Outdoor Unit
I.U.: Indoor Unit

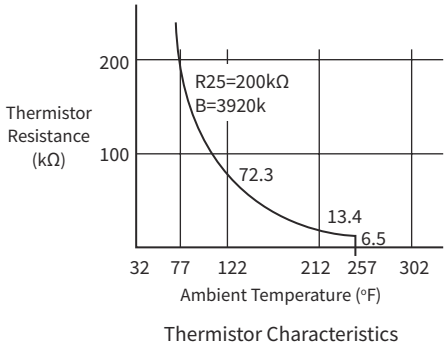


Alarm Code 08	Excessively High Discharge Gas Temperature on Discharge Pipe of Compressor

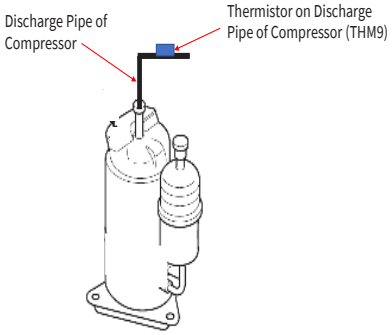
- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when the temperature at the top of the compressor is above 239°F(115°C) for 10 minutes or above 257°F(125°C) for 5 seconds during cooling/heating operation.





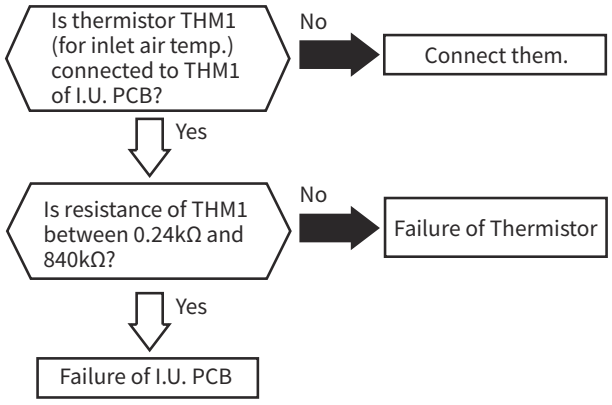
Thermistor Characteristics

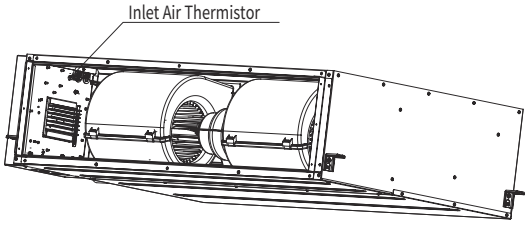


Alarm Code 11	Abnormality of Thermistor for Indoor Unit Inlet Air Temperature (Inlet Air Thermistor)

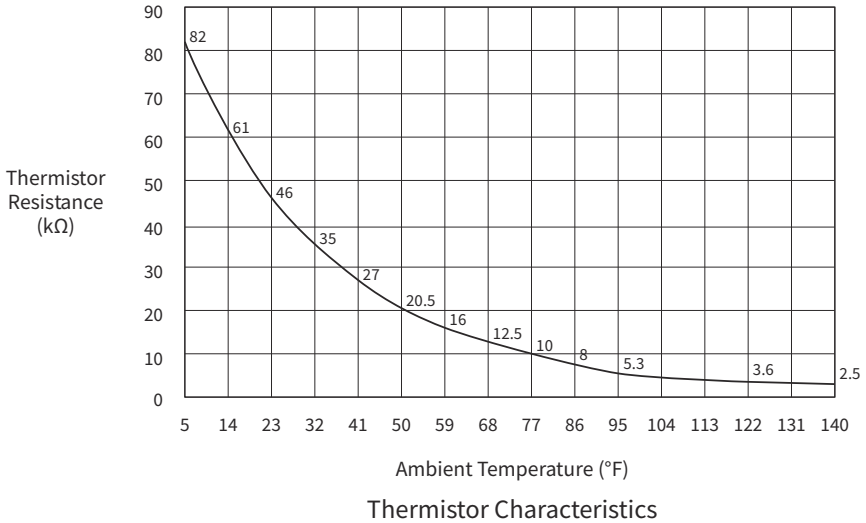
- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when a short circuit (0.24kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected during heating or cooling operation. The operation automatically restarts when the malfunction is removed.

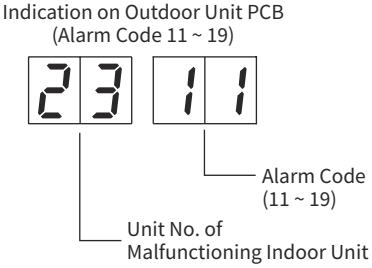




Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Inlet Air Thermistor	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check connection.	Correctly connect wires.
Failure of I.U. PCB		Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.



Thermistor Characteristics



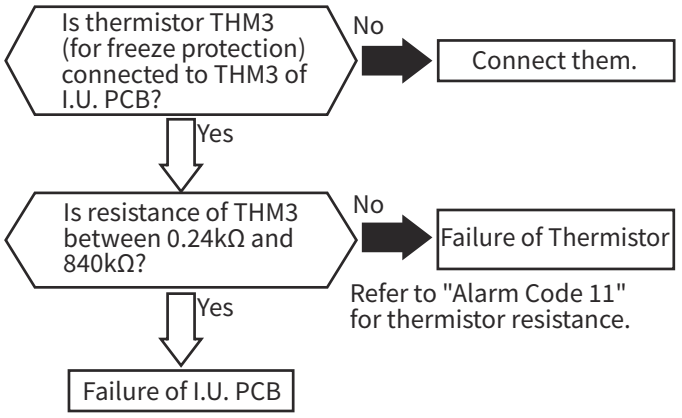
NOTE:

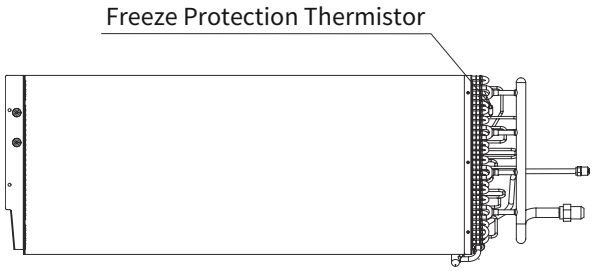
- This figure is applicable to the following thermistors.
  1. Inlet Air Thermistor (THM1)
  2. Freeze Protection Thermistor (Freeze Protection) (THM3)

Alarm Code 13	Abnormality of Thermistor for Coil Temperature at Indoor Unit Heat Exchanger (Freeze Protection Thermistor)

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when a short circuit (0.24kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected during heating or cooling operation. The operation automatically restarts when the malfunction is removed.



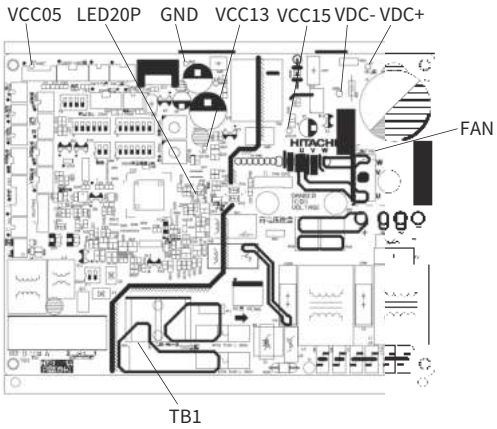


Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Freeze Protection Thermistor	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to I.U. PCB.	Correctly connect wires.
Failure of I.U. PCB		Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.

Alarm Code 19	Activation of Protection Device for Indoor Fan Motor

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when the indoor fan motor rotates with less than 70rpm for 5 seconds three times in 30 minutes during the operation.



⚠CAUTION

- Perform the following check after setting the air flow volume to "HIGH".
- A high voltage is applied to electrical parts. Perform the check carefully to prevent an electric shock.

NOTE:
Turn OFF the power source securely before connector checking.
If not, it may cause DC fan motor failure.
(Built-in PCB for DC fan motor may be damaged.)

Occurrence of Alarm Code "19"

Check connectors TB1, FAN, DCL1 and DCL2 on I.U. PCB.

Check that 208/230V is applied between L1 and N1 of TB1.

Is LED20P on I.U. PCB OFF?(*1)
- Yes → Failure of I.U. PCB → Replace I.U. PCB.
  (*1) The electrical source for I.U. PCB is not supplied when LED20P is turned OFF.
- No ↓

Is DC power of FAN driver PCB normal? (*2)
- Yes → Failure of I.U. PCB → Replace I.U. PCB.
  (*2) Measure the voltage between VDC+ and VDC- with a tester. (Normal Voltage: DC280V)
- No ↓

Is DC power output of I.U. PCB normal? (*3)
- No → Failure of I.U. PCB → Replace I.U. PCB.
  (*3) Measure the voltage between VCC15 and VDC- (15V±10%) with a tester.
- Yes ↓

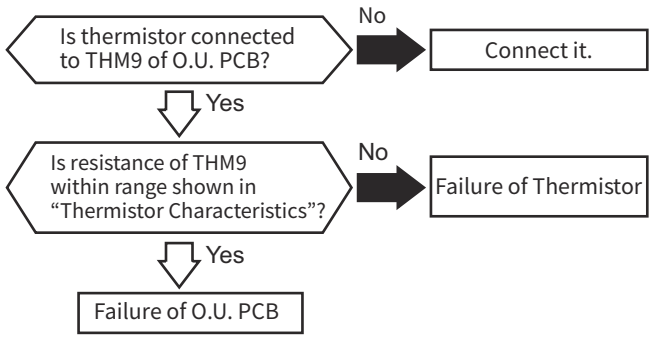
Is DC power output of I.U. PCB normal? (*4)
- No → Failure of I.U. PCB → Replace I.U. PCB.
  (*4) Measure the voltage of the following check points with a tester.
  Between VCC05 and GND: 5V±4%
  Between VCC13 and GND: 13.1V±10%
- Yes ↓

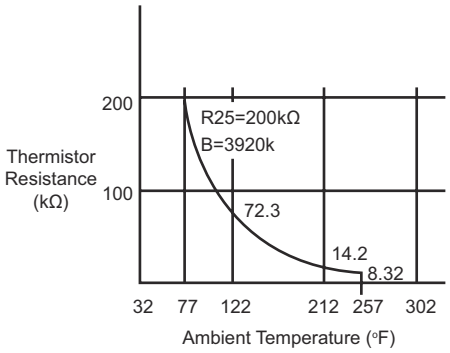
Does Fan Motor run?
- No → Failure of I.U. PCB → Replace I.U. PCB.

Alarm Code	Abnormality of Thermistor on the Compressor Discharge Pipe

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when a short circuit (0.9kΩ or less) or disconnection (5946kΩ or more) of the thermistor is detected during heating or cooling operation.





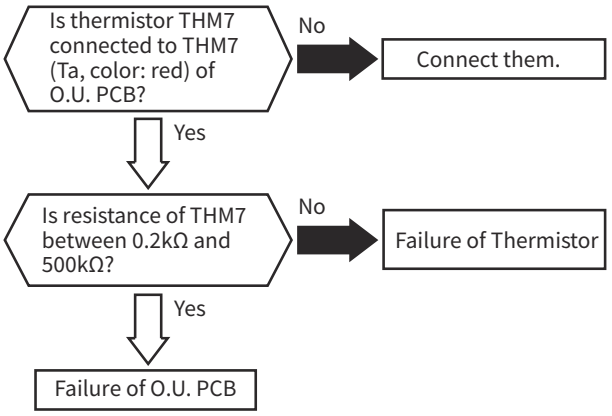
Thermistor Characteristics

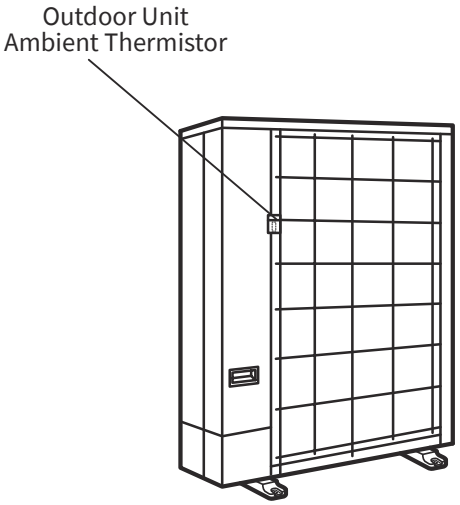
Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Thermistor for Discharge Gas Temp. on Discharge Pipe of the Compressor	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to O.U. PCB.	Repair wiring and connection.
Failure of O.U. PCB		Replace O.U. PCB and check operation.	Replace O.U. PCB if faulty.

Alarm Code	Abnormality of Thermistor for Outdoor Air Temperature (Outdoor Unit Ambient Thermistor)

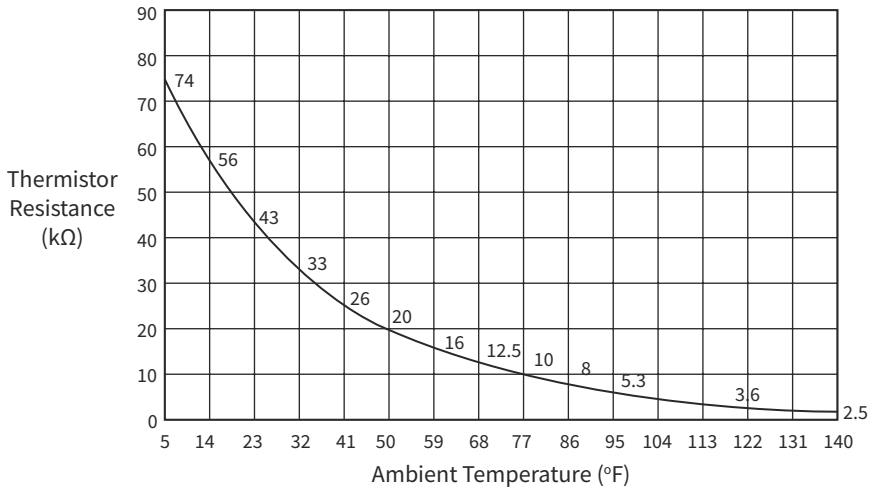
- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when a short circuit (0.2kΩ or less) or disconnection (500kΩ or more) of the thermistor is detected during heating or cooling operation.





Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Thermistor for Outdoor Air Temp.	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to O.U. PCB.	Repair wiring and connection.
Failure of O.U. PCB		Replace O.U. PCB and check operation.	Replace O.U. PCB if faulty.

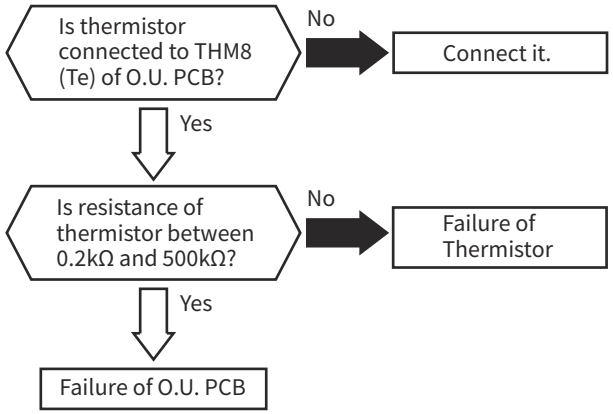


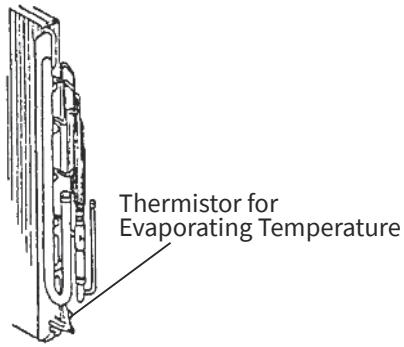
Ambient and Evaporating Temp. Thermistor Characteristics for Outdoor Unit

Alarm Code	24	Abnormal Heat Exchanger Liquid Side Temperature (Te) Thermistor

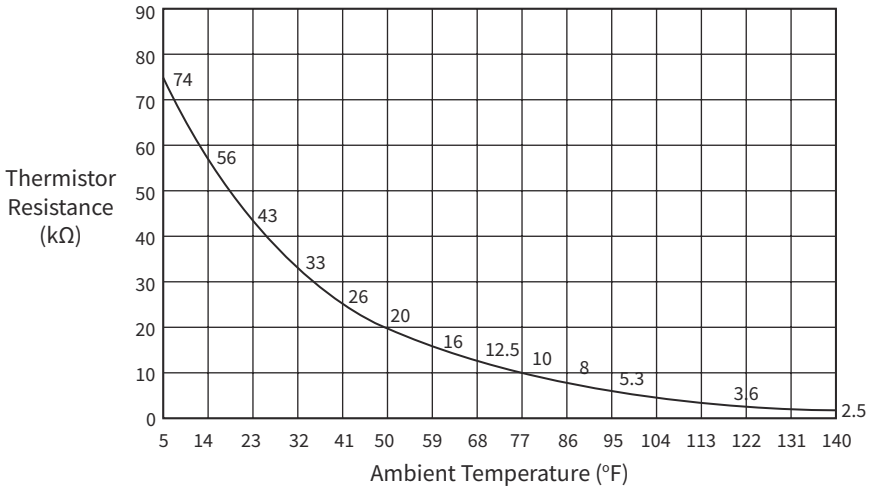
- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when a short circuit (0.2kΩ or less) or disconnection (500kΩ or more) of the thermistor is detected during heating or cooling operation.





Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Thermistor for Evaporating Temperature during Heating	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to O.U. PCB.	Repair wiring and connection.
Failure of O.U. PCB		Replace O.U. PCB and check operation.	Replace O.U. PCB if faulty.

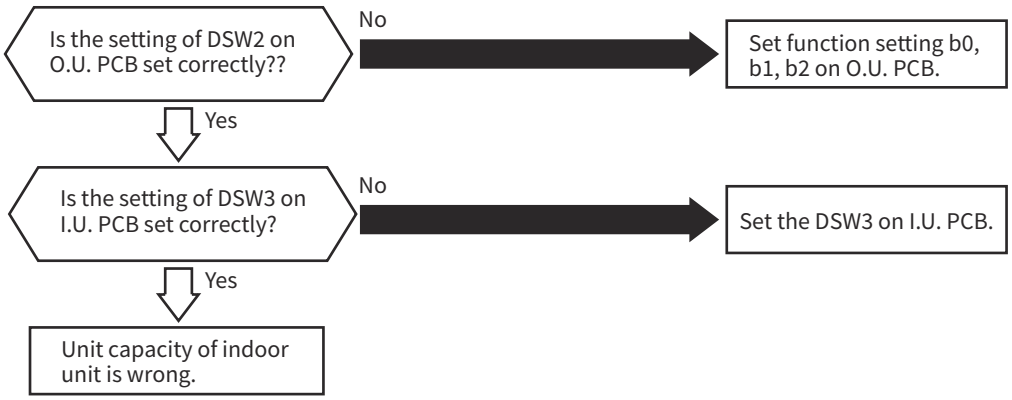


Ambient and Evaporating Temp. Thermistor Characteristics for Outdoor Unit

Alarm Code 31	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when the indoor unit capacity is outside the range of 80% to 120% of the capacity of the combined outdoor unit.



Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Incorrect Capacity Setting of Indoor Unit		Check combination of indoor units and capacity setting on I.U. PCB.	Correctly set dip switch, set the DSW3 on I.U. PCB.
Incorrect Capacity Setting of Outdoor Unit		Check capacity setting on O.U. PCB.	Correctly set dip switch, function setting b0, b1, b2 on O.U. PCB.

NOTE:

- In the case of H-LINK system, this alarm code may be displayed when DSW4 (for refrigerant cycle No. setting) on the outdoor unit PCB and DSW5 (for refrigerant cycle No. setting) on the indoor unit PCB are not set correctly. In this case, turn OFF the power source and set them correctly, and turn ON the power source again.

Alarm Code 35	Incorrect Setting of Indoor Unit and Outdoor Unit Number

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed in 5 minutes after power-on of outdoor unit, if the indoor unit No. set by DSW6 in the same refrigerant group duplicates.

★ This alarm code is displayed when 4 or more indoor units are connected to one outdoor unit.

★ This alarm code is displayed when the refrigerant cycle No. and the address setting value are 64 or more. (The alarm code “b1” is displayed on the wired remote controller.)

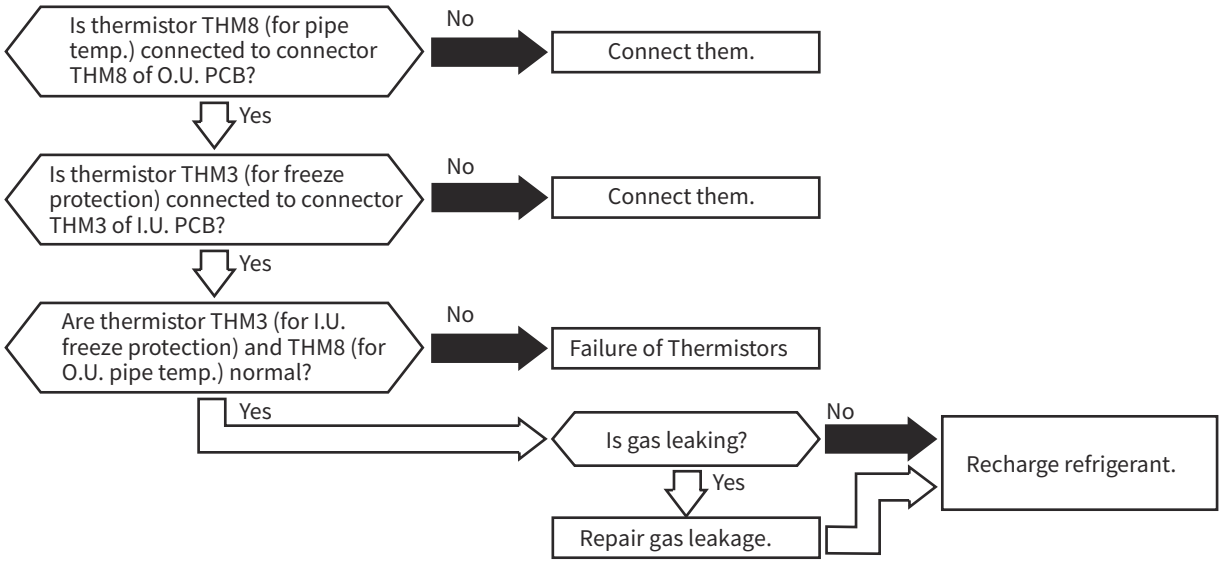
NOTE:

- In the case of H-LINK system, this alarm code may be displayed when DSW4 (for refrigerant cycle No. setting) on the outdoor unit PCB and DSW5 (for refrigerant cycle No. setting) on the indoor unit PCB are not set correctly. In this case, turn OFF the power source and set them correctly, and turn ON the power source again.

Alarm Code 47	Activation to Protect System from Excessively Low Suction Pressure (Protection from Vacuum Operation)

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

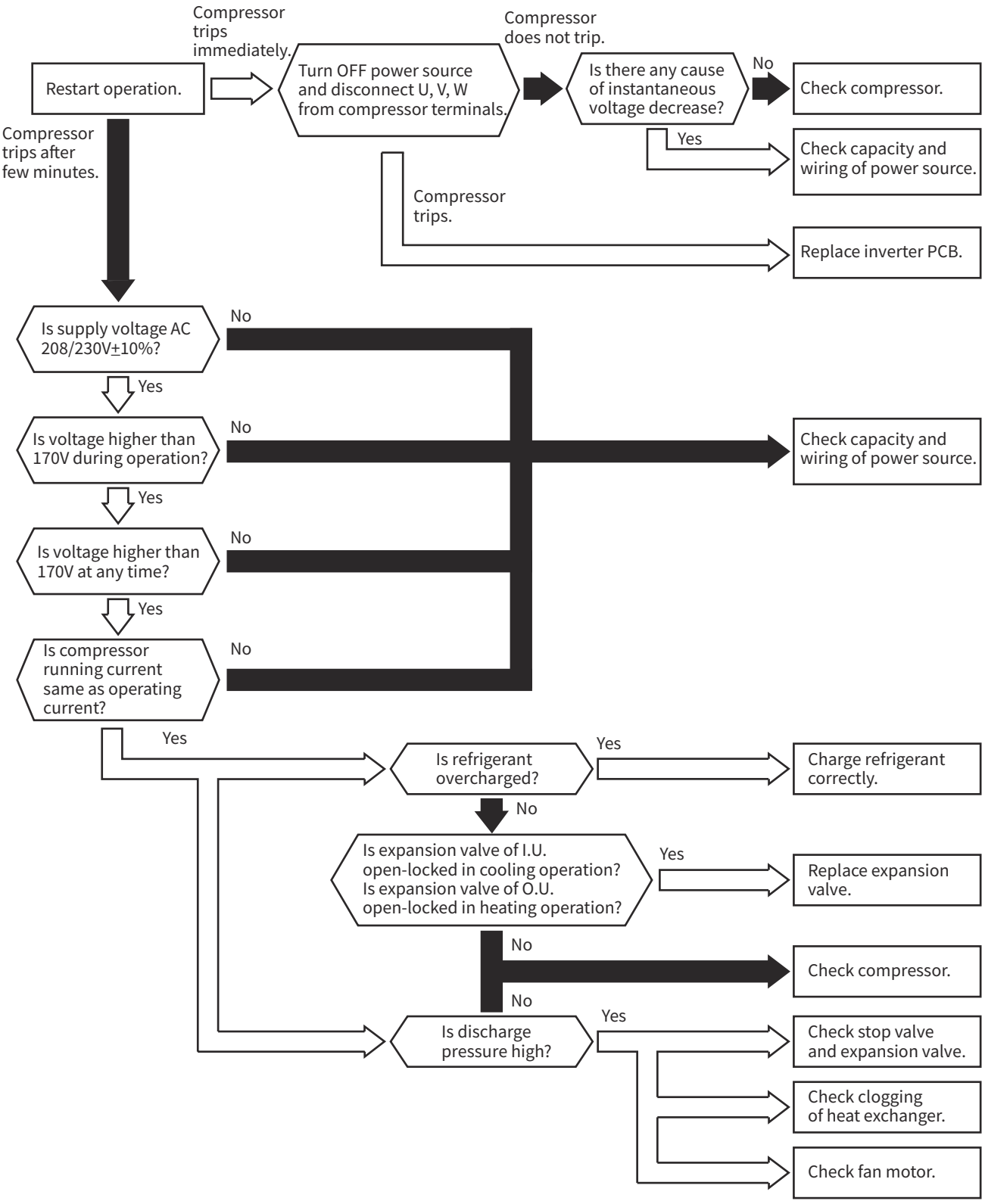
★ In the case that the evaporating temperature (Cooling: Freeze Protection [Liquid Refrigerant Piping Temperature] of Indoor Unit, Heating: Evaporating Temperature of Outdoor Unit) is lower than -34.6°F(-37°C) and the temperature at top of compressor is maintained higher than 194°F(90°C) for 10 minutes, the operation is retried to perform 3 minutes after the compressor is stopped. However, when the abnormality is detected 3 times in one hour, this alarm code is displayed.



Phenomenon	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Freeze Protection Thermistor of I.U. and Evaporating Thermistor of O.U.	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to O.U.and I.U. PCB.	Repair wiring and connection.
Failure of O.U and I.U. PCB		Replace PCB and check operation.	Replace PCB if faulty.
Excessively Low Suction Pressure (in Vacuum)	Liquid line stop valve is not fully opened.	Check stop valve.	Fully open stop valve.
	Failure or Malfunction of Expansion Valve	Check for clogging.	Remove clogging.
		Check connecting wiring and connectors.	Replace connectors.
		Check operating sound from coil.	Replace coil.
		Check discharge gas thermistor (THM9).	Correctly install it.
		Check discharge gas thermistor (THM9) is correctly installed.	Correctly install it.
	Refrigerant Leakage	Check ambient temp. and pressure.	Charge refrigerant after vacuum pumping.
		Check for any gas leakage.	Charge correct amount of refrigerant after repairing gas leakage.
Failure of Outdoor Fan in Heating Operation	Failure of MOF	Measure resistance of coil and insulation resistance.	Replace fan motor if faulty.

Alarm Code 48	Activation of Overcurrent Protection Device for Inverter

O.U.: Outdoor Unit
I.U.: Indoor Unit



NOTE:

- The maintenance and replacement for inverter PCB should be performed surely according to the item 1.2.4 (3) “Checking Method for Inverter Module” after performing the voltage discharge work.

Alarm Code	51	Abnormality of Current Sensor

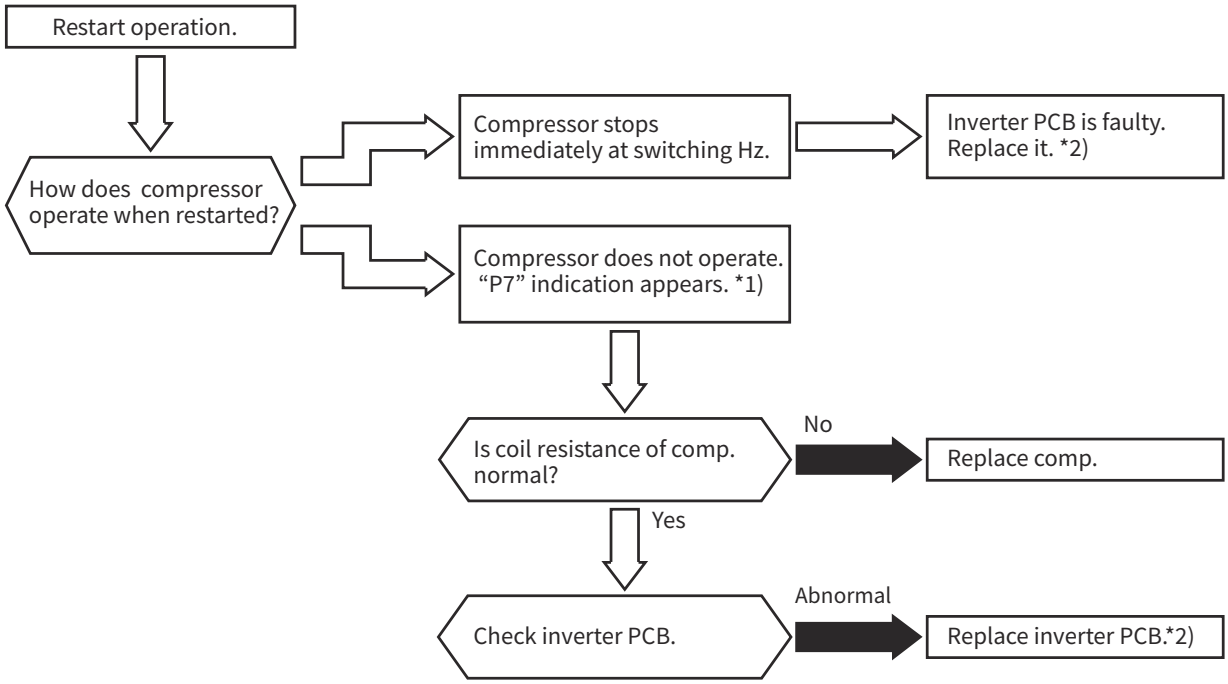
- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed when the following condition occurs 3 times in 30 minutes. If this occurs less than 3 times in 30 minutes, the operation is automatically retried.

Condition of Activation:

(1) When the compressor frequency pass through the switching frequency, one of the effective value of running current at each phase is less than 1.5A (including 1.5A).

(2) The wave height value of running current for the phase positioning is less than 5A before the compressor is started (at completing the phase positioning).



*1) The indication appears on 7-segment display of the outdoor unit PCB.

*2) The maintenance and replacement for inverter PCB should be performed surely after performing the voltage discharge work according to the item 1.2.4 (2) "Checking Method for Rectifier Circuit".

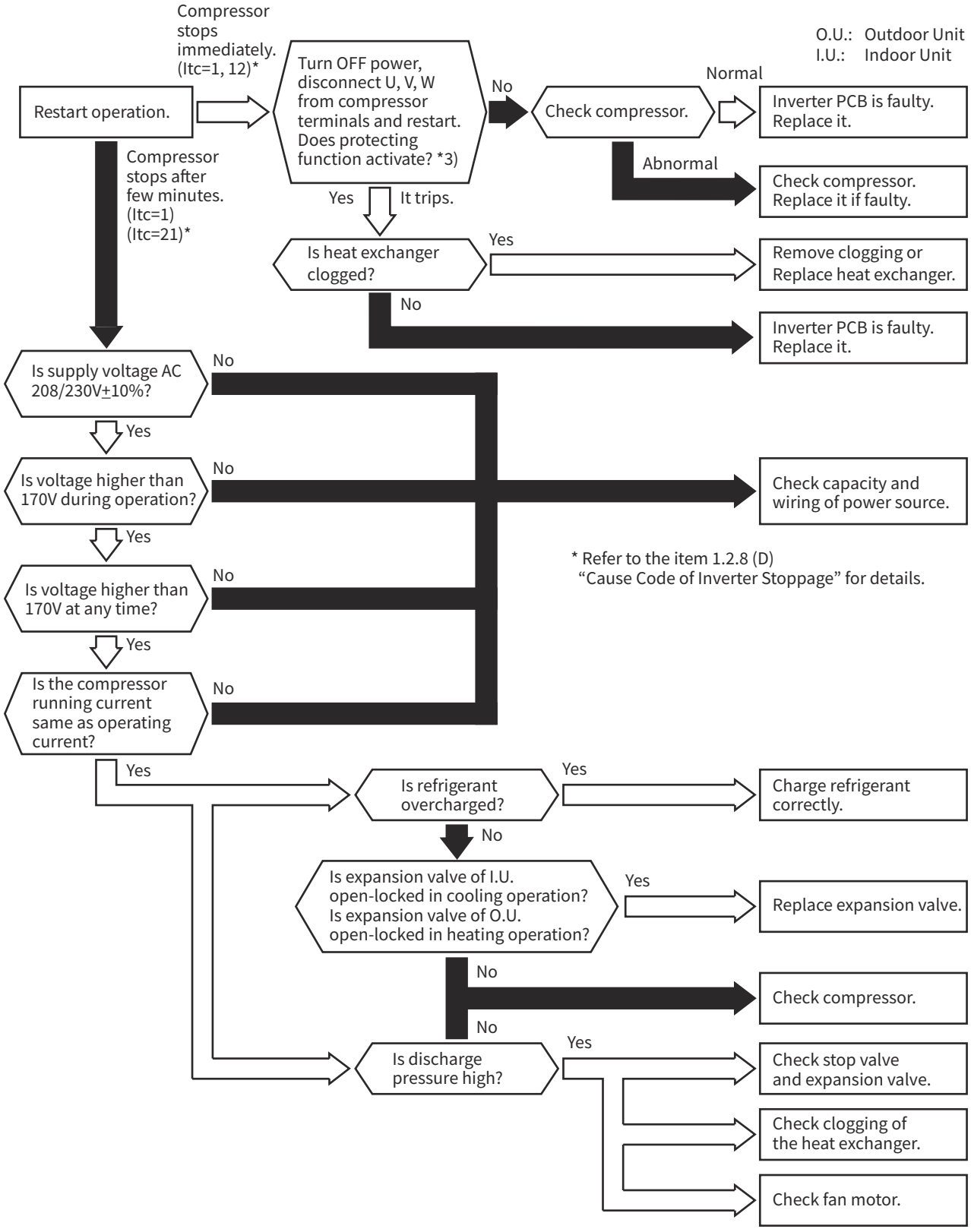
Alarm Code	53	Activation of Transistor Module Protection Device

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ IPM (Transistor Module) of inverter PCB has detecting function of abnormality. This alarm is displayed when any of the following conditions is met 7 times in 30 minutes. If this occurs less than 7 times in 30 minutes, the operation is automatically retried.

Condition of Activation:

(1) An abnormal current is applied to the inverter transistor due to a short circuit, a ground fault or over current.
(2) The temperature at transistor module increases abnormally.
(3) The control voltage decreases.
(4) The angle difference between the shaft in compressor and the shaft in the control program exceeds +60deg.



*1) The maintenance and replacement for inverter PCB should be performed surely after performing the voltage discharge work according to the item 1.2.4 (2) "Checking Method for Rectifier Circuit".
*2) The maintenance should be performed according to the item 1.2.4 (3) "Checking Method for Inverter Module".
*3) Turn ON the No.1 switch of DSW1 on inverter PCB when restarting with disconnecting the terminals of the compressor. After troubleshooting, turn OFF the No.1 switch of DSW1 on inverter PCB.

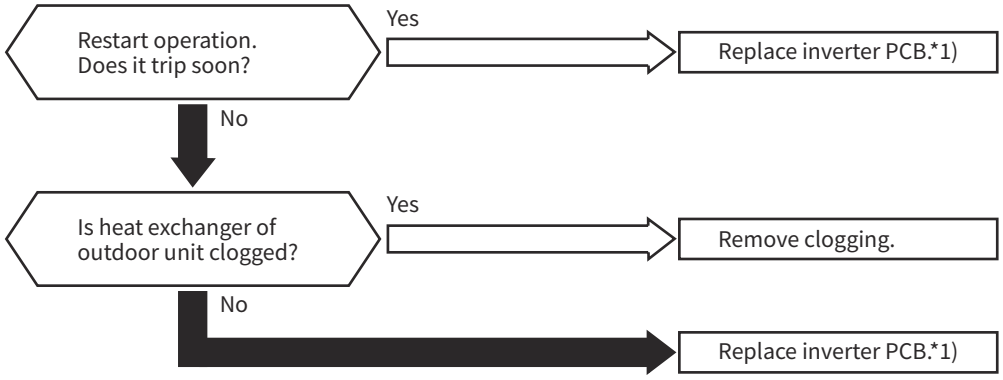
When this alarm code is displayed, the outdoor fan motor may be damaged.
Surely perform the troubleshooting according to the item 1.2.6 "Checking Method of DC Fan Motor for Outdoor Unit". If the fan motor is damaged, the normal inverter PCB may be damaged.

Alarm Code 54	Abnormality of Inverter Fin Temperature

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ When the following condition occurs 3 times in 30 minutes, the operation stops and this alarm code is displayed. If this occurs less than 3 times in 30 minutes, the operation is automatically retried.

Condition of Activation:
The radiation fin temperature exceeds 185°F(85°C).



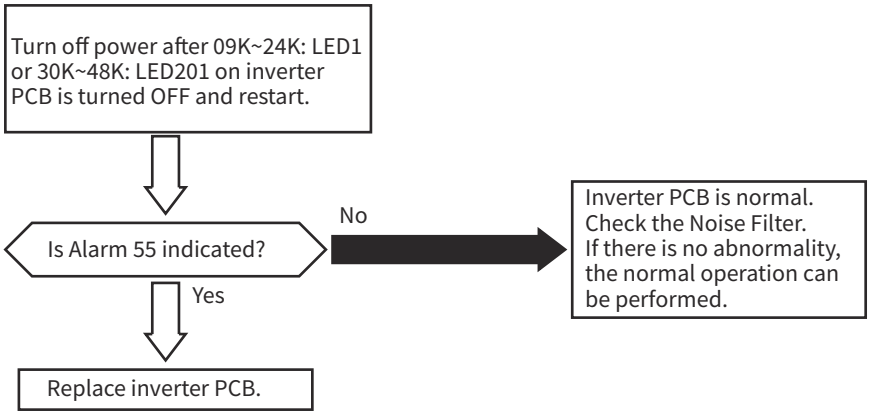
*1) The maintenance and replacement for inverter PCB should be performed after performing surely the voltage discharge work according to the item 1.2.4 (2) “Checking Method for Rectifier Circuit”.

Alarm Code	55	Inverter Failure

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ The abnormality is detected when the actual frequency is NOT received over 10Hz from inverter PCB after the inverter frequency is output from O.U. PCB to inverter PCB. This alarm is displayed when it occurs three times in 30 minutes. (The retry operation is performed up to the occurrence twice.)

Condition of Activation: This alarm is displayed when inverter PCB is in abnormal condition.

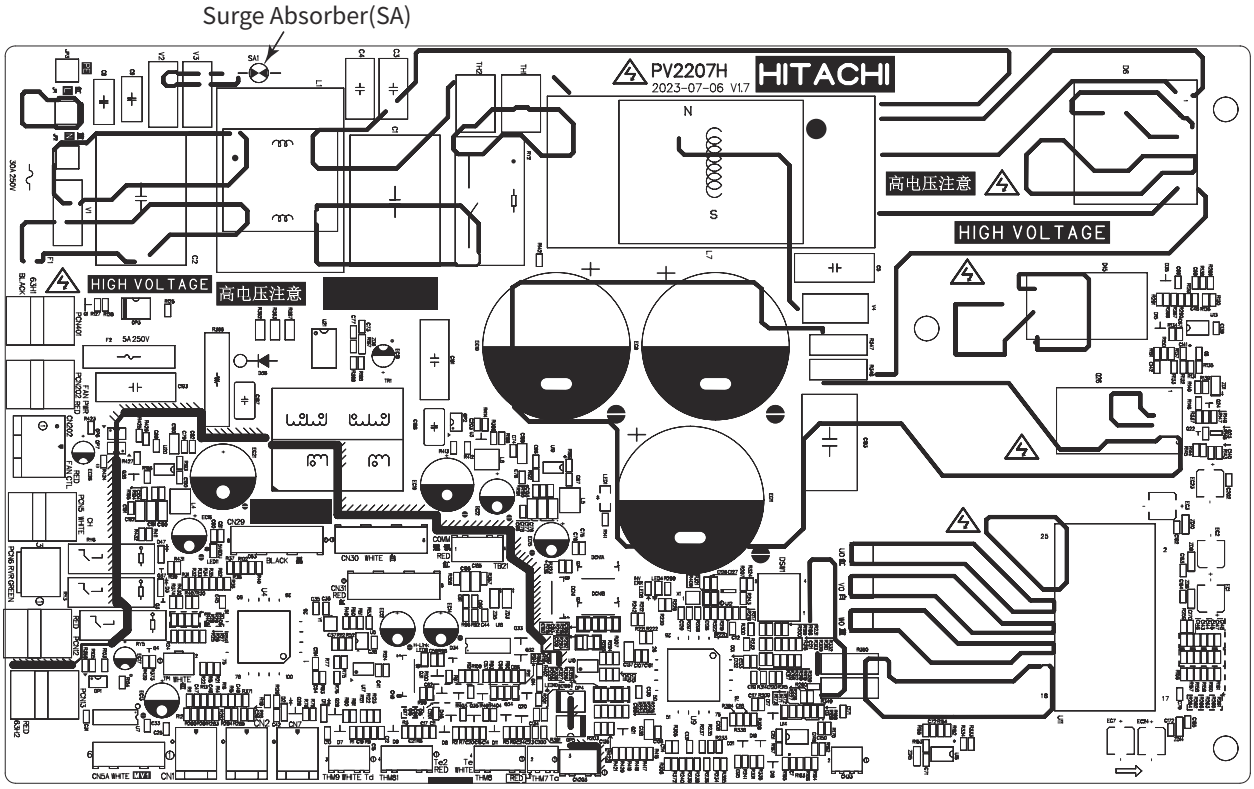


NOTE:

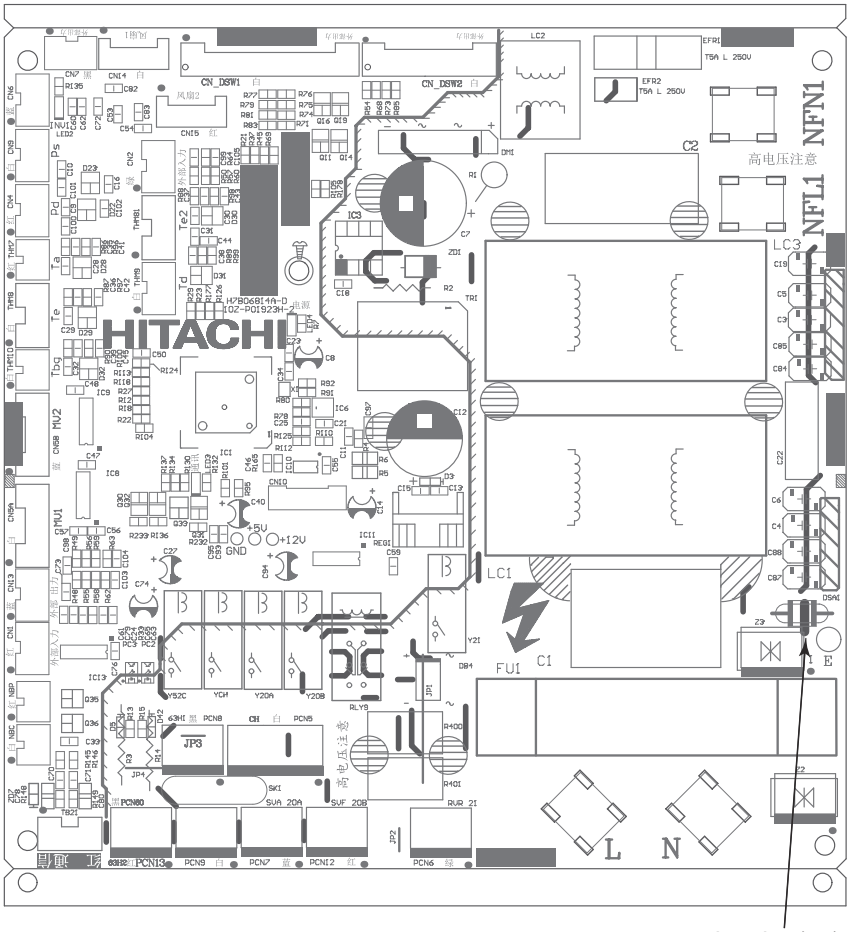
- When the excessive surge current is applied to the unit due to lighting or other causes, this alarm code or the cause code of inverter stoppage (Itc=11) will be displayed on the 7-segment display on O.U. PCB and the unit can not be operated. In this case, check to ensure the surge absorber (SA) on O.U. PCB. The surge absorber may be damaged if the inner surface of the surge absorber is changed to black. If the surge absorber is damaged, replace O.U. PCB. If the surge absorber does not have abnormality, turn OFF the power source once and wait until turning OFF 09K~24K:LED1 or 30K~48K:LED201 on inverter PCB for approx. 5 min. Then, turn ON again.

< Position of Surge Absorber (on O.U. PCB) >

< 09K~24K >



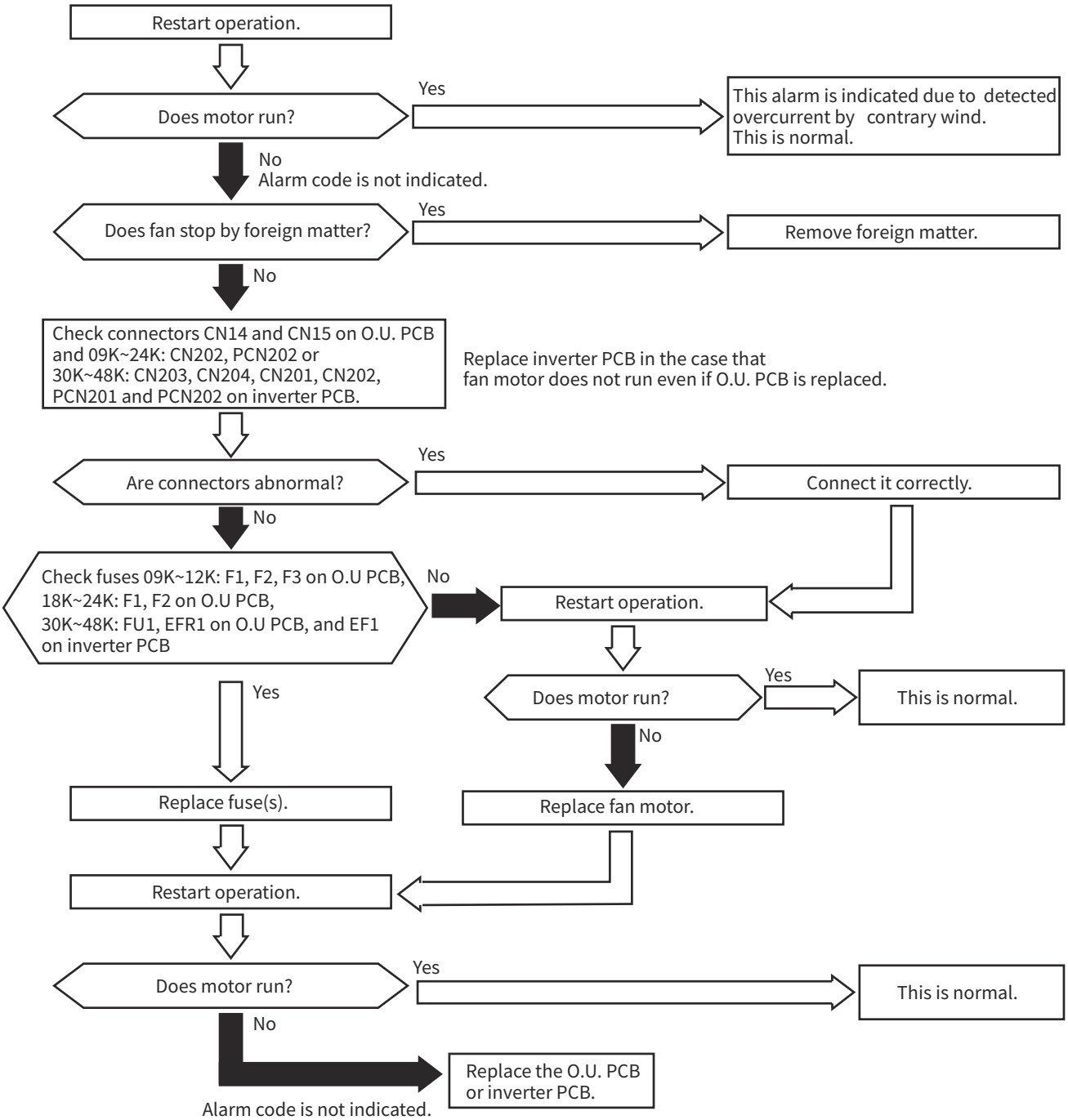
< 30K~48K >



Alarm Code	57	Abnormality of Fan Motor

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ If the rotation pulse output of the fan motor is less than or equal to 10 per minute after 10 seconds of starting, the fan motor will stop. If this occurs again 9 times in the next 5 minutes, the operation stops and this alarm code is displayed. The alarm is caused by locking of the fan motor.

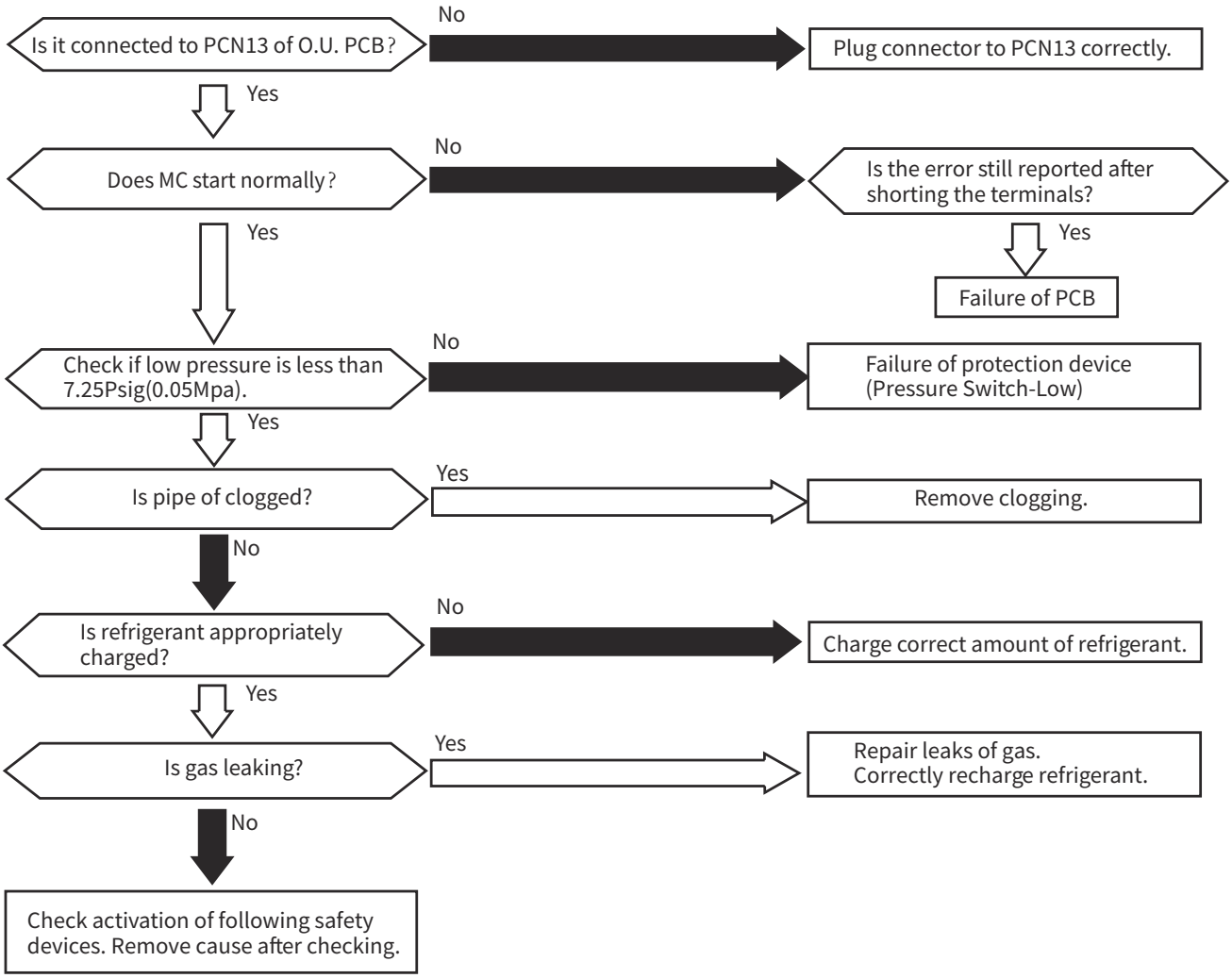


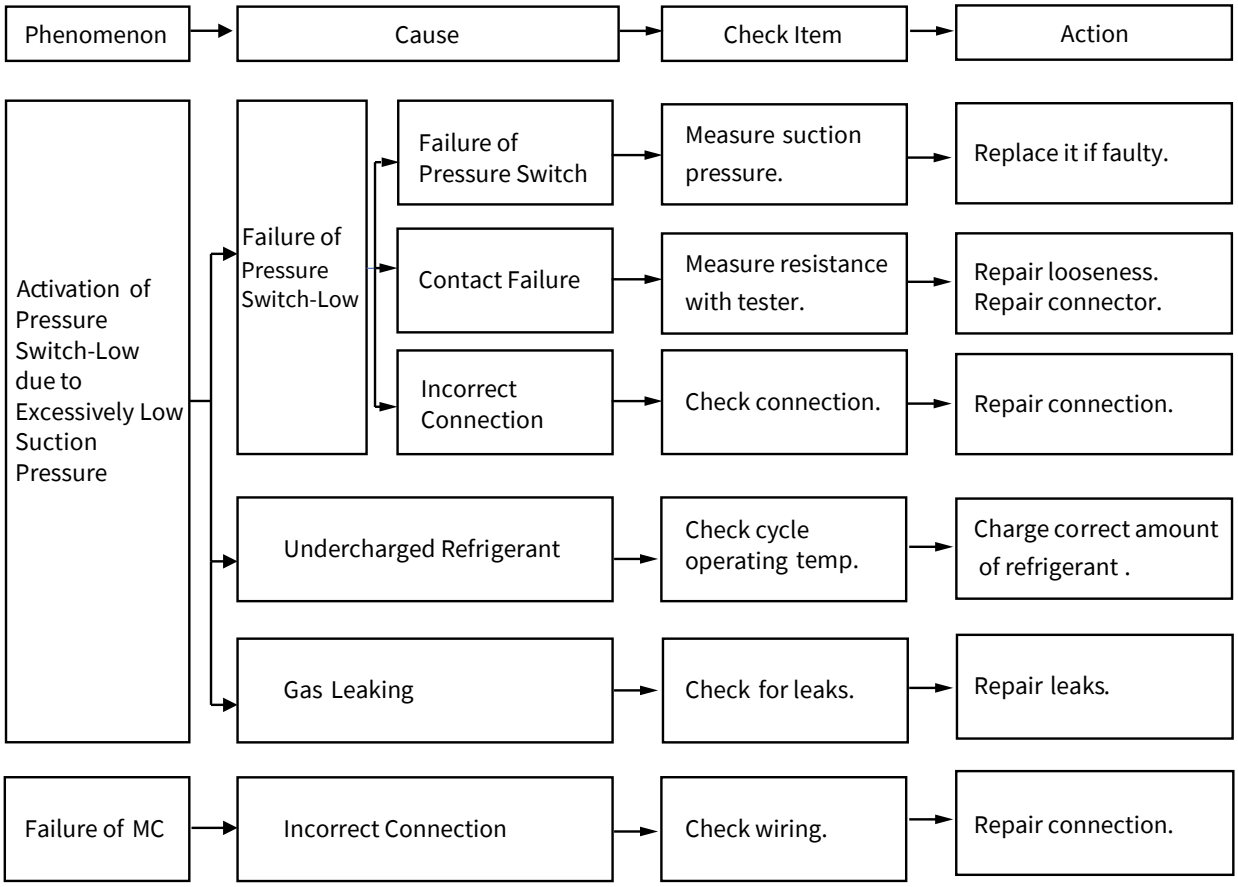
NOTE:

- Refer to the item 1.2.6 “Checking Method of DC Fan Motor for Outdoor Unit” about the troubleshooting.

Alarm Code	58	Activation of Protection Device (Low Pressure Cut)

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.
- The alarm code is displayed when the protection device (Pressure Switch-Low) is activated during the compressor operation (Y52C: ON).




Phenomenon
Cause
Check Item
Action
Activation of Pressure Switch-Low due to Excessively Low Suction Pressure
Failure of Pressure Switch-Low
Failure of Pressure Switch
Measure suction pressure.
Replace it if faulty.
Contact Failure
Measure resistance with tester.
Repair looseness. Repair connector.
Incorrect Connection
Check connection.
Repair connection.
Undercharged Refrigerant
Check cycle operating temp.
Charge correct amount of refrigerant .
Gas Leaking
Check for leaks.
Repair leaks.
Failure of MC
Incorrect Connection
Check wiring.
Repair connection.

Alarm Code	Incorrect Setting of Unit Model Code

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed in the following condition. Check the unit model code setting (DSW4) of I.U. PCB after turning OFF the power source.

Condition	Action
The unit model code setting (DSW4) is not set (all pins are "OFF"), or is set for the incorrect indoor unit type.	Set DSW4 correctly according to the dip switch setting in "Installation and Maintenance Manual".

Alarm Code	Incorrect Setting of Unit and Refrigerant Cycle Number

- The RUN indicator (Red) flashes.
- The alarm code and the unit model code are displayed on the LCD, and the alarm code is displayed on the 7-segment display of outdoor unit PCB.

★ This alarm code is displayed in the following conditions. Check the settings of the dip switches (DSW) after turning OFF the power source.

Conditions	Action
The unit No. setting (DSW6) or the refrigerant cycle No. setting (DSW5) on I.U. PCB is set as "64" or more.	a) Unit No. Setting / Ref. Cycle No. Setting Starting from "1" (recommended). Set the unit No. and the refrigerant cycle No. from "1" to "63". (Setting No. for the 64th unit shall be "0".) b) Unit No. Setting / Ref. Cycle No. Setting Starting from "0". Set the unit No. and the refrigerant cycle No. from "0" to "63." (Setting No. for the 64th unit shall be "63".)

Alarm Code	EF	Compressor Protection

★ This alarm code appears when one of the following alarms occurs three times within 6 hours, which may result in serious compressor damages, if the outdoor unit is continuously operated without removing the cause.

Alarm Code	Content of Abnormality
02	Activation of Protection Device (Pressure Switch-High) in Outdoor Unit
07	Abnormal Low Superheat of Compressor Discharge Gas
08	Excessively High Discharge Gas Temperature at Top of Compressor
45	Activation of High Pressure Increase Protection Device
47	Activation to Protect System from Excessively Low Suction Pressure (Protection from Vacuum Operation)
58	Activation of Protection Device(Pressure Switch-Low) in Outdoor Unit

These alarms are able to be checked by the CHECK Mode 1. Follow the action indicated in each alarm chart. These alarms are cleared only by turning OFF the main power switch to the system.
Do not restart the operation without taking any necessary action, since there is a possibility of causing serious damages to the compressor.

1.2.3 Checking Method for Outdoor Unit PCBA

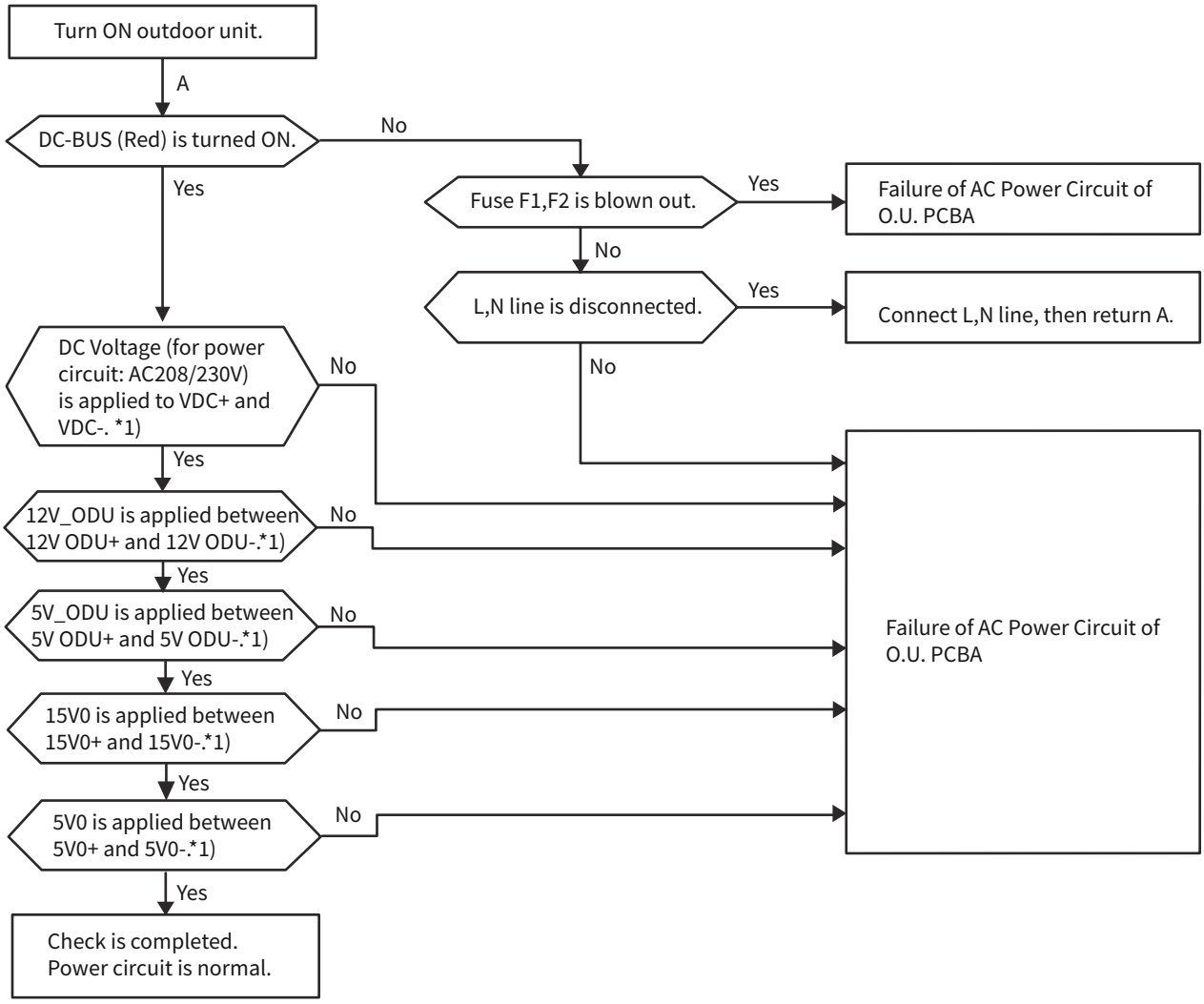
(1) Checking Power Circuit

Check the power circuit on O.U. PCB in following procedures. Refer to the figure on next page about the positions of LEDs, fuses and check points. Refer about check points by a circuit tester and judgment value as well.

⚠ CAUTION

- Pay attention to an electric shock when the voltage is measured by a circuit tester.
- Do not contact the test lead to unspecified check points when measuring by circuit tester. It may cause failure of terminal and circuit tester.
- There is protective coatings on the test points of PCBA. Remove the glue before turning on the power to avoid inaccurate test.

< 09K~12K >



*1) The following table shows the check points and the normal range of voltage in the case that the voltage on O.U. PCBA is measured by a digital multimeter. The setting of digital multimeter shall be set within the DC voltage measurement range when the following voltages are measured.

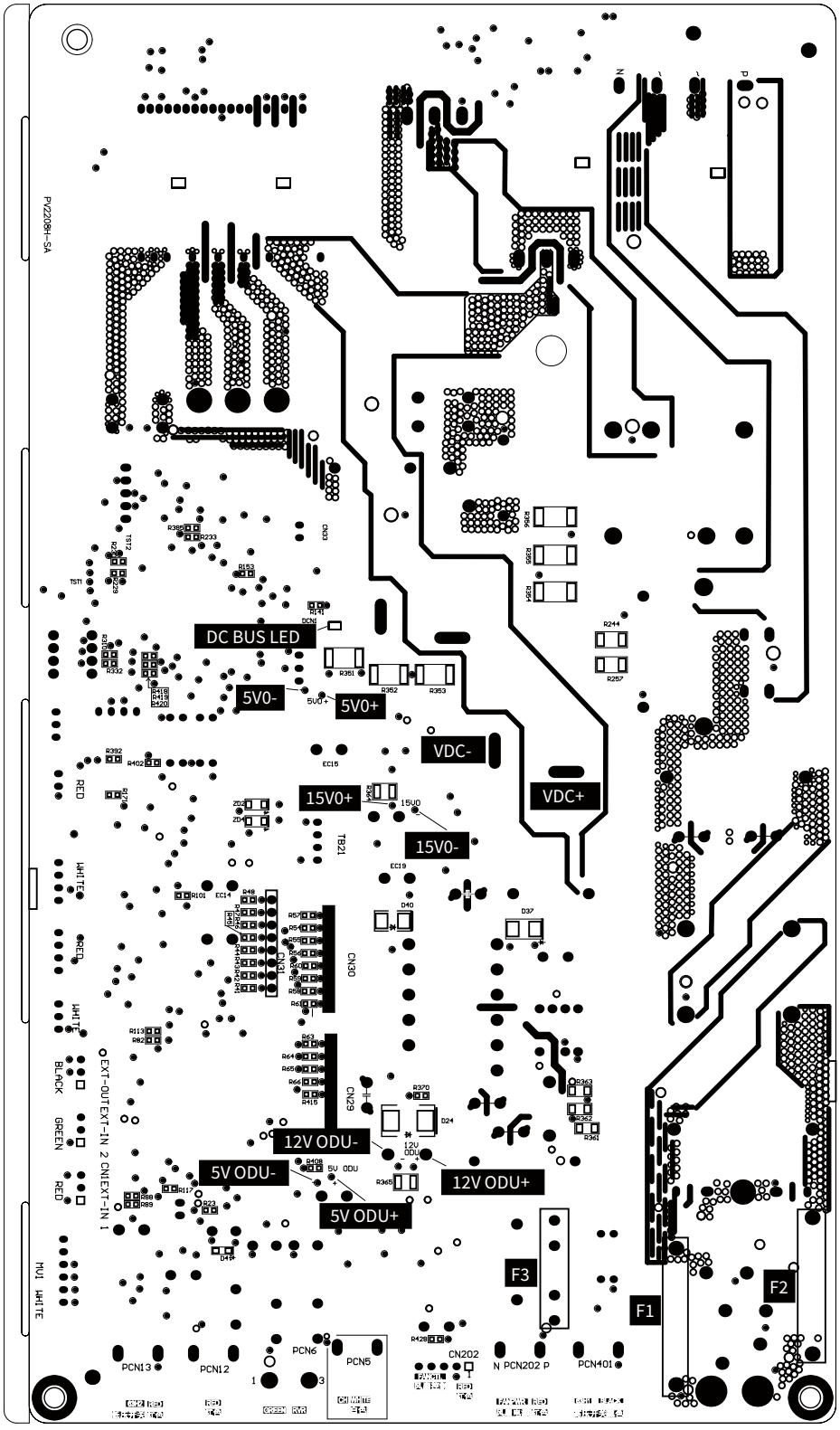
Check Point		Normal Range(V)
(+) Side of Digital Multimeter	(-) Side of Digital Multimeter	
VDC+	VDC-	Power Source AC208V (rms): approx. 294VDC Power Source AC230V (rms): approx. 325VDC
12V ODU+	12V ODU-	11.7VDC~14.3VDC
5V ODU+	5V ODU-	4.75VDC~5.25VDC
15V0+	15V0-	13.5VDC~16.5VDC
5V0+	5V0-	4.75VDC~5.25VDC

CAUTION

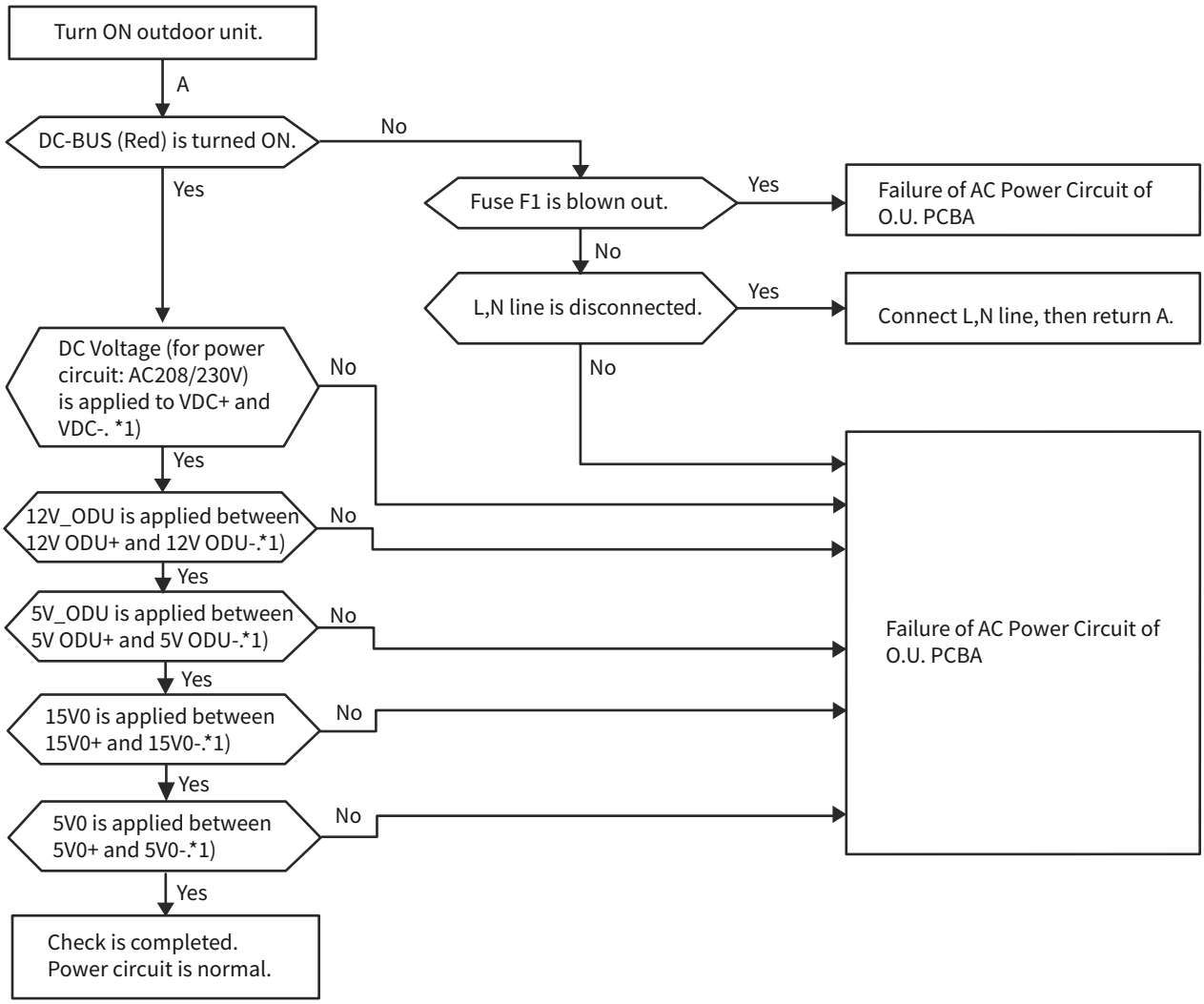
- When the voltage is measured by a digital multimeter, the range should be set within the DC voltage measurement. If the setting is not correct, it may cause failure of O.U. PCBA and digital multimeter.

