

**SPLIT TYPE
ROOM AIR CONDITIONER**

**Large Ceiling type
INVERTER**

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	AB*30LBAG	AO*30LMBWL
	AB*36LBAG	AO*36LMBWL
	AB*45LBAG	AO*45LJBYL

Refrigerant

R410A

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Large Ceiling type **INVERTER**

1 . SPECIFICATIONS

1. SPECIFICATIONS

TYPE				CEILING MODELS		
				INVERTER HEAT PUMP		
MODEL NAME	INDOOR		AB * 30LBAG	AB * 36LBAG		
	OUTDOOR		AO * 30LMBWL	AO * 36LMBWL		
POWER SOURCE			230V ~ 50Hz			
AVAILABLE VOLTAGE RANGE			198-264V ~ 50Hz			
EUROPEAN ENERGY LABEL			COOLING	C	E	
CAPACITY	COOLING	RATED/MAX	kW	8.50/10.00	10.0/11.20	
			BTU/h	29000/34100	34100/38200	
	HEATING	RATED/MAX	kW	10.00/11.20	10.8/12.77	
			BTU/h	34100/38200	36900/43600	
INPUT POWER	COOLING	RATED/MAX	kW	3.00/3.45	4.12/4.35	
	HEATING	RATED/MAX		2.90/3.50	3.26/4.15	
CURRENT	COOLING	RATED/MAX	A	13.1/15.2	18.0/18.4	
	HEATING	RATED/MAX		12.7/15.3	14.2/18.8	
STARTING CURRENT			A	10	10	
EER		COOLING	kW/kW	2.83	2.43	
COP		HEATING		3.45	3.31	
MOISTURE REMOVAL			l/h (pints/h)	2.5 (5.3)	3.0 (6.3)	
AIR CIRCULATION COOL/HEAT	INDOOR	High	m ³ /h	1660 / 1660	1850 / 1850	
		Med		1500 / 1450	1660 / 1500	
		Low		1270 / 1150	1430 / 1270	
		Quiet		-	-	
	OUTDOOR	High		3600 / 3800	-	
		Low		-	-	
FAN SPEED COOL/HEAT	INDOOR	High	r.p.m	1000 / 1000	1100 / 1100	
		Med		900 / 850	1000 / 900	
		Low		750 / 650	850 / 750	
		Quiet		-	-	
	OUTDOOR	High		850 / 900	-	
		Low		-	-	
FAN TYPE x Q'ty			INDOOR	SIROCCO × 4		
			OUTDOOR	PROPELLER × 1		
FAN MOTOR OUTPUT			INDOOR	160		
			OUTDOOR	103		
NOISE LEVEL (SOUND PRESSURE)	INDOOR	High	dB(A)	45.0 / 45.0	48.0 / 48.0	
		Med		42.0 / 42.0	45.0 / 45.0	
		Low		37.0 / 37.0	41.0 / 41.0	
COOL/HEAT	OUTDOOR			53.0 / 55.0	54.0 / 55.0	
COMPRESSOR	TYPE		DC TWIN ROTARY (INVERTER)			
	OUTPUT		W	1300		
	STARTING METHOD		Inverter			
HEAT EXCHANGER TYPE	INDOOR	Coil	Copper tube			
		Fin	Aluminium			
		Rows × Stages	3 × 12			
		Fin Pitch	mm	1.45		
	Coil Dimensions	mm	252 × 1350 × 39.9			
	OUTDOOR	Coil	Copper tube			
		Fin	Aluminium			
		Rows × Stages	2 × 38			
Fin Pitch		mm	1.3			
Coil Dimensions	mm	798 × 900 × 36.38				
CASING COLOR			INDOOR	White (5Y9/0.5NN)		
			OUTDOOR	Beige (10YR7.5/1.0NN)		
DIMENSIONS H × W × D	INDOOR	NET	mm	240 × 1660 × 700		
	OUTDOOR			830 × 900 × 330		
	INDOOR	GROSS		318 × 1800 × 790		
	OUTDOOR			970 × 1050 × 445		
WEIGHT	INDOOR	NET /	kg(lbs)	48 / 61 (106 / 134)		
	OUTDOOR	GROSS		64 / 70 (141 / 154)		
PIPE	CONNECTION METHOD			FLARE		
	SIZE	LIQUID	mm	Φ 9.52 (3 / 8 inc.)		
		GAS		Φ 15.88 (5 / 8 inc.)		
	MAX LENGTH			m	50 (chargeless:15)	
	MAX HEIGHT			m	30	
REFRIGERANT		TYPE	R410A			
		CHARGE	g	2200		
REFRIGERANT OIL			TYPE	POE		
OPERATION(OUTDOOR)	COOLING	°C	-10 to 43			
	HEATING		-10 to 24			
REMOTE CONTROLLER TYPE			WIRELESS			
DRAIN PIPE	MATERIAL			ABS		
	SIZE			mm		
			Outer diameter 25.6 / Inner diameter 22.0			

Note: Specifications are based on the following conditions.
Cooling: Indoor temperature of 27 °CDB / 19 °CWB, and outdoor temperature of 35 °CDB/24 °CWB.
Heating: Indoor temperature of 20 °CDB / 15 °CWB, and outdoor temperature of 7 °CDB/6 °CWB.
Pipe length : 7.5 m, Height difference : 0 m.(Outdoor unit - Indoor unit)

TYPE				CEILING MODELS		
				INVERTER HEAT PUMP TYPE		
MODEL NAME	INDOOR		AB * 45LBAG			
	OUTDOOR		AO * 45LJBYL			
POWER SOURCE				230V~ 50Hz		
AVAILABLE VOLTAGE RANGE				198-264V~ 50Hz		
CAPACITY	COOLING	RATED/MAX	kW	12.5/14.0		
			BTU/h	42700/47800		
	HEATING	RATED/MAX	kW	14.0/16.0		
			BTU/h	47800/54600		
INPUT POWER	COOLING	RATED/MAX	kW	4.45/5.15		
	HEATING	RATED/MAX		4.25/4.60		
CURRENT	COOLING	RATED/MAX	A	19.5/22.6		
	HEATING	RATED/MAX		18.5/20.0		
STARTING CURRENT			A	15		
EER	COOLING		kW/kW			
COP	HEATING		3.29			
MOISTURE REMOVAL			l/h (pints/h)	4.0(8.5)		
AIR CIRCULATION COOL/HEAT	INDOOR	High	m ³ /h	2000/2000		
		Med		1850/1850		
		Low		1590/1590		
		Quiet		-		
	OUTDOOR	High		6600/6600		
		Low		-		
FAN SPEED COOL/HEAT	INDOOR	High	r.p.m	1200/1200		
		Med		1100/1100		
		Low		950/950		
		Quiet		-		
	OUTDOOR	High		Upper fan : 850 , Lower fan : 750		
		Low		-		
FAN TYPE x Q'ty		INDOOR	Sirocco x 4			
		OUTDOOR	Propeller x 2			
FAN MOTOR OUTPUT		INDOOR	W	160		
		OUTDOOR		103 x 2		
NOISE LEVEL (SOUND PRESSURE)	INDOOR	High	dB(A)	50/50		
		Med		47/47		
		Low		43/43		
COOL/HEAT	OUTDOOR			52/53		
COMPRESSOR		TYPE		DC SCROLL(INVERTER)		
		OUTPUT	W	2500		
		STARTING METHOD		Inverter		
HEAT EXCHANGER TYPE	INDOOR	Coil		Copper tube		
		Fin		Aluminium		
		Rows x Stages		3 x 12		
		Fin Pitch		mm	1.45	
		Coil Dimensions			252 x 1350 x 39.9	
	OUTDOOR	Coil		Copper tube		
		Fin		Aluminium		
		Rows x Stages		2 x 60		
		Fin Pitch		mm	1.3	
		Coil Dimensions			1260 x 900 x 36.38	
CASING COLOR		INDOOR	White(5Y9/0.5NN)			
		OUTDOOR	Beige(10YR7.5/1.0NN)			
DIMENSIONS H x W x D	INDOOR	NET	mm	240 x 1660 x 700		
	OUTDOOR			1290 x 900 x 330		
	INDOOR	GROSS		318 x 1800 x 790		
	OUTDOOR			1430 x 1050 x 445		
WEIGHT	INDOOR	NET /	kg(lbs)	48/61 (106/134)		
	OUTDOOR	GROSS		105/112 (231/247)		
PIPE	CONNECTION METHOD			FLARE		
	SIZE	LIQUID	mm	φ 9.52(3/8 inc.)		
		GAS		φ 15.88(5/8 inc.)		
	MAX LENGTH		m	70 (chargeless:20)		
	MAX HEIGHT		m	30		
REFRIGERANT		TYPE	R410A			
		CHARGE	g	3400		
REFRIGERANT OIL		TYPE		POE		
OPERATION(OUTDOOR)	COOLING		°C	-15 to 43		
	HEATING			-15 to 24		
REMOTE CONTROLLER TYPE				WIRELESS		
DRAIN PIPE	MATERIAL			ABS		
	SIZE		mm	Outer diameter 25.6 / Inner diameter 22.0		

Note: Specifications are based on the following conditions.
Cooling: Indoor temperature of 27 °CDB / 19 °CWB, and outdoor temperature of 35 °CDB/24 °CWB.
Heating: Indoor temperature of 20 °CDB / 15 °CWB, and outdoor temperature of 7 °CDB/6 °CWB.
Pipe length : 7.5 m, Height difference : 0 m.(Outdoor unit - Indoor unit)

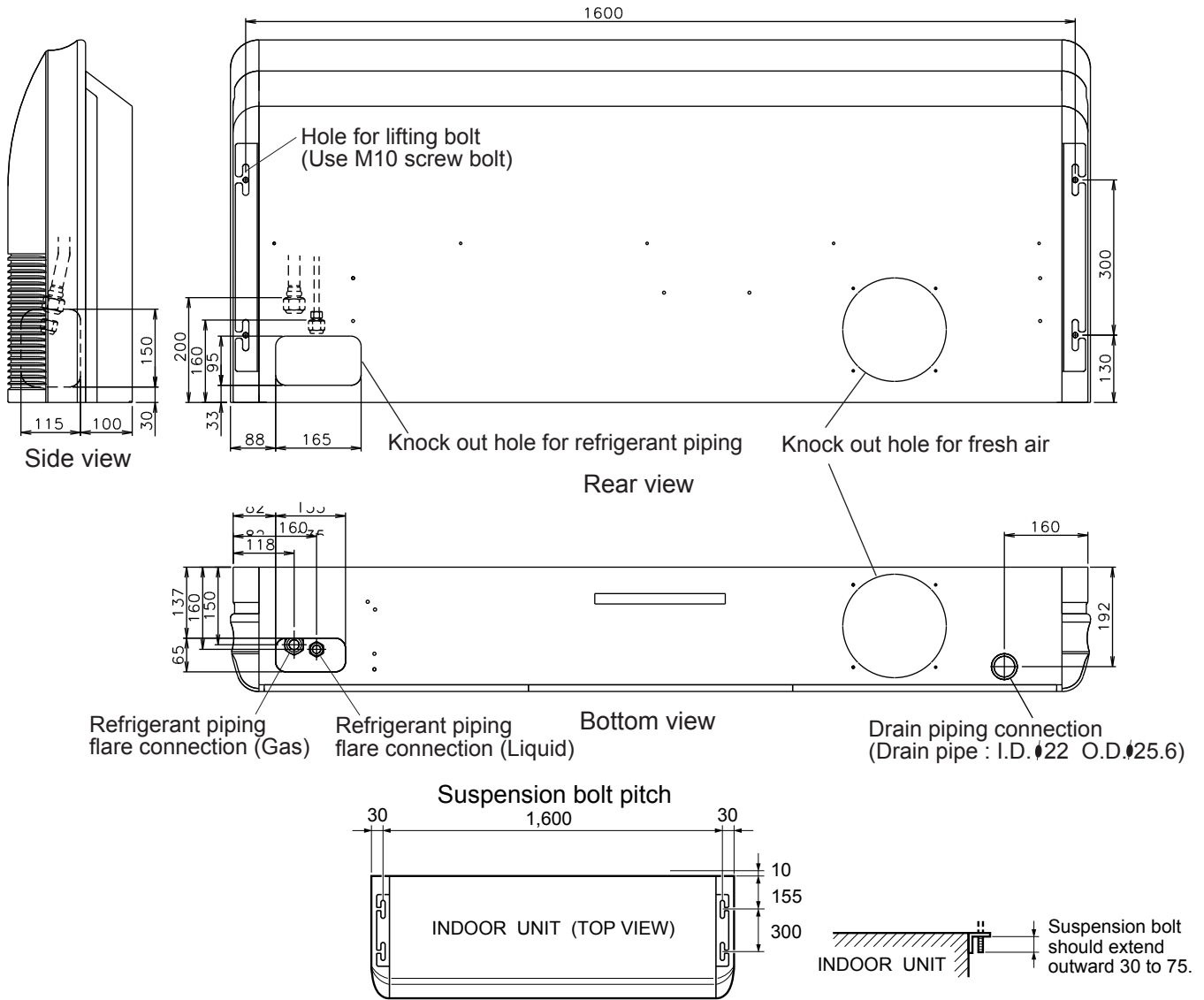
Large Ceiling type **INVERTER**

2 . DIMENSIONS

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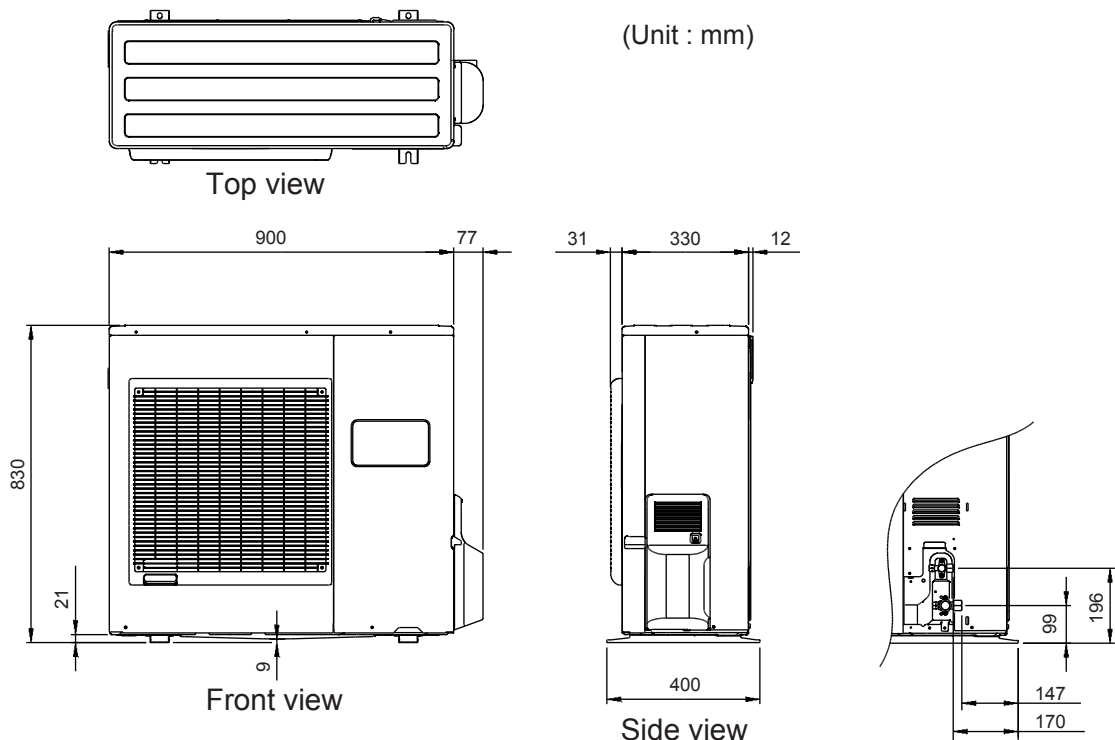
■ MODEL : AB*30/ 36LBAG

(Unit : mm)

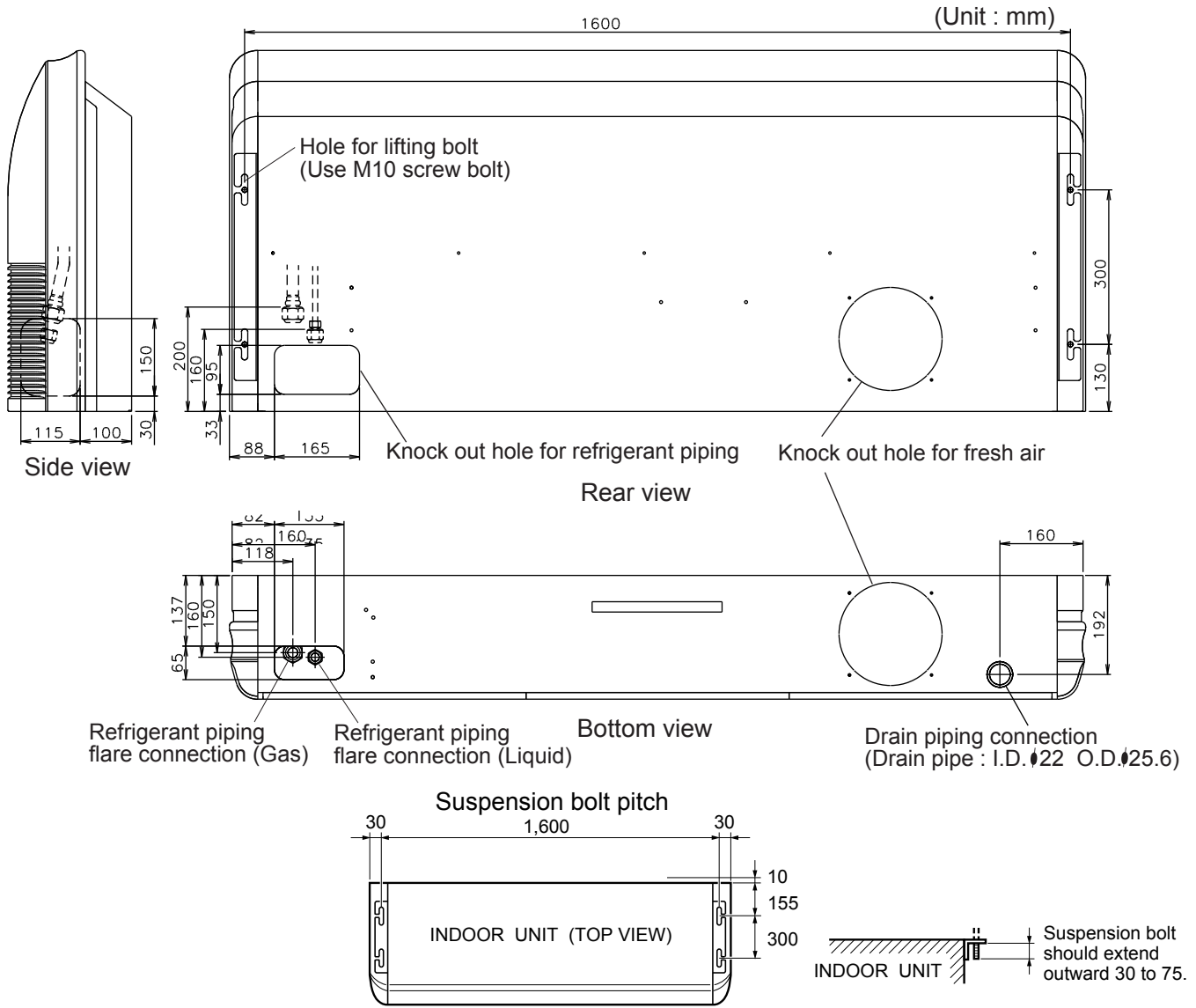


■ MODEL : AO*30/ 36LMBWL

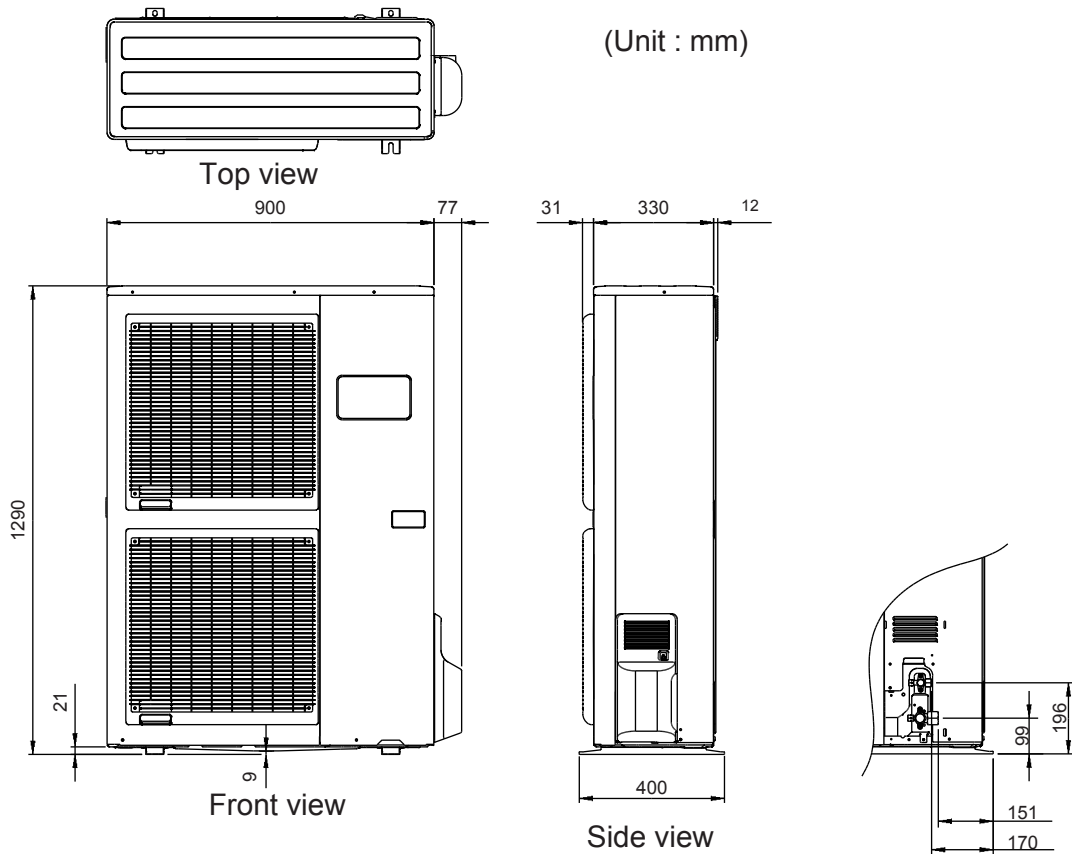
(Unit : mm)



■ MODEL : AB*45LBAG



■ MODEL : AO*45LJBYL

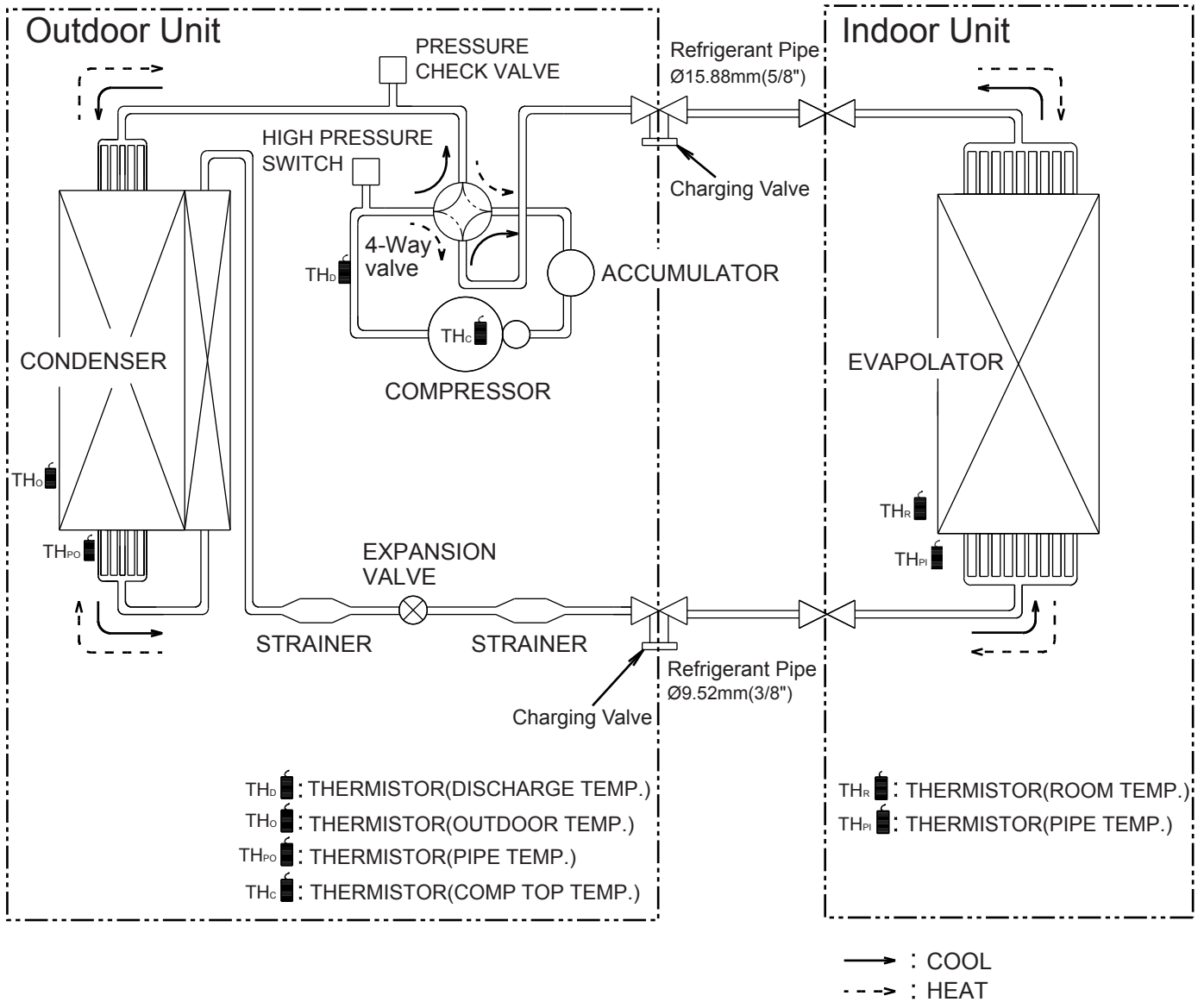


Large Ceiling type **INVERTER**

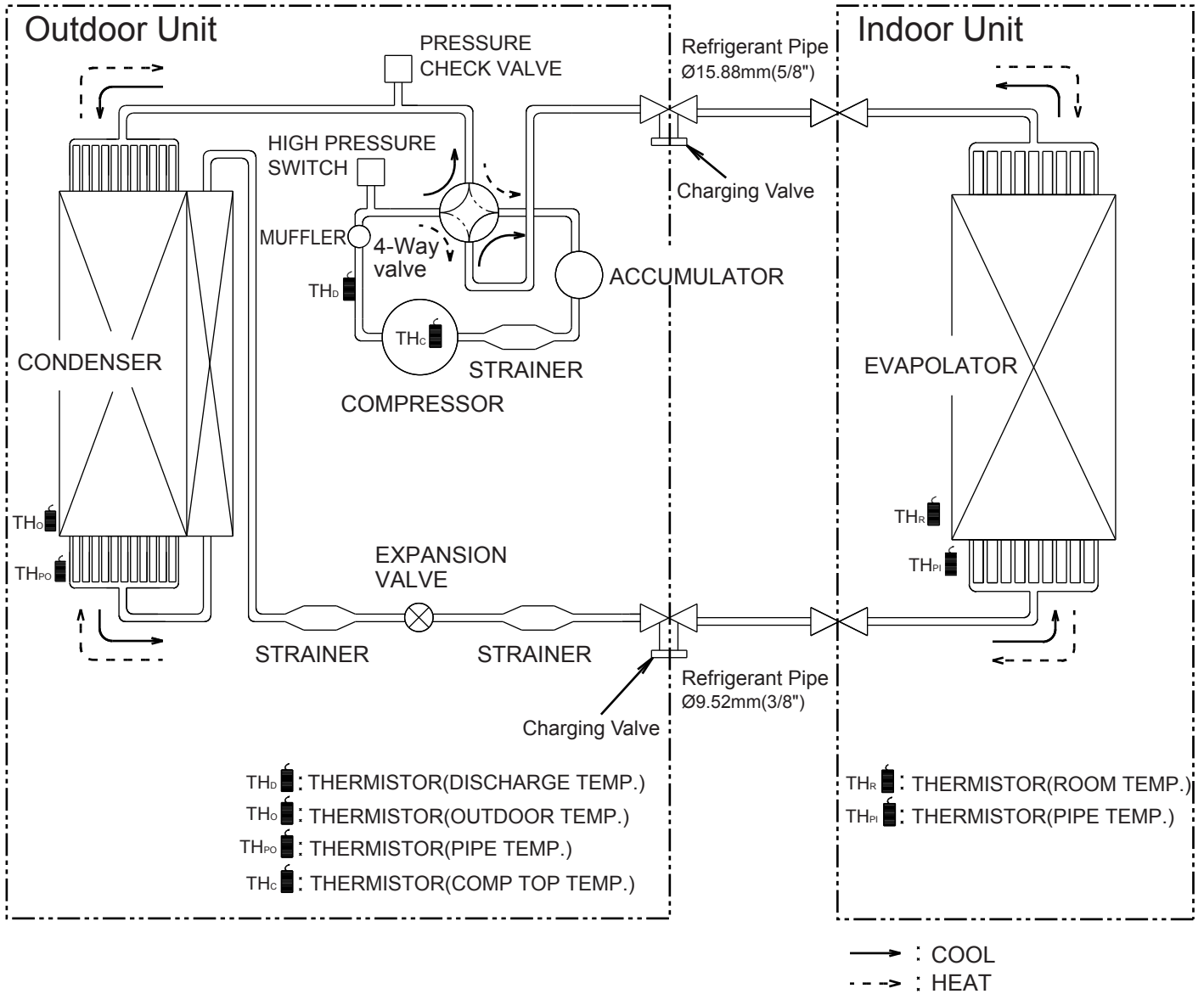
3 . REFRIGERANT SYSTEM DIAGRAM

3. REFRIGERANT CIRCUIT

■ MODEL : AB*30/ 36LBAG / AO*30/ 36LMBWL



■ MODEL : AB*45LBAG / AO*45LJBYL

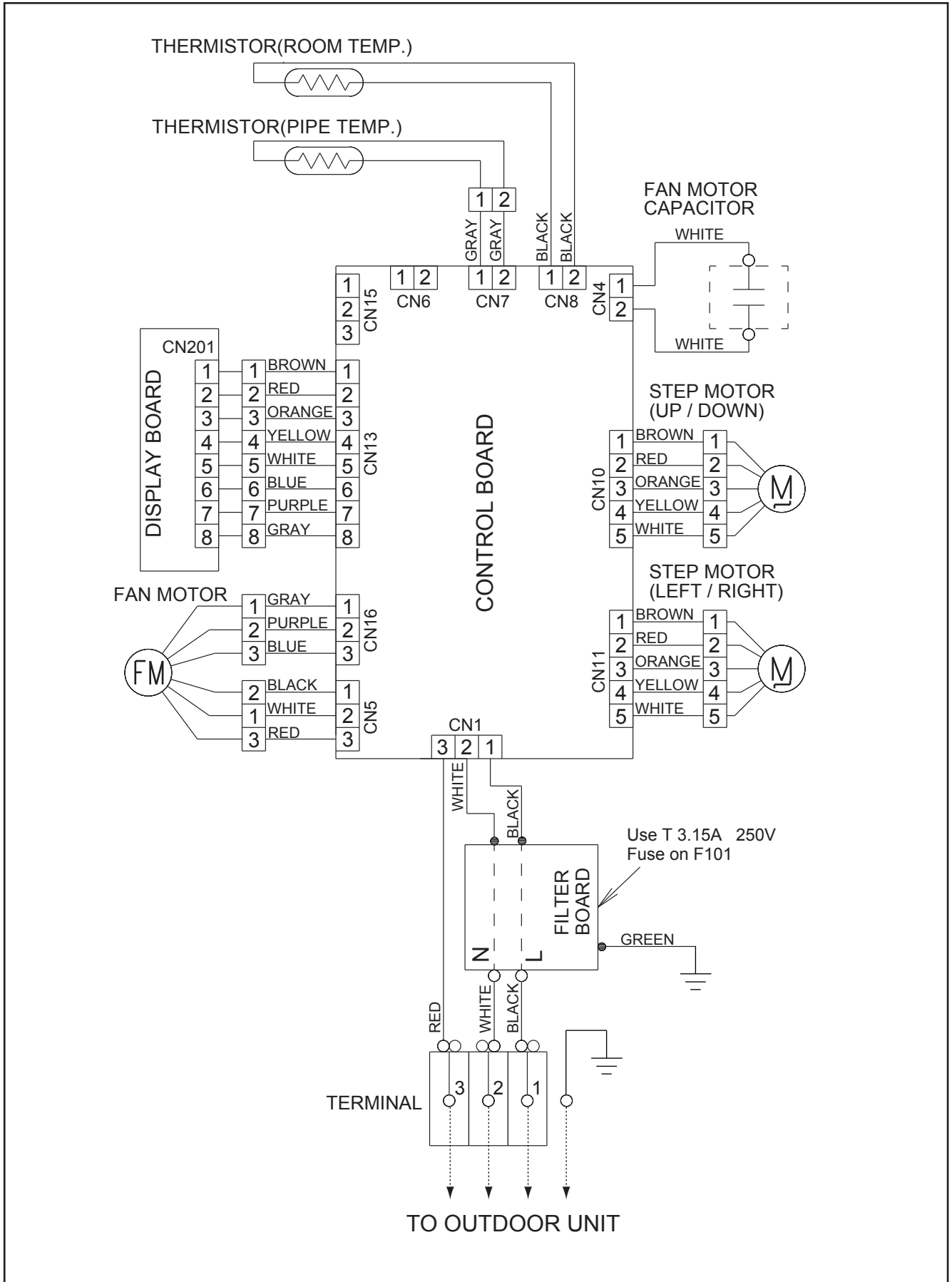


Large Ceiling type **INVERTER**

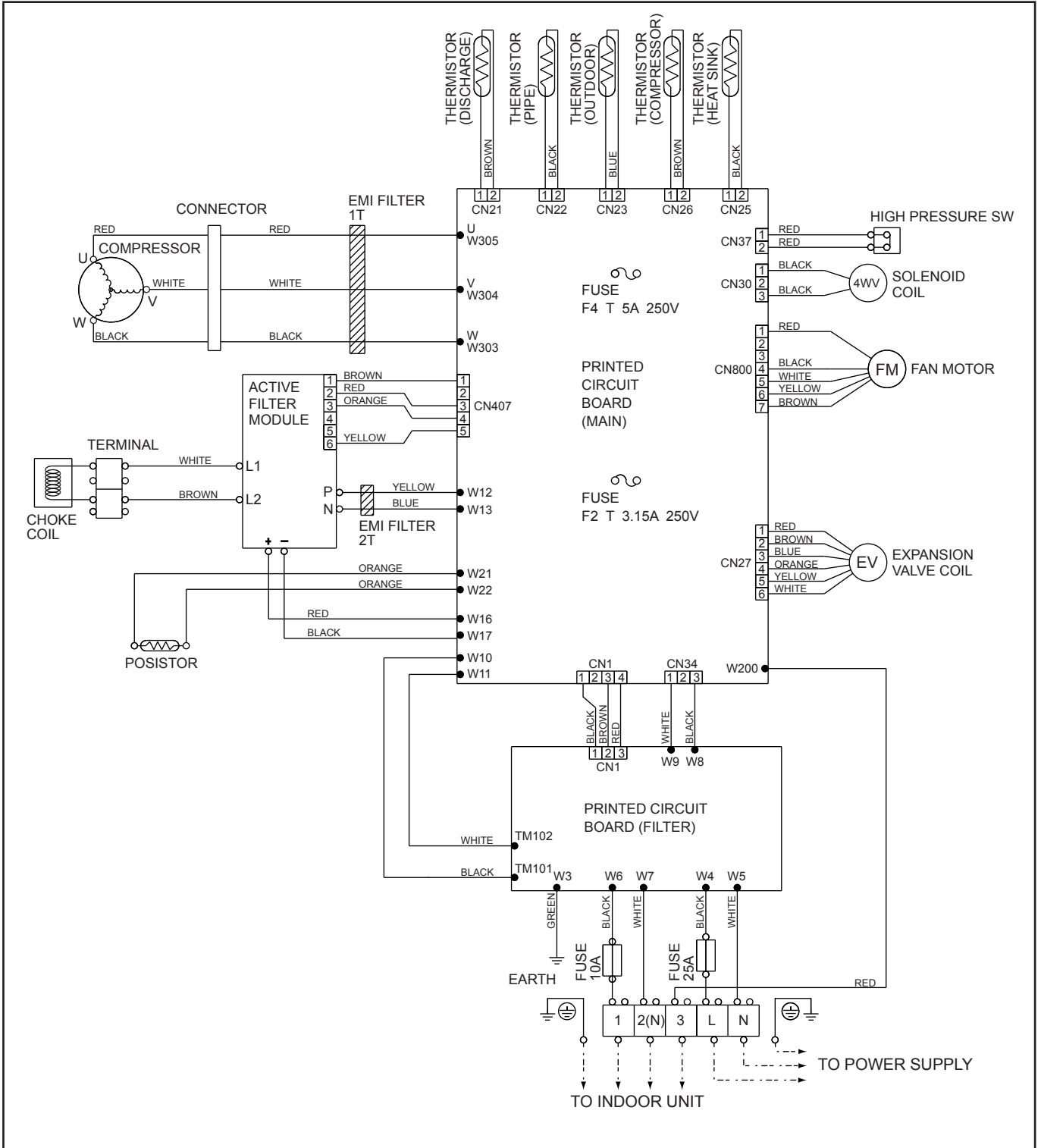
4 . CIRCUIT DIAGRAM

4. CIRCUIT DIAGRAM

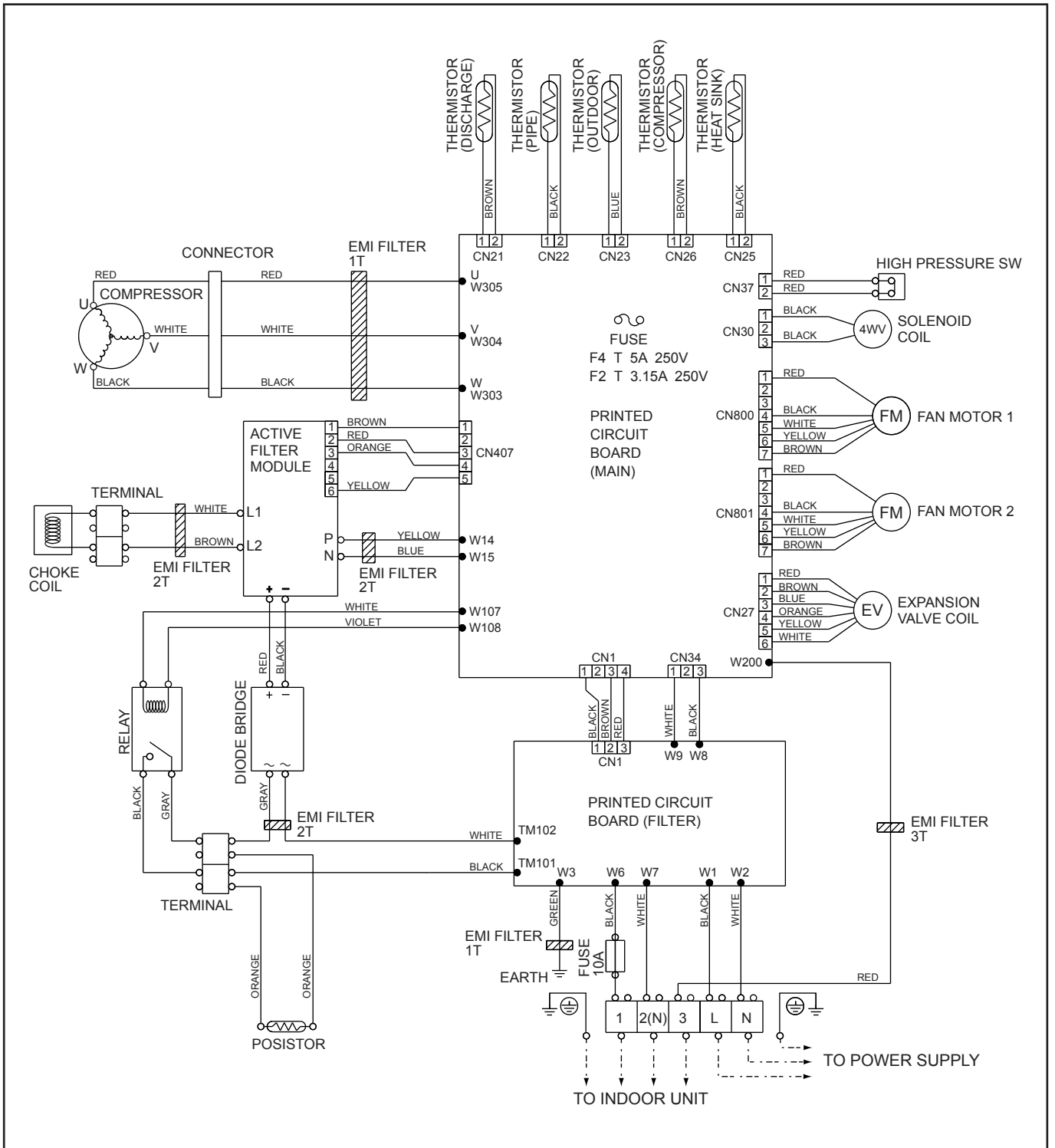
■ MODEL : AB*30/ 36/ 45LBAG



■ MODEL : AO*30/ 36LMBWL



■ MODEL : AO*45LJBYL



Large Ceiling type **INVERTER**

5 . DESCRIPTION OF EACH CONTROL OPERATION

5-1. COOLING OPERATION

5-1-1 COOLING CAPACITY CONTROL

A sensor (room temperature thermistor) built in the indoor unit will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.