The positions of LEDs, connectors, etc. on O.U. PCB are as follow.

Item	Part Name
LED	DC-BUS
Fuse	F1, F2, F3
Check Point	VDC+, VDC-, 5V0+, 5V0-, 15V0+, 15V0-, 5V ODU+, 5V ODU-, 12V ODU+, 12V ODU-



< 18K~24K >



*1) The following table shows the check points and the normal range of voltage in the case that the voltage on O.U. PCBA is measured by a digital multimeter. The setting of digital multimeter shall be set within the DC voltage measurement range when the following voltages are measured.

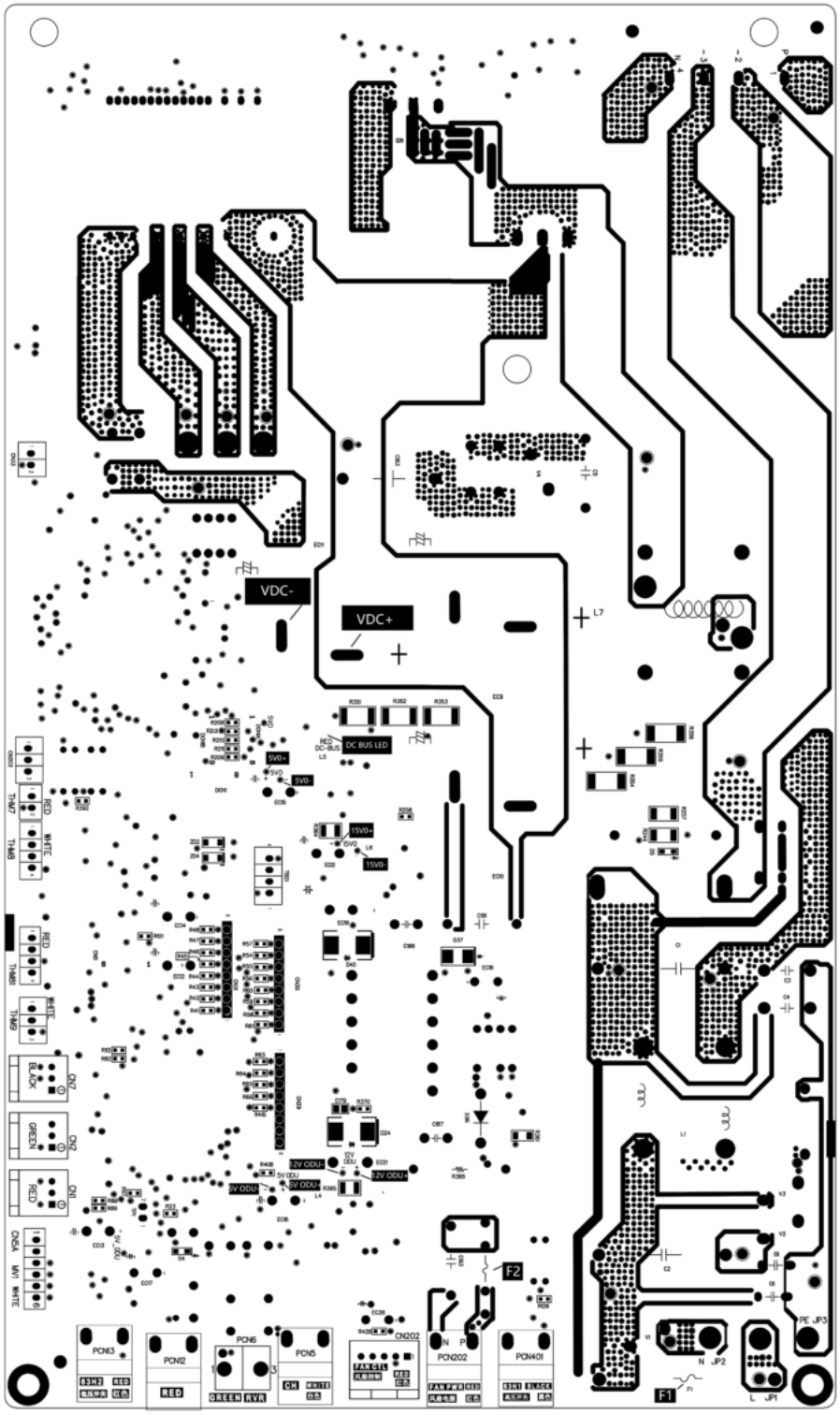
Check Point		Normal Range(V)
(+) Side of Digital Multimeter	(-) Side of Digital Multimeter	
VDC+	VDC-	Power Source AC208V (rms): approx. 294VDC Power Source AC230V (rms): approx. 325VDC
12V ODU+	12V ODU-	11.7VDC~14.3VDC
5V ODU+	5V ODU-	4.75VDC~5.25VDC
15V0+	15V0-	13.5VDC~16.5VDC
5V0+	5V0-	4.75VDC~5.25VDC

CAUTION

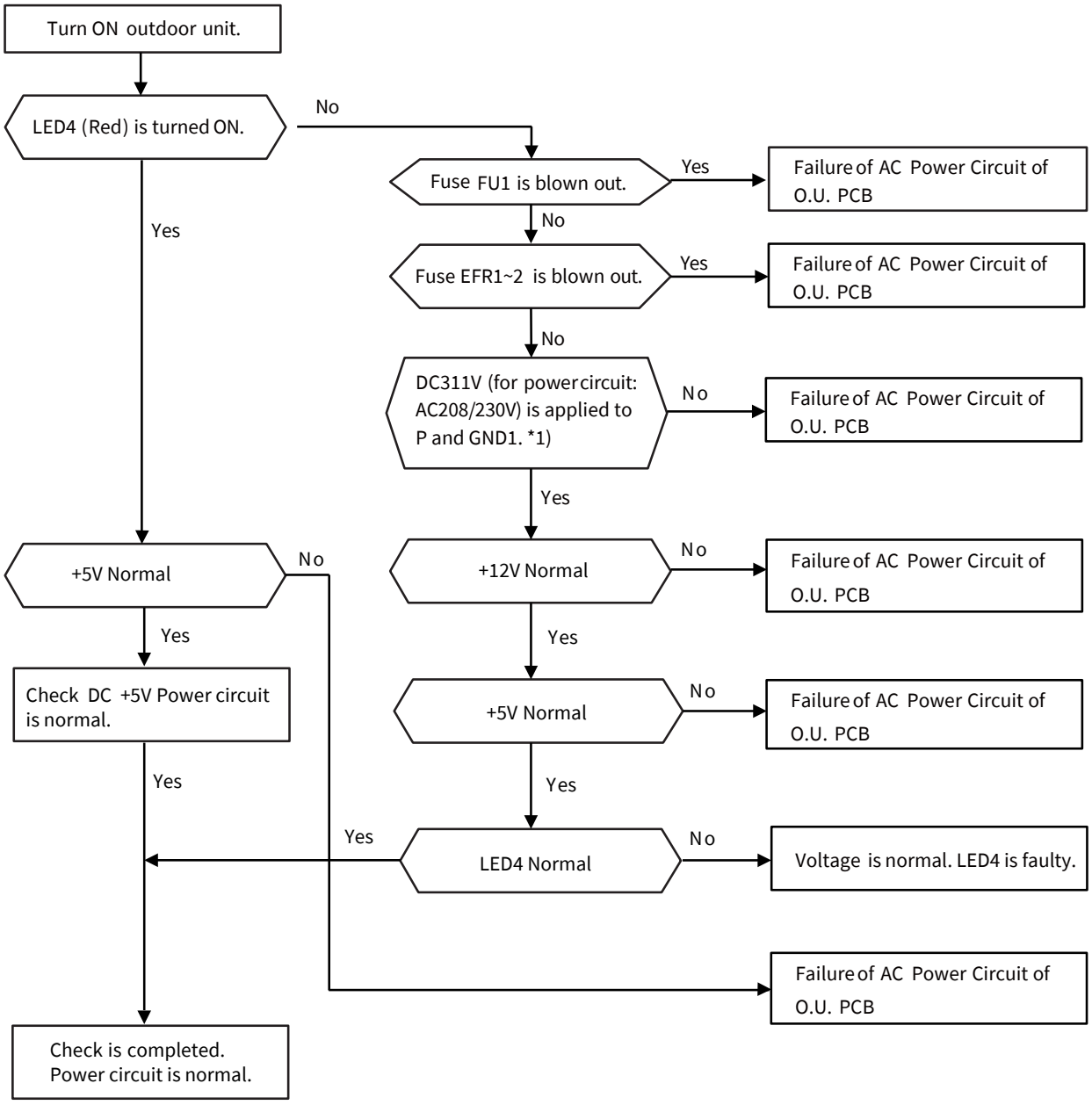
- When the voltage is measured by a digital multimeter, the range should be set within the DC voltage measurement. If the setting is not correct, it may cause failure of O.U. PCBA and digital multimeter.

The positions of LEDs, connectors, etc. on O.U. PCB are as follow.

Item	Part Name
LED	DC-BUS
Fuse	F1, F2
Check Point	VDC+, VDC-, 5V0+, 5V0-, 15V0+, 15V0-, 5V ODU+, 5V ODU-, 12V ODU+, 12V ODU-



< 30K~48K >

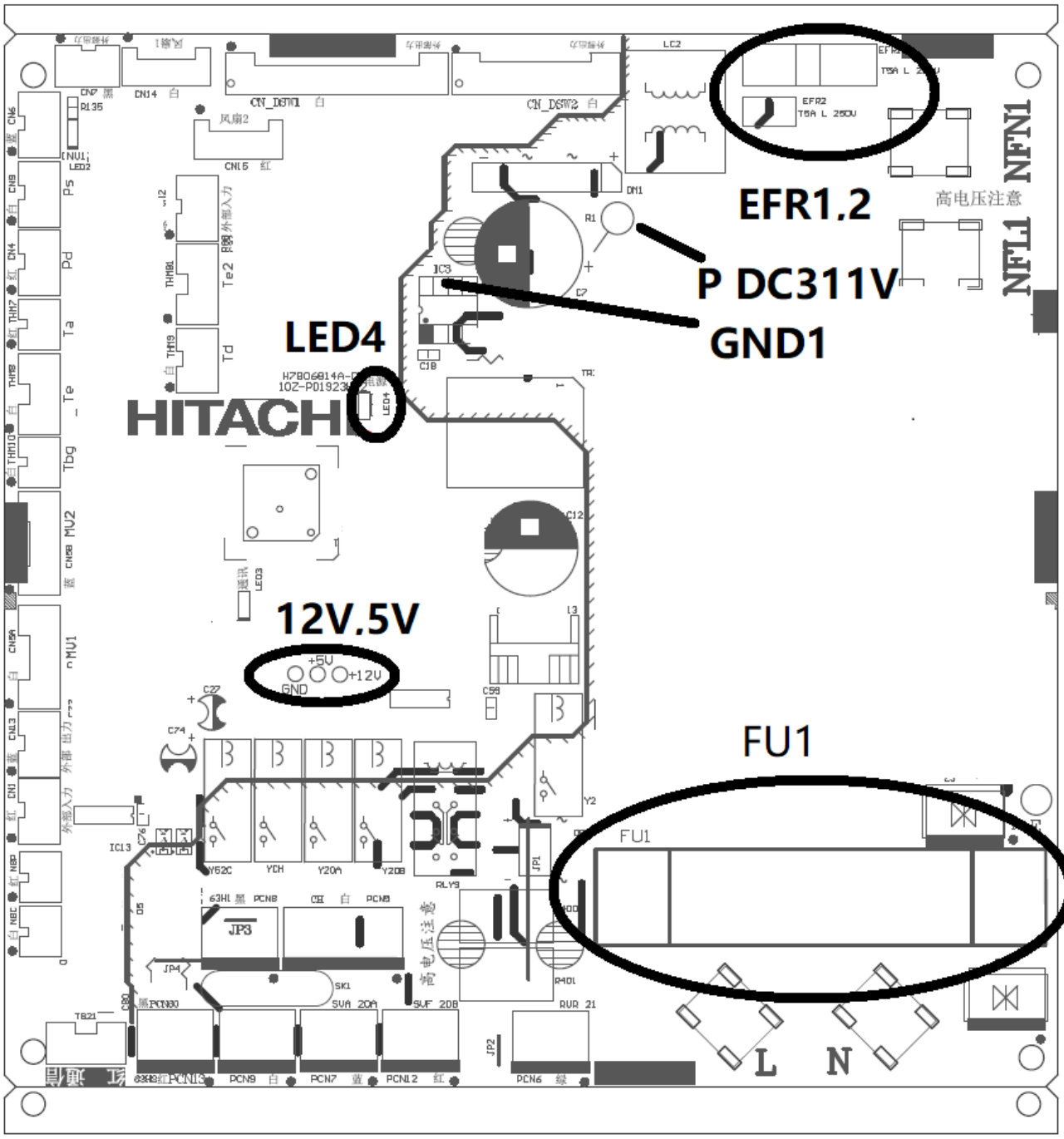


*1) The following table shows the check points and the normal range of voltage in the case that the voltage on O.U. PCBA is measured by a digital multimeter. The setting of digital multimeter shall be set within the DC voltage measurement range when the following voltages are measured.

Check Point		Normal Range(V)
(+) Side of Digital Multimeter	(-) Side of Digital Multimeter	
P	GND1	Power Source AC208V (rms): approx. 294VDC Power Source AC230V (rms): approx. 325VDC
+5V	GND	4.75VDC~5.25VDC
+12V		11.7VDC~14.3VDC

⚠ CAUTION

- When the voltage is measured by a digital multimeter, the range should be set within the DC voltage measurement. If the setting is not correct, it may cause failure of O.U. PCB and digital multimeter.



(2) Checking Item for Fuse

The purpose, capacity and causes of fuse melted are shown in below.
Additionally, the figure for inside O.U. PCBA is as follow.

Model	Fuse	Capacity	Purpose
09K~12K	F1, F2	16A	Protection for short circuiting of control circuit
	F3	5A	Protection for failure of DC fan motor
18K~24K	F1	30A	Protection for short circuiting of control circuit
	F2	5A	Protection for failure of DC fan motor
30K~48K	FU1	50A	Protection for short circuiting of power circuit
	F2	5A	Protection for short circuiting of control circuit

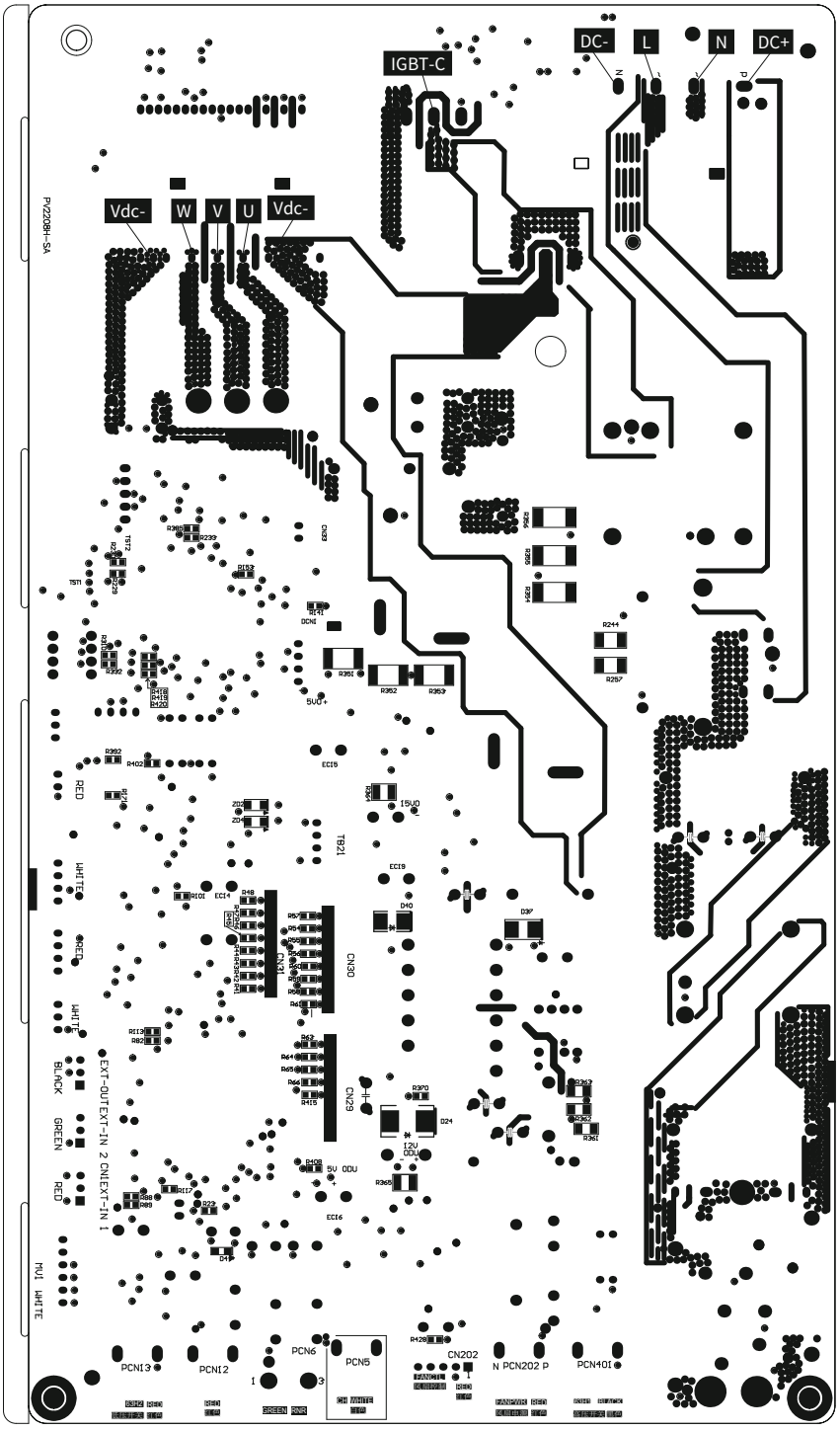
1.2.4 Checking Method for Inverter Part

CAUTION

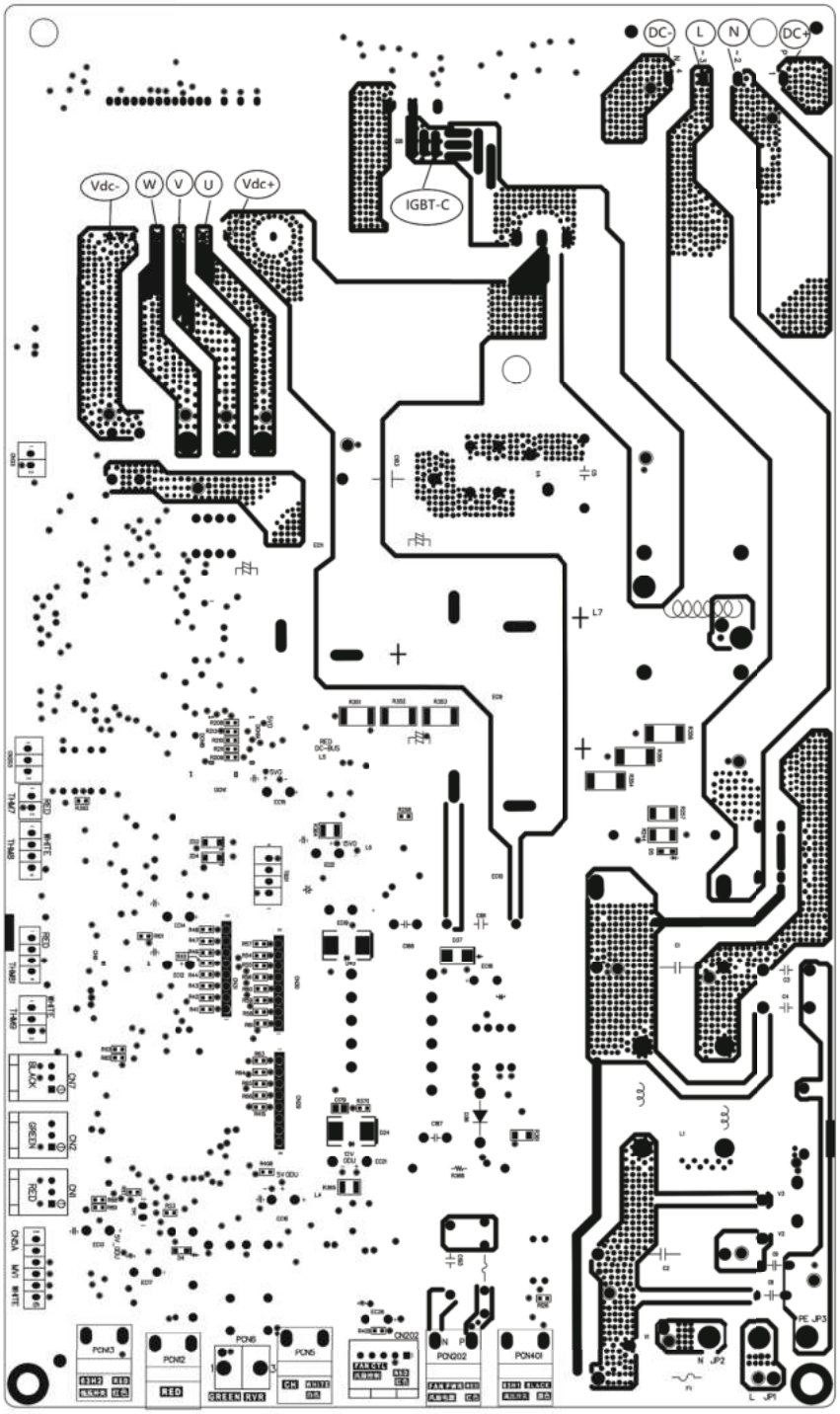
- Perform surely this high voltage discharge work to prevent electric shock.
- Check whether the high voltage is remained in the inverter PCBA for Replacing Parts. When the unit is operated, LED on inverter PCBA is turned ON. At the time of power off the unit, LED is turned OFF. In this case, the residual voltage is less than DC50V.
- There is protective coatings on the test point of PCBA. Remove the glue before turning on the power to avoid inaccurate test.

(1) Checking point diagram

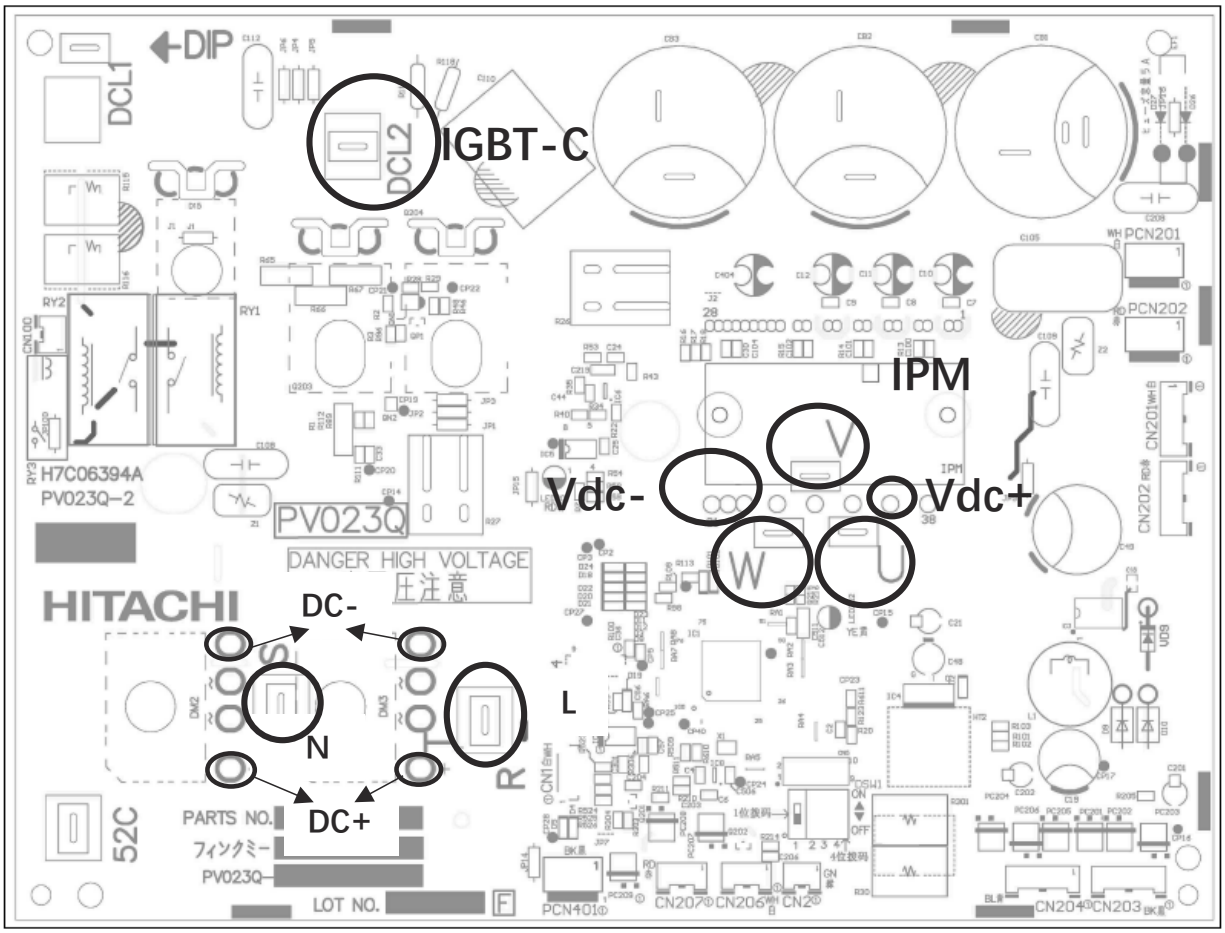
< 09K~12K >



< 18K~24K >


DC-
L
N
DC+
Vdc-
W
V
U
Vdc+
IGBT-C
PCN3
PCN2
RED
PCN6
GREEN
PCN5
CN202
PCN202
PCN401
PE JP3
N JP2
L JP1

< 30K~48K >

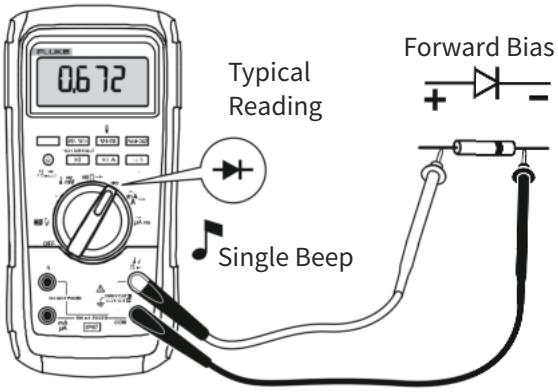

DIP
DCL1
DCL2
IGBT-C
PCN201
PCN202
IPM
Vdc-
Vdc+
H7C06394A
PV023Q–2
PV023Q
DANGER HIGH VOLTAGE
HITACHI
DC-
L
N
DC+
52C
PARTS NO.
PV023Q
LOT NO.
CN207
CN206
CN2
CN204
CN203
PCN401

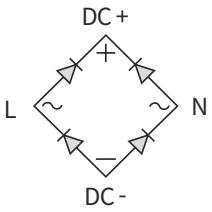
(2) Checking Method for Rectifier Circuit

< Using Diode test of digital multimeter to check rectifier >

⚠ CAUTION

- Perform surely this high voltage discharge work to prevent electric shock.





Remove all the terminals of the inverter PCBA before check.

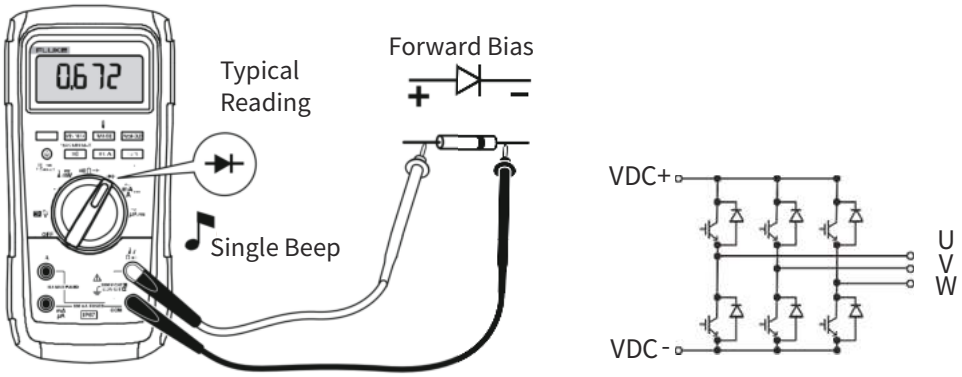
Check the rectifier circuit according to the check sequence in Table1. Within the normal voltage range indicates the rectifier bridge works well. Exceeding the range indicates that the bridge is damaged.

Table1

No.	Check Point		Normal Range(V)	Notes
	(+) Side of Digital Multimeter	(-) Side of Digital Multimeter		
1	DC+	L	≥2.0V or OL	It takes a few seconds for the value to stabilize.
2	DC+	N		
3	L	DC+	0.3~0.85V	
4	N	DC+		
5	DC-	L		
6	DC-	N		
7	L	DC-	≥2.0V or OL	It takes a few seconds for the value to stabilize.
8	N	DC-		

(3) Checking Method for Inverter Module

< Using diode test of digital multimeter to check inverter module >



Remove all the terminals of the inverter PCBA before check.

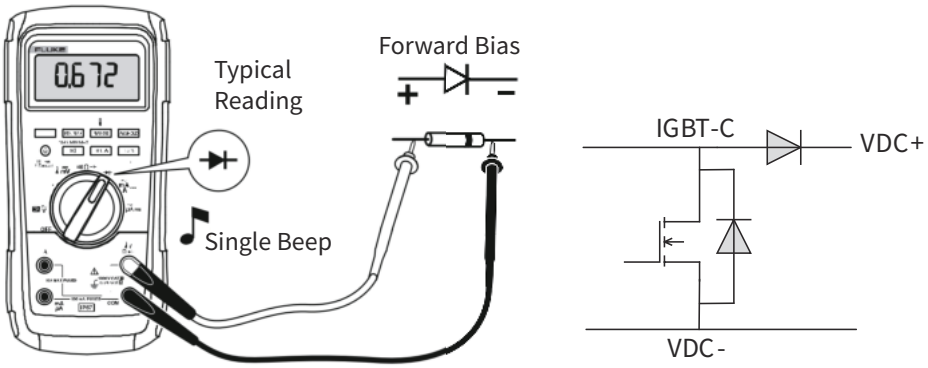
Check the inverter module according to the check sequence in Table2. Within the normal voltage range indicates the inverter module works well. Exceeding the range indicates the inverter module is damaged.

Table2

No.	Check Point		Normal Range(V)	Notes
	(+) Side of Digital Multimeter	(-) Side of Digital Multimeter		
1	VDC+	U	≥2.0V or OL	It takes a few seconds for the value to stabilize.
2	VDC+	V		
3	VDC+	W		
4	U	VDC+	0.3~0.85V	
5	V	VDC+		
6	W	VDC+		
7	VDC-	U		
8	VDC-	V		
9	VDC-	W		
10	U	VDC-	≥2.0V or OL	It takes a few seconds for the value to stabilize.
11	V	VDC-		
12	W	VDC-		

(4) Checking Method for PFC Circuit

< Using diode test of digital multimeter to check PFC circuit >



Remove all the terminals of the inverter PCBA before check.

Check the PFC circuit according to the check sequence in Table3. Within the normal voltage range indicates the PFC circuit works well. Exceeding the range indicates the PFC circuit is damaged.

Table3

No.	Check Point		Normal Range(V)	Notes
	(+) Side of Digital Multimeter	(-) Side of Digital Multimeter		
1	IGBT-C	VDC+	0.3~0.85V	
2	VDC-	IGBT-C		
3	VDC+	IGBT-C	≥2.0V or OL	It takes a few seconds for the value to stabilize.
4	IGBT-C	VDC-		

1.2.5 Checking Method of Electronic Expansion Valve

	For Indoor Unit	For Outdoor Unit
Locked with Fully Closed	Check for the liquid pipe temperature during the heating operation. It is abnormal if the temperature does not increase.	It is abnormal if the liquid pipe pressure does not increase during the cooling operation.
Locked with Slightly Opened	It is abnormal that the cooling and heating effects are very poor.	It is abnormal if the liquid pipe pressure does not increase and the outlet temperature of the expansion valve decreases after the cooling operation is started.
Locked with Fully Opened		It is abnormal under the following conditions; After heating operation for more than 30 min., the discharge gas temperature of compressor is not 18°F(10°C) higher than the condensing temperature and there is no other faults such as excessive charge of refrigerant, etc.

1.2.6 Checking Method of DC Fan Motor for Outdoor Unit

⚠ CAUTION

- Turn OFF all power source switches before performing troubleshooting. If not, this troubleshooting may not be performed correctly, and also components may be damaged.

- Applicable Models

  DC fan motor(s) is attached as follows.

Model	Q'ty
09K~36K	1
48K	2

When the inverter PCB is damaged and the alarm code "03", "04" or "53" is indicated, DC fan motor also may be damaged. If the inverter PCB is operated with faulty DC fan motor, the inverter PCB and fuses may be damaged. Accordingly, when replacing the inverter PCB, check the DC fan motor in the following procedure.

< Procedure >

(1) Disconnect the connector for DC fan motor from O.U. PCB, and rotate the fan motor shaft by hand.

It is normal when the fan motor shaft rotates smoothly.
It is abnormality if the fan motor shaft does not rotate smoothly or continuously when rotating the fan motor shaft by hand. If the short-circuit occurs in the electronic circuit of DC fan motor, the fan motor shaft does not rotate smoothly due to braking of the built-in magnets.

(2) Measure the resistance at DC fan motor.

Necessary Tool: Circuit Tester

(a) Disconnect the connector for DC fan motor (PCN201/PCN202 and CN201/CN202) from O.U. PCB.
(b) Connect the black test lead wire to the pin terminal of black wiring for PCN201/CN201.
(c) Connect the red test lead wire to each measuring pin terminal for PCN201/PCN202 and CN201/CN202.

It is normal when the resistance is the same or closed as the normal values in the table below.

It is abnormal if the resistance is completely different from the normal values in the table below.

(Open fault: infinity, Short-circuit fault: several Ω to several kΩ)

The condition of open fault and short-circuit fault in the electronic circuit of DC fan motor can be checked if the value shows abnormality.

Model	Fan Model	Vcc-GND	Vm-GND	Vs-GND
09K~12K	ZWA228D70C	∞	0.996MΩ	196.6KΩ
18K~24K	SIC-82F-D880-1	∞	1.088MΩ	205.1KΩ
30K~48K	ZWF-138X ZWF-138H	3MΩ	5MΩ	143MΩ

NOTE:

- The table above shows approximate normal values. Accurate resistance may change depending on the circuit tester type. However, as for the measurement of open fault and short-circuit fault, any type of circuit tester is available.

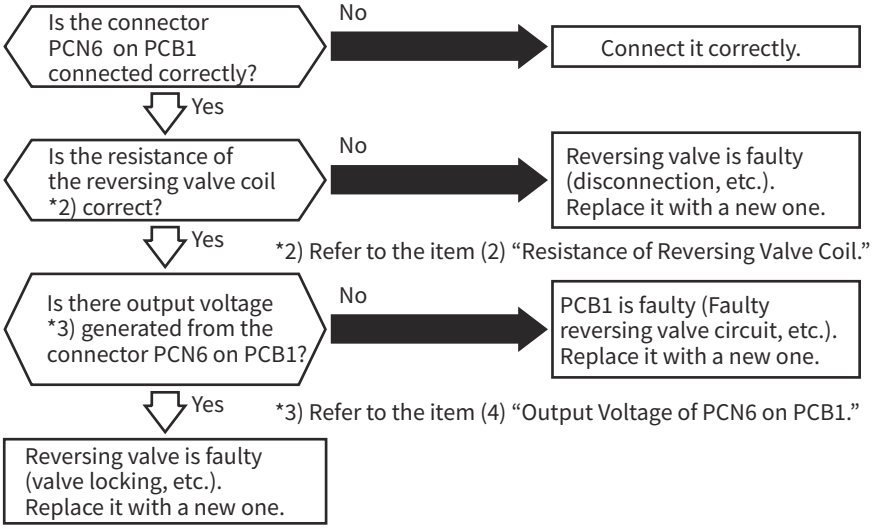
1.2.7 Checking of Electrical Coil Resistance for Each Electrical Component

Parts	Model	Type	Resistance (Ω)
Electronic Expansion Valve Coil	09K~48K	CAM-MD12HS-2	46±4 (at 68°F[20°C])
Reversing Valve Coil	09K~48K	SQ-A2522G-000541-RK	2085±10% (at 68°F[20°C])
Compressor	09K~12K	KSN108D32UFZR	1.72 (at 68°F[20°C])
	18K	/	1.82 (at 68°F[20°C])
	24K	/	1.03±5% (at 68°F[20°C])
	30K/36K/48K	/	0.5 (at 68°F[20°C])

1.2.8 Checking of Reversing Valve

If DC Inverter outdoor units (for R32) do not start the heating operation or defrosting operation, there may be a malfunction of the reversing valve. The troubleshooting is indicated below.

(1) Troubleshooting of Reversing Valve



*1)

Connector No.	Pin No.
PCN6 (PCB1)	1 to 3

PCB1: Printed Circuit Board for Outdoor Unit

(2) Resistance of Reversing Valve Coil

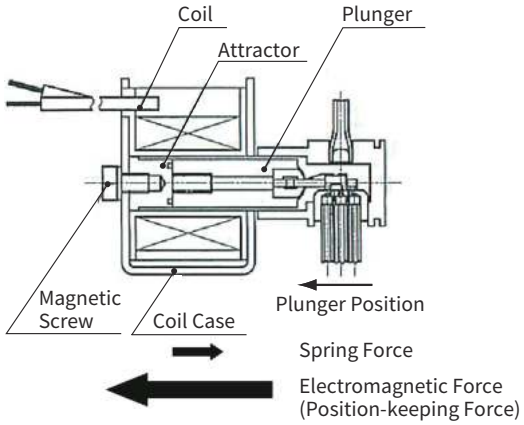
Item	Model	Coil Resistance (Ω) at 68°F(20°C)	Applicable Outdoor Unit Model
Reversing Valve Coil *4)	SQ-A2522G-000541-RK	2085±10%	09K~48K

*4) Refer to the item (3) "Actions of Reversing Valve" for details of actions of reversing valve.

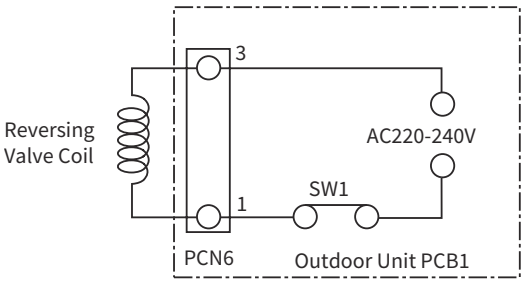
(3) Actions of Reversing Valve

Operation Mode: Heating Reversing Valve Coil: ON

Electric Current Applied
Current is applied to the reversing valve coil and so attraction is generated. The plunger position is kept by the electromagnetic force.

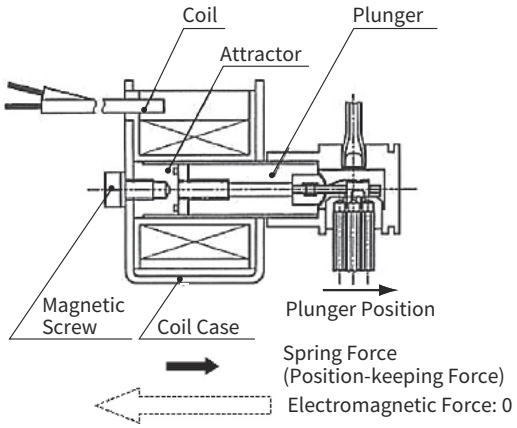


< Electrical Circuit >

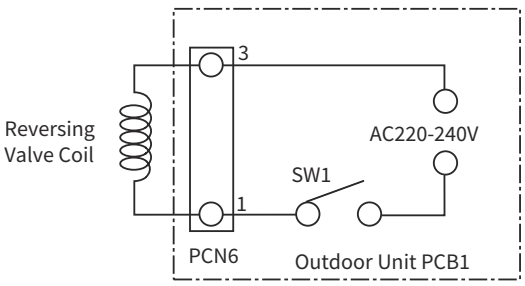


Operation Mode: Cooling Reversing Valve Coil: OFF

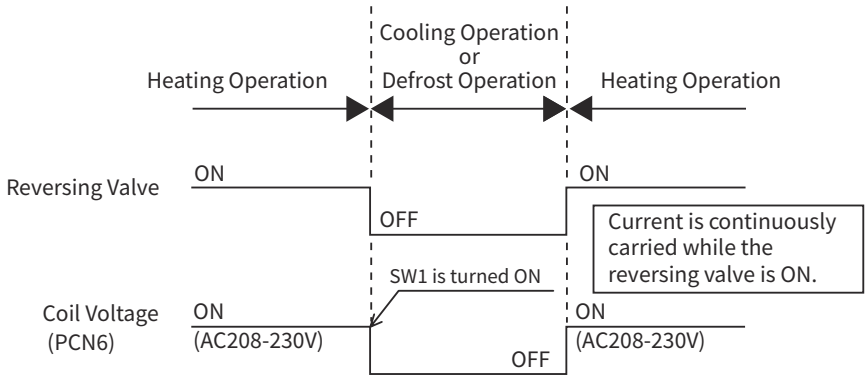
No Electric Current Applied
No current is applied to the reversing valve coil and so no attraction is generated. The plunger position is kept by spring force.



< Electrical Circuit >



< Time Chart >



(4) Output Voltage of PCN6 on PCB1

	Reversing Valve: ON	Reversing Valve: OFF
Test Lead (+ Side)	PCN6-1	PCN6-3
Test Lead (- Side)	PCN6-3	PCN6-1
Appropriate Range of Voltage	Power Supply Voltage AC208-230V Voltage fluctuation:-15%~+10%	Power Supply Voltage AC208-230V Voltage fluctuation:-15%~+10%

NOTES:

1. The values may differ depending on testers.
2. Refer to the item (1) “Troubleshooting of Reversing Valve” if there is no output voltage or the reversing valve does not switch.

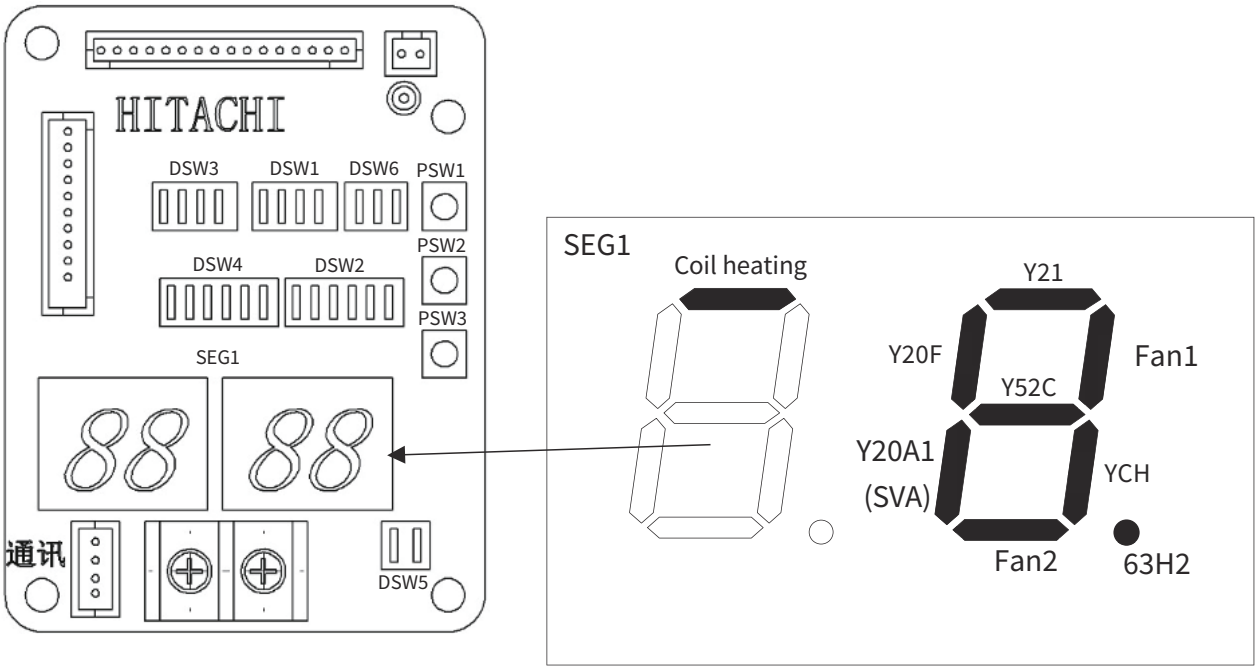
1.2.9 Checking by 7-segment Display on Outdoor Unit PCB

⚠ WARNING

- 208/230V is applied to the outdoor unit PCB and electrical components. Never touch them when checking. Additionally, do not touch the tools (metallic) to PCB and electrical components not to short circuit.

The operating conditions and each part of refrigerant cycle temperature condition can be checked by 7-segment display (SEG1) on the outdoor unit PCB and push switches (PSW).
To start the checking, press PSW2 for more than 3 seconds.
Press PSW2 to move the checking item forward, or press PSW3 to move the checking item backward.
To cancel the checking, press PSW2 for more than 3 seconds.

(A) Location of Push Switches and 7-Segment Display



(B) Details of 7-Segment Display

Item	Code	Contents
Input/Output State of Outdoor Micro-Computer	SC	Indication only for segments corresponding to equipment in "Location of Push Switches and 7-Segment Display"
Capacity of Operating Indoor Unit	oP	0 ~ 199 When capacity is higher than 100, last 2 digits flash.
Control Software No.	SP	Control Software No. in use is indicated. Alternately upper 2 digits and lower 2 digits are indicated every 0.5 sec.
Inverter Software No.	iP	Inverter Software No. in use is indicated. Alternately upper 2 digits and lower 2 digit are indicated every 0.5 sec.
Inverter Order Frequency to Compressor	H1	0 ~ 199 (Hz) When frequency is higher than 100Hz, last 2 digits flash.
Air Flow Ratio	Fo	0 ~ 16
Outdoor Unit Expansion Valve Opening	Eo	0 ~ 100(%) When expansion valve opening is 100%, "00" flashes.
Discharge Pressure	Pd.	14.5Psig ~ 710.7Psig(0.1MPa ~ 4.9MPa)
Discharge Pressure (Estimated value)	P.d.	14.5Psig ~ 710.7Psig(0.1MPa ~ 4.9MPa)
Suction Pressure (Low)	PS.	0Psig ~ 275.6Psig(0.1MPa ~ 1.9MPa)
Suction Pressure (Estimated value)	P.S.	0Psig ~ 275.6Psig(0.1MPa ~ 1.9MPa)
Temperature at the Top of Compressor	Td	33.8°F ~ 287.6°F(1°F ~ 142°C) When temperature is higher than 100°C, last 2 digits flash.
Evaporating Temperature at Heating	TE	-2.2°F ~ 176°F(-19°C ~ 80°C)
Ambient Air Temperature	To	-2.2°F ~ 176°F(-19°C ~ 80°C)
Condensing Temperature at Cooling	TC	-2.2°F ~ 176°F(-19°C ~ 80°C)
Compressor Suction Temperature	TS	-2.2°F ~ 176°F(-19°C ~ 80°C)
Inverter Fin Temperature	TF	-2.2°F ~ 260.6°F(-19°C ~ 127°C) When temperature is 212°F(100°C), "00" flashes.
Inverter Firstly Current	A1	00 ~ 199 (A) When current is higher than 100A, last 2 digits flash.
Inverter Secondary Current	A2	00 ~ 199 (A) When current is higher than 100A, last 2 digits flash.
Indoor Unit Address	nA	0 ~ 3 (Unit No.)
Indoor Unit Expansion Valve Opening	EA	00 ~ 100(%) When opening is 100%, "00" flashes.
Middle Temperature of Indoor Unit A Pipe	LA	-2.2°F ~ 260.6°F(-19°C ~ 127°C)
Indoor Unit Inlet Air Temperature	iA	-2.2°F ~ 260.6°F(-19°C ~ 127°C)
Cause of Indoor Unit Stoppage	dA	0 ~ 99
Nth Indoor unit	nn	0 ~ 3
Expansion valve opening of the Nth Indoor unit	En	0 ~ 100(%) When opening is 100%, "00" flashes.
Temperature in the tube of the Nth Indoor unit	Ln	-2.2°F ~ 260.6°F(-19°C ~ 127°C)
Suction Temperature of the Nth Indoor unit	in	-2.2°F ~ 260.6°F(-19°C ~ 127°C)

Item	Code	Contents
Reason for stopping indoor unit	dn	0 ~ 99
Accumulated Operating Time of Compressor	UU	0 ~ 9,999 (x 10 hours) Alternately upper 2 digits and lower 2 digits are indicated every 0.5 sec.
Accumulated Operating Time of Compressor	cU	0 ~ 9,999 (x 10 hours) Alternately upper 2 digits and lower 2 digits are indicated every 0.5 sec.
Outdoor Unit Alarm Code	AC	00 ~ FF
Code for inverter (compressor) stop	iF	0 ~ 99
Code for inverter (Fan1) stop	F1	0 ~ 99
Code for inverter (Fan2) stop	F2	0 ~ 99
Abnormal Data Record	n1	One of the abnormal data record from latest (n1) to oldest (n9) is indicated. Alarm code or cause code is indicated.
Outdoor unit capacity	CA	0 ~ 99
Total Capacity of Indoor Unit Connected	CP	0 ~ 199
Connected Indoor Unit Number	AA	0 ~ 3
Refrigerant Address	dA	0 ~ 63

NOTE:

- All temperature and pressure units in the table are °F and Psig.

(C) Cause Code for Indoor Unit Stoppage (dA)

Code (SEG1)	Item	Code (SEG1)	Item
0	Operation OFF, Power OFF	18	Retry due to Inverter Voltage Decrease; Retry due to Inverter Overvoltage
1	Thermo-OFF	19	Electronic Valve Opening Difference Protection
2	Alarm	21	Forced Thermo-OFF for Oil Return
3	Freeze Protection; Overheating Protection	22	The Outdoor Unit Hot Start
5	Instantaneous Power Failure at Outdoor Unit	26	Retry due to High Pressure Decrease
6	Instantaneous Power Failure at Indoor Unit	28	Cooling Air Discharge Temperature Decrease
7	Stoppage of Cooling Operation due to High/ Low Outdoor Air Temperature Stoppage of Heating Operation due to High Outdoor Air Temperature	33	Forced Thermo-OFF
10	Demand. Forced Stoppage	34	Forced Thermo-OFF
11	Retry due to Pressure Ratio Decrease	35	Retry due to Abnormal Operating Mode (4-Way Valve Switching Failure)
12	Retry due to Ps Increase	36	Retry after Defrosting Operation
13	Retry due to Pd Increase	39	Forced Thermo-OFF for the Indoor Units Rotation
15	Retry due to Discharge Gas Temperature Increase; Retry due to Low Pressure Decrease	40	Forced Thermo-OFF for Floor Sense Cool Air Flow
16	Retry due to Discharge Gas Superheat Decrease	41	Forced Thermo-OFF for the Outdoor Unit Control
17	Instantaneous Overcurrent of Inverter; Electronic Thermal Activation of Inverter Retry; Abnormal Current Sensor of Inverter Retry.	42	Forced Thermo-OFF Depending on Outdoor Air Temperature Limitation for Auxiliary Heater

NOTES:

- The cause code of indoor unit stoppage is not always "02" (Alarm) during stoppage by the abnormality. If the unit is under Thermo-OFF by other cause of stoppage before "02" (A larm) occurs, the previous cause code of indoor unit stoppage remains.
- When the communication between the driver board and the outdoor unit PCB is disconnected for 30 seconds, the outdoor micro-computer will be reset. Accordingly when the alarm code "04". (Communication Failure between Driver Board and Outdoor Unit PCB) occurs, the cause code of indoor unit stoppage may be indicated "05".
- When the communication between the indoor unit and the outdoor unit is disconnected for 3 minutes, the indoor micro-computer will be reset. Accordingly when the alarm code "03". (Communication Failure between Indoor Unit and Outdoor Unit) occurs, the cause code of indoor unit stoppage may be indicated "06".

(D) Cause Code for Inverter Stoppage (, F)

Code (SEG1)	Cause	Corresponding of Cause Code of I.D. Stoppage	Remark	
			Indication during Retry	Alarm Code
1	IPM Error	17	P7	53
2	Instantaneous Overcurrent	17	P7	48
3	Inverter Fin Thermistor Protection Activation	17	P7	54
4	Electronic Thermal Protection	17	P7	48
5	Inverter Voltage Decrease	18	P8	06
6	Overvoltage	18	P8	06
7	Abnormal Communication	18	--	04
8	Abnormal Current Detection	17	P7	51
9	Instantaneous Power Failure Detection	18	--	--
11	Reset of Micro-Computer for Inverter	18	--	--
12	Ground Fault Detection from Compressor	17	P7	53
13	Open Phase Detection	18	--	--
16	Inverter Malfunction	18	P8	55
17	Communication Error	18	P8	55
18	Protection Device Actuation (PSH)	--	--	02
19	Abnormal Protective Device	--	--	38
20	Early Return Protective Device	18	--	--
21	Step-Out Detection	17	P7	53
22	Abnormal PCB Setup	--	--	31
23	EERPOM Error	--	--	55
25	Abnormal Rotation Speed	18	--	--
26	Pre-charge Malfunction	--	--	55

(E) Indoor Unit Capacity Table

Code	Capacity (Btu/h)
8	09K
11	12K
20	18K
22	-
26	24K
28	-
32	30K
35	-
40	36K
48	48K

1.2.10 Checking of Protection Control Information

Protection control code is displayed on 7-segment display while a protection control is activated. It is turned OFF when the protection control is canceled. If several protection controls are activated, the code of the protection control with highest priority will be displayed. Also if several retry control is activated, the code of the latest retry control will be displayed.

< Protection Control Priority Order >

Priority Order	Protection Control	Code
1	Pressure Ratio Control	P1
2	High Pressure Increase Protection	P2
3	Inverter Current Protection	P3
4	Inverter Fin Temperature Increase Protection	P4
5	Discharge Gas Temperature Increase Protection	P5
6	Suction Pressure Decrease Protection	P6
7	Demand Current Control	PA
8	Suction Pressure Increase Protection	Pd
9	Discharge Pressure Decrease Protection	P9

NOTES:

- While a higher-priority protection control is activated, lower-priority ones are not available.
- If a higher-priority protection control is the increase/decrease prohibition protection of compressor frequency while a lower-priority protection control is the forced increase/decrease protection of compressor frequency, the forced increase/decrease protection will be prioritized.

(A) Protection Control Code and Retry Control Code

Code (SEG1)	Protection Control	Remark
P1	Pressure Ratio Control	To control the compressor frequency for prevention of operation with high/low pressure ratio.
P2	High Pressure Increase Protection	To control the compressor frequency for prevention of high pressure increase.
P3	Inverter Current Protection	To control the compressor frequency for prevention of inverter current increase in the outdoor unit during operation.
P4	Inverter Fin Temperature Increase Protection	To control the compressor frequency for prevention of inverter fin temperature increase. The inverter fin temperature is detected at the inverter PCB.
P5	Discharge Gas Temperature Increase Protection	To control the compressor frequency for prevention of discharge gas temperature increase during operation.
P6	Suction Pressure Decrease Protection	Control compressor frequency to prevent suction pressure decrease.
PA	Demand Current Control	To control the compressor frequency for fixing the inverter primary current around the set value (40~100% of rated current for cooling)
Pd	Suction Pressure Increase Protection	To control the compressor frequency for prevention of suction pressure increase.
P9	Discharge Pressure Decrease Protection	To control the compressor frequency for prevention of discharge pressure decrease.

Code (SEG1)	Retry Control	Remark
P7	Inverter Trip Retry	To stop the unit operation temporarily for protection of the compressor and inverter. The operation will be restarted or stopped depending on the retry frequency.
P8	Insufficient Voltage/ Excessive Voltage Retry	

(B) Activation and Cancellation Condition of Protection Control and Retry Control

Code	Protection Control	Activation Condition	Cancellation Condition
P1	Pressure Ratio Control *1)	Estimated Pressure Ratio ε (= estimated value calculated from cycle operating temperature) during cooling or heating operation is as follows. *5) a) Estimated Pressure Ratio ε <1.5 → Frequency Increase b) 1.5 < Estimated Pressure Ratio ε < 7.5 → Frequency Decrease Prevention c) 7.5< Estimated Pressure Ratio ε < 8.0 → Frequency Increase Prevention d) Estimated Pressure Ratio ε > 8 → Frequency Decrease	a) Compressor stops. b) 1.5 < Estimated Pressure Ratio ε < 7.5
P2	High Pressure Increase Protection	Estimated High Pressure (= estimated value detected by a high pressure sensor) exceeds 493.1Psig(3.4MPa). a) Estimated High Pressure > 493.1Psig(3.4MPa) → Frequency Increase Prevention b) Estimated High Pressure > 565.6Psig(3.9MPa) → Frequency Decrease to 536.6Psig(3.7MPa) or less	Estimated High Pressure<464.1Psig(3.2MPa)
P3	Inverter Current Protection *2)	Inverter Primary/Secondary Current > Set Value → Frequency Decrease → Frequency Increase Prevention (Depending on the current value, either of the actions above is selected.)	Inverter Primary/Secondary Current ≤ Set Value
P4	Inverter Fin Temperature Increase Protection *3)	Inverter Fin Temperature > Set Value → Frequency Decrease → Frequency Increase Prevention (Depending on the current value, either of the actions above is selected.)	Inverter Fin Temperature ≤ Setting
P5	Discharge Gas Temperature Increase Protection	Discharge Gas Temperature > 197.6°F(92 °C) → Frequency Decrease to Set Value (If the operating frequency exceeds the set value, it will decrease by this protection control)	a) Operating frequency is less than the set value. b) Discharge Gas Temperature < 197.6°F(92 °C)
P6	Suction Pressure Decrease Protection	Suction pressure < 14.5Psig(0.1MPa) a) When the inspiratory pressure<14.5Psig(0.1MPa), → Frequency decrease to 14.5Psig(0.1MPa) or more.	Suction pressure > 14.5Psig(0.1MPa)
PA	Demand Current Control *4)	Demand current control is activated under the following conditions. a) The demand current control signal is output from the central controller. b) Demand current control signal is input to the outdoor unit external input. c) Demand function setting is set from the outdoor unit PCB. d) Wave function setting is set from the outdoor unit PCB. → Frequency Decrease → Frequency Increase Prevention (Depending on the current value, either of the actions above is selected.)	No demand current control signal is output.
Pd	Suction Pressure Increase Protection	When the suction pressure > 188.5Psig(1.3MPa), → Compressor frequency decrease	Suction pressure < 188.5Psig(1.3MPa)
P9	Discharge Pressure Decrease Protection	When the discharge pressure<145.0Psig(1.0MPa), → Compressor frequency increase.	Discharge Pressure >174.0Psig(1.2MPa)

*1): The estimated pressure ratio and estimated high pressure might differ from the actual values.

*2): If the inverter primary or secondary current continues to increase even after the protection control “P3” is activated, the retry control “P7” (stop & restart of operation) will be activated. “P7” will be indicated on the 7-segment display. If the problem cannot be solved even after repeating the retry control “P7,” the operation stops abnormally. Alarm code “48 (Activation of Overcurrent Protection)” will be indicated on the 7-segment display.

*3): If the inverter fin temperature continues to increase even after the protection control “P3” is activated, the retry control “P7” (stop & restart of operation) will be activated. “P7” will be indicated on the 7-segment display. If the problem cannot be solved even after repeating the retry control “P7,” the operation stops abnormally. Alarm code “54 (Abnormality of Inverter Fin Temperature)” will be indicated on the 7-segment display.

*4): The protection control “PA” is not available while the compressor is running or during defrosting operation.

*5): For high pressure, use a value detected by a high pressure sensor.

2. Servicing

2.1 MESP Ducted Type

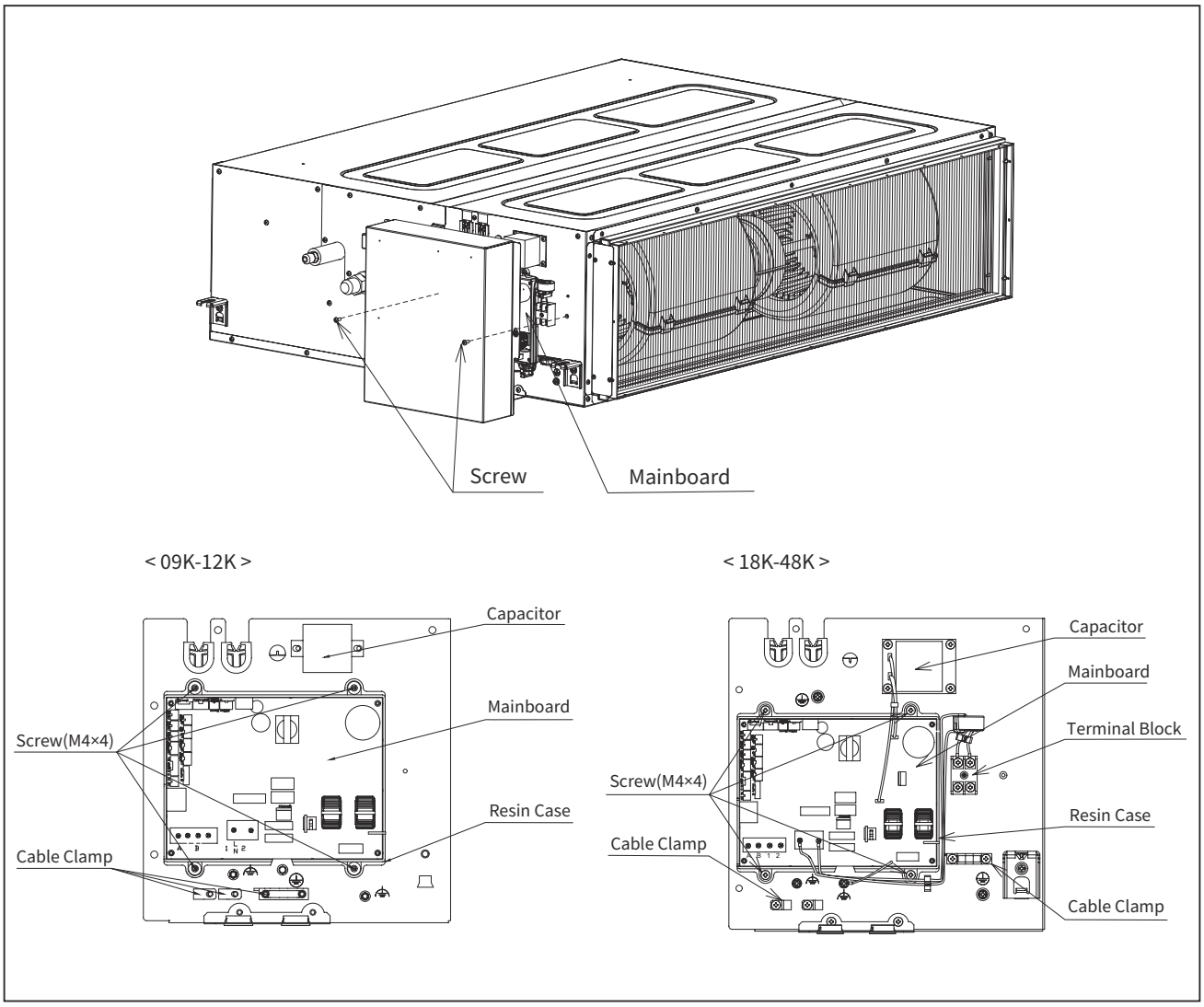
⚠ WARNING

- TURN OFF all power source switches.

2.1.1 Removing PCB, Fan and Fan Motor

(1) Loosen two M4 screws that are fixing the electrical box cover. Exert slight force and lift the electric cover upwards and pull it upwards to remove the electrical box cover.

Tool	Phillips Screwdriver



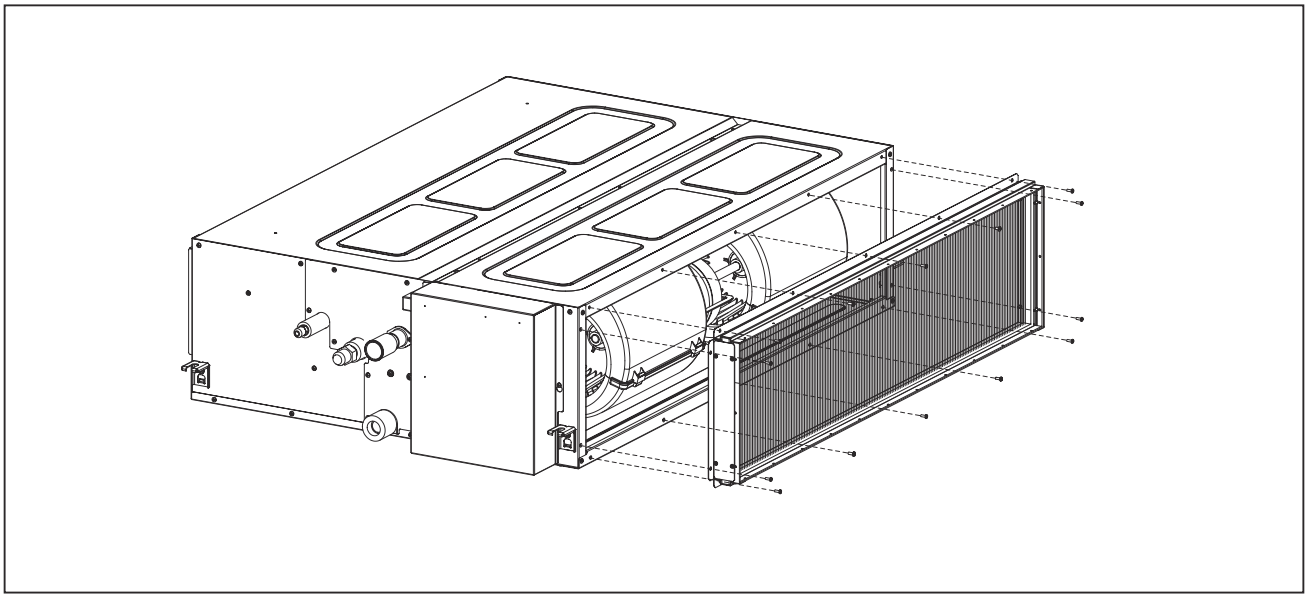
NOTE:

- Do not apply excessive force to the control board (mainboard). Otherwise, it may lead to malfunction.

(2) Unplug the connectors inside the electrical box from the PCB.
Unplug the connectors of float switch, air inlet thermistor, water pump (for units with water pump) and the motor.

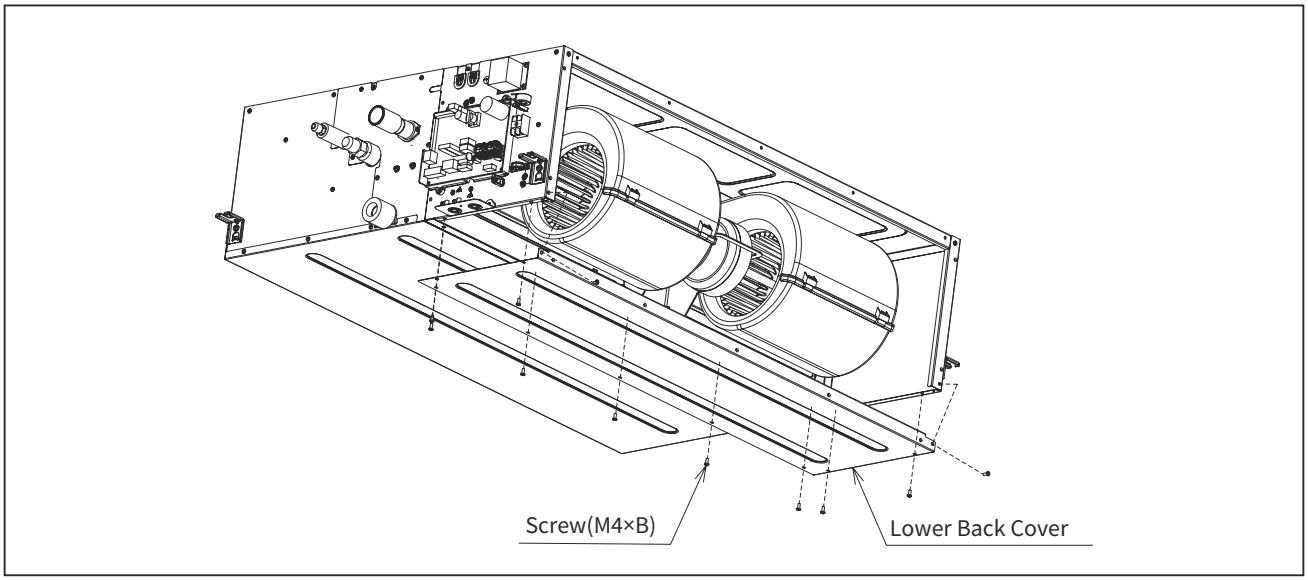
(3) Remove M4 screw (Quantity: A) of the filter.
Quantity (A) of M4 screw: 10 (09K-12K)
12 (18K-30K)
16 (36K-48K)

Tool	Phillips Screwdriver, Screwdriver



(4) Remove M4 screw (Quantity: B) that is fixing the lower back cover to the indoor motor side. Remove the lower back cover.
Quantity (B) of M4 screw: 7 (09K-12K)
11 (18K-30K)
12 (36K-48K)

Tool	Phillips Screwdriver



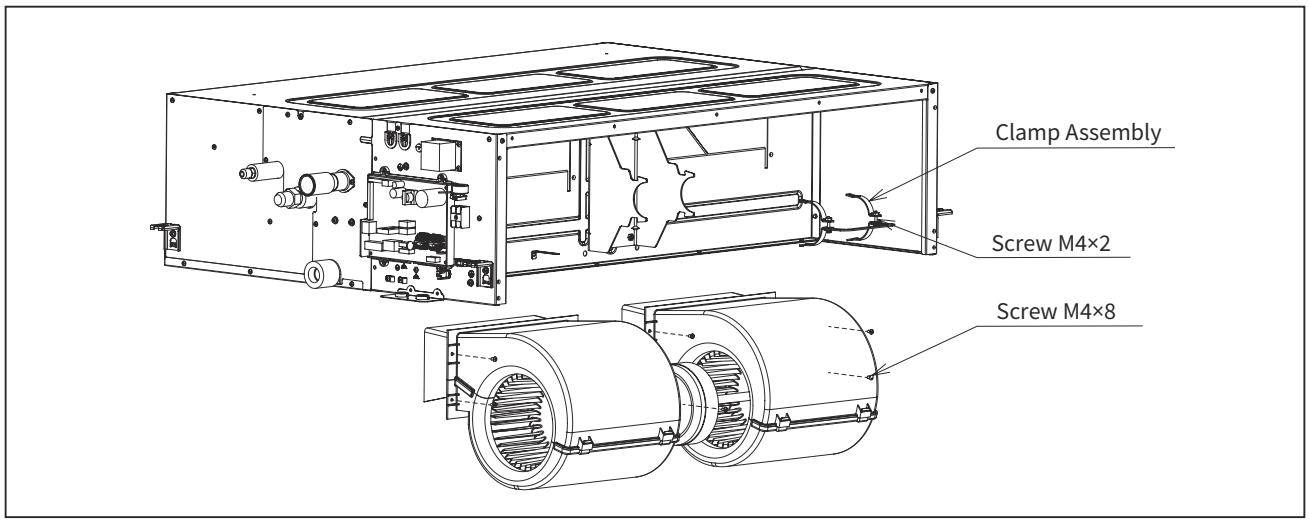
(5) Fan assembly can be seen after removing of lower back cover. Pull the wires out from the wire clamp for easy removal of fan motor.

(6) Remove M4 screws (09K-12K: 4 pcs, 18K-48K: 8 pcs) that are fixing the fan casing to the fan fixing plate. Gently push the fan casing assembly downwards.

(MESP Ducted Type)

(7) Hold the fan motor with hands and loosen the M4 screws (quantity: 2) that are fixing the motor clamps. Remove the motor clamp assembly to remove the fan assembly (Motor, casing assembly, fan). Remove the fan and fan motor from the bottom of the indoor unit.

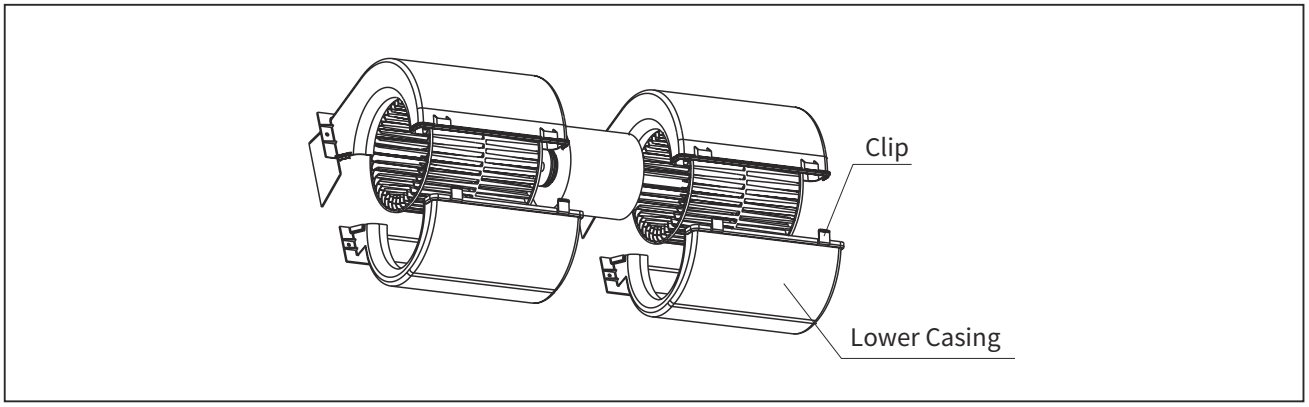
Tool	Phillips Screwdriver, Screwdriver



NOTE:

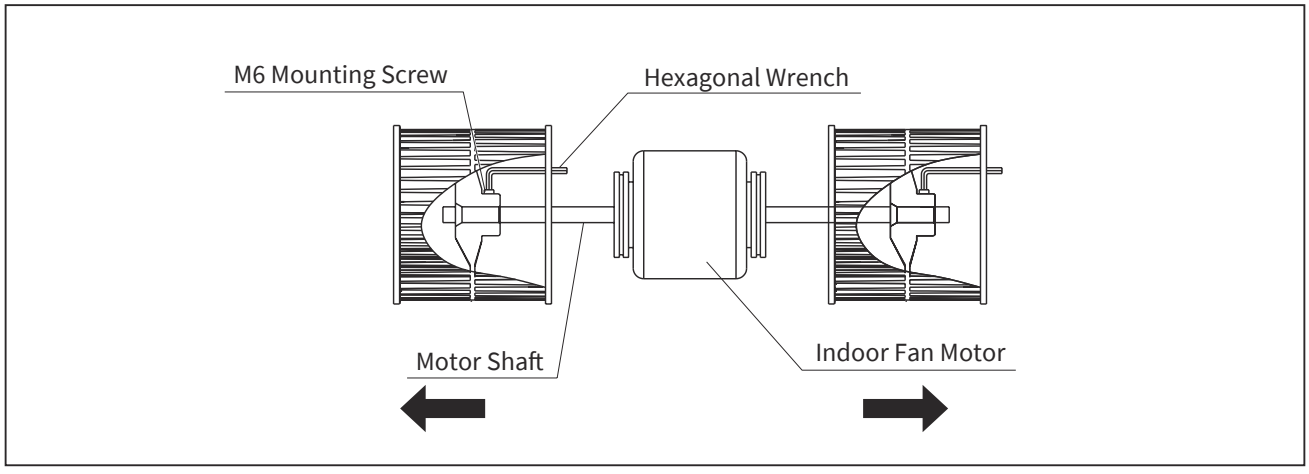
- Total weight of the fan assembly (motor, fan casing assembly, fan) is approximately 33lbs(15kg). Ensure care during removal process.

(8) Push the clip on either side of the fan casing to remove the lower and upper casings.



(9) Use hexagonal wrench to remove the M6 screw (1 pc per fan) that is fixing the fan. Remove the fan from the motor shaft in the direction shown by the arrow in the figure.

Tool	Hexagonal Wrench



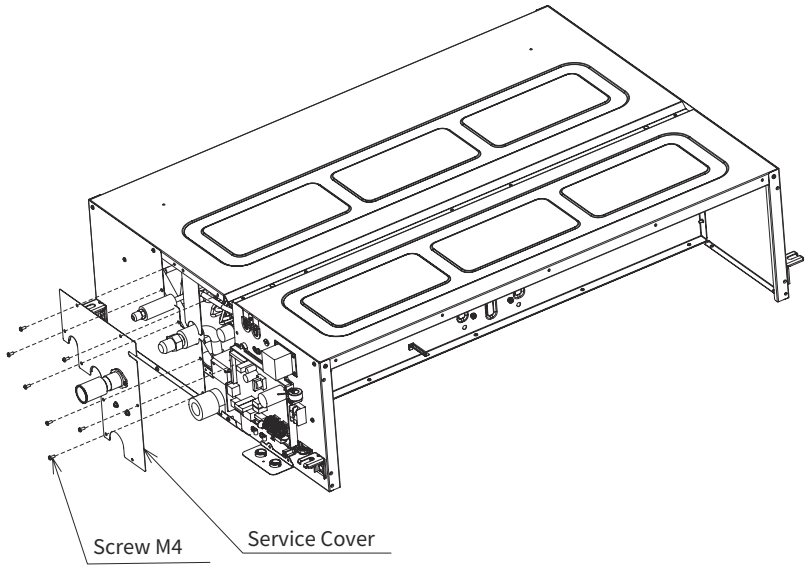
⚠ WARNING

- TURN OFF all power source switches.

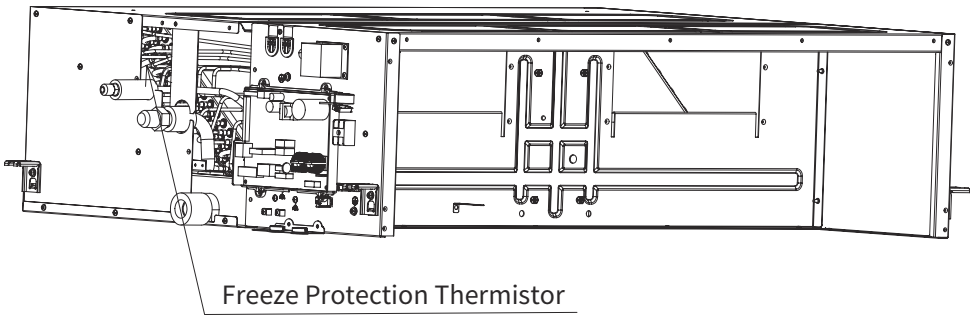
2.1.2 Removing Thermistor for Freeze Protection & Air Inlet

(1) Remove M4 screws (7 pcs) that are fixing the service cover and then remove the service cover.

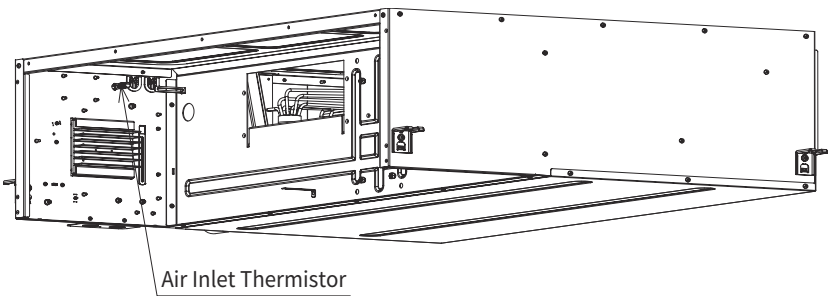
Tool	Phillips Screwdriver



(2) Remove the Mid-pipe thermistor for freeze protection from the HEX assembly.



(3) The air inlet thermistor is fixed by two plastic clips of itself, remove it from rear side of E-BOX as bellow.



(MESP Ducted Type)

⚠ WARNING

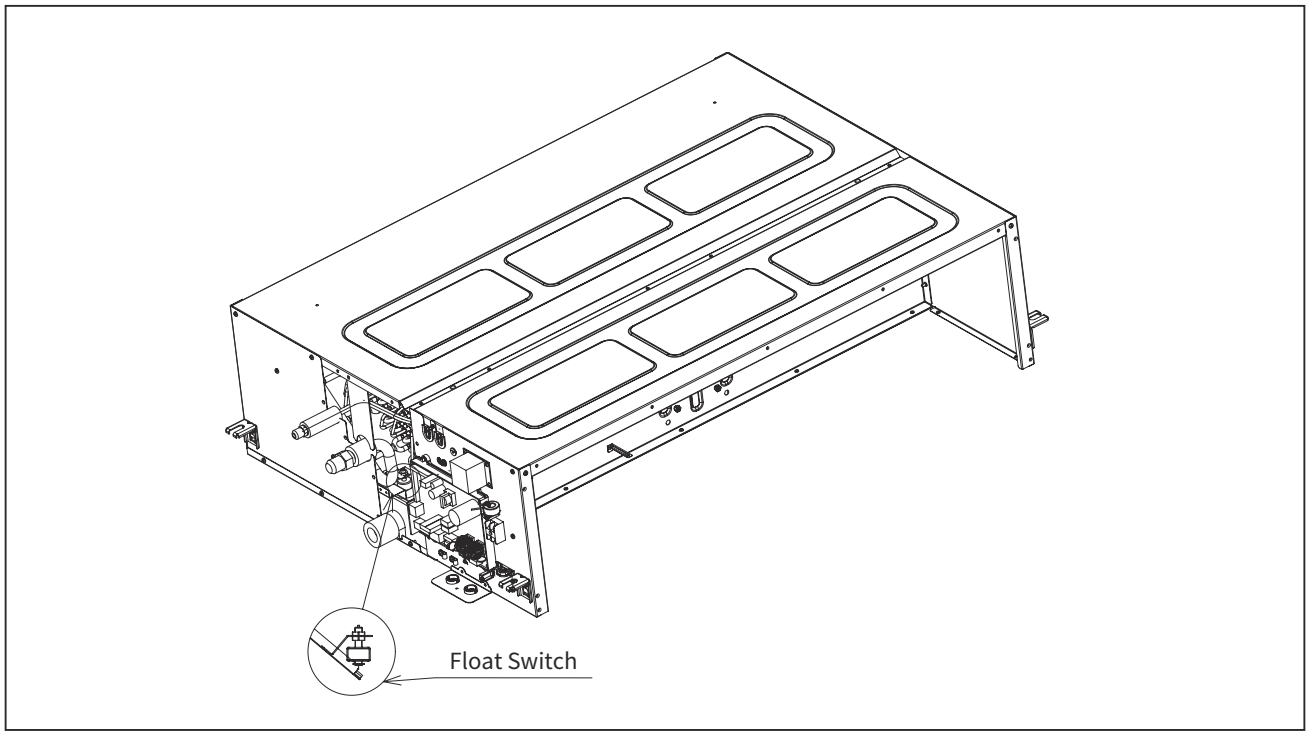
- TURN OFF all power source switches.

2.1.3 Removing Float Switch

(1) Remove the side cover according to step (1) in section 2.1.2. The float switch can be seen fixed to the right-side cover.

(2) Use a pair of wrenches to remove the float switch.

Tool	Phillips Screwdriver, Wrench



⚠ CAUTION

- Be careful when installing the float switch. (Tightening torque for the mounting nut of the float switch is 0.2lb·ft[0.3 N·m]) If the float switch falls, it will malfunction.

⚠ WARNING

- TURN OFF all power source switches.

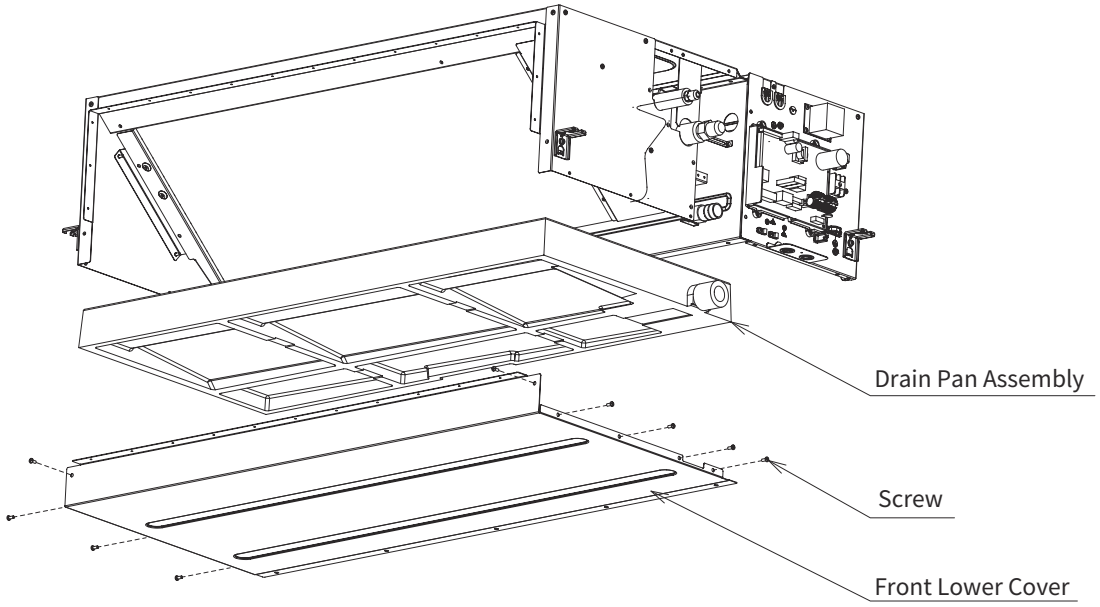
2.1.4 Removing Drain Pan Assembly

(1) Remove the back cover according to step (4) in section “2.1.1 Removing PCB, Fan and Fan Motor” .

(2) Remove M4 screws (2 pcs) under the air outlet and M4 screws (Quantity: C) under the connecting pipe side. Remove M4 screws (3 pcs) under the other side to remove the front lower cover.
Quantity (C) of M4 screw: 09K-12K: 3 pcs, 18K-48K: 4 pcs

(3) Slightly draw the drain pan assembly out.

Tool	Phillips Screwdriver



(4-Way Cassette Type)

2.2 4-Way Cassette Type

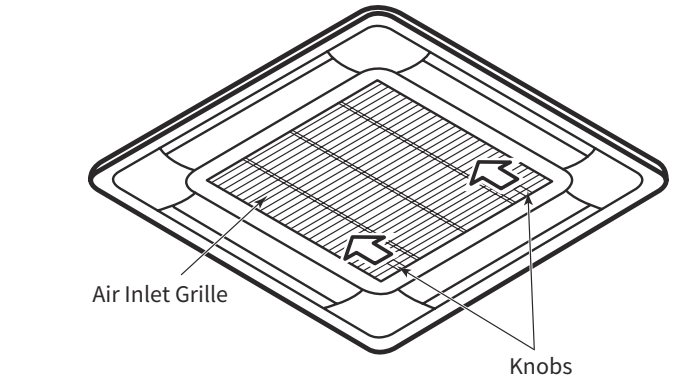
⚠ WARNING

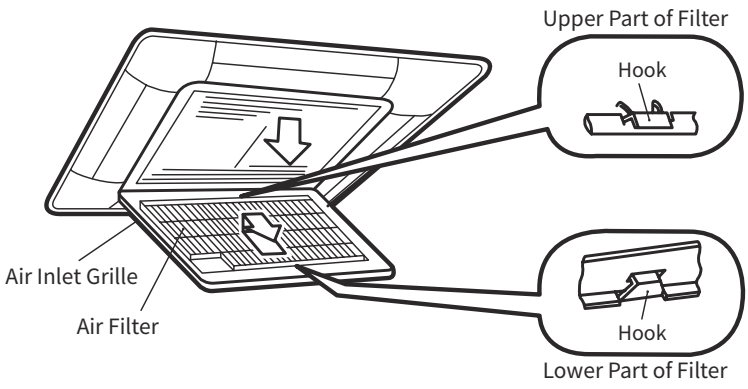
- TURN OFF all power source switches.

2.2.1 Removing Air Filter and Air Inlet Grille

(1) The air filter is attached inside the air inlet grille. While pushing both ends of knobs at the air inlet grille toward the arrow direction, open the air inlet grille.

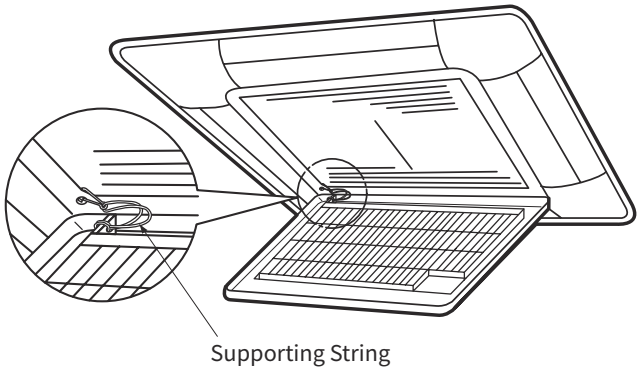
(2) Hold the lower side of the air inlet grille keeping it inclined.
Remove the hooks of air filter from the air inlet grille and remove the air filter.





(3) Remove the supporting string from the air panel.
After lifting the air inlet grille keeping it inclined, draw the air inlet grille forward to remove.

(4) When attaching the air inlet grille, the supporting string shall be attached to the air panel.



⚠ WARNING

- TURN OFF all power source switches.

⚠ CAUTION

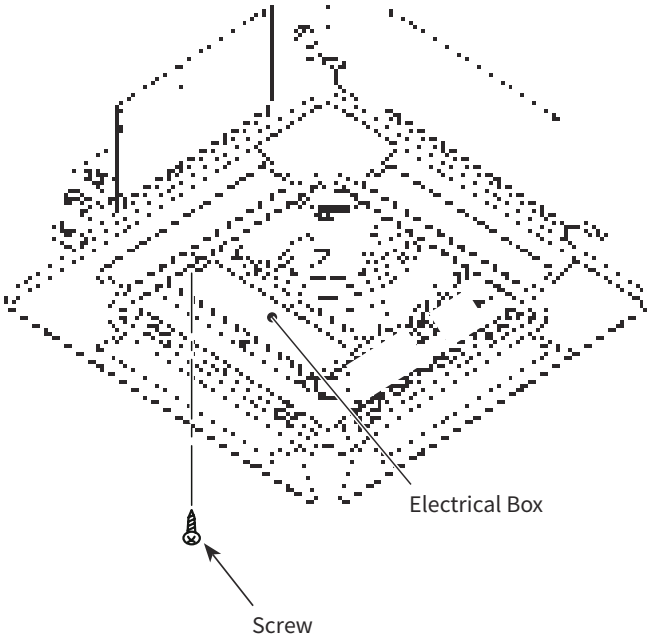
- Pay attention not to fall the electrical box cover.

2.2.2 Removing Electrical Box Cover

(1) The electrical box appears when opening the air inlet grille. Remove the fixing screw for electrical box cover and open the electrical box.

(2) The electrical box cover can hook onto the electrical box during the maintenance.

Tool	Phillips Screwdriver



(4-Way Cassette Type)

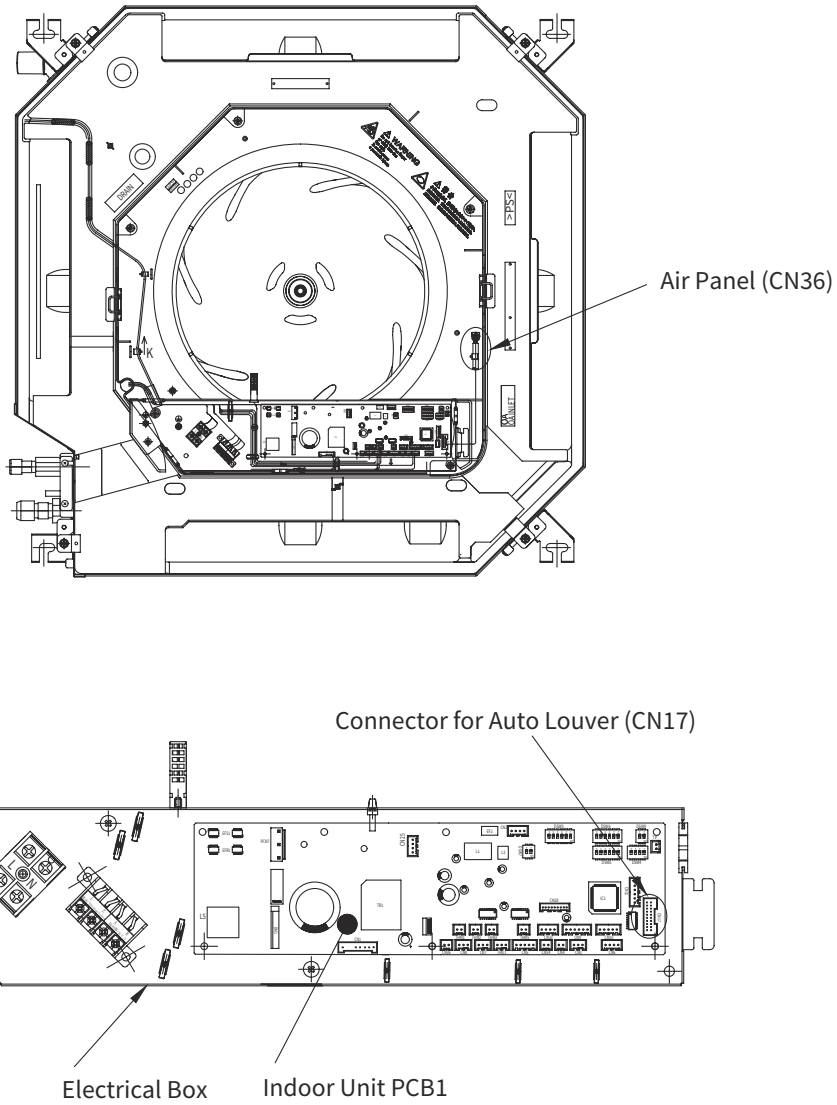
⚠ WARNING

- TURN OFF all power source switches.

2.2.3 Removing Optional Air Panel

(1) Open the air inlet grille. Remove the connector (CN36) at the air panel from the connector for auto louver (CN17) on the indoor unit PCB1.

Tool	Phillips Screwdriver, Screwdriver

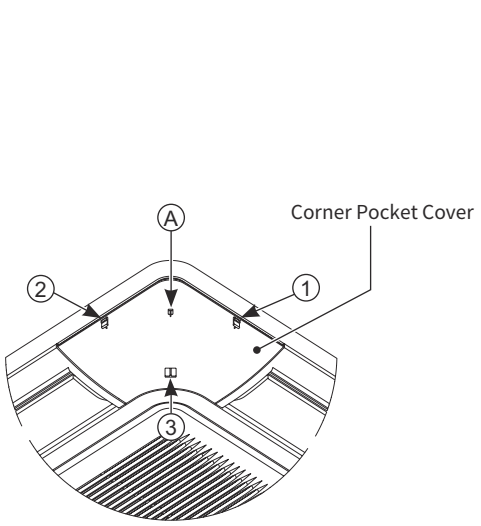


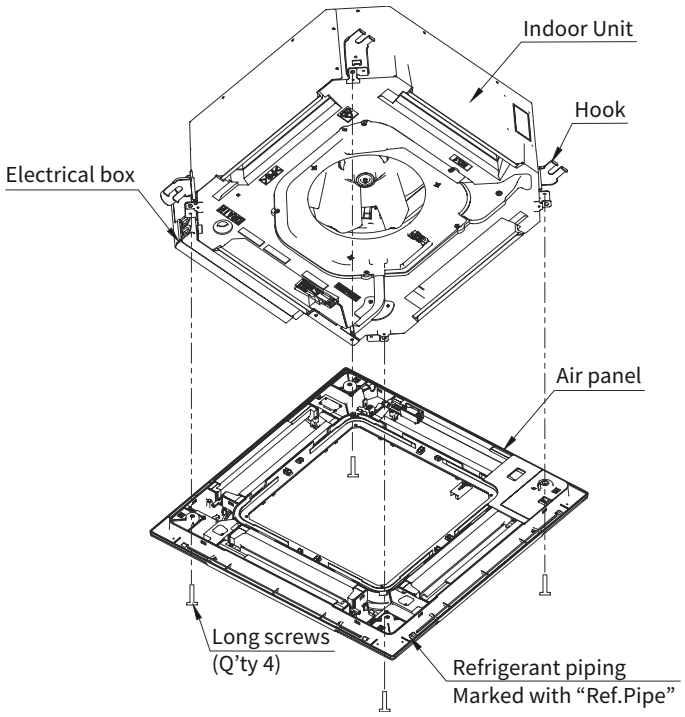
(2) Remove the air inlet grille from the air panel.

(3) Remove four (4) corner pocket covers from the air panel. They can be removed pulling "Ⓐ" part toward the arrow direction in the figure below.

* To attach the corner pocket covers again, insert the fixing hooks (① and ②) to the air panel and insert the fixing hook (③) to the air panel.

(4) Remove four (4) long screws from the air panel.





SERVICING

(4-Way Cassette Type)

⚠ WARNING

- TURN OFF all power source switches.

2.2.4 Removing Turbo Fan and Fan Motor

(1) Moving Electrical Box

Remove the drain pump motor connector(CN36), the float switch(CN14), the pipe thermistor(THM3) and the fan motor connector(CN1) from indoor unit PCB1.

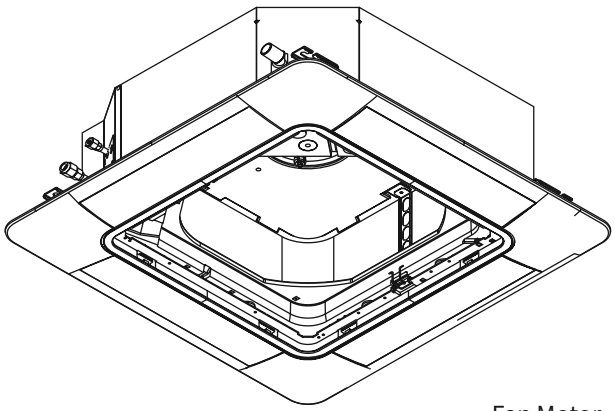
(2) Removing Drain Pan
Remove four (4) fixing screws to remove the drain pan.

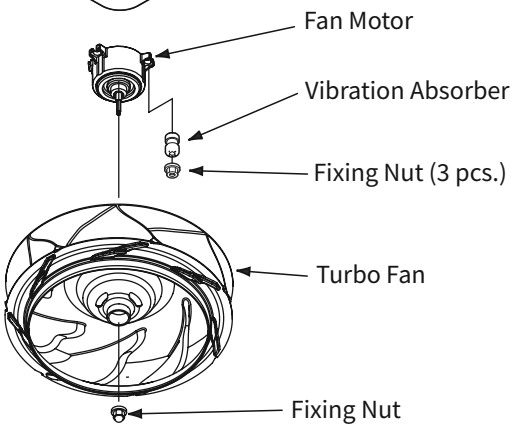
(3) Removing Turbo Fan and Fan Motor
Remove the turbo fan after the fixing nut for the turbo fan is removed. Remove the fan motor after three (3) fixing nuts for the fan motor are removed. (When reassembling, the tightening torque for nuts shall be approximately 8N•m.)

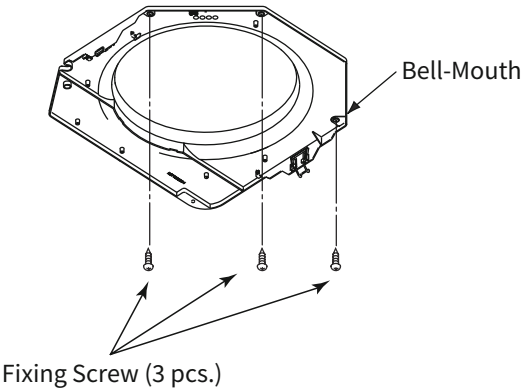
< Notes for Reassembling >
When reassembling, temporally fix the fixing screws, and align the center of turbo fan and bell-mouth to match. Tighten securely after keeping the clearance between the turbo fan and the bell-mouth evenly. In addition, securely fix lead wires for fan motor, 2 pipe thermistors and expansion valve by the cord clamp attaching at the partition plate.
(Refer to the item 2.2.10 “Removing Auto Louver Motors”.)

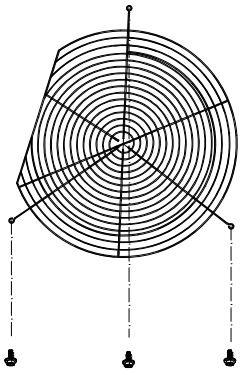
⚠ WARNING

- TURN OFF all power source switches.









Fixing Screw (3 pcs.)

(4-Way Cassette Type)

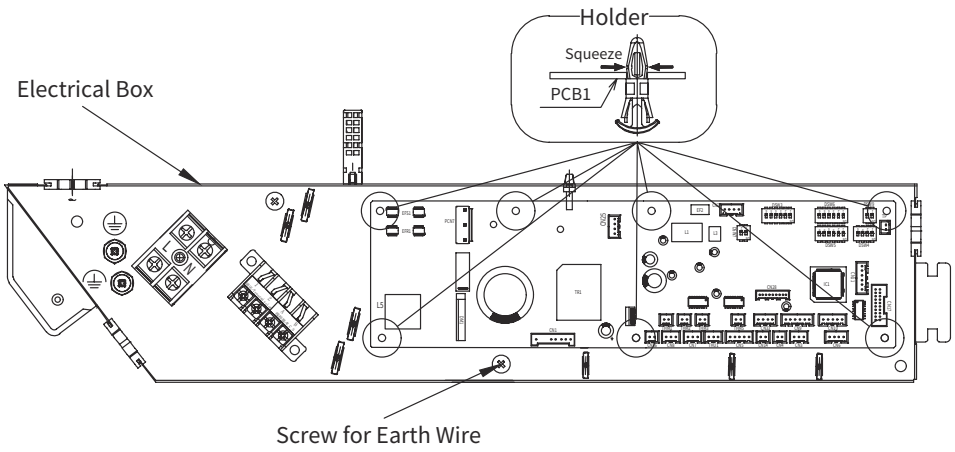
⚠ WARNING

- TURN OFF all power source switches.

2.2.5 Removing Printed Circuit Board (PCB1)

(1) Remove the air inlet grille according to the item 2.2.1 “Removing Air Filter and Air Inlet Grille”.
(2) Remove the electrical box according to the item 2.2.2 “Removing Electrical Box Cover“.
(3) Disconnect all wiring connectors from PCB1.
(4) Remove the screw for earth wire.
(5) The PCB1 is fixed by seven(7) holders. Squeeze holders and draw PCB1 out as figure shown below.

Tool	Phillips Screwdriver



NOTES:

1. Do not touch electrical parts on PCB1.
2. Pay attention not to apply an excessive force to PCB1. It may cause failure of PCB1.
3. When reassembling, attach connectors to the correct position. If not, the PCB1 may be damaged. In addition, securely attach the screw for earth wire.

⚠ WARNING

- TURN OFF all power source switches.

2.2.6 Removing Drain Pan

(1) Remove the air panel according to the item 2.2.3 “Removing Optional Air Panel”.

(2) Remove the electrical box cover according to the item 2.2.2 “Removing Electrical Box Cover“. Disconnect connectors of air outlet thermistor, 2 pipe thermistors (gas and liquid), the expansion valve, the drain pump, the float switch and the fan motor.

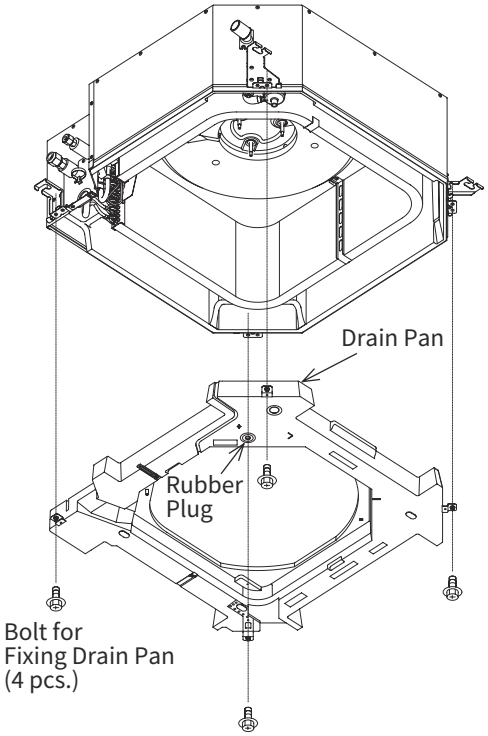
(3) Remove the electrical box and the bell-mouth according to the item 2.2.4 “Removing Turbo Fan and Fan Motor”.

(4) Draining Drain Water
Pull out the rubber plug from the drain pan, and drain the water remaining in the drain pan.
Although the silicon sealant is applied around the rubber plug, the rubber plug can be removed cutting the silicon sealant by a cutter. (Pay attention not to damage the rubber plug by a cutter.)
In addition, check the clogging at the drain hole.

(5) Removing Drain Pan
Remove four (4) bolts fixing the drain pan. Remove the drain pan.

< Note for Attachment >
When attaching the rubber plug again, push in it into the drain hole by using Phillips Screwdriver, etc. after the rubber plug is wet by water. Seal the rubber plug after the silicone sealant is applied around the flange part of rubber plug.

Tool	Phillips Screwdriver, Bucket (approx. 5 liters content)



(4-Way Cassette Type)

⚠ WARNING

- TURN OFF all power source switches.

2.2.7 Removing Drain-Up Mechanism

(1) Remove the drain pan according to the item 2.2.6 “Removing Drain Pan”.

(2) Remove the insulation which attaches the wires for float switch and drain-up mechanism together.

(3) Cut the plastic band fixing the wires at the fixing plate for float switch.

(4) Cut the hose band for drain hose by nipper, and remove the drain hose from the drain-up mechanism.

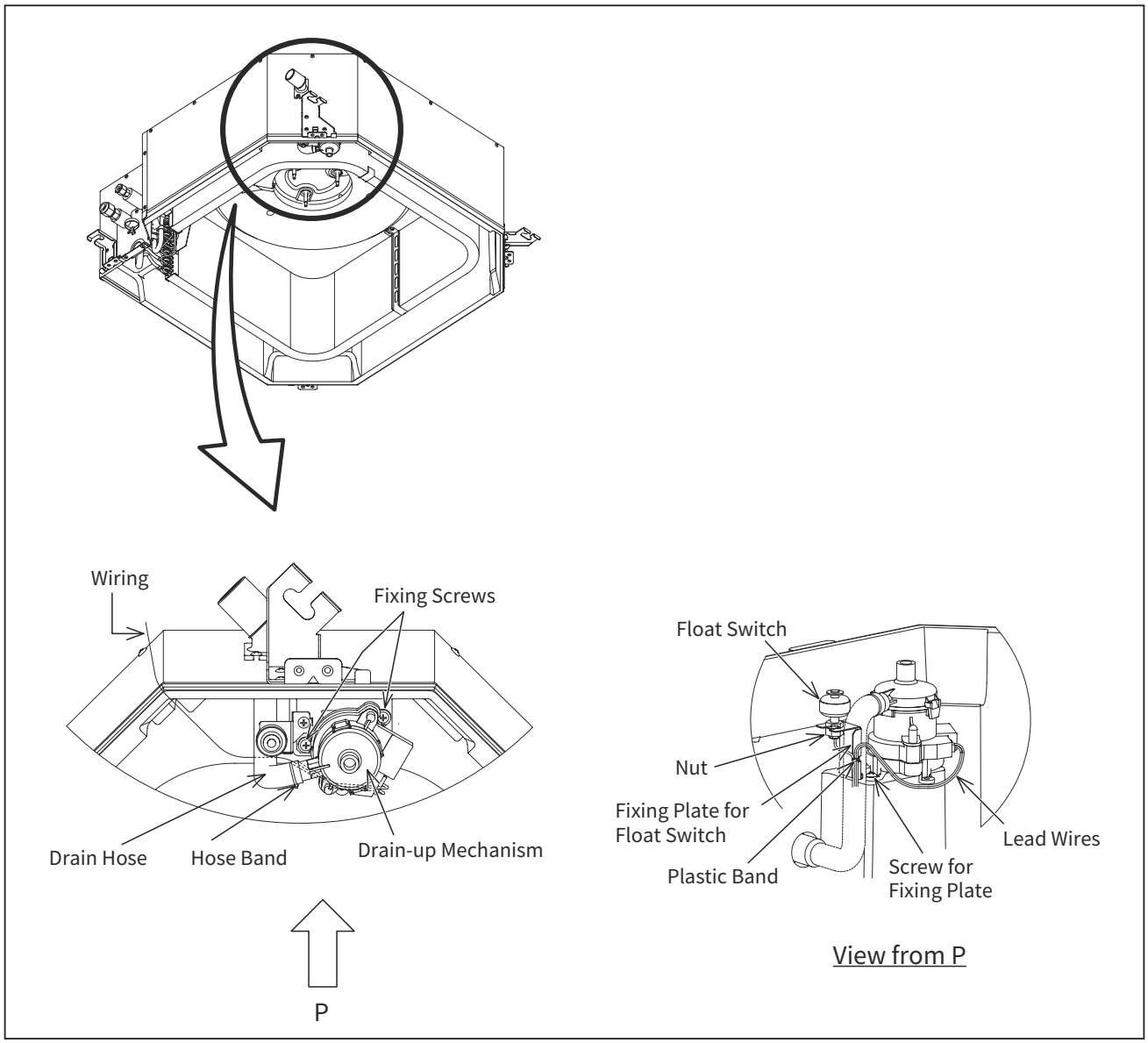
(5) Remove two (2) fixing screws for drain-up mechanism. When removing, hold the drain-up mechanism by hand in order not to fall.

(6) Remove the drain-up mechanism.

< Note for Reassembling >

When reassembling, wrap up the wires for float switch and drain-up mechanism together by the insulation Fix securely them to the original position. When attaching the drain pan again, pay attention not to pull the wires strongly. Otherwise, the insulation attaching at the cabinet may be peeled.

Tool	Phillips Screwdriver, Nipper



⚠ WARNING

- TURN OFF all power source switches.

2.2.8 Removing Float Switch

(1) Remove the drain pan according to the item 2.2.6 “Removing Drain Pan”.

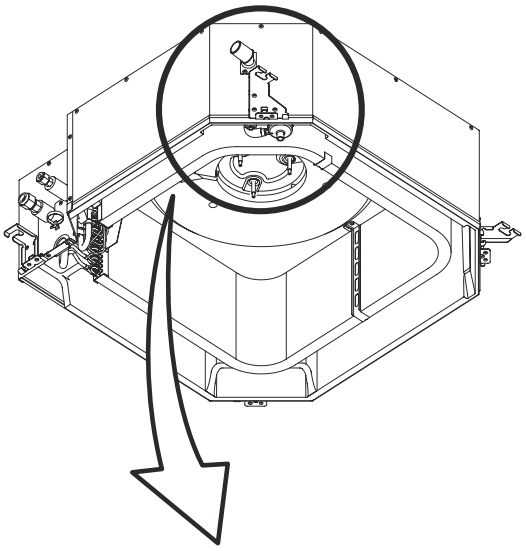
(2) Remove the insulation which attaches the wires for float switch and drain-up mechanism together.

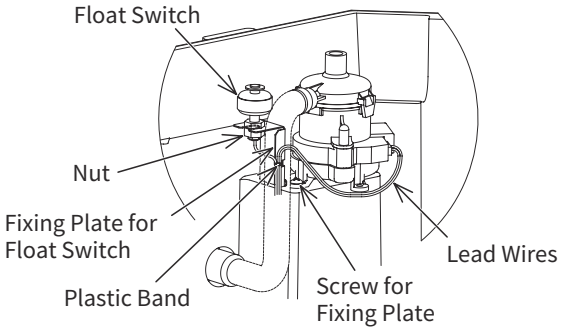
(3) Cut the plastic band fixing the wires at the fixing plate for float switch.

(4) Removing Float Switch
The float switch is attached next to the drain-up mechanism. Remove the float switch by loosening the fixing screw for the fixing base.

< Note for Reassembling >
When reassembling, wrap up the wires for float switch and drain-up mechanism together by the insulation. Fix securely them to the original position. When attaching the drain pan again, pay attention not to pull the wires strongly. Otherwise, the insulation attaching at the cabinet may be peeled.

Tool	Phillips Screwdriver, Nipper





NOTES:

- Pay attention to handle the float switch. If it is dropped to a floor, the malfunction may occur.
- When attaching the float switch, tighten the screw by hand. (Do not use a motor-driven screwdriver.)

(4-Way Cassette Type)

⚠ WARNING

- TURN OFF all power source switches.

2.2.9 Removing Freeze Protection Thermistor for Heat Exchanger

(1) Remove the air panel according to the item 2.2.3 “Removing optional Air Panel”.

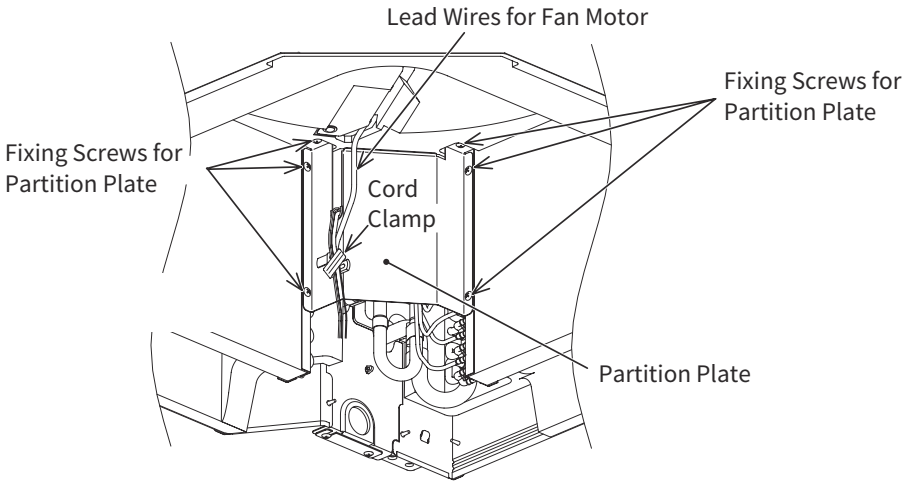
(2) Remove the bell-mouth according to the item 2.2.4 “Removing Turbo Fan and Fan Motor”.

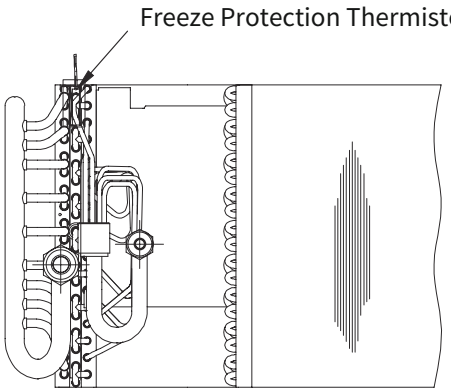
(3) Remove the drain pan according to the item 2.2.6 “Removing Drain Pan”.

(4) Removing Partition Plate

Remove six (6) fixing screws for partition plate. Remove Freeze Protection thermistor from cord clamp on heat exchanger.

Tool	Nipper, Phillips Screwdriver, Bucket (approx. 5 liters content)





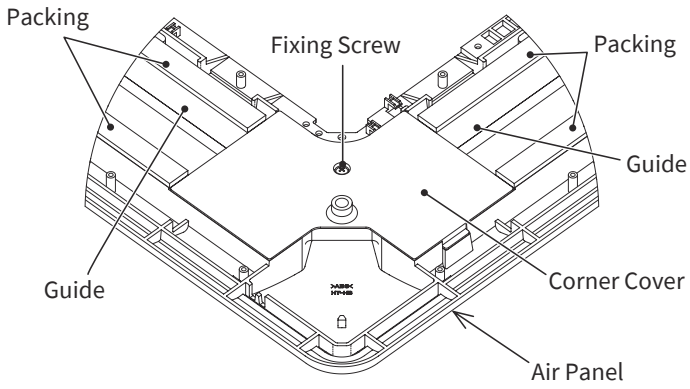
⚠ WARNING

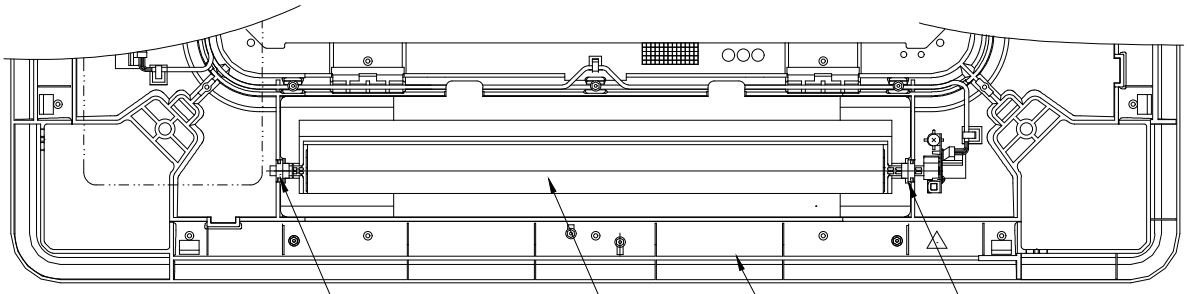
- TURN OFF all power source switches.

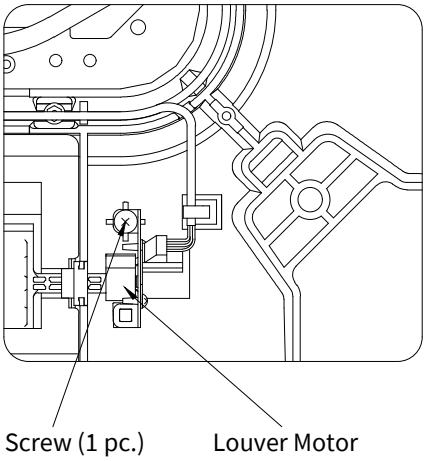
2.2.10 Removing Auto Louver Motors

(1) Remove the air panel according to the item 2.2.3 “Removing Optional Air Panel”.
(2) Remove the fixing screws for each corner cover and remove the corner covers.
(3) Remove the packings and guides.
(4) Remove one (1) fixing screw for each motor from the air panel.
Remove the screw for louver bearing, and pull it out from the air panel. Then, remove the louvers, louver bearings and motors.
(5) Remove the motors from the louvers.
(6) Remove each connector connected to the motors.

Tool	Phillips Screwdriver







(4-Way Cassette Type)

⚠ WARNING

- TURN OFF all power source switches.

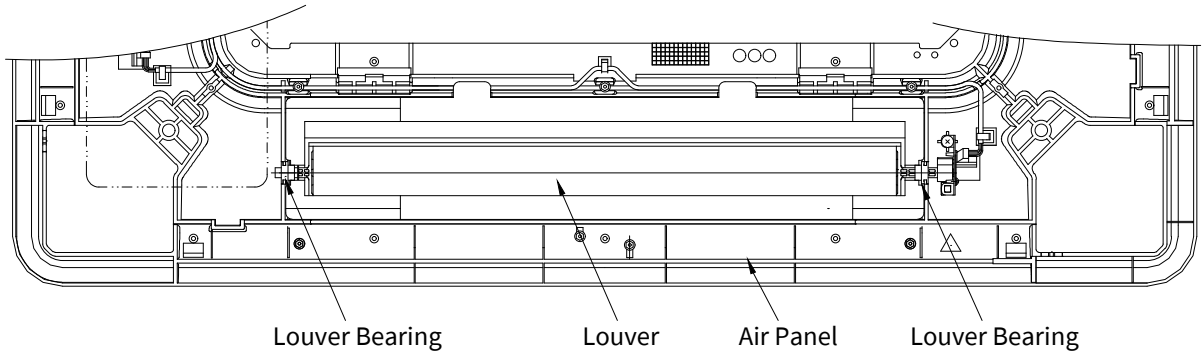
2.2.11 Removing Louver

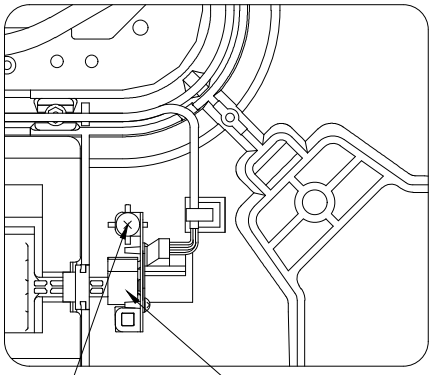
(1) Remove the air panel according to the item 2.2.3 “Removing Optional Air Panel”.

(2) Remove the louver motors according to the item 2.2.10 “Removing Auto Louver Motors”.

(3) Remove the louver.

Tool	Phillips Screwdriver





2.3 Ceiling Suspended Type

⚠ WARNING

- TURN OFF all power source switches.

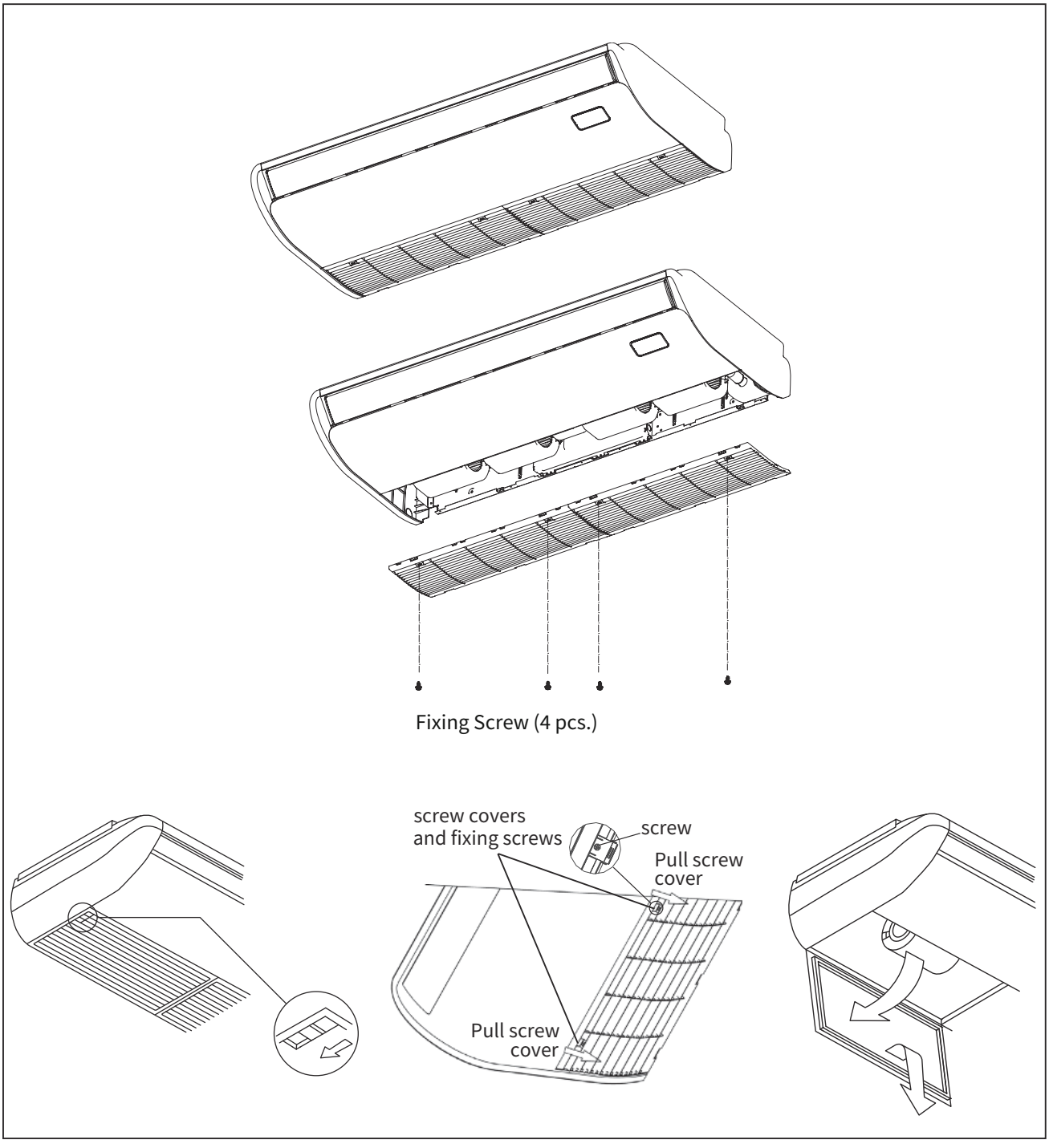
2.3.1 Removing Air Filter

⚠ CAUTION

- Do not operate the system without the air filter to protect the indoor unit heat exchanger against being clogged.
- TURN OFF the main power switch before taking out the filter. (The previous operation mode may appear.)

Open the air inlet grille after removing four screw covers and fixing screws.

Tool	Phillips Screwdriver



(Ceiling Suspended Type)

⚠ WARNING

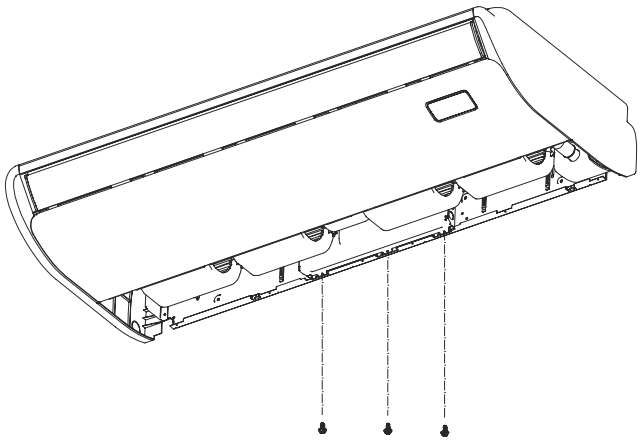
- TURN OFF all power source switches.

2.3.2 Removing Electrical Box Cover

Based on 2.3.1 operation.

Open the electrical box after removing three fixing screws and electrical box cover.

Tool	Phillips Screwdriver



Fixing Screw (3 pcs.)

⚠ WARNING

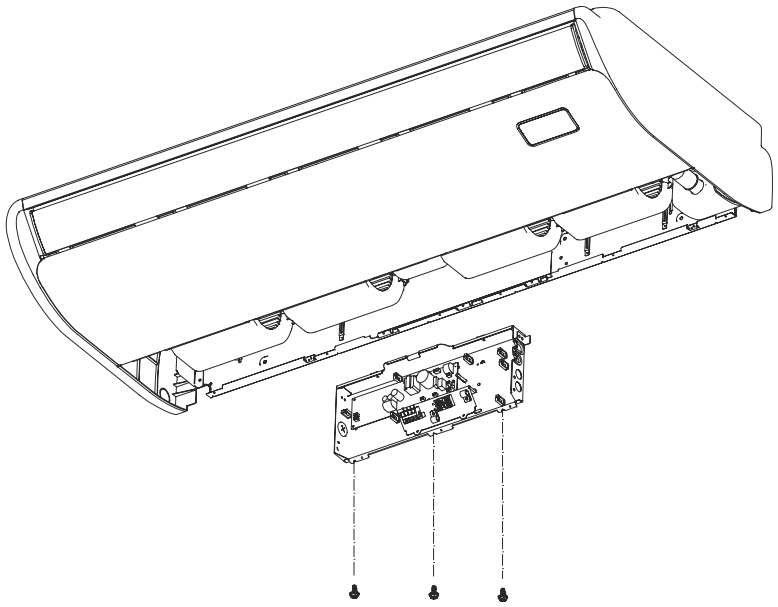
- TURN OFF all power source switches.

2.3.3 Removing Electrical Box

Based on 2.3.1, 2.3.2 operation.

Remove electrical wiring connection, and then take out electrical box after removing three fixing screws.

Tool	Phillips Screwdriver



Fixing Screw (3 pcs.)

(Ceiling Suspended Type)

⚠ WARNING

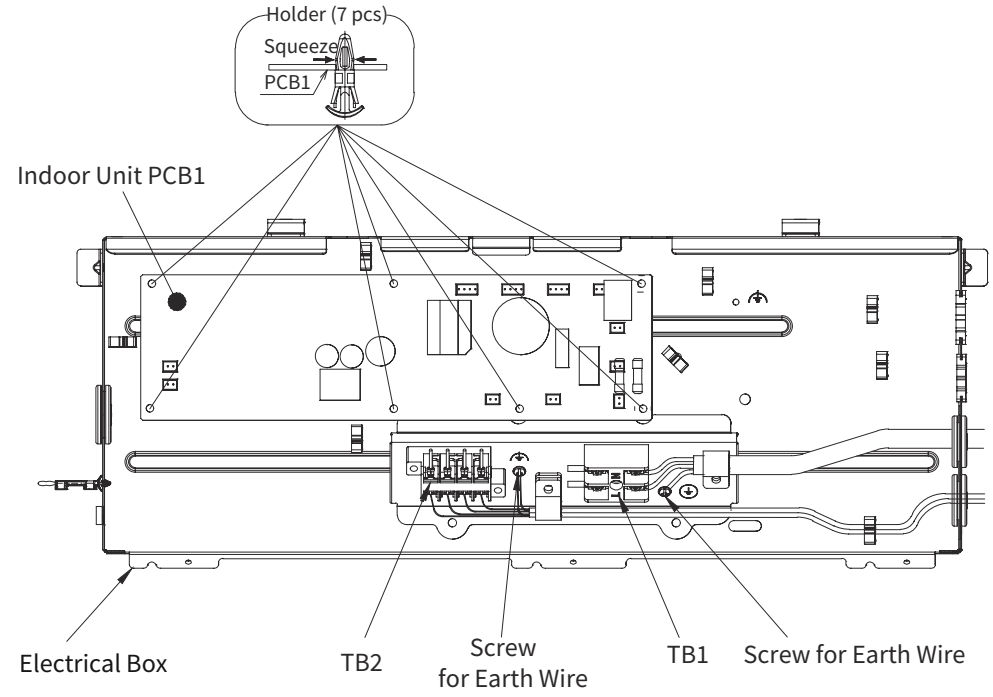
- TURN OFF all power source switches.

2.3.4 Removing Printed Circuit Board (PCB1)

Based on 2.3.1, 2.3.2, 2.3.3 operation.

Remove printed circuit board (PCB1) by removing seven holders.

Tool	Phillips Screwdriver



⚠ WARNING

- TURN OFF all power source switches.

2.3.5 Removing Fan Motor

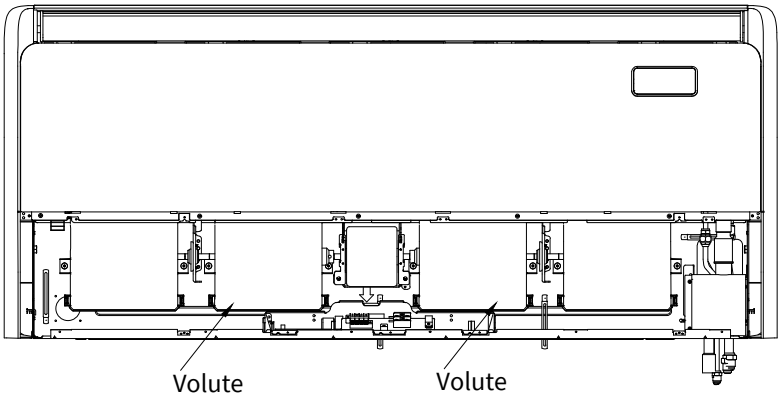
Based on 2.3.1, 2.3.2 operation.

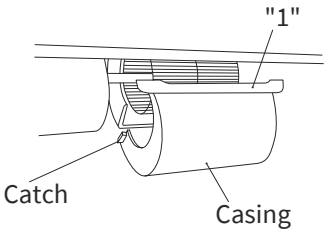
(1) Removing two volutes by pushing holders.

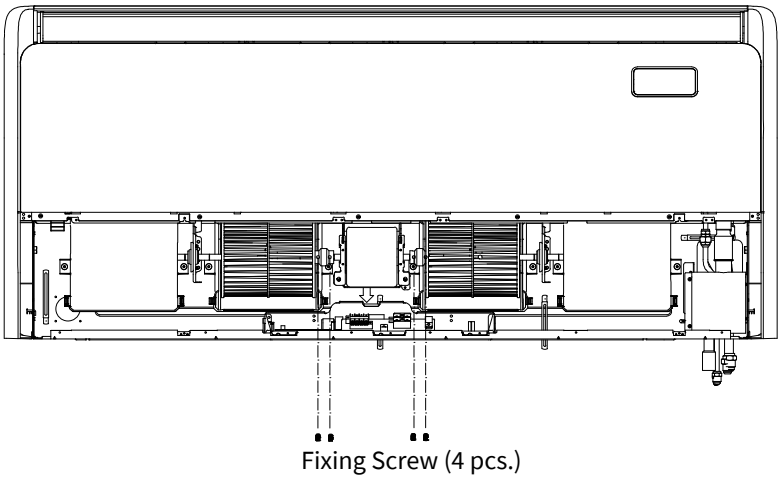
(2) Removing flexible coupling from motor by removing fixing screws.

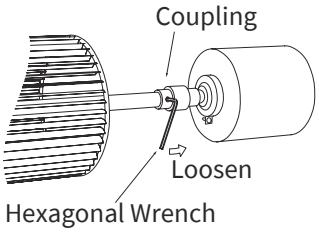
(3) Removing fan motor by removing two screws and motor fixing band.

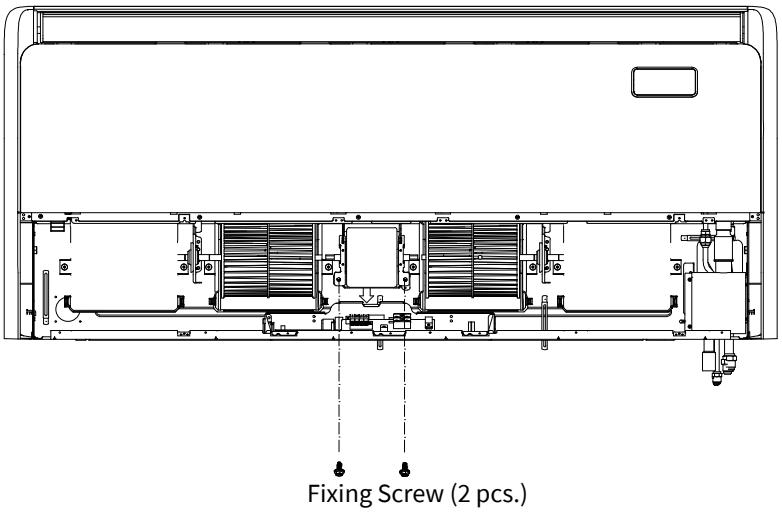
Tool	Phillips Screwdriver

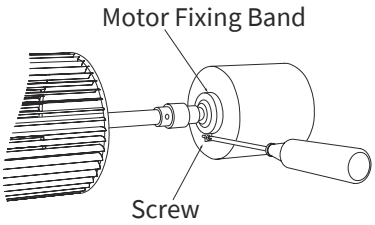












(Ceiling Suspended Type)

⚠ WARNING

- TURN OFF all power source switches.

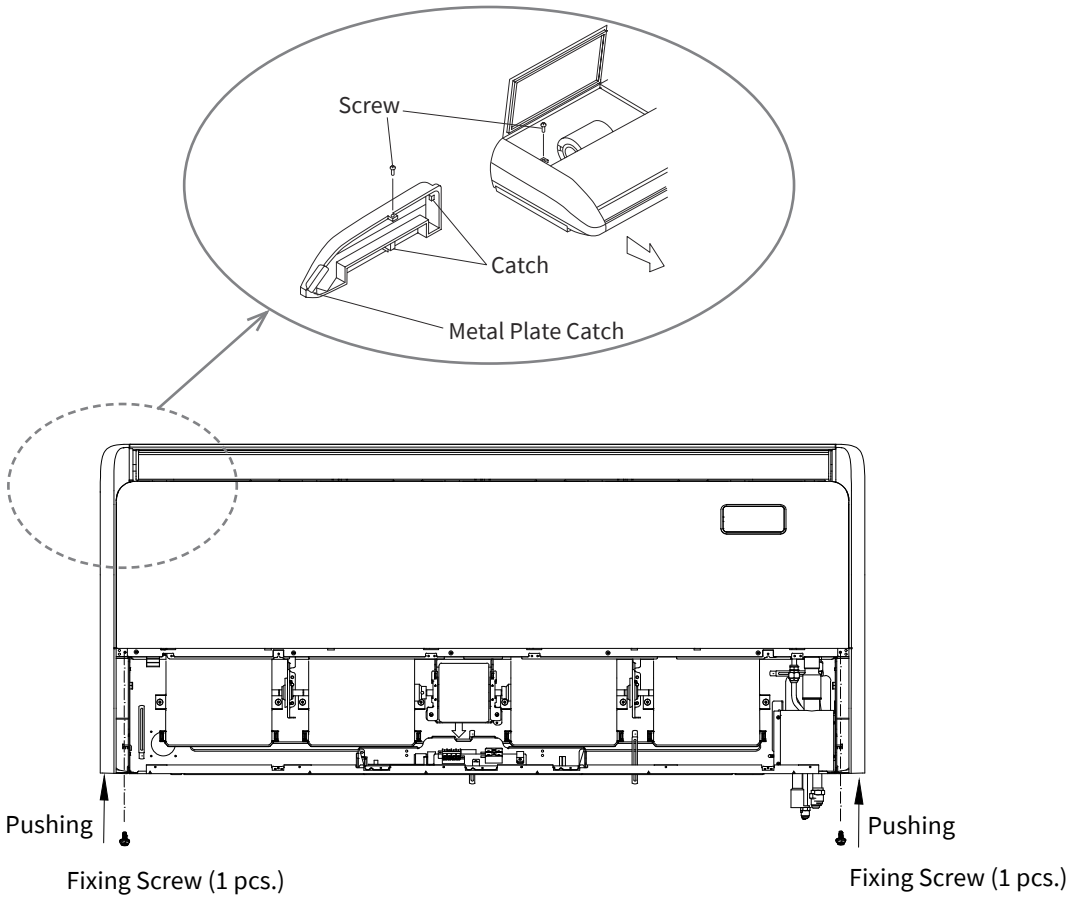
2.3.6 Removing Left & Right-Side Cover

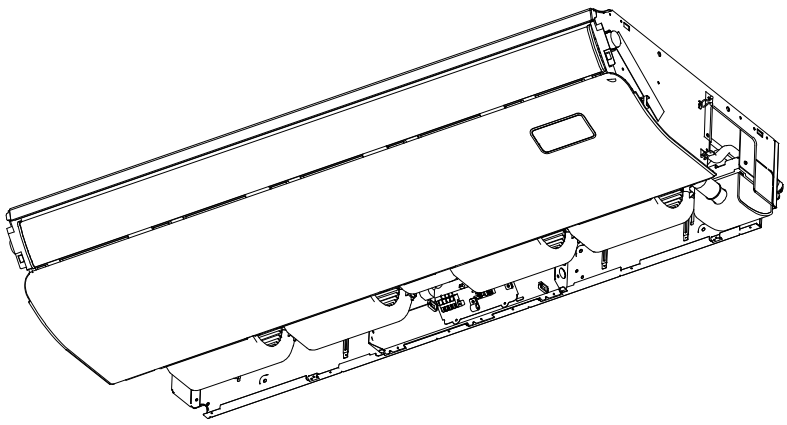
Based on 2.3.1, 2.3.2 operation.

(1) Remove fixing screw from Left-Side Cover and remove the Left-Side Cover by pushing side face.

(2) Remove fixing screw from Right-Side Cover and remove the Right-Side Cover by pushing side face.

Tool	Phillips Screwdriver





⚠ WARNING

- TURN OFF all power source switches.

2.3.7 Removing Optional Drain Pump

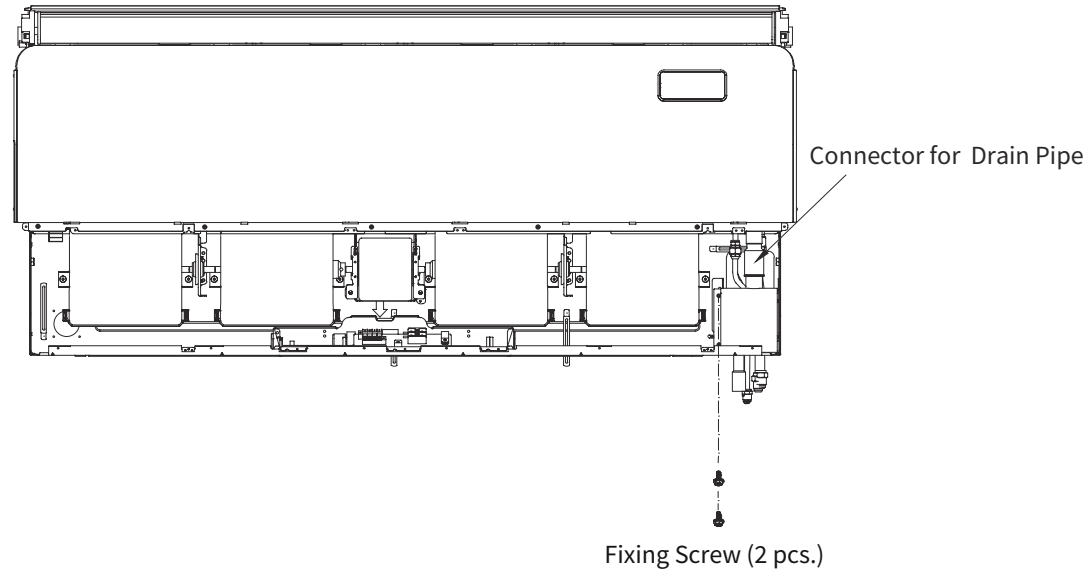
Based on 2.3.1, 2.3.2, 2.3.6 operation.

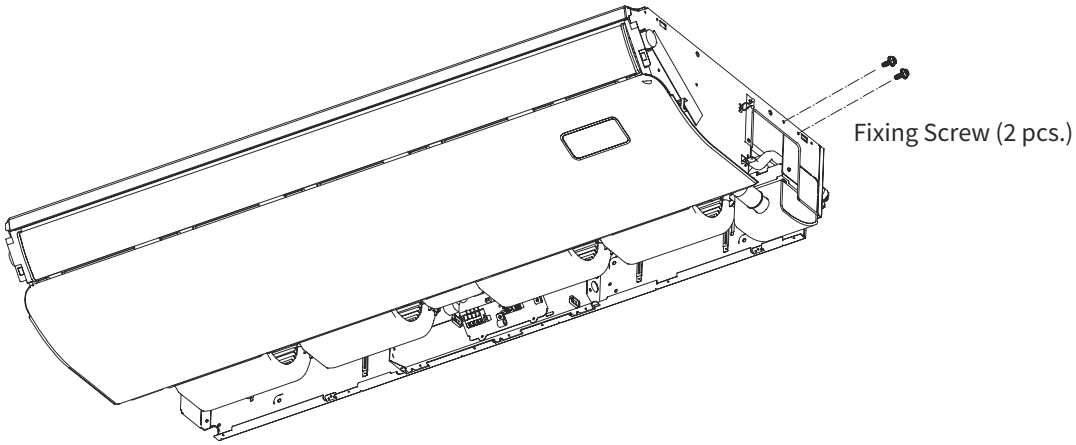
(1) Remove two fixing screws from side face.

(2) Remove two fixing screws in optional drain pump supporter.

(3) Remove optional drain pump by removing the connector between pump and pipe.

Tool	Phillips Screwdriver





(Ceiling Suspended Type)

⚠ WARNING

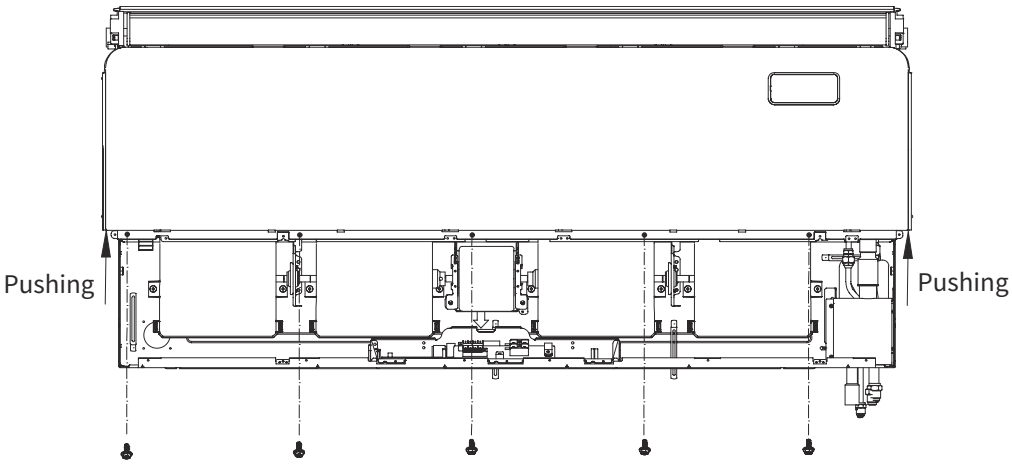
- TURN OFF all power source switches.