- * If the room temperature is 2 degC higher than a set temperature, the compressor operation frequency will attain to maximum performance.
- * If the room temperature is 2 degC lower than a set temperature, the compressor will be stopped.
- * When the room temperature is between +2 degC to -2 degC of the setting temperature, the compressor frequency is controlled within the range shown in Table1. However, the maximum frequency is limited in the range shown in Figure 1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor Frequency Range)

	minimum frequency	maximum frequency
AB*30LBAG	20Hz	90Hz
AB*36LBAG	20Hz	90Hz
AB*45LBAG	20Hz	92Hz

(Fig. 1 : Limit of Maximum Frequency based on Outdoor Temperature)

Outdoor air temperature		Fan speed mode			
		Hi	Me	Lo	
31°C	A zone	AB*30LBAG	90Hz	70Hz	70Hz
		B zone	70Hz	65Hz	65Hz
		C zone	65Hz	55Hz	55Hz
		D zone	55Hz	45Hz	45Hz
19°C	B zone	AB*36LBAG	90Hz	75Hz	75Hz
		B zone	75Hz	70Hz	70Hz
		C zone	70Hz	65Hz	65Hz
		D zone	65Hz	55Hz	55Hz
11°C	C zone	AB*45LBAG	92Hz	72Hz	72Hz
		B zone	72Hz	60Hz	60Hz
		C zone	60Hz	60Hz	60Hz
		D zone	60Hz	53Hz	53Hz
	D zone				

5-2. HEATING OPERATION

5-2-1 HEATING CAPACITY CONTROL

A sensor (room temperature thermistor) built in the indoor unit will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.

- * If the room temperature is lower 3 degC than a set temperature, the compressor operation frequency will attain to maximum performance.
- * If the room temperature is higher 2 degC than a set temperature, the compressor will be stopped.
- * When the room temperature is between +2 degC to -3 degC of the setting temperature, the compressor frequency is controlled within the range shown in Table2. However, the maximum frequency is limited in the range shown in Figure 2 based on the outdoor temperature.

(Table 2 : Compressor Frequency Range)

	minimum frequency	maximum frequency
AB*30LBAG	20Hz	95Hz
AB*36LBAG	20Hz	95Hz
AB*45LBAG	20Hz	92Hz

(Fig.2 : Limit of Maximum Frequency based on Outdoor Temperature)

Outdoor air temperature		Limit of Maximum Frequency	
16°C	C zone	AB*30LBAG A zone	95Hz
		B zone	90Hz
		C zone	80Hz
12°C	B zone	AB*36LBAG A zone	95Hz
		B zone	90Hz
		C zone	80Hz
A zone	A zone	AB*45LBAG A zone	92Hz
		B zone	90Hz
		C zone	80Hz

5-3. DRY OPERATION

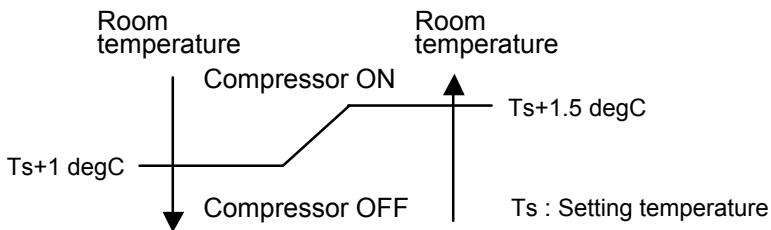
5-3-1 INDOOR UNIT CONTROL

The compressor rotation frequency shall change according to set temperature and room temperature variation which the room temperature sensor of the indoor unit has detected as shown in the Table 3.

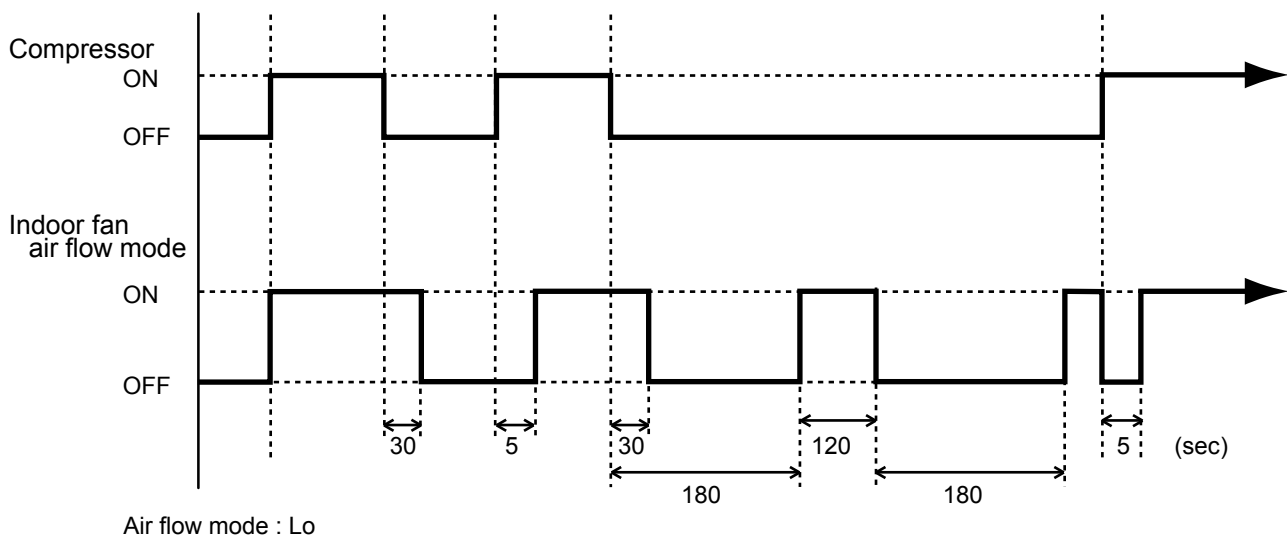
(Table 3 : Compressor frequency)

	Operating frequency
AB*30LBAG	45Hz
AB*36LBAG	45Hz
AB*45LBAG	30Hz

(Fig.3 : Compressor Control based on Room Temperature)



(Fig.4 : Indoor Fan Control)



5-4. AUTO CHANGEOVER OPERATION

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

- ① When operation starts, only the indoor fan is operated for 1 minute. (Air flow mode: S- Lo)
After 1 minute, depends on the room temperature and outdoor unit's operation mode, the operation mode is selected in accordance with the table below.

(Table 4 : Operation mode selection table)

Room temperature :TR	Operation mode
$TR \geq Ts + 2 \text{ degC}$	Cooling
$Ts + 2 \text{ degC} > TR > Ts - 2 \text{ degC}$	Monitoring
$Ts + 2 \text{ degC} \geq TR$	Heating

Ts : Setting temperature

- ② When COOLING was selected at ①, the same operation as COOLING OPERATION is performed.
- ③ When HEATING was selected at ①, the same operation as HEATING OPERATION is performed.
- ④ When the compressor was stopped for 6 consecutive minutes by the temperature control function after the COOLING or HEATING operation mode was selected at ① above, operation is switched to MONITORING and the operation mode is selected again.

5-5. INDOOR FAN CONTROL

1. Fan speed

(Table 5 : Indoor Fan Speed)

• AB*30LBAG

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1000
	Me	850
	Lo	650
	S-Lo	200
Cooling	Hi	1000
	Me	850
	Lo	650
	S-Lo	200

• AB*36LBAG

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1100
	Me	900
	Lo	750
	S-Lo	200
Cooling	Hi	1100
	Me	900
	Lo	750
	S-Lo	200

• AB*45LBAG

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1200
	Me	1100
	Lo	950
	S-Lo	200
Cooling	Hi	1200
	Me	1100
	Lo	950
	S-Lo	200

2. FAN OPERATION

The airflow can be switched in 4 steps such as AUTO, LOW, MED, HIGH, while the indoor fan only runs.

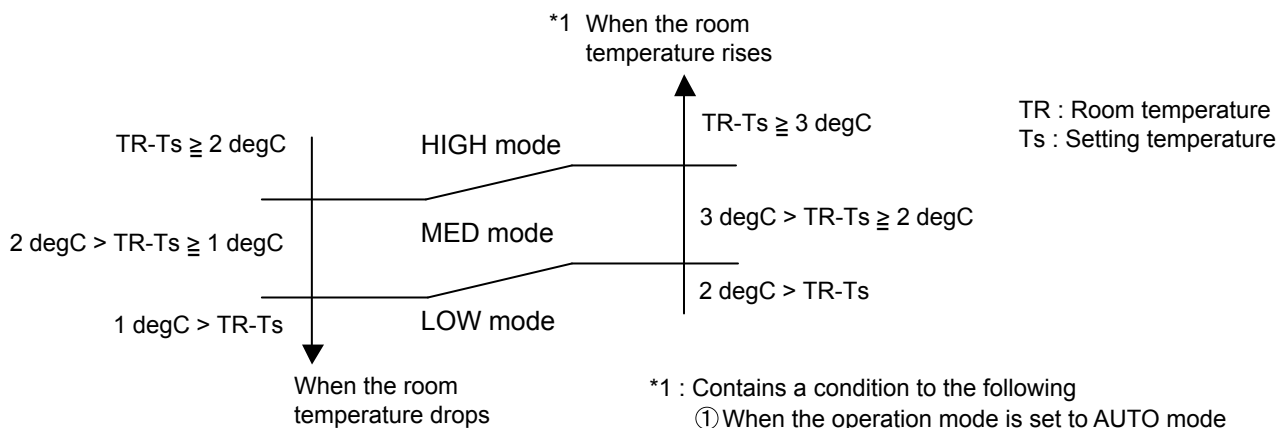
When [AUTO] is selected, the indoor fan motor runs LO and OFF at 1 minute intervals.

3. COOLING OPERATION

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure 5.

On the other hand, if switched in [HIGH]~[LOW], the indoor motor will run at a constant airflow of [COOL] operation modes LOW, MED, HIGH, as shown in Table 5.

(Fig.5 : Airflow change - over (Cooling : AUTO))

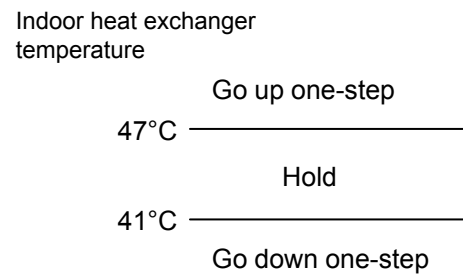


4. HEATING OPERATION

When the airflow is set to [AUTO], the indoor fan motor operates [MED] mode. Then the indoor fan motor will run according to a room temperature, as shown in Figure 6.

On the other hand, if switched in [HIGH] ~ [LOW], the indoor motor will run at a constant airflow of [COOL] operation modes LOW, MED, HIGH, as shown in Table 5.

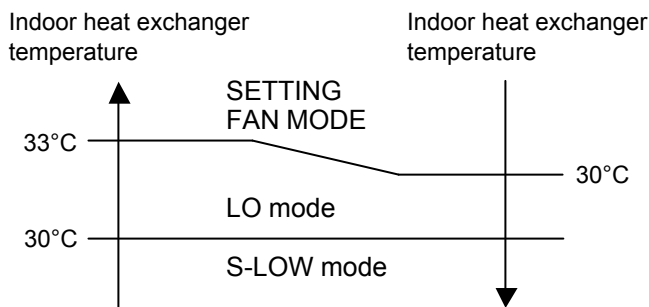
(Fig.6 : Airflow change - over (Heating : AUTO))



5. COOL AIR PREVENTION CONTROL (Heating mode)

The maximum value of the indoor fan speed is set as shown in Figure 7, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

(Fig.7 : Cool Air Prevention Control)



6. DRY OPERATION

Refer to the Figure 4.

During the dry mode operation, the fan speed setting can not be changed.

5-6. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

Following table shows the fan speed of the outdoor unit.

(Table 6 : Fan speed of the outdoor unit)

		Cooling	Heating
AB*30LBAG		850/ 780/ 400/ 250/ 170 rpm	900/ 780/ 400/ 250/ 170 rpm
AB*36LBAG			
AB*45LBAG	Upper fan	850/ 780/ 400/ 350/ 300 rpm	850/ 780/ 350/ 200/ 150 rpm
	Lower fan	780/ 750/ 350/ 0 rpm	780/ 750/ 350/ 200/ 150 rpm

* AB*45LBAG has two fan motors.

* The outdoor fan speed changes in the range mentioned above depending on the compressor frequency and outdoor temperature.

(When the compressor frequency and outdoor temperature increase, the outdoor fan speed also changes to the higher speed.

When the compressor frequency and outdoor temperature decrease, the outdoor fan speed also changes to the lower speed.)

* For AB*30/ 36LBAG

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

When the outdoor heat exchanger temperature is lower than 2°C, the fan speed switches to 900rpm on heating mode.

* For AB*45LBAG

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

When the outdoor heat exchanger temperature is lower than 2°C, the fan speed switches to 850rpm(Upper fan) and 750rpm(Lower fan) on heating mode.

5-7. LOUVER CONTROL

1. VERTICAL LOUVER CONTROL

(Function Range)

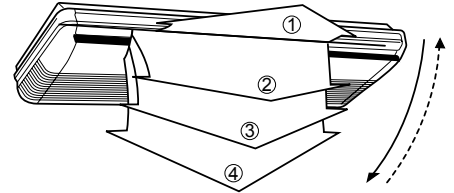
Each time the button is pressed, the air direction range will change as follows:

① ↔ ② ↔ ③ ↔ ④

(Operation Range)

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

(Fig.8 : Air Direction Range)



Use the air direction adjustments within the ranges shown above.

- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.

Cooling / Dry / Fan mode	:	Horizontal flow	①
Heating mode	:	Downward flow	④
- At the start of operation if the setting louver position is ① or ②, the setting position is set to ① or ② after the louver moves from totally-enclosed position to ③. (Positioning Control)
- The indoor fan motor starts after the louver reaches to the setting position.

1-2. SWING OPERATION

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

(Swinging Range)

Airflow direction set	Range of swing
①	① to ③
②	② to ④
③	② to ④
④	① to ④

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

2. HORIZONTAL LOUVER CONTROL

(Function Range)

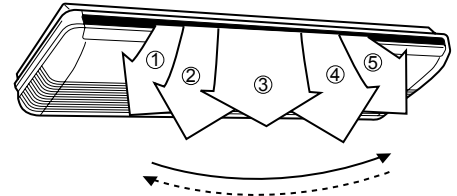
Each time the button is pressed, the air direction range will change as follows:

① → ② → ③ → ④ → ⑤

(Operation Range)

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

(Fig.9 : Air Direction Range)



Use the air direction adjustments within the ranges shown above.

- The horizontal airflow direction is set automatically on ③ after initialization.

2-1. SWING OPERATION

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

(Swinging Range)

Airflow direction set	Range of swing
①	① to ⑤
②	① to ③
③	② to ④
④	③ to ⑤
⑤	① to ⑤

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

5-8. COMPRESSOR CONTROL

1. OPERATION FREQUENCY RANGE

The operation frequency of the compressor is different based on the operation mode as shown in Table 7.

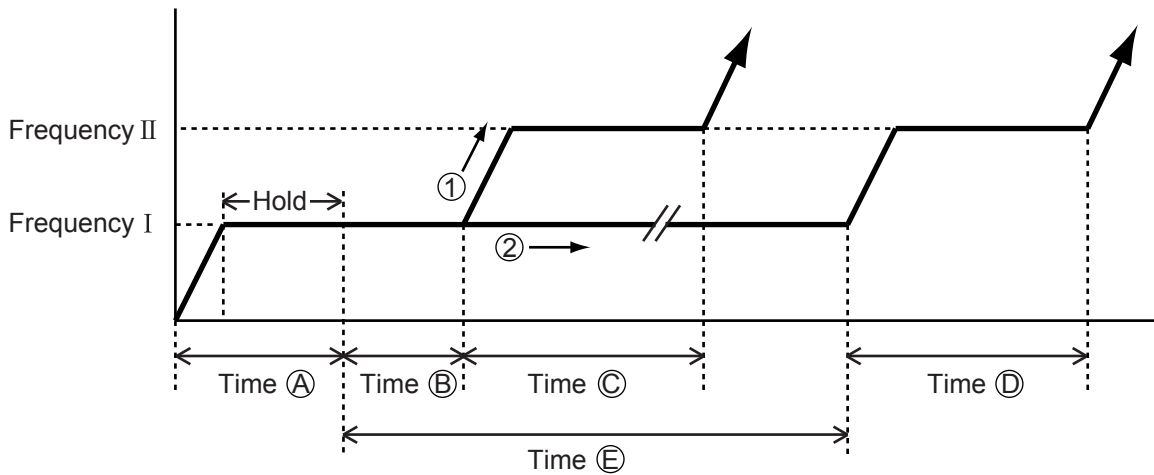
(Table 7 : Compressor Operation Frequency Range)

	Cooling		Heating		Dry
	Min	Max	Min	Max	
AB*30LBAG	20Hz	90Hz	20Hz	95Hz	45Hz
AB*36LBAG	20Hz	90Hz	20Hz	95Hz	45Hz
AB*45LBAG	20Hz	92Hz	20Hz <td 92Hz	30Hz	

2. OPERATION FREQUENCY CONTROL AT START UP

The compressor frequency soon after the start-up is controlled as shown in Figure 10.

(Fig.10 : Compressor Control at Start-up)



For AB*30/ 36LBAG

- ① Discharge pipe temp. $\geq 30^{\circ}\text{C}$
- ② Discharge pipe temp. $< 30^{\circ}\text{C}$

For AB*45LBAG

- ① Discharge pipe temp. $\geq 35^{\circ}\text{C}$
- ② Discharge pipe temp. $< 35^{\circ}\text{C}$

(Frequency)

	Frequency I	Frequency II
AB*30LBAG	40Hz	56Hz
AB*36LBAG	40Hz	56Hz
AB*45LBAG	56Hz	70Hz

(Time)

	Time A	Time B	Time C	Time D	Time E
AB*30LBAG	180sec	60sec	120sec	120sec	720sec
AB*36LBAG	180sec	60sec	120sec	120sec	720sec
AB*45LBAG	180sec	80sec	180sec	180sec	720sec

5-9. TIMER OPERATION CONTROL

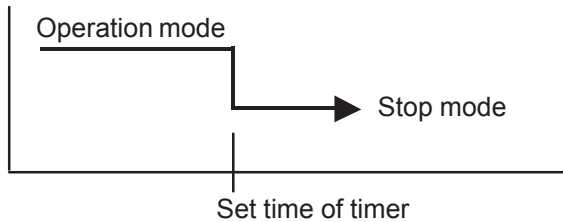
5-9-1 Wireless Remote Controller

AR- JW1

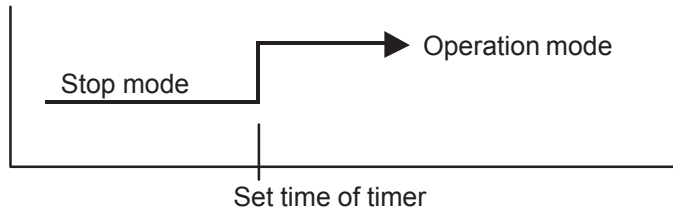
- ON / TIMER
- OFF / TIMER
- PROGRAM TIMER
- SLEEP TIMER

1. ON / OFF TIMER

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

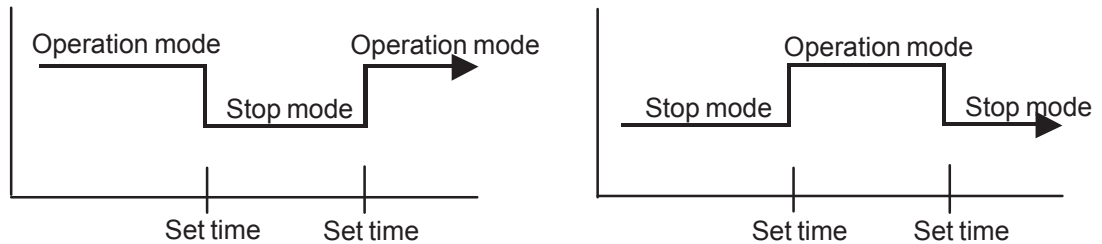


- ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. PROGRAM TIMER

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



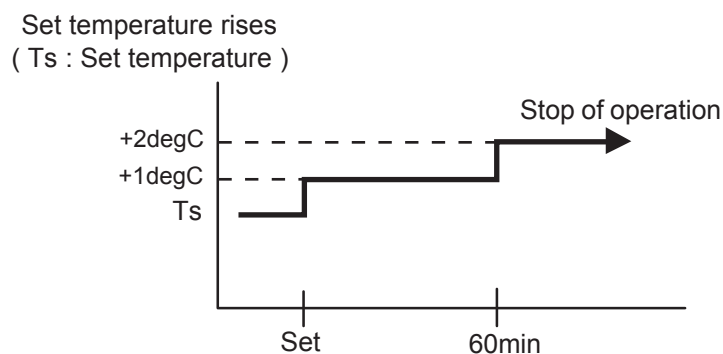
- Operation will start from the timer setting (either OFF timer or ON timer) whichever is closest to the clock's current timer setting.
The order of operations is indicated by the arrow in the remote control unit's display.
- SLEEP timer operation cannot be combined with ON timer operation.

3. SLEEP TIMER

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

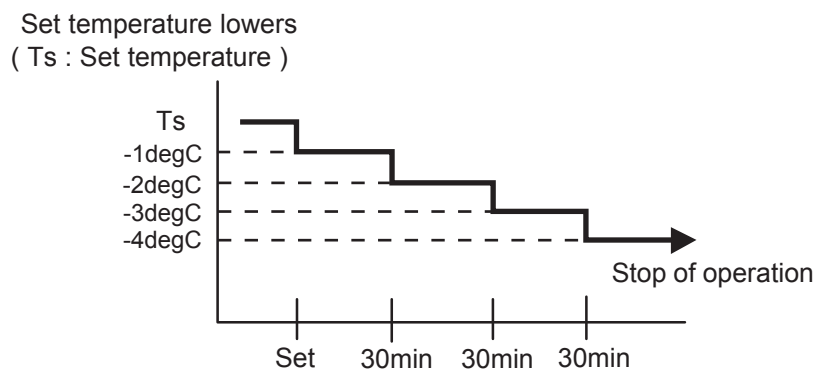
In the cooling operation mode

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



In the heating operation mode

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



5-10. ELECTRONIC EXPANSION VALVE CONTROL

The most proper opening of the electronic expansion valve is calculated and controlled under the present operating condition based on the following values.

The compressor frequency, the temperatures detected by the discharge temperature sensor and the outdoor temperature sensor.

- * The pulse range of the electronic expansion valve control is between 50 to 480 pulses.
- * At the time of supplying the power to the outdoor unit, the initialization of the electronic expansion valve is operated (1000 pulses are input to the closing direction).

5-11. TEST OPERATION CONTROL

▪ With Wireless Remote Controller

Under the condition where the air conditioner runs, short two metal contacts under the battery compartment lid, and the test operation control mode will appear.

During test running, the operation lamp and timer lamp of the air conditioner body twinkle simultaneously. Set the test operation mode, and the compressor will continue to run regardless of whether the room temperature sensor detects.

The test operation mode is released if 60 minutes have passed after setting up the test operation.

5-12. PREVENT TO RESTART FOR 3 MINUTES (3 MINUTES ST)

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

5-13. 4-WAY VALVE EXTENSION SELECT

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

5-14. AUTO RESTART

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

When the power is interrupted and recovered during timer operation, timer operation is canceled, but only setting time is memorized.

[Operation contents memorized when the power is interrupted]

- Operation mode
- Set temperature
- Set air flow
- Timer mode and timer time
- Air flow Direction
- Swing
- Thermistor detected position

5-15. PUMP DOWN (Refrigerant collecting operation)

Perform the following procedures to collect the refrigerant when moving the indoor unit or the outdoor unit.

When the product is stopped:

1. Press the PUMP DOWN switch (SW2) on the outdoor unit.
(The LED on the outdoor unit circuit board flickers every 1second.)
2. The pump down operation (cooling operation) begins right away.
After operation starts, close the 3-way valve (liquid).
3. After 2-3minutes, operation stops. Close the 3-way valve (gas) within 1minute after operations stops.
4. The LED will go out 3minutes after it stops. Disconnect the power supply after confirming that the LED has gone out.

When the product is operating:

1. Press the PUMP DOWN switch (SW2) on the outdoor unit. The LED on the outdoor unit circuit board flickers every 1second, and operation stops.
At this point, recovery has not been completed, so do not close the 2 and 3-way valves.
2. The pump down operation (cooling operation) begins after 3minutes.
Close the 3-way valve (liquid) after operation starts.
3. After 2-3minutes, operation stops. Close the 3-way valve (gas) within 1minute after operations stops.
4. The LED will go out 3minutes after it stops. Disconnect the power supply after confirming that the LED has gone out.

5-16. COMPRESSOR PREHEATING

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

When operation was started, and when the outdoor temperature rises to Release temperature or greater, preheating is over.

(Table 8 : Preheating Operation / Release Temperature)

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

5-17. DEFROST OPERATION CONTROL

1. CONDITION OF STARTING THE DEFROST OPERATION

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

(Table 9 : Condition of starting Defrost Operation)

	Compressor integrating operation :Less than 45min.	Compressor integrating operation :45min and over		Outdoor temp. - Outdoor heat exchanger temp.	Outdoor heat exchanger temp.
		Less than 6 min. *1 or 10min. *2	After 6 min. *1 or 10min. *2		
AB*30LBAG	Does not operate		-8°C *3	_____	_____
AB*36LBAG			-10°C *4		
AB*45LBAG	Does not operate		-8°C *3	12 degC	_____
			-10°C *4		

*1. It means contiguous operation time.

*3. Outdoor temp. \geq -1°C

*2. Compressor stop time: Below 20min. → Select 6min.
Above 20min. → Select 10min.

*4. Outdoor temp. $<$ -1°C

2. CONDITION OF THE DEFROST OPERATION COMPLETION

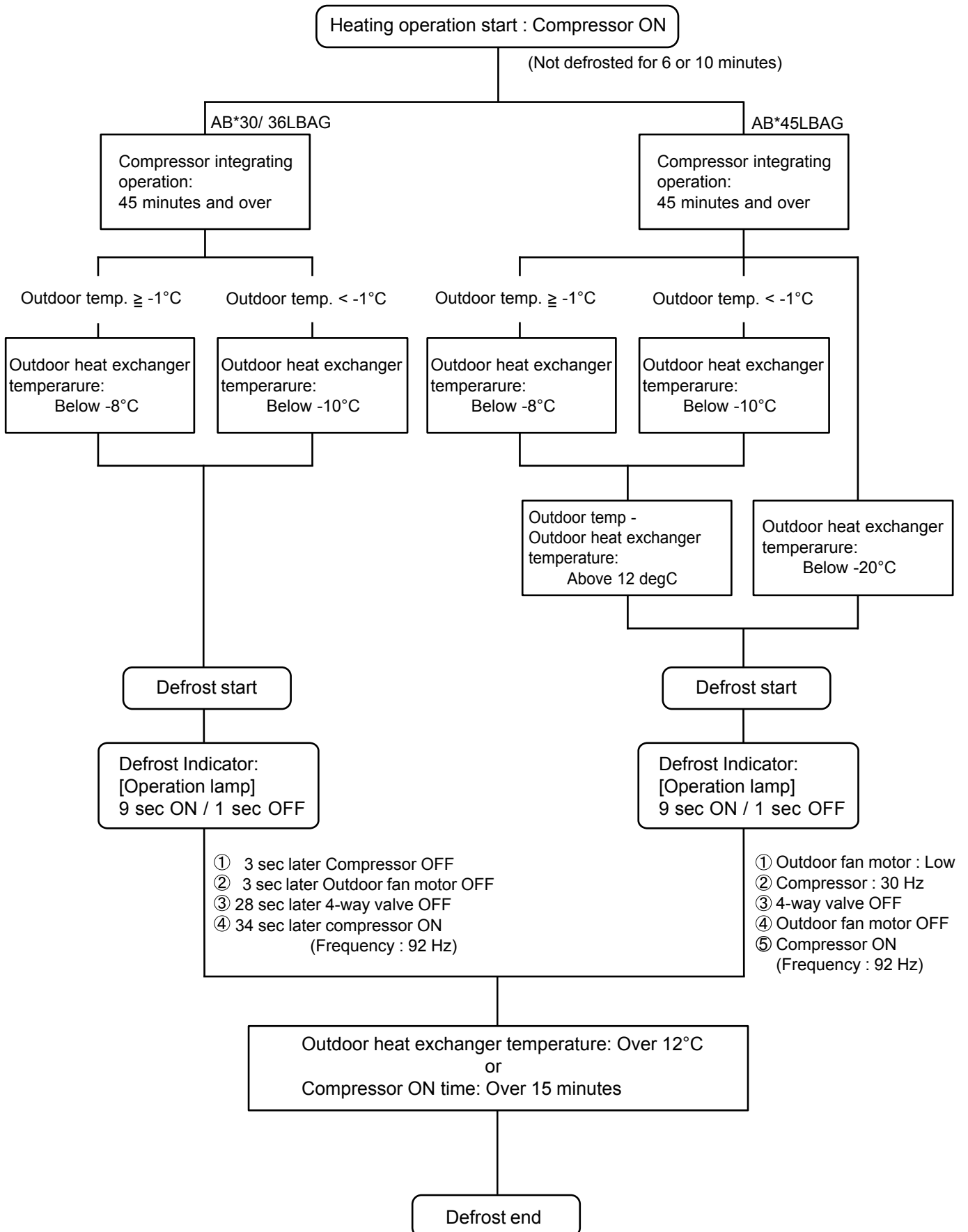
Defrost operation is released when the conditions become as shown in Table 10.

(Table 10 : Defrost Release Condition)

	Release Condition
AB*30LBAG	Outdoor heat exchanger temperature sensor value is higher than 12°C or Compressor operation time has passed 15 minutes.
AB*36LBAG	
AB*45LBAG	

3. Defrost Flow Chart

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



5-18. MANUAL AUTO OPERATION

If MANUAL AUTO Button is set, the operation is controlled as shown in Table 11.

If the remote control is lost or battery power dissipated, this function will work without the remote control.

(Table 11 : Manual auto operation)

OPERATION MODE	Auto changeover
FAN CONT. MODE	Auto
TIMER MODE	Continuous (No timer setting available)
SETTING TEMP.	23°C
SETTING LOUVER	Standard
SWING	OFF

5-19. VARIOUS PROTECTIONS

1. DISCHARGE GAS TEMPERATURE OVER RISE PREVENTION CONTROL

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

When the discharge temperature becomes higher than Temperature I ,the compressor frequency is decreased 10 Hz, and it continues to decrease the frequency for 10 Hz every 120 seconds until the temperature becomes lower than Temperature I.

When the discharge temperature becomes lower than Temperature II ,the control of the compressor frequency is released.

When the discharge temperature becomes higher than Temperature III ,the compressor stops.

When the discharge temperature becomes lower than Temperature IV ,the compressor operates.

(Table 12 : Discharge Temperature Over Rise Prevention Control / Release Temperature)

	Temperature I	Temperature II	Temperature III	Temperature IV
AB*30LBAG	110°C	105°C	120°C	80°C
AB*36LBAG				
AB*45LBAG				

2. CURRENT RELEASE CONTROL

The compressor frequency is controlled so that the outdoor unit input current does not exceed the current limit value that was set up with the outdoor temperature.

The compressor frequency returns to the designated frequency of the indoor unit at the time when the frequency becomes lower than the release value.

(Table 13 : Current Release Operation Value / Release Value)

[Heating]

AB*30LBAG AB*36LBAG	Outdoor unit fan speed				
	900 rpm	780 rpm	400 rpm	250 rpm	170 rpm
$T_0 \geq 16^\circ\text{C}$	15.0A / 14.5A	15.0A / 14.5A	13.0A / 12.5A	10.0A / 9.5A	8.0A / 7.5A
$16^\circ\text{C} > T_0 \geq 5^\circ\text{C}$	18.0A / 17.5A				
$T_0 < 5^\circ\text{C}$		18.0A / 17.5A	18.0A / 17.5A	18.0A / 17.5A	18.0A / 17.5A

T0: Outdoor temperature

[Heating]

AB*45LBAG	Outdoor unit fan speed				
	850 rpm	780 rpm	350 rpm	200 rpm	150 rpm
$T_0 \geq 12^\circ\text{C}$	23.5A / 23.0A	20.0A / 19.5A	20.0A / 19.5A	15.0A / 14.5A	12.0A / 11.5A
$T_0 < 12^\circ\text{C}$		23.5A / 23.0A	23.5A / 23.0A	23.5A / 23.0A	23.5A / 23.0A

T0: Outdoor temperature

[Cooling]

AB*30LBAG AB*36LBAG	Outdoor unit fan speed				
	850 rpm	780 rpm	400 rpm	250 rpm	170 rpm
$T_0 \geq 45^\circ\text{C}$	10.0A / 9.5A	10.0A / 9.5A	10.0A / 9.5A	7.0A / 6.5A	5.5A / 5.0A
$45^\circ\text{C} > T_0 \geq 38^\circ\text{C}$	14.0A / 13.5A	14.0A / 13.5A			
$38^\circ\text{C} > T_0 \geq 19^\circ\text{C}$	18.0A / 17.5A				
$19^\circ\text{C} > T_0 \geq 13^\circ\text{C}$		15.0A / 14.5A	15.0A / 14.5A		7.0A / 6.5A
$13^\circ\text{C} > T_0 \geq 0^\circ\text{C}$				12.0A / 11.5A	
$T_0 < 0^\circ\text{C}$					9.5A / 9.0A

T0: Outdoor temperature

[Cooling]

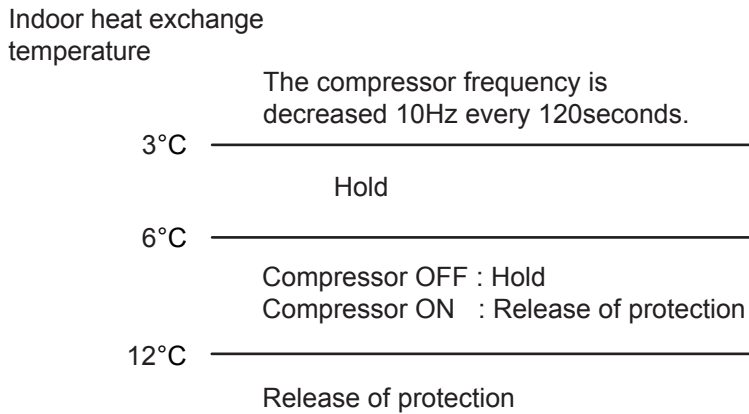
AB*45LBAG	Outdoor unit fan speed				
	850 rpm	780 rpm	400 rpm	350 rpm	300 rpm
$T_0 \geq 45^\circ\text{C}$	12.0A / 11.5A	12.0A / 11.5A	12.0A / 11.5A	12.0A / 11.5A	12.0A / 11.5A
$45^\circ\text{C} > T_0 \geq 38^\circ\text{C}$	20.0A / 19.5A	20.0A / 19.5A	18.0A / 17.5A	18.0A / 17.5A	15.0A / 14.5A
$38^\circ\text{C} > T_0 \geq 31^\circ\text{C}$	23.5A / 23.0A				
$31^\circ\text{C} > T_0 \geq 25^\circ\text{C}$					
$25^\circ\text{C} > T_0 \geq 19^\circ\text{C}$			20.0A / 19.5A		
$19^\circ\text{C} > T_0 \geq 13^\circ\text{C}$					15.0A / 14.5A
$T_0 < 13^\circ\text{C}$					18.0A / 17.5A

T0: Outdoor temperature

3. ANTI-FREEZING CONTROL (Cooling mode)

The compressor frequency decreases on cooling mode when the indoor heat exchanger temperature sensor detects the temperature lower than 3°C. Then, the anti-freezing control is released when it becomes higher than 6°C.

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



- When the compressor frequency becomes lower than minimum frequency, the compressor operates at minimum frequency. If the indoor heat exchanger temperature sensor detects the temperature lower than 3°C after 2minutes upon operating the compressor at minimum frequency, the compressor stops.

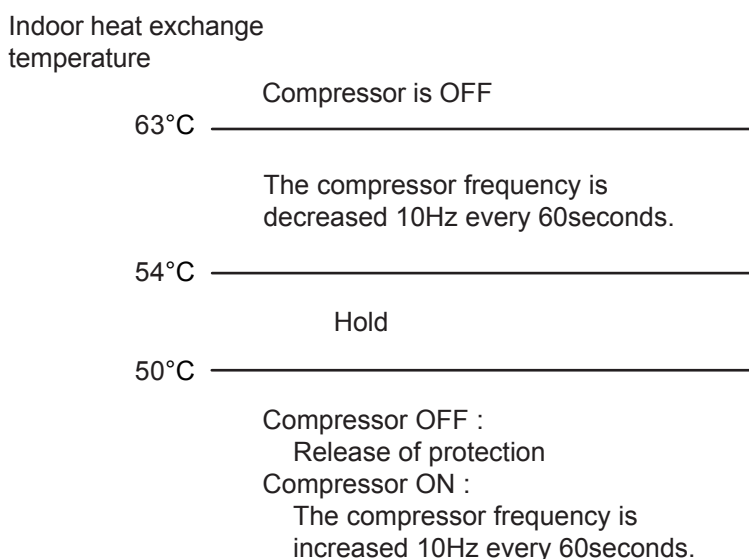
4. COOLING PRESSURE OVER RISE PROTECTION

When the outdoor unit heat exchange sensor temperature rises to 70.5°C or greater, the compressor is stopped and error display is indicated.

5. HIGH TEMPERATURE RELEASE CONTROL (HEATING MODE)

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

(Fig.12 : Heating Overload Protection Control)



Large Ceiling type **INVERTER**

6 . REFRIGERANT CAUTION -R410A-

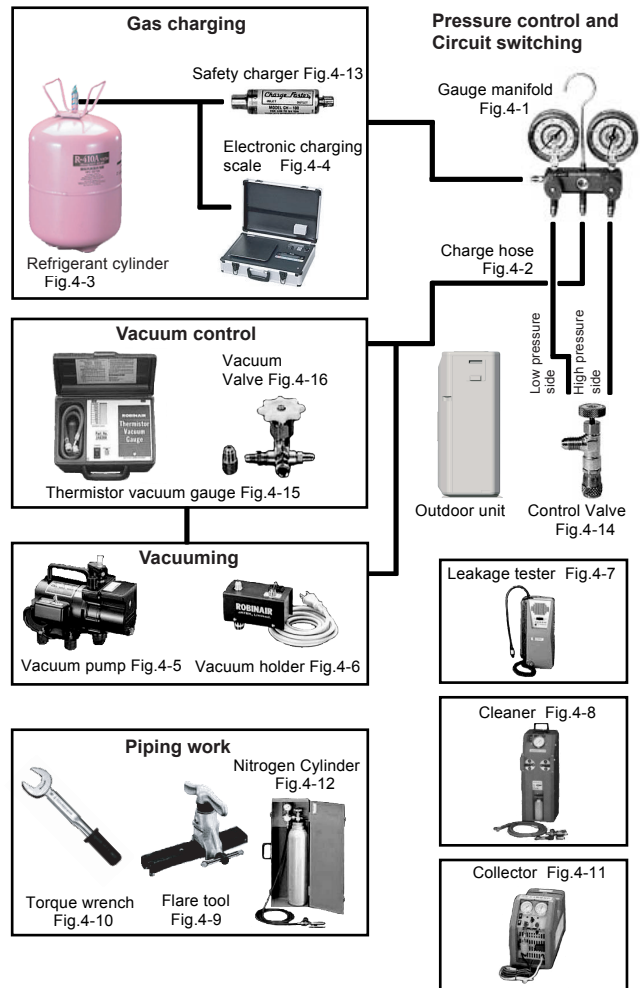
6. REFRIGERANT CAUTION -R410A-

6-1. R410A TOOLS

This air conditioner used R410A.
 For installation and servicing, it is necessary to prepare the tools and machines that are different from the previous refrigerant.

- ⊙ **Mark shows the exclusive use for R410A.**
- ⊙ **Gauge manifold** (Fig.4-1)
 The specification of the gauge is different due to higher pressure.
 The size of connection pipe is also different to prevent mis-use.
- ⊙ **Charge hose** (Fig.4-2)
 Since the normal pressure is high, the connection pipe size is also different.
- ⊙ **Refrigerant cylinder** (Fig.4-3)
 Confirm the refrigerant type before charging. Always charge liquid-phase refrigerant.
- Electronic balance for refrigerant charging** (Fig.4-4)
 Electronic balance is recommended as in the case of R410A.
- ⊙ **Vacuum pump with adapter to prevent reverse flow**(Fig.4-5)
 Conventional pump can be used.
- Vacuum holder** (Fig.4-6)
 Conventional pump can be used if adapter for preventing vacuum pump oil from flowing back is used.
- ⊙ **Gas leakage tester** (Fig.4-7)
 Exclusive for HFC
- Refrigerant cleaner** (Fig.4-8)
 Brown paint as designated by the ARI, USA
- ⊙ **Flare tool** (Fig.4-9)
 The shape of flare is different for high pressure condition.
- ⊙ **Torque wrench** (Fig.4-10)
- ⊙ **Refrigerant recovering equipment (Collector)** (Fig.4-11)
 The type which can be used for any refrigerant is available
- Nitrogen cylinder** (Fig.4-12)
 This prevents an oxide film from forming in the pipe silver-alloy brazing work by turning the air out of the pipe and preventing the inside combustion.
- ⊙ **Safety charger** (Fig.4-13)
 It is always compulsory to change the liquid, because R410A is a mixed refrigerant and there is some fear that a mixing ratio changes. In order to avoid the refrigerant from returning to the compressor in a liquid state, the refrigerant can be charged instead of giving a load to the compressor with a safety charger.
- Control valve** (Fig.4-14)
 The control valve prevents the refrigerant from spouting when it is removed, as the charging hose side and the service port side are possible to open and close at the same time.
- Thermistor vacuum gauge** (Fig.4-15)
 To remove moisture from the refrigerating cycle completely, it is necessary to perform appropriate vacuum drying. For that reason, vacuum conditions can be confirmed certainly.
- Vacuum valve** (Fig.4-16)
 This valve builds in a check valve, and it is easily possible to vacuum a refrigerating cycle or check for degree of vacuum with it.