2.3.8 Removing Front Panel

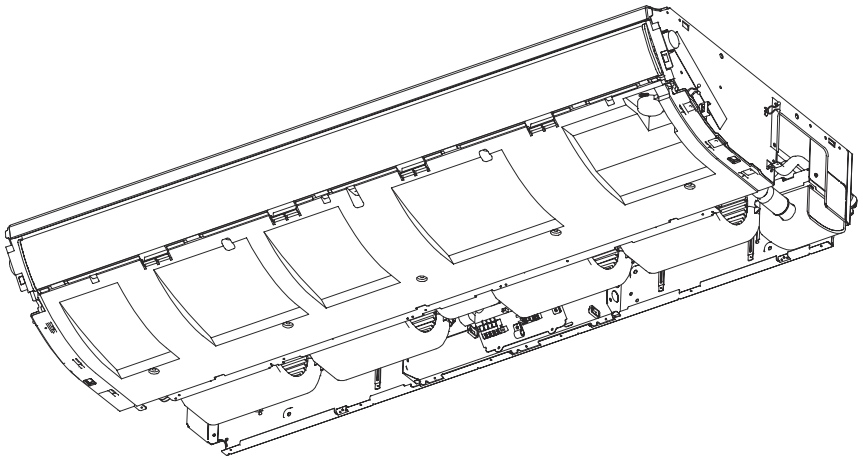
Based on 2.3.1, 2.3.2, 2.3.6 operation.

Remove fixing screws from front and remove the front panel by pushing side face.

Tool	Phillips Screwdriver



Fixing Screw (5 pcs.)



⚠ WARNING

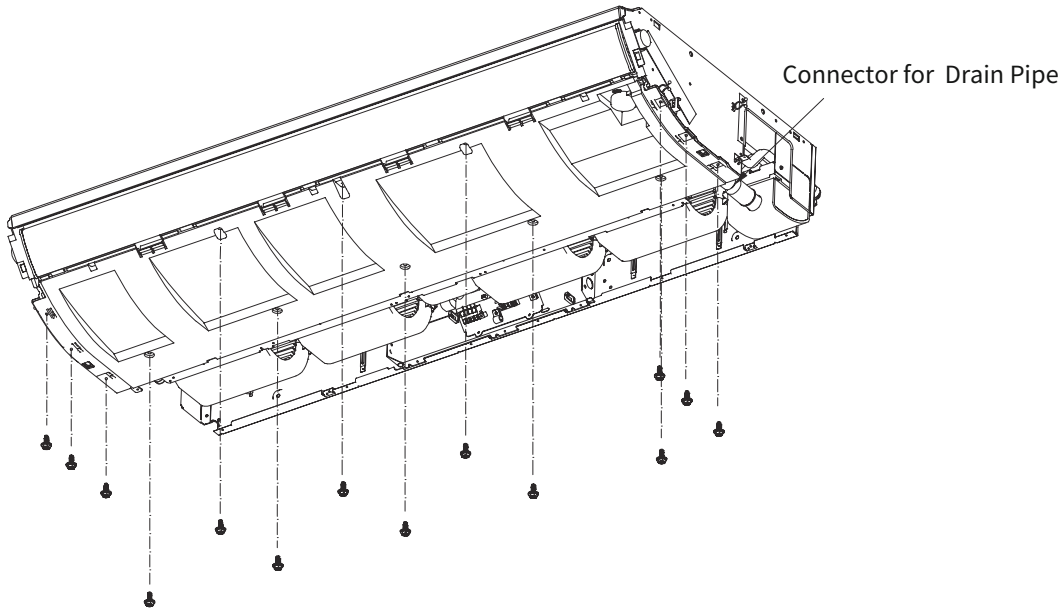
- TURN OFF all power source switches.

2.3.9 Removing Drain Pan

Based on 2.3.1, 2.3.2, 2.3.6, 2.3.8 operation.

(1) Remove fourteen fixing screws from drain pan.
(2) Remove the connector between drain pan and pipe.
(3) Remove drain pan from unit.

Tool	Phillips Screwdriver



Fixing Screw (14 pcs.)

SERVICING

(Ceiling Suspended Type)

⚠ WARNING

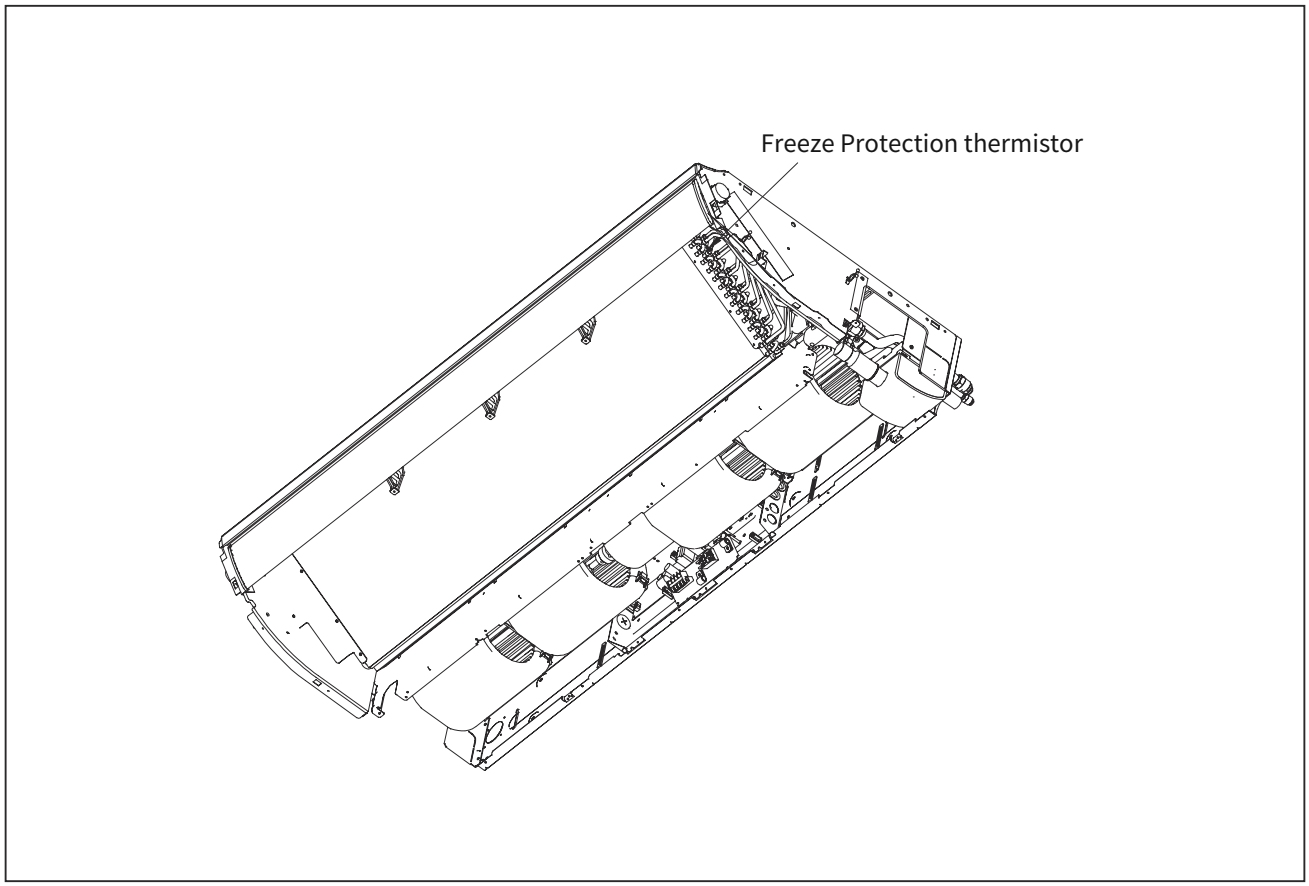
- TURN OFF all power source switches.

2.3.10 Removing Freeze Protection thermistor

Based on 2.3.1, 2.3.2, 2.3.6, 2.3.8, 2.3.9 operation.

(1) Remove freeze protection thermistor from pipe.
(2) Remove freeze protection thermistor wiring.
(3) Remove freeze protection thermistor from unit.

Tool	Phillips Screwdriver



⚠ WARNING

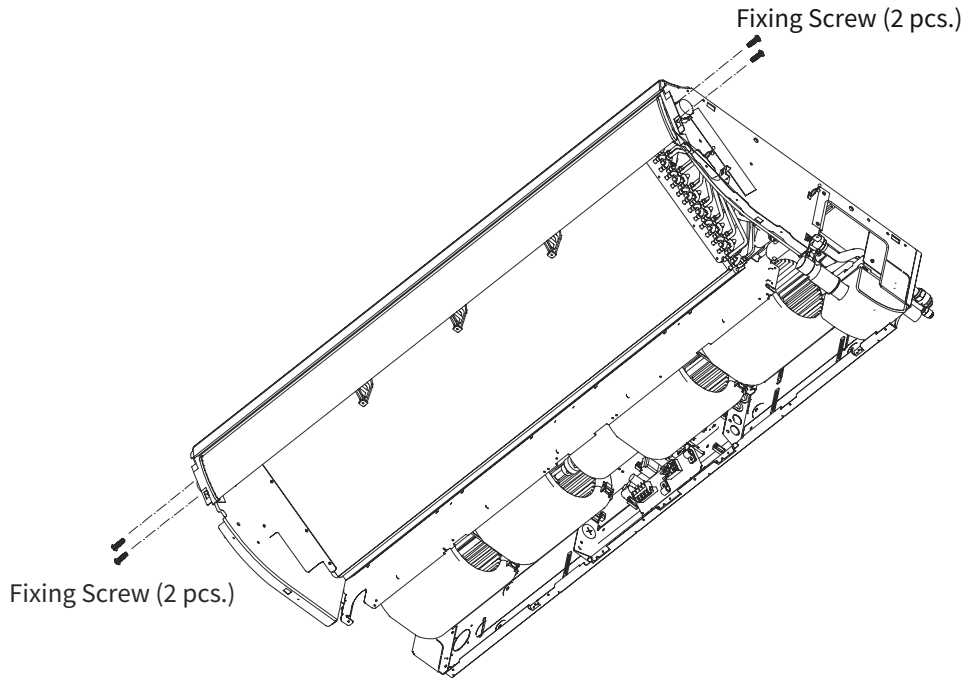
- TURN OFF all power source switches.

2.3.11 Removing Louvers Motor

Based on 2.3.1, 2.3.2, 2.3.6, 2.3.8, 2.3.9 operation.

(1) Remove fixing screws from louvers motor.
(2) Remove louvers motor wiring.
(3) Remove louvers motor from unit.

Tool	Phillips Screwdriver



2.4 4-Way Mini Cassette Type

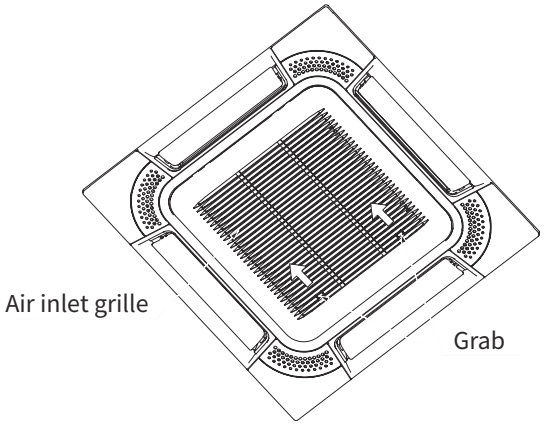
⚠ WARNING

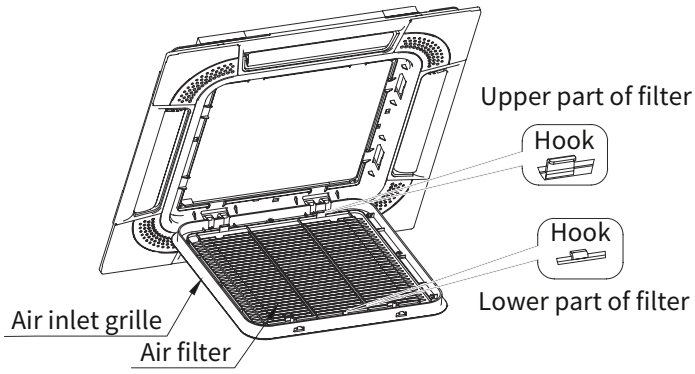
- TURN OFF all power source switches.

2.4.1 Removing Air Filter and Air Inlet Grille

(1) The air filter is attached inside the air inlet grille. While pushing both ends of knobs at the air inlet grille toward the arrow direction, open the air inlet grille.

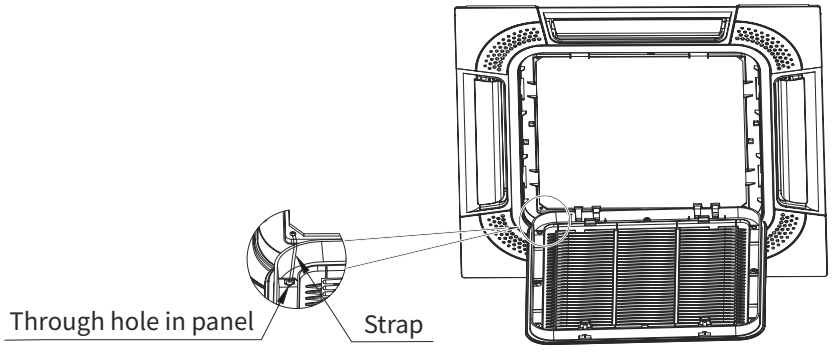
(2) Hold the lower side of the air inlet grille keeping it inclined.
Remove the hooks of air filter from the air inlet grille and remove the air filter.





(3) Remove the supporting string from the air panel.
After lifting the air inlet grille keeping it inclined, draw the air inlet grille forward to remove.

(4) When attaching the air inlet grille, the supporting string shall be attached to the air panel.



⚠ WARNING

- TURN OFF all power source switches.

⚠ CAUTION

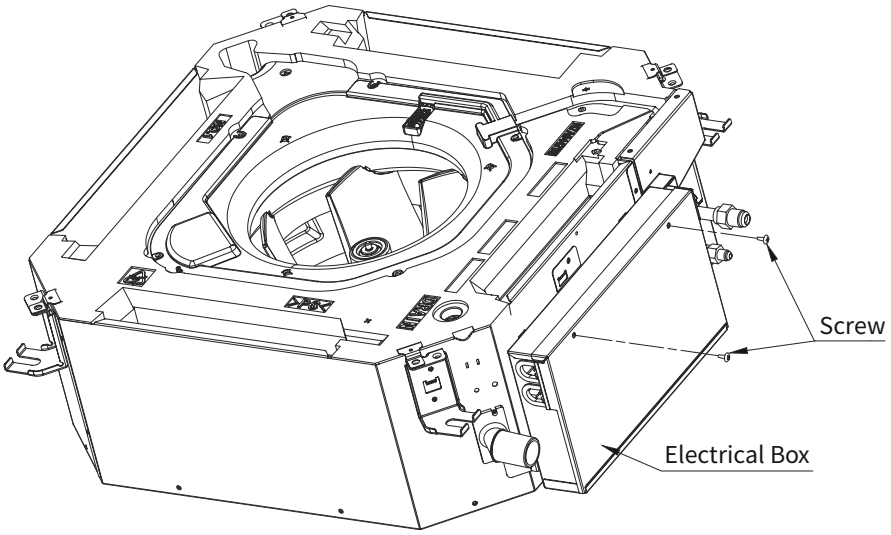
- Pay attention not to fall the electrical box cover.

2.4.2 Removing Electrical Box Cover

(1) The electrical box appears when opening the air inlet grille. Remove the fixing screw for electrical box cover and open the electrical box.

(2) The electrical box cover can hook onto the electrical box during the maintenance.

Tool	Phillips Screwdriver



(4-Way Mini Cassette Type)

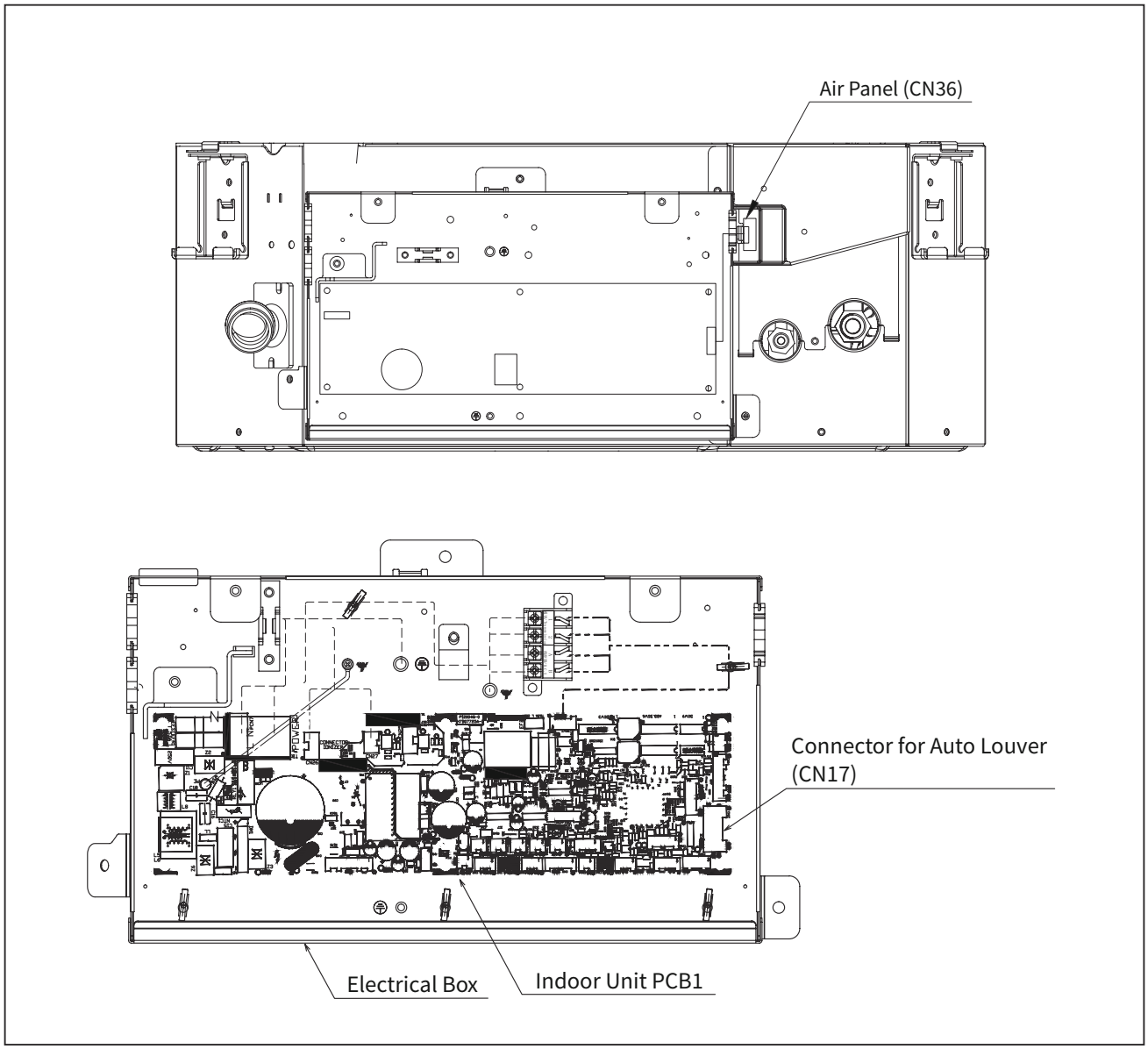
⚠ WARNING

- TURN OFF all power source switches.

2.4.3 Removing Optional Air Panel

(1) Open the air inlet grille. Remove the connector (CN36) at the air panel from the connector for auto louver (CN17) on the indoor unit PCB1.

Tool	Phillips Screwdriver, Screwdriver

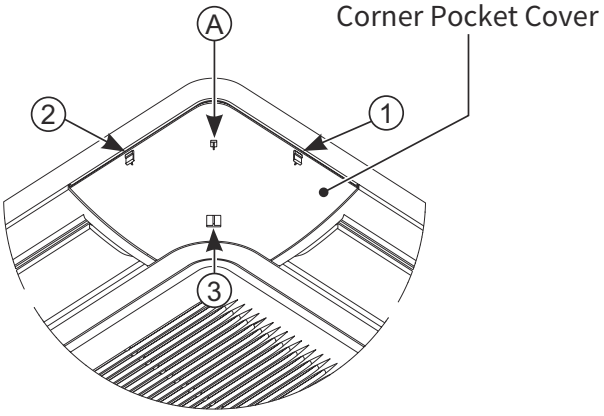


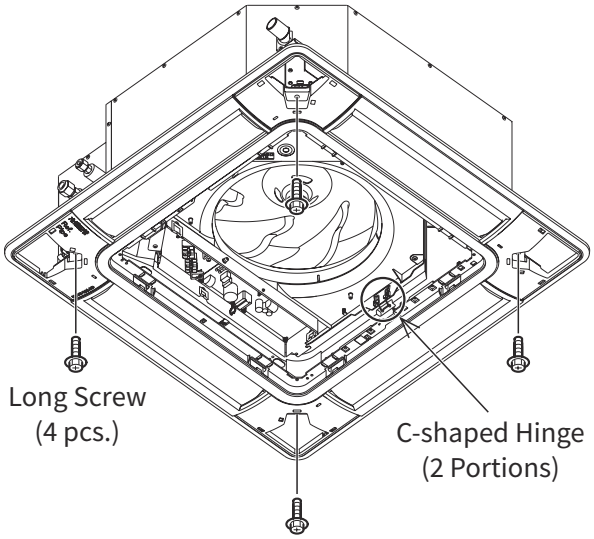
(2) Remove the air inlet grille from the air panel.

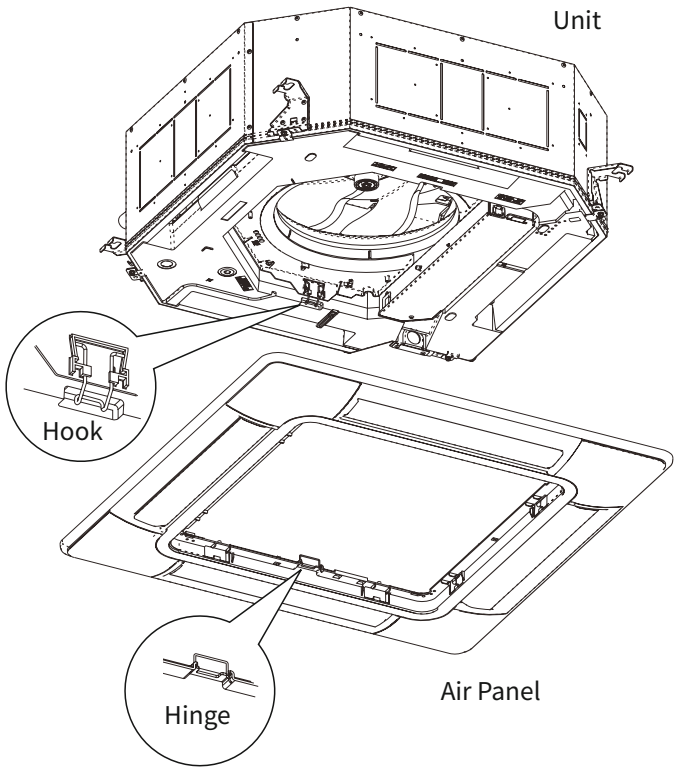
(3) Remove four (4) corner pocket covers from the air panel. They can be removed pulling "Ⓐ" part toward the arrow direction in the figure below.

* To attach the corner pocket covers again, insert the fixing hooks (① and ②) to the air panel and insert the fixing hook (③) to the air panel.

(4) Remove four (4) long screws from the air panel. Remove them with attention to temporally hook hinges of air panel (2 portions) onto hooks of unit (2 portions). Then, remove the air panel after unhooking two (2) hinges from the two (2) hooks.







(4-Way Mini Cassette Type)

⚠ WARNING

- TURN OFF all power source switches.

2.4.4 Removing Turbo Fan and Fan Motor

(1) Remove the air inlet grille and the electrical box cover according to the item 2.4.1 “Removing Air Filter and Air Inlet Grille“ and the item 2.4.2 “Removing Electrical Box Cover“.

(2) Moving Electrical Box

(a) Remove the drain pump motor connector(CN36), the float switch(CN14), the pipe thermistor(THM3) and the fan motor connector(CN1) from indoor unit PCB1.

(b) Remove the fixing screws for electrical box and hang the electrical box from the unit.

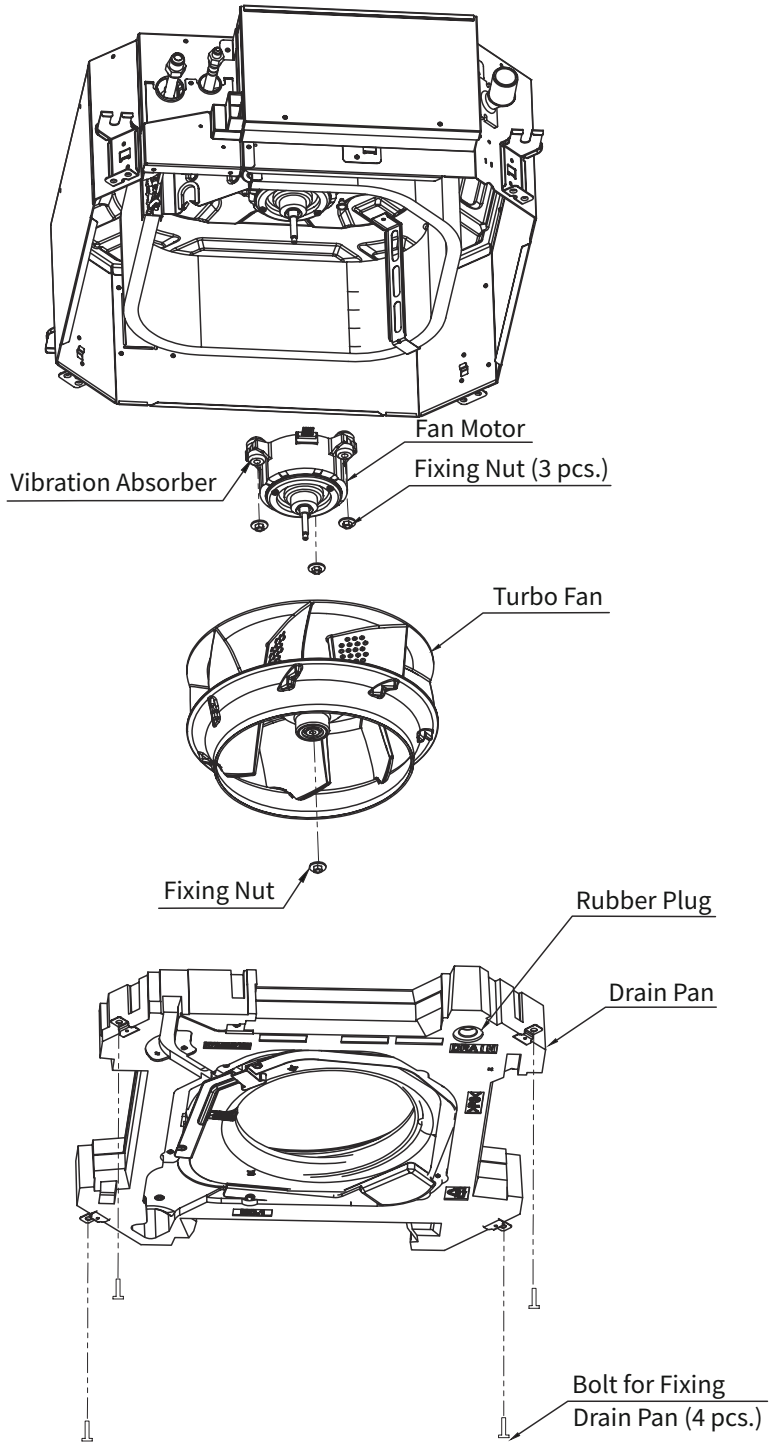
(3) Removing Bell-Mouth
Remove three (3) fixing screws for bell-mouth fixed to the drain pan, and remove the bell-mouth.

(4) Removing Turbo Fan and Fan Motor
Remove the turbo fan after the fixing nut for the turbo fan is removed. Remove the fan motor after three (3) fixing nuts for the fan motor are removed. (When reassembling, the tightening torque for nuts shall be approximately 8N•m.)

< Notes for Reassembling >
When reassembling, temporally fix the fixing screws, and align the center of turbo fan and bell-mouth to match. Tighten securely after keeping the clearance between the turbo fan and the bell-mouth evenly. In addition, securely fix lead wires for fan motor, 2 pipe thermistors and expansion valve by the cord clamp attaching at the partition plate.
(Refer to the item 2.4.10 “Removing Auto Louver Motors”.)

⚠ WARNING

- TURN OFF all power source switches.



(4-Way Mini Cassette Type)

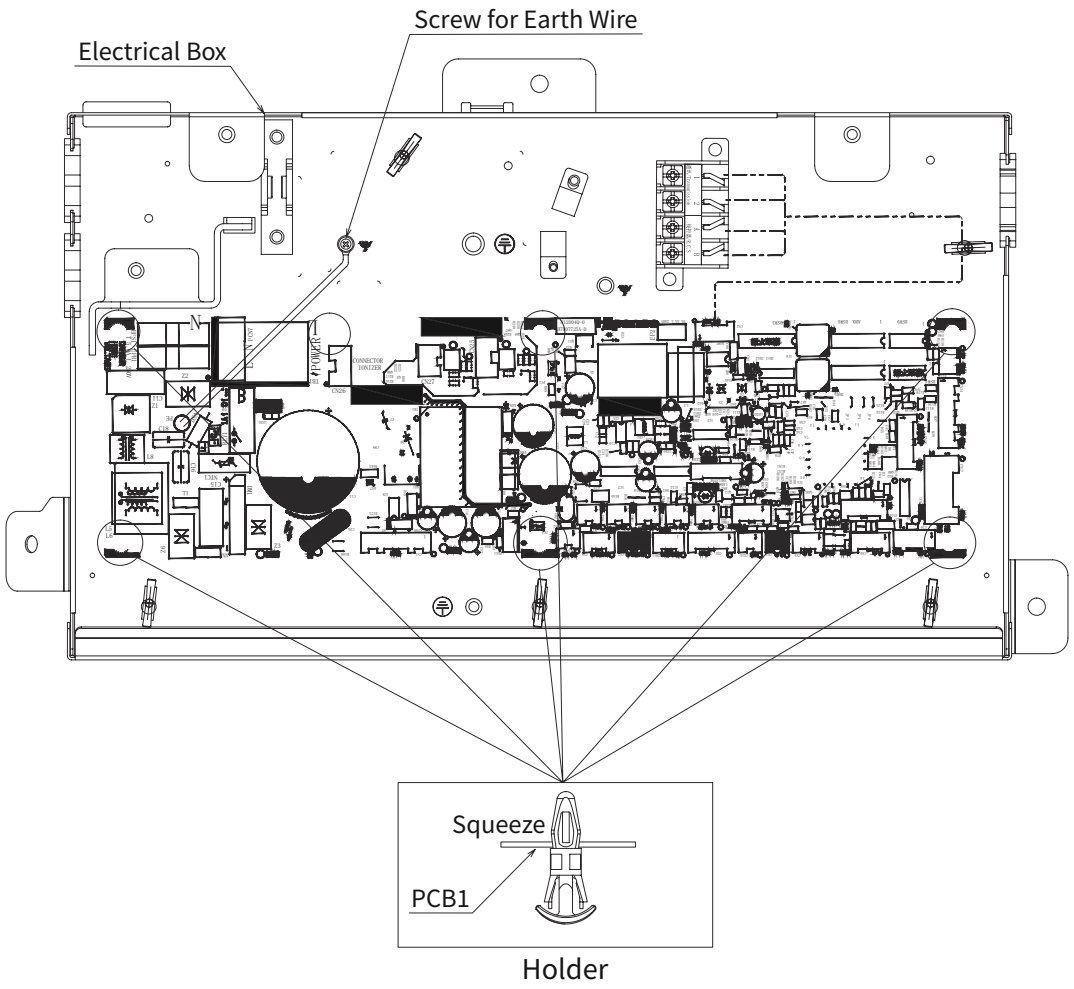
⚠ WARNING

- TURN OFF all power source switches.

2.4.5 Removing Printed Circuit Board (PCB1)

(1) Remove the air inlet grille according to the item 2.4.1 “Removing Air Filter and Air Inlet Grille”.
(2) Remove the electrical box according to the item 2.4.2 “Removing Electrical Box Cover“.
(3) Disconnect all wiring connectors from PCB1.
(4) Remove the screw for earth wire.
(5) The PCB1 is fixed by seven(7) holders. Squeeze holders and draw PCB1 out as figure shown below.

Tool	Phillips Screwdriver



NOTES:

1. Do not touch electrical parts on PCB1.
2. Pay attention not to apply an excessive force to PCB1. It may cause failure of PCB1.
3. When reassembling, attach connectors to the correct position. If not, the PCB1 may be damaged. In addition, securely attach the screw for earth wire.

⚠ WARNING

- TURN OFF all power source switches.

2.4.6 Removing Drain Pan

(1) Remove the air panel according to the item 2.4.3 “Removing Optional Air Panel”.

(2) Remove the electrical box cover according to the item 2.4.2 “Removing Electrical Box Cover“. Disconnect connectors of air outlet thermistor, 2 pipe thermistors (gas and liquid), the expansion valve, the drain pump, the float switch and the fan motor.

(3) Remove the electrical box and the bell-mouth according to the item 2.4.4 “Removing Turbo Fan and Fan Motor”.

(4) Draining Drain Water
Pull out the rubber plug from the drain pan, and drain the water remaining in the drain pan.
Although the silicon sealant is applied around the rubber plug, the rubber plug can be removed cutting the silicon sealant by a cutter. (Pay attention not to damage the rubber plug by a cutter.)
In addition, check the clogging at the drain hole.

(5) Removing Drain Pan
Remove four (4) bolts fixing the drain pan. Remove the drain pan.

< Note for Attachment >
When attaching the rubber plug again, push in it into the drain hole by using Phillips Screwdriver, etc. after the rubber plug is wet by water. Seal the rubber plug after the silicone sealant is applied around the flange part of rubber plug.

(4-Way Mini Cassette Type)

⚠ WARNING

- TURN OFF all power source switches.

2.4.7 Removing Drain-Up Mechanism

(1) Remove the drain pan according to the item 2.4.6 “Removing Drain Pan”.

(2) Remove the insulation which attaches the wires for float switch and drain-up mechanism together.

(3) Cut the plastic band fixing the wires at the fixing plate for float switch.

(4) Cut the hose band for drain hose by nipper, and remove the drain hose from the drain-up mechanism.

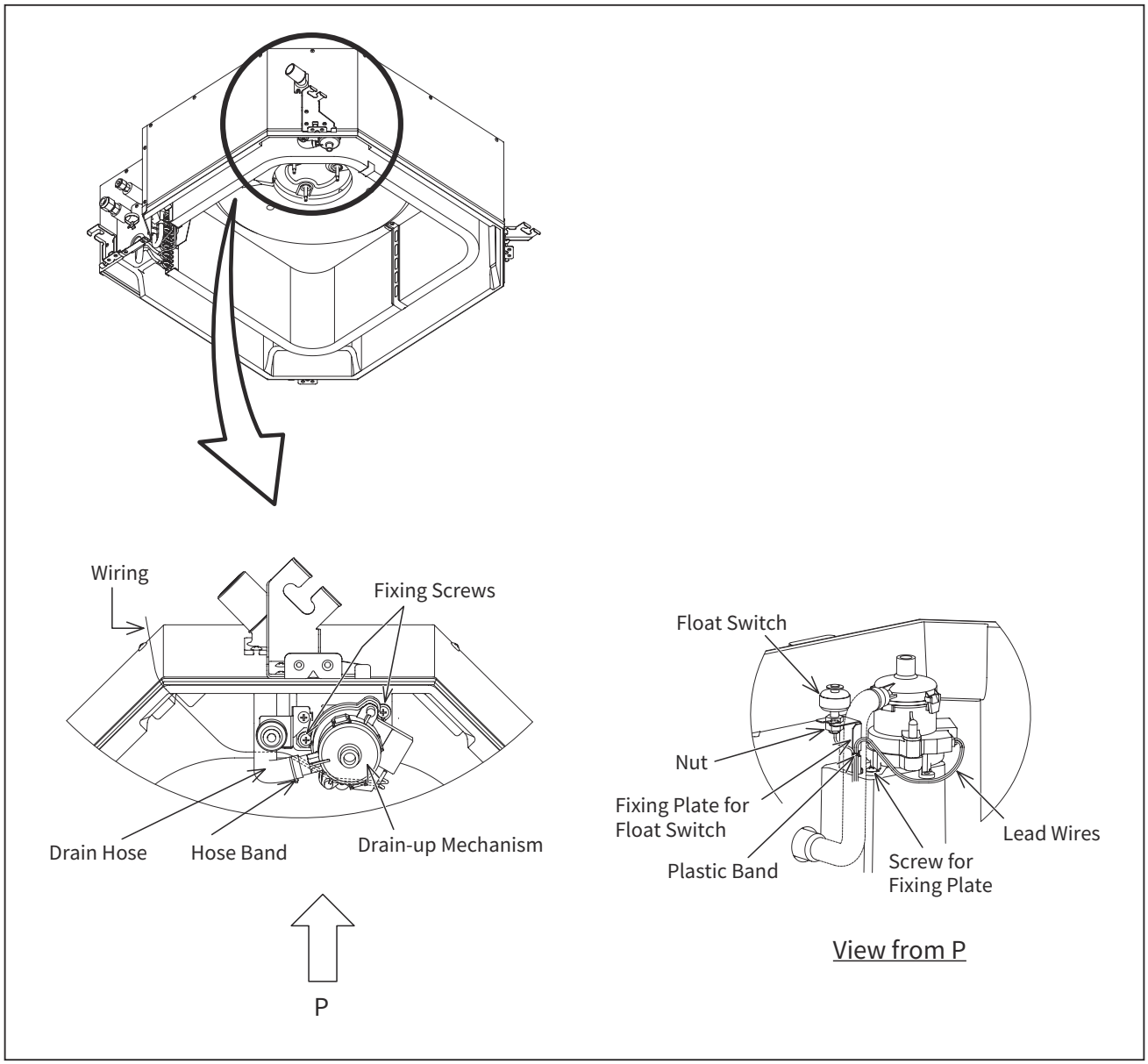
(5) Remove two (2) fixing screws for drain-up mechanism. When removing, hold the drain-up mechanism by hand in order not to fall.

(6) Remove the drain-up mechanism.

< Note for Reassembling >

When reassembling, wrap up the wires for float switch and drain-up mechanism together by the insulation Fix securely them to the original position. When attaching the drain pan again, pay attention not to pull the wires strongly. Otherwise, the insulation attaching at the cabinet may be peeled.

Tool	Phillips Screwdriver, Nipper



⚠ WARNING

- TURN OFF all power source switches.

2.4.8 Removing Float Switch

(1) Remove the drain pan according to the item 2.4.6 “Removing Drain Pan”.

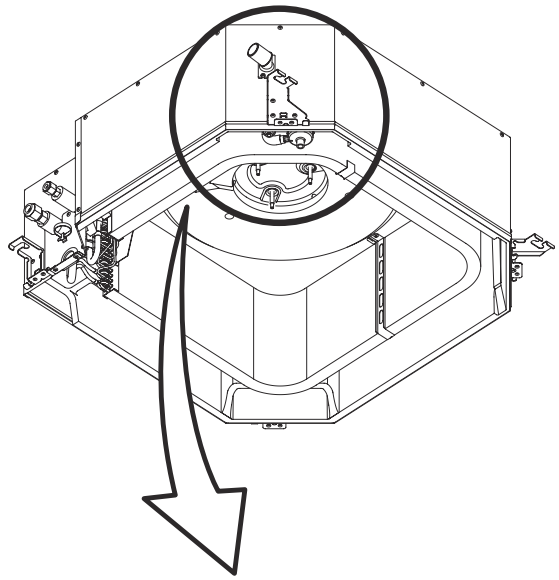
(2) Remove the insulation which attaches the wires for float switch and drain-up mechanism together.

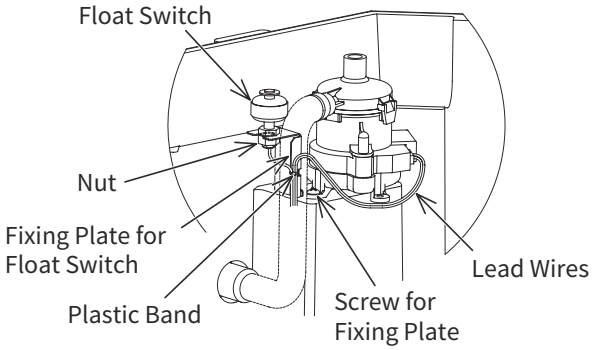
(3) Cut the plastic band fixing the wires at the fixing plate for float switch.

(4) Removing Float Switch
The float switch is attached next to the drain-up mechanism. Remove the float switch by loosening the fixing screw for the fixing base.

< Note for Reassembling >
When reassembling, wrap up the wires for float switch and drain-up mechanism together by the insulation. Fix securely them to the original position. When attaching the drain pan again, pay attention not to pull the wires strongly. Otherwise, the insulation attaching at the cabinet may be peeled.

Tool	Phillips Screwdriver, Nipper





NOTES:
- Pay attention to handle the float switch. If it is dropped to a floor, the malfunction may occur.
- When attaching the float switch, tighten the screw by hand. (Do not use a motor-driven screwdriver.)

(4-Way Mini Cassette Type)

⚠ WARNING

- TURN OFF all power source switches.

2.4.9 Removing Freeze Protection Thermistor for Heat Exchanger

(1) Remove the air panel according to the item 2.4.3 “Removing optional Air Panel”.

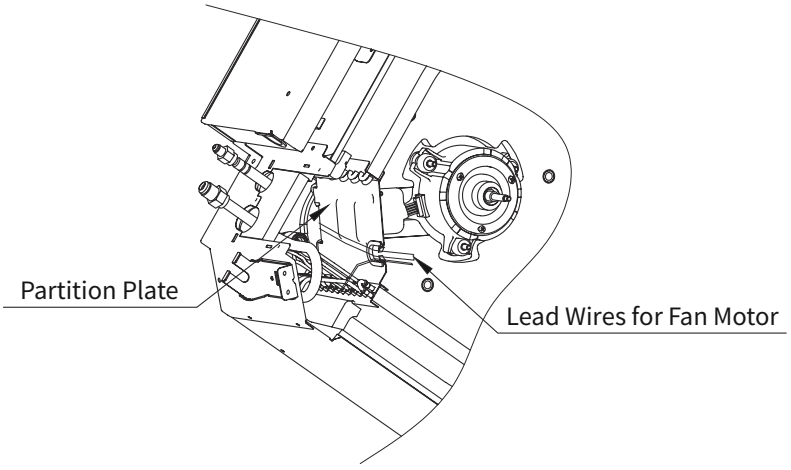
(2) Remove the bell-mouth according to the item 2.4.4 “Removing Turbo Fan and Fan Motor”.

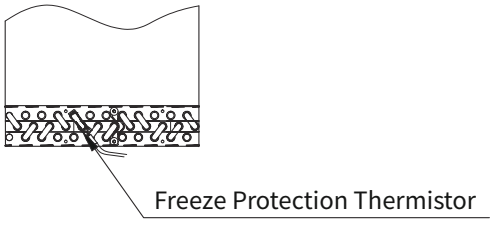
(3) Remove the drain pan according to the item 2.4.6 “Removing Drain Pan”.

(4) Removing Partition Plate

Remove six (6) fixing screws for partition plate. Remove Freeze Protection thermistor from cord clamp on heat exchanger.

Tool	Nipper, Phillips Screwdriver, Bucket (approx. 5 liters content)





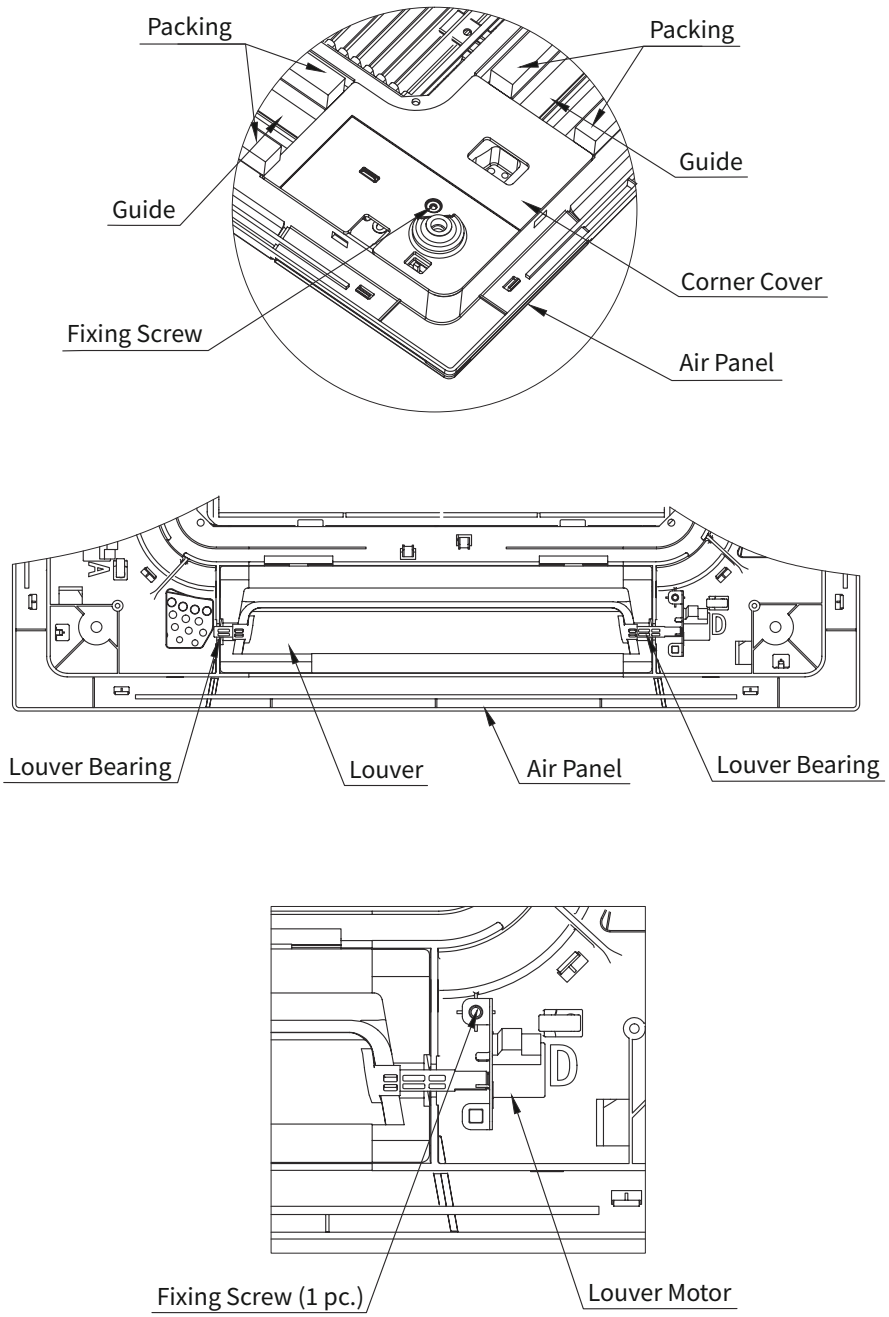
⚠ WARNING

- TURN OFF all power source switches.

2.4.10 Removing Auto Louver Motors

(1) Remove the air panel according to the item 2.4.3 “Removing Optional Air Panel”.
(2) Remove the fixing screws for each corner cover and remove the corner covers.
(3) Remove the packings and guides.
(4) Remove one (1) fixing screw for each motor from the air panel.
Remove the screw for louver bearing, and pull it out from the air panel. Then, remove the louvers, louver bearings and motors.
(5) Remove the motors from the louvers.
(6) Remove each connector connected to the motors.

Tool	Phillips Screwdriver



(4-Way Mini Cassette Type)

⚠ WARNING

- TURN OFF all power source switches.

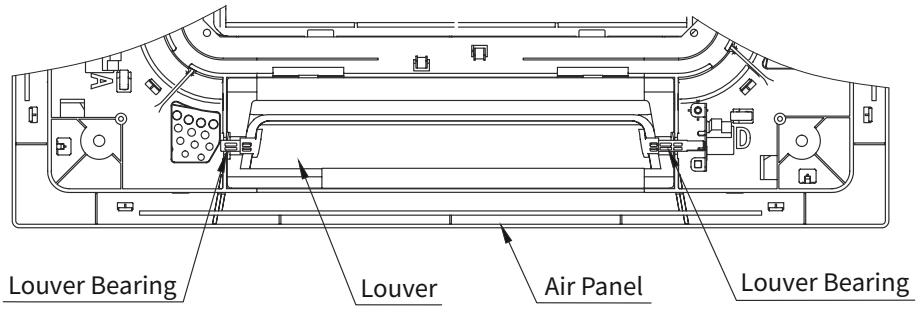
2.4.11 Removing Louver

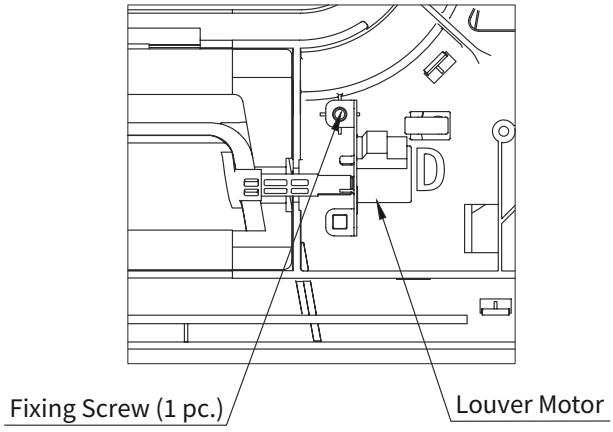
(1) Remove the air panel according to the item 2.4.3 “Removing Optional Air Panel”.

(2) Remove the louver motors according to the item 2.4.10 “Removing Auto Louver Motors”.

(3) Remove the louver.

Tool	Phillips Screwdriver





2.5 High-wall Type

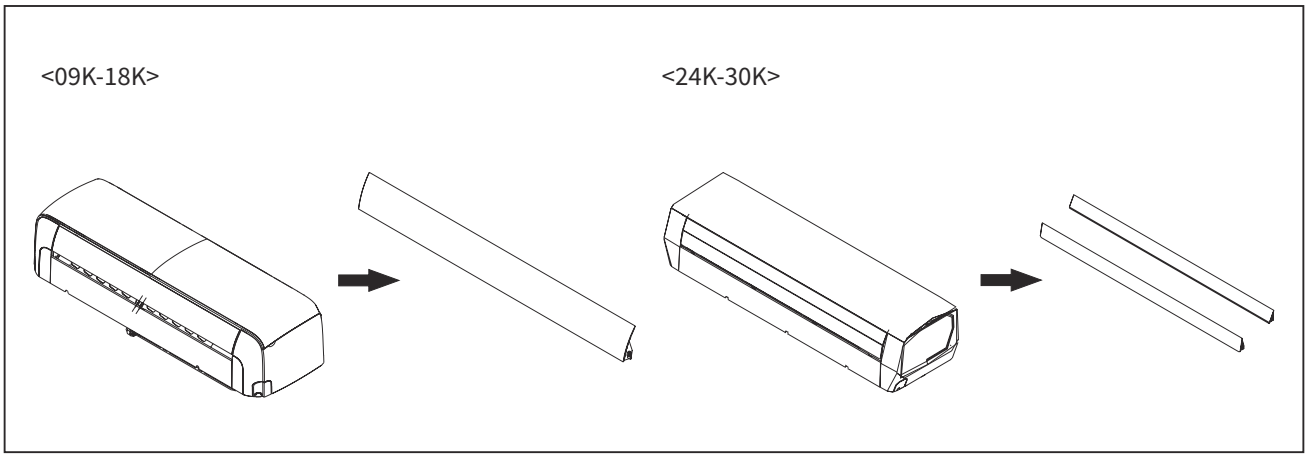
⚠ WARNING

- TURN OFF all power source switches.

2.5.1 Removing the Horizontal Wind Plate

(1) Scare the shaft row in the middle of the wind plate.

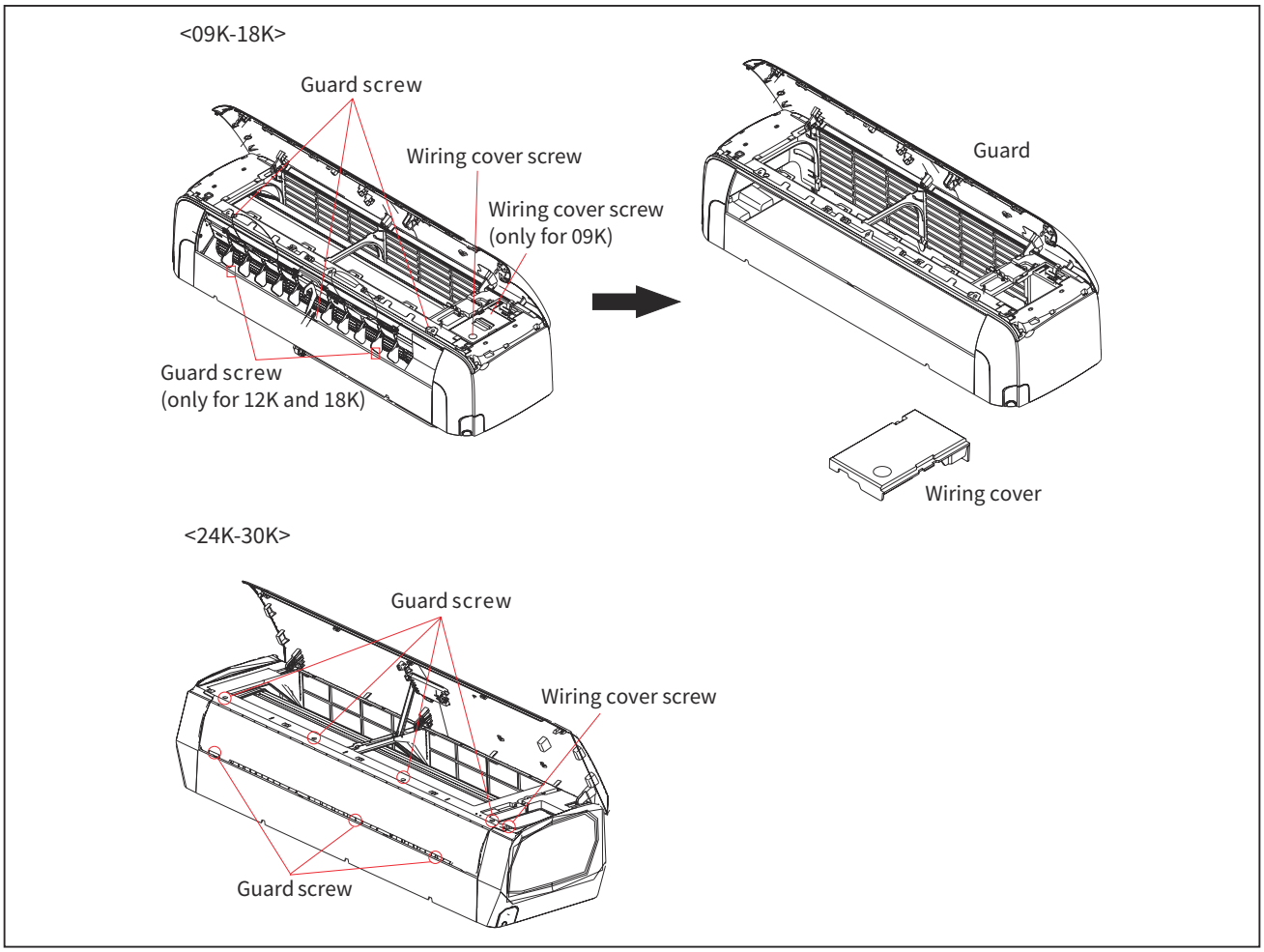
(2) Remove the shaft at both ends, and finally take out the horizontal wind plate.



2.5.2 Remove the Connection Cover and Guard

(1) Open the panel, screw down the wiring cover screw and the guard screw(the outlet screw needs to take out the butterfly cover first), remove the wiring cover and guard.

Tool	Phillips Screwdriver



WARNING

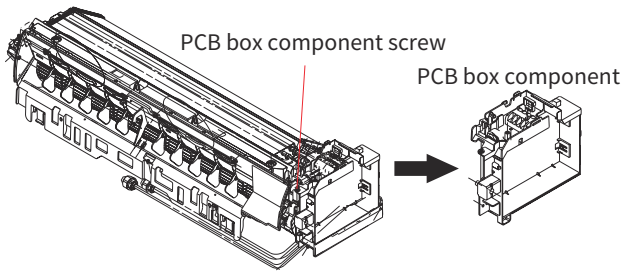
- TURN OFF all power source switches.

2.5.3 Removing the Electrical Box Board and PCB

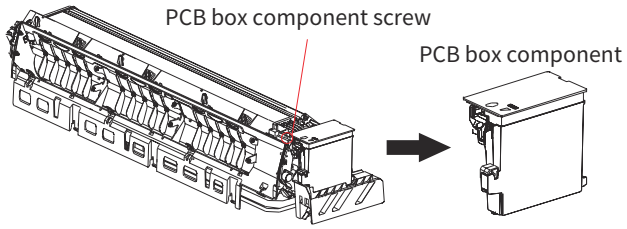
(1) Screw down the PCB box component screw, then remove the PCB box component.

Tool	Phillips Screwdriver

<09K-18K>



<24K-30K>

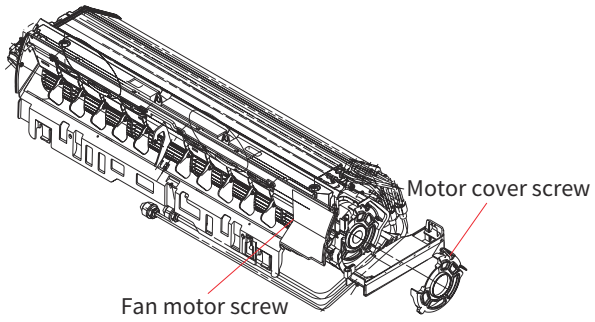


2.5.4 Removing the Pressing Plate and Evaporator

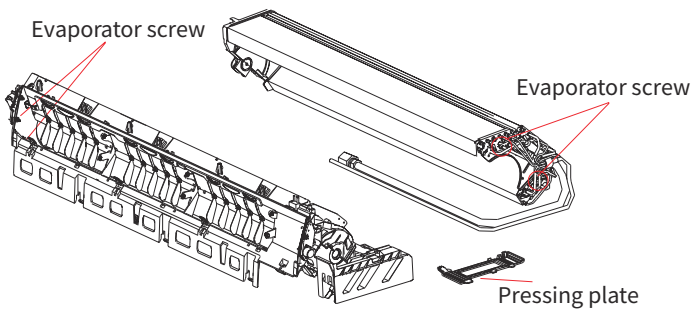
(1) Remove the pressing plate the back of the base and screw down the evaporator screw, then take out the evaporator.

Tool	Phillips Screwdriver

<09K-18K>



<24K-30K>



(High-wall Type)

⚠ WARNING

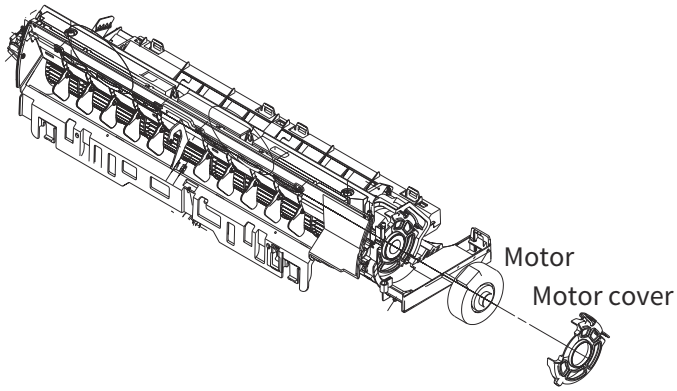
- TURN OFF all power source switches.

2.5.5 Removing the Motor Cover and the Motor

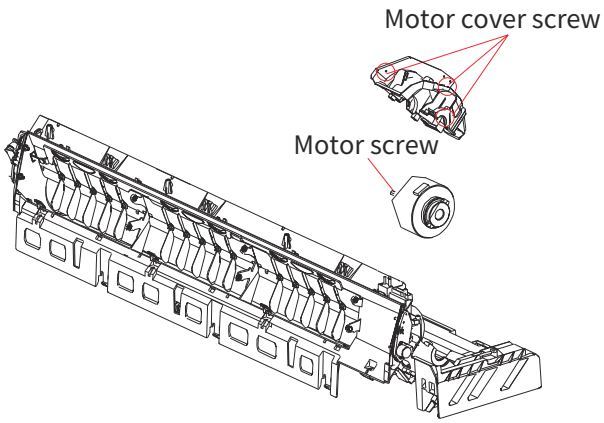
(1) Remove the motor cover, and then remove the motor.

Tool	Phillips Screwdriver

<09K-18K>



<24K-30K>



WARNING

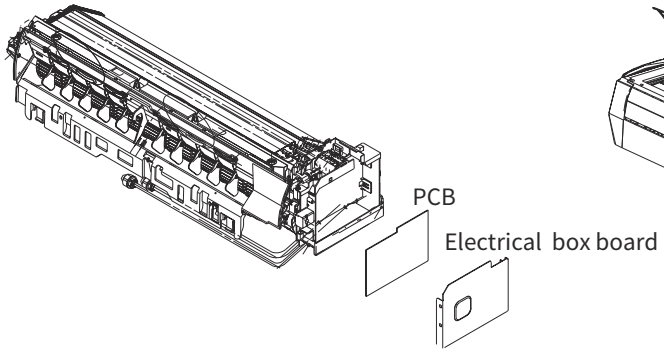
- TURN OFF all power source switches.

2.5.6 Removing the PCB

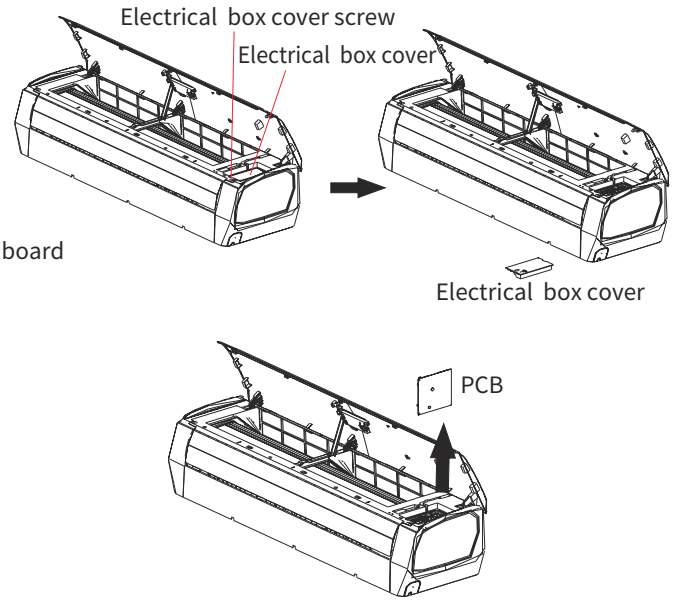
(1) Remove the side electrical box boards, and then remove the PCB.

Tool	Phillips Screwdriver

<09K-18K>



<24K-30K>

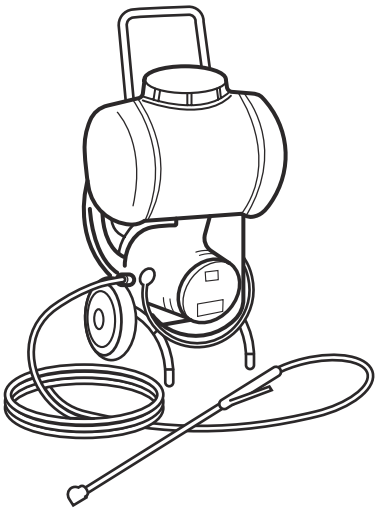
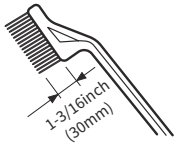


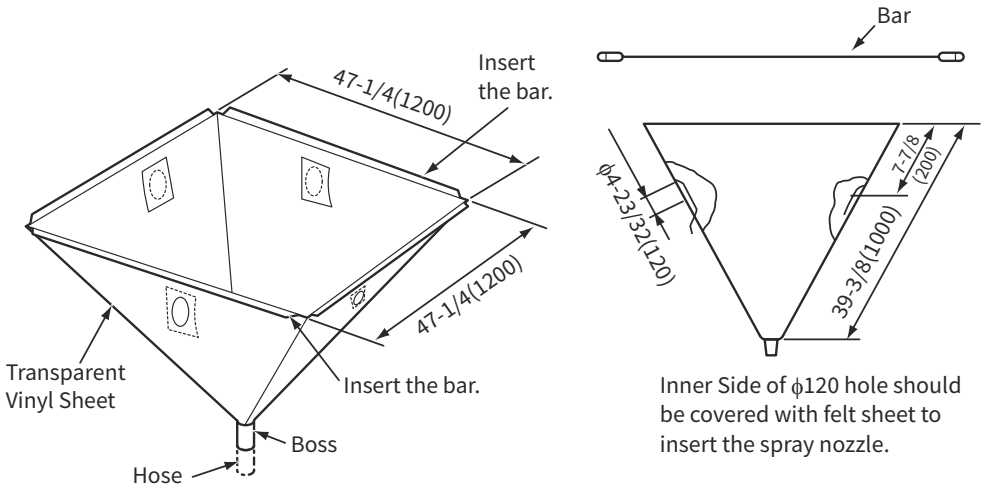
2.6 Cleaning Indoor Unit

2.6.1 Required Tools for Cleaning(for All Indoor Units)

<table>
<tr><th>No.</th><th>Remark</th><th>No.</th><th>Tool</th><th>Remark</th></tr>
<tr><td rowspan="17">1</td><td rowspan="17">Cleaning Water Pump

A water pump equipped with a tank is recommended.

  </td><td>2</td><td>Water Tank
Clean Water</td><td>Approx. 18 liters</td></tr>
<tr><td>3</td><td>Nozzle</td><td>Attached with Water Pump</td></tr>
<tr><td>4</td><td>Brush
(non-metal)
  </td><td>If the heat exchanger is heavily clogged with dust, remove it with this brush.
The length of brush should be 63/64~ 1-3/8inch(25 to 35mm).</td></tr>
<tr><td>5</td><td>Hose for
Water Pan</td><td>Select a hose according to site requirements.</td></tr>
<tr><td>6</td><td>Bucket</td><td>2 Nos. for 5 liters</td></tr>
<tr><td>7</td><td>Phillips
Screwdriver</td><td>1</td></tr>
<tr><td>8</td><td>Nipper</td><td>1</td></tr>
<tr><td>9</td><td>Adjustable Wrench</td><td>1</td></tr>
<tr><td>10</td><td>Megohm Tester</td><td>500V</td></tr>
<tr><td>11</td><td>Cleaning Agent</td><td>Select a neutral type cleaning agent.</td></tr>
<tr><td>12</td><td>Spray</td><td>To spray cleaning water.</td></tr>
<tr><td>13</td><td>Tape with
Adhesive</td><td>To fix the vinyl sheet to protect the room from cleaning water.</td></tr>
<tr><td>14</td><td>Rope</td><td>3.3ft(1m), 4 pieces</td></tr>
<tr><td>15</td><td>Vinyl Sheet</td><td>Select a vinyl sheet with 1/64inch(0.5mm) thickness.</td></tr>
<tr><td>16</td><td>Gloves</td><td></td></tr>
<tr><td>17</td><td colspan="3">Cleaning Water Collector

Unit: in.(mm)
 
Inner Side of ϕ120 hole should be covered with felt sheet to insert the spray nozzle.</td></tr>
</table>

(Cleaning Indoor Unit)

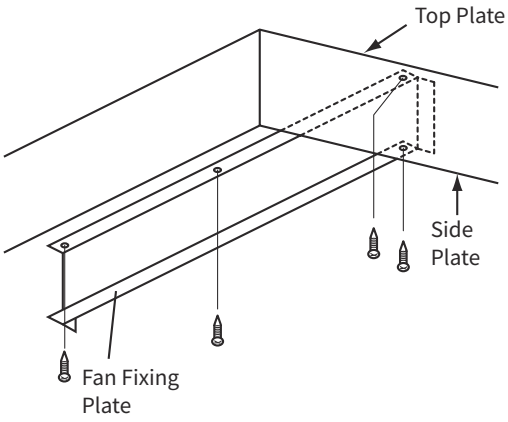
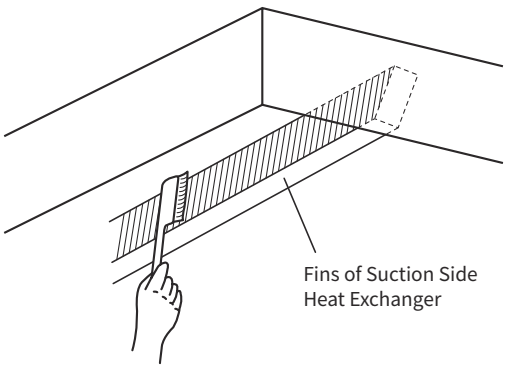
⚠ WARNING

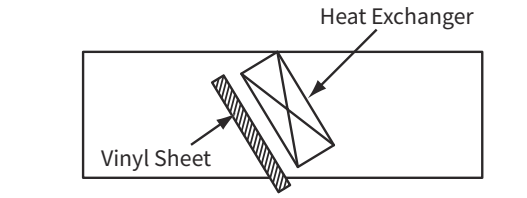
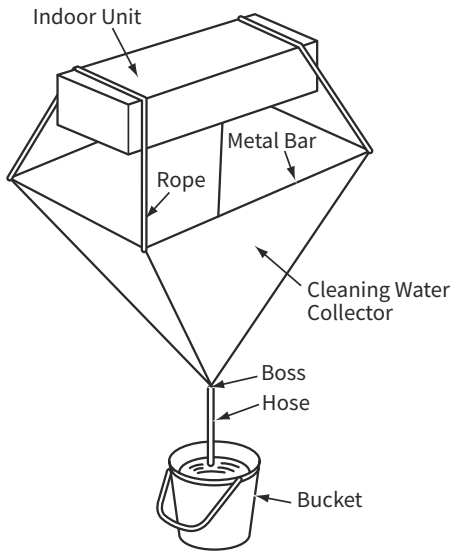
- TURN OFF all power source switches.

2.6.2 MESP Ducted Type

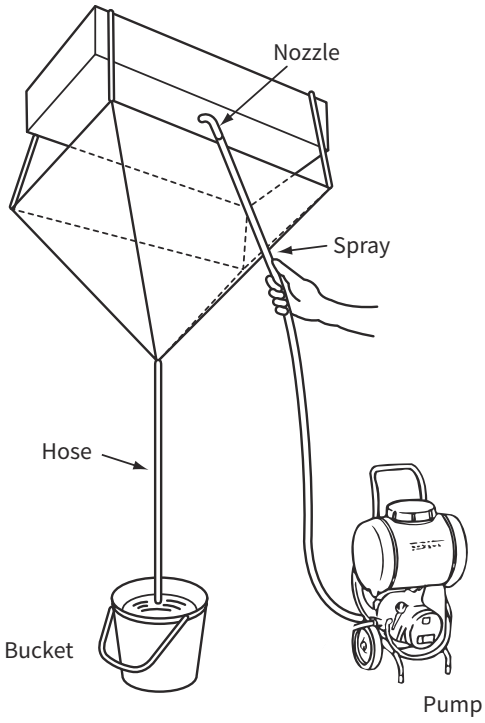
Before cleaning, cover the floor with a vinyl sheet.

* Refer to the item “2.6.1 Required Tools for Cleaning” for cleaning tools.

Step	Procedure		Required Tool
1	Remove the drain pan according to the item “2.1.4 Removing Drain Pan Assembly” and clean the drain pan.		
2	Remove the indoor fan motor and the fan runner assembly according to the item “2.1.1 Removing PCB, Fan and Fan Motor”.		
3	Removing Fan Fixing Plate	 Remove the screws fixing the fan fixing plate and then pull out the fan fixing plate downwards. After removing the fan fixing plate, cover the lead wire with a vinyl sheet to avoid cleaning water.	• Phillips Screwdriver
4	Removing Dust Clogged in Heat Exchanger	 Scratch and remove the dust clogged in fins of the suction side exchanger with a brush. Collect dust in a bucket.	• Brush • Bucket or Paper Board Box

Step	Procedure		Required Tool
5	Protection from Cleaning Water	 Cover the discharge side of the heat exchanger with a vinyl sheet to protect the insulation materials inside the unit from cleaning water. Seal the vinyl sheet properly so as to make no gaps with the adhesive tape. <u>NOTE:</u> Perform the work by wearing gloves to prevent any injuries from touching the fins of the heat exchanger. Attach the vinyl sheet to protect the insulation materials from the cleaning water. (A transparent board is also applicable instead of the vinyl sheet.)	• Vinyl Sheet • Adhesive Tape • Cutter
6	Attaching Cleaning Water Pan	 Hang a cleaning water collector from the indoor unit. (1) Attach ropes to the indoor unit. (2) Put the metal bars through the holes of the cleaning water collector. (3) Attach the ropes to the four bars of the cleaning water collector and suspend the cleaning water collector. (4) Attach the hose to the boss of the cleaning water collector and set the bucket at the end of the hose.	
7	Spraying the Cleaning Water	Spray the cleaning water over the fins of the heat exchanger. * Cleaning Agent	• Cleaning Agent

(Cleaning Indoor Unit)

Step	Procedure		Required Tool
8	Cleaning with Clean Water	 Insert the nozzle into the hole of the cleaning water collector. Operate the pump, wash the dust off on the fins with clean water thoroughly. If the cleaning agent is left on the fins, it may cause corrosion. Adjust the pressure of the spray at approximately 1000 to 2000 in-H_2O(2.5 to 5.0 kg/cm^2) so as not to crush the fins and direct the nozzle in a straight line toward the fins.	• Water Tank • Pump • Washer
9	Make sure that there are no drops of water left after cleaning the fins and reassemble the fan assembly and the drain pan.		• Screwdriver • Hexagon Wrench
10	Measure the condition of insulation of the drain pump with a megohmmeter. (Check to ensure that the resistance is bigger than 1MΩ at 500V.)		
11	Connect the electrical wiring as it was and attach the removed parts.		• Screwdriver
12	Neutralization Treatment after Cleaning The cleaning agent specified in the item 2.6.1 is of neutral type. However, the cleaning water after cleaning may be not neutral due to dust or other foreign particles. Collect all cleaning water and make necessary neutralization for the cleaning water.		