TOOLS AND EQUIPMENT (R410A)



* 1 Gauge Manifold

	R410A	R22, R407C
High pressure gauge	-0.1~5.3 Mpa	-0.1~3.5 Mpa
Compound gauge	-0.1~3.8 Mpa	-0.1~1.7 Mpa
Port size	1/2UNF 5/16"	7/16UNF 1/4"

* 2 Charge hose

	R410A	R22, R407C
Normal pressure	5.1 Mpa	3.4 Mpa
Breaking pressure	27.4 Mpa	17.2 Mpa
Port size	1/2UNF	7/16UNF

6-2. PRECAUTION FOR INSTALLATION

Precaution for installation

Pipe diameter, recommended material and wall thickness

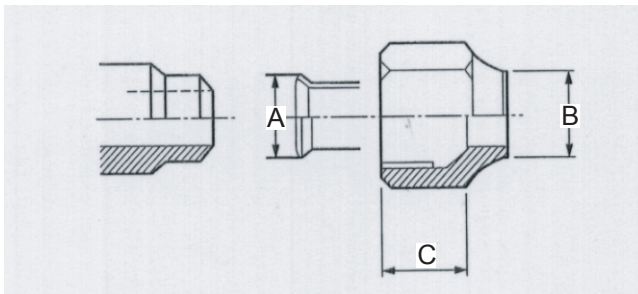
Nominal diameter (in)	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"
Outside diameter (mm)	6.35	9.52	12.70	15.88	19.05	22.22	25.40	28.58	31.75	34.92	38.10
Material	COPPER JIS H3300-C1220T-O or equivalent ¹⁾					COPPER JIS H3300-C1220T-H or equivalent ²⁾					
Wall thickness ³⁾ (mm)	0.8	0.8	0.8	1.0	1.2	1.0	1.0	1.0	1.1	1.2	1.3

1) Allowable tensile stress ≥ 33 (N/mm²); 2) Allowable tensile stress ≥ 61 (N/mm²); 3) Design pressure 4.2MPa.

The pipe must be properly pressure rated for R410A
The pipe must be an air-conditioning refrigerant pipe.

Flare and flare nuts

Diameter	1/4" (6.35mm)		3/8" (9.52mm)		1/2" (12.7mm)		3/8" (15.88mm)		3/4" (19.05mm)	
Refrigerant	R410A	R22 /R407C	R410A	R22 /R407C	R410A	R22 /R407C	R410A	R22 /R407C	R410A	R22 /R407C
A	9.1	9.0	13.2	13.0	16.6	16.2	19.7	19.4	24	23.7
B	13	12	20	15	13	20	25	23	29	29
C	12	11	16	12.5	19	16	22	20	24	24
Nut width	17		22		26	24	29	27	36	

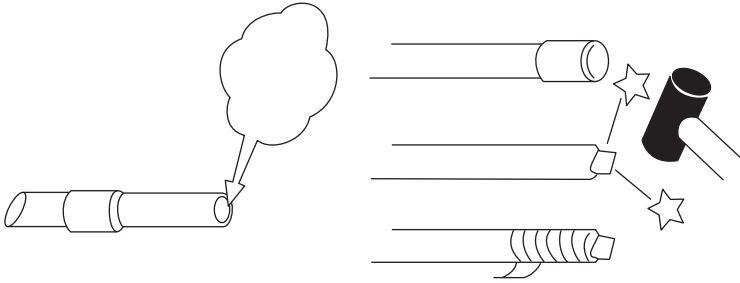


Always use the flare nut that is packed with the product.

Do not use existing (for R22) pipes

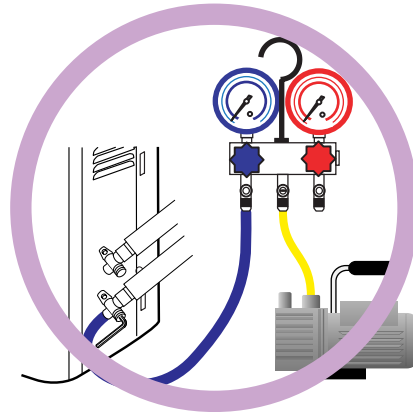
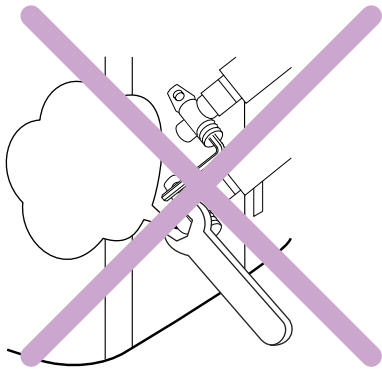
- Be sure to use new pipes when replacing conventional (R22) model with HFC (R407C, R410A) model.
- If you use existing pipes, it may cause resolution of compressor oil by remaining mineral oil.

Be careful not to mix moisture and contamination into the pipe



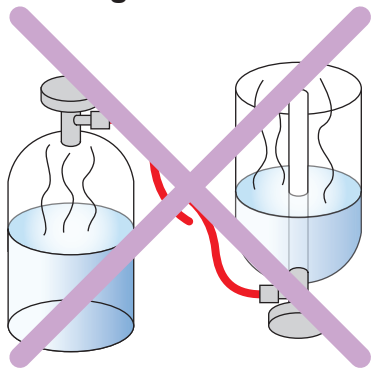
Moisture and contamination in the pipe is a cause of trouble.

Air purge

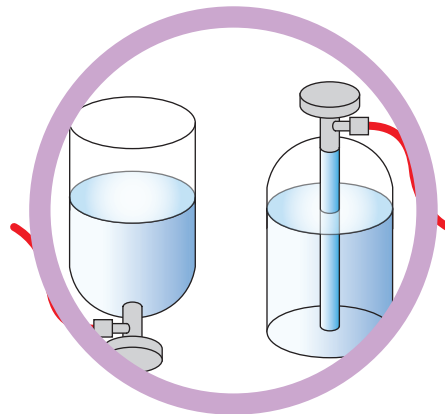


Always use a vacuum pump to purge air.

Refrigerant charge



Don't charge from the gas phase side.



Do it always from the liquid phase side.

Compressor oil is changed

- We developed new synthetic oil, since HFC refrigerant doesn't dissolve in mineral (for R22)oil.
- Be careful to handle synthetic oil, since it resolves easily by moisture and contamination.
- Don't mix new synthetic oil and mineral oil. It may cause trouble.

6-3. PRECAUTION FOR SERVICING

Feature 1 Refrigerant oil is different from before.

<p>Refrigerant oil for New Refrigerant</p> <p>Synthetic oil Ether Esther</p> <p>※ Previously it was mineral oil.</p>	<p>Different point from previous one</p> <ul style="list-style-type: none">• Absorbent character is high.• Contamination occurs when mixed with other kind of oil.	<p>Precaution on Tools</p> <ul style="list-style-type: none">• Use the gauge manifold and charge hose for New Refrigerant(HFC), which shall be segregated from those of R22.• Attach the stop valve on the vacuum pump and avoid the oil from reverse flow.• It is necessary to use the vacuum pump which can obtain the high vacuum condition.
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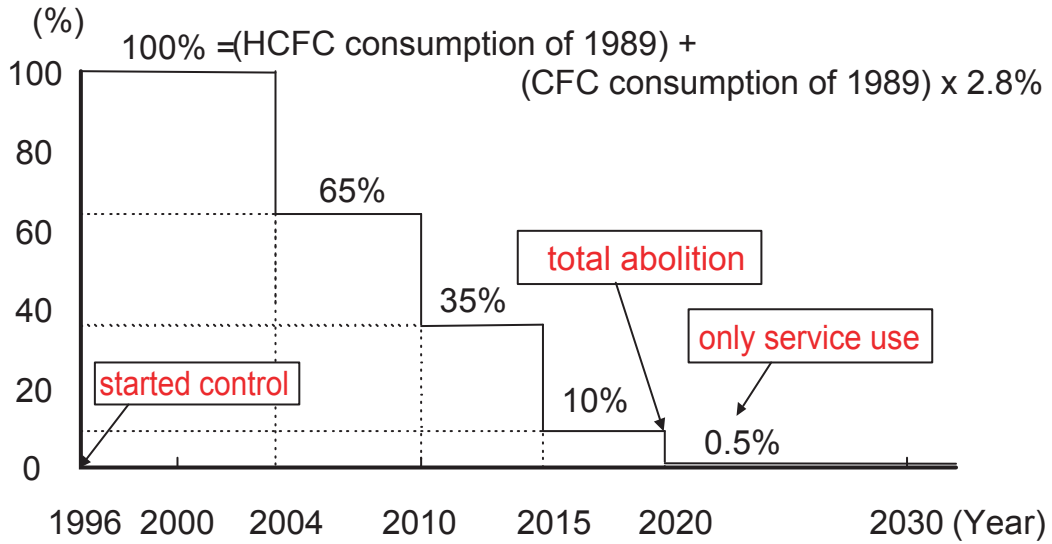
Feature 2 **R410A** New Refrigerant has Approx 1.6 times higher pressure than previous refrigerant. **R22**

<p>R410A</p> <p>High Pressure</p> <p>※ 1.6 times of R22.</p>	<p>Different point from previous one</p> <ul style="list-style-type: none">• Diameter of Service port has been changed from 1/4 Flare to 5/16 Flare.• JIS standard of flare process It became larger• To keep the thickness of copper tube. (1/4, 3/8 = more than 0.8mm)	<p>Precaution on Tools</p> <ul style="list-style-type: none">• It requires the gauge manifold and charge hose exclusively for R410A.• It requires the flare tool and torque wrench that satisfies New JIS standard. <p>※ Previous flare tool + flare adapter can be used as well.</p>
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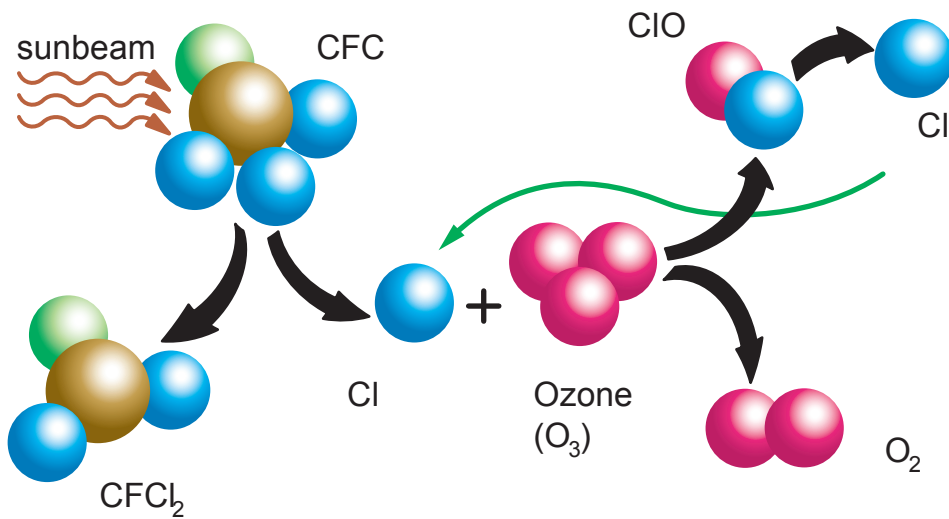
6-4. NEW REFRIGERANT R410A

* What is HFC ?

Phase-out schedule of HCFC according to Montreal protocol



Ozone Layer depleting mechanism



What is CFC and HCFC?

CFC : Chloro-Fluoro-Carbon

High ODP(ozone depletion potential) chemical compound, including chlorine. (ODP:0.6-1.0)
For example : R12 (for refrigerator and car air-conditioner)

HCFC : Hydro-Chloro-Fluoro-Carbon

Low ODP chemical compound, including chlorine and hydrogen. (ODP:0.02-01)
For example : R22 (for air-conditioner)

HFC₃ : Hydro-Fluoro-Carbon

R134a (for Car air conditioner)
R407C (for air conditioner)

Refrigerant characteristics

	R410A	R407C	R22
Composition (wt%)	R32/R125 (50/50)	R32/R125/R134a (23/25/52)	R22 (100)
Boiling Point	- 51.4	- 43.6	- 40.8
Behavior	near azeotrope	zeotrope	---
Pressure at 54.5 °C (kPa)	3,406	2,262	2,151
Temperature Glide (deg)	0.11	5.4	0
ODP	0	0	0.055

Summary of R407C and R410A characteristics

	R410A	R407C
Advantage	<ul style="list-style-type: none"> • higher system performance • Near-Azeotropic refrigerant 	<ul style="list-style-type: none"> • similar pressure as R22 (possible to design large equipment)
Disadvantage	<ul style="list-style-type: none"> • 1.6 times higher pressure than R22 (difficult to design against pressure resistance) 	<ul style="list-style-type: none"> • Zeotropic refrigerant (handle with care)
Suitable for	<ul style="list-style-type: none"> • Small Air-Conditioners 	<ul style="list-style-type: none"> • Large Air-Conditioners

* Designed pressure of R410A refrigerant

Relation between R410A condensing temperature and saturated pressure.

< Pressure → Temp >

Pressure (Mpa)	Temp (°C)
2.20	37.9
2.25	38.7
2.30	39.6
2.35	40.5
2.40	41.3
2.45	42.1
2.55	43.8
2.60	44.6
2.65	45.3
2.70	46.1
2.75	46.8
2.80	47.6
2.85	48.3
2.90	49.0
2.95	49.8
3.00	50.5
3.05	51.2
3.10	51.9
3.15	52.6
3.20	53.2
3.25	53.9
3.30	54.6
3.35	55.3
3.40	55.9
3.45	56.5
3.50	57.1
2.55	57.8
3.60	58.4
3.65	59.0
3.70	59.6
3.75	60.2
3.80	60.8
3.85	61.4
3.90	62.0
3.95	62.5
4.00	63.1
4.05	63.6
4.10	64.2
4.15	64.8

< Temp → Pressure >

Temp (°C)	Pressure (Mpa)
39	2.27
40	2.32
41	2.38
42	2.44
44	2.57
45	2.63
46	2.69
47	2.76
48	2.83
49	2.90
51	3.04
52	3.11
53	3.18
54	3.26
56	3.41
57	3.49
58	3.57
59	3.65
61	3.82
62	3.90
63	3.99
64	4.08

6-5. DEFERENCE FROM CONVENTIONAL MODEL (R22) AND PRECAUTIONS

OIL

- Use new synthetic oils such as ester because HFC series refrigerant has less solubility with mineral oils conventionally used for R22.
- As these new synthetic oils are easily influenced by moisture and dusts, they must be treated more carefully than the conventional lubricating oils.

CAUTION

For installation/servicing, take more precautions than the case of conventional refrigerants to avoid moisture and dusts entering the refrigerant circuit. Also, for storing parts, more precautions must be taken.

COMPRESSOR

- Use better grade of material for sliding parts for securing good lubrication of sliding part as HFC refrigerant does not contain chloride.
- Review insulating materials
- Increase pressure resistance strength

CAUTION

Check if the compressor is suitable for the refrigerant (model) when replacing. Complete welding within 15 minutes after opening the cap when replacing.

HEAT EXCHANGER

- Review the water, contaminants controlling level
- Use thinner tube to increase pressure resistance strength (only outdoor unit) improving performance

CAUTION

During storage, due care must be taken so that foreign matters such as dust and water do not enter.

4-WAY VALVE

- Review materials

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

2, 3-WAY VALVE

- Review material O-ring, valve core seal for securing suitability with oil.

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

Check Valve

- Review materials
- Change shape of pipe ends to increase pressure resistance strength.

CAUTION

Check if the valve is suitable for the refrigerant (model) when replacing.

Other Piping

- Review the water, contaminants controlling level.
- Review thickness of pipes.

CAUTION

During storage, due care must be taken so that foreign matters such as dust and water do not enter.

Large Ceiling type **INVERTER**

7 . TROUBLE SHOOTING

7. TROUBLESHOOTING

7-1 ERROR DISPLAY

7-1-1 INDOOR UNIT DISPLAY

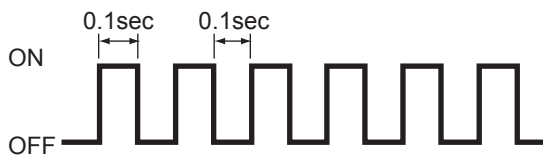
1. ERROR DISPLAY

Please refer the blinking pattern as follows.

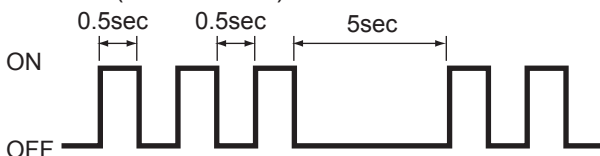
Error Contents	Operation LED (RED)	Timer LED (GREEN)	Vertical Swing LED (ORANGE)	Trouble shooting
Indoor EEPROM abnormal (Model No.)	Continuous blink	Continuous blink	OFF	8
Room temperature sensor open	2 times blink	Continuous blink	OFF	3
Room temperature sensor short-circuited	2 times blink	Continuous blink	Continuous blink	
Indoor heat exchanger temperature sensor open	3 times blink	Continuous blink	OFF	4
Indoor heat exchanger temperature sensor short-circuited	3 times blink	Continuous blink	Continuous blink	
Communication error (Serial reverse transfer error)	5 times blink	Continuous blink	OFF	2
Indoor fan motor abnormal	6 times blink	Continuous blink	OFF	9
Outdoor communication signal error (Forward transfer signal error)	5 times blink	Continuous blink	Continuous blink	10
Outdoor heat exchanger temperature sensor error	Continuous blink	3 times blink	OFF	5
Outdoor temperature sensor error	Continuous blink	4 times blink	OFF	6
Outdoor discharge pipe temperature sensor error	Continuous blink	5 times blink	OFF	7
Compressor temperature sensor error	Continuous blink	8 times blink	OFF	11
Pressure switch error	Continuous blink	9 times blink	OFF	12
IPM error	Continuous blink	10 times blink	OFF	13
CT error	Continuous blink	11 times blink	OFF	14
Active filter module (AFM) error	Continuous blink	12 times blink	OFF	15
Compressor rotor location cannot detect (permanent stop)	Continuous blink	13 times blink	OFF	16
Outdoor unit fan motor error	Continuous blink	14 times blink	OFF	17

2. ERROR DISPLAY METHOD

- LED Continuous Blink : 0.1sec ON / 0.1sec OFF blinking



- LED Blink (2 to 14 times) : 0.5sec ON / 0.5sec OFF blinking



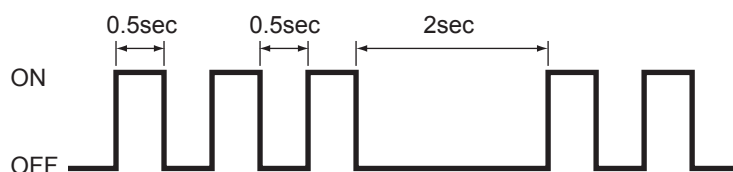
7-1-2 OUTDOOR UNIT DISPLAY

1. ERROR DISPLAY

Error contents	LED Flashing Pattern	Display priority	Trouble shooting
Outdoor communication signal error (Forward transfer signal error)	1 time blink	1	10
Outdoor discharge pipe temperature sensor error	2 times blink	2	7
Outdoor heat exchanger temperature sensor error	3 times blink	3	5
Outdoor temperature sensor error	4 times blink	4	6
Compressor temperature sensor error	7 times blink	5	11
Heat sink temperature sensor error	8 times blink	6	18
Pressure switch abnormal	9 times blink	7	12
IPM error	12 times blink	8	13
Compressor rotor location cannot detect	13 times blink	9	16
Compressor Start-up error	14 times blink	10	19
Outdoor unit fan motor error (upper fan)	15 times blink	11	17
Outdoor unit fan motor error (lower fan)	16 times blink	12	

2. ERROR DISPLAY METHOD

Outdoor LED Blink (1 to 16 times) 0.5sec ON / 0.5sec OFF blinking



3. NORMAL OPERATION DISPLAY

Operation	LED Blinking Pattern
Normal operation	Continuously lighting
Protected operation	5sec ON / 1sec OFF
Pump down operation	1sec ON / 1sec OFF

7-2 TROUBLE SHOOTING WITH ERROR CODE

Trouble shooting 2
OUTDOOR UNIT Error Method:
Communication Error
(Serial Reverse Transfer Error)

Indicate or Display:

Indoor Unit : Operation LED: 5 times blink, Timer LED: Blink,
 Vertical swing LED: OFF
 Outdoor Unit : No indication

Detective Actuators:

Outdoor Unit Main PCB Circuit

Detective details:

When the indoor unit cannot receive the serial signal from Outdoor unit more than 10seconds.

Forecast of Cause:

1. Connection failure 2. External cause 3. Main PCB failure 4. Active Filter Module failure

Check Point 1-1 : Reset the power and operate

· Does Error indication show again?

YES

Check Point 2 : Check Connection

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

OK

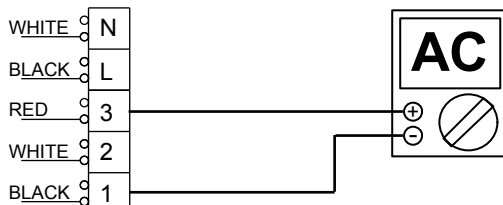
Check Point 3 : Check the voltage of power supply

- Check the voltage of power supply
 >> **Check if AC198 - 264V appears at Outdoor Unit Terminal L - N.**

OK

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

- Check Serial Signal (Reverse Transfer Signal)
 >> **Check if Indicated value swings between AC70V and AC130V at Outdoor Unit Terminal 1 - 3.**
 >> **If it is abnormal, Check Active Filter Module. (PARTS INFORMATION 3)**
 >> **If Active Filter Module is abnormal, replace it.**
 >> **If Active Filter Module is normal, replace Main PCB.**



Trouble shooting 3 INDOOR UNIT Error Method: Room Temperature Sensor Error	Indicate or Display: Indoor Unit : Operation LED: <u>2 times blink</u> , Timer LED: <u>Blink</u> , Vertical swing LED: <u>OFF / Blink</u> Outdoor Unit : No indication
---	--

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

Forecast of Cause :
1. Connector connection failure 2. Thermistor failure 3. Controller PCB failure

Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value

Ω

Thermistor Characteristics (Approx. value)

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

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

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



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

DC

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

► If the voltage does not appear, replace Controller PCB.

Trouble shooting 4 INDOOR UNIT Error Method: Indoor Heat Exchanger Temperature Sensor Error	<u>Indicate or Display:</u> Indoor Unit : Operation LED: <u>3 times blink</u> , Timer LED: <u>Blink</u> , Vertical swing LED: <u>OFF / Blink</u> Outdoor Unit : No indication
--	--

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

Forecast of Cause :
1. Connector connection failure 2. Thermistor failure 3. Controller PCB failure

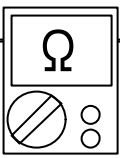
Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)


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

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

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



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



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

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

Trouble shooting 5 OUTDOOR UNIT Error Method: Outdoor Heat Exchanger Temperature Sensor Error	Indicate or Display: Indoor Unit : Operation LED: <u>Blink</u> , Timer LED: <u>3 times blink</u> , Vertical swing LED: <u>OFF</u> Outdoor Unit : LED <u>3 times blink</u>
--	---

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

Forecast of Cause :
1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value

Ω

Thermistor Characteristics (Approx. value)

Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C
Resistance Value (k Ω)	27.5	20.9	16.1	12.4	9.73	7.67	6.10	4.89	3.95

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



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

DC

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

► If the voltage does not appear, replace Main PCB.

Trouble shooting 6 OUTDOOR UNIT Error Method: Outdoor Temperature Sensor Error	Indicate or Display: Indoor Unit : Operation LED: <u>Blink</u> , Timer LED: <u>4 times blink</u> , Vertical swing LED: <u>OFF</u>
	Outdoor Unit : LED <u>4 times blink</u>

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

Forecast of Cause :
1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

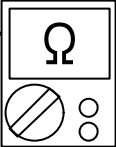
Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)


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

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

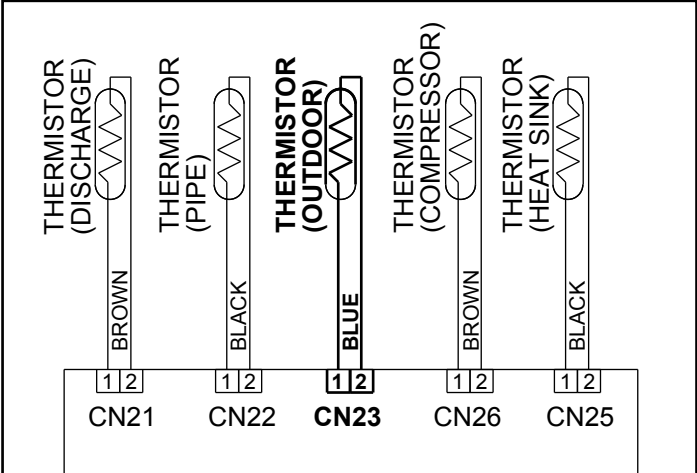
► If Thermistor is either open or shorted, replace it and reset the power.



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



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



► If the voltage does not appear, replace Main PCB.

Trouble shooting 7 OUTDOOR UNIT Error Method: Outdoor Discharge Pipe Temperature Sensor Error	Indicate or Display: Indoor Unit : Operation LED: Blink , Timer LED: 5 times blink , Vertical swing LED: OFF Outdoor Unit : LED 2 times blink
--	---

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

Forecast of Cause :
1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value

Ω

Thermistor Characteristics (Approx. value)

Temperature	0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C	60°C
Resistance Value (k Ω)	176	135	105	81.8	64.5	41.1	26.9	18.1	12.5

Temperature	70°C	80°C	90°C	100°C	120°C	140°C	160°C	180°C
Resistance Value (k Ω)	8.78	6.31	4.61	3.43	1.98	1.21	0.77	0.51

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



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

DC

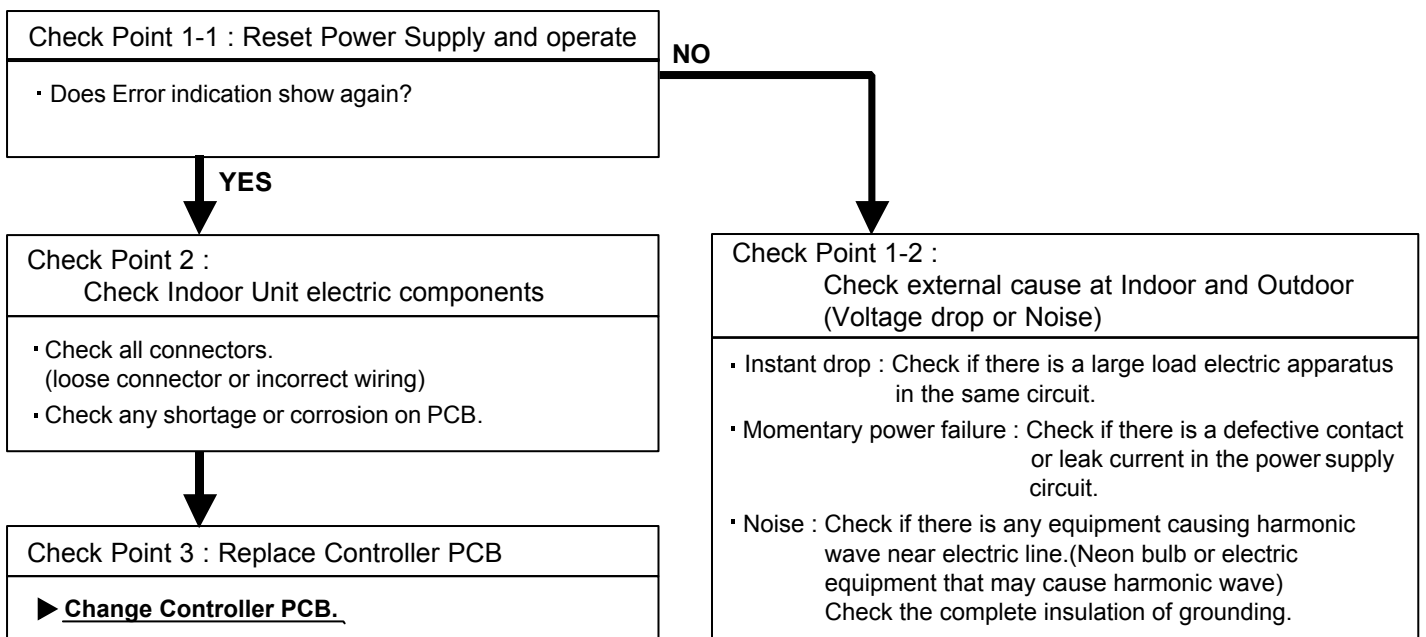
Make sure circuit diagram of outdoor unit and check terminal voltage at Thermistor (DC5.0V)

► If the voltage does not appear, replace Main PCB.

Trouble shooting 8 INDOOR UNIT Error Method: Indoor EEPROM abnormal (Model No.)	Indicate or Display: Indoor Unit : Operation LED: <u>Blink</u> , Timer LED: <u>Blink</u> , Vertical swing LED: OFF Outdoor Unit : No indication
--	--

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

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



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

Trouble shooting 9 INDOOR UNIT Error Method: Indoor Fan Motor abnormal	Indicate or Display: Indoor Unit : Operation LED: 6 times blink , Timer LED: Blink , Vertical swing LED: OFF Outdoor Unit : No indication
---	--

Detective Actuators: Indoor Unit Controller PCB Circuit Indoor Fan Motor	Detective details: When the condition that actual frequency of Indoor Fan is below 1/3 of target frequency is continued more than 56 seconds.
---	---

Forecast of Cause: 1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by surrounding temperature rise 4. Capacitor failure 5. Control PCB failure
--

Check Point 1 : Check rotation of Fan

- Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)

>>If Fan or Bearing is abnormal, replace it.



Check Point 2 : Check Motor winding

- Check Indoor Fan motor. (PARTS INFORMATION 5)

>>If Fan motor is abnormal, replace it.



Check Point 3 : Check ambient temp. around motor

- Check excessively high temperature around the motor.
(If there is any surrounding equipment that causes heat)

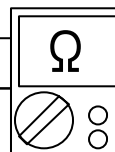
>>Upon the temperature coming down, restart operation.



Check Point 4 : Check Motor Capacitor

- Check continuity of motor capacitor

>>If it is shorted, replace the capacitor.



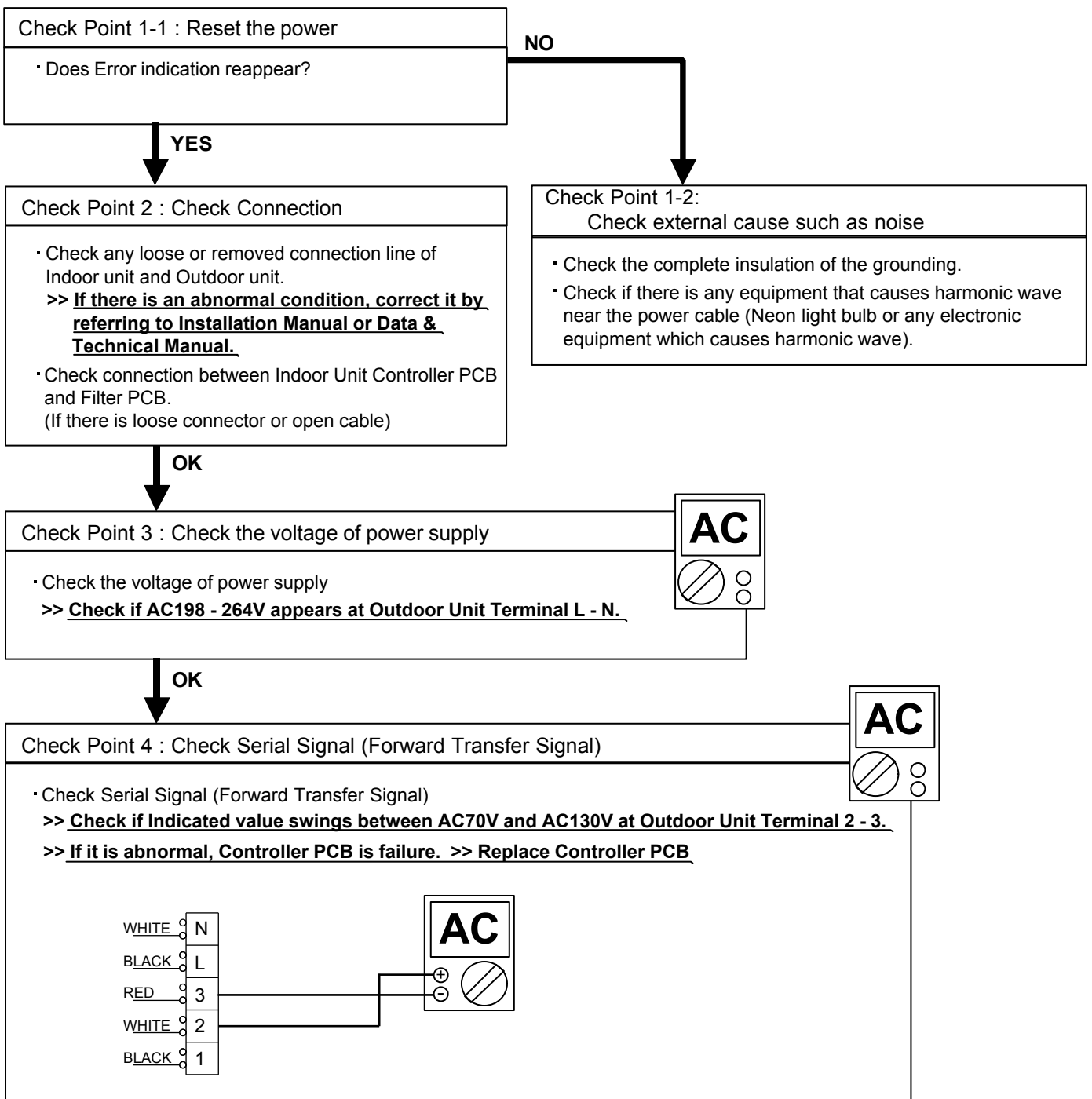
Check Point 5 : Replace Controller PCB

▶ If Check Point 1-4 do not improve the symptom, replace Controller PCB.

Trouble shooting 10 INDOOR UNIT Error Method: Outdoor Communication Signal Error (Forward Transfer Signal Error)	Indicate or Display: Indoor Unit : Operation LED: <u>5 times blink</u> , Timer LED: <u>Blink</u> , Vertical swing LED: <u>Blink</u> Outdoor Unit : LED <u>1 time blink</u>
---	--

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

Forecast of Cause:
1. Connection failure 2. External cause 3. Controller PCB failure



Trouble shooting 11 OUTDOOR UNIT Error Method: Compressor Temperature Sensor Error	Indicate or Display: Indoor Unit : Operation LED: Blink , Timer LED: 8 times blink , Vertical swing LED: OFF Outdoor Unit : LED 7 times blink
---	---

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

Forecast of Cause :
 1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value

Ω

Thermistor Characteristics (Rough value)

Temperature	0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C	60°C
Resistance Value (k Ω)	176	135	105	81.8	64.5	41.1	26.9	18.1	12.5

Temperature	70°C	80°C	90°C	100°C	120°C	140°C	160°C	180°C
Resistance Value (k Ω)	8.78	6.31	4.61	3.43	1.98	1.21	0.77	0.51

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



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

DC

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

► If the voltage does not appear, replace Main PCB.

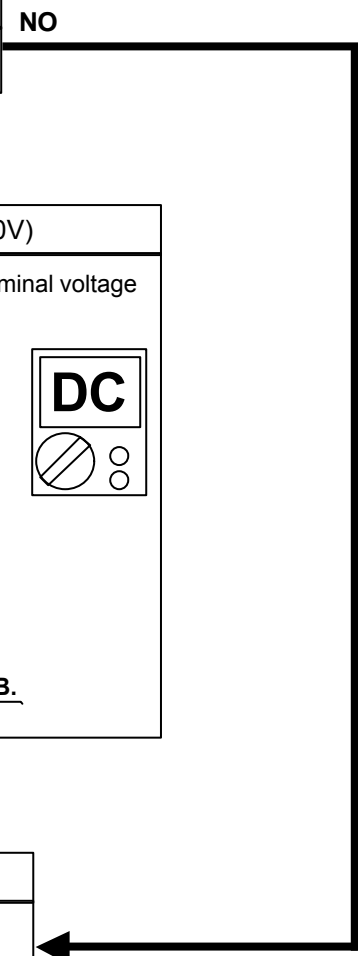
Trouble shooting 12 <u>OUTDOOR UNIT Error Method:</u> Pressure Switch Error	<u>Indicate or Display:</u> Indoor Unit : Operation LED: <u>Blink</u> , Timer LED: <u>9 times blink</u> , Vertical swing LED: <u>OFF</u> Outdoor Unit : LED <u>9 times blink</u>
--	--

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit Pressure Switch	<u>Detective details:</u> When pressure switch open is detected in 10 seconds after the power is turned on.
--	--

Forecast of Cause :
1. Connector connection failure 2. Pressure Switch failure 3. Main PCB failure

Check Point 1 : Reset Power Supply and operate
• Does abnormal LED indication show again?

YES



Check Point 2 : Check voltage of Main PCB (DC5.0V)
• Make sure circuit diagram of outdoor unit and check terminal voltage at Pressure Switch. (DC5.0V)

The diagram shows a connector labeled 'CN37' with three terminals. Terminal 1 is connected to a red wire labeled 'RED'. Terminal 2 is connected to another red wire labeled 'RED'. Terminal 3 is connected to a black wire labeled 'BLACK'. These two red wires are connected to a component labeled 'HIGH PRESSURE SW'. The black wire is connected to a capacitor labeled '4WV'. To the right of the diagram is a DC power source symbol consisting of a rectangle with 'DC' inside, a circle with a diagonal line, and two small circles below it.

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

OK

Check Point 3 : Check Pressure Switch
• Check if connector is loose or cable is open.
>> **If no abnormal connection is found, replace Pressure Switch.**
► **After replacing Pressure Switch, check operating condition and pressure in operation.**

Trouble shooting 13 OUTDOOR UNIT Error Method: IPM error (Permanent Stop)	Indicate or Display: Indoor Unit : Operation LED: <u>Blink</u>, Timer LED: <u>10 times blink</u>, Vertical swing LED: <u>OFF</u> Outdoor Unit : LED <u>12 times blink</u>
--	---

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

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

Check Point 1 : Check connections of Outdoor Unit Electrical Components
<ul style="list-style-type: none"> • Check if the terminal connection is loose. • Check if connector is removed. • Check erroneous connection. • Check if cable is open. >> Upon correcting the removed connector or mis-wiring, reset the power.



Check Point 2 : Check Outdoor Fan, Heat Exchanger
<ul style="list-style-type: none"> • Is there anything obstructing the air distribution circuit? • Is there any clogging of Outdoor Heat Exchanger? • Is the Fan rotating by hand when operation is off ? >> If the Fan Motor is locked, replace it. • Check Outdoor Fan Motor. (Refer to Trouble shooting 17) >> If the Fan Motor is failure, replace it.



Check Point 3 : Check Compressor
<ul style="list-style-type: none"> • Check Compressor. (PARTS INFORMATION 2)

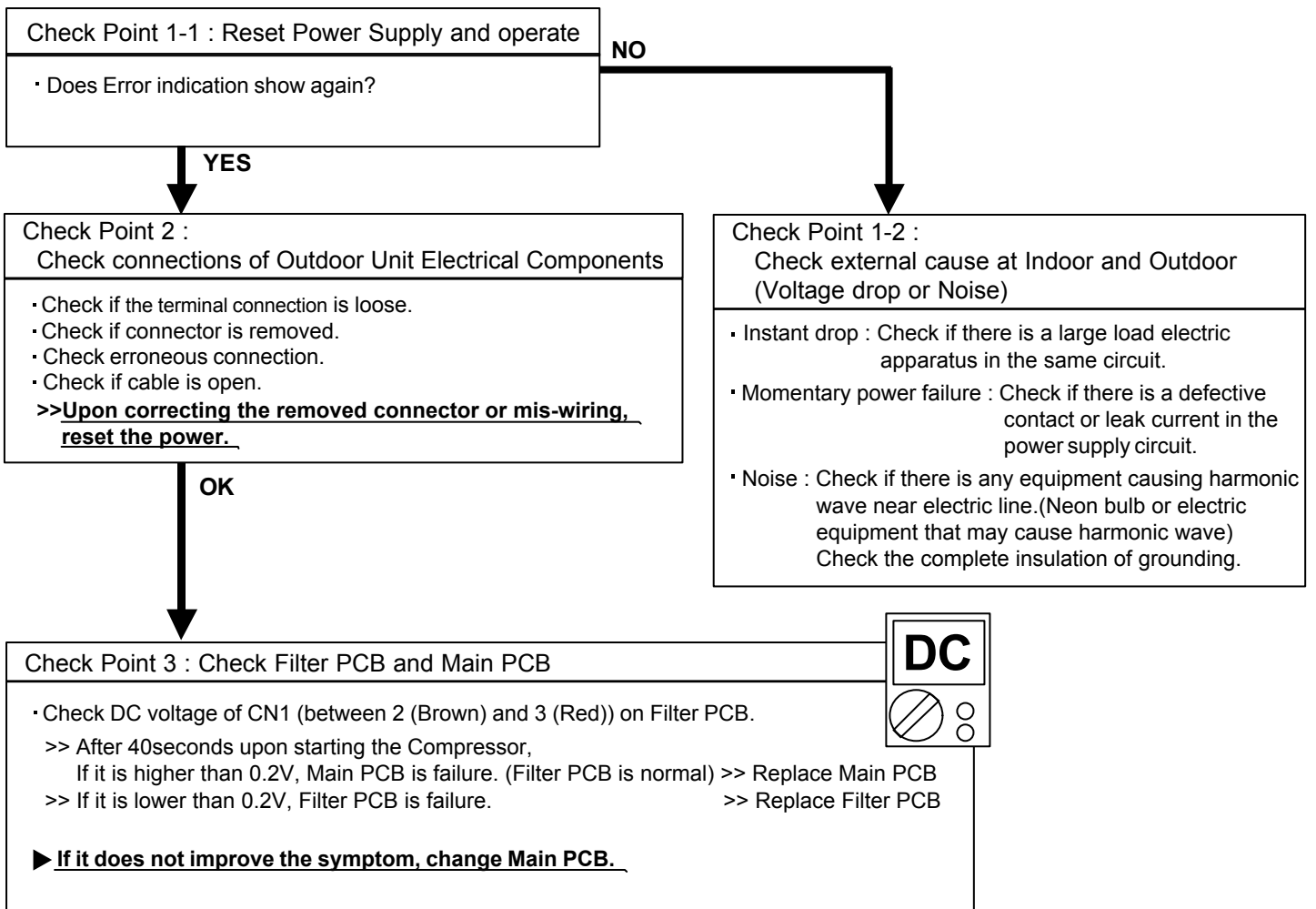


Check Point 4 : Replace Main PCB
► If Check Point 1, 2, 3 do not improve the symptom, change Main PCB.