⚠ WARNING

- TURN OFF all power source switches.

2.6.3 4-Way Cassette Type/4-Way Mini Cassette Type

Spread a vinyl sheet over the floor to protect furniture, etc. from cleaning water before this work.

No.	Procedure	Tool
1	Remove the optional air panel according to the item 2.2.3 "Removing Optional Air Panel".	Phillips Screwdriver
2	Remove the electrical box after opening the electrical box cover and disconnecting the connectors between the indoor and outdoor units and other connectors according to the item 2.2.2 "Removing Electrical Box Cover".	Phillips Screwdriver
3	Remove the bell-mouth and fan according to the item 2.2.4 "Removing Turbo Fan and Fan Motor".	Phillips Screwdriver Adjustable Wrench
4	Remove the drain pan according to the item 2.2.6 "Removing Drain Pan".	Phillips Screwdriver
5	Remove the float switch according to the item 2.2.8 "Removing Float Switch".	Phillips Screwdriver
6	Remove the drain-up mechanism according to the item 2.2.7 "Removing Drain-up Mechanism".	Phillips Screwdriver

NOTES:

Remove the drain pan after removing drain water on the drain pan.

1. Remove the drain water on the drain pan after pulling out the rubber plug. Check to ensure that water can flow smoothly through the hole by pricking it with a pencil.
2. Insert the rubber plug into the hole after the above checking.
3. Remove the drain pan after removing four fixing screws. Carefully remove the drain pan, since drain water may remain at the bottom of the drain pan.
4. Clean and dry the drain pan after removing. Carefully handle the drain pan not to damage it.

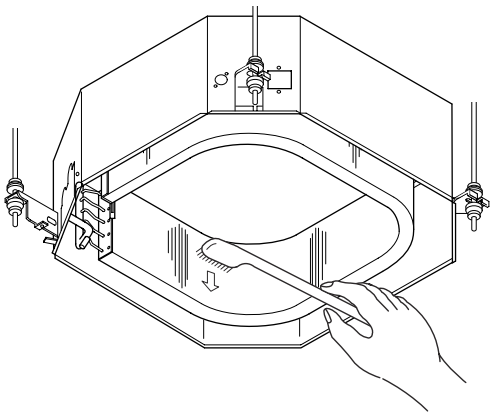
(Cleaning Indoor Unit)

⚠ WARNING

- TURN OFF all power source switches.

(1) Scratch off the dust on the inner surface of the heat exchanger downwards using a brush. Collect all dust in a bucket or carton box.

Tool	Brush, Bucket (or Carton Box)



(2) Attach a vinyl sheet by using adhesive tape around the heat exchanger so that cleaning water will not be splashed over the insulation surface and drain-up pump. Seal the gap between vinyl sheets by using adhesive tape.

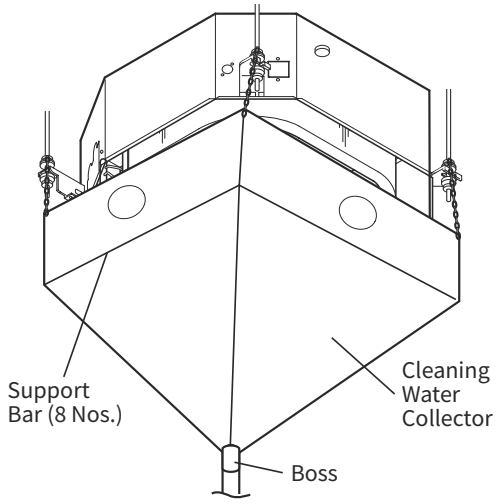
(3) Attach ropes to the each suspension bracket.

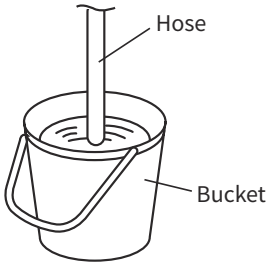
(4) Put the metal bars through the holes of the cleaning water collector.

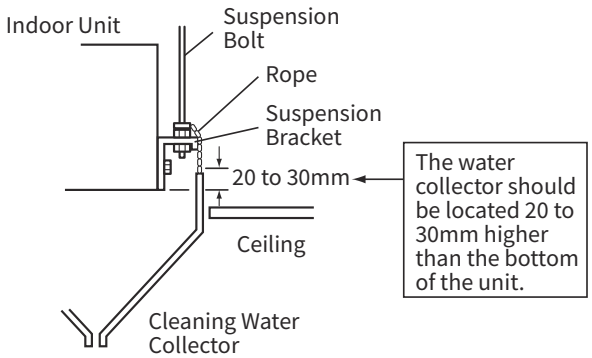
(5) Attach the ropes to the four bars of the cleaning water collector and suspend the cleaning water collector as shown in the figure.

(6) Connect a hose to the boss and put end of hose in a bucket.

Tool	Cutter Knife, Bucket



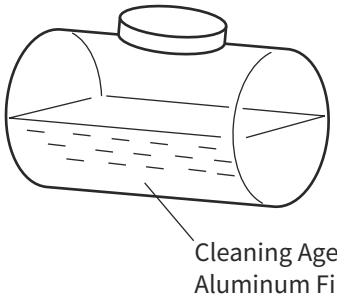




⚠ WARNING

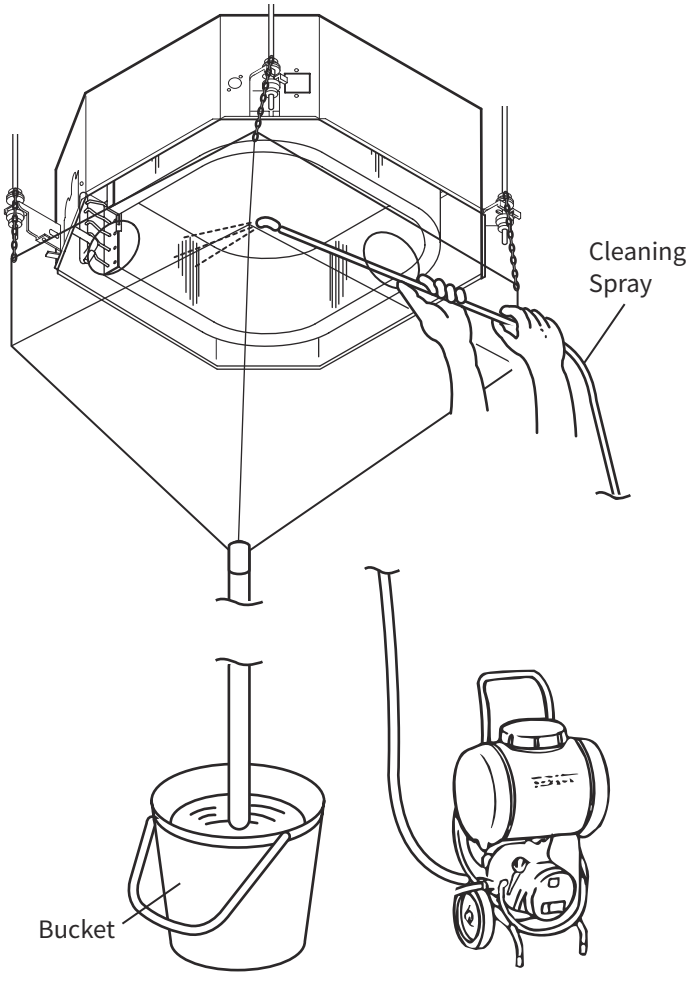
- TURN OFF all power source switches.

(7) Put approximately 15 liters of cleaning agent for aluminum fins in a supply tank.



(8) Insert the spray nozzle through the hole of the cleaning water collector. Operate the water pump and clean the dust on the heat exchanger. After cleaning, spray clean water to remove the cleaning water. Adjust the pressure of the water pump so as not to damage the fins.

Tool	Clean Water, Cleaning Agent, Water Pump, Cleaning Spray



NOTES:
1. If the cleaning water remains, fins will be corroded.
2. Adjust the pressure of the pump at 2.5 to 5.0 kg/cm^2 so as not to damage fins.

(Cleaning Indoor Unit)

⚠ WARNING

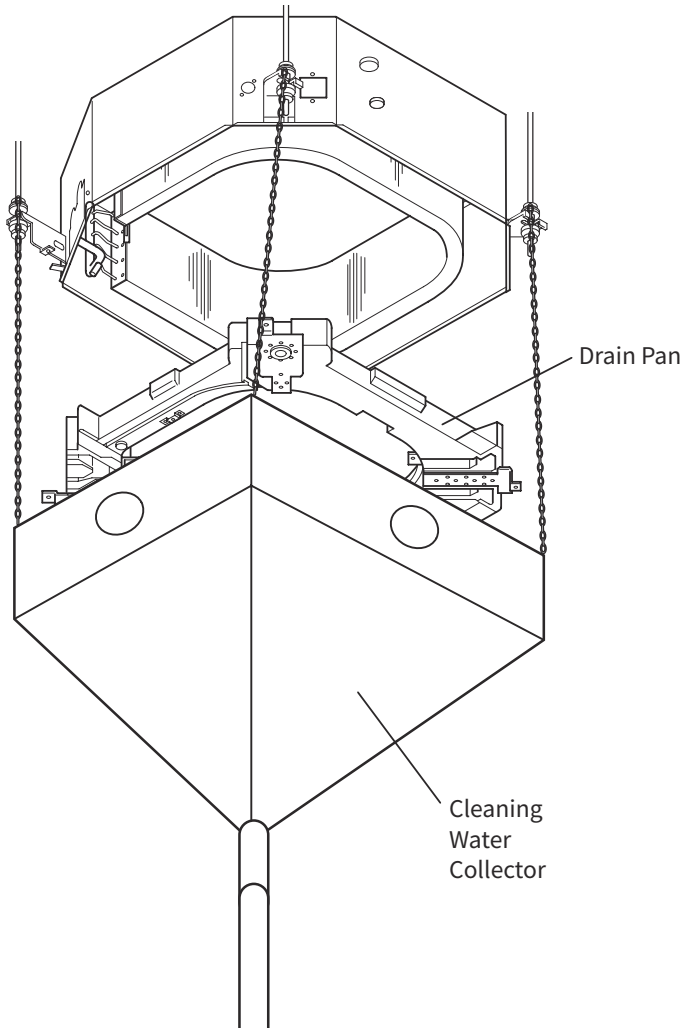
- TURN OFF all power source switches.

(9) After cleaning, mount the drain pan by extending the rope downwards.

NOTE:

- In the case that the cleaning water collector is removed, wipe off the drops from the indoor unit.

Tool	Phillips Screwdriver



(10) Check the insulation of the drain pump with a megohm-meter. Check to ensure that the insulation is greater than 1 MΩ when 500V is applied.

(11) Connect wiring as it was.

(12) Neutralization Treatment after Cleaning
The cleaning agent specified in the item 2.6.1 is of the neutral type. However, the cleaning water after use may be not neutral. Collect all cleaning water and make necessary neutralization treatment for the cleaning water.

⚠ WARNING

- TURN OFF all power source switches.

2.6.4 Ceiling Suspended Type

Spread a vinyl sheet over the floor to avoid cleaning water before this work.

(1) Remove air filter according to the item 2.3.1 “Removing Air Filter”.

Tool	Phillips Screwdriver

(2) Remove fixing screw from left and right cover and remove the cover by pushing head face according to the item 2.3.6 “Removing Left & Right-Side Cover”.

Tool	Phillips Screwdriver

(3) Based on 2.3.1, 2.3.2, 2.3.6 operation. Remove fixing screw from front and remove the front panel by pushing head face according to the item 2.3.8 “Removing front panel”.

Tool	Phillips Screwdriver

(4) Based on 2.3.1, 2.3.2, 2.3.6, 2.3.8 operation. Remove fixing screws from drain pan, remove the connector between drain pan and pipe, and remove drain pan from the unit according to the item 2.3.9 “Removing Drain Pan”.

Tool	Phillips Screwdriver

(5) Attach the drain pan and lower cover according to the reverse procedures in the item (4).

Tool	Phillips Screwdriver

(6) Cover all components except the drain pan with a vinyl sheet avoid splashed cleaning water.
NOTE:
- Wear gloves to avoid any injury during this due to sharp edge of fins.

Tool	Vinyl Sheet, Tape, Cutter, Phillips Screwdriver

(7) Spray the cleaning water over the fins from the rear side of the heat exchanger. If the heat exchanger is heavily covered with dust, use a brush to wipe off.

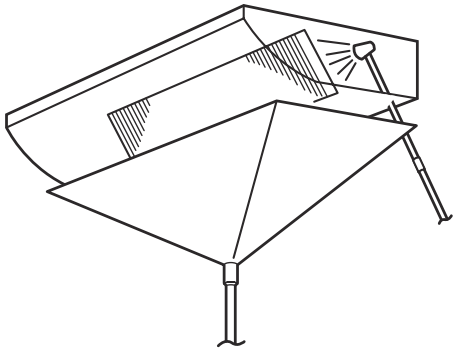
Tool	Spray, Brush

(Cleaning Indoor Unit)

(8) Cleaning with Clean Water

(a) Operate the pump and clean the heat exchanger with clean water completely.
(b) Adjust pressure of the pump so as not to damage fins.

Tool	Clean Water, Pump, Cleaning Water



NOTES:

1. If the cleaning water remains, fins will be corroded.
2. Adjust the pressure of the pump at 2.5 to 5.0 kg/cm^2 so as not to damage fins.

(9) Check the insulation of the terminal board with a megohm-meter.

Check to ensure that the insulation is greater than 1MΩ when 500V is applied.

Tool	Megohm-Meter

(10) Check to ensure that water can flow smoothly after pouring water on the drain pan.

NOTE:

- Pay attention to the drain pan not to overflow.

(11) Neutralization Treatment after Cleaning

The cleaning agent specified in the item 2.6.1 is of the neutral type. However, the cleaning water after use may be not neutral. Collect all cleaning water and make necessary neutralization treatment for the cleaning water.

⚠ WARNING

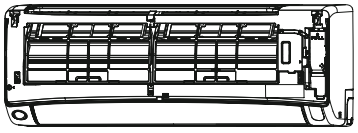
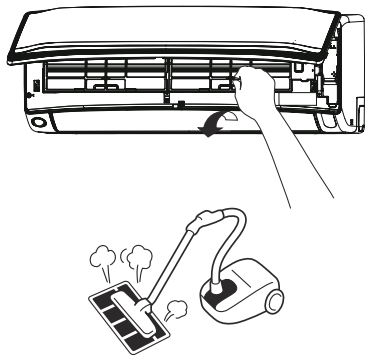
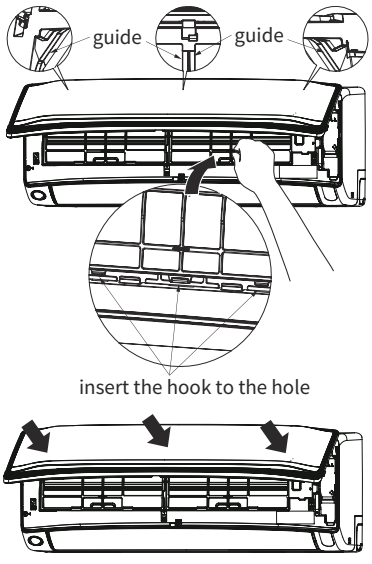
- TURN OFF all power source switches.

2.6.5 High-wall Type

Cleaning and maintenance must be carried out only by qualified service personal.

1. Air Filter

Please clean the filter once about every two weeks. By doing so, energy costs are saved. In case the air filter is full of dust, the air flow will decrease and the cooling capacity will be reduced. Further, noise may occur. Be sure to clean the filter following the procedure below.

Step	Procedure		Required Tool
1	Open the front panel carefully and remove the filter.		
2	Vacuum dust from the air filter using vacuum cleaner. If there is too much dust, wash the filter with a detergent and rinse it thoroughly. After that, dry it in the shade.		
3	Set the filter with “FRONT” mark facing front, and slot them into the original state with putting the filter on the guide and insert the hook to the hole. After attaching the filters, push the front panel at three arrow portions as shown in figure and close it.		

NOTES:

1. Do not wash with hot water at more than 104°F(40°C). The filter may shrink.
2. Do not wash with pressing hard on the filter, bending too much or using a brush. The filter may break.
3. When washing it, shake off moisture completely and dry it in the shade; do not expose it directly to the sun. The filter may shrink.
4. Don’t operate the unit without filter. Fault may occur if you continue.

SERVICING

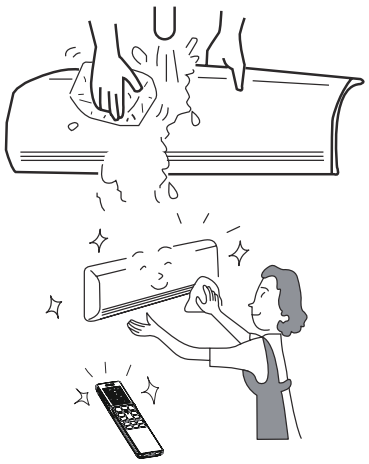
(Cleaning Indoor Unit)

2. Cleaning of Front Panel

(1) Remove the front panel and wash with clean water. Wash it with a soft sponge.
After using neutral detergent, wash thoroughly with clean water.

(2) When front panel is not removed, wipe it with a soft dry cloth. Wipe the remote controller thoroughly with a soft dry cloth.

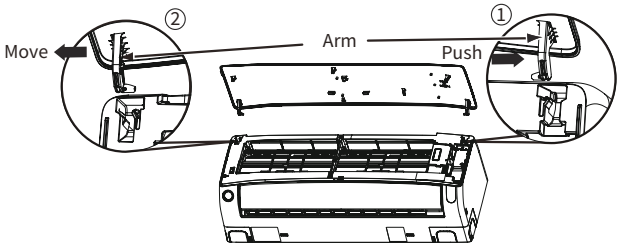
(3) Wipe the water thoroughly. If water remains at indicators or signal receiver of indoor unit, it causes trouble.



Method of removing the front panel.

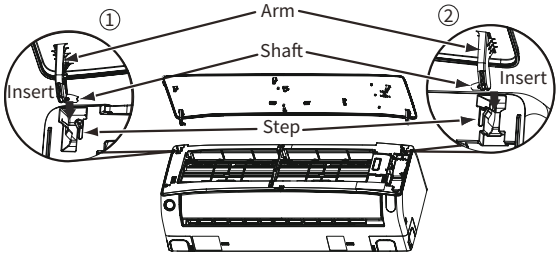
Be sure to hold the front panel with both hands to detach and attach it.

Removing the Front Panel



1. Push the end of the right-side arm outward to release the tab.
2. Move the left-side arm outward to release the left tab, and then pull the panel towards you.

Attaching the Front Panel



1. Insert the shaft of the left arm along the step on the unit into the hole.
2. Securely insert the shaft of the right arm along the step on the unit into the hole.
3. Make sure that the front panel is securely attached, and then close the front panel.

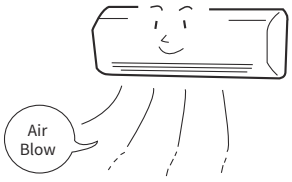
NOTES:

1. Do not splash or direct water to the body of the unit when cleaning it as this may cause short circuit.
2. Never use hot water (above 104°F(40°C)), benzine, gasoline, acid, thinner or a brush, because they will damage the plastic surface and the coating.

3. Maintenance at Beginning of Long Off Period

(1) Run the unit by setting the operation mode to (FAN) and the fan speed to Super High for about half a day on a fine day, and dry the whole of the unit.

(2) Switch off the power plug or turn off the circuit breaker.



2.7 Outdoor Unit

⚠ WARNING

- TURN OFF all power source switches.

NOTICE

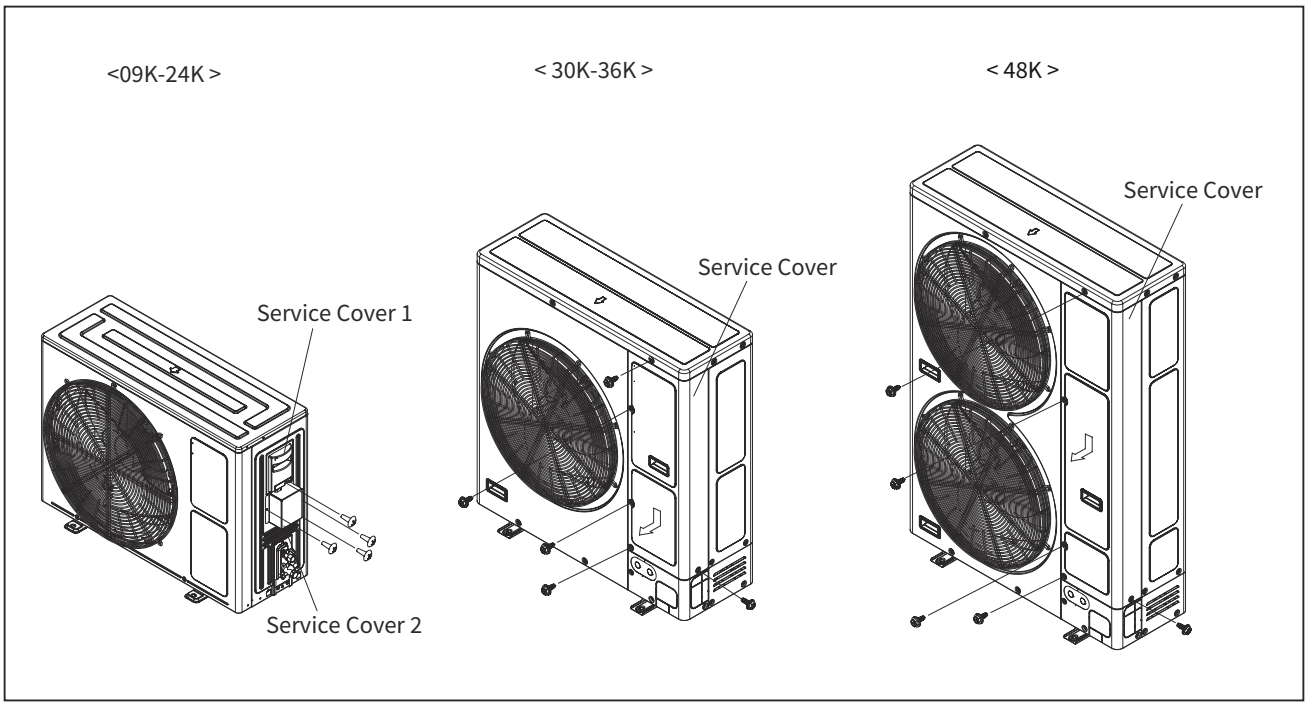
- Removing main parts should be performed according to the following procedures.
- To attach new parts after replacement, reverse the removal procedure.
- To prevent contamination of the refrigerant by water or foreign materials, do not expose the refrigerant parts open to atmosphere for long periods. If necessary, seal pipe ends using caps or tape.

2.7.1 Removing Service Cover

< 09K-24K >
Remove the service cover drawing it downward after removing four (4) fixing screw for the service covers.

< 30K-48K >
Remove the service cover drawing it downward after removing five (5) fixing screws for the service cover. When removing the service cover, take special care not to drop it.

Tool	Phillips Screwdriver



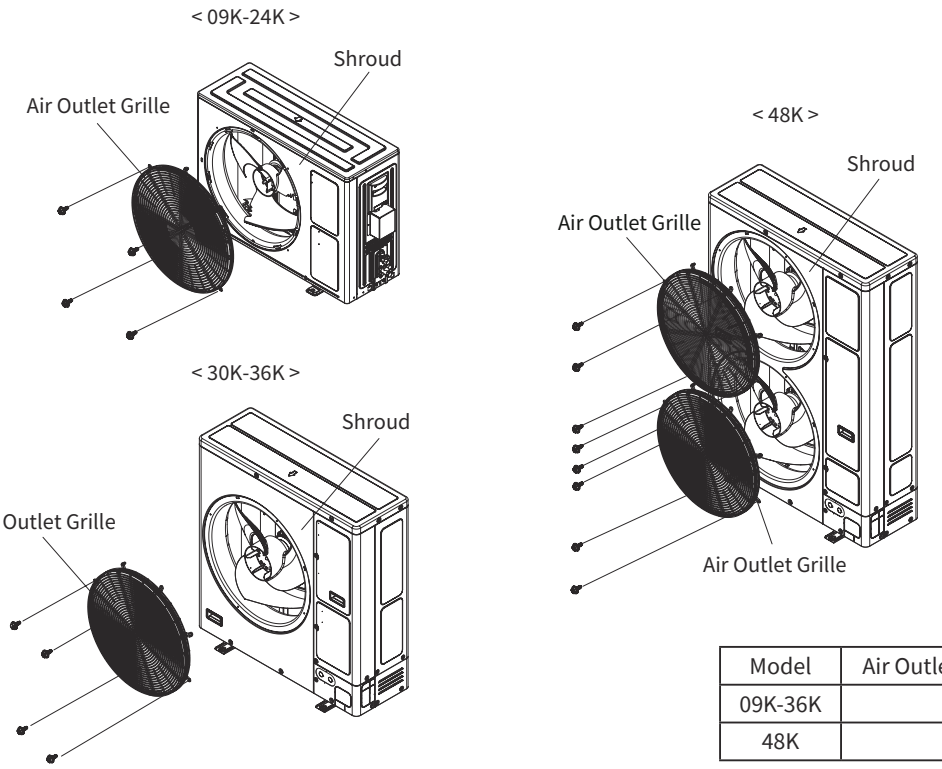
WARNING

- TURN OFF all power source switches.

2.7.2 Removing Air Outlet Grille

Remove four (4) fixing screw for each air outlet grille.

Tool	Phillips Screwdriver

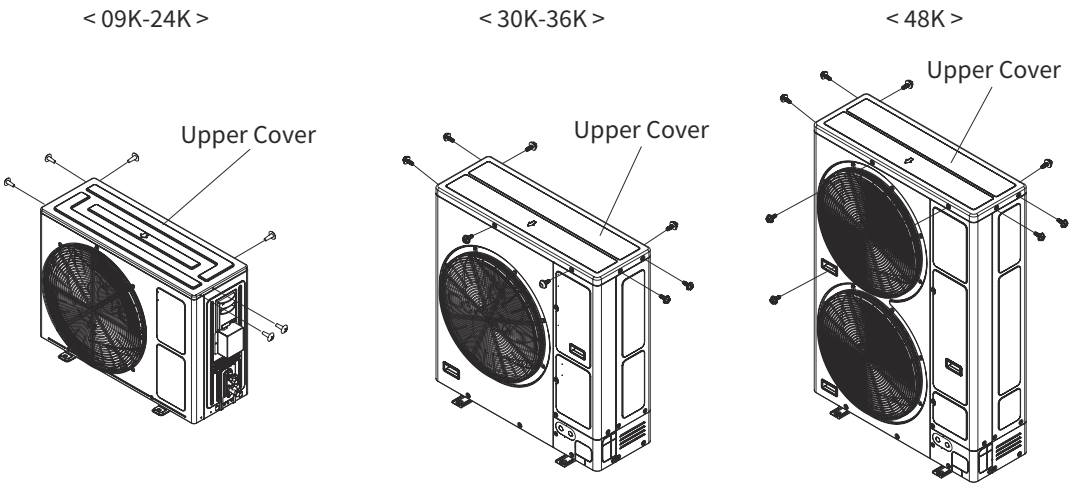


Model	Air Outlet Grille Q'ty
09K-36K	1
48K	2

2.7.3 Removing Upper Cover

After removing fixing screws for the upper cover, lift the upper cover up.

Tool	Phillips Screwdriver



Model	Fixing Screw Q'ty
09K-24K	6
30K-48K	8

⚠ WARNING

- TURN OFF all power source switches.

2.7.4 Removing Shroud and Right Side Cover (for 09K to 24K) / Removing Front Side Piping Cover and Rear Cover (for 30K to 48K)

< 09K-24K >

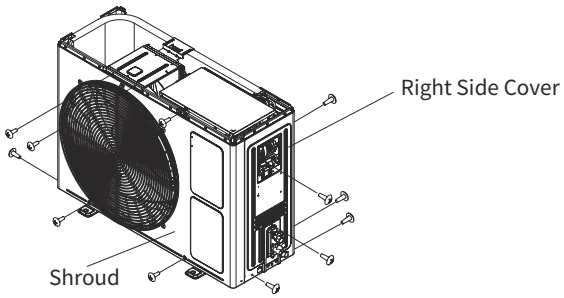
(1) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.
(2) Remove six (6) fixing screws for the shroud.
(3) Remove the service cover according to the item “2.7.1 Removing Service Cover”.
(4) Remove six (6) fixing screws for the right side cover.

< 30K-48K >

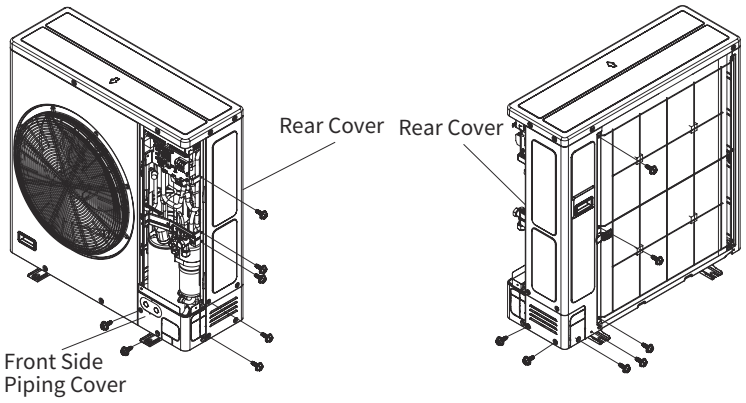
(1) Remove four (4) fixing screws for the front side piping cover.
(2) Remove the front side piping cover pulling it forward.
(3) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.
(4) Remove ten (10) fixing screws for rear cover (for 30K to 36K).
Remove eleven (11) fixing screws for rear cover (for 48K).
(5) Remove the rear cover pulling it backward.

Tool	Phillips Screwdriver

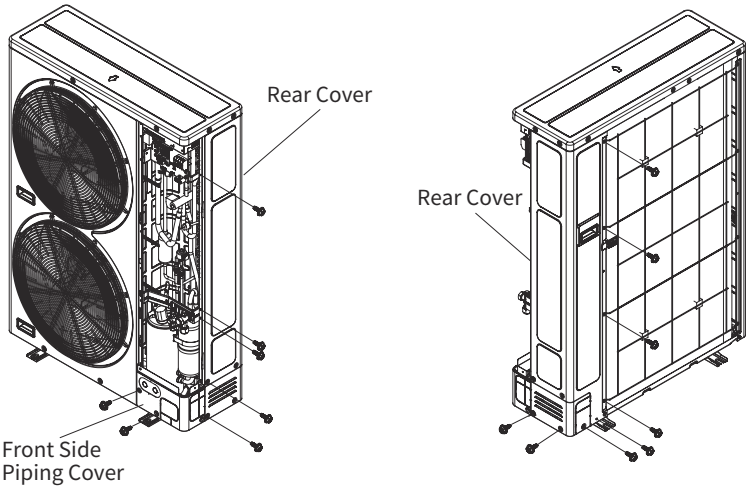
< 09K-24K >



< 30K-36K >



< 48K >



(Outdoor Unit)

⚠ WARNING

- TURN OFF all power source switches.

2.7.5 Removing Outdoor Fan Motor

(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.

(2) Remove the air outlet grille according to the item “2.7.2 Removing Air Outlet Grille”.

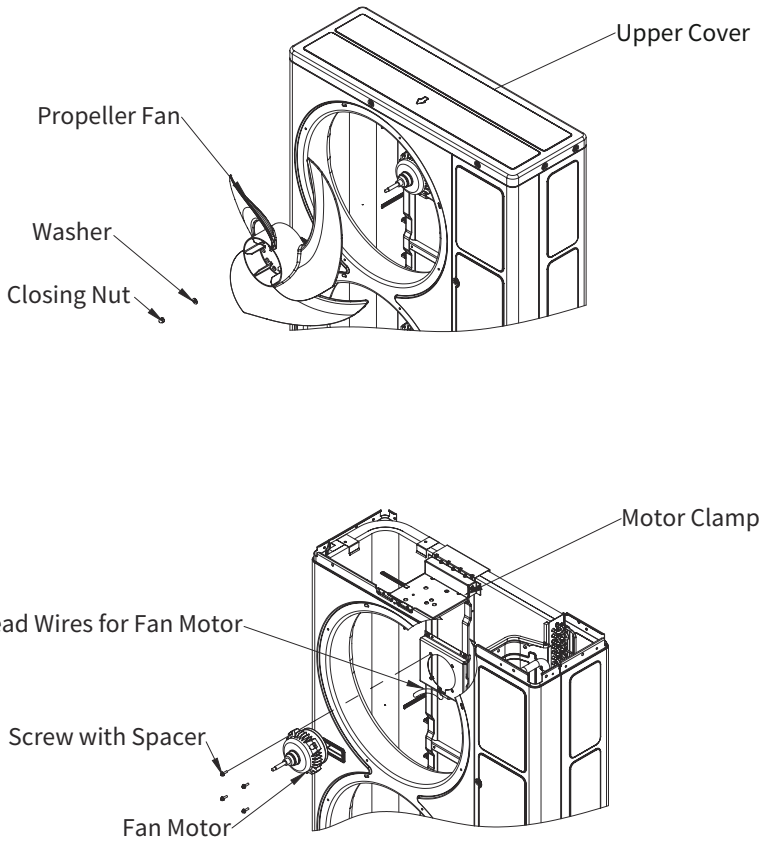
(3) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.

(4) Remove the closing nut and the washer fixing the propeller fan to the motor shaft with a socket wrench. Then remove the propeller fan from the motor shaft. (If it is difficult to remove, use pullers.)

(5) Removing Fan Motor

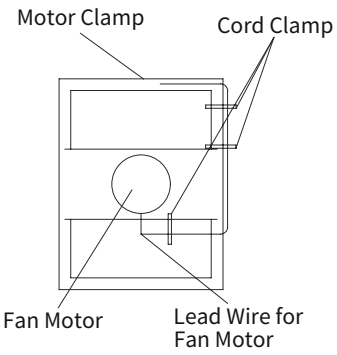
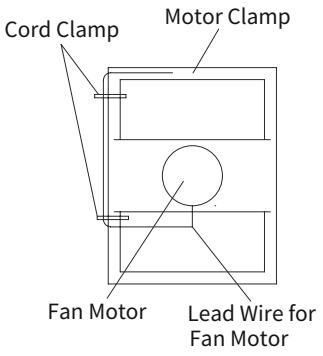
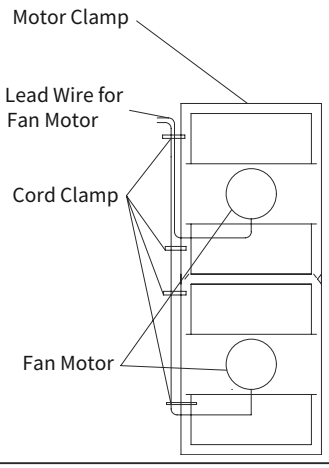
(a) Disconnect the connectors for the fan motor(s) from the outdoor unit PCB in the electrical box.
(b) Remove four (4) spacer screws fixing the fan motor.

Tool	Phillips Screwdriver, Adjustable Wrench, Puller



⚠ WARNING

- TURN OFF all power source switches.

Model	Fan Motor Q'ty	Connector		Fixing Screw for Fan Motor		Fixing Position of Motor Clamp and Wires
		Upper Fan Motor	Lower Fan Motor	Upper Fan Motor	Lower Fan Motor	
09K-12K	1	O.U. PCB PCN202 (Red) CN202 (Red)	-	M5 (Screw with Spacer) × 4	-	
18K-24K	1	O.U. PCB PCN202 (Red) CN202 (Red)	-	M6 (Screw with Spacer) × 4	-	
30K-36K	1	O.U. PCB PCN202 (Red) CN202 (Red)	-	M6 (Screw with Spacer) × 4	-	
48K	1	O.U. PCB PCN202 (Red) CN202 (Red)	O.U. PCB PCN201 (White) CN201 (White)	M6 (Screw with Spacer) × 4	M6 (Screw with Spacer) × 4	

NOTES:

- Mount the fan motor to face the outlet of lead wires downward.
  (Adjust the position not to touch the propeller fan to shroud.)
- Fix the lead wires for fan motor by cord clamp to the initial position not to touch to the propeller fan.
- Mounting Propeller Fan
  Insert the propeller fan to the fan motor shaft to match the D-cut hole of propeller fan boss with D-cut part of fan motor shaft.
  Firmly fix the propeller fan after the head of the fan shaft appears enough. (Tightening Torque: 14.8lb·ft[20N·m])
- Connect the connector for fan motor to the outdoor unit PCB in the electrical box.
  When connecting, check to ensure that the colors of connectors on the the outdoor unit PCB are matched with lead wires.
- Surely fix the air outlet grille to the shroud after replacing the fan motor.

(Outdoor Unit)

⚠ WARNING

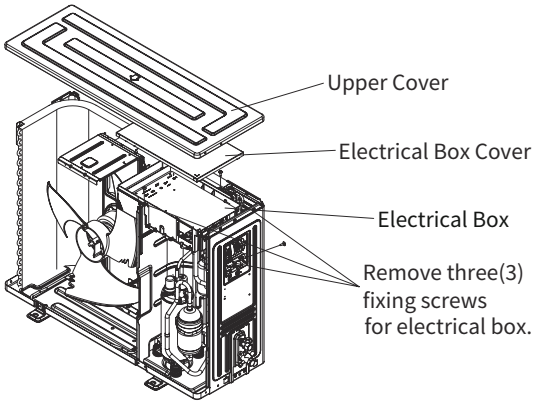
- TURN OFF all power source switches.

2.7.6 Removing Electrical Box

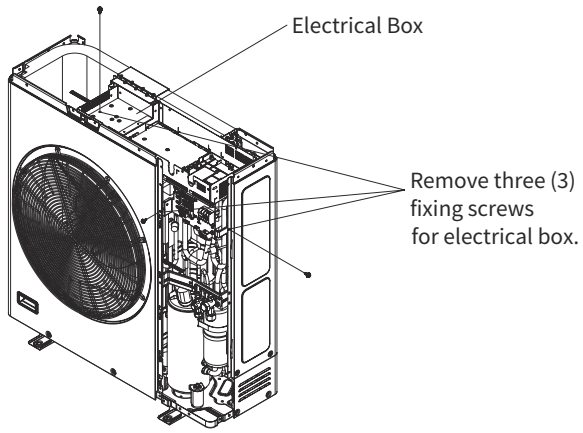
(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.
(2) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.
(3) Remove three (3) fixing screws for electrical box.
(4) Remove the electrical box lifting it upward.

Tool	Phillips Screwdriver, Adjustable Wrench, Nipper

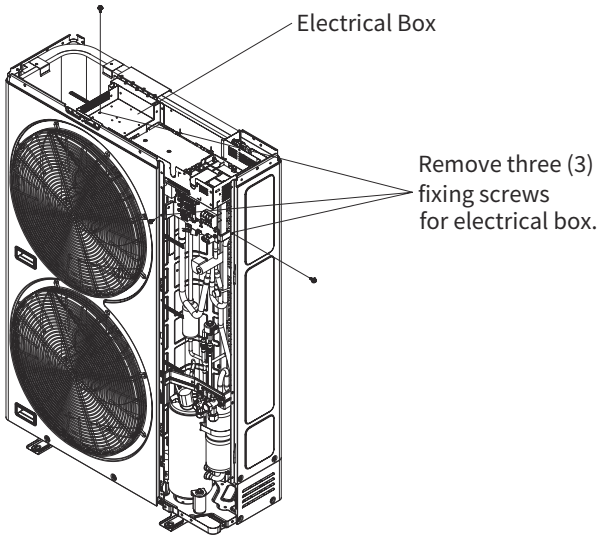
< 09K-24K >



< 30K-36K >



< 48K >



Remove the electrical box after disconnecting wires.

1. Remove the reversing valve coil according to the item “2.7.11 Removing Reversing Valve Coil”.
2. Remove the expansion valve coil according to the item “2.7.12 Removing Electronic Expansion Valve Coil”.
3. Disconnect the faston terminals from Pressure Switch-High/Pressure Switch-Low.
4. Disconnect all connectors from the outdoor unit PCB.
5. Disconnect the compressor wires in the terminal box of compressor.

⚠ WARNING

- TURN OFF all power source switches.

2.7.7 Removing Electric Heating Tube

(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.

(2) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.

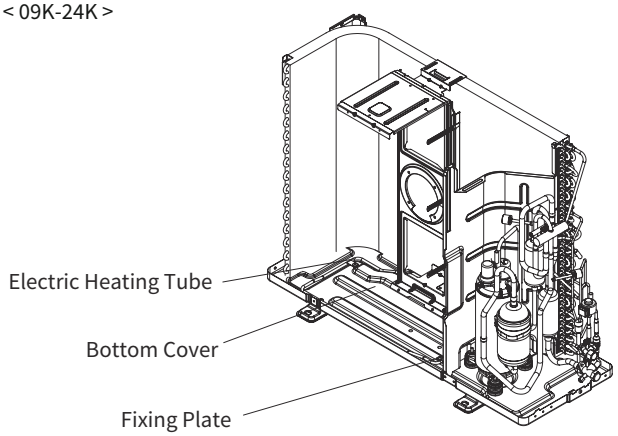
(3) Removing the shroud and the right side cover according to the item “2.7.4 Removing Shroud and Right Side Cover”. In the case that the outdoor unit is located near the wall, remove the refrigerant pipes and move the outdoor unit away from the wall.

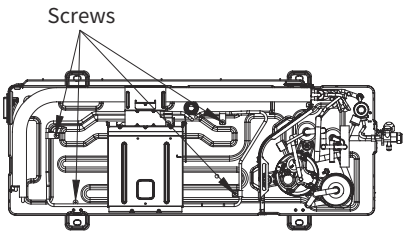
(4) Remove the electrical box according to the item “2.7.6 Removing Electrical Box”.

(5) Remove the four (4) screws that secure the electric heating tube to the bottom cover with fixing plates.

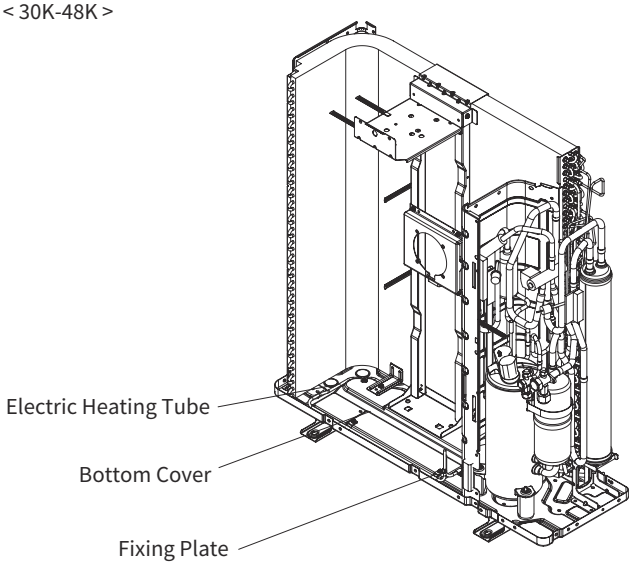
Tool	Phillips Screwdriver

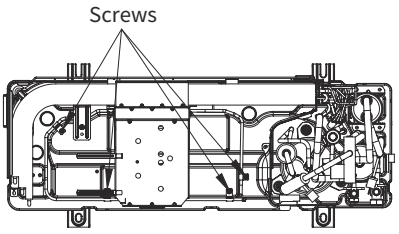
< 09K-24K >





< 30K-48K >





(Outdoor Unit)

⚠ WARNING

- TURN OFF all power source switches.

2.7.8 Removing Compressor

< 09K-24K >

(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.

(2) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.

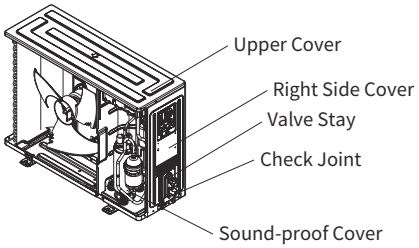
(3) Removing the shroud and the right side cover according to the item “2.7.4 Removing Shroud and Right Side Cover”. In the case that the outdoor unit is located near the wall, remove the refrigerant pipes and move the outdoor unit away from the wall.

(4) Remove the electrical box according to the item “2.7.6 Removing Electrical Box”.

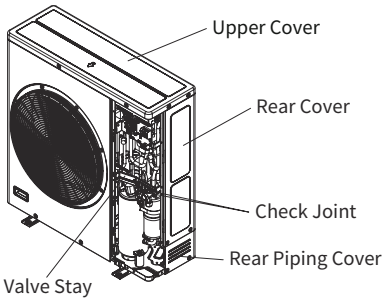
(5) Recover the refrigerant from the check joint (for the gas pipe stop valve).

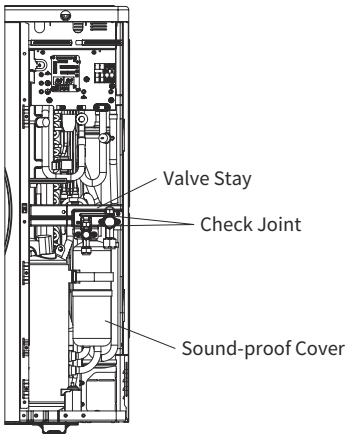
Tool	Phillips Screwdriver, Charging Hose, 2 Adjustable Wrenches

< 09K-24K >

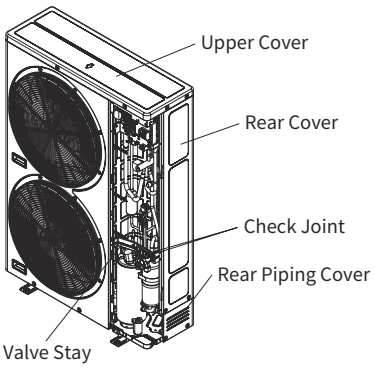


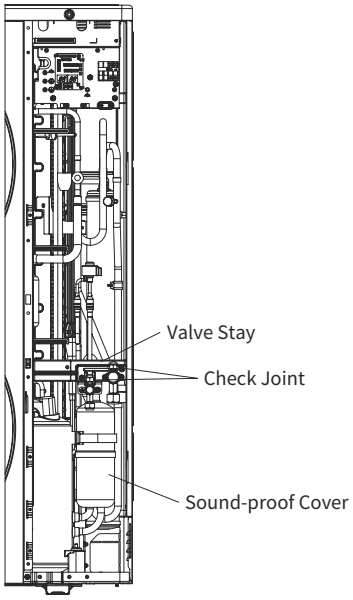
< 30K-36K >





< 48K >





(6) Open the soundproof cover wrapped around the compressor, remove the terminal box cover for the compressor and disconnect the wires.

NOTE:

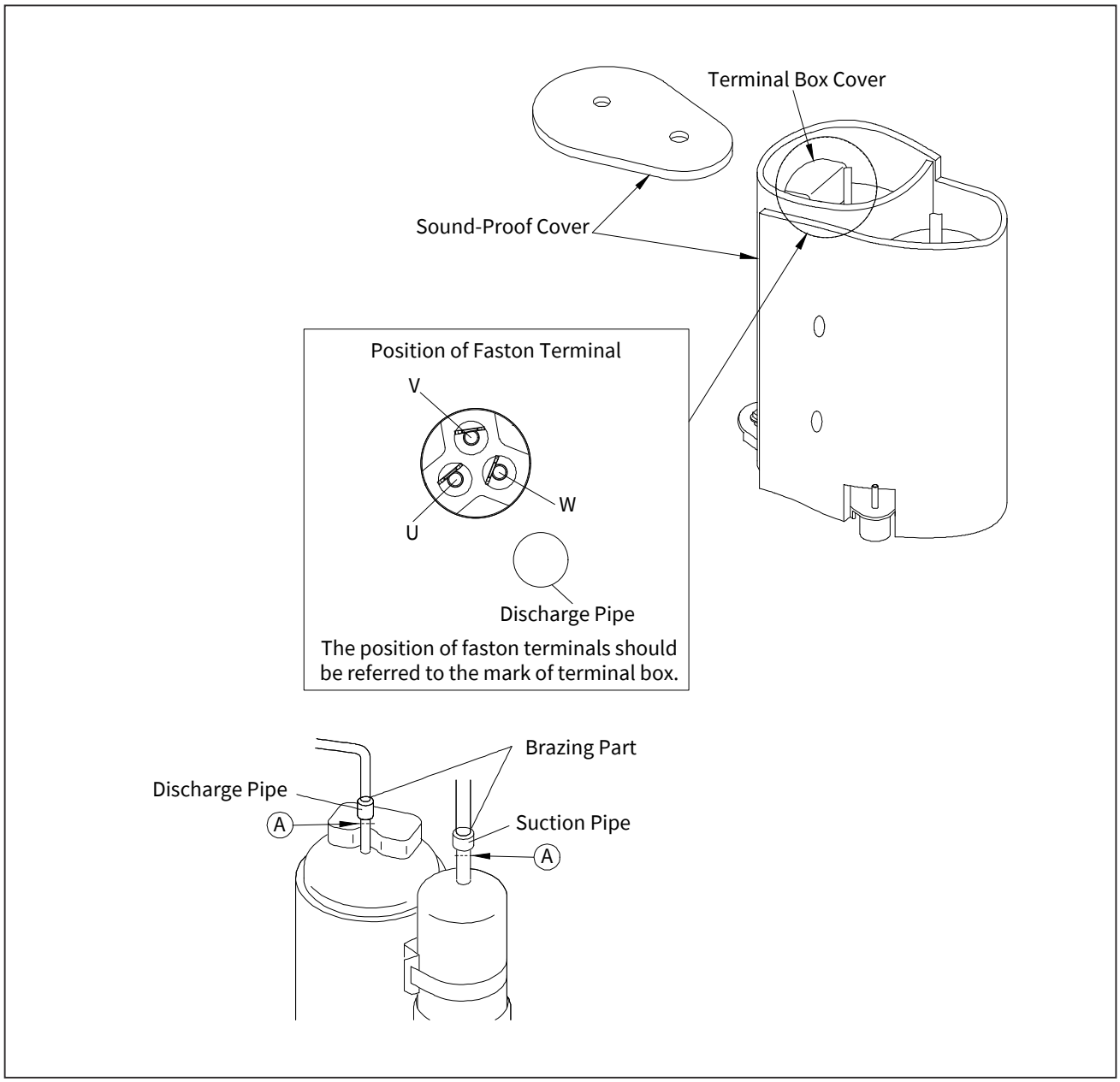
- In reassembly, connect the wires to match surely the terminal number and the mark band. If the wires are connected incorrectly to the terminal, the compressor will fail due to reverse rotation.

(7) Disconnect the suction pipe and discharge pipe from the compressor.
(Remove the brazed part after cutting the pipes at "Ⓐ" with a pipe cutter.)

NOTE:

- Check to ensure that wirings and electrical parts should be kept away from the brazing part. If not, they may catch fire at brazing work.

Tool	Phillips Screwdriver, Charging Hose, 2 Adjustable Wrenches, Burner



(Outdoor Unit)

(8) Remove two (2) nut (at " ① " and " ② ") fixing the compressor, and remove the compressor by lifting up.

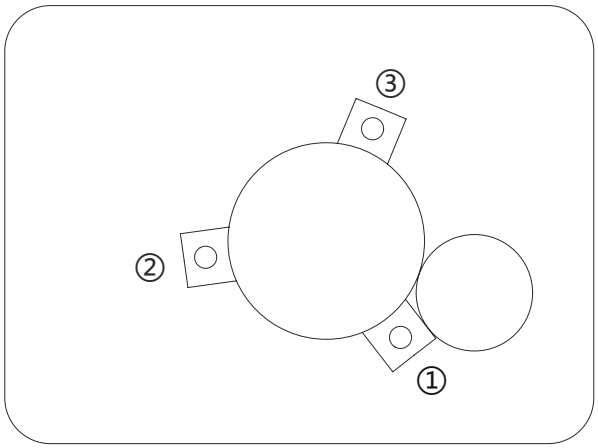
(9) When performing the brazing work for the replaced compressor, cool the pipes with a wet cloth to prevent the brazing material from entering the compressor and perform the work quickly. If the brazing flows into the compressor, the compressor will be damaged.

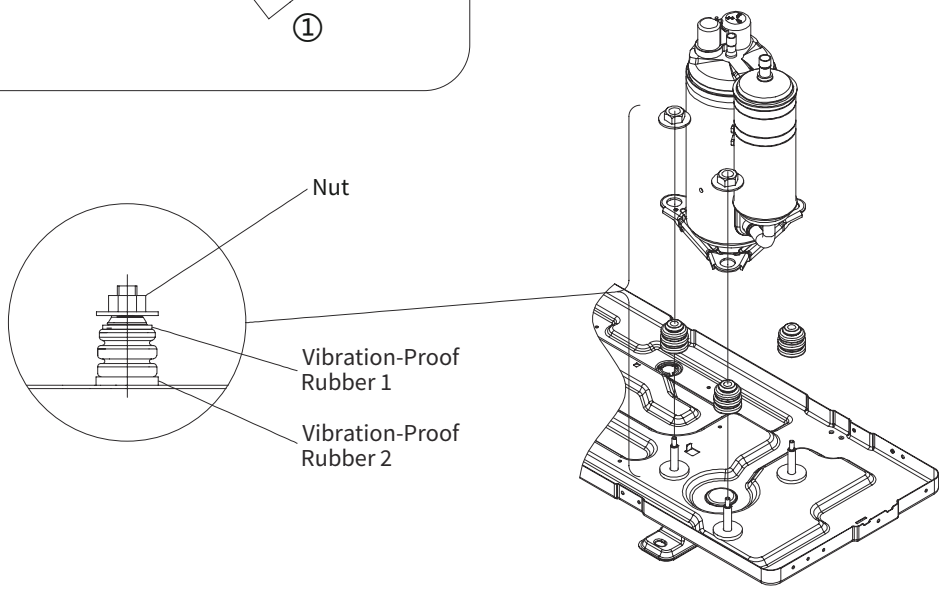
(10) To mount the new compressor after replacement, reverse the removal procedure.

(a) Check to ensure that the faston terminals of the wires are normal. When a pulling force of 20N or more is required, it is normal. If there is abnormal, replace the faston terminals with new ones.

(b) Check to ensure that wires are firmly fixed.

Tool	Spanner, Pipe Cutter, Adjustable Wrench, Burner, Wet Cloth





Compressor Position	1	2	3
Vibration-Proof Rubber 1	○	○	○
Vibration-Proof Rubber 2	○	○	○
Nut	○	○	-

○ : Attached
- : Not Attached

NOTE:
Check to ensure that wires are firmly fixed.
Do not touch the wires to the edge of plate and the high temperature pipes.

NOTES:

- To prevent contamination of the refrigerant by water or foreign materials, do not expose the refrigerant parts to atmosphere for long periods. If necessary, seal the pipe ends using caps or tapes.
- Remove the caps for pipes of the new compressor right before replacement. When replacing the compressor, seal the suction and discharge pipes with tapes to prevent water and foreign particles from entering the compressor, and remove it right before brazing work.
- Securely check terminal numbers and mark bands before disconnecting lead wires. In reassembly, connect them to match surely the terminal numbers and the mark bands.
  If the lead wires are connected incorrectly to the terminal, the compressor will be damaged due to reverse rotation.

⚠ WARNING

- TURN OFF all power source switches.

< 30K-48K >

(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.

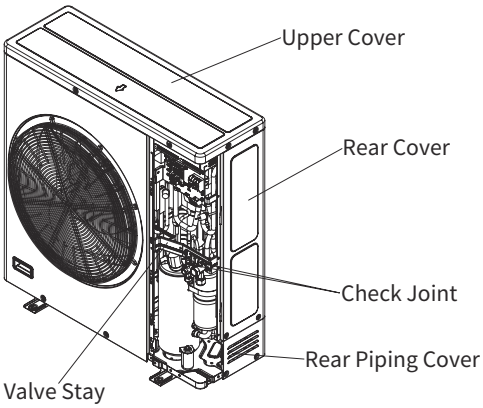
(2) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.

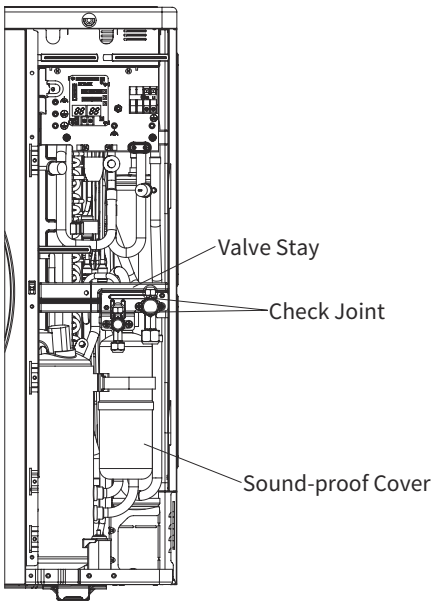
(3) Remove the front piping cover and the rear cover according to the item “2.7.4 Removing Front Side Piping Cover and Rear Cover”. In the case that the outdoor unit is located near the wall, remove the refrigerant pipes and move the outdoor unit away from the wall.

(4) Remove the electrical box according to the item “2.7.6 Removing Electrical Box”.

(5) Recover the refrigerant from 2 check joints (for the liquid pipe stop valve, the gas pipe stop valve.)

Tool	Phillips Screwdriver, Charging Hose, 2 Adjustable Wrenches





NOTES:

- The compressor and pipes are connected by brazing. Before brazing work, check to ensure that there is no flammable material around, as remaining oil inside the pipe might catch fire.
- To prevent contamination of the refrigerant by water or foreign materials, do not expose the refrigerant parts to atmosphere for long periods. If necessary, seal the pipe ends using caps or tapes.
- Remove the caps for pipes of the new compressor right before replacement. When replacing the compressor, seal the suction and discharge pipes with tapes to prevent water and foreign particles from entering the compressor, and remove it right before brazing work.
- Securely check terminal numbers and mark bands before disconnecting lead wires. In reassembly, connect them to match surely the terminal numbers and the mark bands. If the lead wires are connected incorrectly to the terminal, the compressor will be damaged due to reverse rotation.

(Outdoor Unit)

(6) Open the soundproof cover wrapped around the compressor, remove the terminal box cover for the compressor and disconnect the wires.

NOTE:

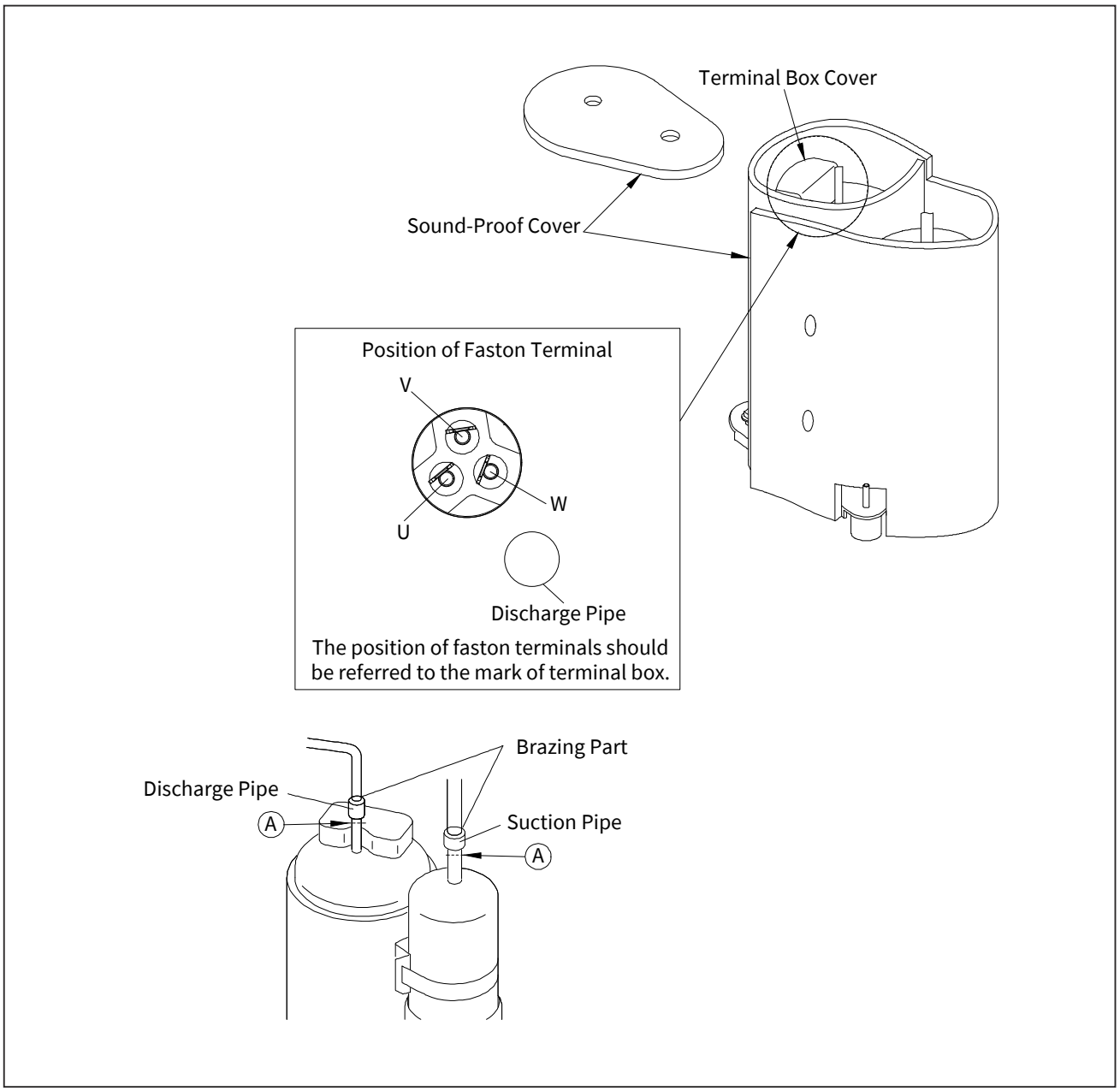
- In reassembly, connect the wires to match surely the terminal number and the mark band.
  If the wires are connected incorrectly to the terminal, the compressor will fail due to reverse rotation.

(7) Disconnect the suction pipe and discharge pipe from the compressor.
(Remove the brazed part after cutting the pipes at "Ⓐ" with a pipe cutter.)

NOTE:

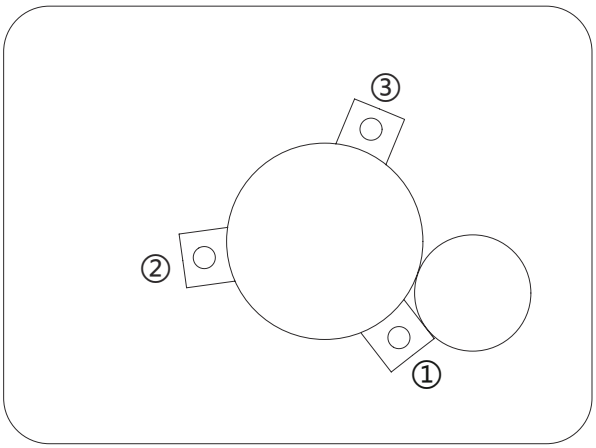
- Check to ensure that wirings and electrical parts should be kept away from the brazing part.
  If not, they may catch fire at brazing work.

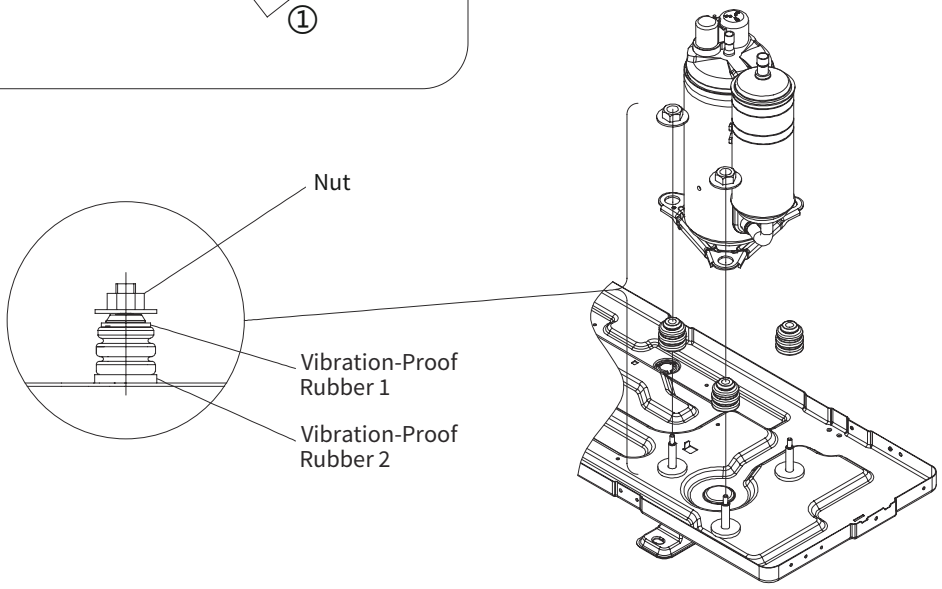
Tool	Phillips Screwdriver, Charging Hose, 2 Adjustable Wrenches, Burner



(8) Remove two (2) nut (at " ① " and " ② ") fixing the compressor, and remove the compressor by lifting up.
(9) When performing the brazing work for the replaced compressor, cool the pipes with a wet cloth to prevent the brazing material from entering the compressor and perform the work quickly. If the brazing flows into the compressor, the compressor will be damaged.
(10) To mount the new compressor after replacement, reverse the removal procedure.
  (a) Check to ensure that the faston terminals of the wires are normal. When a pulling force of 20N or more is required, it is normal. If there is abnormal, replace the faston terminals with new ones.
  (b) Check to ensure that wires are firmly fixed.

Tool	Spanner, Pipe Cutter, Adjustable Wrench, Burner, Wet Cloth





Compressor Position	1	2	3
Vibration-Proof Rubber 1	○	○	○
Vibration-Proof Rubber 2	○	○	○
Nut	○	○	-

○ : Attached
- : Not Attached

NOTE:
Check to ensure that wires are firmly fixed.
Do not touch the wires to the edge of plate and the high temperature pipes.

NOTES:

- To prevent contamination of the refrigerant by water or foreign materials, do not expose the refrigerant parts to atmosphere for long periods. If necessary, seal the pipe ends using caps or tapes.
- Remove the caps for pipes of the new compressor right before replacement. When replacing the compressor, seal the suction and discharge pipes with tapes to prevent water and foreign particles from entering the compressor, and remove it right before brazing work.
- Securely check terminal numbers and mark bands before disconnecting lead wires. In reassembly, connect them to match surely the terminal numbers and the mark bands.
  If the lead wires are connected incorrectly to the terminal, the compressor will be damaged due to reverse rotation.

(Outdoor Unit)

⚠ WARNING

- TURN OFF all power source switches.

2.7.9 Removing Pressure Switch-High and Pressure Switch-Low

(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.

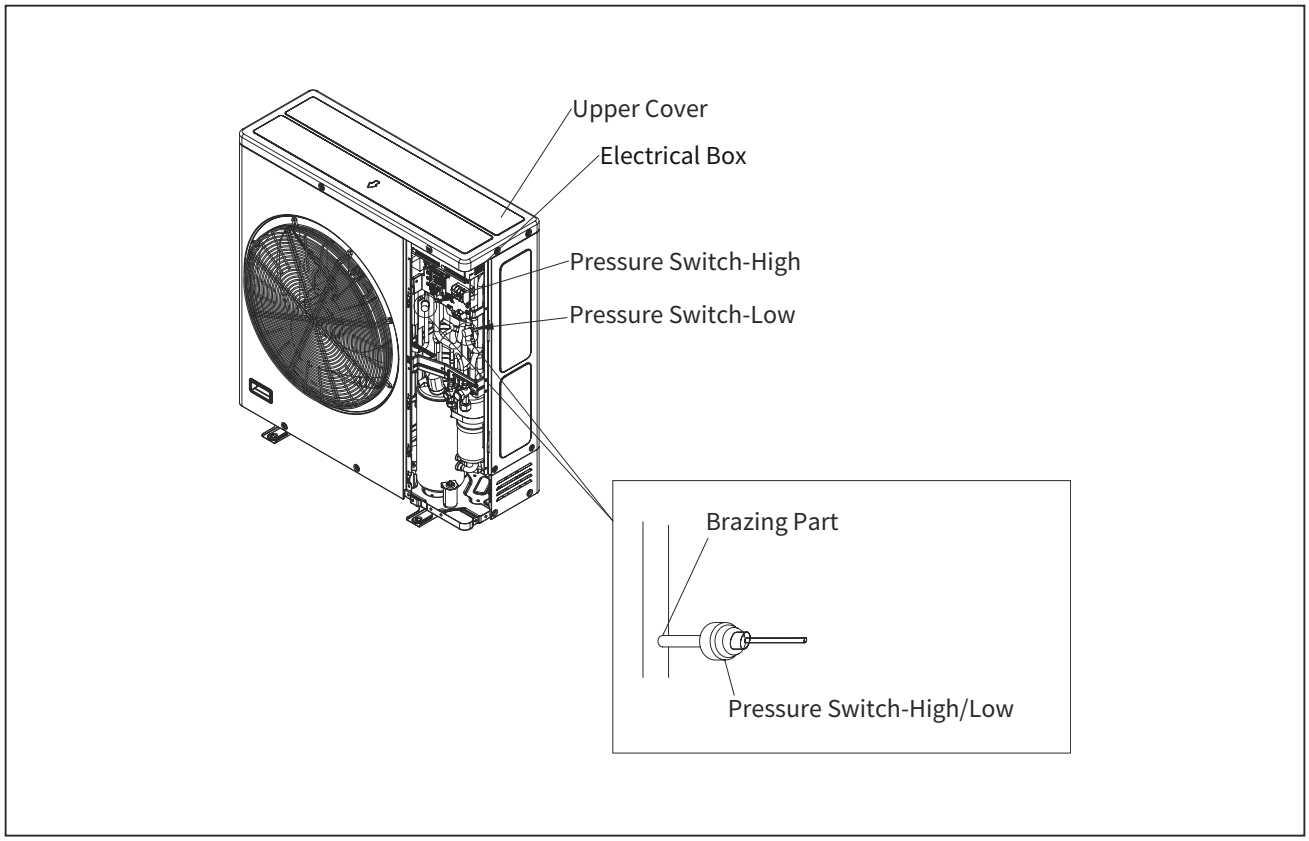
(2) Recover the refrigerant from check joints according to the item “2.7.8 Removing Compressor”.

(3) Remove the soundproof cover at the compressor.

(4) Disconnect the connector (PCN401/Pressure Switch-High and PCN13/Pressure Switch-Low) on the outdoor unit PCB.

(5) Remove the Pressure Switch-High and the Pressure Switch-Low for PD control from the brazing part of pipe.

Tool	Phillips Screwdriver, Charging Hose, Burner



⚠ DANGER

- < 09K-24K >

  Do not touch the electrical components when LED1 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

- < 30K-48K >

  Do not touch the electrical components when LED201 (red) on the inverter PCB and LED4 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

⚠ WARNING

- TURN OFF all power source switches.

2.7.10 Opening Electrical Box

< 09K-24K >

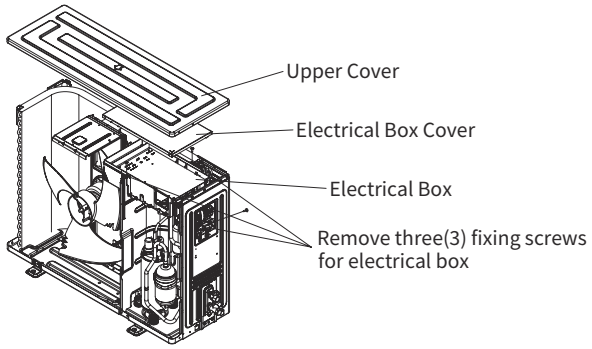
(1) Remove the service cover according to “2.7.1 Removing Service Cover”.
(2) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.
(3) Removing the shroud and the right side cover according to the item “2.7.4 Removing Shroud and Right Side Cover”.
(4) Remove the electrical box according to the item “2.7.6 Removing Electrical Box”.
(5) Turning the electrical box upside down.
(6) Remove the three (3) screws from the mesh sheet metal, and remove the sheet metal and debug board assembly.

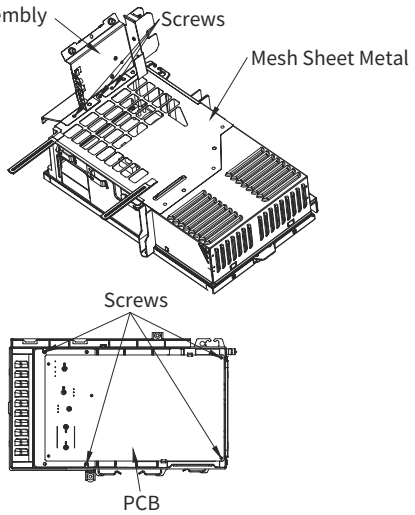
< 30K-48K >

(1) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.
(2) Open the electrical box cover.

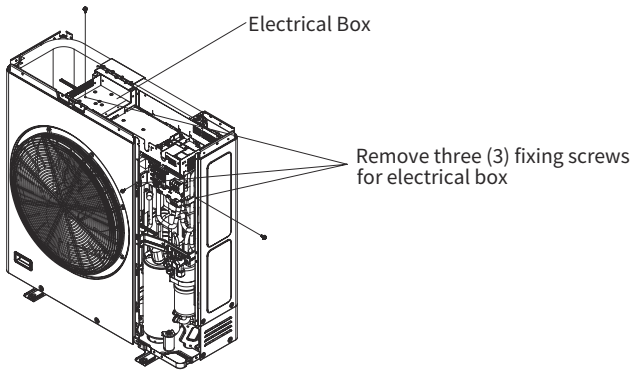
Tool	Phillips Screwdriver (Long)

< 09K-24K >





< 30K-48K >



(Outdoor Unit)

DANGER

- < 09K-24K >

  Do not touch the electrical components when LED1 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

- < 30K-48K >

  Do not touch the electrical components when LED201 (red) on the inverter PCB and LED4 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

WARNING

- TURN OFF all power source switches.

2.7.11 Removing Reversing Valve Coil

(1) Remove the shroud according to the item“2.7.4 Removing Shroud and Right Side Cover (for 09K to 24K)”.
Remove the service cover according to the item “2.7.1 Removing Service Cover” (for 30K to 48K).

(2) Open the electrical box according to the item “2.7.10 Opening Electrical Box”.

(3) Disconnect the connector (PCN6) on the outdoor unit PCB in the electrical box.

(4) Remove the reversing valve by removing one (1) fixing screw for reversing valve.

(5) To attach the reversing valve, reverse the removal procedure.

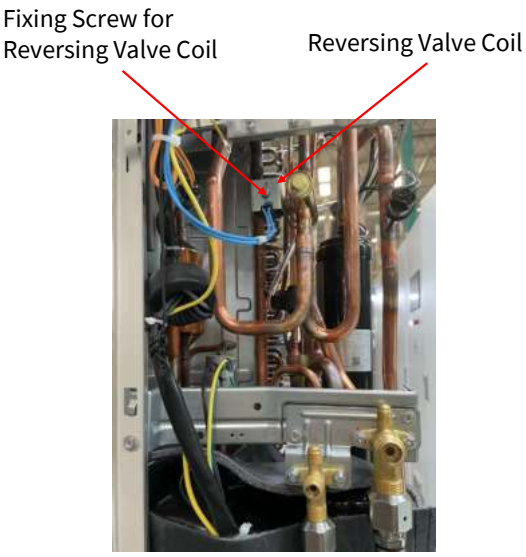
NOTE:

- Run the lead wires to be located to the original position, and fix them by the plastic bands.

Tool	Phillips Screwdriver, Stubby Phillips Screwdriver, Nipper

< 09K-24K >

< 30K-48K >



⚠ DANGER

- < 09K-24K >

  Do not touch the electrical components when LED1 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

- < 30K-48K >

  Do not touch the electrical components when LED201 (red) on the inverter PCB and LED4 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

⚠ WARNING

- TURN OFF all power source switches.

2.7.12 Removing Electronic Expansion Valve Coil

(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.
Remove the shroud and right side cover according to the item “2.7.4 Removing Shroud and Right Side Cover (for 09K to 24K)”.

(2) Open the electrical box according to the item “2.7.10 Opening Electrical Box”.

(3) Disconnect the connector (CN5A) on the outdoor unit PCB.

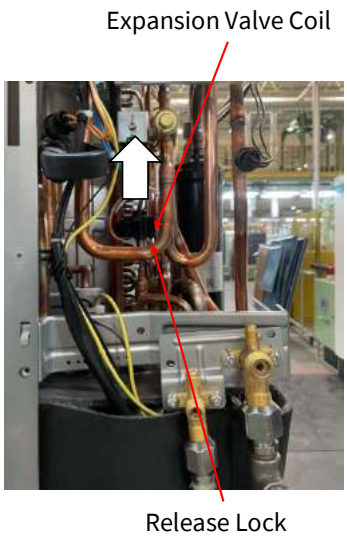
(4) Pull out the expansion valve coil upward while holding it.
(It is easy to remove the expansion valve coil by pulling it upward while rotating it.)

(5) To attach the new expansion valve coil after replacement, reverse the removal procedure. The expansion valve coil has a lock mechanism. After attaching the expansion valve coil, rotate it until it clicks.
NOTE:
- Run the lead wires to be located to the original position, and fix them by the plastic band.

Tool	Phillips Screwdriver, Nipper

< 09K-24K >

< 30K-36K >



< 48K >

(Outdoor Unit)

⚠ WARNING

- TURN OFF all power source switches.

2.7.13 Removing Reversing Valve

(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.

(2) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.

(3) Remove the front piping cover and the rear cover according to the item “2.7.4 Removing Front Side Piping Cover and Rear Cover”.

(4) Remove the reversing valve coil according to the item “2.7.11 Removing Reversing Valve Coil”.

(5) Remove the electrical box according to the item “2.7.6 Removing Electrical Box”.

(6) Recover the refrigerant from check joints according to the item “2.7.8 Removing Compressor”.

(7) Remove the valve stay.

(8) Remove the reversing valve assemblies from the fixed positions. (※4 brazed parts).

(a) Remove the reversing valve and the stop valve while cooling the valve bodies with a wet cloth.
(b) Perform the brazing work with attention not to burn the electrical wirings and the piping insulations.

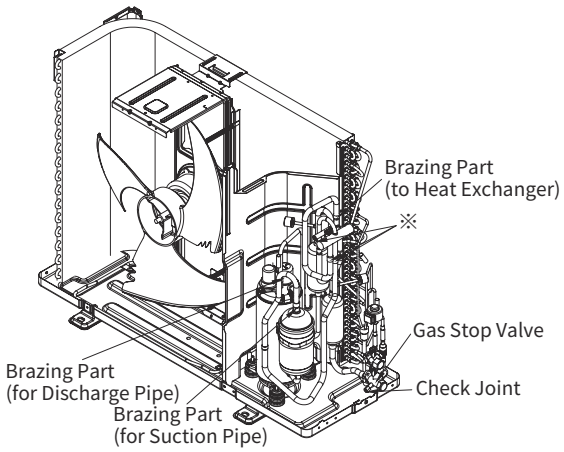
(9) Remove the reversing valve from the assemblies. (3 parts) Remove/Attach the reversing valve while cooling the valve bodies with a wet cloth.

(10) To attach the new reversing valves after replacement, reverse the removal procedure.

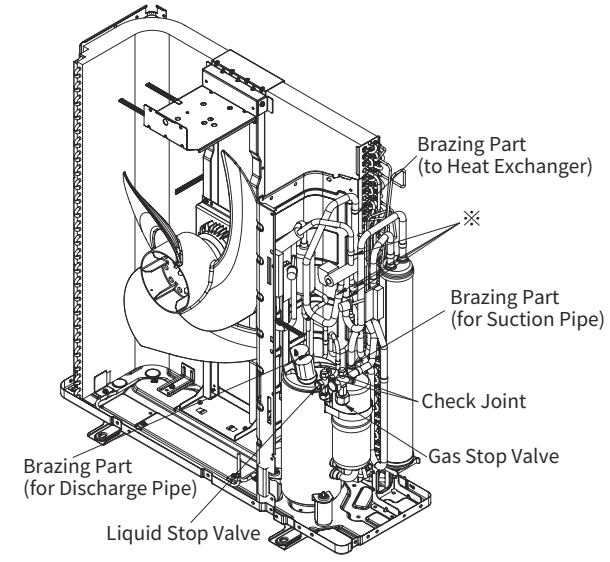
(a) Run the lead wires to be located to the original position, and fix them by the plastic band.

Tool	Phillips Screwdriver, Charging Hose, Nipper, Burner, Wet Cloth, Adjustable Wrench

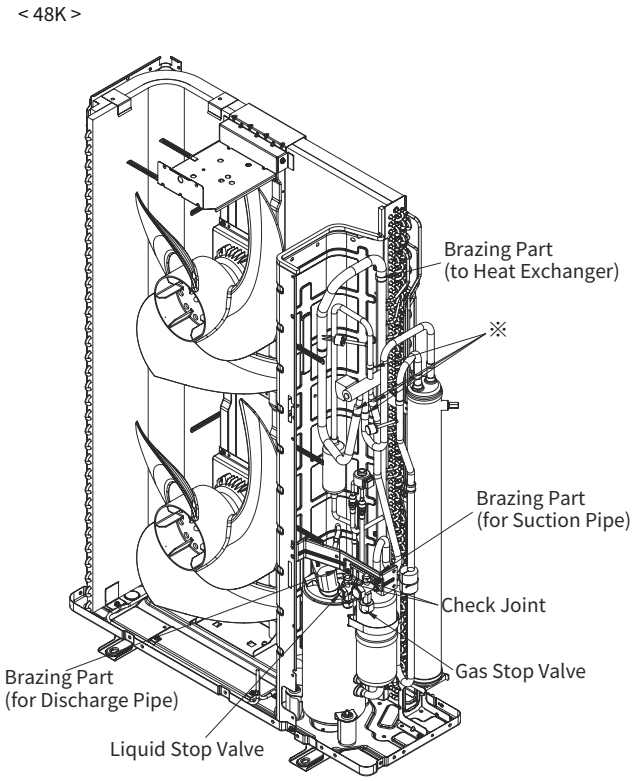
< 09K-24K >



< 30K-36K >



< 48K >



⚠ WARNING

- TURN OFF all power source switches.

2.7.14 Removing Electronic Expansion Valve

(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.

(2) Remove the front piping cover and the rear cover according to the item “2.7.4 Removing Front Side Piping Cover and Rear Cover”.

(3) Recover the refrigerant from check joints according to the item “2.7.8 Removing Compressor”.

(4) Remove the coils according to the item “2.7.12 Removing Electronic Expansion Valve Coil”.

(5) Remove the brazed parts as shown in the figures.

(a) Remove the electronic expansion valve and the solenoid valve with cooling the valve bodies by wet cloth.

(b) Perform the brazing work with attention not to burn the electrical wirings and the piping insulations.

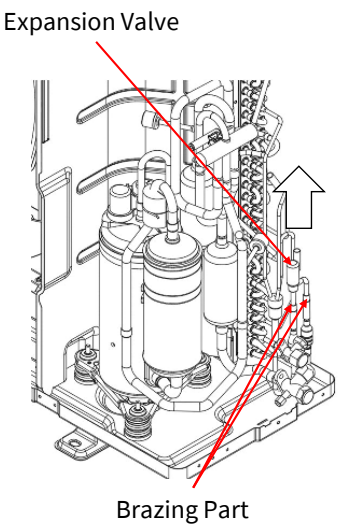
(6) To attach the new valves after replacement, reverse the removal procedure.

NOTE:

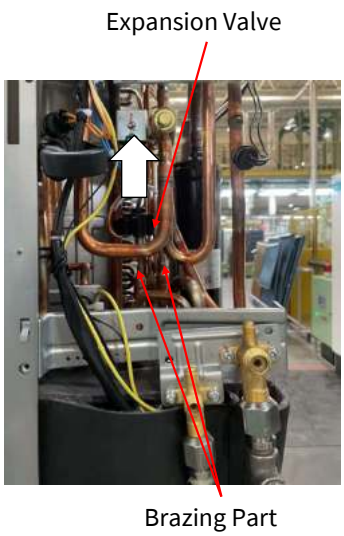
- Run the lead wires to be located to the original position, and fix them by the plastic band.

Tool	Phillips Screwdriver, Charging Hose, Nipper, Burner, Wet Cloth, Adjustable Wrench

< 09K-24K >



< 30K-36K >



< 48K >

(Outdoor Unit)

⚠ DANGER

- < 09K-24K >

  Do not touch the electrical components when LED1 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

- < 30K-48K >

  Do not touch the electrical components when LED201 (red) on the inverter PCB and LED4 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

⚠ WARNING

- TURN OFF all power source switches.

2.7.15 Removing Printed Circuit Board (Outdoor Unit PCB) and Inverter PCB

< 09K-24K >

(1) Remove the service cover according to “2.7.1 Removing Service Cover.”

(2) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.

(3) Removing the shroud and the right side cover according to the item “2.7.4 Removing Shroud and Right Side Cover”.

(4) Remove the electrical box according to the item “2.7.6 Removing Electrical Box”.

(5) Turning the electrical box upside down.

(6) Remove the three (3) screws from the mesh sheet metal, and remove the sheet metal and debug board assembly.

(7) Disconnect all connectors from the outdoor unit PCB.

(8) Remove the outdoor unit PCB by four (4) screws.

< 30K-48K >

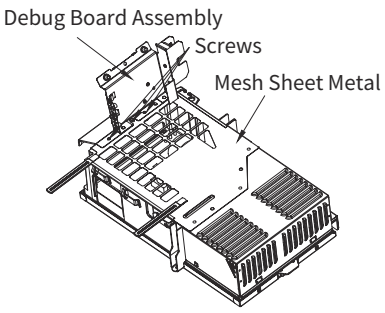
(1) Remove the upper cover according to the item “2.7.3 Removing Upper Cover”.

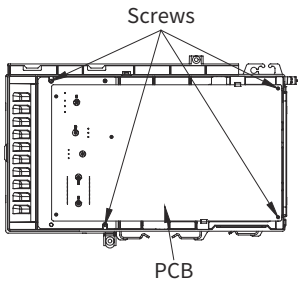
(2) Open the electrical box according to the item “2.7.10 Openning Electrical Box”.

(3) Remove the outdoor unit PCB by eleven (11) screws.

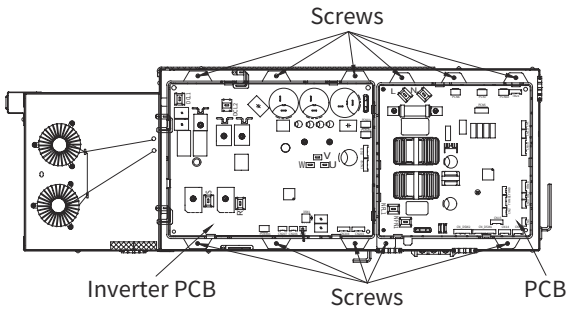
Tool	Phillips Screwdriver, Long-Nose Pliers, Stubby Phillips Screwdriver

< 09K-24K >





< 30K-48K >



⚠ DANGER

- < 09K-24K >

  Do not touch the electrical components when LED1 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

- < 30K-48K >

  Do not touch the electrical components when LED201 (red) on the inverter PCB and LED4 (red) on the outdoor unit PCB are turned ON. It may cause an electric shock.

⚠ WARNING

- TURN OFF all power source switches.

2.7.16 Removing Other Electrical Components

(1) Remove the service cover according to the item “2.7.1 Removing Service Cover”.

(2) Removing Each Electrical Components

(a) Disconnect all the lead wires connecting with the terminal strip.

Remove fixing screws for the terminal strip and remove the terminal strip.

(b) Disconnect all lead wires connected to the debug board.

Remove the debug board by pressing the top of the holder (4 portions) with long-nose pliers.

(3) Open the electrical box according to the item “2.7.10 Opening Electrical Box”.

(4) Remove fixing screws for the reactor and remove the reactor.

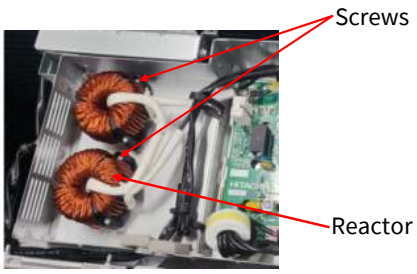
NOTE:

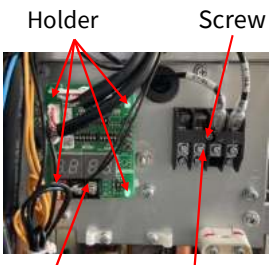
- When electrical components are reassembled, connect correctly lead wires to match the mark bands.
  If the lead wires are connected incorrectly to the terminal, the electrical components will be damaged.

Tool	Phillips Screwdriver, Long-Nose Pliers, Stubby Phillip Screwdriver, No.3 size Phillips Screwdriver

< 09K-24K >

< 30K-48K >

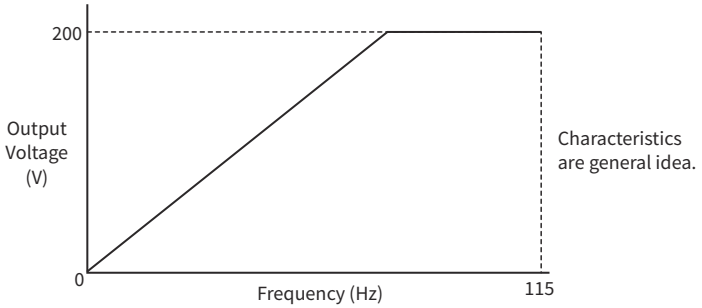
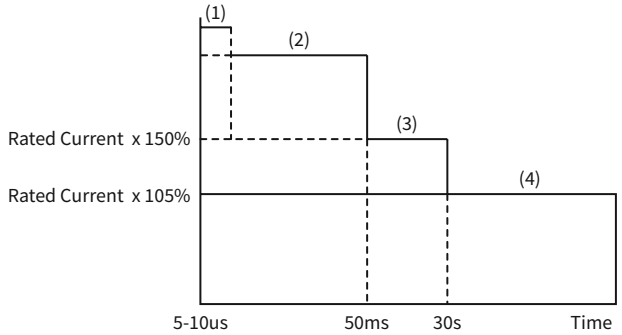




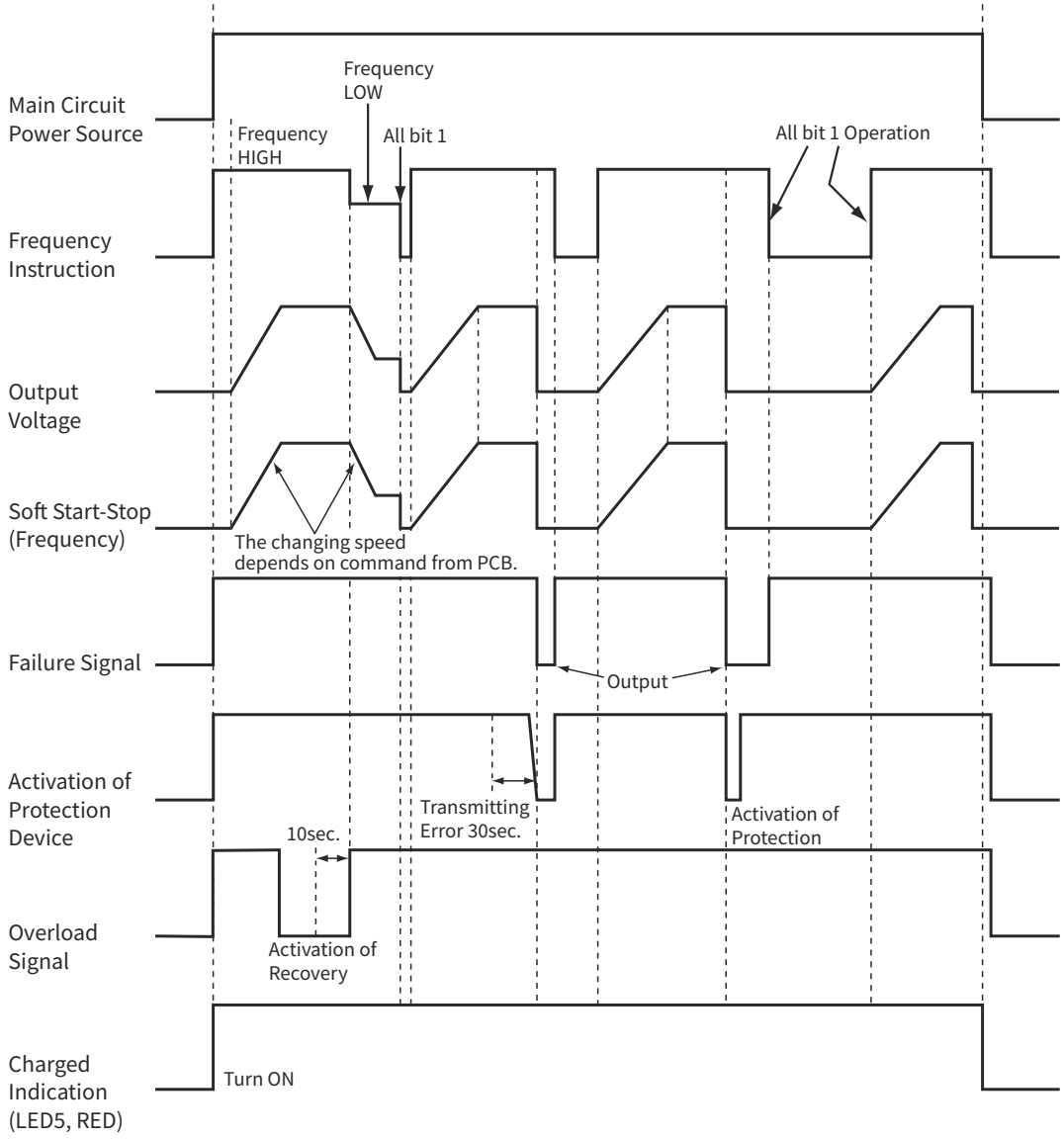
3. Main Parts

3.1 Inverter

3.1.1 Specifications of Inverter

Power Supply	Single phase			
Applicable Model	PAS-09BUFASDQ1 PAS-12BUFASDQ1	PAS-18BUFASDQ1	PAS-24BUFASDQ1	PAS-30BUFASDQ1 PAS-36BUFASDQ1 PAS-48BUFASDQ1
Power Source	AC 208/230V 60Hz			
Input Current (Maximum)	9.5A	14A	16A	30A
Output Current (Maximum)	6A	8.5A	10A	21.5A
Control Method	Vector Control			
Output / Characteristics				
Protection Function				
Excessive High or Low Voltage for Inverter	The output is cut out, when voltage is lower than 196V DC or higher than 424V DC. Cause of Abnormality: Failure of Inverter PCBA, Decreasing Capacity of Condenser, Incorrect Wiring			
Abnormality of Current Sensor (0A Detection)	(1) When the compressor frequency pass through the switching frequency, one of the effective value of running current at each phase is less than 1.5A (including 1.5A). (2) The wave height value of running current for the phase positioning is less than 5A before the compressor is started (at completing the phase positioning). Cause of Abnormality: Failure of Current Sensor (on Inverter PCBA) Failure of IPM, Failure of Compressor, Disconnected Wiring			
Overcurrent Protection for Inverter (Electronic Thermal/ Instantaneous Overcurrent)	 (1) Short-Circuit Trip of Arm (2) Instantaneous Overcurrent Trip } Internal Protection of IPM (3) Instantaneous Overcurrent Trip: It is detected when current value is over rated current x 150%. (4) Electronic Thermal Trip: Condition is maintained longer than 30 seconds or accumulated longer than 3 minutes during 10 minutes sampling time.			
Protection of Dip IPM of Inverter PCBA	The transistor module has three protection functions for self-protection. (1) Some of the output terminals "U", "V" or "W" are short-circuited. (2) Running current of Dip IPM of Inverter PCBA reaches the maximum rated current. (3) Control voltage of Dip IPM of Inverter PCBA abnormally decreases.			
Overload Control	Overload control is cancelled when Current Value ≥ Rated Current x 105% Current Value ≤ Rated Current x 88%			
Fin Temperature Increase	The unit is stopped when the fin temperature is higher than 185°F.			
Earth-Fault Detection	The unit is stopped when the compressor is earthing in starting the compressor.			

3.1.2 Inverter Time Chart



3.1.3 Protective Function

(1) Excessive High or Low Voltage for Inverter

(a) Level of Detection
When the voltage of direct current is higher than 424V, an abnormality is detected.
When the voltage of direct current is lower than 196V, an abnormality is detected.

(b) Function
When an abnormality is detected, the inverter compressor is stopped and transmit the signal code of stoppage cause to outdoor unit PCBA.

(c) Cancellation of Protection Function
Transmission signal about stoppage cause is canceled when the wired remote controller is off or main power source is cut off.

(2) Abnormality of Current Sensor

(a) Level of Detection
- When the compressor frequency pass through the switching frequency, one of the effective value of running current at each phase is less than 1.5A (including 1.5A).
- The wave height value of running current for the phase positioning is less than 5A before the compressor is started (at completing the phase positioning).

(b) Function
When an abnormality is detected, the inverter compressor is stopped, and transmit the signal code of stoppage cause to outdoor unit PCBA.

(c) Cancellation of Protection Function
Transmission signal about stoppage cause is canceled when the wired remote controller is off or main power source is cut off.

(3) Overcurrent Protection for Inverter

(a) Level of Detection
- When the current detected by current sensor reaches 150% of the rated current, overcurrent is detected. (Instantaneous Overcurrent)
- When the current detected by current sensor exceeds 105% of the rated current continuously for 30 seconds or for more than 3 minutes in total during a 10 minutes period, overcurrent is detected. (Electric Thermal Relay)

(b) Function
When an abnormality is detected, the inverter compressor is stopped and transmit the signal code of stoppage cause to outdoor unit PCBA.

(c) Cancellation of Protection Function
Transmission signal about stoppage cause is canceled when the wired remote controller is off or main power source is cut off.

(4) Protection of Dip IPM of Inverter PCBA

(a) Level of Detection
- When some of the output terminals between “U” and “V”, “V” and “W”, “W” and “U” of Dip IPM of inverter PCBA are short-circuited, an abnormality is detected.
- When the running current of Dip IPM of inverter PCBA reaches the maximum rated current, an abnormality is detected.
- When the control voltage of Dip IPM of inverter PCBA abnormally decreases, an abnormality is detected.

(b) Function
When an abnormality is detected, the inverter compressor is stopped and the signal code of stoppage cause is transmitted to outdoor unit PCBA.

(c) Cancellation of Protection Function
Transmission signal about stoppage cause is canceled when the wired remote controller is off or main power source is cut off.

(5) Fin Temperature Increase

(a) Level of Detection
When the temperature of internal thermistor exceeds more than 185°F, an abnormality is detected.

(b) Function
When an abnormality is detected, the inverter compressor is stopped and the signal code of stoppage cause is transmitted to outdoor unit PCBA.

(c) Cancellation of Protection Function
Transmission signal about stoppage cause is canceled when the wired remote controller is off or main power source is cut off.

(6) Earth Detection

(a) Level of Detection
When the starting current of the compressor reaches 80% of the overcurrent protection value, an abnormality is detected.

(b) Function
When an abnormality is detected, the inverter compressor is stopped and the signal code of stoppage cause is transmitted to outdoor unit PCBA.

(c) Cancellation of Protection Function
Transmission signal about stoppage cause is canceled when the wired remote controller is off or main power source is cut off.

3.1.4 Overload Protection Control

(a) Level of Detection
When the output current exceeds 105% of the maximum output current, an abnormality is detected.

(b) Function
An overload signal is issued when output current exceeds 105% of the maximum output current, and the frequency decreases.
For 10 seconds after the output current decreases lower than 88% of the rated current, the compressor maximum frequency is limited to the specified value.
However, if the frequency order is smaller than the maximum value, the operation is performed according to the order.

(c) Cancellation of Protection Function
After the operation described in the above item (b) is performed for 10 seconds, this control is canceled.

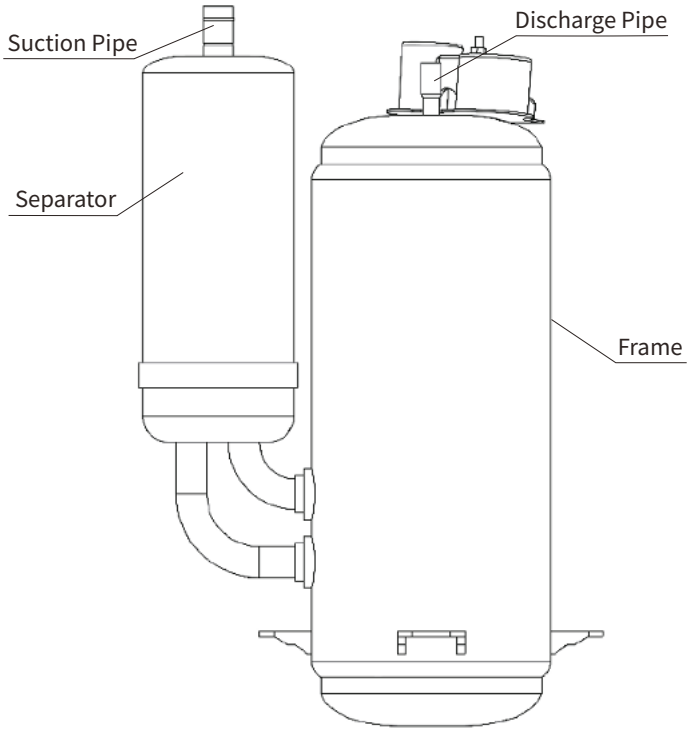
3.2 Rotary Compressor

3.2.1 Reliable Mechanism for Low Vibration and Low Sound

(1) The rotating direction is definite.

(2) The pressure inside of the chamber is high pressure.

3.2.2 Structure

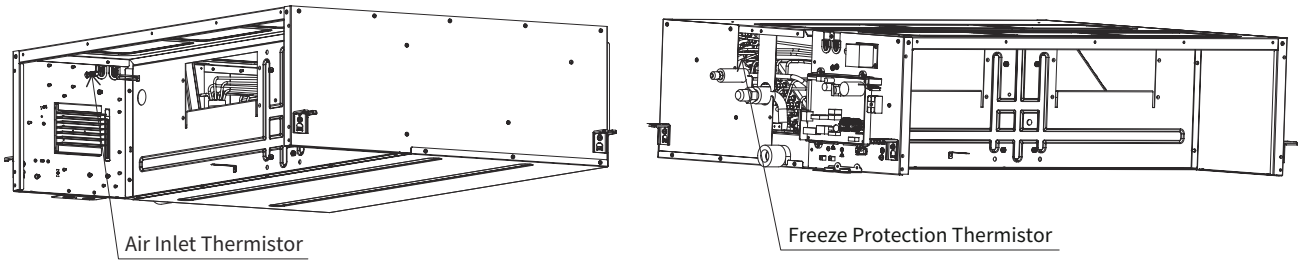


3.3 Thermistor

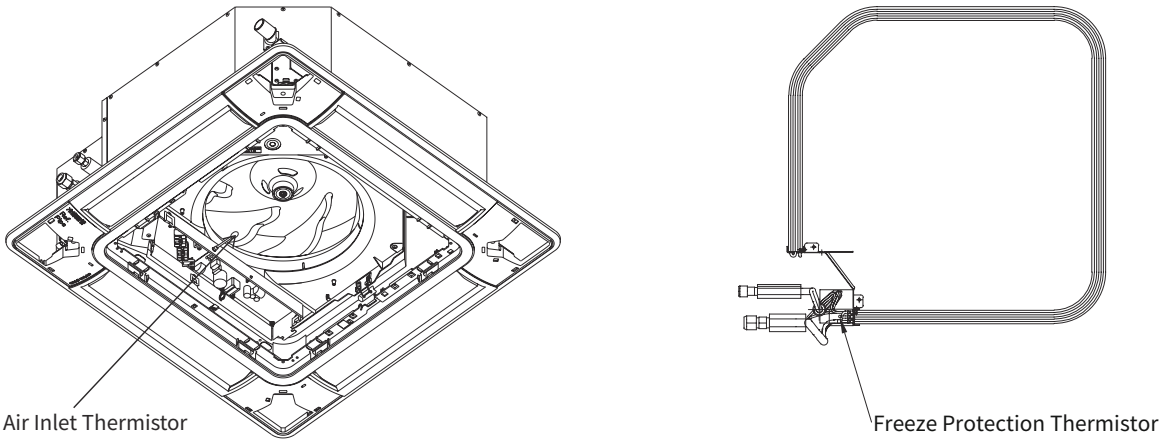
3.3.1 Thermistor for Indoor Unit

(1) Position of Thermistor

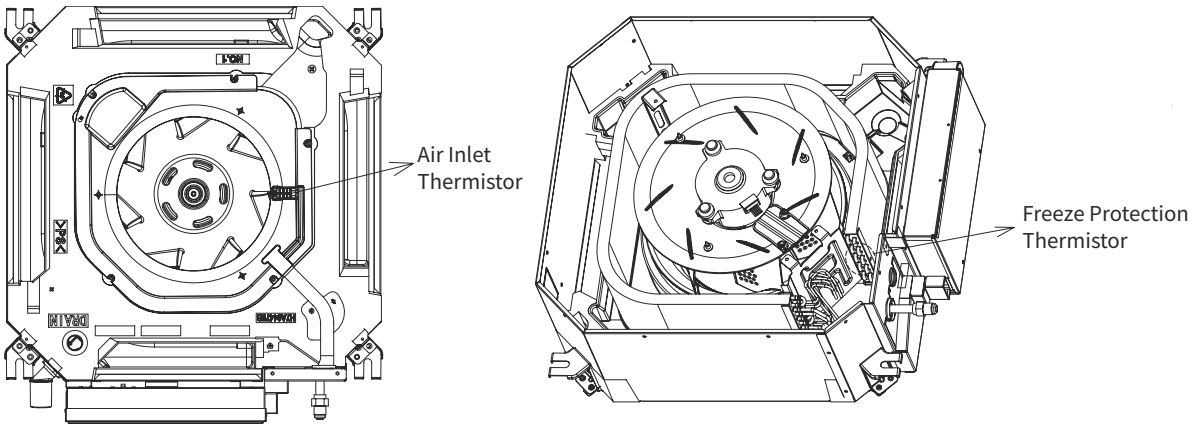
MESP Type



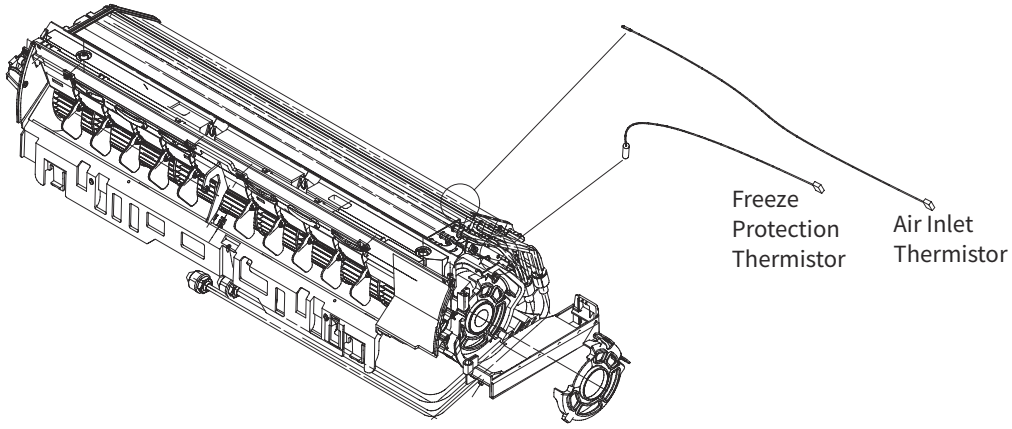
4-Way Cassette Type



4-Way Mini Cassette Type



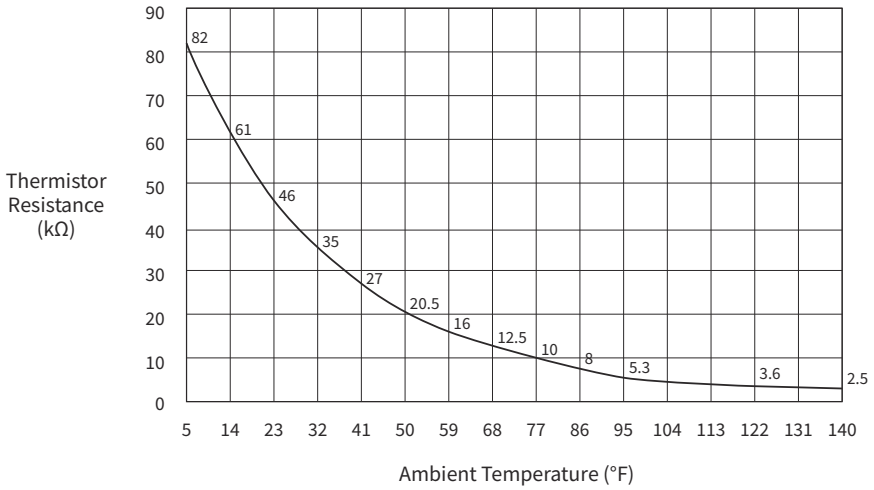
High-wall Type



(2) Thermistor for Indoor Suction Air Temperature (For Room Temperature Control)

The room temperature is controlled by the thermistor for indoor suction air temperature detecting the temperature at the suction air inlet of the indoor unit.

The setting temperature is indicated on the L.C.D. of the remote control switch by number.
Adjust the setting temperature for prevention from excessive cooling and heating.
It is recommended to set the temperature as follows;



Thermistor Characteristics

Economical Cooling Operation: 80°F to 84°F / Economical Heating Operation: 64°F to 68°F
The resistance characteristics of thermistor is shown in the above figure.

ATTENTION:
The thermo-off value of the indoor unit air inlet thermistor is set at the temperature higher than the value indicated on the wired remote controller by 7°F and the maximum is 86°F, because the suction air temperature during heating operation has a tendency to become higher than that of the occupied zone, intending comfortable heating operation.

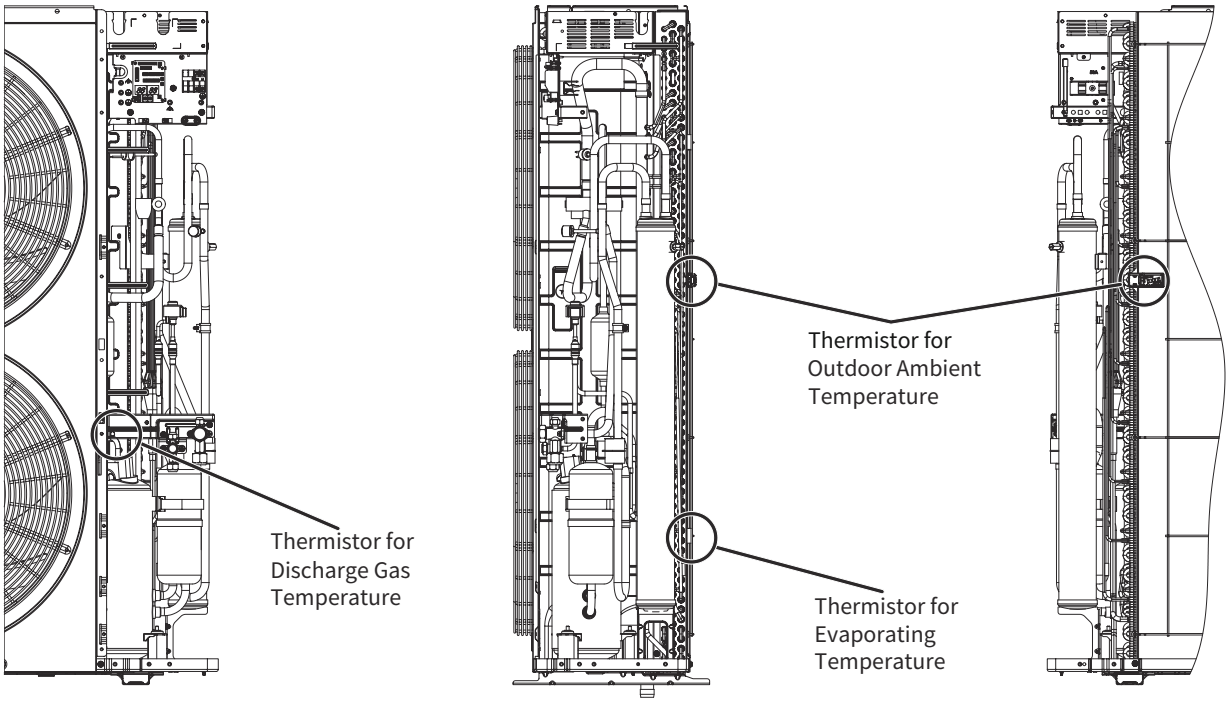
(3) Thermistor for Coil Temperature of Indoor Heat Exchanger

When the temperature of the heat exchanger is below 32°F, the thermostat is turned OFF automatically and when it is over 58°F, the thermostat is turned ON again. → To Prevent freezing of the heat exchanger in COOL and DRY operation.

The resistance characteristics of thermistor is shown in the above figure.

3.3.2 Thermistor for Outdoor Unit

(1) Position of Thermistor

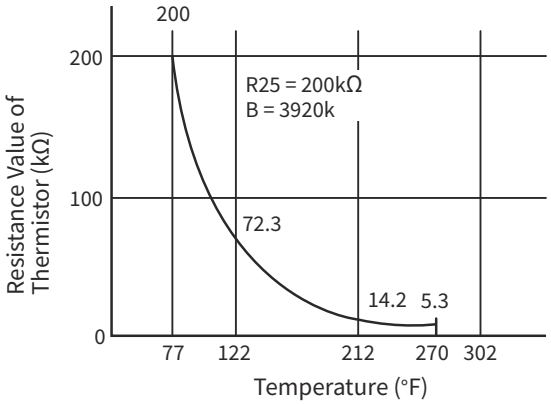


(2) Thermistor for Upper Part Temperature of Compressor
(For Prevention of Discharge Gas Overheating)

(a) A thermistor for the upper part temperature of the compressor is installed to prevent discharge gas from overheating.
If discharge gas temperature increases excessively lubricating oil deterioration occurs and lubricating properties deteriorate, resulting in short compressor life.

(b) If discharge gas temperature increases excessively, compressor temperature increases. At the worst, compressor motor winding will be burnt out.

(c) When the upper part temperature of compressor increases during heating operation, the unit is controlled according to the following method.



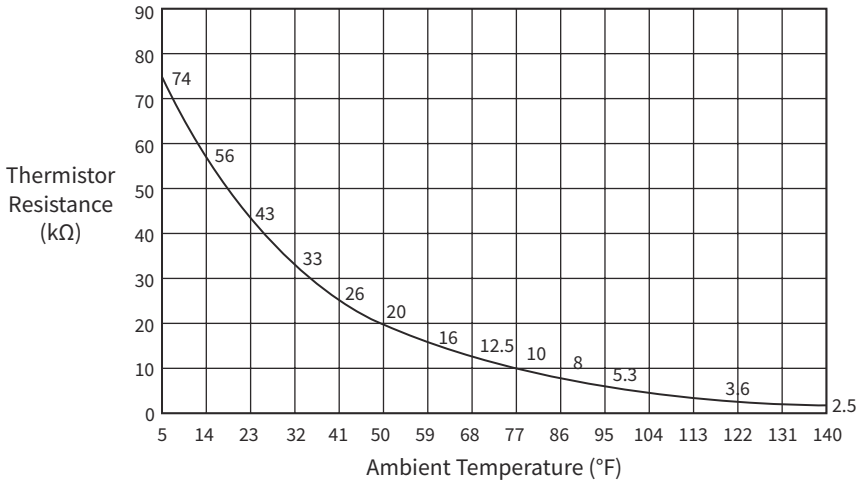
Resistance Characteristics of Thermistor
for Discharge Gas Overheating Protection

(d) If compressor upper part temperature increases excessively, the protection control is activated and the compressor forced frequency reduction according to the following method.

Upper Part Temperature of Compressor	Compressor Frequency
Blow 198°F	Normal control
198°F~212°F	Prohibit increasing
Over 212°F	Forced descent

(3) Thermistor for Ambient Temperature
The thermistor resistance characteristics are shown in the figure below.

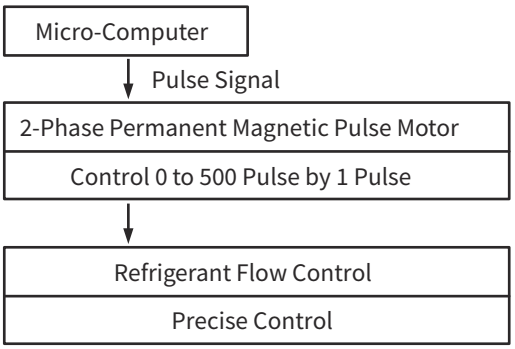
(4) Thermistor for Evaporating Temperature of Outdoor Unit in Heating Operation (For Defrosting)
The characteristics for the thermistor is the same with the value of ambient thermistor as shown in the figure below.

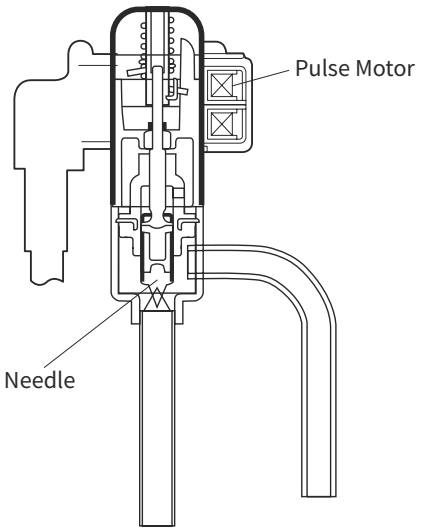


Ambient and Evaporating Temp. Thermistor Characteristics for Outdoor Unit

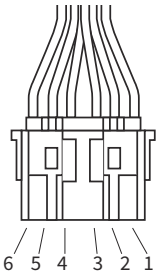
3.4 Electronic Expansion Valve

Electronic Expansion Valve for Outdoor Units





Specifications

Items	Specifications
Type	CAM Series
Refrigerant Used	R32, R410A, R407c
Ambient Temperature	-22°F to 140°F (Duty ratio 50% Max) -22°F to 158°F (Duty ratio 20%)
Liquid Temperature	-22°F to 158°F (Duty ratio 50% Max)
Valve Location	value location: Motor upside or to vertical(within ±90°)
Operating Pressure	0 to 602Psig
Flow Direction	bidirectional
Rated Voltage	DC12V±10%
Recommended Drive Condition	unipolar drive,1-2 phase excitation
Pulse rate	30 to 90 pps
Full Stroke Pulses	500 Pulses
Coil Resistance	46Ω±4Ω(at 68°F)
Wiring Diagram, Drive Circuit and Activation Mode	 Arrangement of Connector No.

Connector No.	Color of Lead Wire
1	Red
2	Brown
3	Blue
4	Orange
5	Yellow
6	White

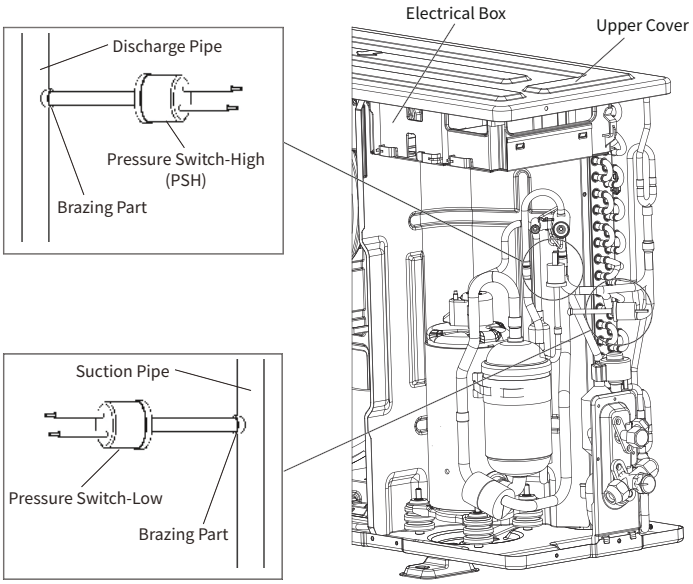
< Checking Method of Coil for Electronic Expansion Valve >

1. Measure the coil resistance between the connector No. 1 (common) and each phase.
2. The measured resistance value is normal if approximately 46 ± 4Ω in an ambient temperature of 68°F.

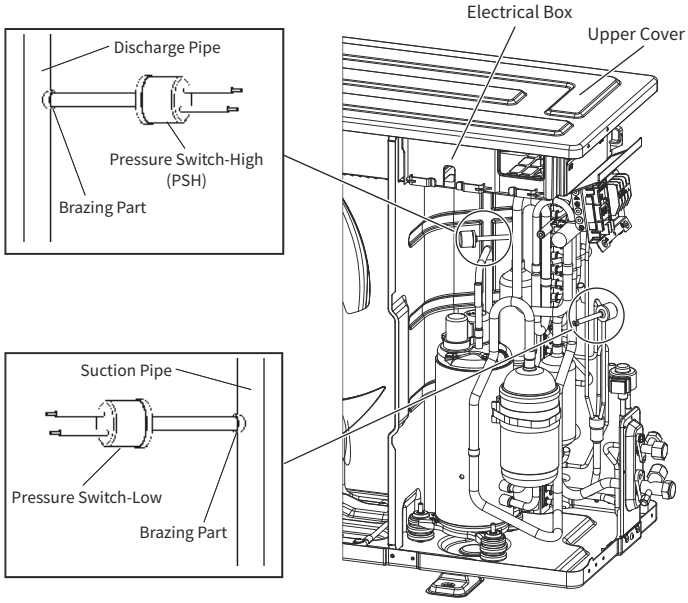
3.5 Pressure Switch-High for Protection

When the discharge pressure reaches 601.9PSI(4.15MPa), compressor is stopped to protect the refrigerant cycle components.

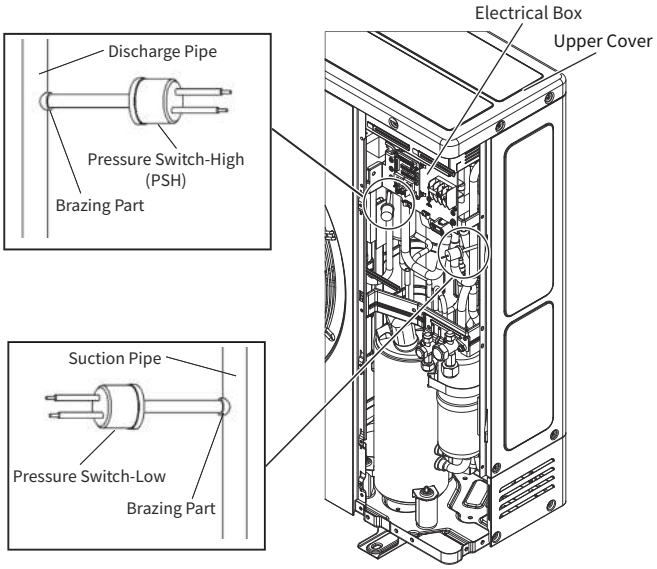
< PAS-09BUFASDQ1~PAS-12BUFASDQ1 >



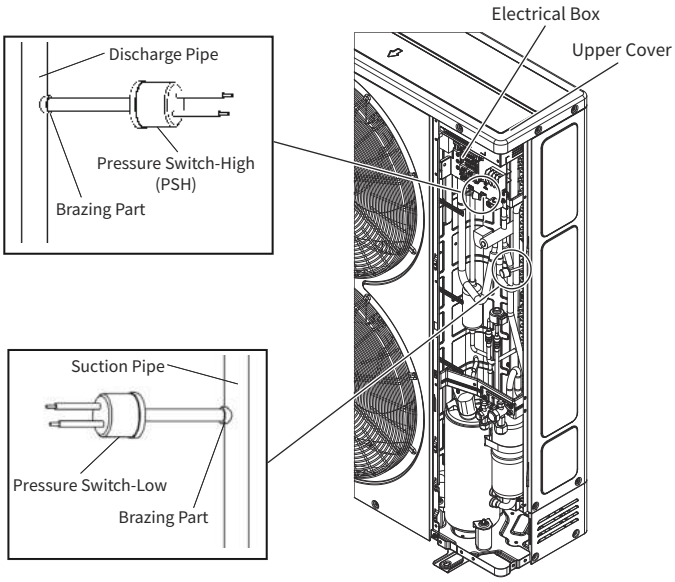
< PAS-18BUFASDQ1~PAS-24BUFASDQ1 >



< PAS-30BUFASDQ1~PAS-36BUFASDQ1 >



< PAS-48BUFASDQ1 >



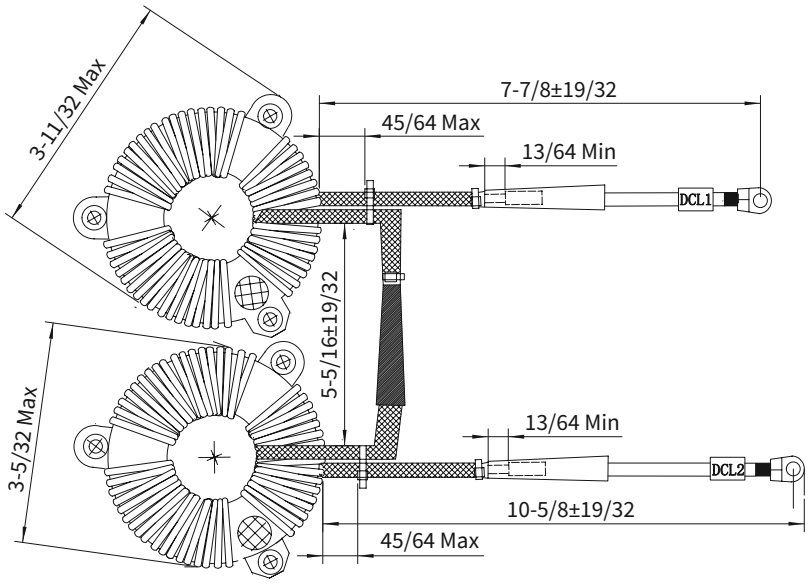
3.6 Reactor (DCL)

This part is used for changing the alternative current to the direct current for the inverter.

208/230V, 60Hz(DCL)

Items	Specifications
Character	437μH Min.(at 0A, 25KHz, 0.3V, 68°F)
	376μH Min.(at38A, 25KHz, 0.3V, 68°F)
Rated Current	AC 38A
Direct Current Resistance	42mΩ Min.
Permissible Temperature Range	-22°F to 158°F

(inch)



4. Optional Function

NOTE:

- The wired remote controller can be used with all airCore 700 indoor units, some functions maybe not available for some indoor unit types.

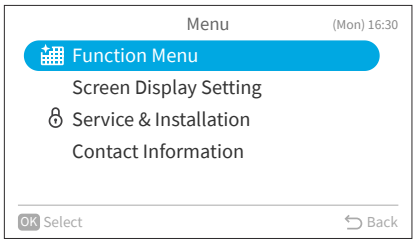
4.1 Optional Function Setting Method from Wired Remote Controller

The function selection and the input/output setting can be set from Installation Menu.

- Setting Method

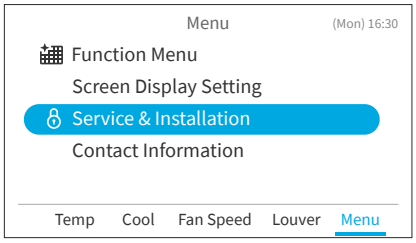
Step1. Enter Menu

Turn the air conditioner OFF, press "›" to scroll across to the "Menu" and press "OK" to display the Menu screen.



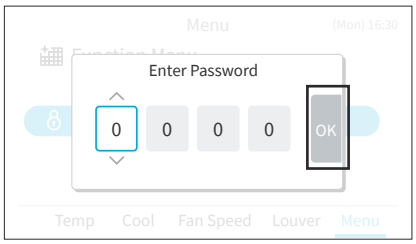
Step2. Select "Service & Installation"

Select "Service & Installation" and press "OK".



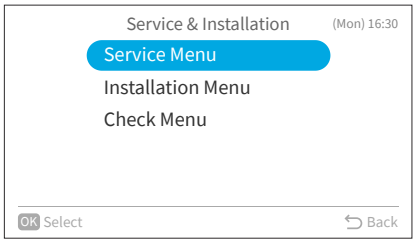
Step3. Input Password

Input password by pressing "^", "v", "<", or ">", select "OK".
Then press "OK".
Password is required to prevent unintentional and unauthorised settings.
The default user password is "0000".



Service & Installation Menu screen is displayed.

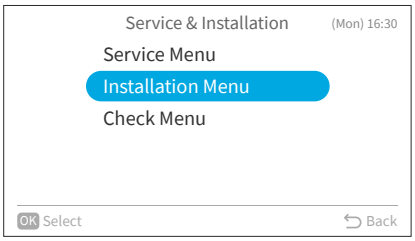
If the password input effective time has been set to "Everytime" then the password will need to be entered each time the Service and Installation menu is accessed. If the password input effective time has been set to either 10, 30, 60 or 120 minutes, then the password prompt will not display if accessed within these durations.



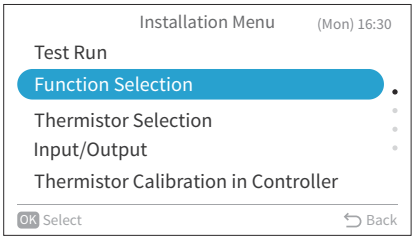
- Function Selection

Function Selection is set from Installation Menu.

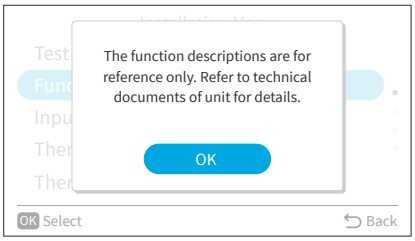
Step1. Select "Installation Menu" and press "OK" .



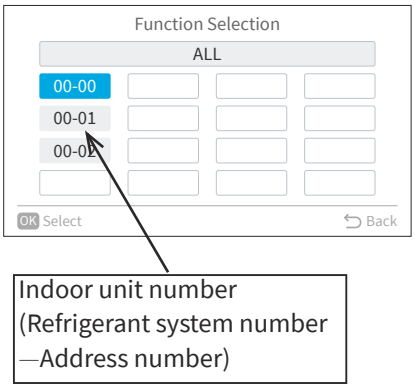
Step2. Select "Function Selection "and press "OK".



Step3. Press "OK".

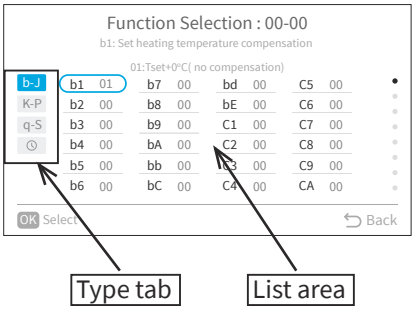


Step4. Press "∧", "∨", "<", or ">" to select the indoor unit to be set and press "OK".
This screen is not displayed when only one indoor unit is connected to the wired remote controller. (The screen in Step5 is shown.)



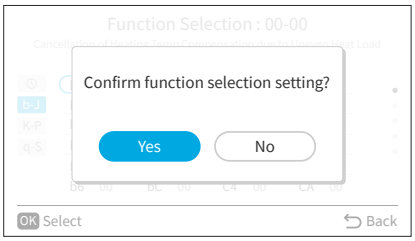
Step5. Press "∧" or "∨" to select the type tab and press "OK".
→It changes in the order of "b-J" ↔ "K-P" ↔ "q-S" ↔ "🕒".

Step6. Press "∧", "∨", "<", or ">" to select the item to set from the list.
Press "OK" and press "<" or ">" to change the setting value.
After selecting the setting value, press "⮌" to return to the setting item selection mode.
To return to Step 5, press "⮌" in the setting item selection mode.



Step7. To confirm the setting, press "⮌" in the tab selection mode.

Step8. Select "Yes" and press "OK" to confirm the setting and return to Step2.
Select "No" and press "OK" to discard the settings and return to Step2.
Press "⮌"to return to Step5.



OPTIONAL FUNCTION

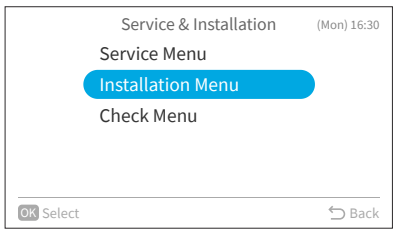
(Operation from Wired Remote Controller)

- Input/Output Setting

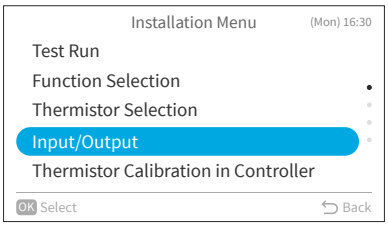
Set Input/output from the Installation Menu. Please refer to Table 4.1 and Table 4.2 for details on each input setting.

1. Set Input/Output

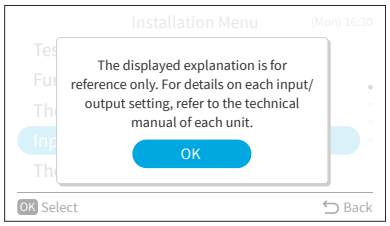
Step1. Select "Installation Menu" on the Service & Installation screen and press "OK" .



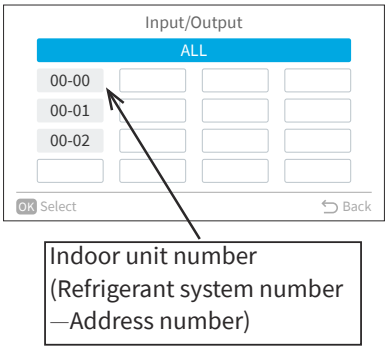
Step2. Select "Input/Output" setting and press "OK".



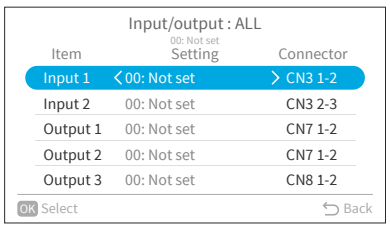
Step3. Press "OK".



Step4. Select the indoor unit by pressing "∧", "∨", "<", or ">" and press "OK".
(This screen is NOT displayed when only one indoor unit is connected with the controller. In this case, "Step4" is displayed.)



Step5. Press "∧" or "∨" to select the item.
Step6. Press "<" or ">" to change the setting.



Step7. Press "OK" and the confirmation screen is displayed.
Step8. Select "Yes" and press "OK" to confirm the setting and the screen returns to Step2.
If "Cancel" is selected, the setting is cancelled and the screen returns to Step2.
If there is more than one indoor unit connected to the remote controller, the screen returns to Step3.
Press "⮌" to return to Step4.

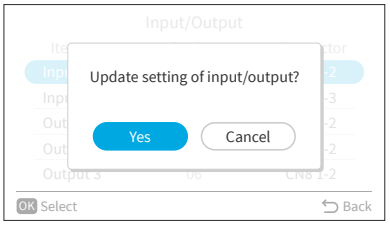


Table 4.1 Input and Output Number Display and Connectors

Input Number Display	Port	Factory Setting		Setting
Input/Output Indication		Setting Item	Indication	
Input 1	CN3 1-2	Remote ON/OFF 1 (Level)	03	
Input 2	CN3 2-3	Forbidding Remote Control after Manual Stoppage	06	
Output 1	CN7 1-2	Operation	01	
Output 2	CN7 1-3	Alarm	02	
Output 3	CN8 1-2	Thermo-ON for Heating	06	

Table 4.2 Input and Output Settings and Display Codes

Code Indicated	Input	Output
00	Not set	Not set
01	Room Thermostat (for Cooling)	Operation
02	Room Thermostat (for Heating)	Alarm
03	Remote ON/OFF 1 (Level)	Cooling
04	Remote ON/OFF 2 (Operation)	Thermo-ON for Cooling
05	Remote ON/OFF 2 (Stoppage)	Heating
06	Forbidding Remote Control after Manual Stoppage	Thermo-ON for Heating
07	Remote Cooling / Heating Change	Total Heat Exchanger
08	Elevate Grille Input	Elevate Grille Output
09	Setback Operation	Fan Operation
10~15	Not set	Not set

NOTES:

- Change the optional setting after waiting at least three minutes elapsed time after start-up.
- Do not set the elevating grille for the total heat exchanger.
- Record the setting conditions for each input and output in the "Setting" column of the table.