Trouble shooting 14 OUTDOOR UNIT Error Method: CT error	Indicate or Display: Indoor Unit : Operation LED: <u>Blink</u> , Timer LED: <u>11 times blink</u> , Vertical swing LED: OFF Outdoor Unit : No indication
--	---

Detective Actuators: Outdoor Unit Main PCB Circuit Outdoor Unit Filter PCB Circuit (Input current sensor unit)	Detective details: When Input Current Sensor has detected lower than 0.5A while Inverter Compressor is operating at higher than 56Hz, after 1minute upon starting the Compressor. (Except during the defrost operation)
--	--

Forecast of Cause :
1. Defective connection of electric components 2. External cause 3. Filter PCB failure 4. Main PCB failure



Trouble shooting 15 OUTDOOR UNIT Error Method: Active Filter Module (AFM) error	Indicate or Display: Indoor Unit : Operation LED: <u>Blink</u> , Timer LED: <u>12 times blink</u> , Vertical swing LED: <u>OFF</u> Outdoor Unit : No indication
--	---

Detective Actuators: Outdoor Unit Main PCB Circuit Active Filter Module	Detective details: When inverter input DC voltage is higher than 467V or lower than 237V. When a momentary power cut off occurred on low voltage.
--	--

Forecast of Cause : 1. External cause 2. Connector connection failure 3. Active Filter Module failure 4 . Main PCB failure
--

Check Point 1 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)
<ul style="list-style-type: none"> ▪ Instant drop : Check if there is a large load electric apparatus in the same circuit. ▪ Momentary power failure : Check if there is a defective contact or leak current in the power supply circuit. ▪ Noise : Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check the complete insulation of grounding.



Check Point 2 : Check connection of Connector
<ul style="list-style-type: none"> ▪ Check if connector is removed. ▪ Check erroneous connection. ▪ Check if cable is open. <p>>><u>Upon correcting the removed connector or mis-wiring, reset the power.</u></p>



Check Point 3 : Check Active Filter Module
<ul style="list-style-type: none"> ▪ Check Active Filter Module. (PARTS INFORMATION 3) <p>>><u>If Active Filter Module is abnormal, replace it.</u></p>



Check Point 4 : Replace Main PCB
<p>▶ <u>If Check Point 1, 2 do not improve the symptom, change Main PCB.</u></p>

<p>Trouble shooting 16 <u>OUTDOOR UNIT Error Method:</u> Compressor rotor location cannot detect (Permanent Stop)</p>	<p><u>Indicate or Display:</u> Indoor Unit : Operation LED: <u>Blink</u>, Timer LED: <u>13 times blink</u>, Vertical swing LED: <u>OFF</u> Outdoor Unit : LED <u>13 times blink</u></p>
--	---

<p><u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit</p>	<p><u>Detective details:</u></p> <ol style="list-style-type: none"> ① While running the compressor, if the detected rotor location is out of phase with actual rotor location more than 90 degrees, the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ② repeats 5 times, the compressor stops permanently.
--	--

<p><u>Forecast of Cause :</u> 1. Defective connection of electric components 2. Main PCB failure</p>

<p>Check Point 1 : Check connection of around the Compressor components</p>
<p>For Compressor Terminal, Main PCB</p> <ul style="list-style-type: none"> • Check if connector is removed. • Check erroneous connection. • Check if cable is open. <p>(Refer to PARTS INFORMATION 2)</p> <p>>><u>Upon correcting the removed connector or mis-wiring, reset the power.</u></p>



<p>Check Point 2 : Replace Main PCB</p>
<p>▶ <u>If Check Point 1 do not improve the symptom, change Main PCB.</u></p>

Trouble shooting 17 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor Error	Indicate or Display: Indoor Unit : Operation LED: <u>Blink</u> , Timer LED: <u>14 times blink</u> , Vertical swing LED: <u>OFF</u> Outdoor Unit : LED <u>15 (Fan motor 1) / 16(Fan motor 2) times blink</u>
--	---

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

Forecast of Cause:
1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Main PCB failure

Check Point 1 : Check rotation of Fan

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



Check Point 2 : Check ambient temp. around motor

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



Check Point 3 : Check Output Voltage of Main PCB

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

AB*30/ 36LBAG

AU*45LBAG

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

▶ If the voltage is not correct, replace Main PCB.

Trouble shooting 18 OUTDOOR UNIT Error Method: Heat Sink Temperature Sensor Error	Indicate or Display: Indoor Unit : No LED Outdoor Unit : LED <u>8 Times Blink</u>
--	--

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

Forecast of Cause :
1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value

Ω

Thermistor Characteristics (Approx. value)

Temperature	0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C
Resistance Value (k Ω)	16.1	12.4	9.73	7.67	6.10	3.95	2.62	1.79

Temperature	60°C	70°C	80°C	90°C	100°C	110°C	120°C
Resistance Value (k Ω)	1.25	0.89	0.65	0.48	0.36	0.27	0.21

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



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

DC

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

► If the voltage does not appear, replace Main PCB.

Trouble shooting 19 OUTDOOR UNIT Error Method: Compressor Start-up error (Permanent Stop)	Indicate or Display: Indoor Unit : No LED Outdoor Unit : LED <u>14 Times Blink</u>
--	---

Detective Actuators: Outdoor Unit Main PCB Circuit	Detective details: ① On start-up the compressor, when detected rotor position is out of phase with actual rotor position more than 90 degrees, the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ② repeats 5 times, the compressor stops permanently.
--	---

Forecast of Cause : 1. Defective connection of electric components 2. Main PCB failure

Check Point 1 : Check connection of around the Compressor components
For Compressor Terminal, Main PCB <ul style="list-style-type: none"> • Check if connector is removed. • Check erroneous connection. • Check if cable is open. (Refer to PARTS INFORMATION 2) >>Upon correcting the removed connector or mis-wiring, reset the power.



Check Point 2 : Replace Main PCB
▶ <u>If Check Point 1 do not improve the symptom, replace Main PCB.</u>

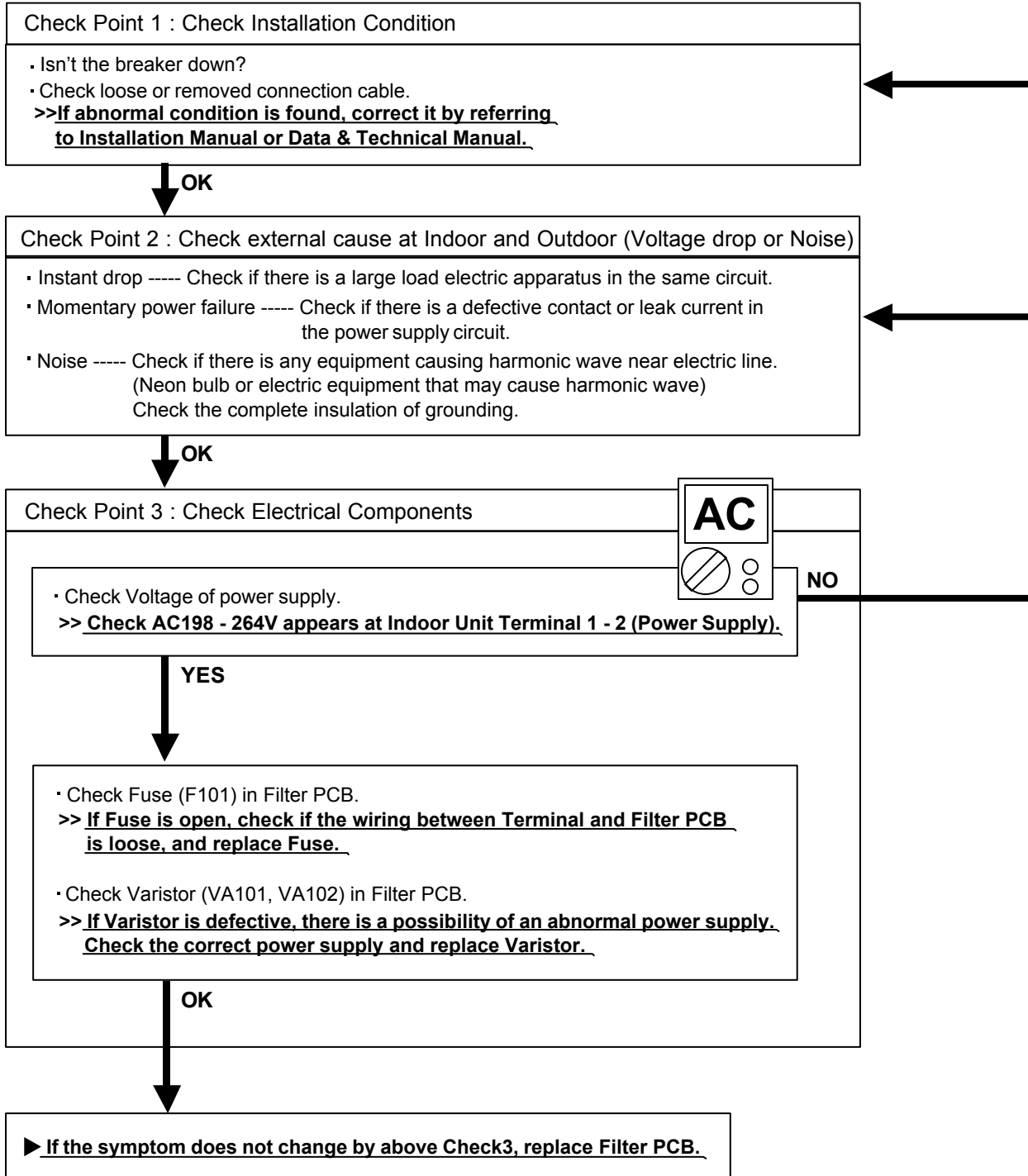
7-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 20

Indoor Unit - No Power

Forecast of Cause:

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

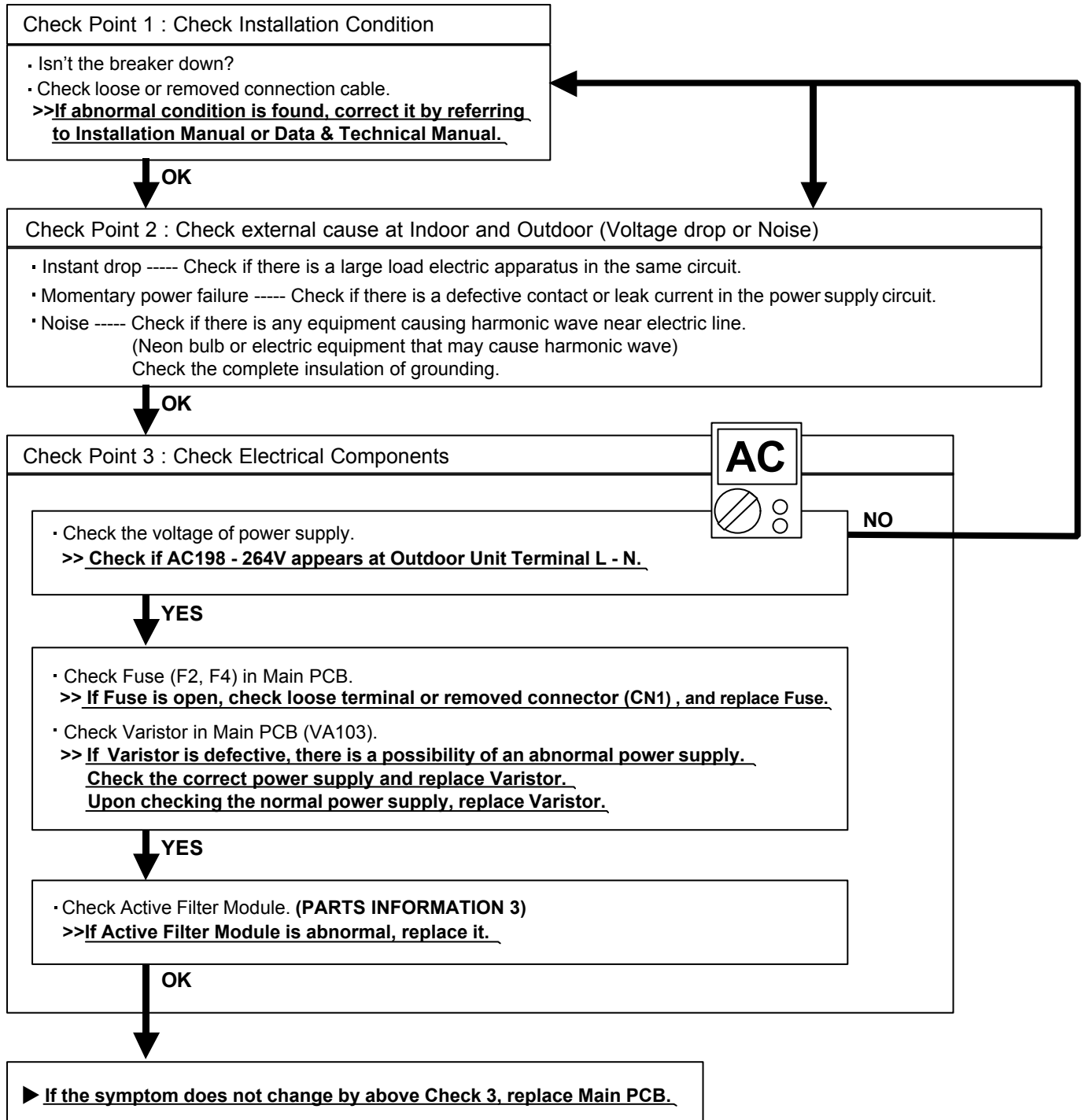


Trouble shooting 21

Outdoor Unit - No Power

Forecast of Cause:

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



Trouble shooting 22

No Operation (Power is ON)

Forecast of Cause:

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

Check Point 1 : Check indoor and outdoor installation condition

- Indoor Unit - Check incorrect wiring between Indoor Unit - Remote Control, or terminals between Indoor Units. Or, check if there is an open cable connection.
- Are these Indoor Unit, Outdoor Unit, and Remote Control suitable model numbers to connect?
>> If there is some abnormal condition, correct it by referring to Installation manual and Data & Technical Manual.

OK

Turn off Power and check/ correct followings.

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

OK

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

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

OK

Check Point 3 : Check Electrical Components at Indoor and Outdoor

- Check Voltage at CN17 of Controller PCB. (Power supply to Remote Control)
>> If it is DC12V, Remote Control is failure. (Controller PCB is normal) >> Replace Remote Control
>> If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB
>> If the symptom does not change by above Check 1, 2, 3, replace Main PCB of Outdoor unit.



Trouble shooting 23

No Cooling / No Heating

Forecast of Cause:

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

Check Point 1 : Check Indoor Unit

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



Check Point 2 : Check Outdoor Unit Operation

- Check if Outdoor Unit is operating
(If not, refer to Trouble shooting 22)
- Check any objects that obstruct the air flow route.
- Check clogged Heat Exchanger.
- Is the Valve open?



Check Point 3 : Check Site Condition

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



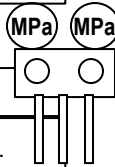
Check Point 4 : Check Indoor/ Outdoor Installation Condition

- Check connection pipe
(specified pipe length & Pipe diameter?)
- Check any loose or removed communication line.
- >> **If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.**



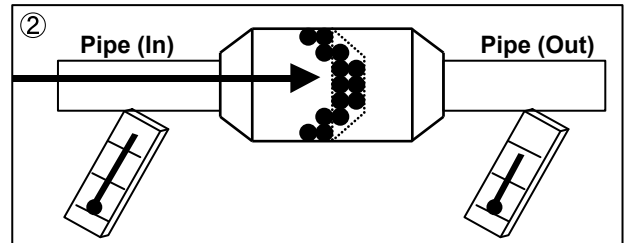
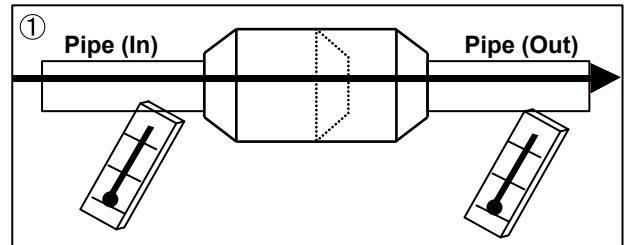
Check Point 5 : Check Refrigeration Cycle

- Check if Strainer is clogged (Refer to the figure at right).
- Measure Gas Pressure and if there is a leakage, correct it.
- >> **When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.**
- Check EEV (PARTS INFORMATION 4)
- Check Compressor (PARTS INFORMATION 1,2)



Attention

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

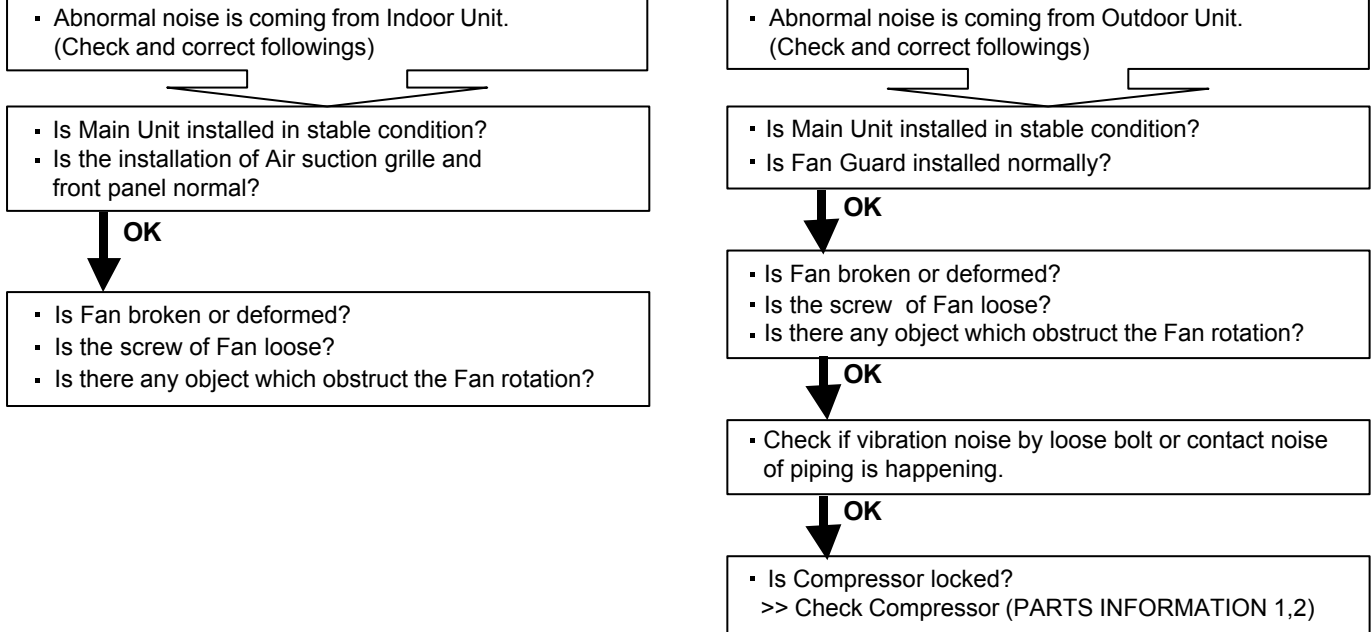


Trouble shooting 24
Abnormal Noise

Forecast of Cause :

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

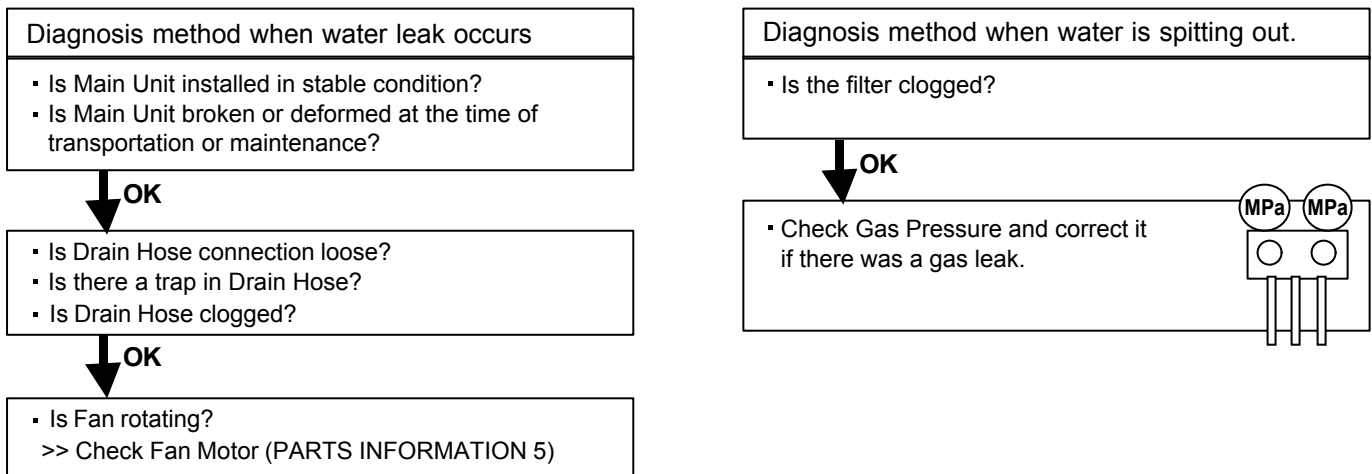
Diagnosis method when Abnormal Noise is occurred



Trouble shooting 25
Water Leaking

Forecast of Cause:

1. Erroneous installation
2. Drain hose failure

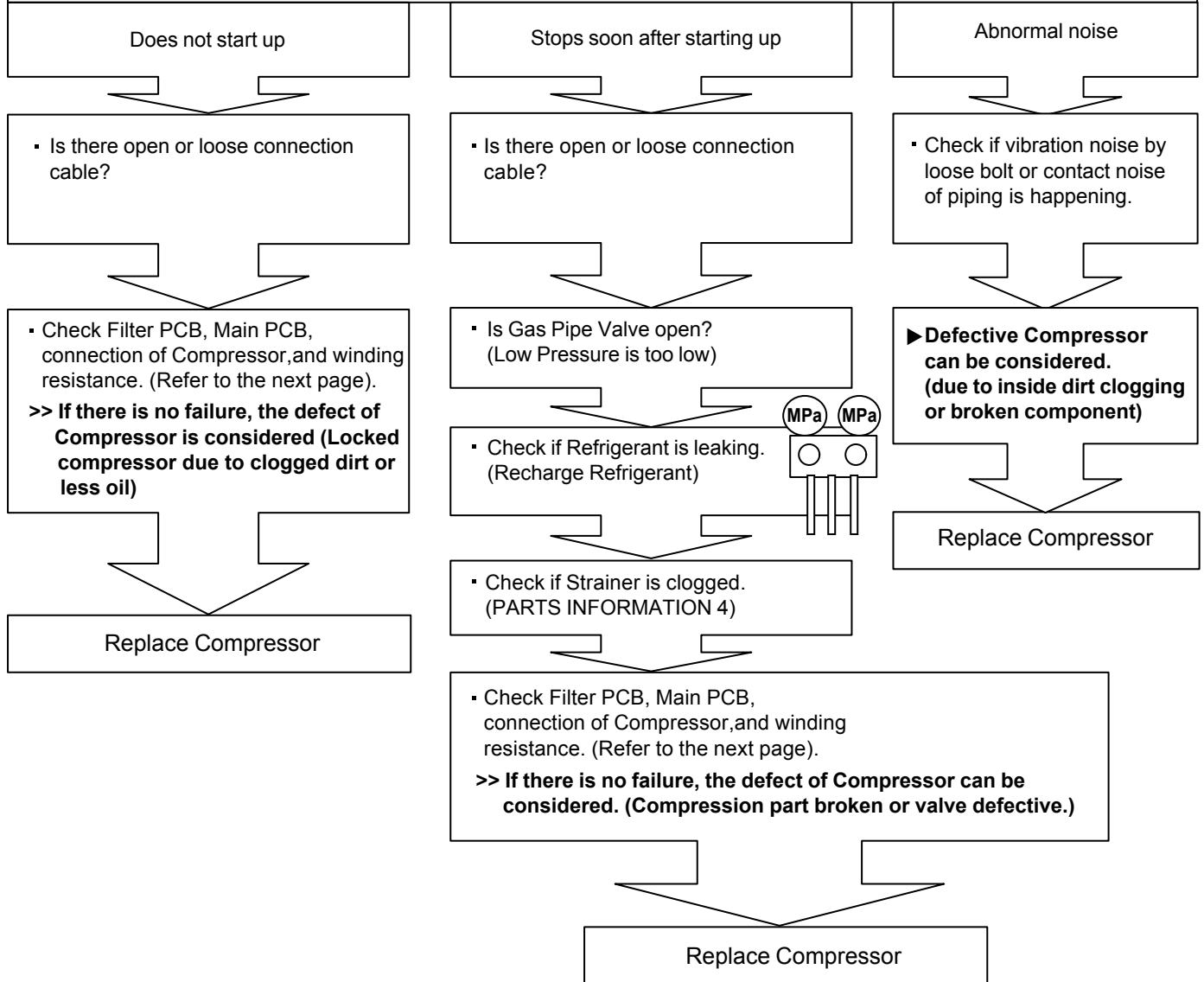


7-4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

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



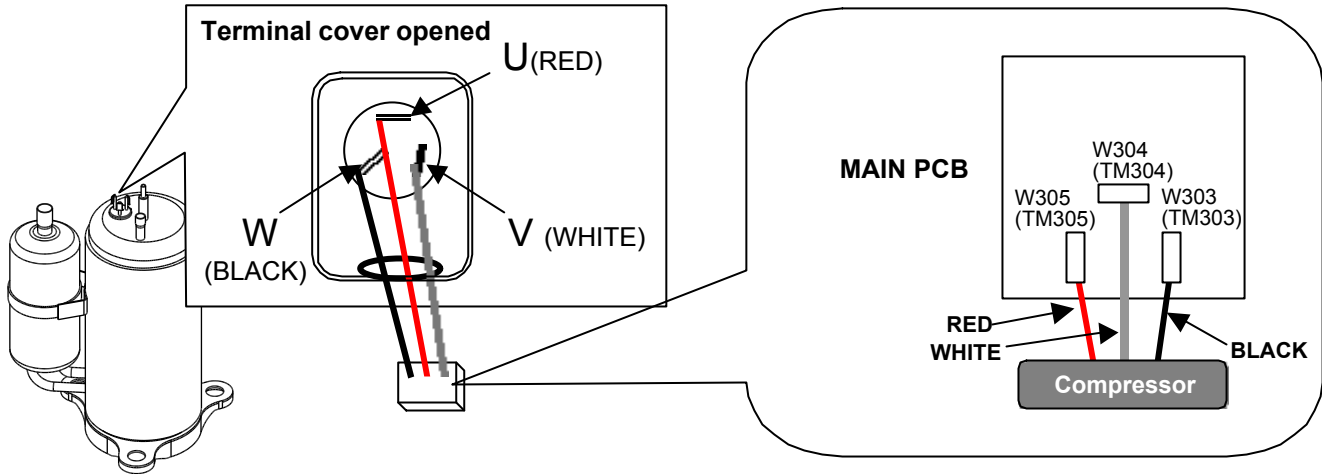
SERVICE PARTS INFORMATION 2

Inverter Compressor

Check Point 1 : Check Connection

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

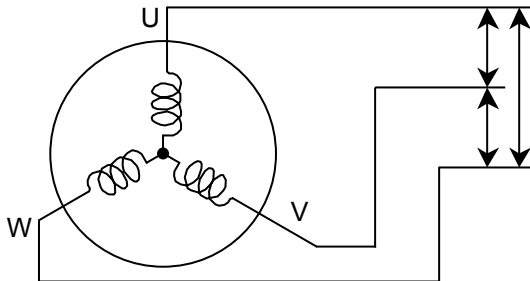
- Check connection of Main PCB (Loose or incorrect wiring)



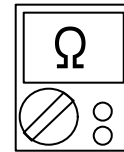
Check Point 2 : Check Winding Resistance

- Check winding resistance of each terminal

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



Resistance Value :
0.88 Ω (For AB*30/ 36LBAG)
0.188 Ω (For AB*45LBAG)
at 20°C



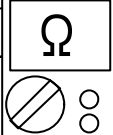
Check Point 3 : Replace Main PCB

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

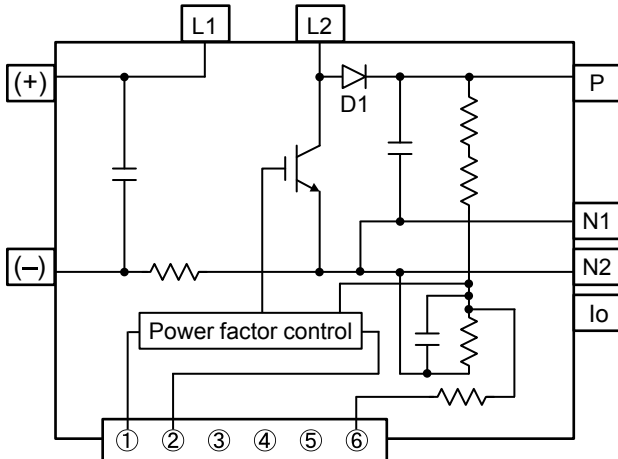
SERVICE PARTS INFORMATION 3

Active Filter Module

Check Point 1 : Check Open or Short-circuit and Diode (D1)



· Remove connector, check the open or short-circuit and the diode in the module



Check the open or short-circuit

Terminal		Resistance value
Tester(+)	Tester(-)	
(+)	(-)	360kΩ ± 20%
(-)	N1	0 Ω
P	(+)	720kΩ ± 20%
L1	L2	1.01MΩ / 761kΩ (Ref. value 1) (Ref. value 2)
P	N1	360kΩ ± 20%
L1,L2	Control Box	∞ Ω
L2	N2	1.65MΩ / 1.14MΩ (Ref. value 1) (Ref. value 2)

Check the diode

Terminal		Resistance value
Tester(+)	Tester(-)	
L2	P	1.32MΩ / 663kΩ (Ref. value 1) (Ref. value 2)
P	L2	1.01MΩ / 762kΩ (Ref. value 1) (Ref. value 2)

Ref. value 1
 Specifications for Multimeter
 Manufacturer : FLUKE
 Model name : FLUKE11
 Power source : DC9V.

Ref. value 2
 Specifications for Multimeter
 Manufacturer : Sanwa
 Model name : PM3
 Power source : DC3V.

► **If it is abnormal,replace ACTIVE FILTER MODULE**

Check Point 2 : Check the Output DC voltage (between P and N1)



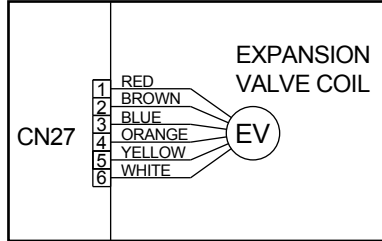
· Check the Output DC voltage (between P and N1) of compressor stopping and operating.
 >> If the output voltage of compressor operating is less than the output voltage of compressor stopping,
 Active Filter Module is defective. >> **Replace Active Filter Module**

SERVICE PARTS INFORMATION 4

Outdoor unit Electronic Expansion Valve (EEV)

Check Point 1 : Check Connections

- Check connection of connector (CN27) (Loose connector or open cable)



Check Point 2 : Check Coil of EEV

- Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	$46 \Omega \pm 4 \Omega$ at 20°C
Yellow - Brown	
Orange - Red	
Blue - Brown	

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

Check Point 3 : Check Voltage from Main PCB.

- Remove Connector and check Voltage (DC12V)

► **If it does not appear, replace Main PCB.**



Check Point 4 : Check Noise at start up

- Turn on Power and check operation noise.

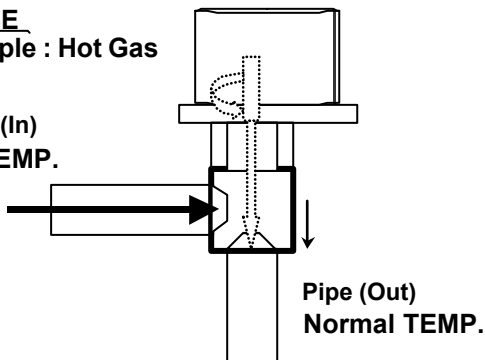
► **If an abnormal noise does not show, replace Main PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

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

CLOSE
Example : Hot Gas

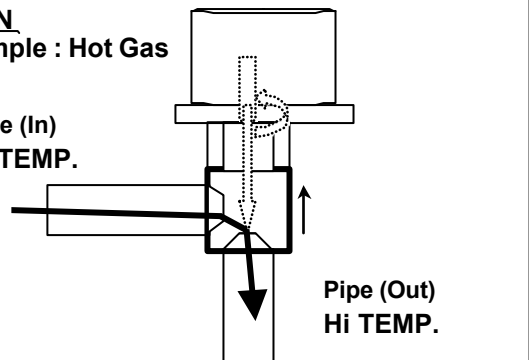
Pipe (In)
Hi TEMP.



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

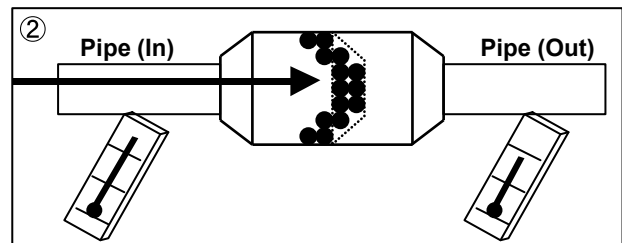
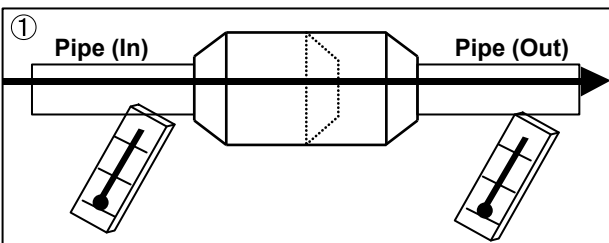
OPEN
Example : Hot Gas

Pipe (In)
Hi TEMP.



Check Point 6 : Check Strainer

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



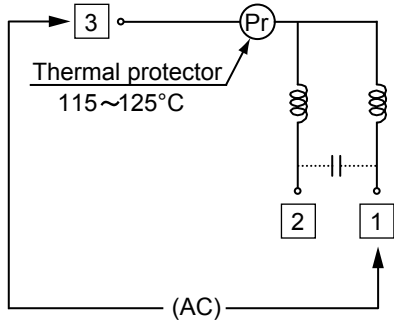
SERVICE PARTS INFORMATION 5

Indoor Unit Fan Motor

Check Point :

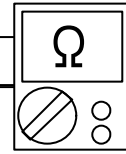
• Check each winding resistance of the motor

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



The connector inserting numbers	Resistance value
1 - 3	22.8 Ω \pm 10%
2 - 3	31.9 Ω \pm 10%

at 20°C



Large Ceiling type **INVERTER**

8 . APPENDING DATA

8. APPENDING DATA

8-1. CAPACITY TABLE

■ MODEL : AB*30/ 36LBAG / AO*30/ 36LMBWL

● COOLING

AFR | 27.7

		Indoor temperature																							
		18 °CDB			21 °CDB			23 °CDB			26 °CDB			27 °CDB			29 °CDB			30 °CDB			32 °CDB		
		12 °CWB			15 °CWB			16 °CWB			18 °CWB			19 °CWB			21 °CWB			22 °CWB			23 °CWB		
Outdoor temperature	(°CDB)	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
	-10	6.53	5.57	1.51	6.95	5.42	1.57	7.09	5.88	1.59	7.35	6.27	1.62	7.48	6.21	1.64	7.73	6.07	1.66	7.84	6.00	1.67	7.95	6.43	1.68
	0	7.19	5.97	1.28	7.82	5.93	1.31	8.02	6.39	1.32	8.44	6.82	1.34	8.65	6.78	1.34	9.08	6.68	1.36	9.28	6.63	1.36	9.49	7.07	1.37
	10	6.43	5.52	1.56	7.01	5.45	1.60	7.19	5.93	1.61	7.56	6.36	1.63	7.75	6.31	1.64	8.11	6.22	1.66	8.29	6.16	1.67	8.46	6.60	1.67
	20	8.13	6.39	1.88	9.04	6.41	1.89	9.36	6.92	1.88	10.01	7.41	1.88	10.35	7.40	1.88	11.04	7.32	1.87	11.39	7.33	1.86	11.73	7.79	1.86
	30	7.02	5.82	2.28	7.87	5.85	2.30	8.15	6.36	2.31	8.74	6.86	2.32	9.05	6.85	2.32	9.67	6.81	2.32	9.99	6.79	2.32	10.29	7.26	2.31
	35	7.72	6.18	3.36	8.68	6.24	3.44	9.01	6.76	3.46	9.65	7.25	3.43	10.00	7.25	3.45	10.73	7.23	3.48	11.03	7.19	3.43	11.40	7.66	3.44
	40	5.97	5.28	3.30	6.74	5.33	3.30	7.01	5.89	3.30	7.56	6.36	3.30	7.85	6.35	3.30	8.35	6.31	3.30	8.65	6.29	3.30	8.94	6.77	3.30
	43	5.41	5.01	3.30	6.14	5.05	3.30	6.39	5.58	3.30	6.90	6.09	3.30	7.17	6.08	3.30	7.64	6.04	3.30	7.92	6.03	3.30	8.19	6.51	3.30

● HEATING

AFR | 27.7

		Indoor temperature														
		16 °CDB		18 °CDB		20 °CDB		23 °CDB		25 °CDB		27 °CDB		30 °CDB		
		(°CDB)	(°CWB)	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
Outdoor temperature	-10	-11	5.83	2.44	5.72	2.49	5.58	2.54	5.35	2.64	5.20	2.70	5.05	2.76	4.81	2.85
	-4	-6	6.74	2.57	6.63	2.63	6.51	2.68	6.27	2.78	6.11	2.84	5.94	2.91	5.69	3.01
	1	-1	7.77	2.69	7.66	2.75	7.53	2.81	7.26	2.91	7.08	2.99	6.89	3.06	6.61	3.17
	7	6	11.55	3.35	11.39	3.43	11.20	3.50	10.79	3.64	10.52	3.73	10.24	3.83	9.79	3.97
	12	10	12.60	3.45	12.41	3.53	12.21	3.61	11.77	3.76	11.46	3.85	11.13	3.95	10.63	4.10
	18	13	13.08	3.40	12.76	3.42	12.44	3.43	11.83	3.39	11.42	3.41	11.01	3.43	10.35	3.42
	20	15	11.90	2.94	11.66	2.96	11.40	2.97	10.93	2.96	10.63	2.96	10.20	2.92	9.56	2.91
	24	17	12.38	2.98	12.02	2.94	11.75	2.95	11.26	2.94	10.96	2.94	10.62	2.95	9.45	2.94

AFR: Air flow rate (m³/min) SHC: Sensible Heat capacity (kW)
 TC : Total capacity (kW) PI : Power Input (kW)

■ MODEL : AB*45LBAG / AO*45LJBYL

● COOLING

AFR | 33.3

		Indoor temperature																							
		18 °CDB			21 °CDB			23 °CDB			26 °CDB			27 °CDB			29 °CDB			30 °CDB			32 °CDB		
		12 °CWB			15 °CWB			16 °CWB			18 °CWB			19 °CWB			21 °CWB			22 °CWB			23 °CWB		
Outdoor temperature	(°CDB)	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI	TC	SHC	PI
	-15	10.06	8.70	2.04	10.59	9.45	2.06	11.13	10.24	2.08	12.07	11.58	2.11	12.55	11.61	2.13	13.50	11.65	2.17	13.99	11.67	2.19	14.49	12.59	2.20
	-10	12.00	9.50	2.43	12.64	10.33	2.45	12.97	11.25	2.46	13.63	12.06	2.49	13.95	11.97	2.51	14.57	11.75	2.53	14.86	11.61	2.54	15.12	12.39	2.55
	0	11.01	8.66	3.02	11.59	9.41	3.05	11.86	10.31	3.07	12.42	11.10	3.11	12.69	11.00	3.13	13.23	10.81	3.15	13.48	10.71	3.16	13.73	11.53	3.17
	10	10.47	8.42	3.33	11.02	9.16	3.36	11.30	10.06	3.38	11.85	10.87	3.42	12.13	10.79	3.43	12.66	10.60	3.46	12.94	10.52	3.48	13.19	11.35	3.49
	20	12.61	9.37	3.51	13.27	10.18	3.53	13.69	11.13	3.53	14.54	12.03	3.52	14.99	11.99	3.52	15.91	11.94	3.50	16.33	11.89	3.48	16.78	12.76	3.47
	30	11.13	8.71	4.23	11.71	9.47	4.24	12.12	10.42	4.25	12.95	11.32	4.26	13.37	11.28	4.27	14.23	11.18	4.27	14.66	11.13	4.27	15.06	11.99	4.27
	35	11.10	8.70	5.13	11.68	9.46	5.13	12.09	10.41	5.16	12.86	11.29	5.13	14.00	11.25	5.15	14.02	11.40	5.18	14.43	11.04	5.13	14.82	11.91	5.15
	40	9.61	7.92	5.00	10.12	8.60	5.00	10.37	9.48	5.00	10.97	10.31	5.00	11.34	10.32	5.00	12.55	10.23	5.00	12.29	10.22	5.00	12.63	11.08	5.00
	43	8.82	7.57	5.00	9.28	8.23	5.00	9.62	9.16	5.00	10.26	10.01	5.00	10.63	9.98	5.00	11.18	9.85	5.00	11.51	9.80	5.00	11.84	10.64	5.00

● HEATING

AFR | 33.3

		Indoor temperature														
		16 °CDB		18 °CDB		20 °CDB		23 °CDB		25 °CDB		27 °CDB		30 °CDB		
		(°CDB)	(°CWB)	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	TC	PI	
Outdoor temperature	-15	-16	8.53	3.78	8.35	3.84	8.24	4.14	7.86	4.14	7.75	4.60	7.45	4.60	7.07	4.60
	-10	-11	10.50	4.20	10.28	4.27	10.03	4.34	9.68	4.46	9.55	4.60	9.17	4.60	8.71	4.60
	-4	-6	12.45	4.38	12.18	4.47	11.91	4.54	11.42	4.60	11.06	4.60	10.71	4.60	10.12	4.60
	1	-1	14.35	4.60	13.97	4.60	13.59	4.60	12.94	4.60	12.45	4.60	12.04	4.60	11.36	4.60
	7	6	16.74	4.60	16.24	4.60	16.00	4.60	15.12	4.60	14.50	4.60	13.85	4.60	12.99	4.60
	12	10	17.66	4.60	17.13	4.60	16.59	4.60	15.89	4.60	15.22	4.60	14.68	4.60	13.73	4.60
	18	13	18.47	4.60	18.08	4.60	17.52	4.60	16.70	4.60	16.15	4.60	15.52	4.60	14.48	4.60
	20	15	18.20	4.60	17.71	4.60	17.33	4.60	16.53	4.60	15.82	4.60	15.28	4.60	14.32	4.60
24	17	17.50	4.60	17.01	4.60	16.62	4.60	15.82	4.60	15.11	4.60	14.61	4.60	13.62	4.60	

AFR: Air flow rate (m³/min) SHC: Sensible Heat capacity (kW)
 TC : Total capacity (kW) PI : Power Input (kW)

8-2. OPERATION RANGE

■ MODEL : AB*30/ 36LBAG / AO*30/ 36LMBWL

Mode	Operation Range		
	Indoor temperature	Indoor humidity	Outdoor temperature
Cooling Dry	18 to 32°C	About 80% or less	-10 to 43°C
Heating	16 to 30°C	–	-10 to 24°C

■ MODEL : AB*45LBAG / AO*45LJBYL

Mode	Operation Range		
	Indoor temperature	Indoor humidity	Outdoor temperature
Cooling Dry	18 to 32°C	About 80% or less	-15 to 43°C
Heating	16 to 30°C	–	-15 to 24°C

8-3. ELECTRIC CHARACTERISTICS

Model Name	Indoor unit		AB * 30LBAG		AB * 36LBAG	
	Outdoor unit		AO * 30LMBWL		AO * 36LMBWL	
Power Supply	Voltage	V	230 ~		230 ~	
	Frequency	Hz	50		50	
Rated Value	Mode		Cooling	Heating	Cooling	Heating
	Current	A	13.1	12.7	18.0	14.2
	Input	kW	3.00	2.90	4.12	3.26
Max Operating Current		A	15.2	15.3	18.3	18.1
Starting Current		A	10		10	
*1) Wiring Spec	Main Fuse (Circuit breaker) Current		A		30	
	Power Cable		mm ²		3.5	
	*2)Limited wiring length		m		23	
Indoor Fan Motor	Input		kW		0.22	
	Full Load Amp.		A		1.0	
Outdoor Fan Motor	Input		kW		0.13	
	Full Load Amp.		A		0.6	

Model Name	Indoor unit		AB * 45LBAG	
	Outdoor unit		AO * 45LJBYL	
Power Supply	Voltage	V	230 ~	
	Frequency	Hz	50	
Rated Value	Mode		Cooling	Heating
	Current	A	19.5	18.5
	Input	kW	4.45	4.25
Max Operating Current		A	22.6	20.0
Starting Current		A	15	
*1) Wiring Spec	Main Fuse (Circuit breaker) Current		A	
	Power Cable		mm ²	
	*2)Limited wiring length		m	
Indoor Fan Motor	Input		kW	
	Full Load Amp.		A	
Outdoor Fan Motor	Input		kW	
	Full Load Amp.		A	

*1) Wiring Spec : Selected Sample (Selected based on Japan Electrotechnical Standard and Codes Committee E0005)

*2) Limited Wiring length : This is the wiring length in case voltage descent is less than 2%.
When the wiring length becomes long, please select the wiring of a more larger diameter.