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

4.1.1 Function Selection Item

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
1	b1	Set heating temperature compensation(*1)	○	00 01 02 03 04	Tset +7°F(default setting) Tset+0°F(no compensation) Tset+3°F (*2) Tset+5°F Tset+2°F	
2	b2	Circulator Function during Heating Thermo-OFF	○	00 01	Unavailable Available	
3	b3	Not used	×	00 01	00 01	
4	b4	Change of filter cleaning period	○	00 01 02 03 04	1200h(default setting) 100h 1200h 2500h No Indication	
5	b5	Lock operation mode on controller	×	00 01	Usual setting Locked (*3)	
6	b6	Lock temperature setting on remote controller	×	00 01	Standard Fixed	
7	b7	Set operation mode as Cooling Unit	×	00 01	Usual setting Locked	
8	b8	Automatic Cool/Heat operation	×	00 01	Unavailable Available	
9	b9	Lock fan speed setting on controller	×	00 01	Standard Locked	
10	bA	Not used	-	-	Not Used(Use as 00 setting conditions)	
11	bb	Set cooling temperature compensation	×	00 01 02	Tset+0°F(no compensation, default setting) Tset–2°F Tset–3°F	
12	bC	Not used	-	00 01	00 01	
13	bd	Not used	-	00 01	00 01	
14	bE	Not used	-	00 01	00 01	
15	C1	Not used	-	00 01	00 01	
16	C2	Not used	-	-	Not Used(Use as 00 setting conditions)	
17	C3	Not used	-	00 01	00 01	
18	C4	Not used	-	00 01	00 01	
19	C5	Static pressure sel. / Increase Fan Hi speed	○	00 01 02	Standard static pressure/ Standard speed High static pressure/ Hi speed 1(*4) Low static pressure/ Hi speed 2	
20	C6	Increase of fan speed at heating Thermo-OFF	○	00 01	Unavailable Available	
21	C7	Cancel 3 min. compressor starting delay	○	00 01	Standard Cancellation	
22	C8	Sensor selection for indoor temp. control	○	00 01 02	Indoor air suction sensor/ average air suction-THM4 Wired controller sensor/ THM4(remote sensor) Average return air sensor and (controller sensor or remote sensor)	
23	C9	Not used	-	-	Not Used(Use as 00 setting conditions)	
24	CA	Not used	-	-	Not Used(Use as 00 setting conditions)	
25	Cb	Selection of forced stoppage logic	○	00 01	Normally Open Normally Closed	
26	CC	Not used	-	00 01	00 01	
27	Cd	Not used	-	00 01	00 01	
28	CE	Not used	-	00 01	00 01	

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
29	CF	Change of Louver Swing Angle	○	00 01 02	Standard setting (7 steps) Cold draft (5 steps) High ceilings (5 steps)	
30	d1	Power Supply ON/OFF 1	○	00 01	Unavailable Available	
31	d2	Not used	-	-	Not Used(Use as 00 setting conditions)	
32	d3	Power Supply ON/OFF 2	○	00 01	Unavailable Available	
33	d4	Prevention of low air outlet temperature in cooling mode(*5)	○	00 01	Unavailable Available	
34	d5	Prevention of low air outlet temperature in heating mode	○	00 01	Unavailable Available	
35	d6	Not used	-	00 01	00 01	
36	d7	Lower the elevating grille	-	00 01 02 03 04 05 06 07	Default setting 100 cm 150 cm 200 cm 250 cm 300 cm 350 cm 400 cm	
37	E1	Ventilation Mode(for Total Heat Exchanger)	-	00 01 02	AUTO venti./ Disabled/ Standard process THEX venti. Normal venti.	
38	E2	Increasing Supply Air Volume(for Total Heat Exchanger)	-	00 01	Unavailable Available	
39	E3	Not used	-	00 01	00 01	
40	E4	Precooling / Preheating Period(for Total Heat Exchanger)	-	00 01 02	Function not available (default setting) 30 min. 60 min.	
41	E5	Not used	-	00 01	00 01	
42	E6	Indoor fan operation time after cooling operation stoppage	○	00 01 02	Unavailable 60 min. 120 min.	
43	E7	Not used	-	00 01	00 01	
44	E8	Indoor Unit fan control during heating Thermo-OFF (remote sensor)	○	00 01	Fan operation is Low speed (default setting) Fan stopped (with remote sensor) or Slow speed (without remote sensor)	
45	E9	Not used	-	00 01	00 01	
46	EA	Not used	-	00 01	00 01	
47	Eb	IU Fan speed during cooling thermo-off	○	00 01 02	Function deactivated (default setting) Low Slow	
48	EC	Forced Thermo-ON after cooling operation stop	○	00 01	Unavailable Available	
49	Ed	Not used	-	00 01	00 01	
50	EE	Automatic Fan Speed Control	○	00 01	Unavailable Available	
51	EF	IU fan speed set to Auto allowing High 2 speed	○	00 01	Unavailable Available	
52	F0	Not used	-	-	Not Used(Use as 00 setting conditions)	

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
53	F1	Automatic OFF Timer Setting	×	00 01 02 • • 23 24 0A 0B 0C 0D 0E 0F	No Function 1h 2h • • 23h 24h 30 min. 90 min. 40 min. 45 min. 50 min. 55 min.	
54	F2	Controller primary-secondary setting	×	00 01	Primary Secondary	
55	F3	Automatic Reset of Setting Temperature (*6)	×	00 01	Unavailable Available	
56	F4	Automatic Reset Time	×	00 01 02 03	30 min. 15 min. 60 min. 90 min.	
57	F5	Automatic Reset Temperature for Cooling (*7)	×	19 20 21 22 23 24 25 26 27 28 29 30	66°F 68°F 70°F 72°F 74°F 76°F 77°F 78°F 80°F 82°F 84°F 86°F	
58	F6	Automatic Reset Temperature for Heating (*10)	×	17 18 19 20 21 22 23 24 25 26 27 28 29 30	62°F 64°F 66°F 68°F 70°F 72°F 74°F 76°F 77°F 78°F 80°F 82°F 84°F 86°F	
59	F7	Operation stoppage prevention by wired controller operation error(*9)	×	00 01	Unavailable Available	
60	F8	Lock Function for Operation Mode Selection	×	00 01	Unavailable Available	
61	F9	Lock Function for Temperature Setting	×	00 01	Unavailable Available	
62	FA	Lock Function for Fan Speed Selection	×	00 01	Unavailable Available	
63	Fb	Lock Function for Swing Louver Operation	×	00 01	Unavailable Available	

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
64	FC	Lower limit for cooling temperature setting (*7)	×	00 01 02 03 04 05 06 07 08 09 10	66°F(Default setting) 68°F 70°F 72°F 74°F 76°F 77°F 78°F 80°F 82°F 84°F	
65	Fd	Upper limit for heating temperature setting (*8)	×	00 01 02 03 04 05 06 07 08 09 10 11 12	86°F(Default setting) 84°F 82°F 80°F 78°F 77°F 76°F 74°F 72°F 70°F 68°F 66°F 64°F	
66	FE	Not used	-	00 01	00 01	
67	FF	Not used	-	00 01	00 01	
68	H1	Not used	-	00 01	00 01	
69	H2	Indication of Hot Start	×	00 01	Indication No Indication	
70	H3	Not used	-	00 01	00 01	
71	H4	Not used	-	00 01	00 01	
72	J1	Not used	-	00 01	00 01	
73	J2	Not used	-	-	Not Used(Use as 00 setting conditions)	
74	J3	Run Indicator Color	×	00 01	Green Red	
75	J4	Not used	×	00 01	00 01	
76	J5	Not used	-	00 01	00 01	
77	J6	Error Sound	×	00 01	Once Continuous	
78	J7	Not used	×	00 01	00 01	
79	J8	Eco-operation (*9)	×	00 01	Unavailable Available	
80	J9	Not used	-	00 01	00 01	
81	JA	Select the Simple Maintenance menu	×	00 01	Unavailable Available	
82	Jb	Not used	-	00 01	00 01	

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
83	JC	Calibration for controller temp. sensor	×	00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15	0°F -1°F -2°F -3°F -3°F -4°F -5°F -6°F +1°F +2°F +3°F +3°F +4°F +5°F +6°F 0°F	
84	Jd	Upper limit for cooling temperature setting	-	00 01 02 03 04 05 06 07 08 09 10	86°F 84°F 82°F 80°F 78°F 77°F 76°F 74°F 72°F 70°F 68°F	
85	JE	Lower limit for heating temperature setting	-	00 01 02 03 04 05 06 07 08 09 10 11 12	62°F 64°F 66°F 68°F 70°F 72°F 74°F 76°F 77°F 78°F 80°F 82°F 84°F	
86	K1	Not used	-	00 01	00 01	
87	K2	Not used	-	00 01	00 01	
88	K3	Not used	-	00 01	00 01	
89	K4	Not used	-	00 01	00 01	
90	K5	Motion sensor detection level	○	00 01 02	Standard setting High Low	
91	K6	Operation mode selection when IDU control sensor is defined by C8 function	○	00 01 02 03	ALL COOL/DRY HEAT ALL	
92	K7	Radiant Temp. sensor detection level	-	00 01 02 03	Default setting Upper Lower Preliminary setting	
93	K8	Not used	-	00 01	00 01	
94	K9	Not used	-	00 01	00 01	
95	KA	Not used	-	00 01	00 01	

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
96	L1	Setting Position of Motion Sensor	-	00 01 02 03	A B -- D	
97	L2	Not used	-	00 01	00 01	
98	L3	Select louver operation in energy-saving Th.-OFF (COOL & DRY)(*10)	○	00 01 02	Low air flow Medium air flow High air flow	
99	L4	Fan Speed during Energy-Saving Forced Thermo-OFF	○	00 01	Usual setting Available	
100	L5	Louver Swing Operation Energy-Saving Forced Thermo-OFF	○	00 01	Unavailable Available	
101	L6	Not used	-	00 01	00 01	
102	L7	Not used	-	-	Not Used (Use as 00 setting conditions)	
103	L8	Not used	-	00 01	00 01	
104	L9	Not used	-	00 01	00 01	
105	LA	Humidifier blow control On/Off	-	00 01	Unavailable Available	
106	Lb	Humidifier blow control time setting	-	00 01	4hours ON 30min OFF 30min ON 10min OFF	
107	P1	Setting temperature	×	00 01	1°F steps 2°F steps	
108	P2	Not used	-	00 01	00 01	
109	P3	Select temperature sensor(*11)	×	00 01 02 03	Inlet Air Thermistor Outlet Air Thermistor Thermistor of Wired Controller Remote Sensor	
110	P4	Temperature sensor display(*12)	×	00 01	Unavailable Available	
111	P5	Temperature setting display in fan mode	×	00 01	Show Hide	
112	P6	Not used	-	00 01	00 01	
113	P7	Menu screen transition prohibited	×	00 01	Unavailable Available	
114	P8	Maintenance explanation display	×	00 01	Available Unavailable	
115	P9	Alarm explanation display	×	00 01	Available Unavailable	
116	PA	Daylight Savings Time	×	00 01	00 01	
117	Pb	Not used	-	00 01	00 01	
118	PC	Not used	-	00 01	00 01	
119	q1	Not used	×	00 01	00 01	
120	q2	Not used	×	00 01	00 01	
121	q3	Not used	×	00 01	00 01	
122	q4	Not used	×	00 01	00 01	
123	q5	Not used	×	00 01	00 01	
124	q6	Not used	×	00 01	00 01	
125	q7	Not used	×	00 01	00 01	

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
126	q8	Not used	-	00 01	00 01	
127	q9	Not used	-	00 01	00 01	
128	qA	Not used	-	00 01	00 01	
129	qb	Operation mode with Setback	×	00 01 02 03	Unavailable COOL only HEAT only COOL & HEAT	
130	qC	Temp. differential for the Setback operation	×	00 01 02 03 04	3°F 5°F 7°F 9°F 2°F	
131	qd	Minimum stop time of Setback	×	00 01 02 03 04 05 06 07 08 09 10 11	10 min. 20 min. 30 min. 40 min. 50 min. 60 min. 70 min. 80 min. 90 min. 100 min. 110 min. 120 min.	
132	qE	Setback Mode	×	00 01 02 03	Always Input Schedule Manual	
133	qF	Operation state after Setback operation ends	×	00 01 02	Stop Run State before Setback Operation	
134	r1	Dual Setpoint	×	00 01	Unavailable Available	
135	r2	Differential temp. setting for Cooling-Heating changeover	×	00 01 02 03 04 05	2°F(Default) 3°F 3°F 4°F 5°F 1°F	
136	r3	Setback Temperature Compensation	×	05 10 15 20 25 30 35 40 45 50 55	1°F 2°F 3°F 3°F 4°F 5°F 6°F 7°F 8°F 9°F 10°F	
137	r4	Enable/Disable Auto-FrostWash 2	-	00 01	Available Unavailable	
138	r5	Not used	-	00 01	00 01	
139	r6	FrostWash Manual Setting	×	00 01	Allow Prohibit	
140	r7	FrostWash Automatic Setting	×	00 01	Allow Prohibit	
141	r8	Enable/Disable Auto-FrostWash	×	00 01	Disable Enable	
142	r9	Remote control prohibition during Setback operation	×	00 01 02	Run/Stop allowed Run & Stop not allowed (not advised for safety reasons) Only stop allowed	

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
143	rA	FrostWash interval settings	×	00	100h	
				01	200h	
				02	400h	
				03	50h	
				04	100h	
				05	100h	
				06	100h	
				07	100h	
144	rb	Minimum Cool/Heat Time for Auto Cool/Heat Operation	×	00	Unavailable	
				01	10 min.	
				02	20 min.	
				03	30 min.	
				04	40 min.	
				05	50 min.	
				06	60 min.	
				07	70 min.	
				08	80 min.	
				09	90 min.	
				10	100 min.	
				11	110 min.	
				12	120 min.	
145	rC	Max. outdoor temp. for Heat operation in Auto Cool-Heat Dual Setpoint	×	00	Unavailable	
				01	68°F	
				02	70°F	
				03	72°F	
				04	74°F	
				05	75°F	
				06	77°F	
				07	78°F	
				08	80°F	
				09	82°F	
				10	84°F	
				11	86°F	
				12	88°F	
				13	90°F	
				14	92°F	
				15	94°F	
				16	95°F	
				17	96°F	
				18	99°F	
				19	100°F	
				20	102°F	
				21	104°F	
				22	32°F	
				23	34°F	
				24	36°F	
				25	38°F	
				26	40°F	
				27	41°F	
				28	42°F	
				29	44°F	
				30	46°F	
				31	48°F	
				32	50°F	
				33	52°F	
				34	54°F	
				35	56°F	
				36	58°F	
				37	59°F	
				38	61°F	
				39	62°F	
				40	64°F	
				41	66°F	

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
146	rd	Min. outdoor temp. for Cool operation in Auto Cool-Heat Dual Setpoint	×	00	Unavailable	
				01	50°F	
				02	52°F	
				03	54°F	
				04	56°F	
				05	58°F	
				06	59°F	
				07	61°F	
				08	62°F	
				09	64°F	
				10	66°F	
				11	68°F	
				12	70°F	
				13	72°F	
				14	74°F	
				15	75°F	
				16	77°F	
				17	78°F	
				18	80°F	
				19	82°F	
				20	84°F	
				21	86°F	
				22	88°F	
				23	90°F	
				24	92°F	
				25	94°F	
				26	95°F	
				27	96°F	
				28	99°F	
				29	100°F	
				30	102°F	
				31	104°F	
				32	-4°F	
				33	-2°F	
				34	0°F	
				35	2°F	
				36	4°F	
				37	5°F	
				38	6°F	
				39	8°F	
				40	10°F	
				41	12°F	
				42	14°F	
				43	16°F	
				44	18°F	
				45	20°F	
				46	22°F	
				47	23°F	
				48	24°F	
				49	26°F	
				50	28°F	
				51	30°F	
				52	32°F	
				53	34°F	
				54	36°F	
				55	38°F	
				56	40°F	
				57	41°F	
				58	42°F	
				59	44°F	
				60	46°F	
				61	48°F	

No.	Item	Optional Function	Individual Setting	Setting Condition	Contents	Setting
147	rE	Setback Activating Temp. for Heat Mode	×	00 01 02 03 04 05 06 07 08 09	59°F 60°F 62°F 64°F 66°F 50°F 52°F 54°F 56°F 58°F	
148	rF	Setback Activating Temp. for Cool Mode	×	00 01 02 03 04 05 06 07 08 09 10	78°F 80°F 82°F 84°F 86°F 88°F 90°F 92°F 94°F 95°F 77°F	
149	S1 (*13)	Econo outside air high humidity control	-	00 01	Unavailable Available	
150	S2	24-hour ventilation control	-	00 01	Unavailable Available	
151	S3	NightPurge control	-	00 01	Unavailable Available	
152	S4	Fan control based on CO2 sensor	-	00 01	Unavailable Available	
153	S5	Rapid ventilation control at the start of operation	-	00 01	Unavailable Available	
154	S6	Humidifier drying operation	-	00 01 02	90 min 180 min Unavailable	
155	S7	Suction humidity level setting	-	00 01 02 03	Unavailable High Med Low	
156	S8	Suction humidity control setting	-	00 01 02	Standard High Humidity Low Humidity	

(*1): Even if temperature sensor selection is changed through “P3” setting, the compensation value will not be changed automatically. Please change b1 setting according to temperature sensor selection.
(*2): The “02”, “03”, “04” settings may not be available depending on the type of indoor unit. When connecting multiple indoor units, do separate settings.
(*3): It is not applicable for Auto mode.
(*4): If Duct type models, 00: Increasing fan speed 1 (standard), 01: Increasing fan speed 2 (high static pressure), 02: Standard (low static pressure).
(*5): Since it depends on the model, please refer to the Service Manual of each model.
(*6): If the set temperature is changed and kept within the set time at “F4”, the temperature is automatically changed to “F5” and “F6”. (If the set temperature is out of range at “F5” and “F6”, it is applied within the upper and lower limits for the set temperature.)
(*7): Applicable to the fan, cooling and dry operation modes.
(*8): Applicable to the heating operation mode.
(*9): When the unit is restarted by the controller, the temperature automatically changes to the setting temperature of “F5” or “F6”.
(*10): Available only for 4-Way Cassette Type, 4-Way Cassette Compact Type.
(*11): Setting “P4” to “01”, then the temperature of selected thermistor (sensor) can be shown.
(*12): Setting “01” can show sensor temperature selected in “P3”.
(*13): Items “S1~S8” are available only for new econo-fresh units.

(Operation from Wired Remote Controller)

NOTES:

- Power ON, wait 3 minutes and then change the optional setting.
- When changing the "CF" setting (changing the louver swing angle), restore the power supply or allow the louver to make one complete swing fully in the auto-swing mode to apply the optional setting.
- The optional settings may be different according to the indoor and outdoor unit models. Check to ensure that the unit has the optional setting.
- Record the setting conditions for each optional setting in the "Setting" column of the table above.
- The above optional functions marked with an "X" at the individual setting can change the condition only when "All Indoor Units" is set.
- Up to 24 history records can be saved.
- The history is initialized when the function selection and the input/output is initialized.

4.1.2 Description of Function Selection Item

(1) Set heating temperature compensation (b1)
This function is utilized when the temperature settings of the wired remote controller and the inlet air temperature of the indoor unit are required to be equal.
This is useful when the inlet air thermistor is removed and installed in another place such as outside of indoor unit, etc.

Setting Temperature for Room Temperature Control at Heating

Setting Condition	Actual Control Temperature
00 (Standard)	Wired Remote Controller Setting Temperature (Indicated Value) +7°F
01	Wired Remote Controller Setting Temperature (Indicated Value)
02	Wired Remote Controller Setting Temperature (Indicated Value) +3°F

NOTE:

- The maximum setting temperature after correction is as follows.
  Inverter Multi Unit: 94°F

(2) Circulator Function during Heating Thermo-OFF (b2)
The standard setting before shipment is which the air flow volume is changed to “LOW” automatically to prevent a cold draft at heating Thermo-OFF.
Therefore, the room air may stratify because warm air stagnates near the ceiling depending on the installation place of the air conditioner or room structure. In this case, it is recommended to utilize this function.
The function keeps the air flow volume at thermo-OFF at the same level as thermo-ON. In this case, the air movement in the room will be kept on the same level as thermo-ON and the room temperature distribution will be homogeneously. In the case of the air conditioner with auto swing function, the auto swing will be activated at heating Thermo-OFF.

NOTE:

- Perceptions of coolness, heat and air flow are subject to personal tastes and behaviors. It is therefore recommended to discuss this with customers thoroughly and then to set the unit accordingly.

(3) Not used (b3)

(4) Change of filter cleaning period (b4)
The period for filter sign indication is set for each indoor unit model before shipment.
The filter sign (“FLTR” on wired remote controller) is indicated according to the filter cleaning time (Factory Setting). However, this filter cleaning time can be changed depending on the condition of the filter as shown in the table below.

Period for Filter Sign Indication	Approx. 1,200 hrs.	Approx. 100 hrs.	Approx. 1,200 hrs.	Approx. 2,500 hrs.	No Indication
Liquid Crystal Display on Wired Remote Controller	00 (Factory Setting)	01	02	03	04

NOTE:

- In the case that “Control by External Input” is valid, if the external input is disconnected, the filter sign will be “No Indication”.

(5) Lock operation mode on controller (b5)
This function is utilized when the operation mode is not required to change.
When this function is valid, the set operation mode can not be changed by the wired remote controller.

(6) Lock temperature setting on remote controller (b6)
This function is utilized when setting temperature is not required to change.
When this function is valid, the set temperature can not be changed by the wired remote controller.

(7) Set operation mode as Cooling Unit (b7)
This function is utilized when exclusive cooling operation is required.
This function invalidates the heating operation and the automatic COOL/HEAT operation, as the operation of exclusive cooling unit.

(8) Automatic Cool/Heat operation (b8)
This function is utilized to operate the unit with changing cooling and heating operation automatically (same operation mode for indoor units in the same refrigerant cycle).
This function is invalid when the outdoor unit is cooling only model or the function of "Fixing of Operation as Exclusive Cooling Unit" is valid.

(9) Lock fan speed setting on controller (b9)
This function is utilized to fix the fan speed.
When this function is valid, the fan speed can not be changed by the wired remote controller.

(10) Not used (bA)

(11) Set cooling temperature compensation (bb)
This function is utilized to provide the longer cooling operation time than the standard.
When this function is valid, Thermo-ON/OFF is controlled under the lower temperature conditions than the setting temperature (indicated value) of the wired remote controller.

Setting Temperature for Room Temperature Control at Cooling

Setting Condition	Actual Control Temperature
00 (Standard)	Wired Remote Controller Setting Temperature (Indicated Value)
01	Wired Remote Controller Setting Temperature (Indicated Value) -2°F
02	Wired Remote Controller Setting Temperature (Indicated Value) -3°F

NOTE:
- The minimum setting temperature after correction is 66°F.

(12) Not used (bC)

(13) Not used (bd)

(14) Not used (bE)

(15) Not used (C1)

(16) Not used (C2)

(17) Not used (C3)

(18) Not used (C4)

(19) Static pressure sel. / Increase Fan Hi speed (C5)
This function is utilized to increase the fan speed for the sufficient air flow volume. It is recommended to use when the air flow volume is decreased by using the optional deodorant air filter, high ceiling installation or etc.

(20) Increase of fan speed at heating Thermo-OFF (C6)
This function is utilized to increase the fan speed at heating Thermo-OFF with the function (19). (The fan speed is not increased at heating Thermo-OFF even if the function (19) is valid.)

(21) Cancel 3 min. compressor starting delay (C7)
The function (3) "Enforced 3 Minutes Minimum Operation Time of Compressor" is the standard function. This function is utilized to cancel the function (3) "Enforced 3 Minutes Minimum Operation Time of Compressor" (Enforced 3 Minutes Compressor Guard).

(22) Sensor selection for indoor temp. control (C8)
This function is utilized to control the unit by the built-in thermistor of the wired remote controller (remote control thermistor) instead of the inlet air thermistor.
Set this function at "01" or "02" when utilizing this function.
However, even if this function is set at "01" or "02", the detecting temperature is abnormal due to the failure of the remote control thermistor, etc., the control is changed to the inlet air thermistor of the indoor unit automatically.

(23) Not used (C9)

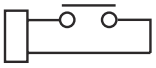
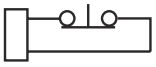
(24) Not used (CA)

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

(25) Selection of forced stoppage logic (Cb)

This function is utilized to select the logic of the contact for forced stoppage signal input.
The setting condition and the logic of the contact are as shown below.

Setting Condition	Logic of Contact	Sequence	Activation	
			Contact "Open"	Contact "Close"
00	A Contact	Indoor PCB 	Normal	Forced Stoppage
01	B Contact	Indoor PCB 	Forced Stoppage	Normal

(26) Not used (CC)

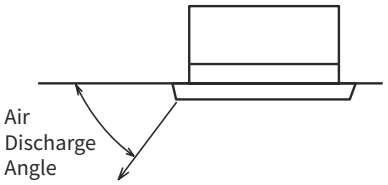
(27) Not used (Cd)

(28) Not used (CE)

(29) Change of Louver Swing Angle (CF)

This function is utilized to the change louver swing angle.

Setting Condition	Louver Swing Angle (Air Discharge Angle)	Purpose
00	Approx. 25° to 60°	Standard Operation
01	Approx. 25° to 50°	Draft Prevention
02	Approx. 35° to 60°	For High Ceiling



NOTE:

- When the setting is changed, turn OFF the power supply or allow the louver to make one complete swing fully in the auto swing mode to validate the setting.

(30) Power Supply ON/OFF 1 (d1)

This function is utilized to run/stop the unit by turning ON/OFF the power supply.
When this function is utilized in the condition that there is no person to operate the unit, provide the system with monitoring for disaster prevention.

NOTE:

- The unit is turned ON/OFF though the power failure occurs. The unit will be restarted after restoring the power source if the power failure occurs during the unit stoppage.

(31) Not used (d2)

(32) Power Supply ON/OFF 2 (d3)

This function is utilized to restart the unit operation automatically when the power supply is recovered after the power failure over 2 seconds.
The standard unit is restarted operation automatically with all the same operating conditions such as operation mode, etc. in case of the power failure within 2 seconds.
(The compressor is restarted operation after three minutes guard in addition to 2 seconds power failure as a maximum.)
When this function is utilized in the condition that there is no person to operate the unit, provide the system with monitoring for disaster prevention.

NOTES:

- In case that the power failure occurs during the unit stoppage, the unit remains stopped after recovering the power supply.
- When the compressor does not reach fixed temperature, the system may not restart automatically after turning on the power supply by hot-start control.

  *Hot-start Control: The control program that cannot operate if fixed temperature is not being supplied after the power is turned ON.

(33) Prevention of low air outlet temperature in cooling mode (d4)
This function is utilized to change Thermo-ON/OFF conditions at the cooling operation and prevent the outlet air temperature decrease. As the result, the perception of cold draft is prevented.

< Thermo-OFF Conditions >
(a) Cooling Operation (including Dry Operation) and
(b) Indoor discharge air temp. ≤ 54°F has been kept for 3 minutes.
(Thermo-OFF is activated when discharge air temperature is low.)
< Thermo-ON Conditions >
(a) Indoor discharge air temp. > 56°F and
(b) Thermo-ON depends on indoor inlet air temperature.
(Thermo-ON is Not activated when discharge air temperature is low.)

(34) Prevention of low air outlet temperature in heating mode (d5)
This function is utilized to prevent discharge air temperature decrease at the heating operation by lowering the actual fan speed than the indications on the wired remote controller.

	Large ← Fan Speed → Small			
Indications on Wired Remote Controller	HIGH2	HIGH	MED	LOW
Actual Fan Speed	HIGH	MED	LOW	LOW

NOTE:
- The above table shows when the optional function setting “Hi Speed” is set as standard (00) by the wired remote controller.

(35) Not used (d6)

(36) Not used (d7)

(37) Ventilation Mode(for Total Heat Exchanger) (E1)
This function is utilized to set the ventilation mode of the total heat exchanger.
The setting condition and the ventilation mode are shown below.

Setting Condition	Ventilation Mode	Contents
00	Automatic Ventilation	It selects automatically effective ventilation mode (Total Heat Exchanging Ventilation or Bypass Ventilation) for energy saving by detecting the temperature difference between the outdoor temperature and the room temperature.
01	Total Heat Exchanging Ventilation	The heat exchanging is performed continuously when the total heat exchanger is operated.
02	Bypass Ventilation	The heat exchanging is not performed continuously when the total heat exchanger is operated.

(38) Increasing Supply Air Volume(for Total Heat Exchanger) (E2)
This function is utilized to increase the supply air volume with the one-step high tap of the fan motor for supply air during operation of the total heat exchanger, make the room pressure higher than the surrounded room with the increased supply air volume and prevent the polluted air and smell from entering into the room.
When this function is valid, the setting air flow volume by wired remote controller and the air flow volume of the total heat exchanger are shown below.

Setting Air Flow Volume by Wired Remote Controller	Air Flow Volume of Total Heat Exchanger
LOW	MED
MED	HIGH
HIGH	HIGH

NOTE:
- In case that the air flow volume “HIGH” is set from the wired remote controller, the air flow volume of the total heat exchanger is "HIGH" even when this function is set.

(39) Not used (E3)

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

(40) Precooling / Preheating Period(for Total Heat Exchanger) (E4)
This function is utilized to delay the start-up of the total heat exchanger operation.
The setting condition and the delaying period of operation start-up are shown below.

Setting Condition	Delaying Period of Operation Start-Up
00	0 minutes
01	30 minutes
02	60 minutes

(41) Not used (E5)

(42) Indoor fan operation time after cooling operation stoppage (E6)
This function is utilized to prevent dew condensation at cooling operation stoppage by “SLOW” indoor fan operation to dry. It is effective to prevent mildew or abnormal odor. “SLOW” operation (for 60 minutes or 120 minutes by setting) is continued when the cooling operation is stopped.

(43) Not used (E7)

(44) Indoor Unit fan control during heating Thermo-OFF (remote sensor) (E8)
This function is utilized to prevent the perception of cold draft by reducing the indoor fan speed at heating Thermo-OFF.

Setting Condition	Fan Operation at Thermo-OFF
00	LOW
01	SLOW

(45) Not used (E9)

(46) Not used (EA)

(47) IU Fan speed during cooling thermo-off (Eb)
This function is utilized to prevent diffusion of odor and high humidity by reducing the indoor fan speed at cooling Thermo-OFF.

Setting Condition	Fan Operation at Thermo-OFF
00	Operation at Set Fan Speed
01	LOW
02	SLOW

(48) Forced Thermo-ON after cooling operation stop (EC)
This function is utilized to stop the operation by forced thermo-ON when cooling operation is stopped.
It is effective to prevent abnormal odor because the heat exchanger is kept in the clean condition such as the heat exchanger is rinsed with drain water.

(49) Not used (Ed)

(50) Automatic Fan Speed Control (EE)
This function is utilized to economize the operation. The air flow volume is automatically adjusted when the room temperature is near the setting temperature.

(51) IU fan speed set to Auto allowing High 2 speed (EF)

This function is utilized to increase the maximum fan speed to "HIGH2" setting condition when the maximum fan speed remain "HIGH" by default.
The fan speed setting (EF) by wired remote controller are shown below.

Function Selection EF Setting	Wired Remote Controller Setting				
	AUTO	HIGH2	HIGH	MED	LOW
00	HIGH - LOW	HIGH2	HIGH	MED	LOW
01	HIGH2 - LOW	HIGH2	HIGH	MED	LOW

(52) Not used (F0)

(53) Automatic OFF Timer Setting (F1)

This function is utilized to set the OFF timer function automatically when the unit is operated by the wired remote controller. During the operation with the automatic OFF timer setting function, the cancellation of the OFF timer and the changing of the setting period for OFF timer can not be performed.
However, the OFF timer function is canceled when the unit is stopped. When the unit is operated again after stoppage, the setting period for OFF timer is set by the optional setting.
The setting condition and the setting period for OFF timer are shown below.

< Example for CIW03-H >

Setting Condition	Setting Period for OFF Timer
00	Invalid
01	1 hour
02	2 hours
⋮	⋮
23	23 hours
24	24 hours
0A	30 minutes
0B	90 minutes
0C	40 minutes
0D	45 minutes
0E	50 minutes
0F	55 minutes

NOTES:

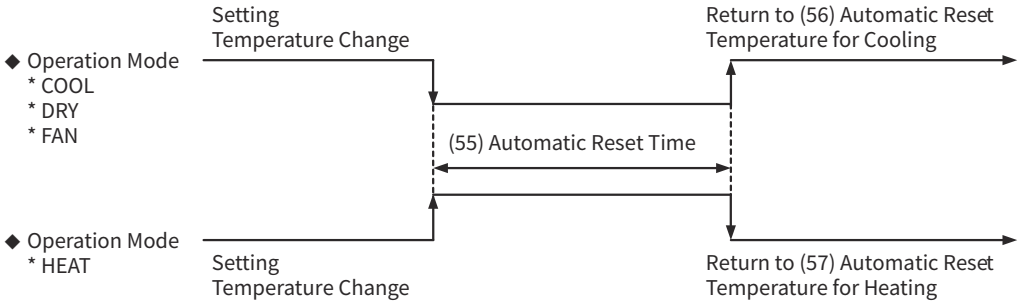
- This function is not available when controlled by the centralized controller, the remote control connecting with CS-NET or 7-day Timer.
- The range of setting period for OFF timer differs depending on the wired remote controller model.

(54) Controller primary-secondary setting (F2)

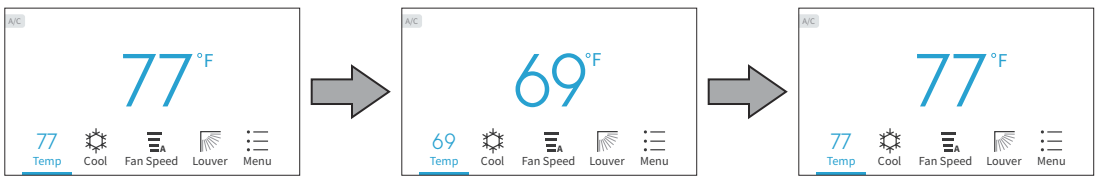
This function is utilized when two wired remote controllers are installed in one system.
Set one wired remote controller to main “00”, another wired remote controller to sub “01”.

(55) Automatic Reset of Setting Temperature (F3)

This function is utilized to economize the operation. When this function is valid, in the case that the set temperature is not changed for certain period of time set by the function (55) “Automatic Reset Time (F4)”, the set temperature is automatically returned to (56/57) “Automatic Reset Temperature for Cooling/Heating (F5/F6)” as following conditions. It is effective to optimize the setting temperature and provide energy saving. However, the setting temperature is not automatically reset in the case that “Automatic COOL/HEAT Operation” mode, or “Prohibiting Operation by Wired Remote Controller” is set by the centralized controller.



<Example> Automatic Reset Temperature for Cooling is 77°F.



Setting temperature is changed from 77 to 69°F by the wired remote controller.

Cooling operation at 69°F is performed temporarily.

If no operation for a defined period, the setting temperature returns to 77°F automatically.

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

(56) Automatic Reset Time (F4)

This function is utilized to set the automatic reset time with the set temperature.
The setting conditions and automatic reset time are as follows:

Setting Condition	Automatic Reset Time of Setting Temperature
00	30 minutes (Factory-Setting)
01	15 minutes
02	60 minutes
03	90 minutes

(57) Automatic Reset Temperature for Cooling (F5)

This function is utilized to set the automatic reset temperature for FAN/COOL/DRY operation.
The setting conditions and the automatic reset temperature for cooling are as follows:

Setting Condition	Setting Temperature for Automatic Reset
19	66°F
20	68°F
⋮	⋮
25	77°F (Factory-Setting)
⋮	⋮
29	84°F
30	86°F

(58) Automatic Reset Temperature for Heating (F6)

This function is utilized to set the automatic reset temperature for HEAT operation.
The setting conditions and the automatic reset temperature for heating are as follows:

Setting Condition	Setting Temperature for Automatic Reset
17	62°F
18	64°F
⋮	⋮
21	70°F (Factory-Setting)
⋮	⋮
29	84°F
30	86°F

(59) Operation stoppage prevention by wired controller operation error (F7)

This function is utilized to prevent the careless operational stoppage caused by wired remote controller operational error. When this function is valid, the operation is stopped by pressing "⏻" (run/stop) switch on the wired remote controller for more than 3 seconds. However, the operation method is not changed.

Operation Lock (60) to (63)

Four operation lock functions are available as shown below.
These functions are utilized to restrict each switch operation from the wired remote controller.
When these functions are valid, the operation is prevented from operational error or tampering.
All operation lock functions are valid ("01" setting) before shipment.

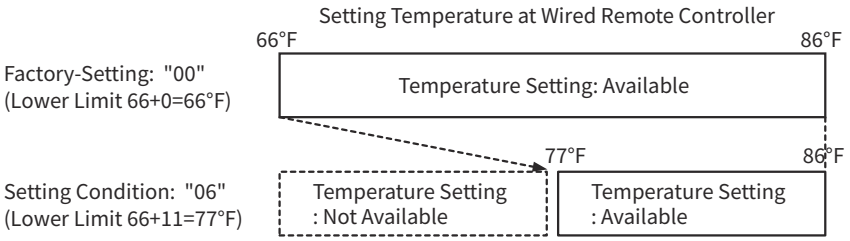
(60) Lock Function for Operation Mode Selection (F8)

(61) Lock Function for Temperature Setting (F9)

(62) Lock Function for Fan Speed Selection (FA)

(63) Lock Function for Swing Louver Operation (Fb)

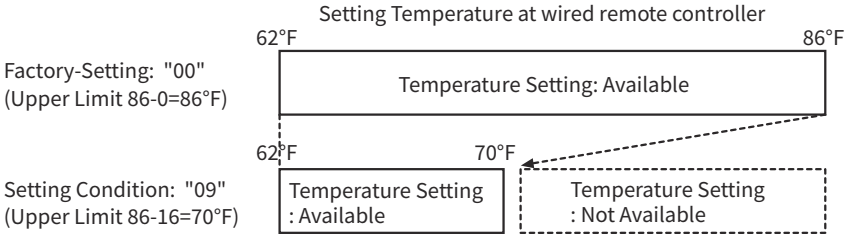
(64) Lower limit for cooling temperature setting (FC)
This function is utilized to limit the lowest setting temperature for FAN/COOL/DRY operations.
When this function is valid, it provides the appropriate cooling operation and energy-saving.
The setting conditions and the minimum setting temperature for cooling are as follows:
<Example>



Setting Condition	Details	Minimum Setting Temperature (FAN/COOL/DRY) *
00	Standard Value	66°F
01	Lower Limit +2°F	68°F
02	Lower Limit +3°F	70°F
⋮	⋮	⋮
09	Lower Limit +16°F	82°F
10	Lower Limit +18°F	84°F

* In case of Standard Unit

(65) Upper limit for heating temperature setting (Fd)
This function is utilized to limit the highest setting temperature for HEAT operation.
When this function is valid, it provides the appropriate heating operation and energy-saving.
The setting conditions and the heating upper limit for the setting temperature are as follows:
<Example>



Setting Condition	Details	Setting Temperature Upper Limit (HEAT) *
00	Standard Value	86°F
01	Upper Limit -2°F	84°F
02	Upper Limit -3°F	82°F
⋮	⋮	⋮
11	Upper Limit -20°F	66°F
12	Upper Limit -22°F	64°F

* In case of Standard Unit

(66) Not used (FE)

(67) Not used (FF)

(68) Not used (H1)

(69) Indication of Hot Start (H2)
When this function is set as “No Indication” (01), “HOT-ST” is not indicated on the wired remote controller.

(70) Not used (H3)

(71) Not used (H4)

(72) Not used (J1)

(73) Not used (J2)

(74) Run Indicator Color (J3)
This function is utilized to set the run indicator color.

Setting Condition	Color
00	Green
01	Red

NOTE:
- The red run indicator is flashing during the alarm.

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

(75) Not used (J4)

(76) Not used (J5)

(77) Error Sound (J6)

This function is utilized to notify the air conditioner's alarm to the user. When the alarm is issued, the buzzer of the wired remote controller is sounded. The buzzer sound can select in "Once" or "Continuous".

Setting Condition	Error Sound	Remarks
00	Once	Only once immediately after alarm
01	Continuous	Continuously sounded during alarm

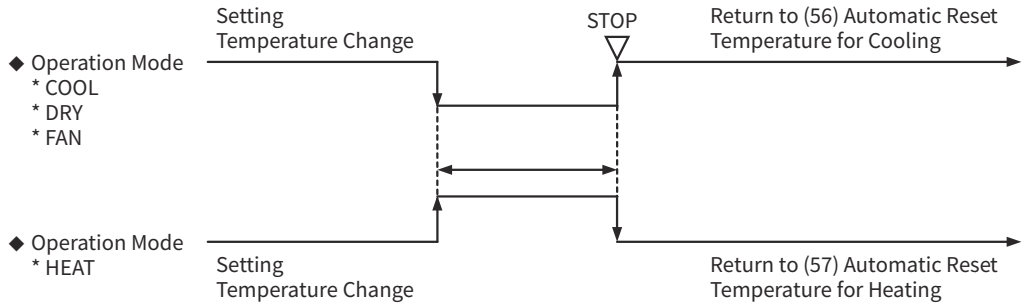
NOTE:

- The operation lamp is flashed red during alarm condition.

(78) Not used (J7)

(79) Eco-operation (J8)

This function is utilized to effective to optimize the setting temperature and provide energy saving.
When the setting temperature is changed during the air conditioning operation and the operation is started/stopped by RUN/STOP switch on the wired remote controller, the set temperature is automatically returned to (56/57) "Automatic Reset Temperature for Cooling/Heating (F5/F6)" as following figure. However, the setting temperature is not automatically reset in the case that "Automatic COOL/HEAT Operation" mode, or "Prohibiting Operation by Wired Remote Controller" is set by the centralized controller.



(80) Not used (J9)

(81) Select the Simple Maintenance menu (JA)

This function is utilized to display the operation data from the service menu "Simple Maintenance Display".

(82) Not used (Jb)

(83) Calibration for controller temp. sensor (JC)

Temperature can be calibrated by the controller thermistor.

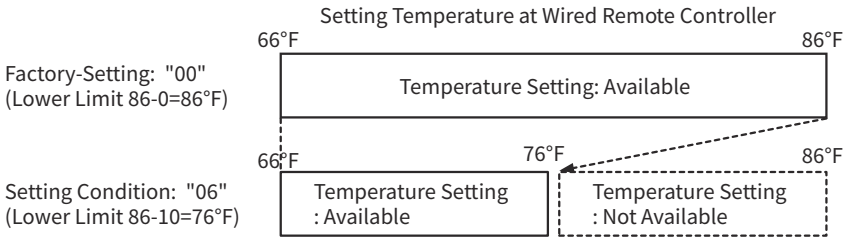
In addition, set optional function setting "C8" to "01" at (22).

Setting Condition	Calibrated Temperature
00	0°F
01	-1°F
02	-2°F
03	-3°F
04	-3°F
05	-4°F
06	-5°F
07	-6°F
08	+1°F
09	+2°F
10	+3°F
11	+3°F
12	+4°F
13	+5°F
14	+6°F
15	0°F

(84) Upper limit for cooling temperature setting (Jd)

This function is utilized to set to prevent the setting temperature in FAN/COOL/DRY operations from getting too high. The setting conditions and the upper limit for cooling temperature are as follows:

<Example>



Setting Condition	Details	Upper limit Setting Temperature (FAN/COOL/DRY) *
00	Standard Value	86°F
01	Upper Limit -2°F	84°F
02	Upper Limit -3°F	82°F
03	Upper Limit -5°F	80°F
04	Upper Limit -7°F	78°F
05	Upper Limit -9°F	77°F
06	Upper Limit -11°F	76°F
07	Upper Limit -13°F	74°F
08	Upper Limit -14°F	72°F
09	Upper Limit -16°F	70°F
10	Upper Limit -18°F	68°F

* In case of Standard Unit

NOTES:

- This function is able to set from "Service Menu" of the wired remote controller CIW03-H.
  When setting from "Service Menu", it is synchronized and reflected to the function selection.
- Ensure that the upper limit for cooling operation (Jd) is equal to or greater than the lower limit for cooling operation (FC).
  If not, the lower limit for cooling operation (FC) has priority.

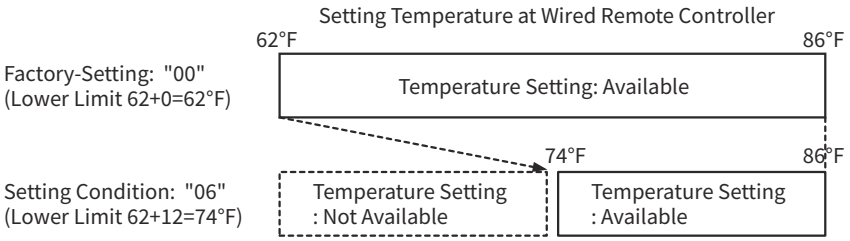
OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

(85) Lower limit for heating temperature setting (JE)

This function is utilized to set to prevent the setting temperature for HEAT operation from getting too low. The setting conditions and the lower limit for heating temperature are as follows:

<Example>



Setting Condition	Details	Lower Limit Setting Temperature (HEAT) *
00	Standard Value	62°F
01	Lower Limit +2°F	64°F
02	Lower Limit +3°F	66°F
03	Lower Limit +5°F	68°F
04	Lower Limit +7°F	70°F
05	Lower Limit +9°F	72°F
06	Lower Limit +11°F	74°F
07	Lower Limit +13°F	76°F
08	Lower Limit +14°F	77°F
09	Lower Limit +16°F	78°F
10	Lower Limit +18°F	80°F
11	Lower Limit +20°F	82°F
12	Lower Limit +22°F	84°F

* In case of Standard Unit

NOTES:

- This function is able to set from "Service Menu" of the wired remote controller CIW03-H.
  When setting from "Service Menu", it is synchronized and reflected to the function selection.
- Ensure that the upper limit for heating operation (Fd) is equal to or greater than the lower limit for heating temperature (JE).
  If not, the upper limit for heating operation (Fd) has priority.

(86) Not used (K1)

(87) Not used (K2)

(88) Not used (K3)

(89) Not used (K4)

(90) Motion sensor detection level (K5)

This function is utilized to determine the amount of human activity depending on the reaction rate as following table.

When "HIGH" (01) is set, the threshold of the amount of human activity is smaller than the standard. As the result, the detection level of human sensor becomes higher sensitivity.

When "LOW" (02) is set, the threshold of the amount of human activity is larger than the standard. As the result, the detection level of human sensor becomes lower sensitivity.

Setting Condition / Amount of Human Activity	00 (Factory Setting)	01	02
	Standard	High Sensitive	Low Sensitive
Large	30% ≤ Reaction Rate	20% ≤ Reaction Rate	40% ≤ Reaction Rate
Small	3% < Reaction Rate < 30%	3% < Reaction Rate < 20%	3% < Reaction Rate < 40%
No Available	Reaction Rate ≤ 3%	Reaction Rate ≤ 3%	Reaction Rate ≤ 3%

(91) Operation mode selection when IDU control sensor is defined by C8 function (K6)(for 4-Way Cassette Type only)

This function is utilized to change the function "Thermistor of Wired Controller / Remote Sensor (C8)" according to operation mode.

Setting Condition	Operation Mode
00	ALL
01	COOL / DRY
02	HEAT
03	same as "00"

NOTE:

- All modes are available during automatic Cool/Heat operation mode.

(92) Radiant Temp. sensor detection level (K7)

This function is utilized to correct the radiation temperature detected higher/lower than actual radiation temperature depending on the environment.

Setting Condition	Temperature Correction
00 (Standard)	0°F
01 (Upward)	+3°F
02 (Downward)	-3°F

(93) Not used (K8)

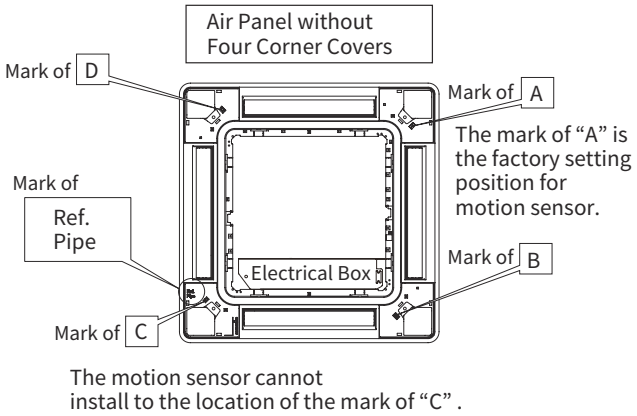
(94) Not used (K9)

(95) Not used (KA)

(96) Setting Position of Motion Sensor (L1)

This function is utilized to select the installation position of the cover for corner with motion sensor and radiation temperature sensor by wired remote controller.

Setting Condition	Installation Position
00	A (Factory-Setting)
01	B
02	- (Not Available)
03	D



(97) Not used (L2)

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

(98) Select louver operation in energy-saving Th.-OFF (COOL & DRY) (L3)

Setting Condition	Energy-Saving Force Thermo-OFF
00 (Receive Air: LOW)	Louver stay in downward air flow position during Auto Swing Mode
01 (Receive Air: MED)	Louver stay in downward air flow position longer than "00" during Auto Swing Mode
02 (Receive Air: HIGH)	Louver is fixed at the 7th step of downward air flow
03 (Not Available)	Cancel the louver operation

(99) Fan Speed during Energy-Saving Forced Thermo-OFF (L4)

This function is utilized to increase the fan speed to prevent the deterioration of comfort due to the forced thermo-OFF for energy saving during the cooling operation.

Setting Condition	Air Volume During Force Thermo-OFF			
Air Flow Volume	HIGH2	HIGH	MED	LOW
00 (Standard)	HIGH2	HIGH	MED	LOW
01 (Hi Speed)	HIGH2	HIGH2	HIGH	MED

(100) Louver Swing Operation Energy-Saving Forced Thermo-OFF (L5)
This function is set at "01", the function "L3" setting will be available.

(101) Not used (L6)

(102) Not used (L7)

(103) Not used (L8)

(104) Not used (L9)

(105) Not used (LA)

(106) Not used(Lb)

(107) Setting temperature (P1)

This function is utilized to set the setting temperature scale for every 1°F at "00" or every 2°F at "01". Control differential of the thermistor also uses the temperature for every 1°F at "00" and every 2°F at "01".

(108) Not used (P2)

(109) Select temperature sensor (P3)

This function is utilized to select the thermistor with function (108).

Setting Condition	**Thermistor (Sensor)**
00	Inlet Air Thermistor
01	Outlet Air Thermistor
02	Thermistor of Remote Control
03	Remote Sensor

(110) Temperature sensor display (P4)
This function is utilized to display the temperature of the sensor selected at (107).

(111) Temperature setting display in fan mode (P5)

This function is utilized to undisplay the setting temperature during the fan mode operation.

(112) Not used (P6)

(113) Menu screen transition prohibited (P7)

This function is utilized to invalidate the menu button.

(114) Maintenance explanation display (P8)

This function is utilized to undisplay the menu at the function selection when selecting "OK" button.

(115) Alarm explanation display (P9)

This function is utilized to undisplay the menu at the alarm when selecting "OK" button.

(116) Daylight Savings Time (PA)

This function is utilized to set the forwarded hours.

Setting Condition	**Forwarded Hour**
00	1 hour
01	2 hours

(117) Not used (Pb)

(118) Not used (PC)

(119) Not used (q1)
(120) Not used (q2)
(121) Not used (q3)
(122) Not used (q4)
(123) Not used (q5)
(124) Not used (q6)
(125) Not used (q7)
(126) Not used (q8)
(127) Not used (q9)
(128) Not used (qA)
(129) Operation mode with Setback (qb)

Setback operation is a function that can keep the room being comfort on the minimum necessary while it is unoccupied.

Any setup in “01 to 03” can activate setback operation in the selected mode.

Setting Condition	Setback Operation Mode
00	Not Available
01	Cooling Only
02	Heating Only
03	Cooling/Heating

NOTE:

- Inlet air thermistor runs the risk of failing to sense a room temperature accurately in the function. Use remote sensor or remote thermistor along with it. In addition, set "01" into C8 in function (22).

(130) Temp. differential for the Setback operation (qC)

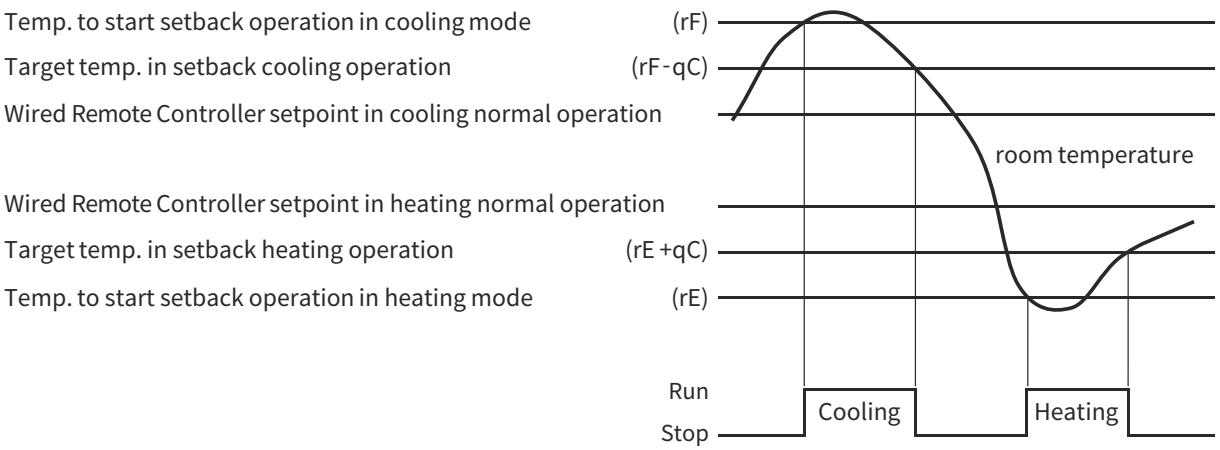
Target temperatures for both cooling and heating operation are determined versus a temperature to start setback operation (rE, rF) selected in function (145) and (146).

Target temperature is calculated as shown below.

Target temperature in cooling mode: rF - qC (°F)
Target temperature in heating mode: rE + qC (°F)

Setting Condition	Target Temperature Difference
00	3°F
01	5°F
02	7°F
03	9°F
04	2°F

Setback operation runs as room temperature reaches the specified temperature to start, stops at the target temperature. Setback operation is function that can keep the room being comfort on the minimum necessary while it is unoccupied. Select a target temperature in cooling mode that is higher than normal operation temperature, lower than in heating mode.



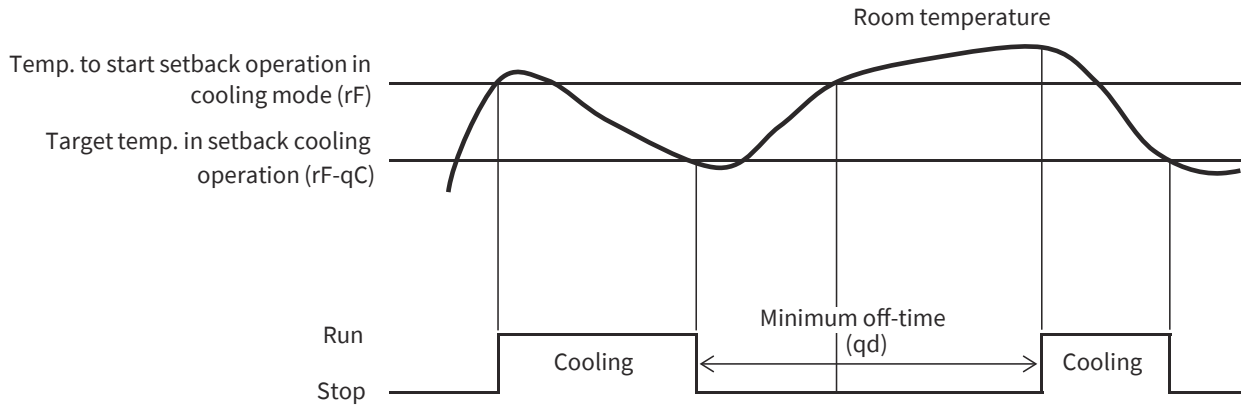
OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

(131) Minimum stop time of Setback (qd)

To save frequent run/stop of setback operation, provide the minimum off-time from stop of setback operation to the next one. As shown below, even if room temperature gets the setpoint to start setback operation, setback operation does not start until the minimum off-time expires.

Setting Condition	Minute off-time
00	10-minute
01	20-minute
02	30-minute
⋮	⋮
10	110-minute
11	120-minute



(132) Setback Mode (qE)

Selection "01 to 03" mentioned in function (127) can change mode into the setback.
Following setback modes can be selected in accordance with the intended use.

Setting Condition	Setback Mode	Description
00	Always	Always the setback operation is available.
01	Input	In hotel rooms, removing the card key triggers the setback operation. Reinserting the card key turns the operation back to normal.
02	Schedule	Setback operation is available during the preset durations, such as night time. After "Scheduling" is configured, set the start time and the stop time by the wired controller to enable the setback operation. When the preset duration is over, the operation goes back to normal operation.
03	Manual	Setback function can be available for long unoccupied periods, such as consecutive holidays. After "Manual" is selected, the setback operation can start with the wired controller to enable the setback function. When the function is null, the normal control works.

When "01: Input" is selected, it requires the setup of "Input: 09" as well.
When "02: Schedule" and "03: Manual" are selected, they need to be setup by the wired remote controller. Refer to Operation Manual for the wired remote controller.

(133) Operation state after Setback operation ends (qF)

Followings are selections of operation state that switch into when a setback duration is over.

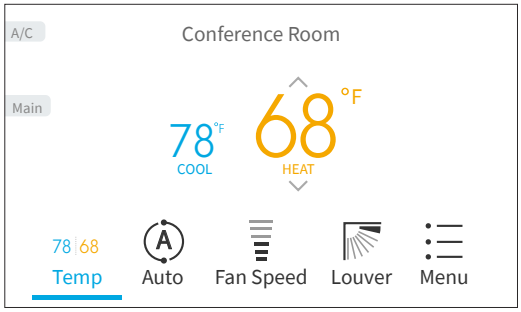
Setting Condition	Run or Stop after Setback Duration
00	Stop
01	Run
02	Operation state before the setback starts.

In case "02: Operation state before the setback starts." is configured, the state goes back to the last operating condition before the setback starts.

(134) Dual Setpoint (r1)

Function in the automatic cooling/heating mode that presets setpoints of cooling/heating mode respectively.

Setting Condition	Automatic Cooling/Heating Dual Setpoint
00	Stop
01	Run



NOTE:

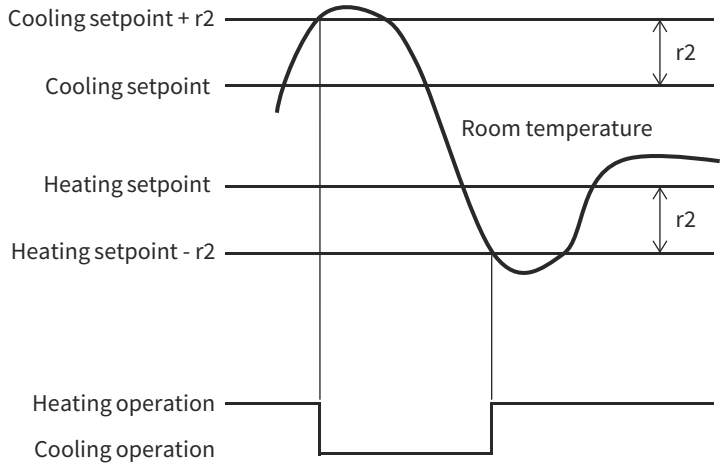
- If the condition of "cooling setpoint ≥ heating setpoint +3°F" is not satisfied, setup is unavailable.
  (It cannot be set up with wired remote controller.)

e.g.

Cooling Setpoint	Heating Setpoint	
77°F	72°F	Available
76°F	72°F	Available
74°F	72°F	Unavailable
72°F	72°F	Unavailable

(135) Differential temp. setting for Cooling-Heating changeover (r2)

When automatic cooling/heating dual temperature setup mentioned in function (132) is in active, setpoint which can switch operation mode preferable can be configured.
As chart shown below, value offset by only r2 can change operation mode.



Setting Condition	Setpoint for Mode Change
00	2°F
01	3°F
02	3°F
03	4°F
04	5°F
05	1°F

(136) Setback Temperature Compensation (r3)

When setback temperature setup mentioned in "Input 09" is in active, setpoint which can compensate setback temperature preferable can be configured.

Operation Mode	Setting Temperature after Setback
Cooling	Setting Temp. + r3
Heating	Setting Temp. - r3
Fan	Setting Temp. (Not Compensate)

Setting Condition	Setpoint for Compensate (Value of "r3")
2.5 (Initial Setting)	4°F
3.0	5°F
3.5	6°F
4.0	7°F
4.5	8°F
5.0	9°F
5.5	10°F
0.5	1°F
1.0	2°F
1.5	3°F
2.0	3°F

(137) Enable/Disable Auto-FrostWash 2 (r4)

This function enables "Auto-FrostWash" by setting "01".
This function "r4" can be set enable/disable from CIW03-H function menu "Enable/Disable Auto-FrostWash" of "FrostWash Setting".

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

(138) Not used (r5)

(139) FrostWash Manual Setting (r6)

This function prohibits the operation of “Manual FrostWash setting” by setting “01”.
When setting “01” in this function, the function menu on the wired controller CIW03-H can not be selected.

(140) FrostWash Automatic Setting (r7)

This function prohibits the operation of “Auto-FrostWash setting” by setting “01”.
When setting "01" in this function, the function menu on the wired controller CIW03-H can not be selected.

(141) Enable/Disable Auto-FrostWash (r8)

This function enables “Auto-FrostWash” by setting “01”.
This function “r8” can be set enable/disable from CIW03-H function menu "Enable/Disable Auto-FrostWash" of "FrostWash Setting".

(142) Remote control prohibition during Setback operation (r9)

Run or stop selected by users can be disabled by remote controller during setback.
NOTE:

- When the mode mentioned in function (130) is selected as "00: Always", the function is fixed as "00: Disabled".

(143) FrostWash interval settings (rA)

When the FrostWash automatic setting is valid, this function is utilized to change the Auto-FrostWash intervals.
When the FrostWash automatic setting is invalid, the icon is displayed on the operation screen of the wired remote controller.
This function can be set from the function menu "Set FrostWash Intervals" of "FrostWash Setting" on the wired remote controller CIW03-H.

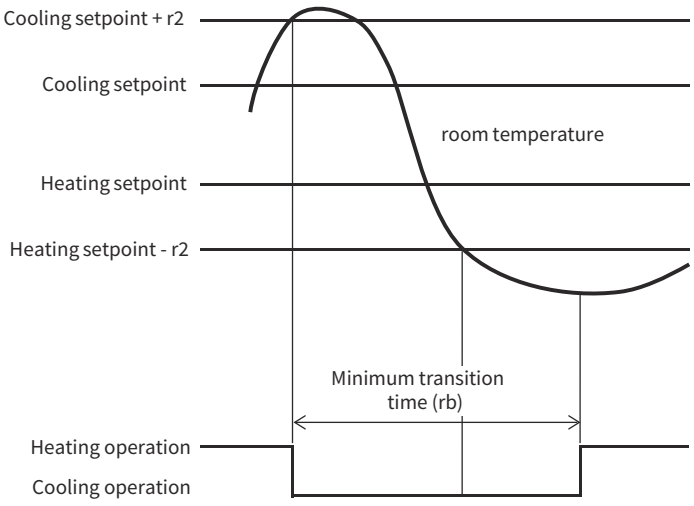
Setting Condition	FrostWash Interval Time
00	100 hrs. (Initial Setting)
01	200 hrs.
02	400 hrs.
03	50 hrs.

Auto-FrostWash Setting	Contents
Available	When total of operating time exceeds the FrostWash interval time, the automatic FrostWash is performed after the operation is stopped.
Unavailable	When total of operating time exceeds the FrostWash interval time, the icon is displayed on the operation screen of the wired remote controller. Then, the manual FrostWash starts or the Auto-FrostWash is setup "Available", the icon is not indicated.

(144) Minimum Cool/Heat Time for Auto Cool/Heat Operation (rb)

To restrain frequent diversion of the cooling/heating operation, the minimum period between the completion of the transition and the next one is determined. As shown the chart below, operation mode does not change until the minimum transition time passes, even if the room temperature reaches the setpoint which shifts to the heating operation.

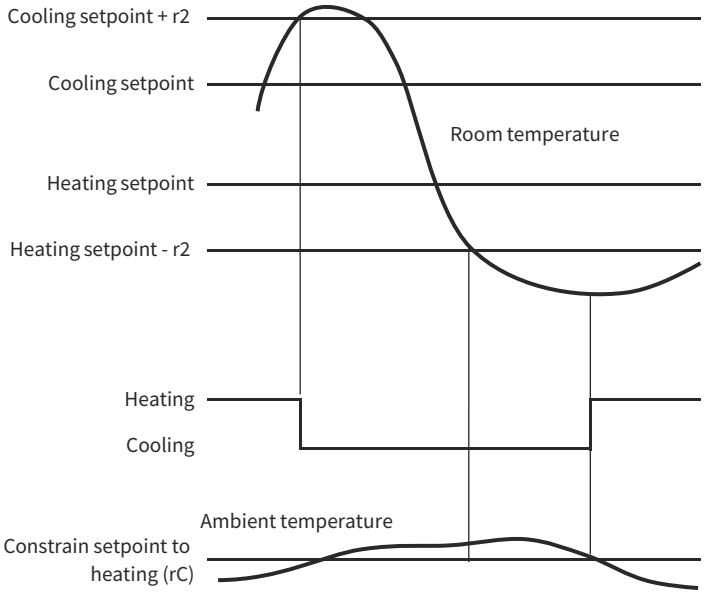
Setting Condition	Minimum Period of Mode Change in Dual Operation
00	Disabled
01	10-minute
02	20-minute
03	30-minute
⋮	⋮
11	110-minute
12	120-minute



(145) Max. outdoor temp. for Heat operation in Auto Cool-Heat Dual Setpoint (rC)

Depending on outdoor temperature, constraints in automatic cooling/heating dual setup are available without performing mode transitions, even though the room temperature reaches the setpoint that shifts the operation mode from cooling to heating. As shown in the chart below, when the ambient is higher than the constrain setpoint, the operation mode does not shift even though the room temperature reaches the setpoint.

Setting Condition	Constrain Setpoint for Ambient in Auto Dual Operation
00	Disabled
01	68°F
02	70°F
03	72°F
⋮	⋮
20	102°F
21	104°F
22	32°F
23	34°F
24	36°F
⋮	⋮
40	64°F
41	66°F



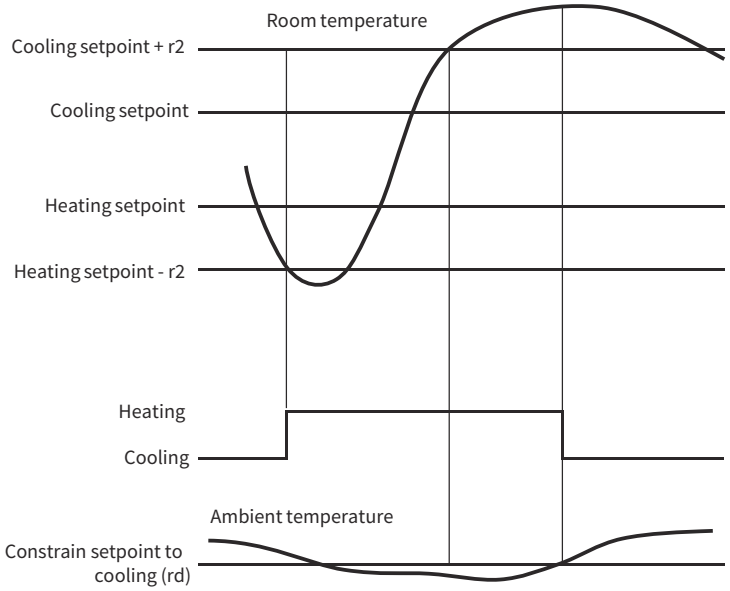
NOTES:

- Water Source type outdoor unit is not programed this function. Use as "00: Disabled".
- Ambient constrain control in outdoor unit takes priority.

(146) Min. outdoor temp. for Cool operation in Auto Cool-Heat Dual Setpoint (rd)

Depending on the outdoor temperature, constraints in the automatic cooling/heating dual setup are available without performing mode transitions, even though the room temperature reaches the setpoint that shifts the operation mode from the heating to cooling. As shown in the chart below, in case the ambient is lower than the constrain setpoint, the operation mode does not change even though the room temperature reaches the setpoint shifting to cooling operation.

Setting Condition	Constrain Setpoint for Ambient in Auto Dual Operation
00	Disabled
01	50°F
02	52°F
03	54°F
⋮	⋮
30	102°F
31	104°F
32	68°F
33	66°F
34	64°F
⋮	⋮
60	46°F
61	48°F



NOTES:

- Water Source type outdoor unit does not match this function. Use as "00: Disabled".
- Ambient constrain control in outdoor unit takes priority.

OPTIONAL FUNCTION

(Operation from Wired Remote Controller)

(147) Setback Activating Temp. for Heat Mode (rE)

Room temperature is determined to start the heating operation during the setback.

Setting Condition	Temp. Start Heating Mode in Setback
00	59°F
01	60°F
02	62°F
03	64°F
04	66°F
05	50°F
06	52°F
07	54°F
08	56°F
09	58°F

(148) Setback Activating Temp. for Cool Mode (rF)

Room temperature is determined to start the cooling operation during the setback.

Setting Condition	Temp. Start Cooling Mode in Setback
00	78°F
01	80°F
02	82°F
03	84°F
04	86°F
05	88°F
06	90°F
07	92°F
08	94°F
09	95°F
10	77°F

(149) Not used (S1)

(150) Not used (S2)

(151) Not used (S3)

(152) Not used (S4)

(153) Not used (S5)

(154) Not used (S6)

(155) Not used (S7)

(156) Not used (S8)

4.2 Troubleshooting in Check Mode by Wired Remote Controller

Each “Check Menu” item and its function are explained in the following table.

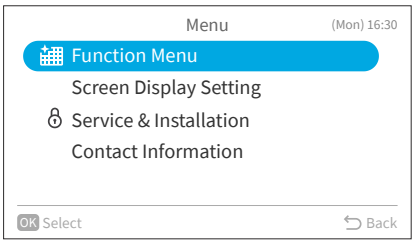
Item	Function
Check 1	Sensor condition of the heat pump are monitored and displayed.
Check 2	Sensor data from the heat pump prior to alarm occurrence is displayed.
Alarm History Display *	Previous alarm history data including date, time, indoor unit number, and alarm code is displayed. (30 Max) The alarm history can be deleted.*
Display Model Number	Model name and manufacturing number are indicated.
Check PCB of the Units	The result and diagnosis of PCB check is displayed.
Self Check	The controller checkout process begins and various settings initialize.

* Press "OK" while the alarm history is displayed, the confirmation screen for deleting the alarm history is displayed. Select "Yes" and press "OK" to delete the alarm history.

- Setting Method

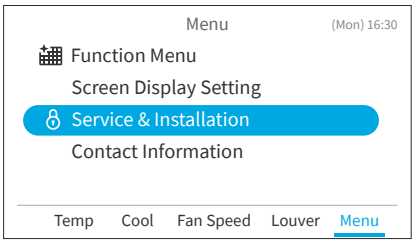
Step1. Enter Menu

Turn the air conditioner OFF, press "›" to scroll across to the "Menu" and press "OK" to display the Menu screen.



Step2. Select "Service & Installation"

Select "Service & Installation" and press "OK".



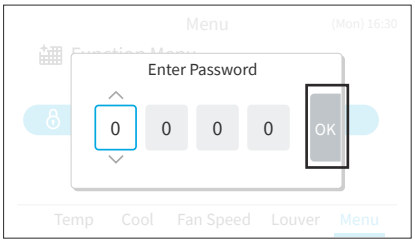
Step3. Input Password

Input password by pressing “^”, “v”, “<”, or “>”, select "OK".

Then press "OK".

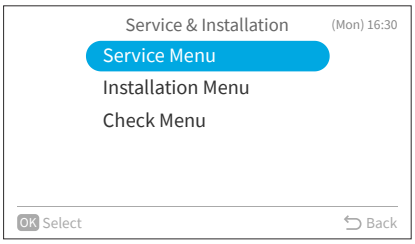
Password is required to prevent unintentional and unauthorised settings.

The default user password is "0000".



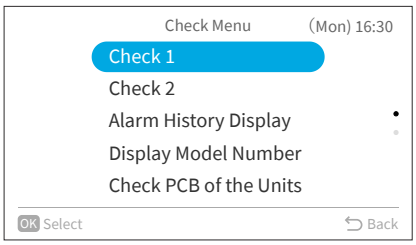
Service & Installation Menu screen is displayed.

If the password input effective time has been set to "Everytime" then the password will need to be entered each time the Service and Installation menu is accessed. If the password input effective time has been set to either 10, 30, 60 or 120 minutes, then the password prompt will not display if accessed within these durations.

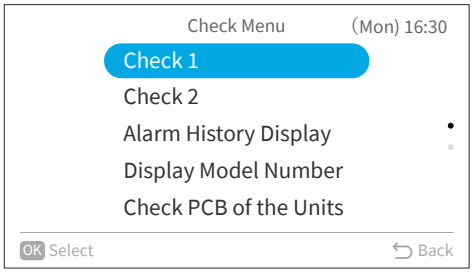
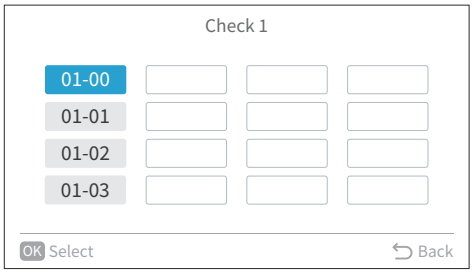
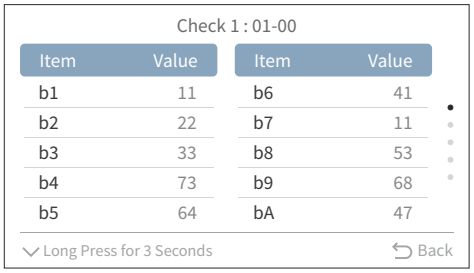


(Operation from Wired Remote Controller)

Step4. Select "Check Menu" and press "OK".



a. Check 1 and Check 2

(1) Select "Check 1" (or "Check 2") from the check menu and press "OK".	
(2) Select the set indoor unit by pressing "∧", "∨", "<", or ">" and press "OK". (This screen is NOT displayed when the number of indoor unit connected with the wired remote controller is 1 (one). In this case, next screen will be displayed.)	
(3) Press "∧" or "∨" to change the screen.	

- Items of Check Mode 1

No.	Item	Data Name
1	b1	Set Temp.
2	b2	Inlet Air Temp
3	b3	Discharge Air Temp.
4	b4	Liquid Pipe Temp.
5	b5	Remote Thermistor Temp.
6	b6	Outdoor Air Temp.
7	b7	Gas Pipe Temp.
8	b8	Outdoor Pipe Temp.
9	b9	Control Information
10	bA	Comp. Top Temp.
11	bb	Sensor temp. of controller
12	bC	Control Information
13	C1	MCU status of Indoor Unit
14	C2	MCU status of Outdoor Unit
15	C3	Indoor Control Software Version
16	d1	Stopping Cause State Indication
17	E1	Times of Abnormality
18	E2	Times of Power Failure
19	E3	Times of Abnormal Transmitting
20	E4	Times of Inverter Tripping
21	F1	Louver Sensor State
22	H1	Discharge Pressure
23	H2	Inlet Pressure
24	H3	Control Information
25	H4	Operating Frequency

No.	Item	Data Name
26	J1	Indoor Unit Capacity
27	J2	Outdoor Unit Code
28	J3	System Number (1)
29	J4	System Number (2)
30	L1	IDU Electronic Expansion Valve
31	L2	ODU Electronic Expansion Valve 1
32	L3	ODU Electronic Expansion Valve 2
33	L4	ODU Electronic Expansion Valve B
34	P1	Comp. Current
35	P2	Comp. Operating Accum. Time
36	q1	Motion Sensor Reaction Rate
37	q2	Radiant Temp. Sensor
38	q3	Motion Sensor 1 Reaction Rate
39	q4	Motion Sensor 2 Reaction Rate
40	q5	Motion Sensor 3 Reaction Rate
41	q6	Motion Sensor 4 Reaction Rate
42	q7	Setting Temp. Collected Value
43	r1	Leak Sensor Energization Accum. Time
44	r2	Leak Sensor Reference Voltage (V)
45	r3	Leak Sensor Output Voltage (V)
46	r4	Leak Sensor Abnormality Times
47	S1	Return Air Humidity
48	S2	Econo Ambient Air Temperature
49	S3	Econo Ambient Air Humidity

- Items of Check Mode 2

No.	Item	Data Name
1	q1	Inlet Air Temp.
2	q2	Discharge Air Temp.
3	q3	Liquid Pipe Temp.
4	q4	Outdoor Air Temp.
5	q5	Gas Pipe Temp.
6	q6	Evaporating Temp. at Heating
7	q7	Control Information
8	q8	Comp. Top Temp.

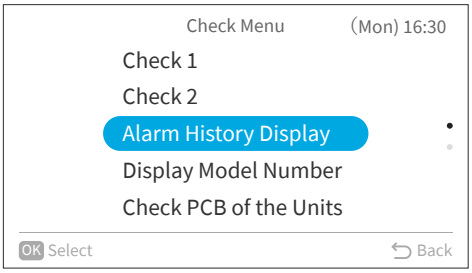
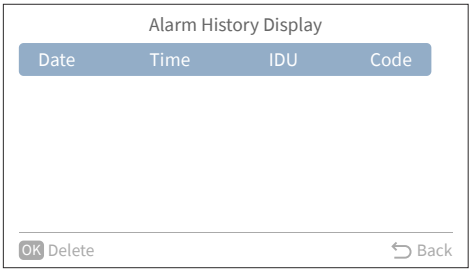
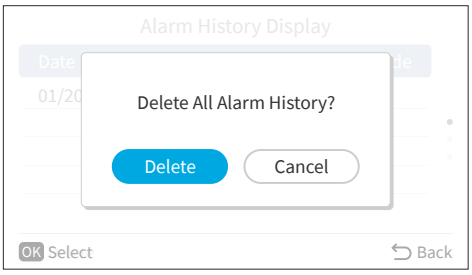
No.	Item	Data Name
9	q9	Discharge Pressure
10	qA	Suction Pressure
11	qb	Control Information
12	qC	Operating Frequency
13	qd	I.U. Expansion Valve
14	qE	O.U. Expansion Valve 1
15	qF	Comp. Current

OPTIONAL FUNCTION

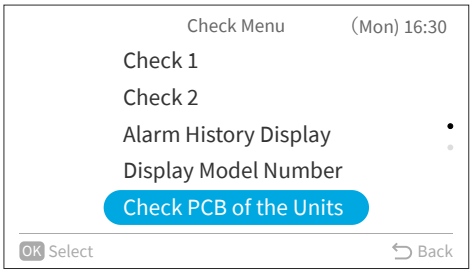
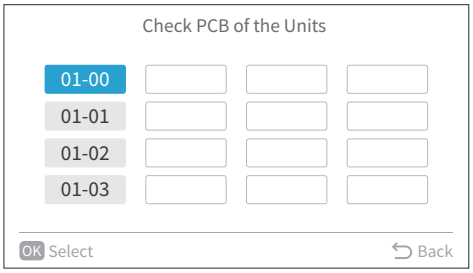
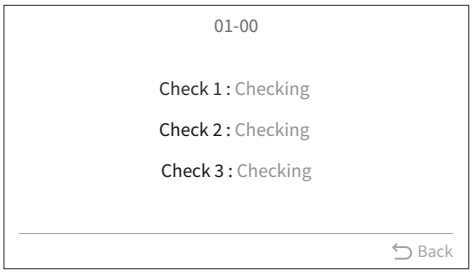
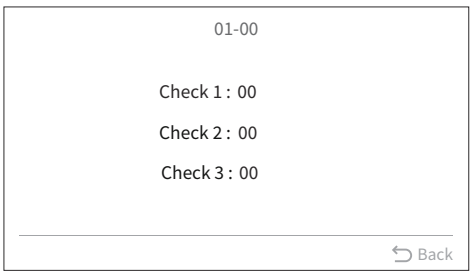
(Operation from Wired Remote Controller)

b. Alarm History Display

The alarm history display can be set from the check menu.

(1) Select "Alarm History Display" from the check menu and press "OK".	
(2) The alarm history display changes by pressing "∧"or "∨".	
(3) To delete the alarm history, press "OK". The confirmation screen will be displayed. Select "Yes" and press "OK". The alarm history is deleted.	

c. Check PCB of the Units

(1) Select "Check PCB of the Units" from the check menu and press “OK”.	
(2) Select the set indoor unit by pressing "∧", "∨", "<", or ">" and press "OK". (This screen is NOT displayed when the number of indoor unit connected with the wired remote controller is 1 (one). In this case, next screen will be displayed.)	
(3) The indoor unit PCB and the outdoor unit PCB checks are started. * If "⮌" (back) is pressed during the check, the check will be paused and return to (2).	
(4) After completing the check, the result of PCB check will be indicated. Press "⮌" (back) and return to (2) above.	