8-4. SAFETY DEVICE

■ OUTDOOR UNIT

	PROTECTION FORM	AO*30LMBWL	AO*36LMBWL
FUSE (SIDE OF POWER SUPPLY TERMINAL)	-	25A 250V	25A 250V
FUSE (SIDE OF INDOOR UNIT)	-	10A 250V	10A 250V
FUSE ON MAIN PCB	-	3.15A 250V	3.15A 250V
	-	5A 250V	5A 250V
FAN MOTOR PROTECTOR	THERMAL PROTECTOR	150±5°C OFF	150±5°C OFF
HIGH PRESSURE PROTECTION	PRESSURE SWITCH	OFF:4.2±0.1MPa ON:3.2±0.15MPa	OFF:4.2±0.1MPa ON:3.2±0.15MPa
DISCHARGE THERMISTOR	THERMAL PROTECTOR	OFF:120±5°C ON:80±5°C	OFF:120±5°C ON:80±5°C
COMPRESSOR THERMISTOR	THERMAL PROTECTOR	OFF:130±5°C ON:80±5°C	OFF:130±5°C ON:80±5°C

	PROTECTION FORM	AO*45LJBYL
FUSE (SIDE OF INDOOR UNIT TERMINAL)	-	10A 250V
FUSE ON MAIN PCB	-	3.15A 250V
	-	5A 250V
FAN MOTOR PROTECTOR	THERMAL PROTECTOR	150±5°C OFF
HIGH PRESSURE PROTECTION	PRESSURE SWITCH	OFF:4.2±0.1MPa ON:3.2±0.15MPa
DISCHARGE THERMISTOR	THERMAL PROTECTOR	OFF:120±5°C ON:80±5°C
COMPRESSOR THERMISTOR	THERMAL PROTECTOR	OFF:130±5°C ON:80±5°C

■ INDOOR UNIT

	PROTECTION FORM	AB*30LBAG	AB*36LBAG
PCB FUSE	-	3.15A 250V	
FAN MOTOR PROTECTION	THERMAL PROTECTOR	120±5°C OFF	

	PROTECTION FORM	AB*45LBAG
PCB FUSE	-	3.15A 250V
FAN MOTOR PROTECTION	THERMAL PROTECTOR	120±5°C OFF

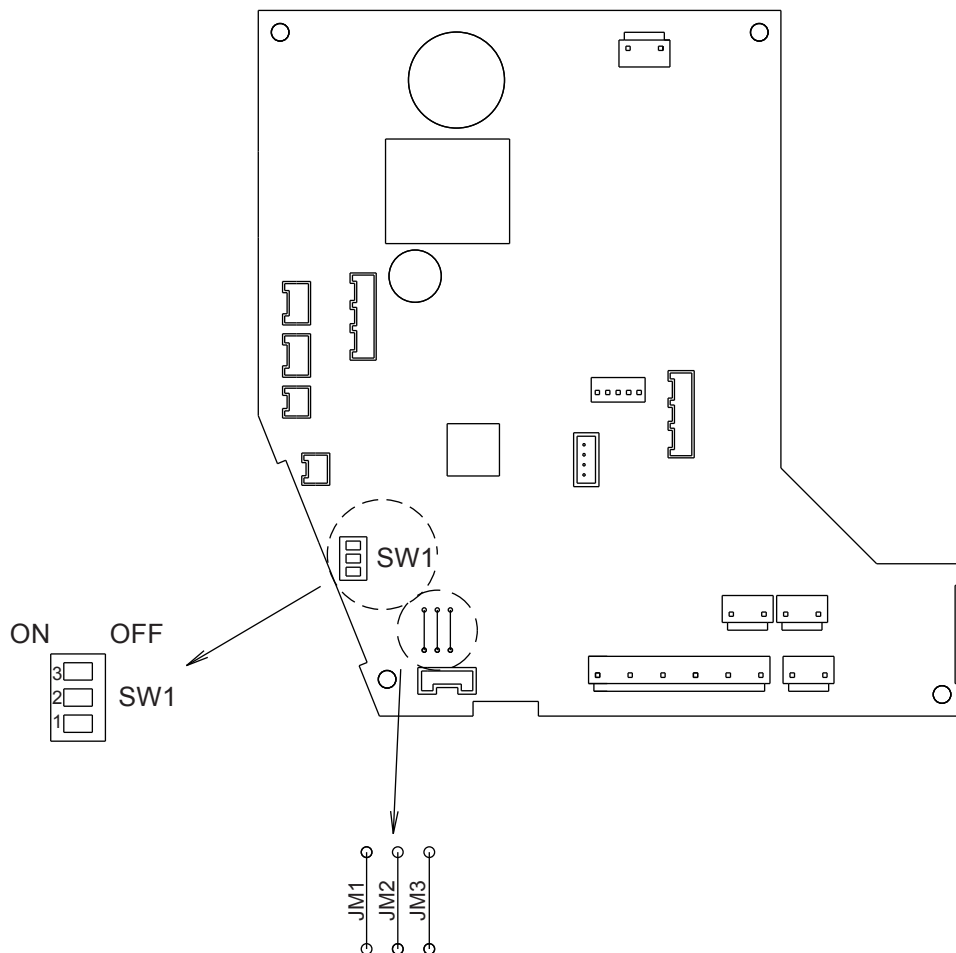
8-5. FUNCTION SETTING

8-5-1 INDOOR UNIT

INDOOR UNIT			
DIP SW	SW1	1	Auto restart validity / invalidity
		2	Room temperature correct coefficient
		3	Room temperature correct coefficient
Jumper Wire	JM1	Forbidden	
	JM2	Remote control unit signal code	
	JM3		

■ SWITCH POSITION

● Indoor unit control circuit board



■ DIP SWITCH SETTING

● SW1-1. Auto restart setting

Auto restart function can be selected by turning this switch ON/OFF.

AUTO RESTART SETTING (◆ . . . Factory setting)

SW 1-1	SW state
OFF	Invalidity
◆ ON	Validity

● SW1-2, 1-3. Room temperature correct coefficient of heating.

Decide the heating temperature correct coefficient vale of heating.

TEMPERATURE CORRECTION (◆ . . . Factory setting)

SW 1-2	SW 1-3	SW state		
		heating	dry	cooling
OFF	OFF	+2 deg	-2 deg	-2 deg
ON	OFF	-2 deg	-2 deg	-2 deg
OFF	ON	0 deg	0 deg	0 deg
◆ ON	ON	+4 deg	0 deg	0 deg

■ JUMPER WIRE SETTING

JM 1, 2, 3 setting forbidden

(◆ . . . Factory setting)

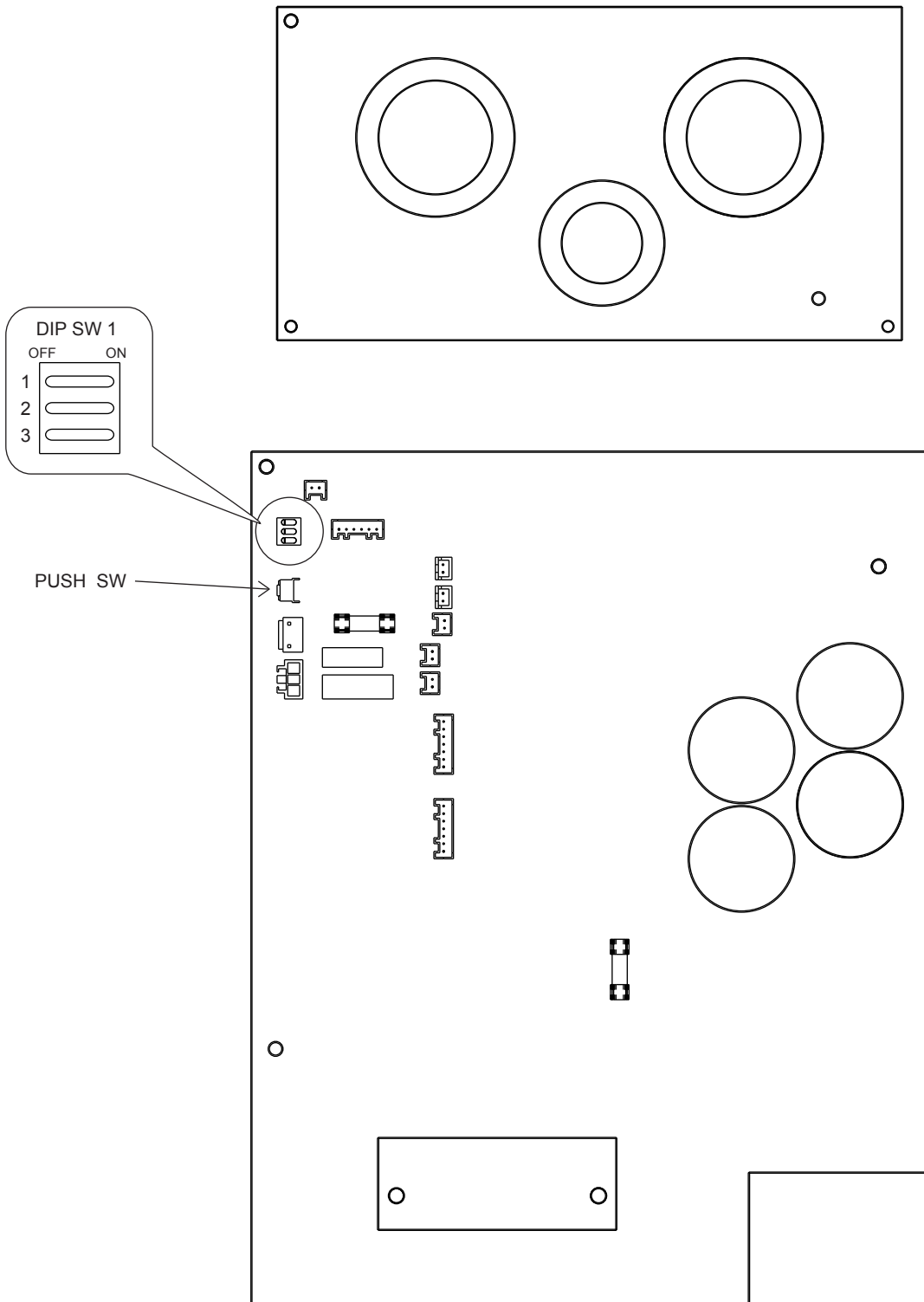
Jumper wire		Remote control unit signal code
JM2	JM3	
◆ connect	connect	A
connect	Disconnect	B
Disconnect	connect	C
Disconnect	Disconnect	D

8-5-2 OUTDOOR UNIT (AO*30/ 36LMBWL)

OUTDOOR UNIT		
DIP SW 1	1	Change current capacity
	2	
	3	No use (OFF)
PUSH SW		Pump down switch

■ SWITCH POSITION

● Outdoor unit control circuit board



■ DIP SWITCH SETTING

● Current capacity setting

DIP-SW1			CURRENT (MAX.)
1	2	3	
OFF	OFF	OFF	18.0A *1
ON	OFF	OFF	15.0A *2
OFF	ON	OFF	13.5A
ON	ON	OFF	12.0A

*1=36000BTU model's factory setting (AO*36LMBWL)

*2=30000BTU model's factory setting (AO*30LMBWL)

■ PUSH SWITCH SETTING

● SW2 setting

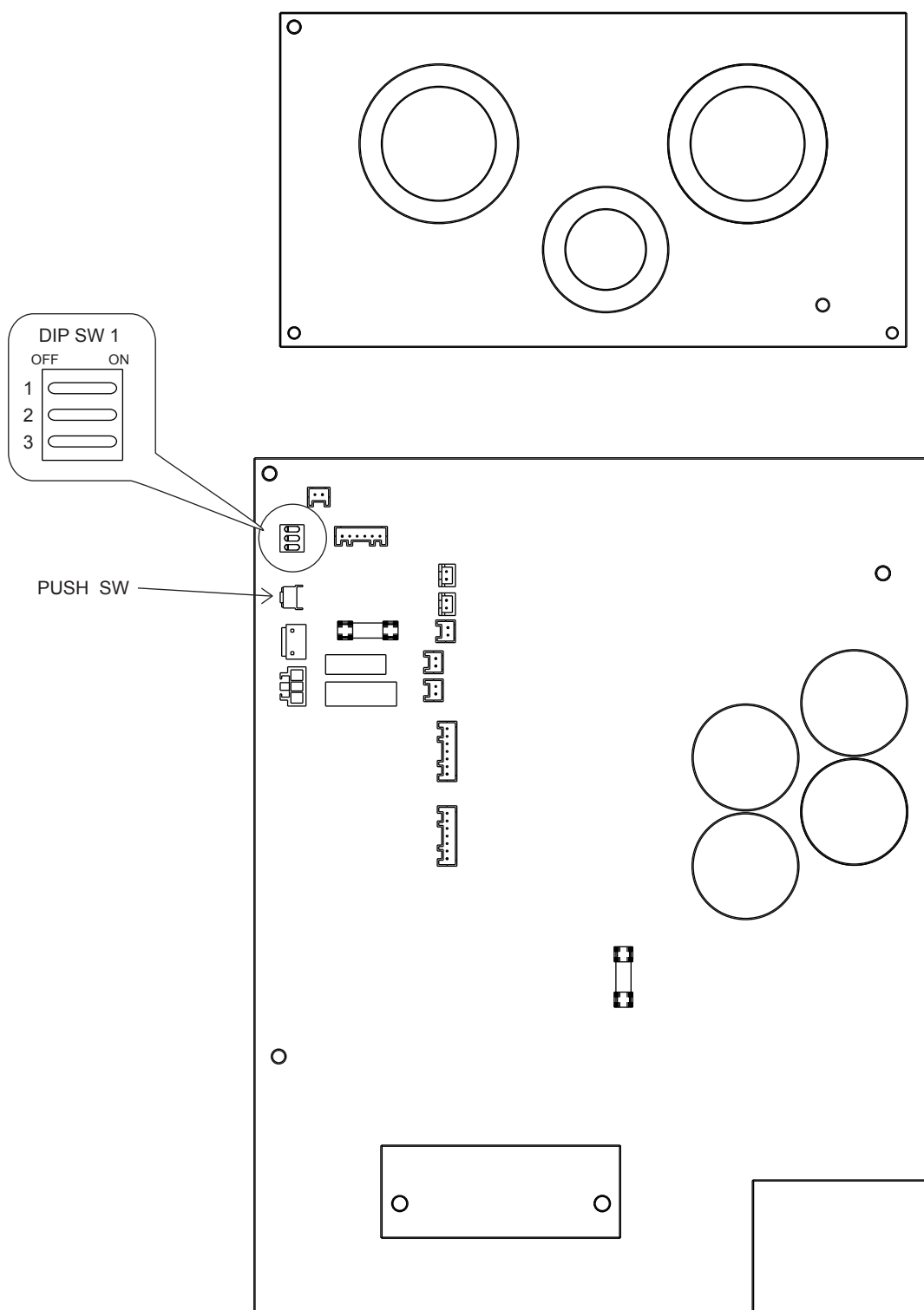
Press the push-button switch, and "PUMP DOWN OPERATION" is starting.

8-5-3 OUTDOOR UNIT (AO*45LJBYL)

OUTDOOR UNIT		
DIP SW 1	1	Change current capacity
	2	
	3	No use (OFF)
PUSH SW		Pump down switch

■ SWITCH POSITION

● Outdoor unit control circuit board



■ DIP SWITCH SETTING

● Current capacity setting

DIP-SW1			CURRENT (MAX.)
1	2	3	
OFF	OFF	OFF	23.5A *1
ON	OFF	OFF	20.0A *2
OFF	ON	OFF	18.0A
ON	ON	OFF	15.5A

*1=54000BTU model's factory setting

*2=45000BTU model's factory setting (AO*45LJBYL)

■ PUSH SWITCH SETTING

● SW2 setting

Press the push-button switch, and "PUMP DOWN OPERATION" is starting.

Large Ceiling type **INVERTER**

9 . INSTALLATION MANUAL

Refrigerant R410A Ceiling Suspension Type SPLIT TYPE AIR CONDITIONER INSTALLATION INSTRUCTION SHEET

(PART NO. 9366160052)

For authorized service personnel only.

WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models. However, pay careful attention to the following points:

- Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.
- Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]
- Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.
- When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.
- When moving, if the compressor stops during pump down, close the valve immediately.

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals -0.1 to 5.3 MPa (-76 cmHg to 53 kgf/cm ²) for high pressure. -0.1 to 3.8 MPa (-76 cmHg to 38 kgf/cm ²) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants. As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials. Thicknesses of copper pipes used with R410A are as shown in the table. Never use copper pipes thinner than that in the table even when it is available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in.)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in.)	1.00 mm
19.05 mm (3/4 in.)	1.20 mm

STANDARD PARTS

The following installation parts are furnished. Use them as required.

INDOOR UNIT ACCESSORIES

Name and Shape	Q'ty	Application
Remote control unit	1	Use for air conditioner operation
Battery (penlight)	2	For remote control unit
Remote control unit holder	1	For mounting the remote control unit
Tagging screw (ø3 × 12)	2	For remote control unit holder installation
Drain hose insulation	1	Adhesive type 70 × 230
VT wire	1	For fixing the drain hose L 280 mm
Coupler heat insulator (large)	2	For indoor side pipe joint (Gas pipe)
Coupler heat insulator (small)	1	For indoor side pipe joint (Liquid pipe)
Nylon fastener	Large 4 Small 4	For fixing the coupler heat insulator
Special nut A (large flange)	4	For installing indoor unit
Special nut B (small flange)	4	For installing indoor unit
Installation template	1	For positioning the indoor unit
Auxiliary pipe assembly	1	For connecting the piping

OPTIONAL PARTS

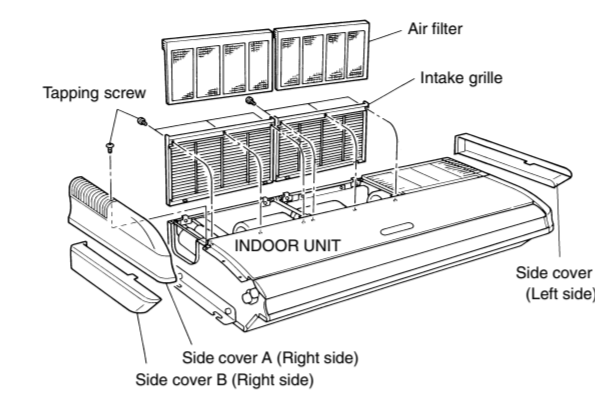
The following options are available.
• DRAIN PUMP UNIT: UTR-DPB241 (P/N 9034087001)

INSTALLATION PROCEDURE

1 PREPARING INDOOR UNIT INSTALLATION

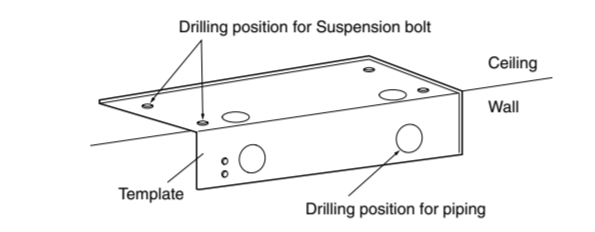
REMOVE THE INTAKE GRILLE AND SIDE COVER

- Remove the two Air filters.
- Remove the two intake grilles.
• For ② Left rear drain and ③ Left drain: Remove air filters and intake grilles at three places. (Refer to "INDOOR UNIT INSTALLATION".)
• For ② Left drain: Remove both the Side cover A (Right and Left side). (Refer to "INDOOR UNIT INSTALLATION".)
• For ③ Left drain: Remove both the Side cover A (Right and Left side). (Refer to "INDOOR UNIT INSTALLATION".)
- Remove the Side cover A (Right side) and Side cover B (Right and Left side).
• For ② Left drain: Remove both the Side cover A (Right and Left side). (Refer to "INDOOR UNIT INSTALLATION".)
• For ③ Left drain: Remove both the Side cover A (Right and Left side). (Refer to "INDOOR UNIT INSTALLATION".)
- This air conditioner can be set up to intake fresh air. For information about how to install for fresh-air intake, refer to "FRESH-AIR INTAKE".

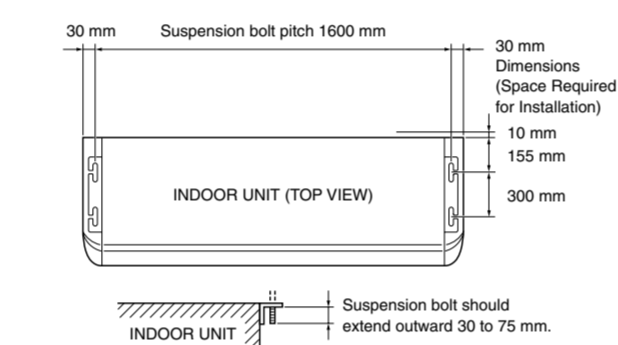


2 INDOOR UNIT INSTALLATION

You can use the accessory template to help you install the indoor unit. The template helps you determine the appropriate locations for suspension bolts and pipe opening (drain pipe and connection cord).

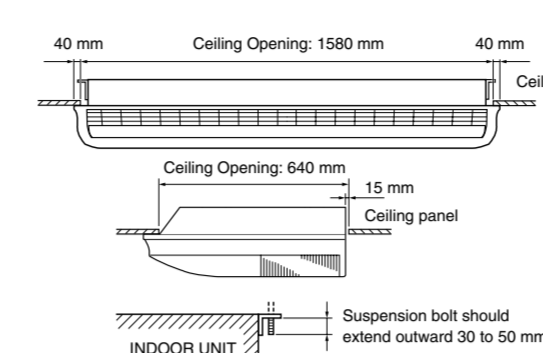


1. LOCATION OF CEILING SUSPENSION BOLTS



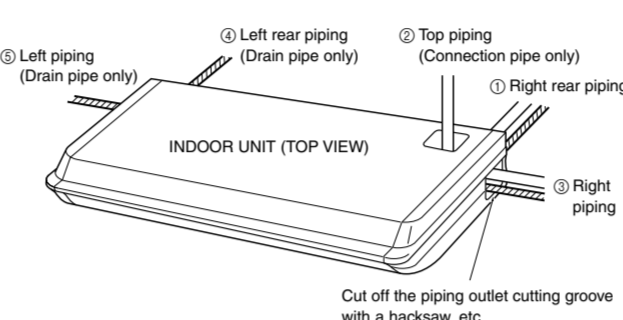
[For Half-Concealed Installation]

- Suspension-bolt pitch should be as shown in the figure.



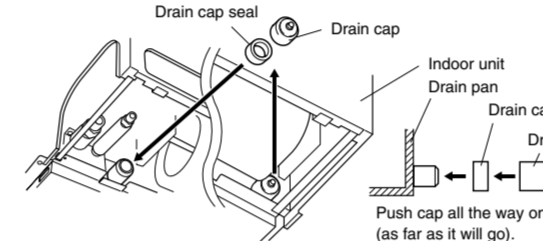
2. SELECT PIPING DIRECTION

Select connection piping and drain piping directions.



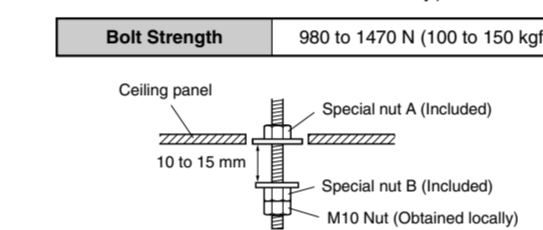
[FOR ② Left rear piping, ③ Left piping]

- Transfer the Drain cap and Drain cap seal.



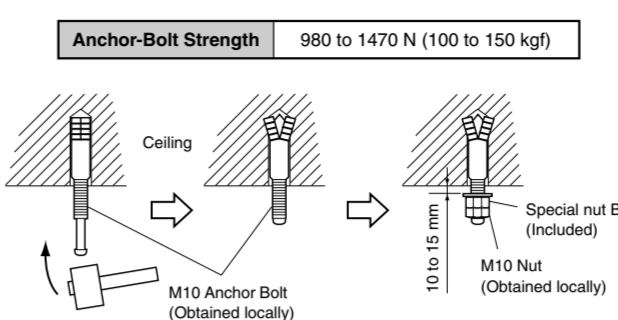
3. DRILLING THE HOLES AND ATTACHING THE SUSPENSION BOLTS

- Drill ø25 mm holes at the suspension-bolt locations.
- Install the bolts, then temporarily attach Special nuts A and B and a normal M10 nut to each bolt. (The two special nuts are provided with the unit. The M10 nut must be obtained locally.) Refer to the figure.



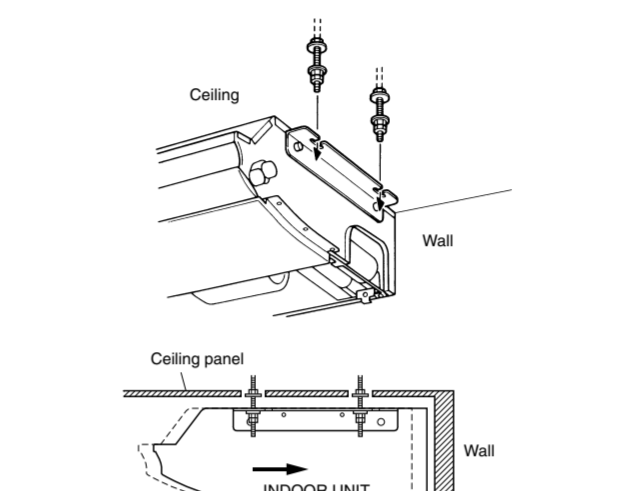
[If using anchor bolts]

- Drill holes for anchor bolts at the locations at which you will set the suspension bolts. Note that anchor bolts are M10 bolts (to be obtained locally).
- Install the anchor bolts, then temporarily attach special nut "B" (included) and a locally-procured M10 nut to each of the bolts.



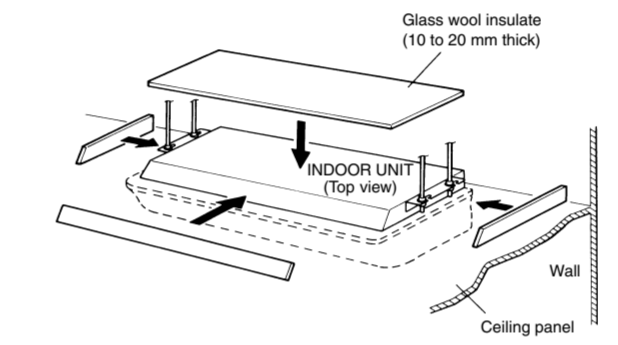
4. INSTALLING THE INDOOR UNIT

- Lift unit so that suspension bolts pass through the suspension fittings at the sides (four places), and slide the unit back.



[For Half-Concealed Installation]

When installing the indoor unit in a semi-concealed installation, make sure to reinforce the insulation of the unit on all sides. Drops of water may fall from the unit if it is not thoroughly insulated.



CAUTION
In order to check the drainage, be sure to use a level during installation of the indoor unit. If the installation site of the indoor unit is not level, water leakage may occur.

CONNECTION PIPE REQUIREMENT

CAUTION
The maximum lengths of this product are shown in the following table. If the units are further apart than this, correct operation cannot be guaranteed.

Diameter	
Liquid	Gas
9.52 mm (3/8 in.)	15.88 mm (5/8 in.)

- Use pipe with water-resistant heat insulation.

CAUTION
Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks. Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only)
In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker.
If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

ELECTRICAL REQUIREMENT

- Electric wire size:

Connection cord (mm ²)	
MAX.	MIN.
2.5	1.0
- Always use H07RN-F or equivalent to the connection cord.
- Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units. (Both indoor unit and outdoor unit)

SELECTING THE MOUNTING POSITION

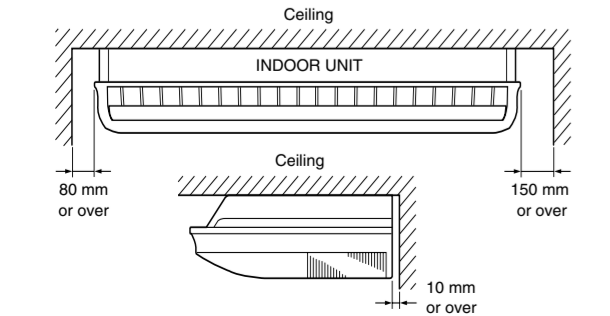
Decide the mounting position with the customer as follows:

WARNING
Select installation locations that can properly support the weight of the indoor and outdoor units. Install the units securely so that they do not topple or fall.

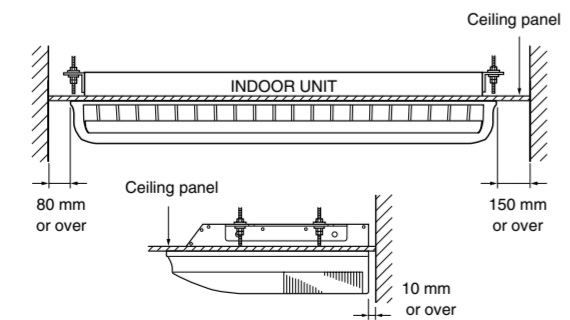
- CAUTION**
Do not install where there is the danger of combustible gas leakage.
- Do not install the unit near heat source of heat, steam, or flammable gas.
- If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

INDOOR UNIT

- Install the indoor unit level on a strong wall which is not subject to vibration.
- The inlet and outlet ports should not be obstructed: the air should be able to blow all over the room.
- Do not install the unit where it will be exposed to direct sunlight.
- Install the unit where connection to the outdoor unit is easy.
- Install the unit where the drain pipe can be easily installed.
- Take servicing, etc., into consideration and leave the spaces shown in the figure. Also install the unit where the filter can be removed.



[FOR HALF CONCEALED INSTALLATION]



2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them. Do not bend the pipes in an angle more than 90°. When pipes are repeatedly bend or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.

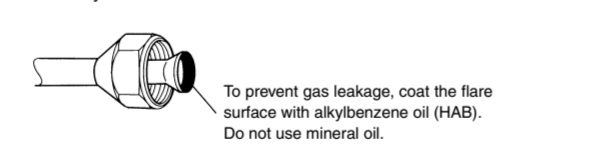
- CAUTION**
To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.
- If the pipe is bent repeatedly at the same place, it will break.

3. CONNECTION PIPES

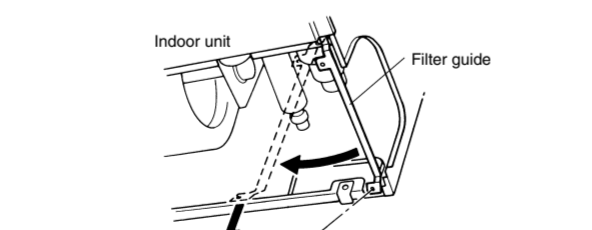
- Detach the caps and plugs from the pipes.

- CAUTION**
Be sure to apply the pipe against the port on the indoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.
- Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.

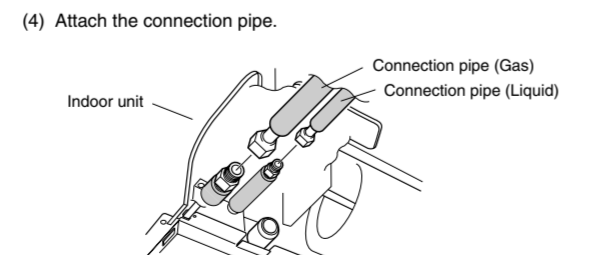
- Centering the pipe against port on the indoor unit, turn the flare nut with your hand.



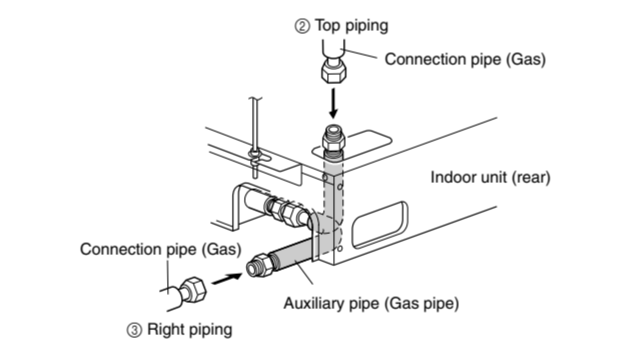
- Remove the filter guide.



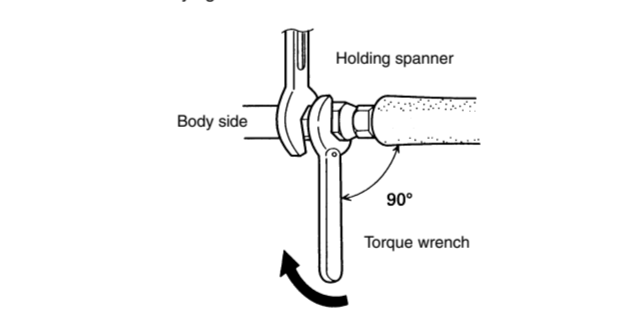
- Attach the connection pipe.



- For ② Top piping and ③ Right piping connections, use the Auxiliary pipe (Gas pipe) provided.



- When the flare nut is tightened properly by your hand, use a torque wrench to finally tighten it.



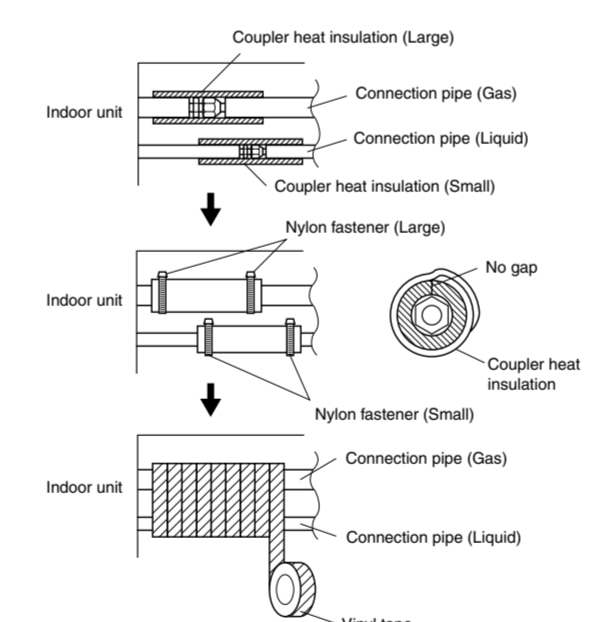
CAUTION
Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.

Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	14 to 18 N·m (140 to 180 kgf·cm)
9.52 mm (3/8 in.) dia.	33 to 42 N·m (330 to 420 kgf·cm)
12.70 mm (1/2 in.) dia.	50 to 62 N·m (500 to 620 kgf·cm)
15.88 mm (5/8 in.) dia.	63 to 77 N·m (630 to 770 kgf·cm)
19.05 mm (3/4 in.) dia.	100 to 110 N·m (1000 to 1100 kgf·cm)

4. HEAT INSULATION ON THE PIPE JOINTS (INDOOR SIDE ONLY)

After checking for gas leaks, insulate by wrapping insulation around the two parts (Gas and Liquid) of the indoor unit coupling, using the coupler heat insulation.

After installing the coupler heat insulation, wrap both ends with vinyl tape so that there is no gap. Secure both ends of the heat insulation material using nylon fasteners. And finally fix connection pipe (Liquid) to connection pipe (Gas) by rolling vinyl tape over coupler heat insulation (Gas) and coupler heat insulation (Liquid).



- When using an auxiliary pipe, make sure that the fastener used is insulated in the same way.

CAUTION
There should be no gaps between the insulation and the product.

4 ELECTRICAL WIRING

1. CONNECTION DIAGRAMS

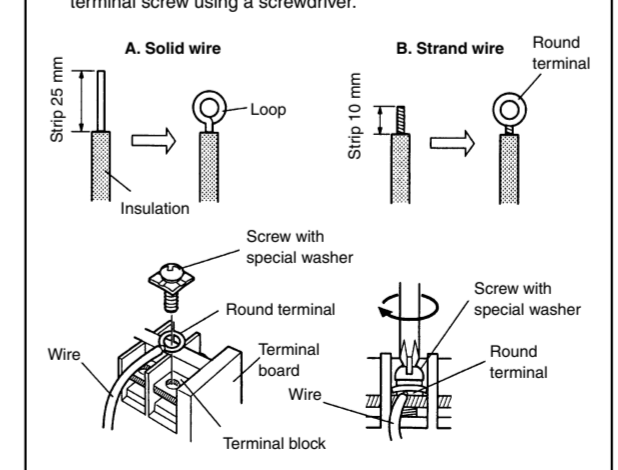
WARNING
Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.

- Match the terminal board numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.
- Connect the connection cords firmly to the terminal board. Imperfect installation may cause a fire.
- Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)
- Always connect the ground wire.

HOW TO CONNECT WIRING TO THE TERMINALS

- A. For solid core wiring (or F-cable)**
(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm to expose the solid wire.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
(4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

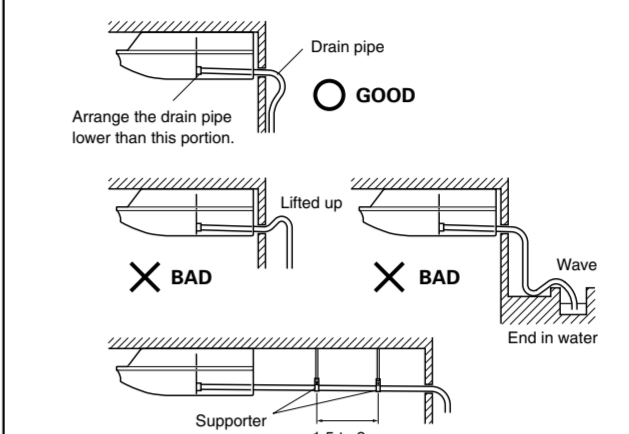
- B. For strand wiring**
(1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to each stripped wire end.
(2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
(3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
(4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.



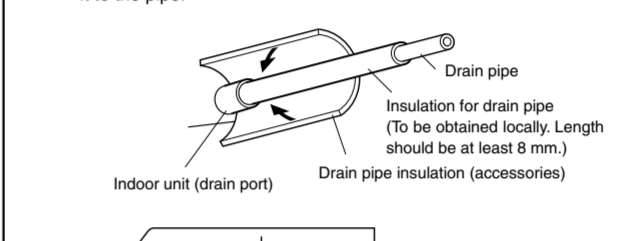
5. DRAIN PIPING

CAUTION
Install the drain pipe in accordance with the instructions in this installation instruction sheet and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.

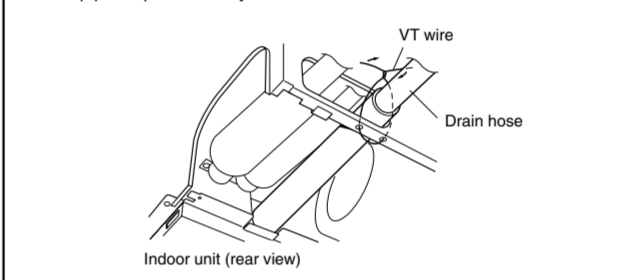
- Install the drain pipe with downward gradient (1/50 to 1/100) and so there are no rises or traps in the pipe.
- Use general hard polyvinyl chloride pipe (VP25) [outside diameter 38 mm].
- During installation of the drain pipe, be careful to avoid applying pressure to the drain port of the indoor unit.
- When the pipe is long, install supporters.
- Do not perform air bleeding.
- Always heat insulate (8 mm or over thick) the indoor side of the drain pipe.



- Install insulation for the drain pipe. Cut the included insulation material to an appropriate size and adhere it to the pipe.



- If "Right rear piping": fasten the drain pipe with VT wire so that the pipe slopes correctly within the indoor unit.



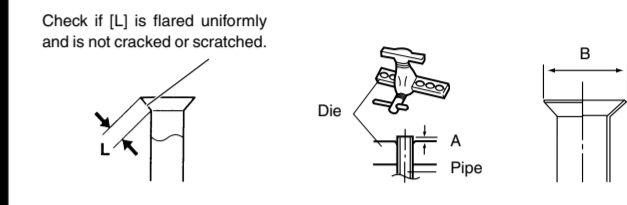
CAUTION
In order to check the drainage, be sure to use a level during installation of the indoor unit. If the installation site of the indoor unit is not level, water leakage may occur.

3 CONNECTING THE PIPE

CAUTION
Do not use mineral oil on flare part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.
While welding the pipes, be sure to blow dry nitrogen gas through them.
The maximum lengths of this product are shown in the table. If the units are further apart than this, correct operation cannot be guaranteed.

1. FLARING

- Cut the connection pipe to the necessary length with a pipe cutter.
- Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
- Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool. Use the special R410A flare tool, or the conventional flare tool.



Pipe outside diameter	Dimension A (mm)
6.35 mm (1/4 in.)	Flare tool for R410A, clutch type
9.52 mm (3/8 in.)	0 to 0.5
12.70 mm (1/2 in.)	
15.88 mm (5/8 in.)	
19.05 mm (3/4 in.)	

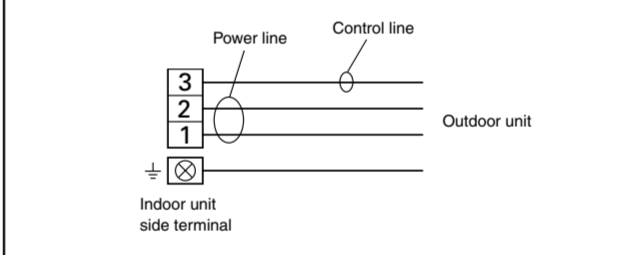
Pipe outside diameter	Dimension B (mm)
6.35 mm (1/4 in.)	9.1
9.52 mm (3/8 in.)	13.2
12.70 mm (1/2 in.)	16.6
15.88 mm (5/8 in.)	19.7
19.05 mm (3/4 in.)	24.0

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Pipe outside diameter	Width across flats of Flare nut
6.35 mm (1/4 in.)	17 mm
9.52 mm (3/8 in.)	22 mm
12.70 mm (1/2 in.)	26 mm
15.88 mm (5/8 in.)	29 mm
19.05 mm (3/4 in.)	36 mm



1. CONNECTION DIAGRAMS



2. CONNECTION CORD PREPARATION

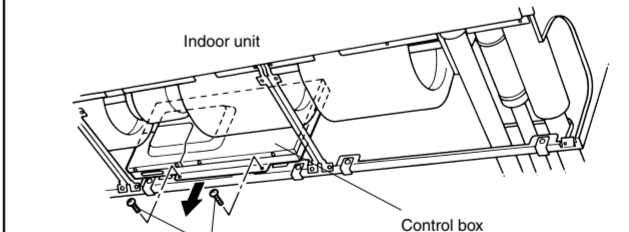
- Remove the two tapping screws and pull the control box downward.



3. INDOOR UNIT

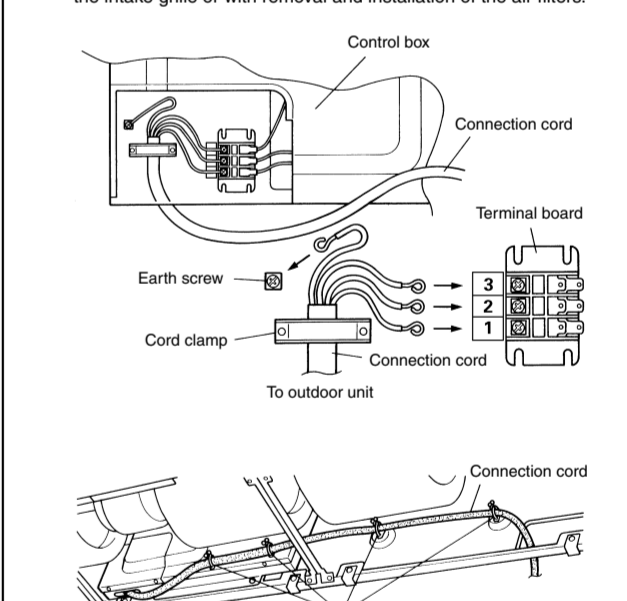
CAUTION
Use care not to mistake the power supply cord and connection wires when installing.

- Remove the two tapping screws and pull the control box downward.
- Remove the Cover A and install the Connection cord.
- Reattach Cover A. Then fasten the control box back into its original position using the two tapping screws.



- After wiring is complete, clamp the Connection cord with the Cord clamp.

- Attach the connection cord and cable clips. Make sure that they are positioned so that they will not interfere with opening and closing of the intake grille or with removal and installation of the air filters.



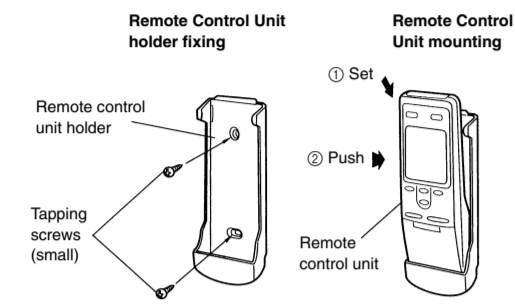
5 REMOTE CONTROL UNIT INSTALLATION

CAUTION

- Check that the indoor unit correctly receives the signal from the remote control unit, then install the remote control unit holder.
- Select the remote control unit holder selection site by paying careful attention to the following:
Avoid places in direct sunlight.
Select a place that will not be affected by the heat from a stove, etc.

1. REMOTE CONTROL UNIT HOLDER INSTALLATION

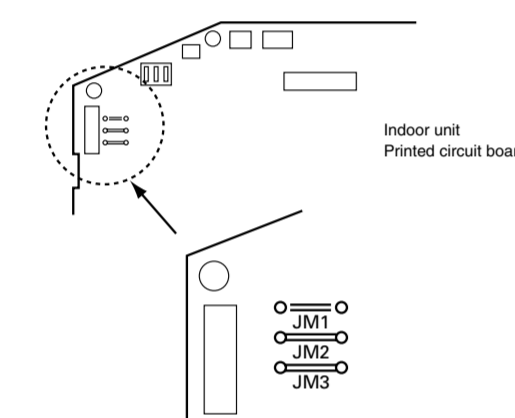
- Install the remote control unit holder to a wall or pillar with the tapping screws.



2. SWITCHING REMOTE CONTROL UNIT SIGNAL CODE

Confirm the setting of the remote control unit signal code and the printed circuit board setting.
If these are not confirmed, the remote control unit cannot be used to operate for the air conditioner.

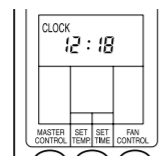
Jumper wire		Remote control unit signal code
JM2	JM3	
Connect	Connect	A (Primary setting)
Connect	Disconnect	B
Disconnect	Connect	C
Disconnect	Disconnect	D



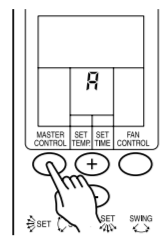
6 FINISHING

- Remote control unit settings

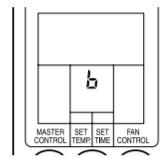
(1) Press the START/STOP button and display only the clock.



(2) Press the MASTER CONTROL button continuously for more than five seconds to display the current signal code.



(3) Change the signal code with the \odot/\odot button (R-b-c-d).



(4) Press the MASTER CONTROL button again to return to the clock display and change the signal code.

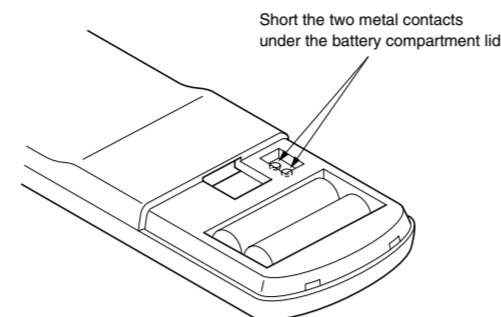
7 CUSTOMER GUIDANCE

Explain the following to the customer in accordance with the operating manual:

- Starting and stopping method, operation switching, temperature adjustment, timer, air flow adjustment, and other remote control unit operations.
- Air filter removal and cleaning.
- Give the operating manual and installation instruction sheet to the customer.

8 TEST RUNNING

- Perform test operation and check items 1 and 2 below.
- For the operation method, refer to the operating manual.
- The outdoor unit may not run, depending on the room temperature. In this case, the 'TEST RUN' signal is received during air conditioner operation (use a metallic object to short the two metal contacts under the battery compartment lid and send the 'TEST RUN' signal from the remote control unit).



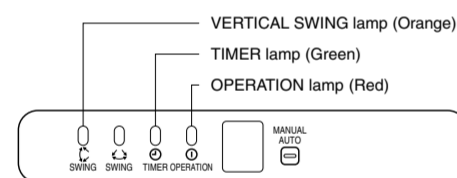
- To end test operation, press the remote control unit START/STOP button.

(When the air conditioner is run by pressing the remote control unit 'TEST RUN' button, the OPERATION and TIMER lamps will simultaneously flash slowly.)

- Is operation of each button on the remote control unit normal?
- Does each lamp light normally?
- Do not air flow direction flap and louvers operate normally?
- Is the drain normal?

9 AN ERROR DISPLAY

Operation can be checked by lighting and flashing of the display section OPERATION, TIMER and VERTICAL SWING lamps.
Perform judgment in accordance with the following.



Test running

When the air conditioner is run by pressing the remote control unit test run button, the OPERATION, TIMER and VERTICAL SWING lamps flash slowly at the same time.

Error

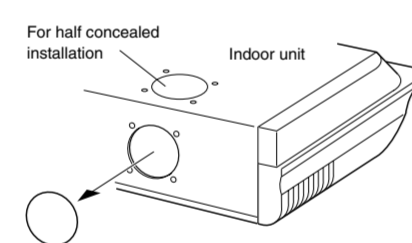
The OPERATION, TIMER and VERTICAL SWING lamps operate as follows according to the error contents.

OPERATION lamp (RED)	TIMER lamp (GREEN)	SWING lamp (ORANGE)	Error contents
○	○	×	Indoor EEPROM abnormal
○	○	○	Outdoor EEPROM abnormal
(2 times) ●	○	×	Indoor room temperature sensor open
(2 times) ●	○	○	Indoor room temperature sensor shortcircuited
(3 times) ●	○	×	Indoor heat exchanger temperature sensor open
(3 times) ●	○	○	Indoor heat exchanger temperature sensor shortcircuited
(4 times) ●	○	×	Float switch operated
(5 times) ●	○	×	Indoor signal abnormal
(5 times) ●	○	○	Outdoor signal abnormal
(6 times) ●	○	×	Indoor fan abnormal
○	(2 times) ●	×	Outdoor power source connection abnormal
○	(3 times) ●	×	Outdoor heat exchanger temperature sensor open
○	(3 times) ●	○	Outdoor heat exchanger temperature sensor shortcircuited
○	(4 times) ●	×	Outdoor temperature sensor open
○	(4 times) ●	○	Outdoor temperature sensor shortcircuited
○	(5 times) ●	×	Outdoor discharge pipe temperature sensor or compressor temperature sensor open
○	(5 times) ●	○	Outdoor discharge pipe temperature sensor or compressor temperature sensor shortcircuited
○	(6 times) ●	×	Outdoor high pressure abnormal
○	(7 times) ●	×	Outdoor discharge pipe temperature sensor or compressor temperature sensor abnormal

○ : 0.1s ON/0.1s OFF (flash) × : OFF
● : 0.5s ON/0.5s OFF (flash)

10 FRESH-AIR INTAKE

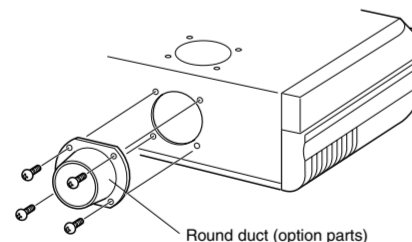
(1) Open up the knockout hole for the fresh-air intake, as shown in the figure. (If using half-concealed installation, open up the top knockout hole instead.)



CAUTION

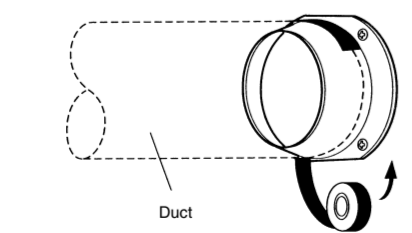
- When removing the cabinet (iron plate), be careful not to damage the indoor unit internal parts and surrounding area (outer case).
- When processing the cabinet (iron plate), be careful not to injure yourself with burrs, etc.

(2) Fasten the round flange (optional) to the fresh-air intake, as shown in the figure. (If using half-concealed installation, attach to the top.)



[After completing "INDOOR UNIT INSTALLATION"...]

- Connect the duct to the round flange.
- Seal with a band and vinyl tape, etc. so that air does not leak from the connection.



SPLIT TYPE AIR CONDITIONER INSTALLATION INSTRUCTION SHEET

CAUTION
R410A REFRIGERANT
This Air Conditioner contains and operates with refrigerant R410A and R410A. THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL. Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operation manuals, before the installation, maintenance and/or service of this product.

(PART NO. 9374995011)

For authorized service personnel only.

This installation instruction sheet describes how to install the outdoor unit only. To install the indoor unit, refer to the installation instruction sheet included with the indoor unit.

DANGER	This mark indicates procedures which, if improperly performed, are most likely to result in the death or serious injury to the user or service personnel.
WARNING	This mark indicates procedures which, if improperly performed, might lead to the death or serious injury of the user.
CAUTION	This mark indicates procedures which, if improperly performed, might possibly result in personal harm to the user, or damage to property.

DANGER

Never touch electrical components immediately after the power supply has been turned off. Electrical shock may occur. After turning off the power, always wait 5 minutes or more before touching electrical components.

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant models. However, pay careful attention to the following points:

- Since the working pressure is 1.6 times higher than that of conventional refrigerant models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant model with a new refrigerant R410A model, always replace the conventional piping and flare nuts with the R410A piping and flare nuts.
- Models that use refrigerant R410A have a different charging port thread diameter to prevent erroneous charging with conventional refrigerant and for safety. Therefore, check beforehand. [The charging port thread diameter for R410A is 1/2 UNF 20 threads per inch.]
- Be more careful that foreign matter (oil, water, etc.) does not enter the piping than with refrigerant models. Also, when storing the piping, securely seal the openings by pinching, taping, etc.
- When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.

Special tools for R410A

Tool name	Contents of change
Gauge manifold	Pressure is high and cannot be measured with a conventional gauge. To prevent erroneous mixing of other refrigerants, the diameter of each port has been changed. It is recommended the gauge with seals -0.1 to 5.3 MPa (-76 cmHg to 53 kgf/cm ²) for high pressure, -0.1 to 3.8 MPa (-76 cmHg to 38 kgf/cm ²) for low pressure.
Charge hose	To increase pressure resistance, the hose material and base size were changed.
Vacuum pump	A conventional vacuum pump can be used by installing a vacuum pump adapter.
Gas leakage detector	Special gas leakage detector for HFC refrigerant R410A.

Copper pipes

It is necessary to use seamless copper pipes and it is desirable that the amount of residual oil is less than 40 mg/10 m. Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface). Otherwise, the expansion valve or capillary tube may become blocked with contaminants. As an air conditioner using R410A incurs pressure higher than when using conventional refrigerant, it is necessary to choose adequate materials. Thicknesses of copper pipes used with R410A are as shown in the table. Never use copper pipes thinner than that in the table even when it is available on the market.

Thicknesses of Annealed Copper Pipes (R410A)

Pipe outside diameter	Thickness
6.35 mm (1/4 in.)	0.80 mm
9.52 mm (3/8 in.)	0.80 mm
12.70 mm (1/2 in.)	0.80 mm
15.88 mm (5/8 in.)	1.00 mm
19.05 mm (3/4 in.)	1.20 mm

WARNING

- For the air conditioner to operate satisfactorily, install it as outlined in this installation instruction sheet.
- Connect the indoor unit and outdoor unit with the room air conditioner piping and cords available standards parts. This installation instruction sheet describes the correct connections using the installation set available from our standard parts.
- Installation work must be performed in accordance with national wiring standards by authorized personnel only.
- Also, do not use an extension cord.
- Do not turn on the power until all installation work is complete.
- Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation.
- There is not extra refrigerant in the outdoor unit for air purging.
- Use a vacuum pump for R410A exclusively.
- Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.
- Use a clean gauge manifold and charging hose for R410A exclusively.
- If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces a toxic gas.

- Be careful not to scratch the air conditioner when handling it.
- After installation, explain correct operation to the customer, using the operating manual.
- Let the customer keep this installation instruction sheet because it is used when the air conditioner is serviced or moved.

STANDARD PARTS

The following installation parts are furnished. Use them as required.

Name and Shape	Qty	Application
Drain pipe	1	For outdoor unit drain piping work (May not be supplied, depending on the model).
Drain cap	2	
Insulation (seal)	1	For filling in a gap at the entrance of connection cords

CONNECTION PIPE REQUIREMENT

CAUTION

The maximum lengths of this product are shown in the following table. If the units are further apart than this, correct operation can not be guaranteed.

Model Type	Diameter		Pipe length		Maximum height (between indoor and outdoor)
	Liquid	Gas	MAX.	MIN.	
30,000 BTU/h class	9.52 mm (3/8 in.)	15.88 mm (5/8 in.)	50 m	5 m	30 m
36,000 BTU/h class					
45,000 BTU/h class					
54,000 BTU/h class			70 m		

- Use pipe with water-resistant heat insulation.

CAUTION

Install heat insulation around both the gas and liquid pipes. Failure to do so may cause water leaks. Use heat insulation with heat resistance above 120 °C. (Reverse cycle model only) In addition, if the humidity level at the installation location of the refrigerant piping is expected to exceed 70%, install heat insulation around the refrigerant piping. If the expected humidity level is 70-80%, use heat insulation that is 15 mm or thicker and if the expected humidity exceeds 80%, use heat insulation that is 20 mm or thicker. If heat insulation is used that is not as thick as specified, condensation may form on the surface of the insulation. In addition, use heat insulation with heat conductivity of 0.045 W/(m·K) or less (at 20 °C).

ELECTRICAL REQUIREMENT

- Electric wire size and breaker capacity:

Model Type	Power supply cord (mm ²)		Connection cord (mm ²)		Breaker capacity (A)
	MAX.	MIN.	MAX.	MIN.	
30,000 BTU/h class	4.0	3.5	2.5	1.5	30
36,000 BTU/h class					
45,000 BTU/h class					
54,000 BTU/h class	6.0	5.3	3.5	2.5	30

- Always use H07RN-F or equivalent to the connection cord.
- Install all electrical works in accordance to the standard.
- Install the disconnect device with a contact gap of at least 3 mm in all poles nearby the units. (Both indoor unit and outdoor unit)
- Install the circuit breaker nearby the units.

SELECTING THE MOUNTING POSITION

Decide the mounting position with the customer as follows:

WARNING

Select installation locations that can properly support the weight of the indoor and outdoor units. Install the units securely so that they do not topple or fall.

CAUTION

- Do not install where there is the danger of combustible gas leakage.
- Do not install the unit near heat source of heat, steam, or flammable gas.
- If children under 10 years old may approach the unit, take preventive measures so that they cannot reach the unit.

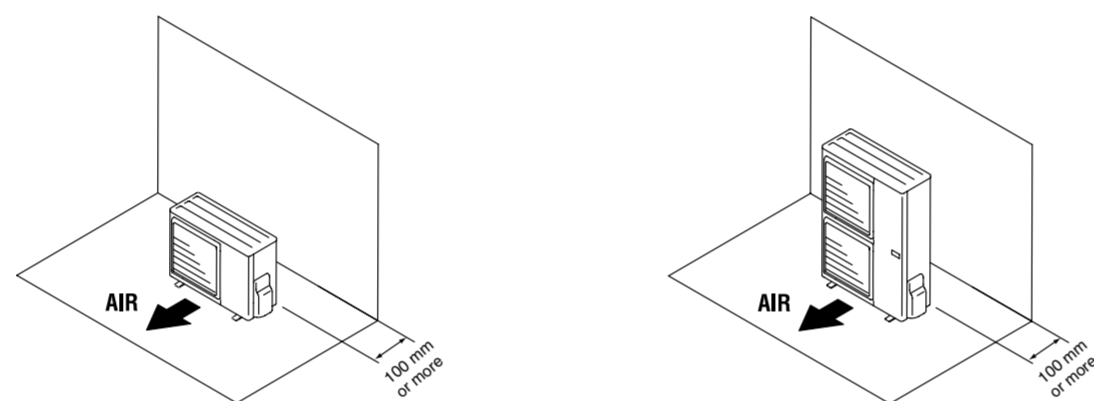
WARNING

- Install the unit where it will not be tilted by more than 3°. However, do not install the unit with it tilted towards the side containing the compressor.
- When installing the outdoor unit where it may be exposed to strong wind, fasten it securely.

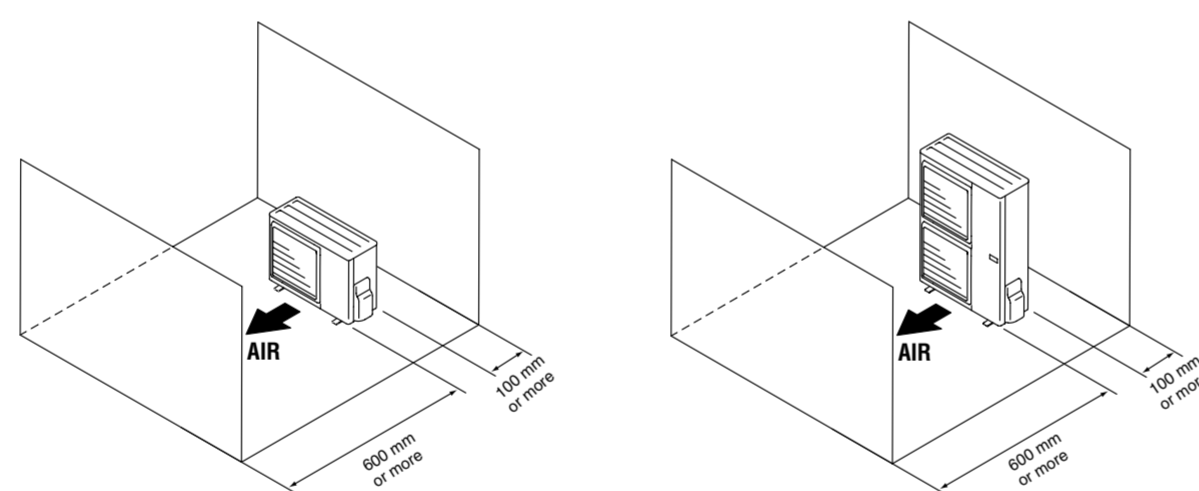
- Install the outdoor unit in a location which can withstand the weight of the unit and vibration, and which can install horizontally.
- Provide the indicated space to ensure good airflow.
- If possible, do not install the unit where it will be exposed to direct sunlight. (If necessary, install a blind that does not interfere with the airflow.)
- Do not install the unit near a source of heat, steam, or flammable gas.
- During heating operation, drain water flows from the outdoor unit. Therefore, install the outdoor unit in a place where the drain water flow will not be obstructed. (Reverse cycle model only)
- Do not install the unit where strong wind blows or where it is very dusty.
- Do not install the unit where people pass.
- Install the outdoor unit in a place where it will be free from being dirty or getting wet by rain as much as possible.
- Install the unit where connection to the indoor unit is easy.

- 30,000 BTU/h class
- 36,000 BTU/h class
- 45,000 BTU/h class
- 54,000 BTU/h class

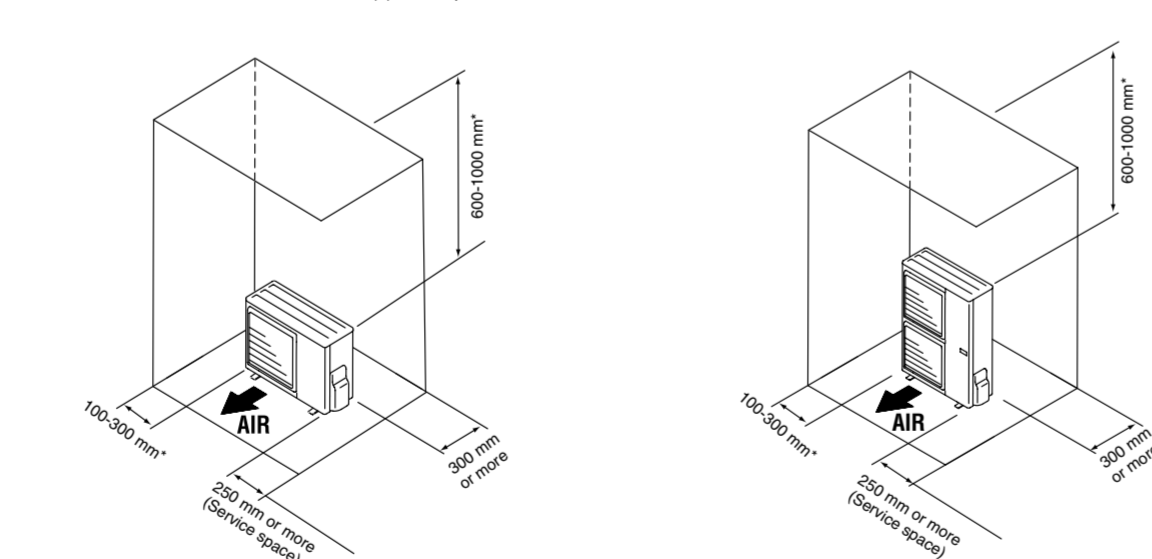
When there are obstacles at the back side.



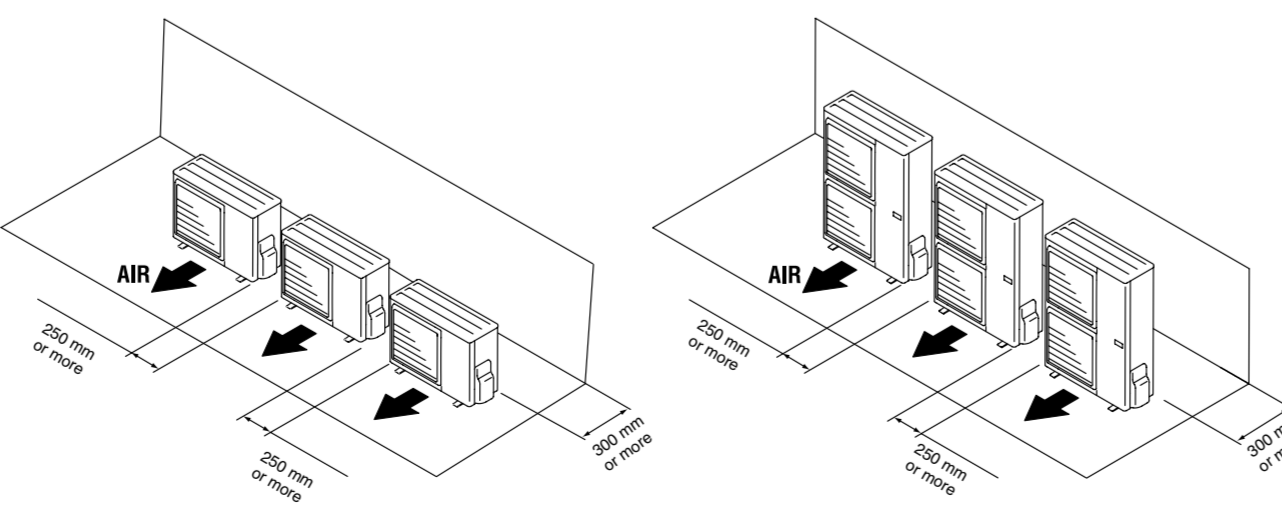
When there are obstacles at the back and front sides.



When there are obstacles at the back, side(s), and top.



When there are obstacles at the back side with the installation of more than one unit.



* If the space is larger than that is stated, the condition will be the same as that there are no obstacles.

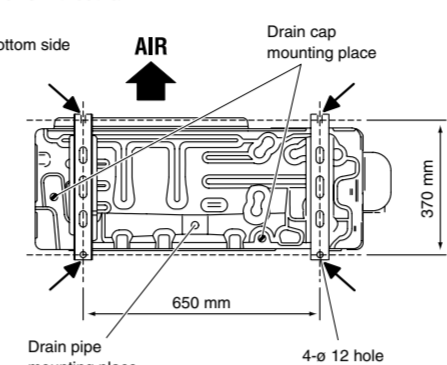
INSTALLATION PROCEDURE

1

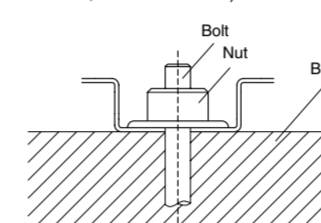
OUTDOOR UNIT INSTALLATION

1. OUTDOOR UNIT PROCESSING

- Outdoor unit to be fasten with bolts at the four places indicated by the arrows without fail.



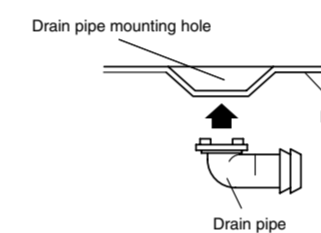
- Fix securely with bolts on a solid block. (Use 4 sets of commercially available M10 bolt, nut and washer.)



- Since the drain water flows out of the outdoor unit during heating operation, install the drain pipe and connect it to a commercial 16 mm hose. (Reverse cycle model only)
- When installing the drain pipe, plug all the holes other than the drain pipe mounting hole in the bottom of the outdoor unit with putty so there is no water leakage. (Reverse cycle model only)

CAUTION

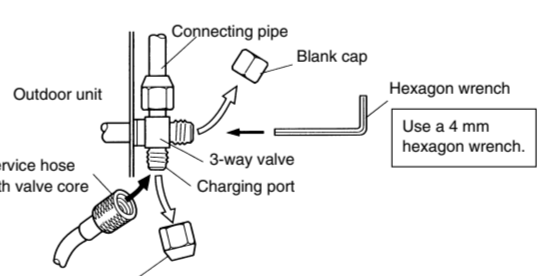
When the outdoor temperature is 0 °C or less, do not use the accessory drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extremely cold weather. (Reverse cycle model only)



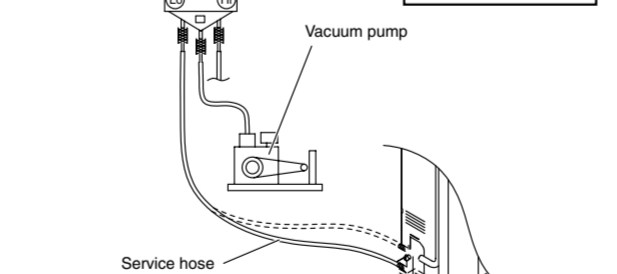
4. VACUUM

- Remove the cap, and connect the gauge manifold and the vacuum pump to the charging valve by the service hoses.
- Vacuum the indoor unit and the connecting pipes until the pressure gauge indicates -0.1 MPa (-76 cmHg).
- When -0.1 MPa (-76 cmHg) is reached, operate the vacuum pump for at least 60 minutes.
- Disconnect the service hoses and fit the cap to the charging valve to the specified torque.
- Remove the blank caps, and fully open the spindles of the 2-way and 3-way valves with a hexagon wrench [Torque: 6-7 N·m (60 to 70 kgf·cm)].
- Tighten the blank caps of the 2-way valve and 3-way valve to the specified torque.

Blank cap	Tightening torque	
	Pipe diameter	Torque
Charging port cap	6.35 mm (1/4 in.)	20 to 25 N·m (200 to 250 kgf·cm)
	9.52 mm (3/8 in.)	20 to 25 N·m (200 to 250 kgf·cm)
	12.70 mm (1/2 in.)	25 to 30 N·m (250 to 300 kgf·cm)
	15.88 mm (5/8 in.)	30 to 35 N·m (300 to 350 kgf·cm)
	19.05 mm (3/4 in.)	35 to 40 N·m (350 to 400 kgf·cm)
	10 to 12 N·m (100 to 120 kgf·cm)	



CAUTION
Use a clean gauge manifold and charging hose for R410A exclusively.



CAUTION

- Do not purge the air with refrigerants, but use a vacuum pump to vacuum the installation! There is no extra refrigerant in the outdoor unit for air purging!
- Use a vacuum pump and gauge manifold and charging hose for R410A exclusively. Using the same vacuum for different refrigerants may damage the vacuum pump or the unit.

2

CONNECTING THE PIPE

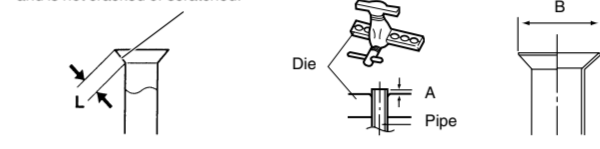
CAUTION

- Do not use mineral oil on flared part. Prevent mineral oil from getting into the system as this would reduce the lifetime of the units.
- While welding the pipes, be sure to blow dry nitrogen gas through them.
- The maximum lengths of this product are shown in the table. If the units are further apart than this, correct operation can not be guaranteed.

1. FLARING

- Cut the connection pipe to the necessary length with a pipe cutter.
- Hold the pipe downward so that cuttings will not enter the pipe and remove the burrs.
- Insert the flare nut (always use the flare nut attached to the indoor and outdoor units respectively) onto the pipe and perform the flare processing with a flare tool.

Check if (L) is flared uniformly and is not cracked or scratched.



Pipe outside diameter	Dimension A (mm)	
	Flare tool for R410A, clutch type	Dimension
6.35 mm (1/4 in.)	0 to 0.5	
9.52 mm (3/8 in.)		
12.70 mm (1/2 in.)		
15.88 mm (5/8 in.)		
19.05 mm (3/4 in.)		

Pipe outside diameter	Dimension B 3 (mm)	
	Dimension	Dimension
6.35 mm (1/4 in.)	9.1	
9.52 mm (3/8 in.)	13.2	
12.70 mm (1/2 in.)	16.6	
15.88 mm (5/8 in.)	19.7	
19.05 mm (3/4 in.)	24.0	

When using conventional flare tools to flare R410A pipes, the dimension A should be approximately 0.5 mm more than indicated in the table (for flaring with R410A flare tools) to achieve the specified flaring. Use a thickness gauge to measure the dimension A.

Pipe outside diameter	Width across flats of Flare nut	
	Width across flats	Width across flats
6.35 mm (1/4 in.)	17 mm	
9.52 mm (3/8 in.)	22 mm	
12.70 mm (1/2 in.)	26 mm	
15.88 mm (5/8 in.)	29 mm	
19.05 mm (3/4 in.)	36 mm	

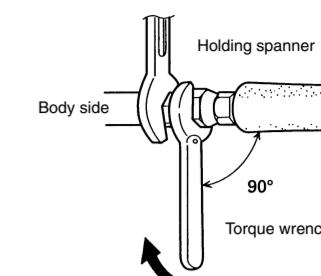
2. BENDING PIPES

The pipes are shaped by your hands. Be careful not to collapse them. Do not bend the pipes in an angle more than 90°.

When pipes are repeatedly bent or stretched, the material will harden, making it difficult to bend or stretch them any more. Do not bend or stretch the pipes more than three times.

CAUTION

- To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150 mm or over.
- If the pipe is bent repeatedly at the same place, it will break.



CAUTION

Hold the torque wrench at its grip, keeping it in the right angle with the pipe, in order to tighten the flare nut correctly.

Flare nut	Tightening torque
6.35 mm (1/4 in.) dia.	14 to 18 N·m (140 to 180 kgf·cm)
9.52 mm (3/8 in.) dia.	33 to 42 N·m (330 to 420 kgf·cm)
12.70 mm (1/2 in.) dia.	50 to 62 N·m (500 to 620 kgf·cm)
15.88 mm (5/8 in.) dia.	63 to 77 N·m (630 to 770 kgf·cm)
19.05 mm (3/4 in.) dia.	100 to 110 N·m (1000 to 1100 kgf·cm)

Outdoor unit

- Detach the caps and plugs from the pipes.

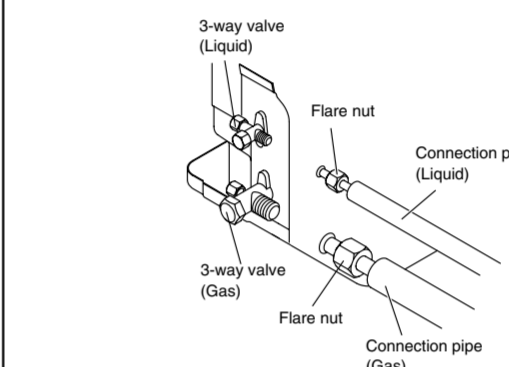
CAUTION

- Be sure to apply the pipe against the port on the indoor unit and the outdoor unit correctly. If the centering is improper, the flare nut cannot be tightened smoothly. If the flare nut is forced to turn, the threads will be damaged.
- Do not remove the flare nut from the indoor unit pipe until immediately before connecting the connection pipe.

- Centering the pipe against port on the outdoor unit, turn the flare nut with your hand.

To prevent gas leakage, coat the flare surface with alkylbenzene oil (HAB). Do not use mineral oil.

- Tighten the flare nut of the connection pipe at the outdoor unit valve connector.



3

POWER

WARNING

- The rated voltage of this product is 230 V a.c. 50 Hz.
- Before turning on, verify that the voltage is within the 198 V to 264 V range.
- Always use a special branch circuit and install a special receptacle to supply power to the air conditioner.
- Use a special branch circuit breaker and receptacle matched to the capacity of the air conditioner. (Install in accordance with standard.)
- Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
- Install a leakage special branch circuit breaker in accordance with the related laws and regulations and electric company standards.
- The circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3 mm between the contacts of each pole.

CAUTION

- The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances. When the current contracted capacity is insufficient, change the contracted capacity.
- When the voltage is low and the air conditioner is difficult to start, contact the power company the voltage raised.

CAUTION

- When moving and installing the air conditioner, do not mix gas other than the specified refrigerant R410A inside the refrigerant cycle.
- When charging the refrigerant R410A, always use an electronic balance for refrigerant charging (to measure the refrigerant by weight).
- When charging the refrigerant, take into account the slight change in the composition of the gas and liquid phases, and always charge from the liquid phase side whose composition is stable.
- Add refrigerant from the charging valve after the completion of the work.
- If the units are further apart than the maximum pipe length, correct operation can not be guaranteed.

6. GAS LEAKAGE INSPECTION

CAUTION

- After connecting the piping, check the all joints for gas leakage with gas leak detector.
- When inspecting gas leakage, always use the vacuum pump for pressure. Do not use nitrogen gas.

WARNING

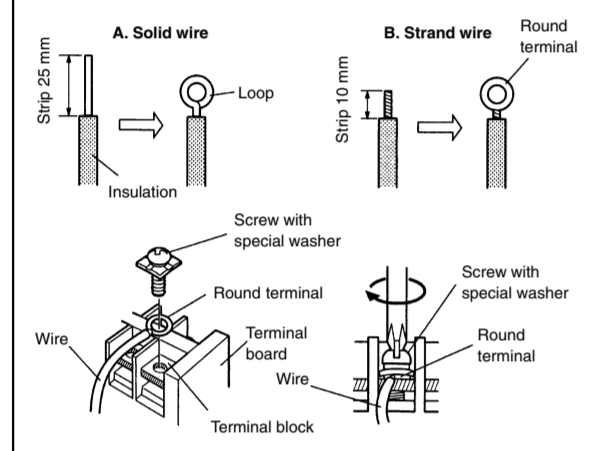
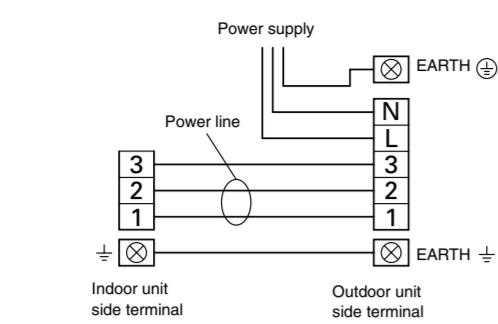
- ① Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.
- ② Match the terminal board numbers and connection cord colors with those of the outdoor unit. Erroneous wiring may cause burning of the electric parts.
- ③ Connect the connection cords firmly to the terminal board. Imperfect installation may cause a fire.
- ④ Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)
- ⑤ Always connect the ground wire.

HOW TO CONNECT WIRING TO THE TERMINALS**A. For solid core wiring (or F-cable)**

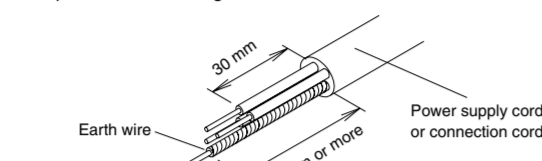
- (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm to expose the solid wire.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
- (4) Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

B. For strand wiring

- (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm to expose the strand wiring.
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal board.
- (3) Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.
- (4) Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.

**1. CONNECTION DIAGRAMS****2. CONNECTION CORD PREPARATION**

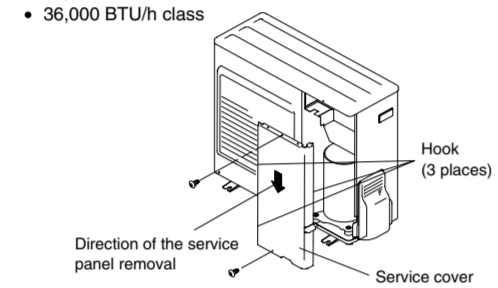
Keep the earth wire longer than the other wires.