< Result of Check Table >

Indoor Unit PCB	
00	Normal
01	Abnormality of Inlet Air Temp. Thermistor
02	Abnormality of Outlet Air Temp. Thermistor
03	Abnormality of Liquid Pipe Temp. Thermistor
04	Abnormality of Remote Thermistor
05	Abnormality of Gas Pipe Temp. Thermistor
08	Abnormality of Transmission of Central Station
0A	Abnormality of EEPROM
0b	Zero Cross Input Failure
EE	Abnormality of Transmission of I.U. during Check

Outdoor Unit PCB	
00	Normal
07	Abnormality of Transmission of Outdoor Unit
F4	ITO Input Failure
F5	PSH Input Failure
F6	Abnormality of Protection Signal Detection Circuit
F7	Abnormality of Phase Detection
F8	Abnormality of Transmission of Inverter
FA	Abnormality of High Pressure Sensor
Fb	Abnormality of Comp. Discharge Gas Temp. Thermistor
FC	Abnormality of Low Pressure Sensor
Fd	Abnormality of Evaporating Temp. Thermistor at Heating
FF	Abnormality of Ambient Air Temp. Thermistor

(Operation from Wired Remote Controller)

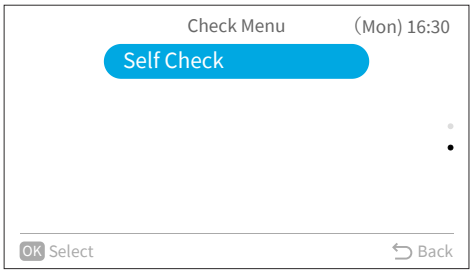
d. Self Check

The self check performs to check the wired remote controller and to clear EEPROM (storage cell inside of the wired remote controller).

NOTE:

- A smart phone with NFC feature is needed during Self Check.

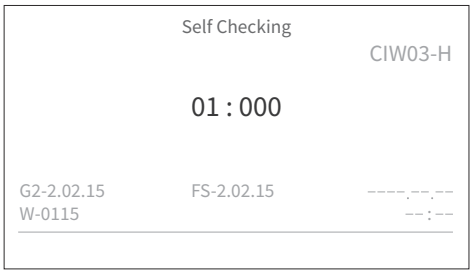
(1) Select "Self Check" from the check menu and press "OK".



(2) Select the process for "Self Checking".

* To start self check, press "OK".

* To clear EEPROM, press "∨" and "⮌" (back) simultaneously.
→ See EEPROM clear process (16) (next page).



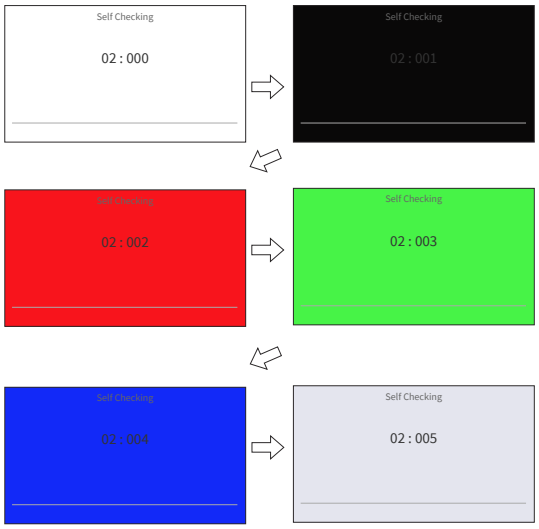
(3) LCD Test

Press "OK" button will enter into LCD check.

Press "〉", the screen color switches every 1 second in the following order.

① white
② black
③ red
④ green
⑤ blue
⑥ gray

Next item automatically shows after 1 second.



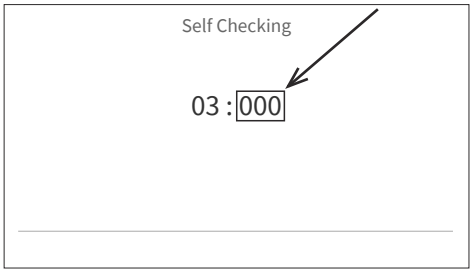
(4) Backlight Test

Press "〉", the screen switches every 1 second in the following order.

① Backlight off (Value : 001)
② Minimum (Value : 002)
③ Normal (Value : 003)
④ Maximum (Value : 004)

Next item automatically shows after 1 second.

The value changes as below.
001 → 002 → 003 → 004



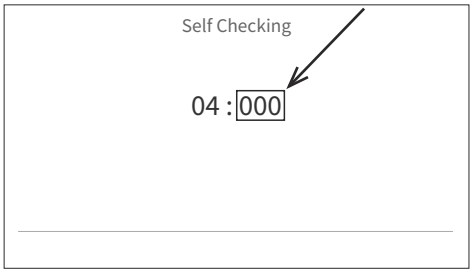
(5) Indicator LED check

Press "〉", the screen switches every 0.5 second in the following order.

① Red light flash twice (Value : 001)
② Green light flash twice (Value : 002)

Next item automatically shows after 1 second.

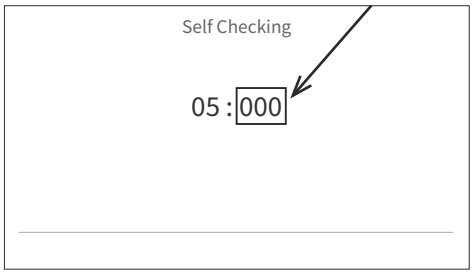
The value changes as below.
001 → 002



(6) Key Check

Press 7 keys in turn.
Order: "Power"→"<"→"∧"→">"→"∨"→"OK"→"⮌" (back)
Enter to next test item when the display switch to "05:007".

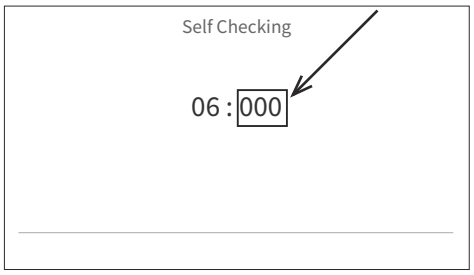
When the key is pressed in the order, the value changes as below order :
001 → 002 → ... → 007



(7) Buzzer check

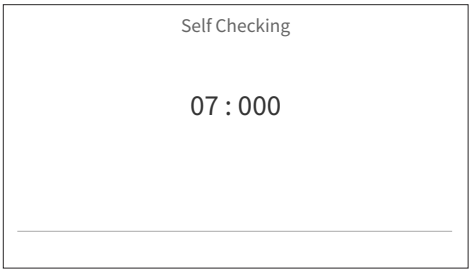
Press "→", the Buzzer volume switches every 0.5 second in the following order.
① Buzzer off (Value : 001)
② Minimum (Value : 002)
③ Normal (Value : 003)
④ Maximum (Value : 004)
Next item automatically shows after 1 second.

The value changes as below.
001 → 002 → 003 → 004



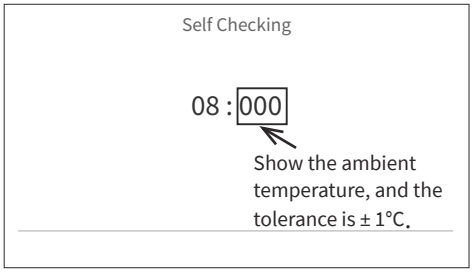
(8) Transmission Circuit Test

The wired remote controller automatically starts to check the transmission circuit.



(9) Wired Remote Controller Thermistor Test

The temperature detected by wired controller.
Thermistor is displayed at black frame in the right figure.



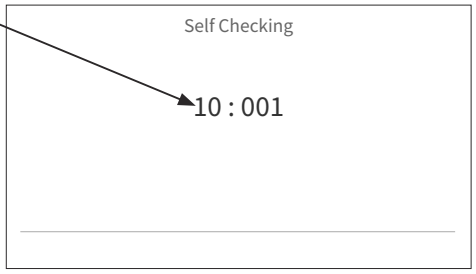
(10) No Function

This function is not used. Press "∨" to proceed.

(11) NFC Circuit Check

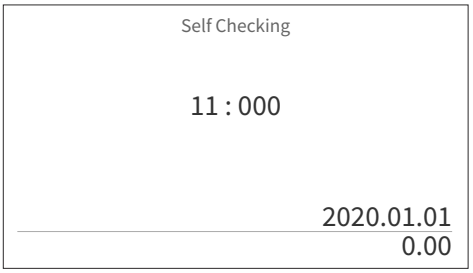
Enable "NFC" feature on your smart phone and close to wired remote controller (distance within 3cm) after wired remote controller displaying "10:001".
If the smart phone is not detected, the process does not proceed to next step.

09: No Function
10: NFC Circuit Check

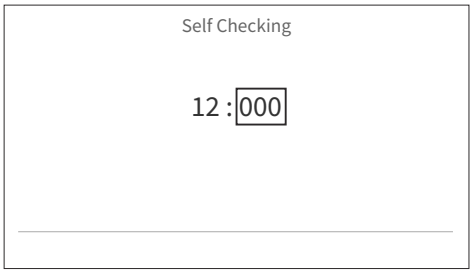
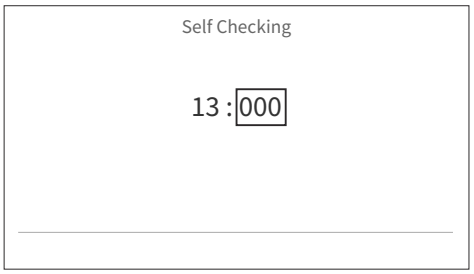
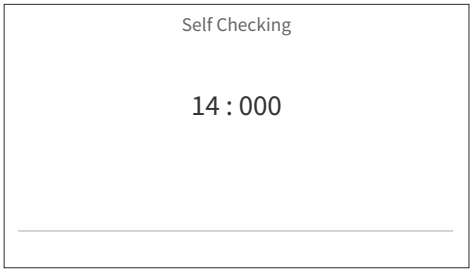
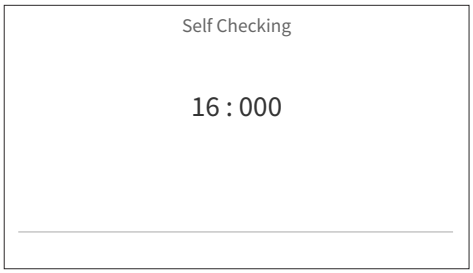


(12) Date/Time Test

The date and time is switched from "2012.03.04 12:34" to "2020. 01. 01 00:00".
Start to next item automatically after 3 seconds.



(Operation from Wired Remote Controller)

(13) External Flash check The wired remote controller automatically starts to check external flash. If the number displayed at black frame during the process is “999”, External flash is in a faulty condition and the process does not proceed to next step.	
(14) EEPROM Test < EEPROM Clearing Cancel > Press "﹀". < EEPROM Clear > Press “OK” or wait 15 seconds. EEPROM data will be cleared. If the number displayed at black frame during the process is "999", EEPROM is in a faulty condition and the process does not proceed to next step.	
(15) NFC EEPROM Check < NFC EEPROM check Cancel > Press "﹀". < NFC EEPROM Check > Press “OK” or wait 15 seconds. NFCEEPROM data will be cleared. If the number displayed at black frame during the process is "999", NFC EEPROM is in a faulty condition and the process does not proceed to next step.	
After several seconds, the self checking is completed and the wired remote controller automatically restarts.	
(16) EEPROM Clear The wired remote controller will automatically start EEPROM clearing process.	
After several seconds, the self checking is completed and the wired controller automatically restarts.	

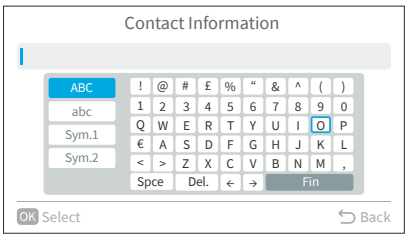
(5) Contact Information Registration

Contact information can be registered from "Set Contact Information".

Step1. Select "Service Menu" on the Service & Installation screen and press "OK".

Step2. Select "Set Contact Information" and press "OK".

Step3. "Contact Information1" screen is displayed. Press "<" to move cursor to font type. Press "∧" or "∨" to select the font type.
*Each time you want to change the font type, press "<" to move the cursor back to font type.

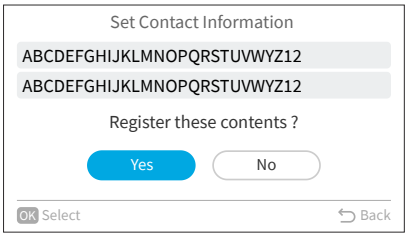


Step4. Press ">" to move cursor to the keypad. Press"∧", "∨", "<", or ">" to select the font and press "OK" to register it.(Up to 60 characters can be can be used for each contact information.)

Step5. After all the characters have been set, select "Fin" and press "OK".

Step6. "Contact Information2" screen is displayed, repeat Step3, Step4 and Step5.

Step7. Select "Yes" and press "OK" to confirm the setting and Step2 is displayed.
If "No" is selected , the screen returns to Step3.

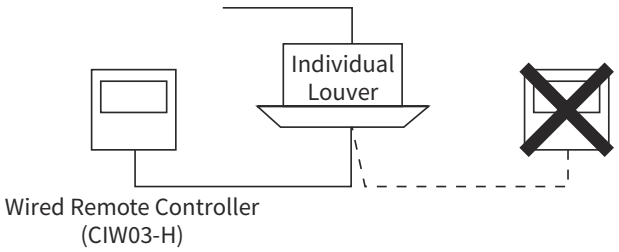


4.3 Cautions for Individual Louver Setting

NOTE:

- This function is not available for duct type indoor unit.

(1) This “Individual Louver Setting” is NOT available with 2 (two) wired remote controllers.



(2) The individual louver function is not for blocking the air outlet. If the air outlet is blocked, 3-Way Outlet Parts Set shall be used.

NOTE:

- The air outlets can not be closed individually by the individual louver setting.

4.4 Other Considerations

4.4.1 Function of Wired Remote Controller

Combination (RSW and I.U.)	Model		Individual Louver Setting	4 Air Flow Volumes	Motion Sensor
RSW : 1 I.U.	CIW03-H		○	○	○
	Receiver Kit (PC-ALH5Q/PC-ALHZ5Q) With PC-LH8QE		×	○	×
2 RSW	CIW03-H		×	○	○*
	Mixed	CIW03-H Receiver Kit (PC-ALH5Q/PC-ALHZ5Q) With PC-LH8QE	×	○	×
		Others	×	×	×
without RSW	-	-	×	×	×
without Transition Wiring 10	-	CIW03-H	○	○	×
	-	Receiver Kit (PC-ALH5Q/PC-ALHZ5Q) With PC-LH8QE	×	×	×

*It is available only for the primary wired remote controller.

RSW: Wired Remote Controller
I.U.: Indoor Unit

4.4.2 Cautions for the Use of IR Receiver Kit

When using the IR Receiver Kit, pay attention to the following points.

(1) When using the IR Receiver Kit with the wired remote controller, set the wired remote controller as the primary one.

(2) The optional function setting “Fixing of Setting Temperature” is not available. When the operation mode is changed with the wireless controller, the setting temperature is the same as the temperature indicated on the wired remote controller.

(3) If using 2 wired remote controllers or IR Receiver kits, do not change the operation mode by external input during emergency operation.

(4) The wireless controller to be used shall be PC-LH8QE.

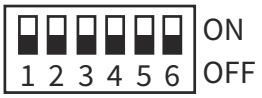
4.5 Optional Function by Outdoor Unit PCB

Setting DSW2 on the outdoor unit PCB (PCB1) is required for "External Input and Output Setting" and "Optional Function Setting". (Refer to the item 1.1.2 "Rotary Switch and Dip Switch Setting for Outdoor Units" for details.)

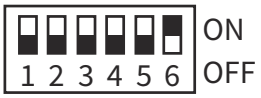
< Setting Method >

- for External Input and Output Setting(DSW2)

Factory Setting Position



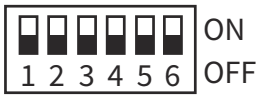
for External Input and Output Setting



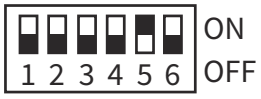
No.6 pin "ON"

- for Optional Function Setting(DSW2)

Factory Setting Position



for Optional Function Setting



No.5 pin "ON"

4.5.1 External Input / Output Setting

On the outdoor unit PCB (PCB1), there are three input terminals (CN1, CN2) to receive external signals and two output terminals (CN7) to send signals outwards. Control functions as shown below table are available by setting input/output terminals.

Control Function	Input	Output
1	Fixing Heating Operation Mode	Operation Signal
2	Fixing Cooling Operation Mode	Alarm Signal
4	Outdoor Fan Motor Start/Stop 1	Defrosting Signal
5	Forced Stoppage	-
6	Demand Current Control 40%	-
7	Demand Current Control 60%	-
8	Demand Current Control 70%	-
9	Demand Current Control 80%	-
10	Demand Current Control 100%	-
11	Outdoor Fan Motor Start/Stop 2	-

The following functions have been already set before shipment.

< Input/Output Terminal 「dr」=0 >

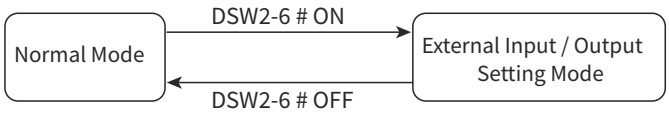
Input/Output Terminal Name		Connector (Pin No.)	Factory setting or outdoor function selection 「dr」=0	
Input/Output	Display		Setting Function	Control Function No.
Input 1	i1	CN1 (1-2)	Fixed Heating Operation Mode	1
Input 2	i2	CN1 (2-3)	Fixed Cooling Operation Mode	2
Input 3	i3	CN2 (1-2)	Demand Stoppage	3
Output 1	o1	CN7 (1-2)	Operation Signal	1
Output 2	o2	CN7 (1-3)	Alarm Signal	2

< Input/Output Terminal 「dr」=1 >

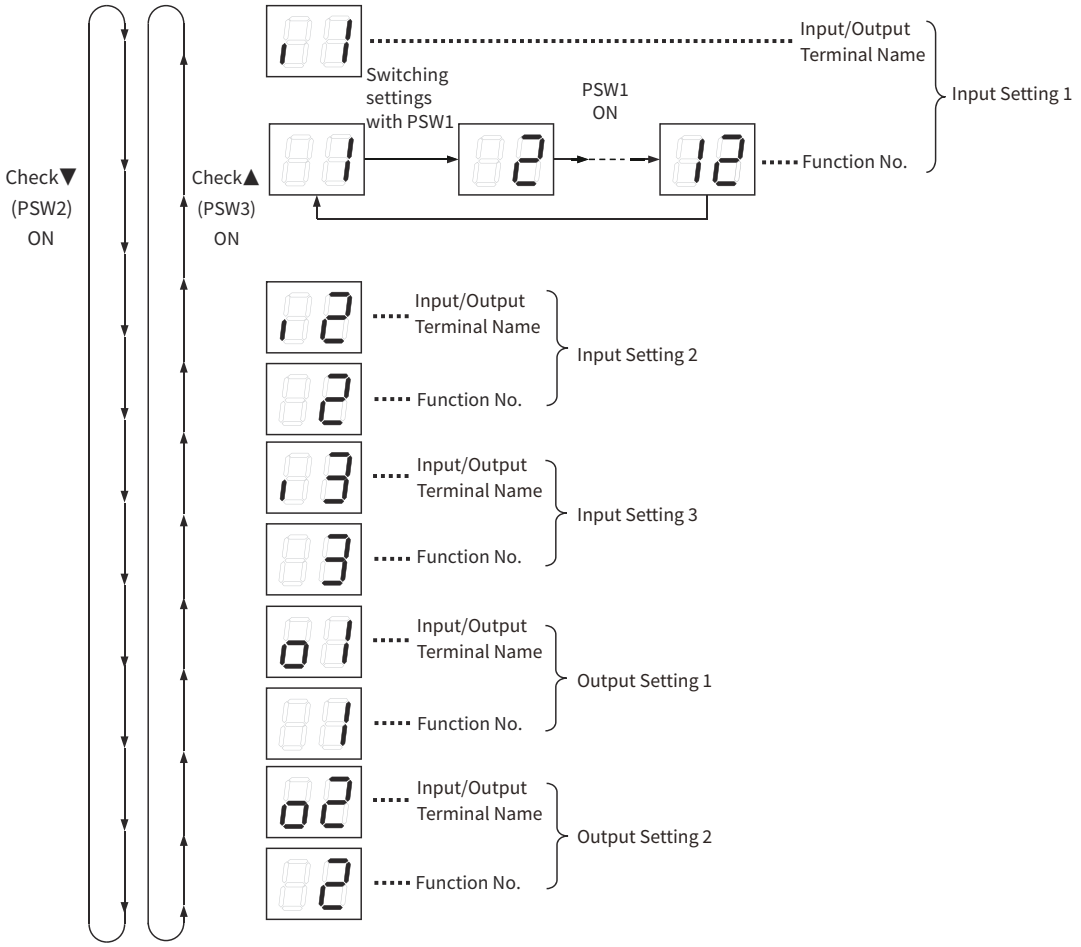
Input/Output Terminal Name		Connector (Pin No.)	Outdoor function selection 「dr」=1	
Input/Output	Display		Setting Function	Control Function No.
Input 3	i3	CN2 (1-2)	Demand Stoppage	3
Output 1	o1	CN7 (1-2)	Operation Signal	1
Output 2	o2	CN7 (1-3)	Alarm Signal	2

4.5.2 External Input / Output Setting Method

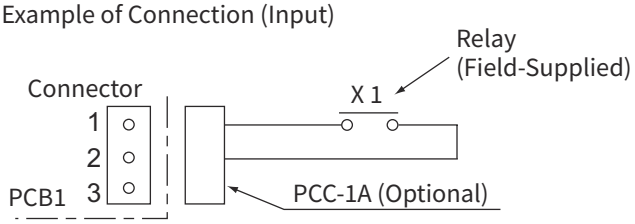
The setting should be performed during the outdoor unit stoppage. This setting is not available during the operation, the check mode and the function setting.



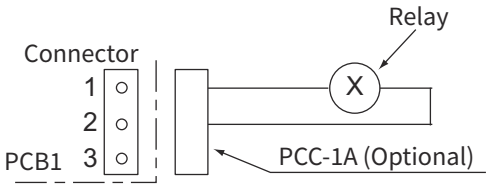
The display content and setting method of the external input and output setting mode are shown in the following figure.



● Example of Connection (Input)



● Example of Connection (Output)



● Specifications of Relay

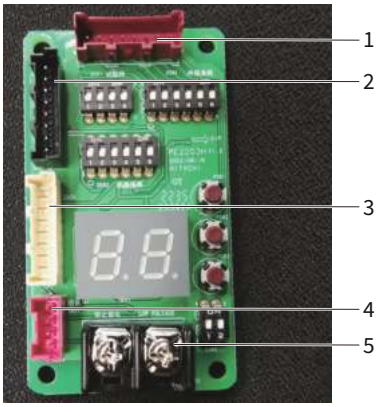
Specifications	Remarks
Mini-Power Relay MY1F (or 2F) made by OMRON Co.	208V/ 230V

● Specifications of Relay

Specifications
Mini-Power Relay LY2F DC12V made by OMRON Co.

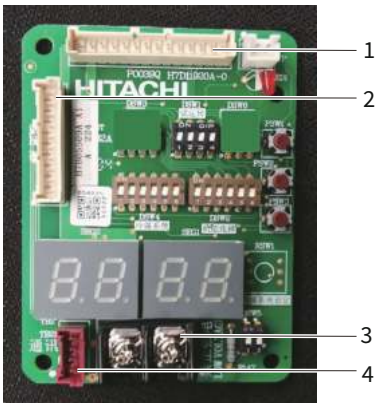
< Arrangement of Push Switches on PCB2 >

PAS-09BUFASDQ1~PAS-24BUFASDQ1



No.	Mark	Description
1	CN31	Connect to PV2207H/PV2016H CN31
2	CN29	Connect to PV2207H/PV2016H CN29
3	CN30	Connect to PV2207H/PV2016H CN30
4	TB21	Connect to PV2207H/PV2016H TB21
5	TB2	Connect to indoor communication

PAS-30BUFASDQ1~PAS-48BUFASDQ1



No.	Mark	Description
1	CN_DSW1	Connect to PO1923H CN_DSW1
2	CN_DSW2	Connect to PO1923H CN_DSW2
3	TB2	Connect to indoor communication
4	TB21	Connect to PO1923H TB21

- External Input Function Setting (dr=0)

The following signals can be received by the outdoor unit PCB. Refer to the table 4.3 for the required main parts.

(1) Input Fixing Heating Operation Mode (Control Function No.1),
Input Fixing Cooling Operation Mode (Control Function No.2)

When the input terminals for the fixing operation mode on the outdoor unit PCB are short-circuited, the operation mode can be fixed at the cooling or heating mode.

Short-circuit between Terminals 1 and 2 of CN1: Fixed Heating Operation Mode
Short-circuit between Terminals 2 and 3 of CN1: Fixed Cooling Operation Mode

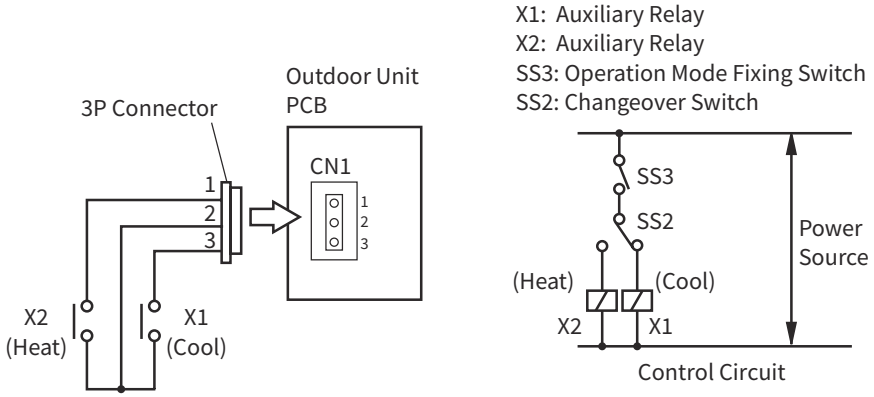
During this fixed heating (or cooling) mode, no cooling (or heating) operation is available. The indoor units under the cooling or dry operation (or heating operation) will be changed to the Thermo-OFF condition during this mode, and stoppage code No. “20” is given.

NOTE:

- For single connection, this setting is NOT required.

- Setting Example

Fixing Heating Operation at Input 1 (between 1 and 2 pins of CN1)
Fixing Cooling Operation at Input 2 (between 3 and 2 pins of CN1)



Wiring Diagram Example of Fixing Operation Mode

OPTIONAL FUNCTION

(Operation from Outdoor PCB)

(2) Input Forced Stoppage (Control Function No.5)

When the input terminals for Demand Stoppage or Forced Stoppage on the outdoor unit PCB are short circuited while running, the compressor(s) is stopped. The fan motor of indoor unit(s) is operated as shown below.

Demand Stoppage (Control Function No.3)		Cooling: Airflow Setting, Heating Lo Setting
Forced Stoppage	Function Setting “FE”=0	Stop
(Control Function No.5)	Function Setting “FE”=1	Cooling: Airflow Setting, Heating Lo Setting

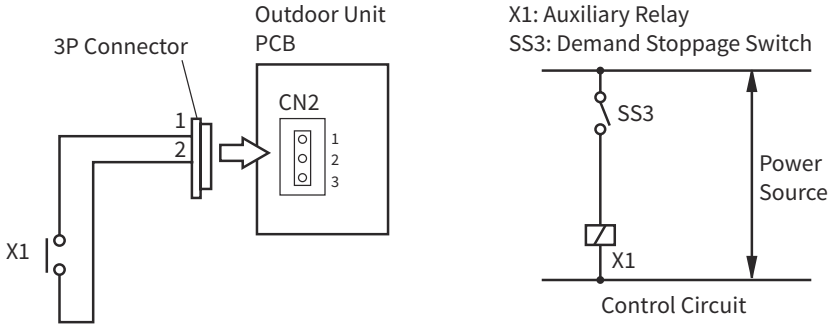
The stoppage code No. “10” is given. In this case, if the input terminals are opened, operation is resumed.

NOTE:

- When demand control (ON/OFF) is performed, it is recommended that the control (ON/OFF) time is set appropriately according to the heat load. Also, set the demand control time approximately once in 15 minutes at the minimum in consideration for saving energy.

● Setting Example

Demand Stoppage at Input 3 (between 1 and 2 pins of CN2)



Wiring Diagram Example of Demand Stoppage

(3) Input Outdoor Fan Motor Start/Stop (Control Function No.4)

This is an auxiliary function to protect the outdoor unit from snow. When the input terminals for Outdoor Fan Motor Start/Stop on the outdoor unit PCB are short-circuited during the compressor stoppage, all the outdoor fan motors start operating. If the compressor restarts operating, the outdoor fan motors will be restored to normal operation. If the input terminals of Outdoor Fan Motor Start/Stop are opened during the outdoor fan motor operation following the short circuit of these terminals, the outdoor fan motor will stop. This function is possible only during the compressor stoppage (during Switch-OFF or Thermo-OFF of the Switch-ON). Therefore, this function will not be possible even if the input signal is sent during the normal cooling or heating operation. This method requires a relay or similar to initiate this function. This is a separate method. An example of basic wiring when the Outdoor Fan Motor Start/Stop (Input 2) is set to 2 and 3 pins of CN1 by an external signal is shown below.

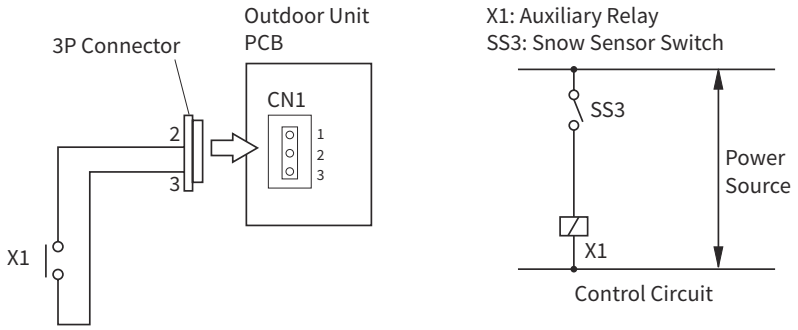
In this section, Switch-ON/Switch-OFF mean:

Switch-ON: Some indoor units are running or staying.

Switch-OFF: All indoor units are stopped.

● Setting Example

Outdoor Fan Motor Start/Stop at Input 2 (between 2 and 3 pins of CN1)



Wiring Diagram Example of Outdoor Fan Motor Start/Stop

NOTES:

- This is an auxiliary function to protect the unit from snow. In snowy regions, make sure to protect the unit with a snow-prevention roof, fence(field-supplied) or snow protection hood (optional). abnormal vibrations because of an imbalanced propeller fan will be caused.
- If the fan motor or fan controller fail during this function, stop all the outdoor fans to suspend this function. Check the alarm code and deal properly with the failure next time the compressor is operated.
- When setting the snow sensor switch for Outdoor Fan Motor Start/Stop, make sure that the continuous operating time is 30 seconds or more. Also Outdoor Fan Motor Start/Stop intervals shall be at least 10minutes. Otherwise, malfunction of the outdoor fan motors will be caused by frequent starts and stops.

(4) Input Demand Current Control 40, 60, 70, 80, 100% (Control Function No.6 to 10)

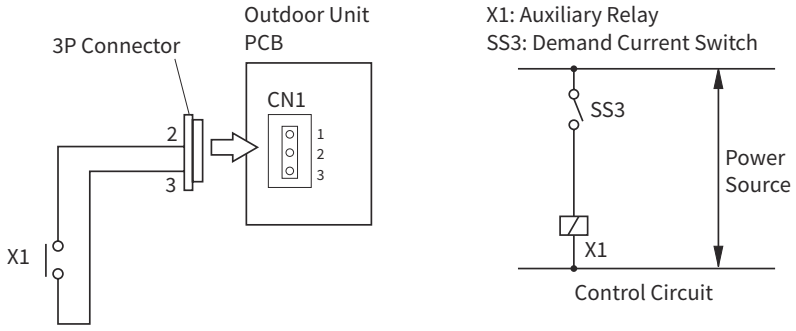
When the input terminals for Demand Current Control on the outdoor unit PCB are short-circuited, the compressor frequency is controlled so that the maximum limit of the outdoor running current is set to 100%, 80%, 70%, 60% or 40% of the reference power consumption. If the outdoor unit running current exceeds the maximum limit for twenty minutes, the indoor unit is put under Thermo-OFF condition. In this case, the stoppage code No. “10” is given. When the input terminal is opened during the demand current control, its control is released.

NOTES:

- Thermo-ON: The outdoor unit and some indoor units are running.
- Thermo-OFF: The outdoor unit and some indoor units stay on, but don’t run.

● Setting Example

Demand Current Control at Input 2 (between 2 and 3 pins of CN1), Control Function No.6 to 10



Wiring Diagram Example of Demand Current Control

(5) Outdoor Fan Motor Start/Stop 2 (Control Function No.11)

When the setting of Function No.11 is valid, ｢Fd｣ can be used in the function selection to set the outdoor fan to run at X seconds every 600 seconds.

External input signal Function No.11 setting	Fan Step
NO	0 (Fan Stop)
YES	Fo=14

According to the ｢FD｣ setting, run the outdoor fan at X seconds every 600 seconds.

｢FD｣ Setting Contents	0	1	2	3	4
Outdoor Fan Running Time X[s]	600[s] (Continuous Running)	30	60	120	300

OPTIONAL FUNCTION

(Operation from Outdoor PCB)

Table 4.3 Specifications of Required Main Parts

Parts		Specifications	Remarks
Auxiliary Relay (X1, X2)		Mini-Power Relay, MY1F (or 2F) made by OMRON	208V/230V
Changeover Switch (SS2, SS3)		Manual Switch	208V/230V
3 Pin Connector Cord		PCC-1A (Connected to JST Connector, XARP-3)	Five Cords with Connectors as One Set
Electric Wire (Inside of Unit)	Low Volt.	22AWG(0.3mm^2)	lower than 24V
	208/230V	20AWG(0.5mm^2) to 18AWG(0.75mm^2)	
Electric Wire (Outside of Unit)	Low Volt.	20AWG(0.5mm^2) to 18AWG(0.75mm^2)	lower than 24V
	208/230V	14AWG(2mm^2)	

NOTES:

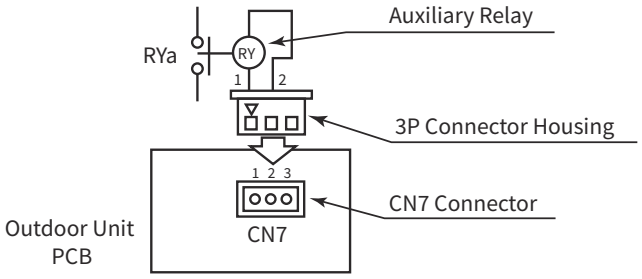
- Make the wire to the terminals as short as possible.
- Do not run the wires along high voltage cable. Keep at least 1ft(0.3m) between the wire and the high voltage cable. (Crossing is applicable.)
  If necessary to run wires along high voltage cable, insert the low voltage cable(s) into metal tube and ground it at one end. If sealed wires are used at the low voltage wire side, ground it at one end of shield wires. The maximum length should be within 230ft(70m).

- External Output Function Setting
  The following signals can be picked up from the outdoor unit PCB.
  Refer to the table 4.4 for the required main parts.

(1) Output Operation Signal (Control Function No.1)

This function is utilized to receive the operation signal.
Auxiliary relay contacting (RYa) is closed during the operation. Operation signal will be sent to output terminals when the indoor units are operating. (Even when one indoor unit is operating, the signal will be sent.) This function can be used for circulator or humidifier operation.

● Setting Example
Operation Signal at Output 1 (between 1 and 2 pins of CN7)

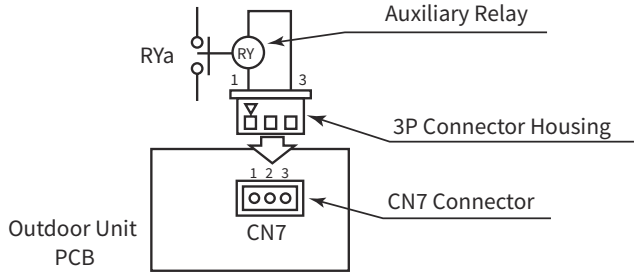


Wiring Diagram Example of Operation Signal

(2) Output Alarm Signal (Control Function No.2)

This function is utilized to receive the alarm signal.
Auxiliary relay contacting (RYa) is closed when the alarm occurs. Alarm signal will be sent to output terminals when the alarm occurs from the indoor units. (The signal will be sent even when the alarm occurs from one indoor unit.)

● Setting Example
Alarm Signal at Output 2 (between 1 and 3 pins of CN7)



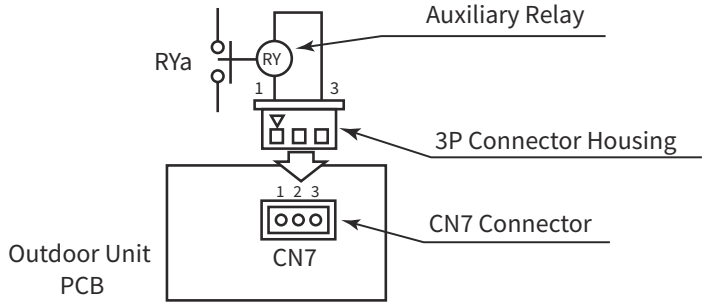
Wiring Diagram Example of Alarm Signal

(3) Output Compressor ON Signal (Control Function No.3)

This function is utilized to receive the compressor operation signal.
Auxiliary relay contacting (RYa) is closed during the compressor operation.

● Setting Example

Compressor ON Signal at Output 2 (between 1 and 3 pins of CN7)



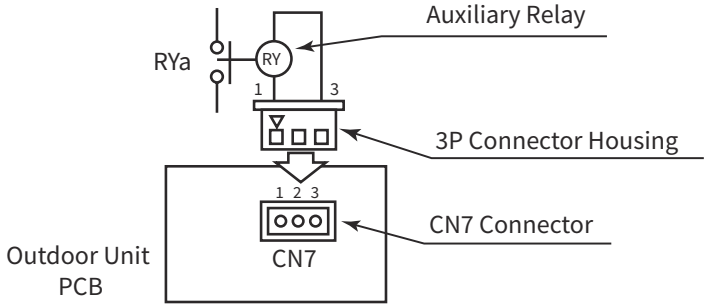
Wiring Diagram Example of Compressor ON Signal

(4) Output Defrosting Signal (Control Function No.4)

This function is utilized to receive the defrosting signal.
Auxiliary relay contacting (RYa) is closed during the defrosting.

● Setting Example

Defrosting Stoppage at Output 2 (between 1 and 3 pins of CN7)



Wiring Diagram Example of Defrosting Signal

Table 4.4 Specifications of Required Main Parts

Parts	Specifications
Auxiliary Relay *	High-Power Relay, LY2F DC12V made by OMRON

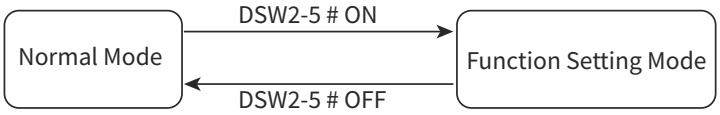
* Do not use the relay with diode built-in.
* Refer to the table 4.3 for the connector parts.

OPTIONAL FUNCTION

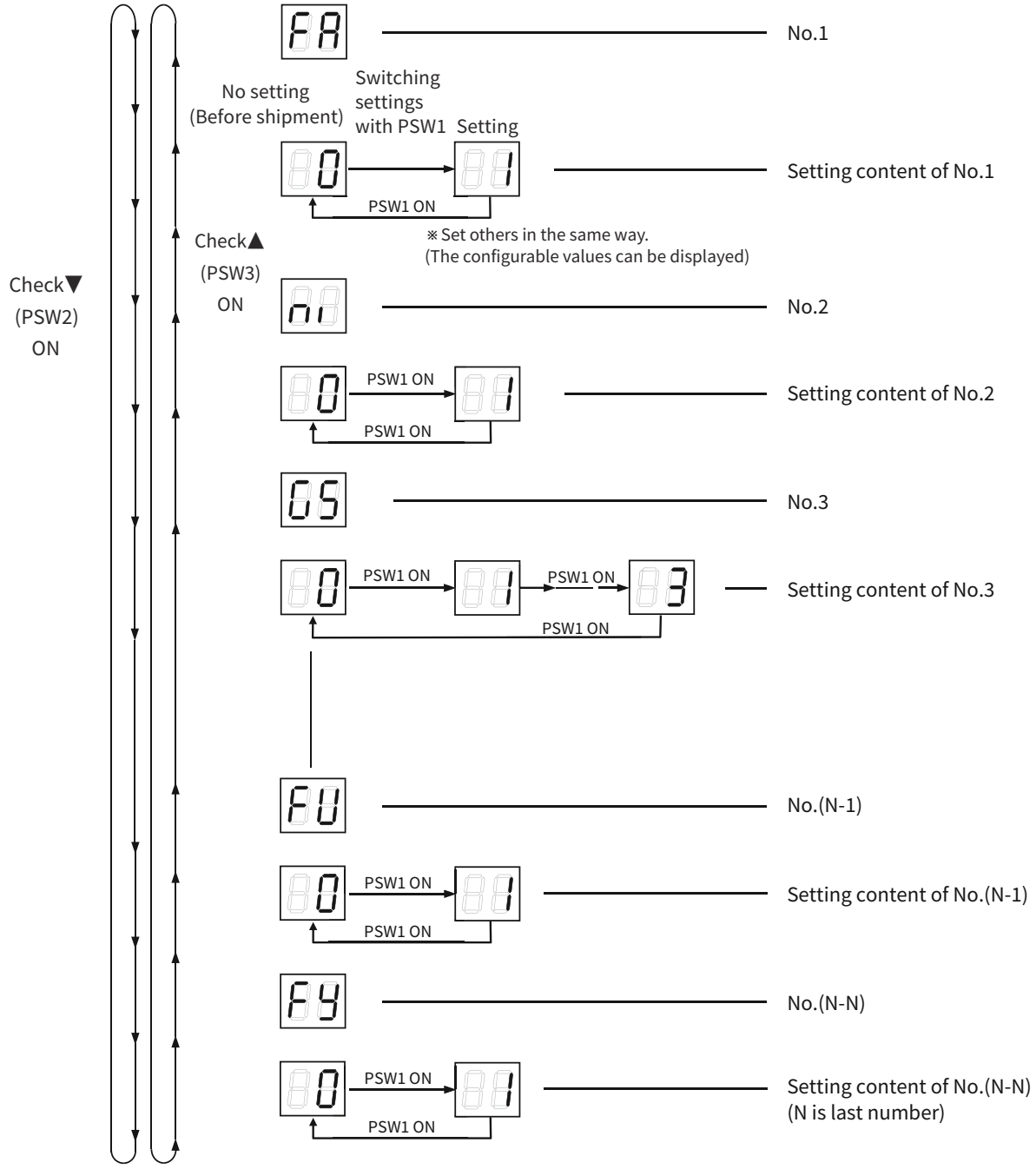
(Operation from Outdoor PCB)

4.5.3 Function Setting from Outdoor Unit PCB

The setting should be performed during the outdoor unit stoppage. This setting is not available during External Input / Output Setting.



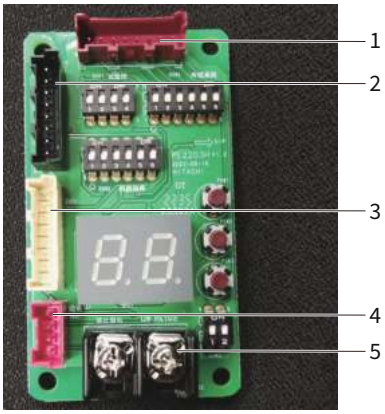
The display content and setting method of the function setting Mode are shown in the following figure.



(Function Setting from Outdoor PCB)

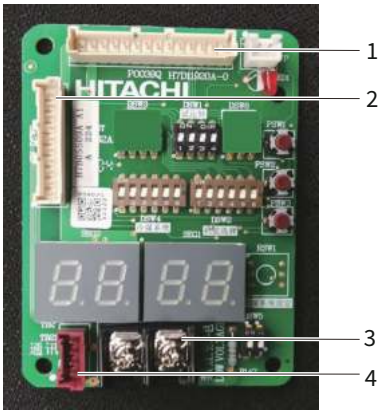
< Arrangement of Push Switches on PCB2 >

PAS-09BUFASDQ1~PAS-24BUFASDQ1



No	Mark	Description
1	CN31	Connect to PV2207H/PV2016H CN31
2	CN29	Connect to PV2207H/PV2016H CN29
3	CN30	Connect to PV2207H/PV2016H CN30
4	TB21	Connect to PV2207H/PV2016H TB21
5	TB2	Connect to indoor communication

PAS-30BUFASDQ1~PAS-48BUFASDQ1



No	Mark	Description
1	CN_DSW1	Connect to PO1923H CN_DSW1
2	CN_DSW2	Connect to PO1923H CN_DSW2
3	TB2	Connect to indoor communication
4	TB21	Connect to PO1923H TB21

No.	7-Segment Display		Setting Item	Contents
1	FA	0	Circular at Heating Thermo-OFF	No setting (continuously operation)
		1		Indoor fan forced ON and OFF (2min. ON/6min. OFF)
2	ni	0	Night Shift (Low Noise)	No setting
		1		Setting night shift for cooling
3	CS	0	Cancellation of Outdoor Ambient Temperature Limit	No setting (valid)
		1		Cancellation for heating
		2		Cancellation for cooling
		3		Cancellation for cooling and heating
4	do	0	Change of Defrost Condition	No setting
		1		Defrost for cold area
		2		Defrost for warm area
		3		Defrost for extremely cold area1
		4		Defrost for extremely cold area2
5	bU	0	SLo (IU Fan Speed) Defrost Setting	No setting (Indoor fan stoppage during defrost operation)
		1		Indoor fan SLo operation when heating operation is activated/during defrost operation
6	HF	0	Cancellation of Hot Start	No setting
		1		Cancellation of hot start
7	nU	0	Priority Capacity Mode	No setting
		1		Change of correction factor for compressor frequency (pattern1)
		2		Change of correction factor for compressor frequency (pattern2)
		3		Change of correction factor for compressor frequency (pattern3)

OPTIONAL FUNCTION

(Function Setting from Outdoor PCB)

No.	7-Segment Display		Setting Item	Contents
8	Hc	0	Compressor Frequency Control Target Value for Cooling	No setting
		1		Change of upper limit for compressor frequency of cooling operation
9	Hh	0	Compressor Frequency Control Target Value for Heating	No setting
		1		Change of upper limit for compressor frequency of heating operation
10	SC	0	Compressor Frequency Fixed Mode	No setting
		1		Fixed frequency mode
11	db	0	Sound Reduced Function	No setting
		1		Low Noise Setting 1
		2		Low Noise Setting 2
		3		Low Noise Setting 3
		4		Low Noise Setting 1
		5		Low Noise Setting 2
		6		Low Noise Setting 3
		7		Low Noise Setting 1
		8		Low Noise Setting 2
		9		Low Noise Setting 3
12	dE	0	Demand Function Setting	No setting
		1		Valid demand function all time
13	UE	0	Demand Function Setting	No setting
		1		Valid wave function (20min. 100% demand/10min. minimum setting)
14	Fb	0	Protection of Decrease in Outlet Temperature of Cooling	No setting
		1		Cooling outlet temperature decrease protection1
		2		Cooling outlet temperature decrease protection2
15	Fr	0	Outlet Temperature Control (DOAS)	No setting
		1		Restrain capacity control
		2		Outlet air temperature control
16	E1	0	Prepared 1	
		1		
17	dS	0	Thermo-OFF Setting for Outdoor Unit After Defrosting Operation	No setting (continuously operation)
		1		Valid forced stoppage after defrost operation
18	F 1	0	Intermittent Operation of Outdoor Fan Motor1 (Snow Prevention)	No setting
		1		Intermittent outdoor fan operation (30sec ON/570sec. OFF)
		2		Intermittent outdoor fan operation (60sec. ON/540sec. OFF)
		3		Intermittent outdoor fan operation (120sec. ON/480sec. OFF)
		4		Intermittent outdoor fan operation (300sec. ON/300sec. OFF)
19	F2	0	Prepared 2	
		1		
20	F3	0	Prepared 3	
		1		

No.	7-Segment Display		Setting Item	Contents
21	F4	0	Invalid Electronic Expansion Valve Opening Difference Protection	No Setting (valid)
		1		Invalid electronic expansion valve opening deference protection
22	F6	0	Prepared 4	
		1		Voltage balance control for power supply
23	F8	0	Crankcase Heater Control during Stoppage	No setting (Preheating during outdoor unit stoppage)
		1		Power saving during outdoor unit stoppage (without preheating by crankcase heater)
24	F9	0	Invalid Motion Sensor during Prepare Defrost	No Setting
		1		Invalid starting defrosting by motion sensor detecting "no human activity (absent)"
25	FC	0	Prepared 5	
		1		
30	Fd	0	Intermittent Operation of Outdoor Fan Motor2 (Snow Prevention)	No setting
		1		Intermittent outdoor fan operation (30sec. ON/570sec. OFF)
		2		Intermittent outdoor fan operation (60sec. ON/540sec. OFF)
		3		Intermittent outdoor fan operation (120sec. ON/480sec. OFF)
		4		Intermittent outdoor fan operation (300sec. ON/300sec. OFF)
31	FE	0	Permit Indoor Fan Operation during Forced Stoppage	No setting (Indoor fan stoppage during forced stoppage by DSW1-4 or input function No.5)
		1		Permit indoor fan operation during forced stoppage
33	FF	0	Cancellation control of abnormality detection	No setting
		1		Disable gas abnormality detection control (49 alarm)
34	FH	0	Disable stop defrosting	No setting
		1		Disable stop defrosting (not implemented)
35	FJ	0	Change stop defrosting area	Stop defrosting available, outdoor fan input condition: 1.01
		1		Stop defrosting available, outdoor fan input condition: Kdwfan
36	Fn	0	High latent heat adaptation mode	No setting
		1		Switch the correction coefficient of the operating frequency during cooling
37	FP	0	Disable early termination condition of freezing	No setting
		1		Disable startup control 2 and end condition of freezing control in freezing mode
38	Fr	0	Defrost period of forced defrost 1	No setting
		1		Shorten the operating cumulative time condition of the defrost preparation start condition of forced defrost 1
39	FU	0	Expand the lower limit of heating set temperature	No setting
		1		Expand the lower limit of heating set temperature for cold regions.

OPTIONAL FUNCTION

(Function Setting from Outdoor PCB)

No.	7-Segment Display		Setting Item	Contents
40	b0	0	Product series (region)	No setting
		1		ANZ
		2		PH(Prepared)
		3		NA
		4-15		Others(Prepared)
41	b1	0	Unit capacity	No setting
		1		09K
		2		12K
		3		-
		4		-
		5		18K
		6		24K
		7		-
		8		30K
		9		36K
		10		48K
		11		-
		12		-
		13		-
		14		-
		15		-
42	b2	0	Power supply	1Ph/220~240V/50Hz
		1		Prepared
		2		Prepared
		3		3Ph/380-415V/50Hz
		4		1Ph/208~230V/60Hz
43	dr	0	DR command	No setting
		1		No setting

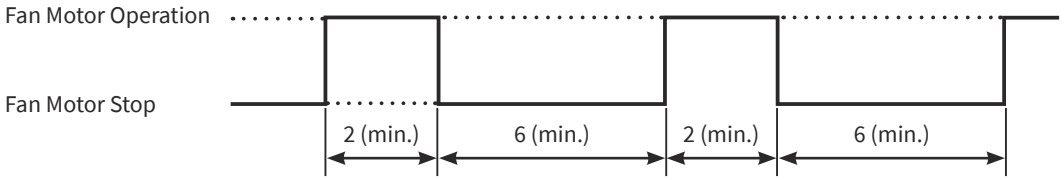
(1) Circulator Function at Heating Thermo-OFF (Control Function "FA")

Press "PSW3" and select the setting conditions "1" in the circulator function at heating Thermo-OFF "FA". Normally, the fan speed is changed to "LOW" at heating Thermo-OFF. (There is a case that the room temperature is too high at the heating Thermo-OFF.) However, the indoor fan motor is operated at "LOW" and stopped repeatedly by setting this function.

NOTE:

- When the compressor is stopped, the indoor fan motor operates at "LOW" speed continuously.

The action when the indoor fan motor operates at the circulator function indicated as follows.

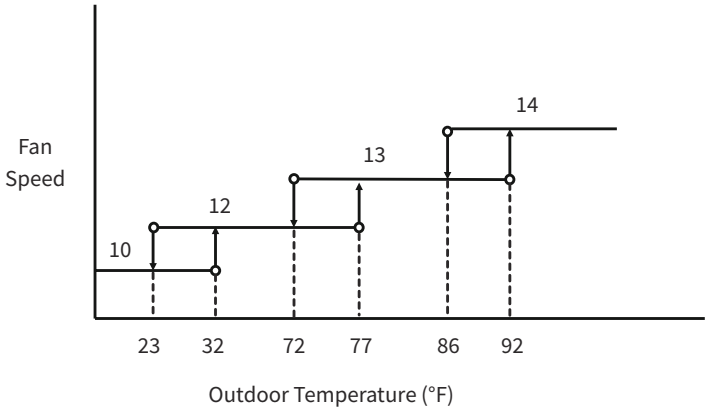


(2) Night-Shift (Low Noise) (Control Function "ni")

Press "PSW3" and select the setting condition "1" at the night shift (low noise) "ni". Then, this function can be set. (only in the cooling operation)

The outdoor fan operation is controlled by fan controller as shown below. The night shift operation shall be applied in case that the cooling capacity has the margin to be allowed for the capacity decrease and the low sound operation is required especially in the nighttime.

(a) Outdoor Fan



(b) Frequency Range (Cooling Operation)

	Outdoor Unit Capacity (K)	Minimum Frequency (Hz)	Maximum Frequency (Hz)	Conditions
When Night Shift is not Set ni=0	09	30	70	Except for the Conditions on the Right
	12	30	84	
	18	15	90	
	24	15	73	
	30	15	70	
	36	15	79	
	48	15	90	

	Outdoor Unit Capacity (K)	Minimum Frequency (Hz)	Maximum Frequency (Hz)	Conditions
When Night Shift is Set ni=1	09	30	30	-
	12	30	39	
	18	15	45	
	24	15	28	
	30	15	25	
	36	15	34	
	48	15	47	

(3) Cancellation of Outdoor Ambient Temperature Limit (Control Function "CS")

Press "PSW3" and select the setting condition "0" to "3" at the cancellation of outdoor ambient temperature limit of "CS". Then, this function can be set.

The heating operation is continued under a high outdoor temperature or the cooling operation is continued under a low temperature.

Setting Condition	Operation Mode for Cancellation
0	Not Available (Default Setting)
1	Heating
2	Cooling
3	Heating/Cooling

Cancelled Conditions for Outdoor Unit Ambient Temperature Limit

(Function Setting from Outdoor PCB)

< Heating Operation >
If one of following conditions is continued for 1 second, the unit will be under Termo-OFF.

- Ta > 74°F and Ti > 74°F
- Ta > 66°F, Ti > 77°F
- Ta > 62°F, Ti > 80°F
- Ta > 48°F, Ti > 100°F
- Ta < -4°F

< Cooling Operation >
If the following condition is continued for 1 second, the unit will be under Termo-OFF.

- Ta < 23°F

Ta: Outdoor Ambient Temperature
Ti : Indoor Air Inlet Temperature

NOTE:

- If this function is set and the outdoor unit operates in the stoppage area for a long time, the outdoor unit may be damaged since protection control is cancelled.

(4) SLo Defrost Setting (Control Function "bJ")

Press "PSW3" and select the setting condition "0" and "1" at the SLo defrost setting "bJ".
The indoor fan operation is stopped during the defrost operation.

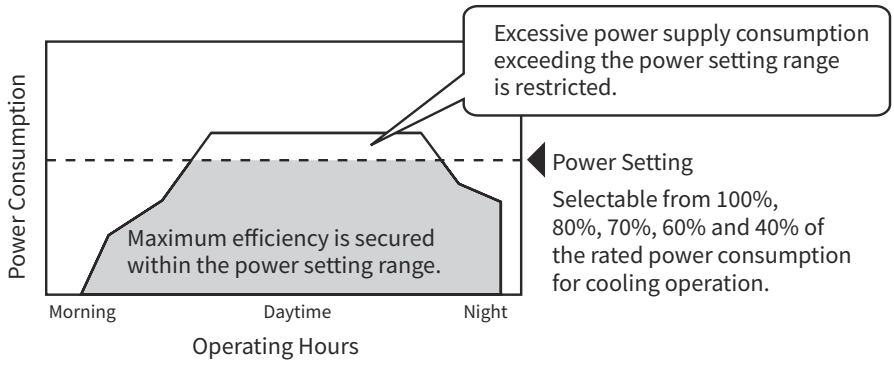
Setting Condition	Indoor Fan Operation
0	Indoor fan stop during defrost operation.
1	Indoor fan SLo during defrost operation.

(5) Demand Function Setting (Control Function "dE")

This function "dE" will be available by setting to "1" for the demand current control without inputting the signal to the external input terminal on the outdoor unit PCB. The table below is shown for the limit of the operating current for this function.

Function No. of external input terminal (1 ~ 3) set by external input/output setting	Demand Running Current Control
Others	100%
6	40%
7	60%
8	70%
9	80%
10	100%

- Demand Control
  Adopting self-demand function which drastically decreases power consumption has largely improved energy-saving.



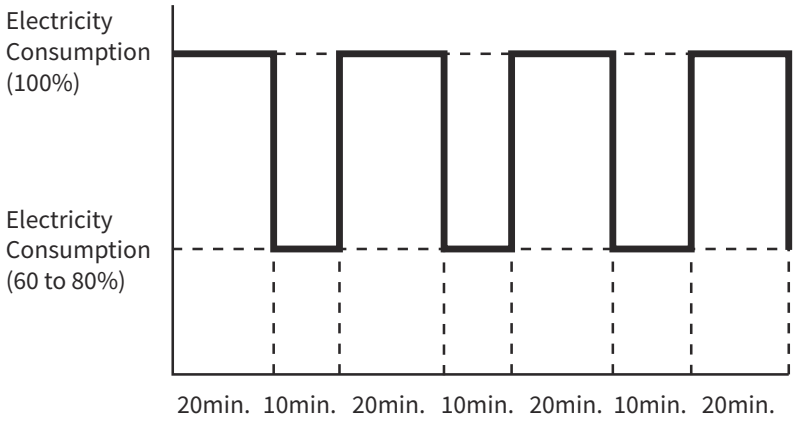
(6) Low Noise Setting (Control Function "db")

This function "db" will be available by setting to "1". Unlike the night shift setting, the compressor frequencies (heating and cooling) are set lower than the normal setting regardless of the outdoor temperature.

(7) Wave Function Setting (Control Function "UE")

Press "PSW3" and select the setting condition "6" to "8", so that the wave function setting "UE" can be set. While this function is activated, the maximum limit of running current is changed from 60% to 80% as shown in the figure.

Function No. of external input terminal (1 ~ 3) set by external input/output setting	Running Current Lower Limit Setting
6	60%
7	70%
8	80%



(8) Cold Draft Protection (Control Function "Fb")

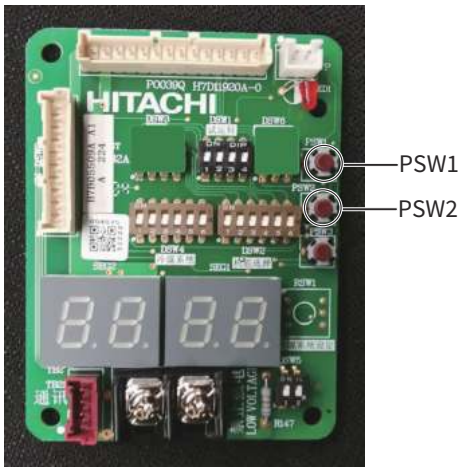
Press "PSW3" and select the setting condition "0" to "2" at the cold draft protection "Fb", so the cold draft protection can be set. When the indoor unit discharge air temperature falls down to ※°F and below at cooling operation, outdoor fan stops and compressor frequency forcibly decreases to prevent a drop in discharge air temperature.

Setting Condition	※°F	Condition
0	-	Not Available (Default Setting)
1	54	The cold draft is prevented by the compressor frequency control and turning ON SVC (solenoid valve for high pressure bypass circuit).
2	54	The cold draft is prevented by the compressor frequency control.

4.6 Optional Function by Heater

- Equipped with a heater that prevents condensate from freezing.
- Without a heater, freezing condensate can cause noise, damage to fan blades, condenser, and system performance reduction.

When PSW1 and PSW2 are pressed simultaneously for more than 3 seconds, the heater will switch on and the heater will switch off when it has worked for more than 90 minutes.



5. Field Work Instruction

5.1 Select Guide of Condensate Pipe for Indoor Unit

- Selecting Method of Condensate Pipe Diameter

<Step 1> Calculation of Drain Flow Volume
Calculate from that the drain flow volume is approximately 1/3 [l/hr] per 1K of the indoor unit nominal capacity.
For Example:
Common condensate pipe for four 18K indoor units and four 24K indoor units.

(1) Total Horse Power of Indoor Unit: 4×18K+4×24K =168K

(2) Total Drain Flow Volume: 168K×1/3 [l/hr.KBTU] =56[l/hr]

<Step 2> Select Condensate Pipe from Table A and B

(1) Horizontal Common Pipe with Slope 1/50: VP30 for above Example

(2) Horizontal Common Pipe with Slope 1/100: VP30 for above Example

(3) Vertical Common Pipe: VP30 for above Example

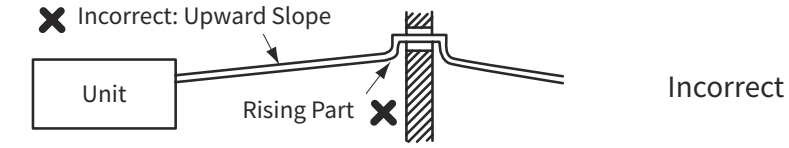
Table A. Permissible Drain Flow Volume of Horizontal Vinyl Pipe

JIS Symbol	Inner Diameter (inch)	Permissible Flow Volume [l/hr]		NOTE
		Slope=1/50	Slope=1/100	
VP20	0.78	39	27	Not Applicable to Common Pipe
VP25	0.98	70	50	
VP30	1.22	125	88	Applicable to Common Pipe
VP40	1.57	247	175	
VP50	2	473	334	

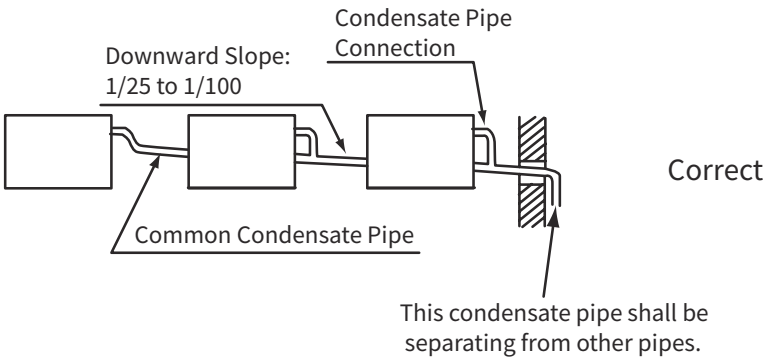
Table B. Permissible Drain Flow Volume of Vertical Vinyl Pipe

JIS Symbol	Inner Diameter (inch)	Permissible Flow Volume (l/hr)	NOTE
VP20	0.79	220	Not Applicable to Common Pipe
VP25	0.98	410	
VP30	1.22	730	Applicable to Common Pipe
VP40	1.57	1,440	
VP50	2	2,760	
VP65	2.64	5,710	
VP75	3.03	8,280	

- Drain Piping



Incorrect



Correct

5.2 Maintenance Work

(1) For Indoor Unit and Outdoor Unit

(a) Fan and Fan Motor

- Lubrication - All fan motors are pre-lubricated and sealed at the factory. Therefore, no lubricating maintenance is required.
- Sound and Vibration - Inspect for abnormal sound and vibration.
- Rotation - Check that the fan rotates counterclockwise and inspect the rotating speed.
- Insulation - Inspect for electrical insulation resistance.

(b) Heat Exchanger

- Clogging - Inspect for any accumulated dirt and dust and remove it if any at regular intervals. As for outdoor unit, other obstacles such as growing grass and pieces of paper, which might intercept air flow, should also be removed.

(c) Piping Connection

- Leakage - Inspect for refrigerant leakage at piping connection.

(d) Cabinet

- Stain and Lubrication - Inspect for any stain and lubrication and remove it if any.
- Fixing Screw - Inspect for loosened or lost screws and fix it if any.
- Insulation - Inspect for peeled thermal insulation material on the cabinet and repair it if any.

(e) Electrical Equipment

- Activation - Inspect for PCB and etc.
- Line Condition - Pay attention to working voltage, amperage and phase balance. Inspect for faulty contact caused by loosened terminal connections, oxidized contacts, foreign matter, and other items. Inspect for electrical insulation resistance.

(f) Control and Protective Devices

- Setting - Do not readjust the setting in the field unless the setting is maintained at a point other than the point listed in “SAFETY AND CONTROL DEVICE SETTING” of “Technical Catalog”.

(2) For Indoor Unit

(a) Air Filter

- Cleaning - Inspect for any accumulated dirt and dust and remove it if any according to “Technical Catalog.”

(b) Drain Pan, Drain-up Mechanism and Condensate Pipe

- Drain Line - Inspect and clean the condensate drain line at least twice a year.
- Drain-up Mechanism - Inspect for activation of drain-up mechanism.

(c) Float Switch

- Activation - Inspect for activation of float switch.

(3) For Outdoor Unit

(a) Compressor

- Sound and Vibration - Inspect for abnormal sound and vibration.
- Activation - Check that the voltage drop of power supply line is within 16% at start and within 2% during operation.

(b) Reverse Valve

- Activation - Inspect for any abnormal activating sound.

(c) Strainer

- Clogging - Check that there is no temperature difference between both ends.

(d) Earth Wire

- Earth Line - Inspect for continuity to the earth.

5.3 Service & Maintenance Record by 7-Segment Display

Customer's Name: DATE: - -

Outdoor Unit Model (Serial No.)		PAS- (Serial No.)	PAS- (Serial No.)	PAS- (Serial No.)
(1) Operation Mode				
(2) Test Run Start Time				
(3) Data Collect Start Time				
(4) Read Out Data from 7-Segment in Outdoor Unit				
Outdoor Microcomputer Output	SC			
Indoor Total Operating Capacity	oP			
Outdoor Alarm Code	AC			
Inverter Frequency	H1			
High Pressure	Pd			
Low Pressure	Ps			
Outdoor Fan Step	Fo			
Outdoor Unit Expansion Valve Opening	Eo			
Discharge Gas Temperature	Td			
Heat Exchanger Liquid Temperature	TE			
Outdoor Temperature	To			
Outdoor Condensation Temperature	TC			
Compressor Suction Temperature	TS			
Inverter Stoppage Cause Code	iT			
Inverter Fin Temperature	TF			
Control Information	A1			
Compressor Running Current				
Indoor Unit (Unit No.)				
Heat Exchanger Liquid Temperature	LA			
Inlet Air Temperature	iA			
Indoor Unit Stoppage Cause Code	dA			

5.4 Service & Maintenance Record by Wired Remote Controller

Data Sheet for Checking by Wired Remote Controller

Time				:	:	:	:	:
I.U. Model								
I.U. Serial No.								
I.U. No. / Alarm Code								
		Check Mode 1	Check Mode 2	1 • 2	1 • 2	1 • 2	1 • 2	1 • 2
B	Temp. Indication							
	Set Temp.	b1	- -					
	Inlet Air Temp.	b2	q1					
	Discharge Air Temp.	b3	q2					
	Liquid Pipe Temp.	b4	q3					
	Remote Thermistor Temp.	b5	- -					
	Outdoor Air Temp.	b6	q4					
	Gas Pipe Temp.	b7	q5					
	Evaporating Temp. at Heating	b8	q6					
	Condensing Temp. at Cooling	b9	q7					
	Comp. Top Temp.	bA	q8					
	Thermo Temp. of Remote Control Switch	bb	- -					
	Not Prepared	bC	- -					
C	Micro-Computer State Indication							
	I.U. Micro-Computer	C1	- -					
	O.U. Micro-Computer	C2	- -					
D	Stopping Cause State Indication							
	Stopping Cause State Indication	d1	- -					
E	Alarm Occurrence							
	Times of Abnormality	E1	- -					
	Times of Power Failure	E2	- -					
	Times of Abnormal Transmitting	E3	- -					
	Times of Inverter Tripping	E4	- -					
F	Automatic Louver State							
	Louver Sensor State	F1	- -					
H	Pressure, Frequency State Indication							
	Discharge Pressure	H1	q9					
	Suction Pressure	H2	qA					
	Control Information	H3	qb					
	Operating Frequency	H4	qC					
J	I.U. Capacity Indication							
	I.U. Capacity	J1	- -					
	O.U. Code	J2	- -					
	Refrigerant Cycle Number	J3	- -					
	Refrigerant Cycle Number	J4	- -					
L	Opening of Expansion Valve							
	O.U. Expansion Valve 1	L2	qE					
P	Running Current Indication (Reference)							
	Comp. Current	P1	qF					
Q	Motion Sensor Indication							
	Motion Sensor Reaction Rate	q1	- -					

Client:	
Installation Date:	
System No.:	
Date Checked:	
Checked by:	

Result	

5.5 Service & Maintenance Record

Service and Maintenance Record

No.	Check Item	Action	Judgement
1	Is service space sufficient?		YES or NO
2	Short Circuit of Discharge Air?		YES or NO
3	Any Heat Influence		YES or NO
4	Is earth wire connected?		YES or NO
5	Refrigeration Piping		GOOD or NOT GOOD
6	Fixing of Units		GOOD or NOT GOOD
7	Any Damage on Outer or Internal Surface?		YES or NO
8	Checking of Screw and Bolts	Tighten if loosen.	TIGHTENED or NOT TIGHTENED
9	Tightening of Terminal Screws	Tighten all terminal screws by phillips driver.	TIGHTENED or NOT TIGHTENED
10	Are compressor terminals tightly fixed?	Push all terminals.	PUSHED or NOT PUSHED
11	Insulation Resistance	Measure insulation resistance by insulation resistance-meter. Comp. and Fan Motor: greater than 3MΩ Others: greater than 3MΩ	GOOD or NOT GOOD
12	Does drain water smoothly flow?	Check for smooth flow by pouring water.	GOOD or NOT GOOD
13	Check for leakage at compressor.	Check for any leakage.	GOOD or NOT GOOD
14	Check for leakage at outdoor heat exchanger.	ditto	GOOD or NOT GOOD
15	Check for leakage at indoor heat exchanger.	ditto	GOOD or NOT GOOD
16	Check for leakage at reversing valve.	ditto	GOOD or NOT GOOD
17	Check for leakage at check valve.	ditto	GOOD or NOT GOOD
18	Check for leakage at accumulator.	ditto	GOOD or NOT GOOD
19	Check for leakage at strainer.	ditto	GOOD or NOT GOOD
20	Check for leakage at electronic expansion valve.	ditto	GOOD or NOT GOOD
21	Check for leakage at piping.	ditto	GOOD or NOT GOOD
22	Check direction of fans.	by Viewing or Air Flow Volume	GOOD or NOT GOOD
23	Vibration and Sound	Check fan, compressor, piping, etc.	GOOD or NOT GOOD
24	Activation of Each Operation Mode	Check activation of COOL, HEAT, STOP and TEMP. switches.	GOOD or NOT GOOD
25	Check activation of drain mechanism.	Check it during cooling operation.	GOOD or NOT GOOD
26	Indoor Inlet Air Temp. (DB/WB)		°F DB/ °F WB
27	Indoor Outlet Air Temp. (DB/WB)		°F DB/ °F WB
28	Outdoor Inlet Air Temp. (DB/WB)		°F DB/ °F WB
29	Outdoor Outlet Air Temp. (DB/WB)		°F DB/ °F WB
30	Pressure Switch-High		Psig
31	Pressure Switch-Low		Psig
32	Operating Voltage		V
33	Operating Current		A
34	Instruction Cleaning of Air Filter to Client		DONE or NOT YET
35	Instruction for Cleaning Method to Client		DONE or NOT YET
36	Instruction for Operation to Client		DONE or NOT YET

Specifications in this document are subject to change without notice, in order that Hitachi-Johnson Controls Air Conditioning, Inc. may bring the latest innovations to their customers.

Hitachi-Johnson Controls Air Conditioning, Inc.

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