**3. OUTDOOR UNIT****CAUTION**

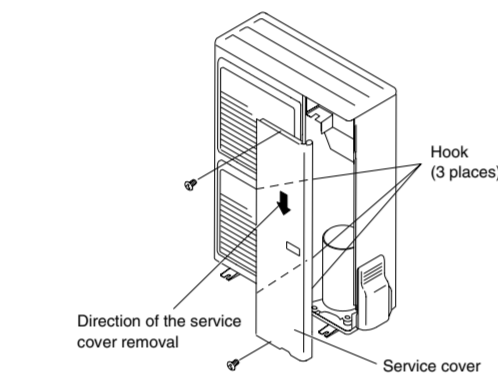
When connecting the power supply cord, make sure that the phase of the power supply matches with the phase of the terminal board. If the phases do not match, the compressor will rotate in reverse and will not be able to compress.

- (1) Service cover removal
 - Remove the two mounting screws.
 - Remove the service cover by pushing downwards.

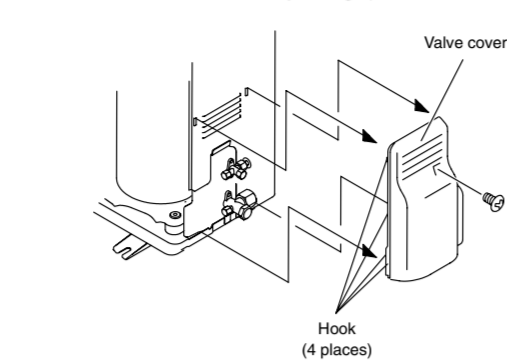
- 30,000 BTU/h class
- 36,000 BTU/h class



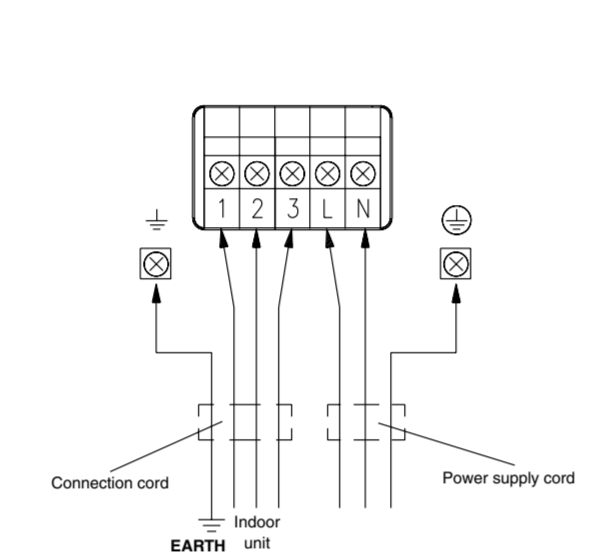
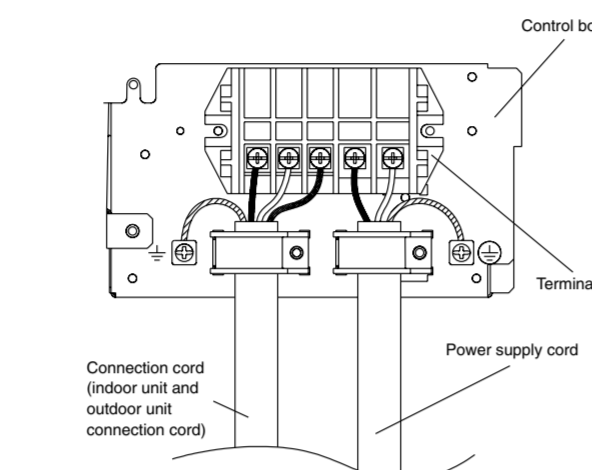
- 45,000 BTU/h class
- 54,000 BTU/h class



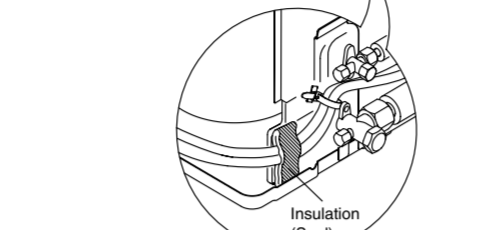
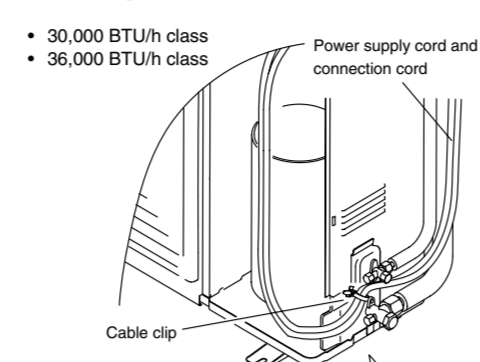
- (2) Valve cover removal.
 - Remove the one mounting screw.
 - Remove the valve cover by sliding upward.



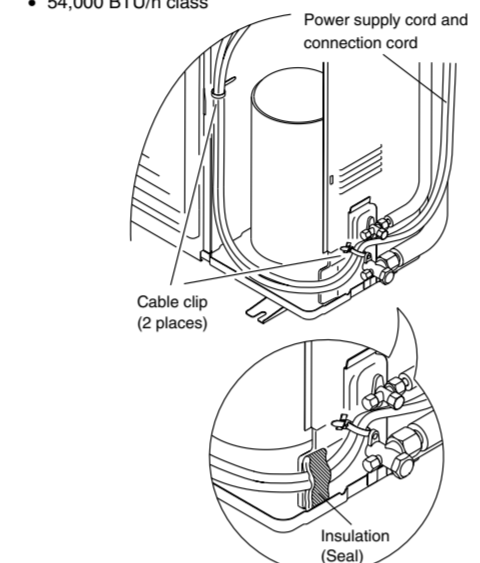
- (3) Connect the power supply cord and the connection cord to terminal.
- (4) Fasten the power supply cord and connection cord with cord clamp.



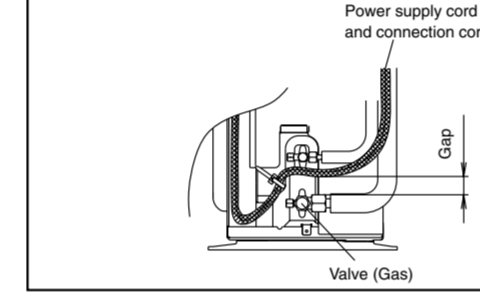
- (5) Power supply cord and connection cord should be fixed with cable clip as shown in the figure. Fill in a gap at the entrance of the cords with insulation (seal).



- 45,000 BTU/h class
- 54,000 BTU/h class

**CAUTION**

Do not make power supply cord and connection cord come in contact with valve (Gas).



- (6) Put the service cover and valve cover back after completion of the work.

CAUTION

Always turn on the power 12 hours prior to the start of the operation in order to ensure compressor protection.

1. Make a TEST RUN in accordance with the installation instruction sheet for the indoor unit.

2. OUTDOOR UNIT LEDS

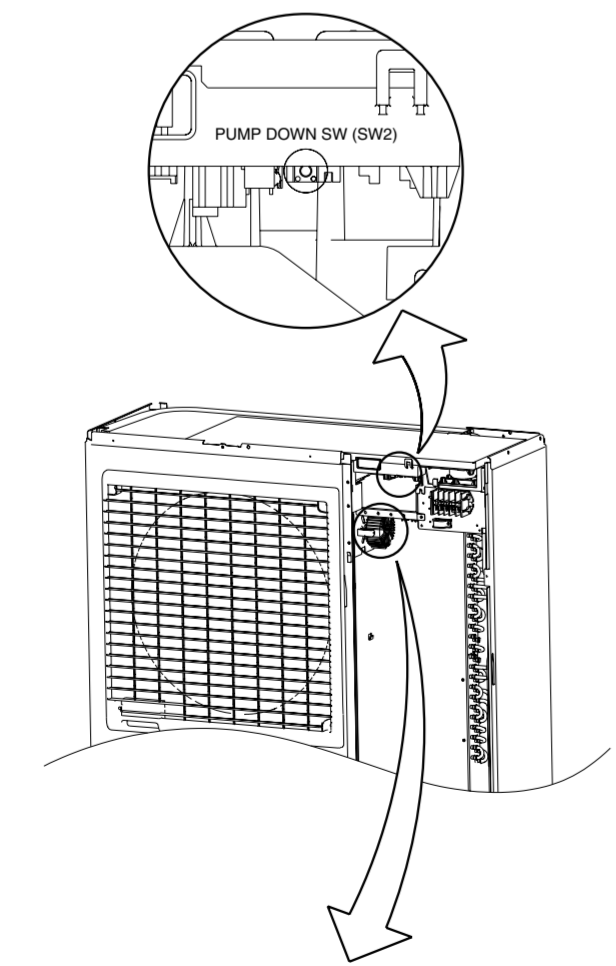
When a malfunction occurs in the outdoor unit, the LED on the circuit board lights to indicate the error. Refer to the following table for the description of each error according to the LED.

LED	Error contents
1 flash	Communication error (Indoor unit - Outdoor unit)
2 flash	Discharge pipe temperature sensor
3 flash	Outdoor heat exchanger temperature sensor
4 flash	Outdoor temperature sensor
7 flash	Compressor temperature sensor
8 flash	Heat sink temperature sensor
9 flash	Pressure switch abnormal
12 flash	iPM error
13 flash	Compressor rotor position cannot detect
14 flash	Compressor cannot operate
15 flash	Outdoor fan abnormal (upper fan)
16 flash	Outdoor fan abnormal (lower fan)
5 sec. ON	Protect operation
1 sec. OFF repeated lighting	No error

PUMP DOWN (Refrigerant collecting operation)

Perform the following procedures to collect the refrigerant when moving the indoor unit or the outdoor unit.

- (1) Press the push-button switch (SW2) on the circuit board once. The LED on the circuit board starts flashing (one second ON/one second OFF). This indicates the start of PUMP DOWN operation. When the switch is pressed while the compressor is in operation, PUMP DOWN operation starts automatically. When the switch is pressed while the compressor is in stop, the compressor starts to operate automatically, and then move on to PUMP DOWN operation.
- (2) PUMP DOWN operation continues for about 1 minute. When PUMP DOWN operation is completed, the compressor stops automatically. Then close the 2-way valve and 3-way valve immediately.
- (3) Turn the power off.

**DANGER**

This part (Choke coil) generates high voltages. Never touch this part.

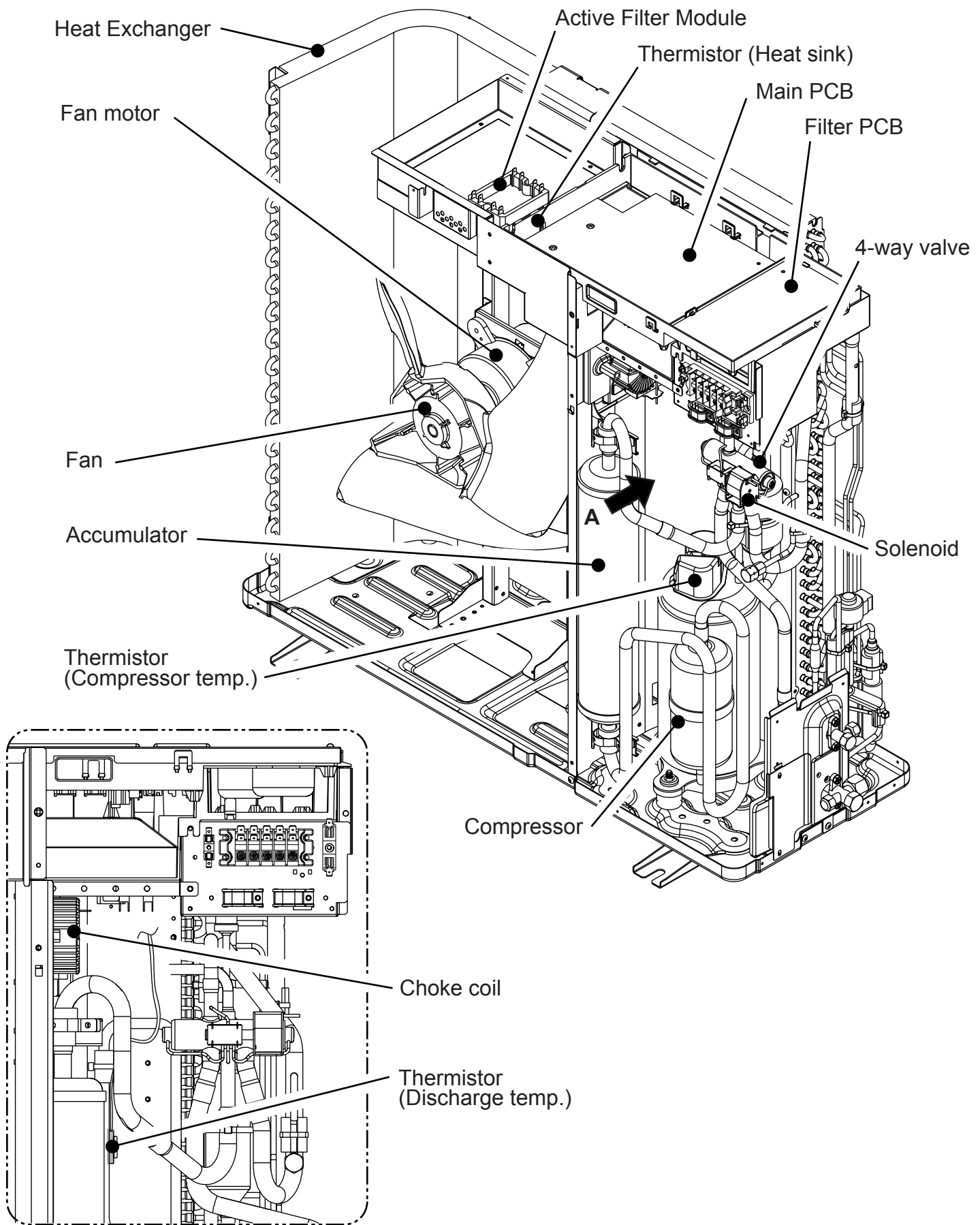
Large Ceiling type **INVERTER**

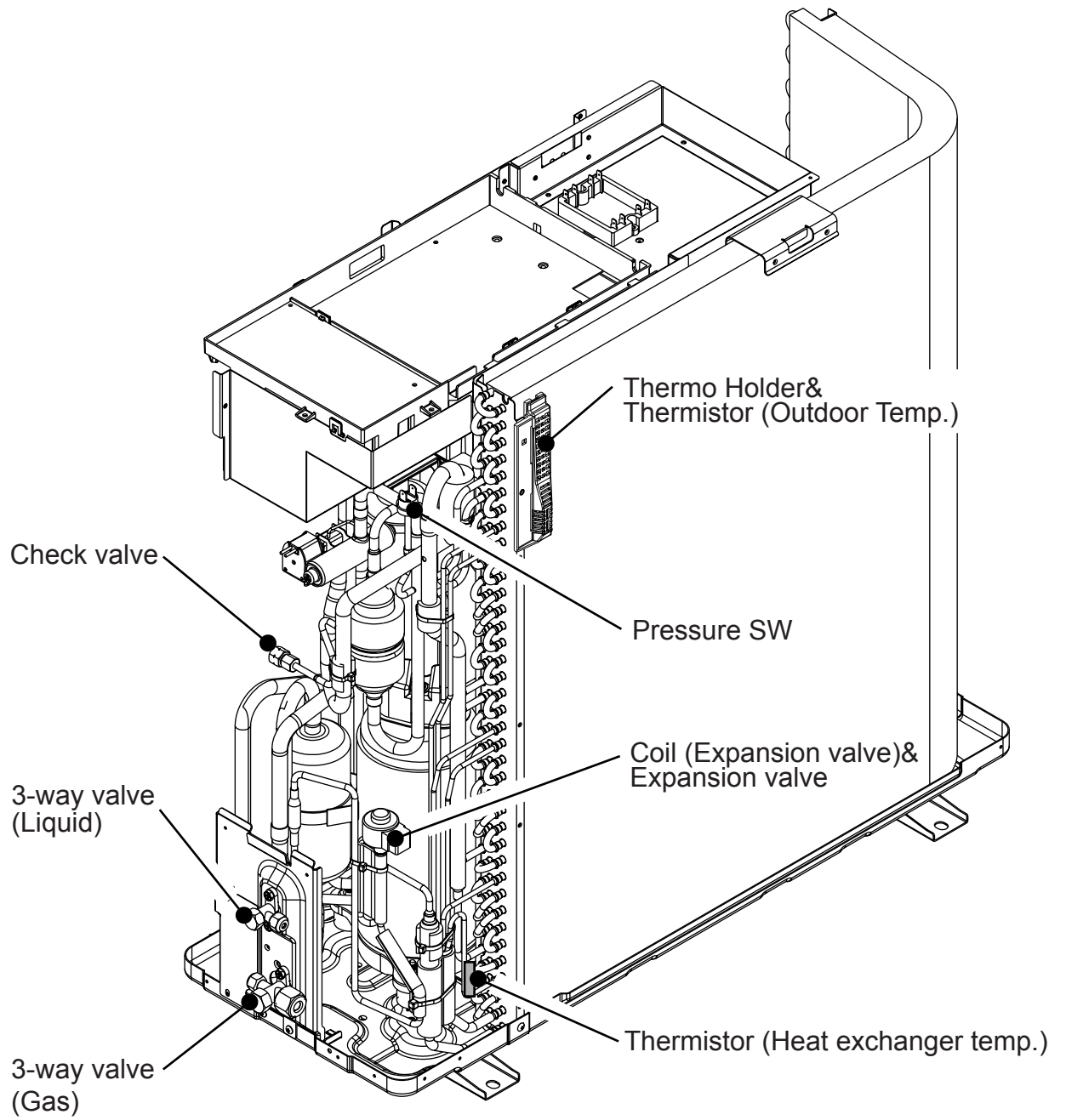
10 . REPLACEMENT PARTS

1. REPLACEMENT PARTS (For OUTDOOR UNIT)

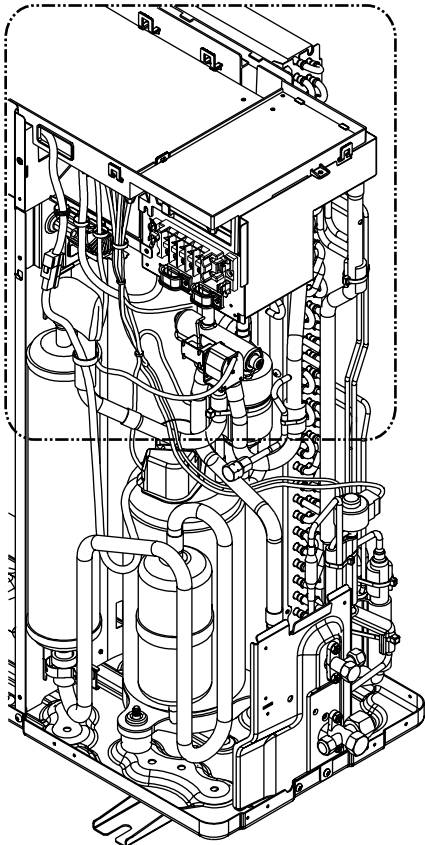
1-1 For AO*30/ 36LMBWL

1-1-1 PARTS LAYOUT DRAWING





1-1-2 WIRING (For AO*30/ 36LMBWL)



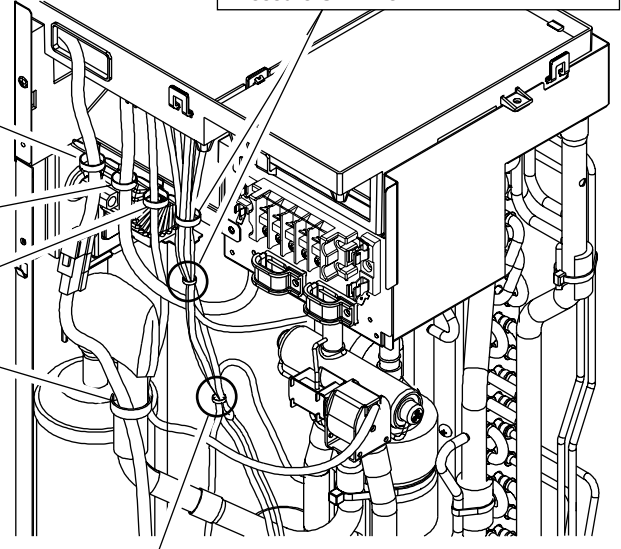
CLAMP & BIND
 Thermistor (Discharge temp.) wire
 Thermistor (Outdoor temp.) wire
 Thermistor (Compressor temp.) wire
 Thermistor (Heat exchanger temp.) wire
 Coil (Expansion valve) wire
 Pressure SW wire

CLAMP
 (Compressor wire)

CLAMP
 (Fan motor wire)

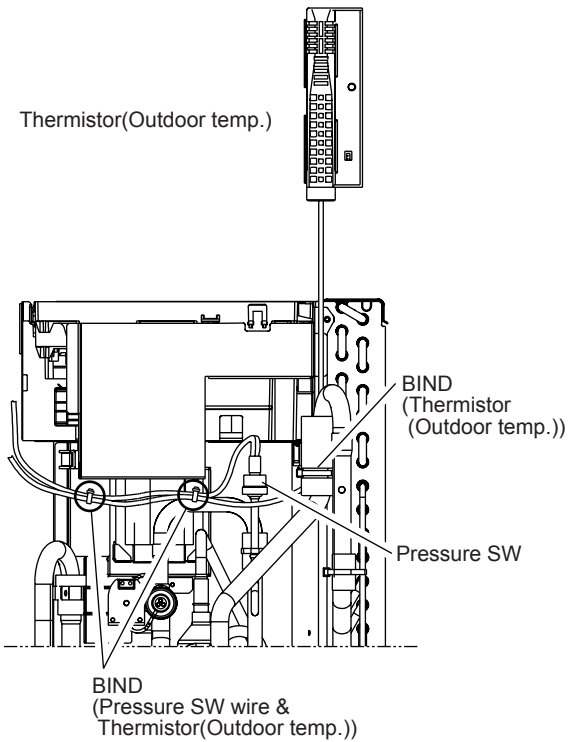
CLAMP
 (Solenoid wire)

BIND
 (Compressor wire
 & Solenoid wire)

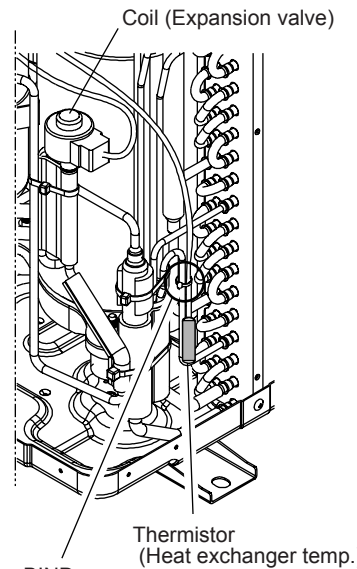
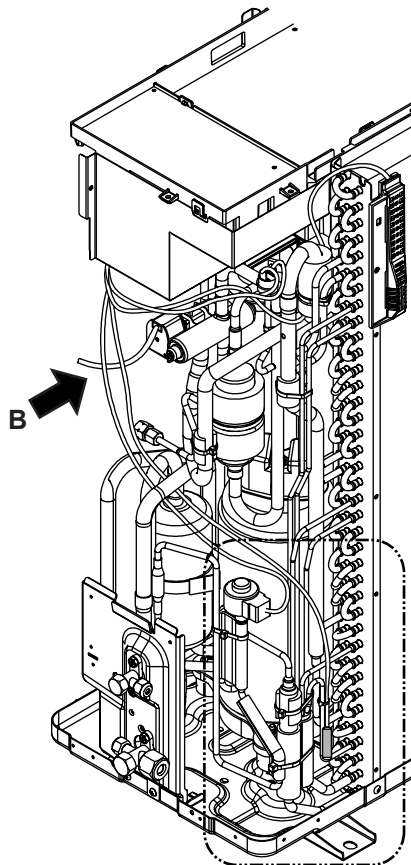


BIND
 (Thermistor (Discharge temp.))
 (Thermistor (Compressor temp.))
 (Thermistor (Heat exchanger temp.))
 (Coil (Expansion valve))

ENLARGED DETAIL



VIEW - B

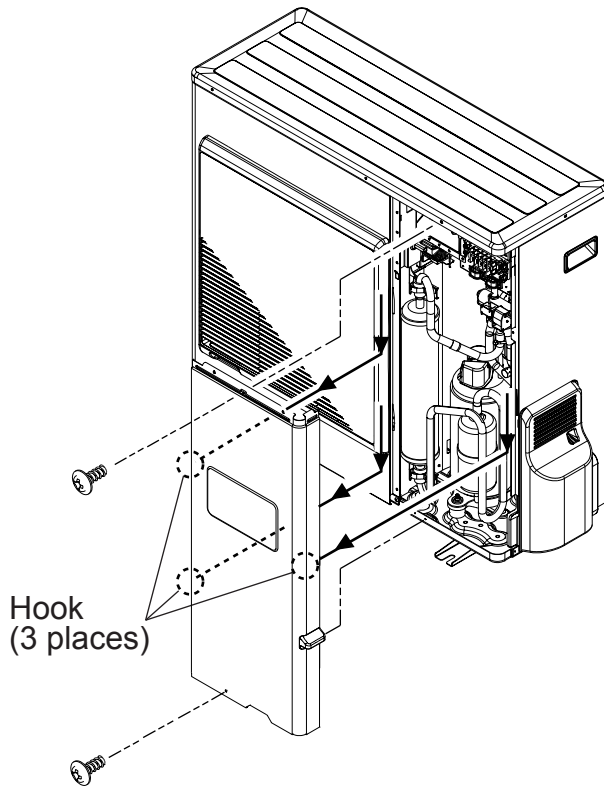


ENLARGED DETAIL

1-1-3 DISASSEMBLY PROCESS (For AO*30/ 36LMBWL)

1. SERVICE PANEL removal

- Remove the 2 mounting screws.
- Remove the SERVICE PANEL by sliding downward.

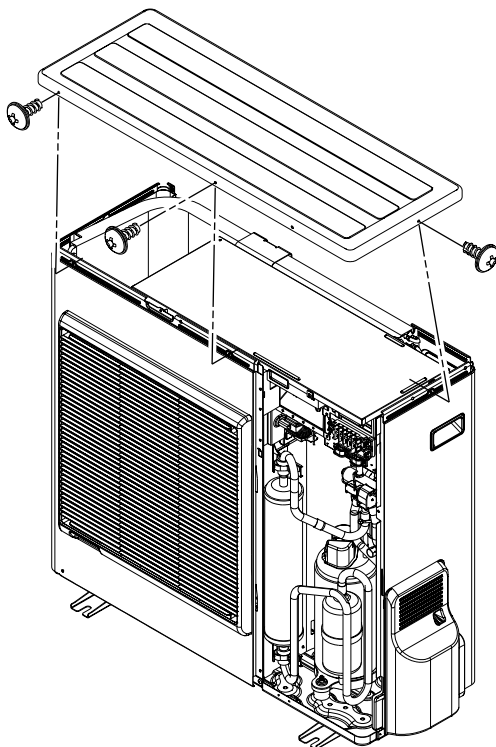


Replaceable Component

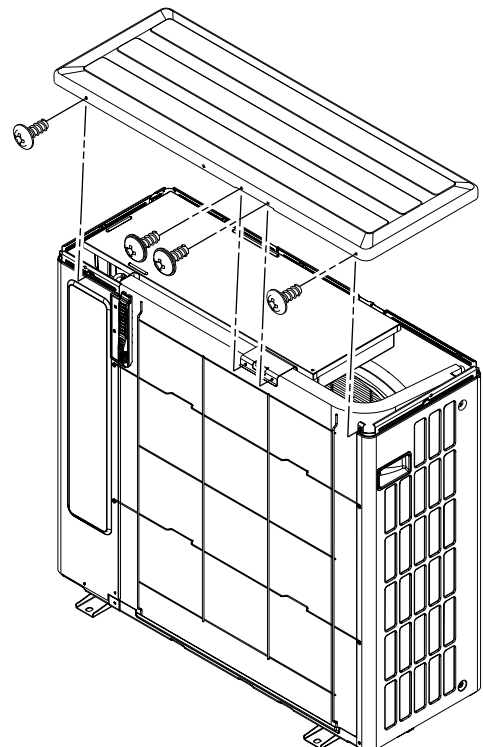
Compressor
Accumulator
4-way valve
Solenoid
Thermistor (Compressor temp.)
Thermistor (Discharge temp.)
Thermistor (Outdoor temp.)
Thermistor (Heat exchanger temp.)
Pressure SW
Coil (Expansion valve)

2. TOP PANEL removal

- Remove the 7 mounting screws.
- Remove the TOP PANEL upward.



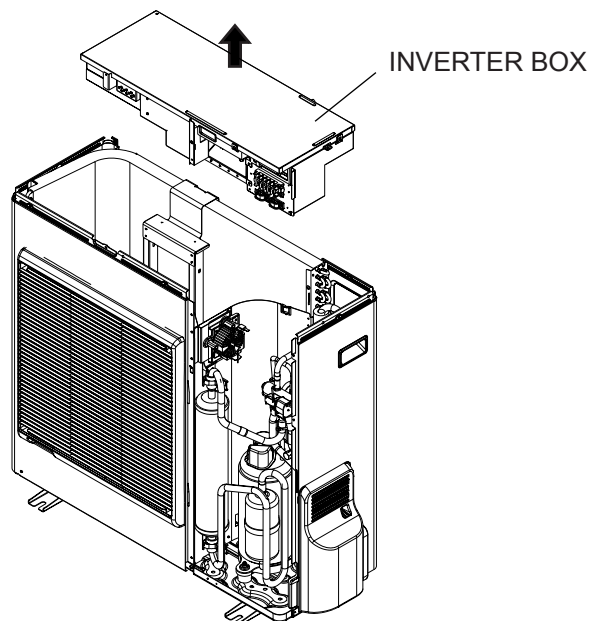
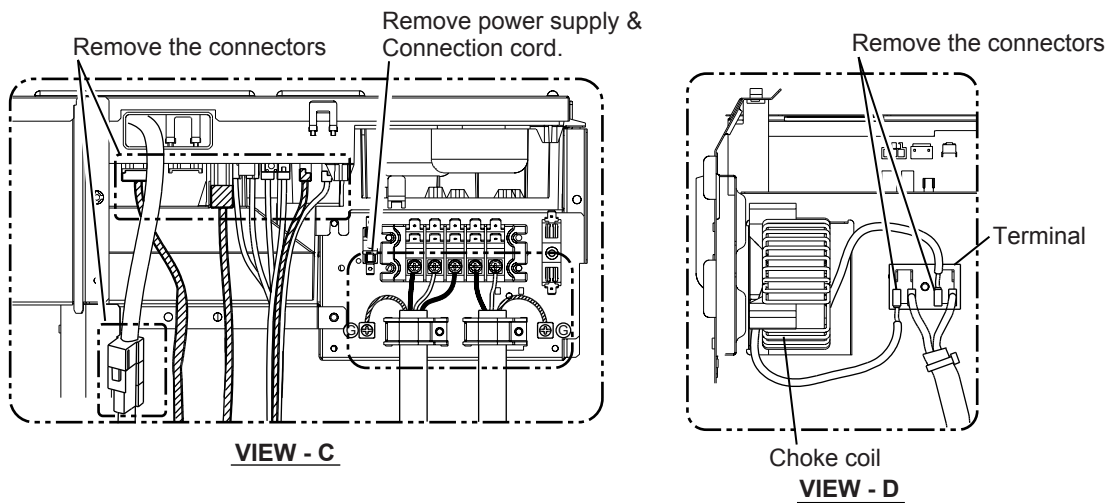
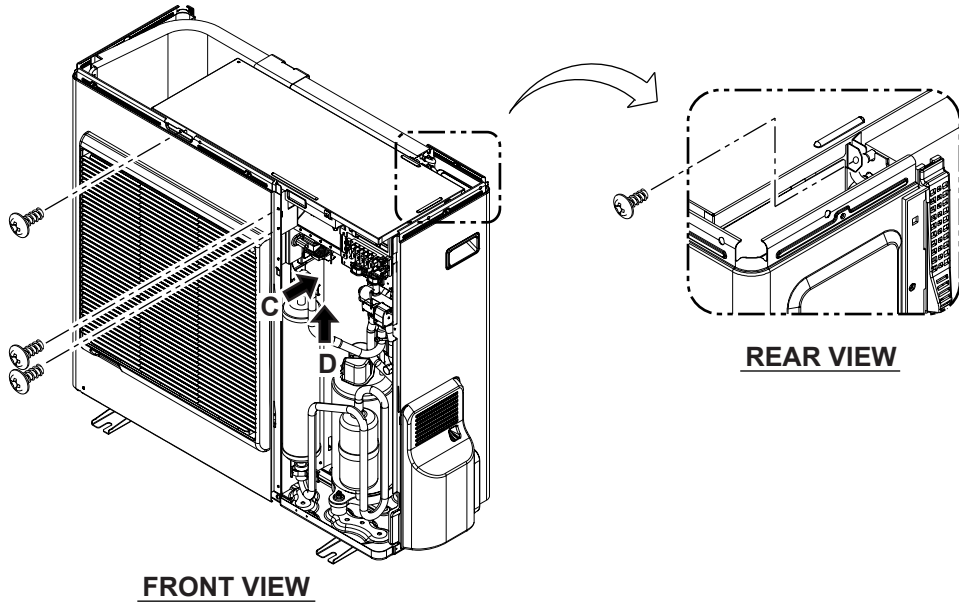
FRONT VIEW



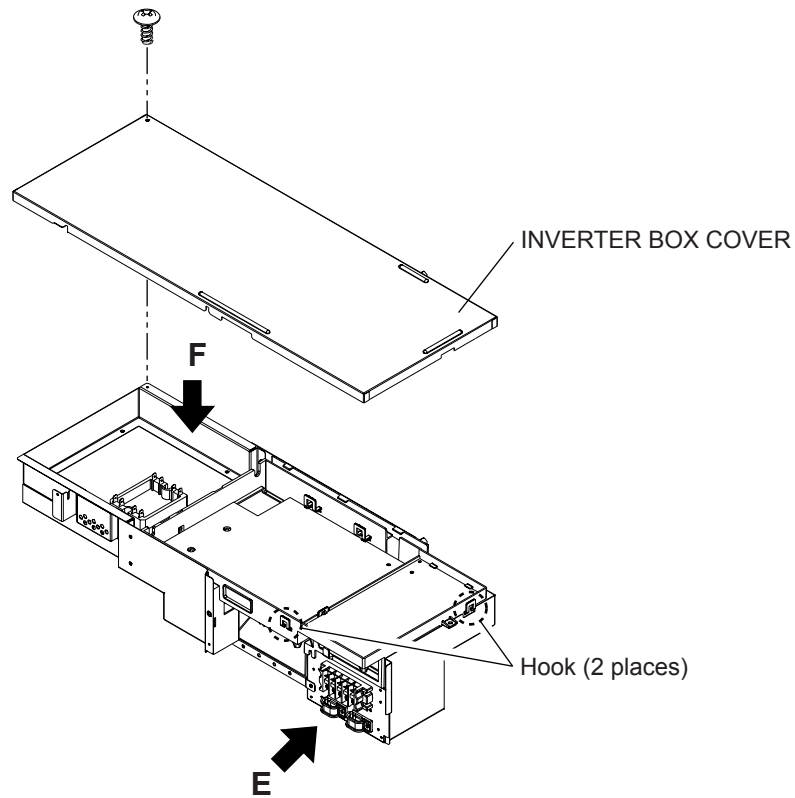
REAR VIEW

3. INVERTER BOX removal

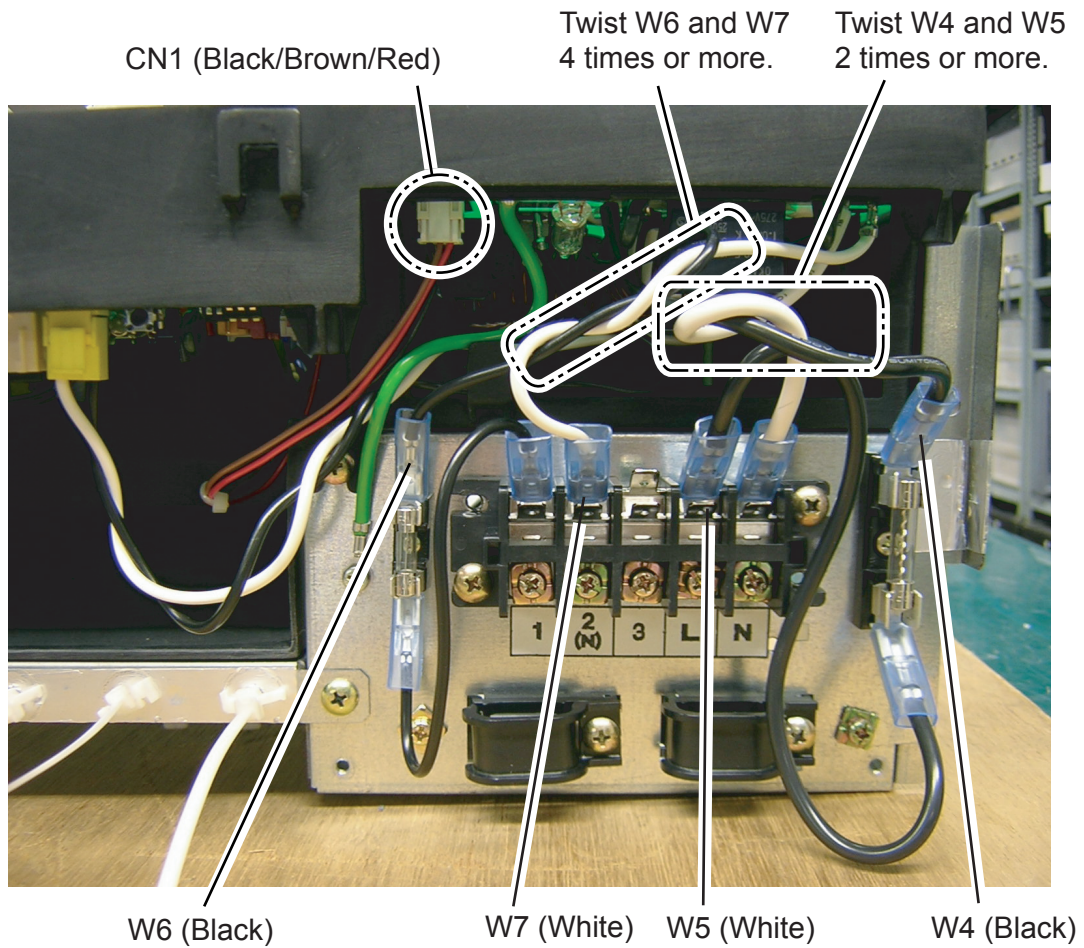
- Remove the 4 mounting screws.
- Remove the connectors and cords. (Refer to VIEW -C,-D)
- Remove the INVERTER BOX upward.



- Remove the 1 mounting screw.
- Remove the INVERTER BOX COVER upward.

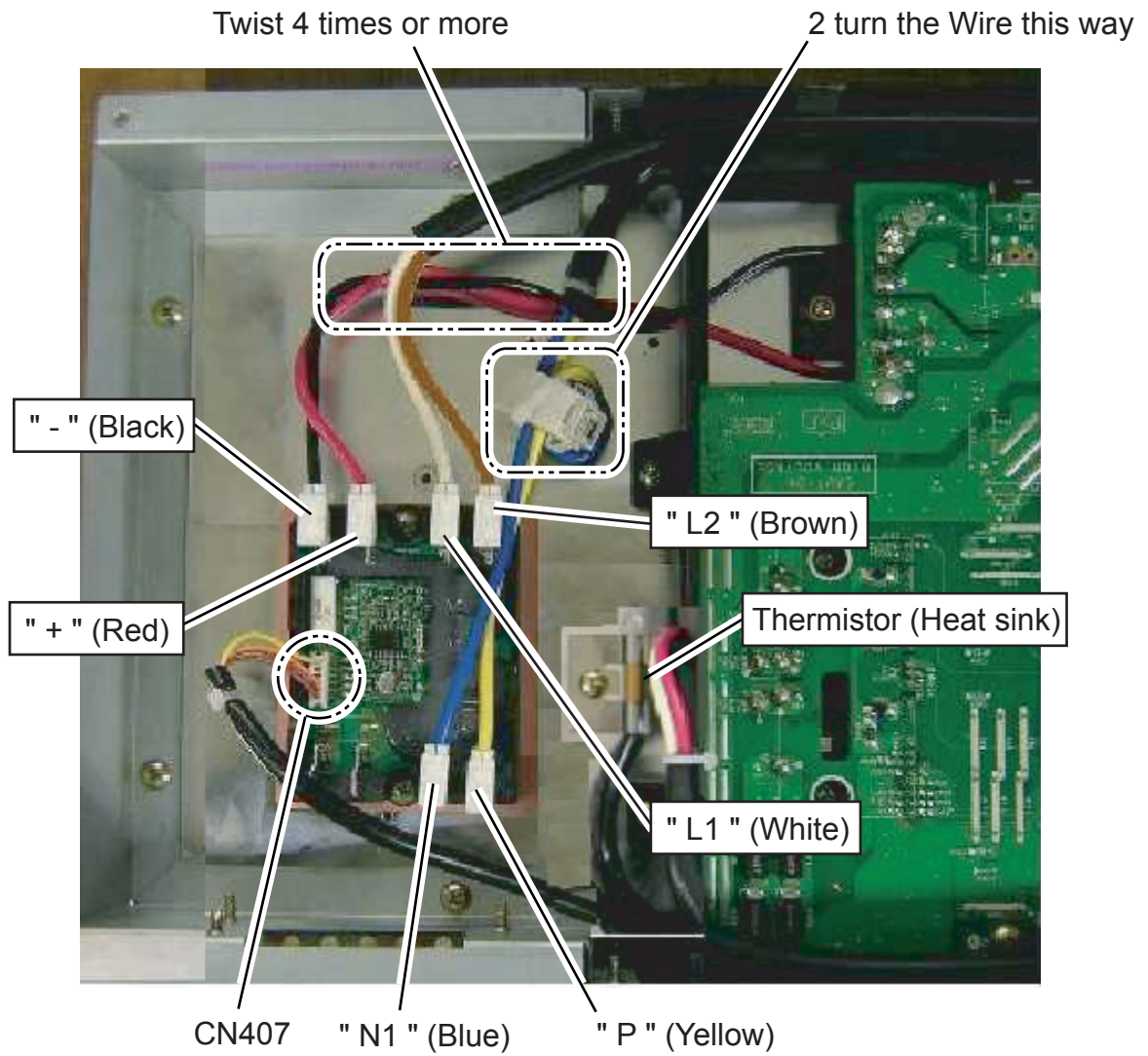


- Remove the connector and cords.

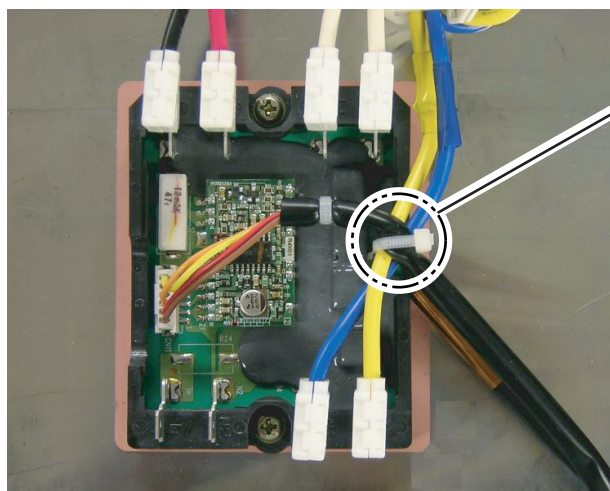


VIEW - E

Remove the connector and cords.



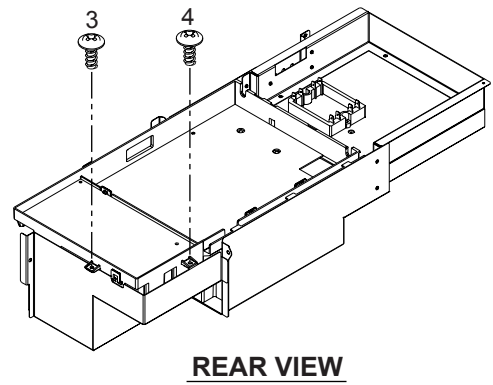
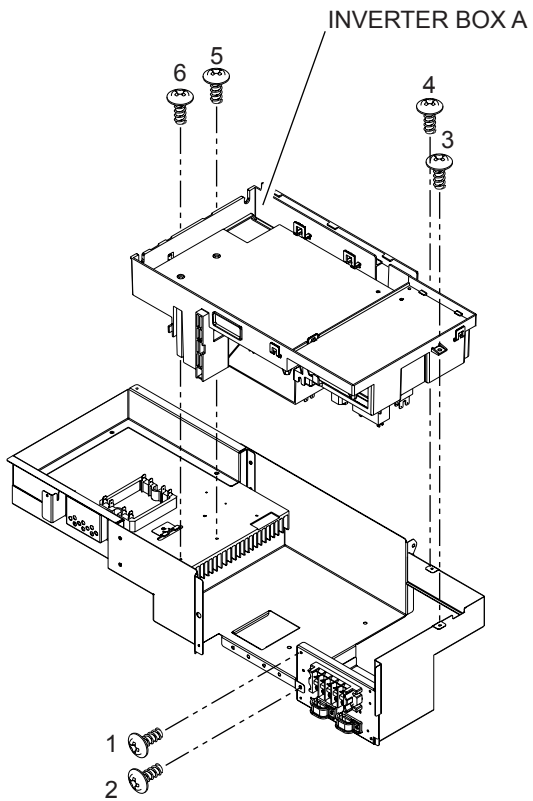
VIEW - F



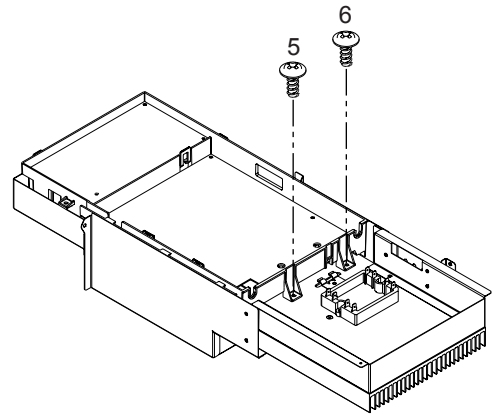
BIND
W12 / "P" (Yellow)
W13 / "N1"(Blue)
CN407

DETAIL

- Remove the 6 mounting screws.
- Remove the INVERTER BOX A upward.



REAR VIEW



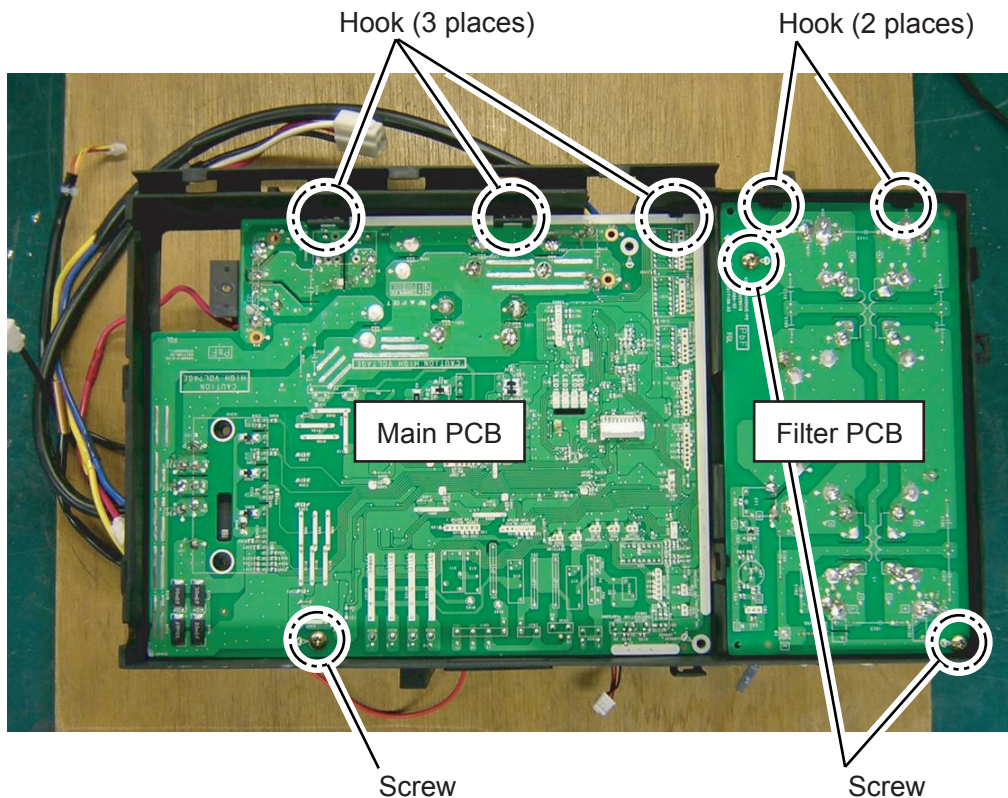
LEFT SIDE VIEW

Main PCB

- Remove the 1 mounting screw.
- Remove the Main PCB upward.

Filter PCB

- Remove the 2 mounting screws.
- Remove the Filter PCB upward.



1-1-4 ASSEMBLY PROCESS of INVERTER UNIT (For AO*30/ 36LMBWL)

1. FILTER PCB

- As shown in Fig.1, assemble FILTER PCB to INVERTER BOX A.
- As shown in Fig.2, pull out the wires of FILTER PCB.

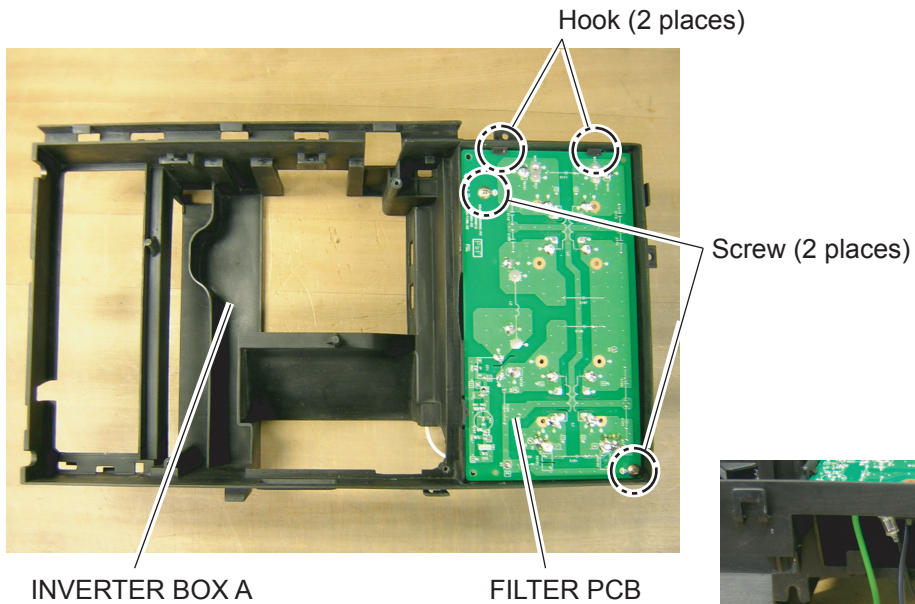


Fig.1

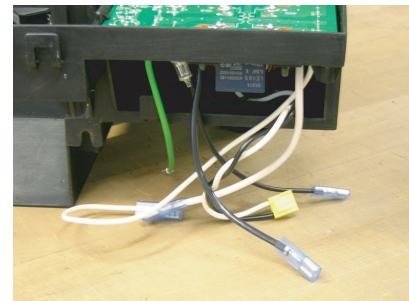
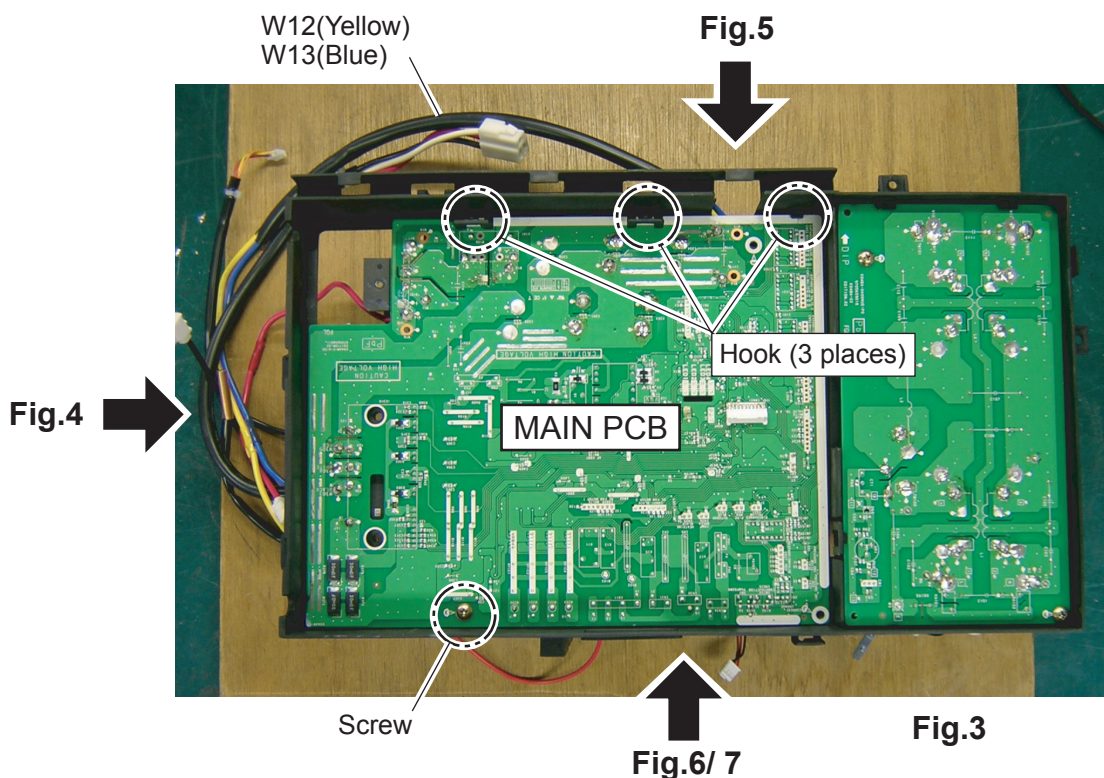


Fig.2

2. MAIN PCB

- As shown in Fig.3, temporarily fix MAIN PCB to INVERTER BOX A.
- After it is temporary fix of MAIN PCB, As shown in the Fig 4 - 7, pull out the wires of MAIN PCB.



- As shown in Fig.4, pull out the wires.

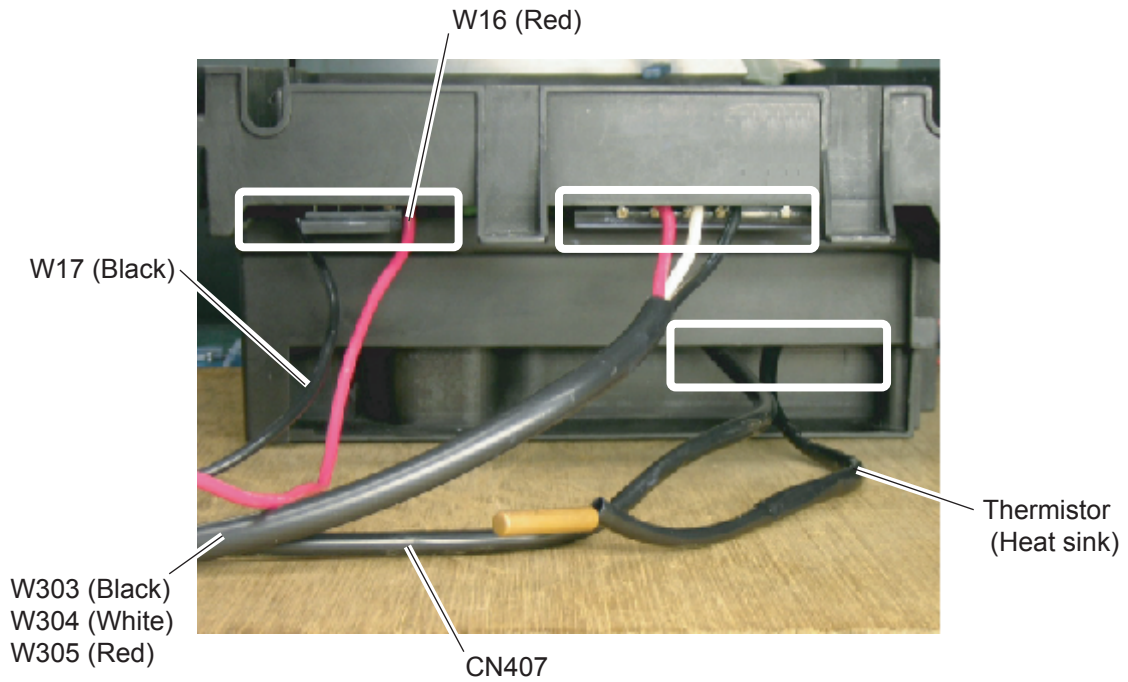


Fig. 4

- As shown in Fig.5, pull out the wires and fix them.

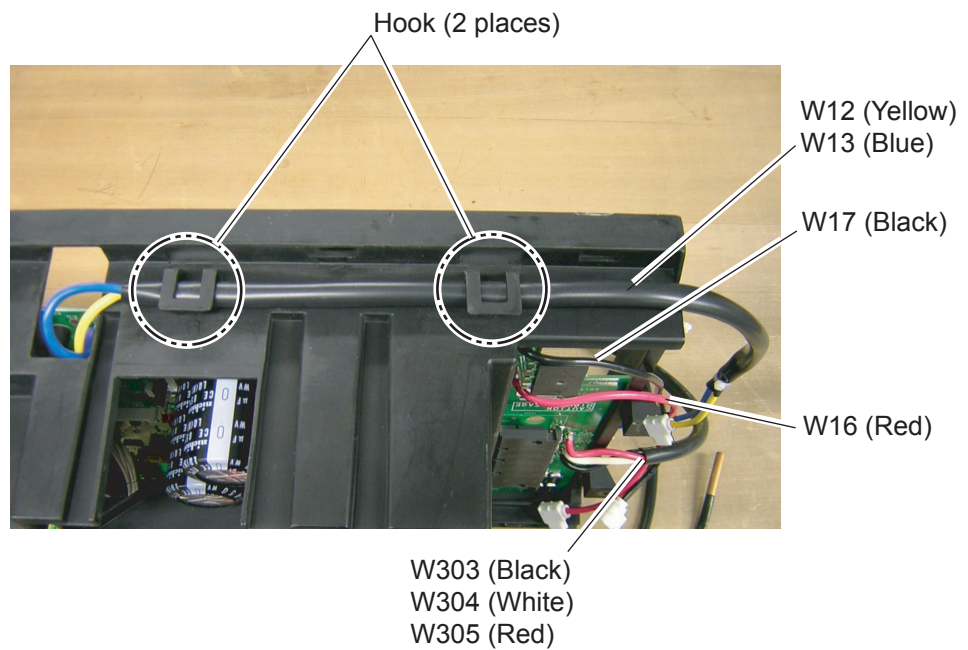


Fig. 5

- As shown in Fig.6, pull out the wires.

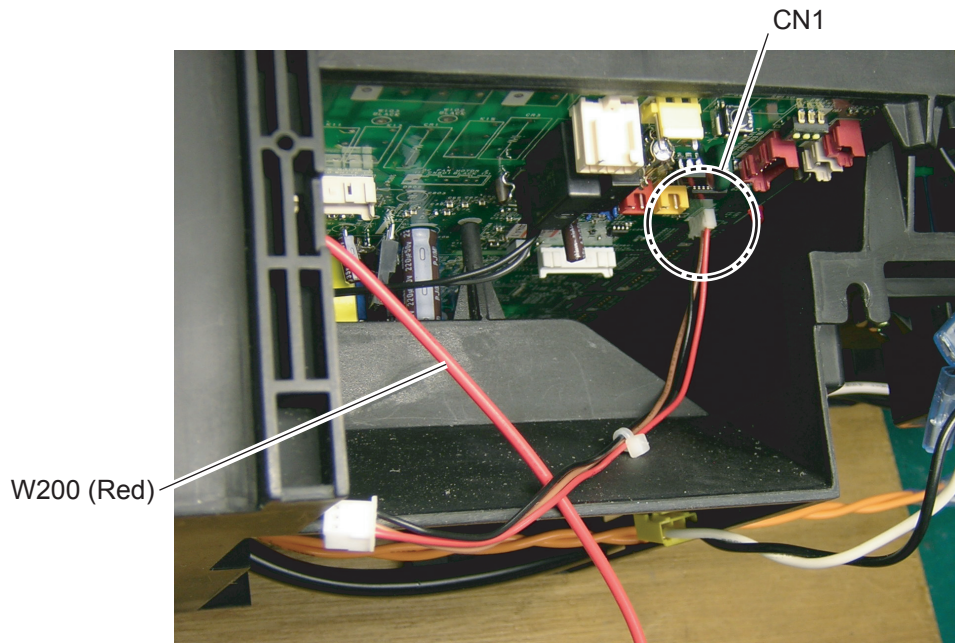


Fig. 6

- As shown in Fig.7, pull out the wires.

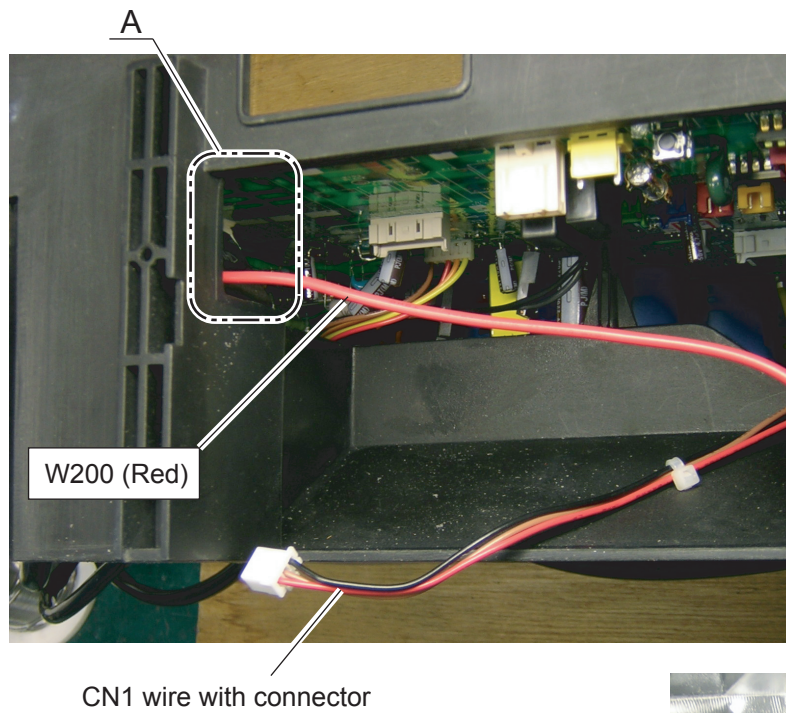
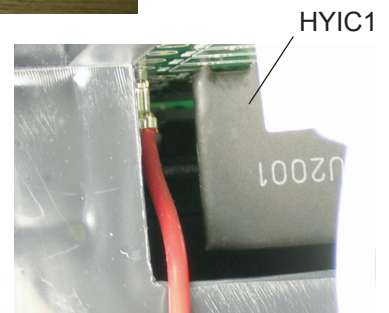


Fig. 7



Don't come in contact with HYIC1.

DETAIL - A

- As shown in Fig.8, connect wires.

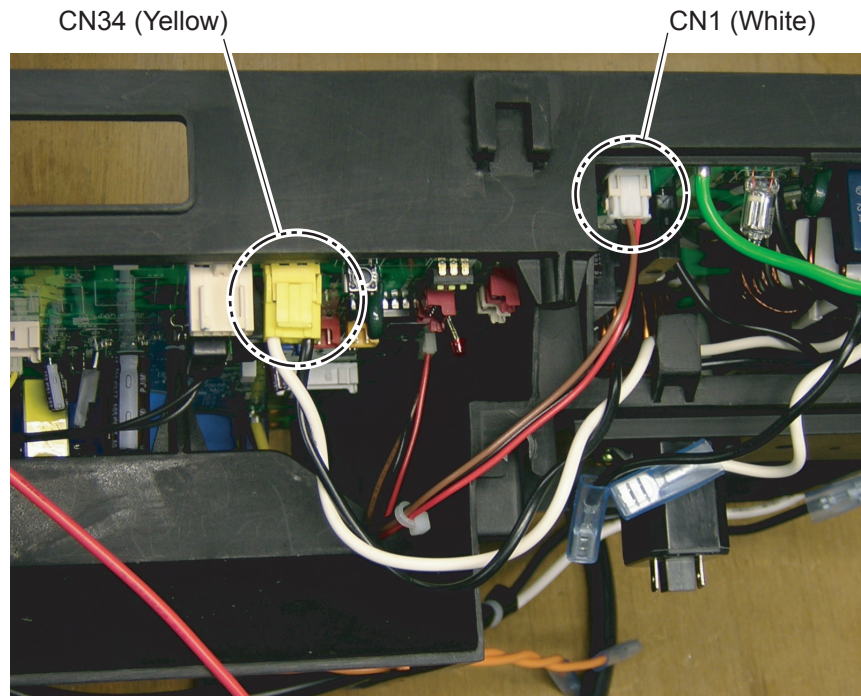


Fig. 8

-
- As shown in Fig.9, connect wires.

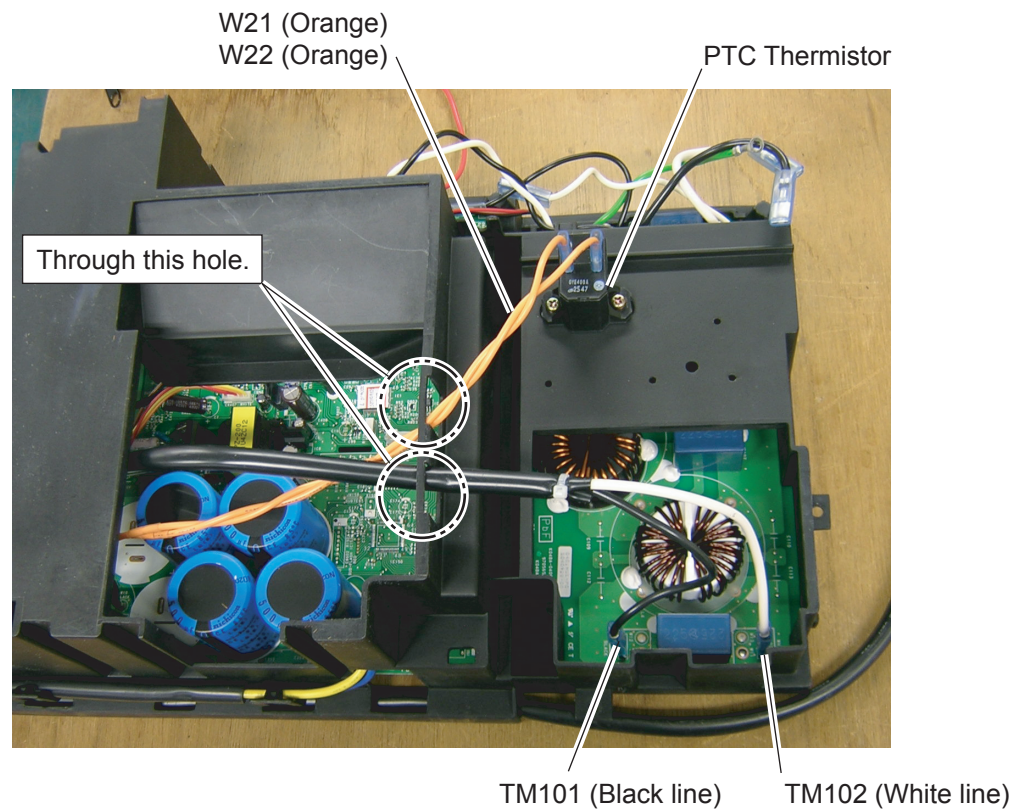


Fig. 9

▪ As shown in Fig.10, fix the wire to INVERTER BOX A.

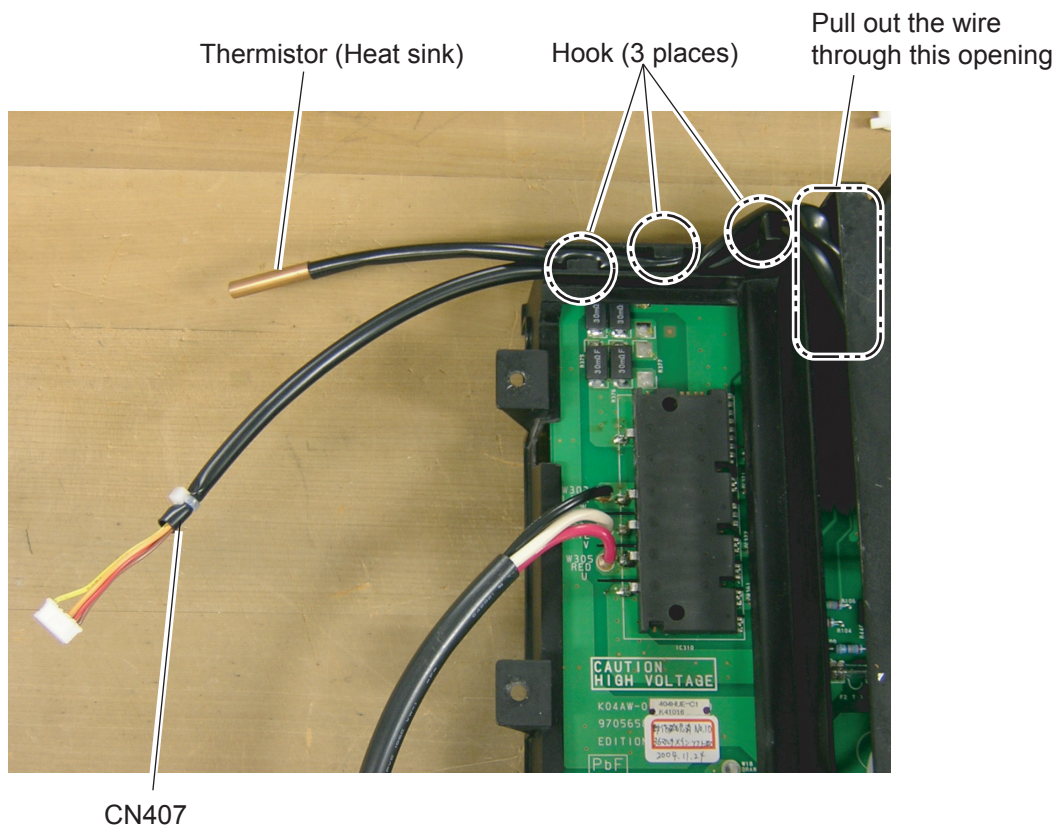


Fig. 10

▪ As shown in the figures, set wire with connector and bind it to INVERTER BOX A.

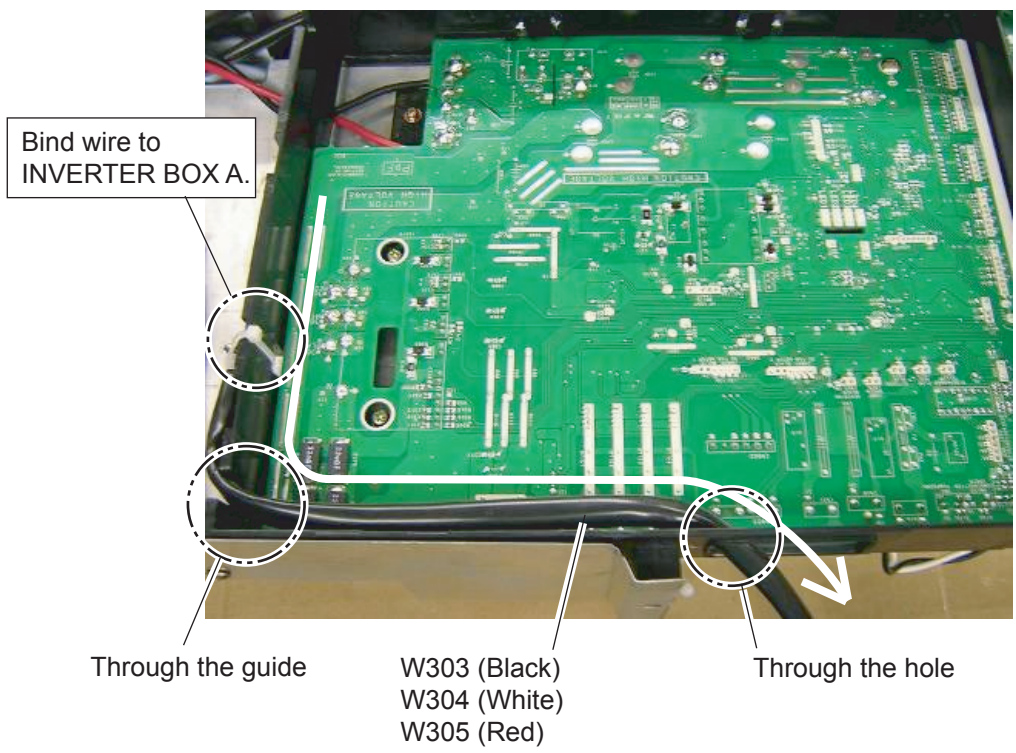
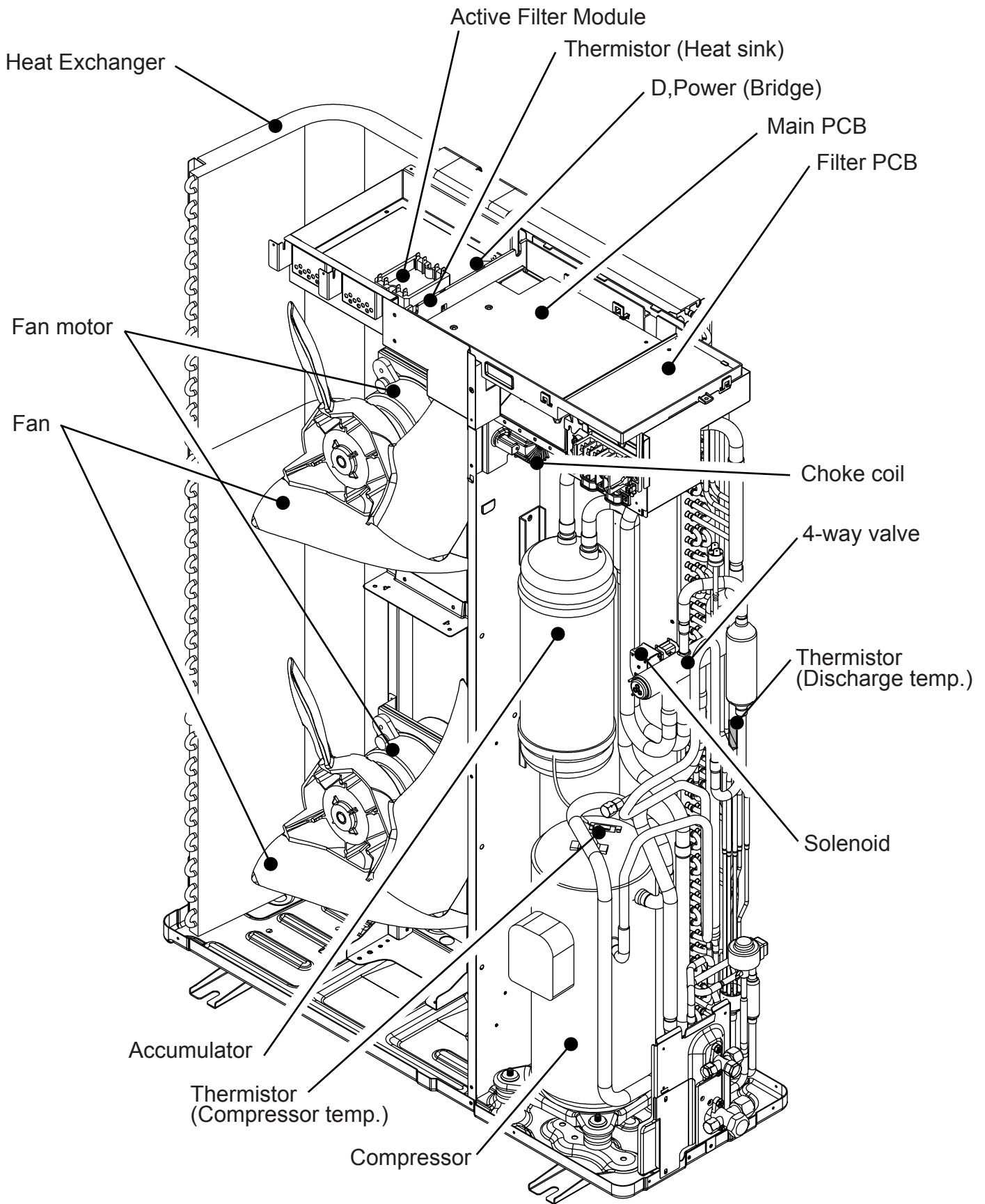
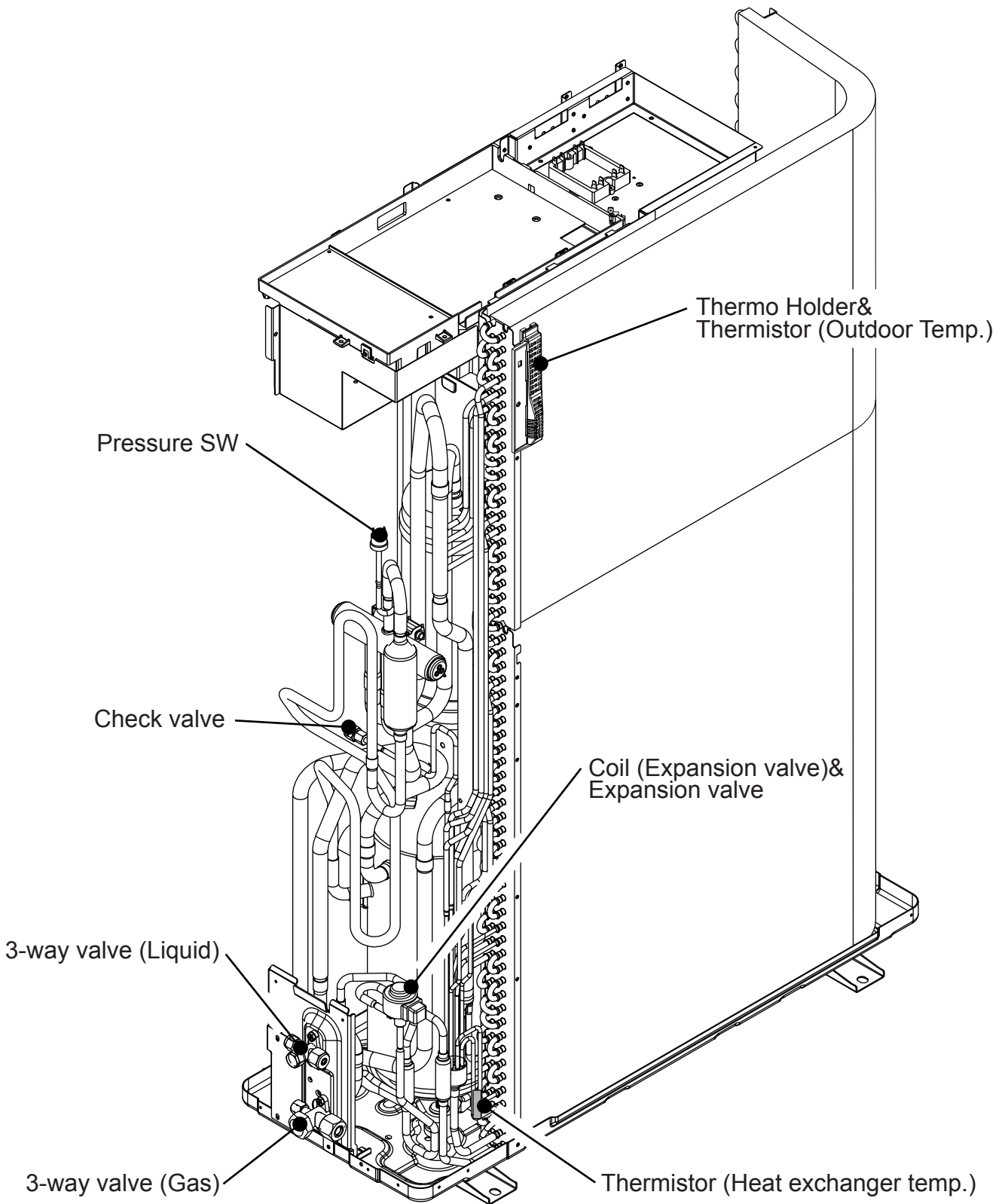


Fig. 11

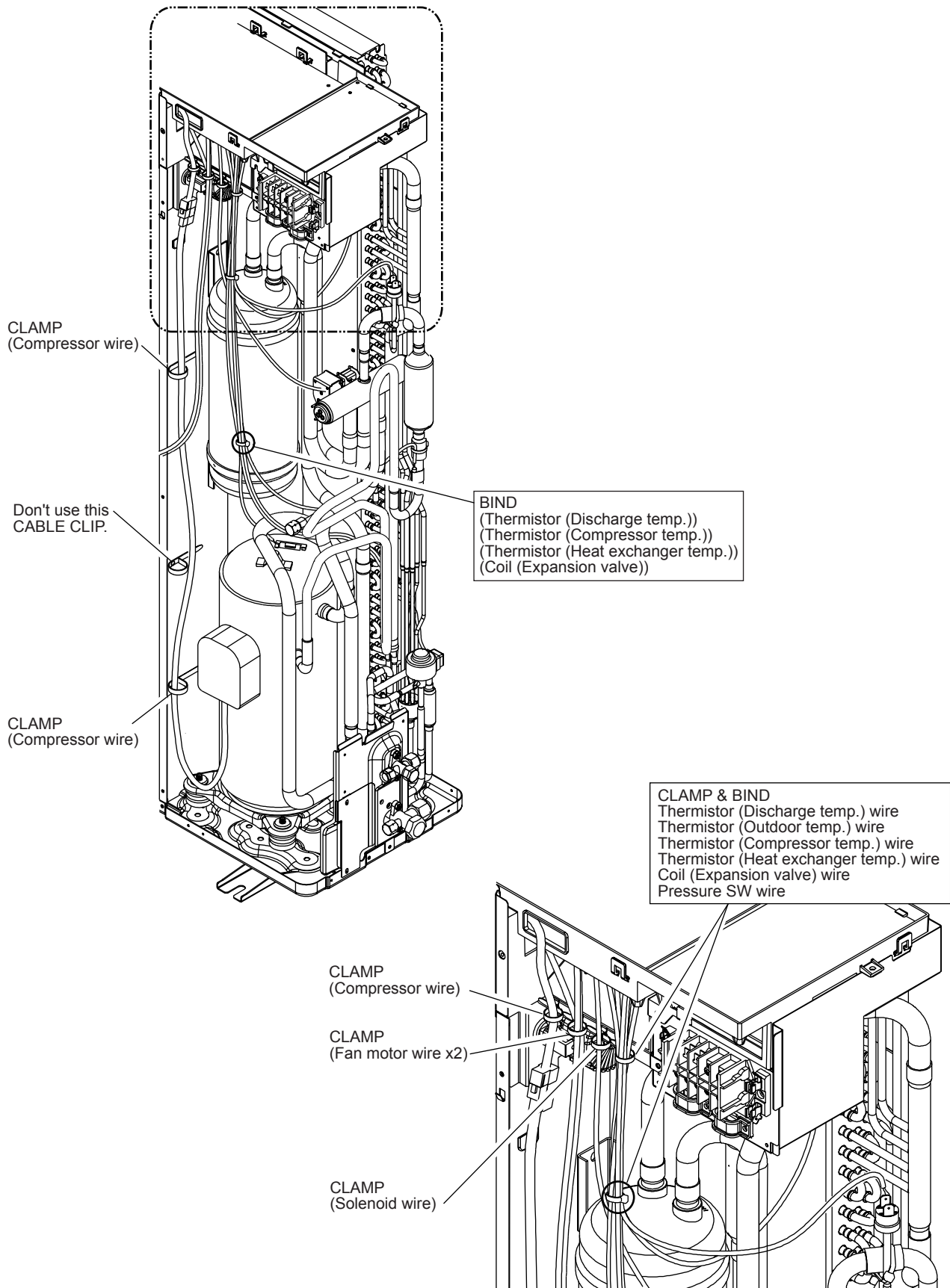
1-2 For AO*45LJBYL

1-2-1 PARTS LAYOUT DRAWING

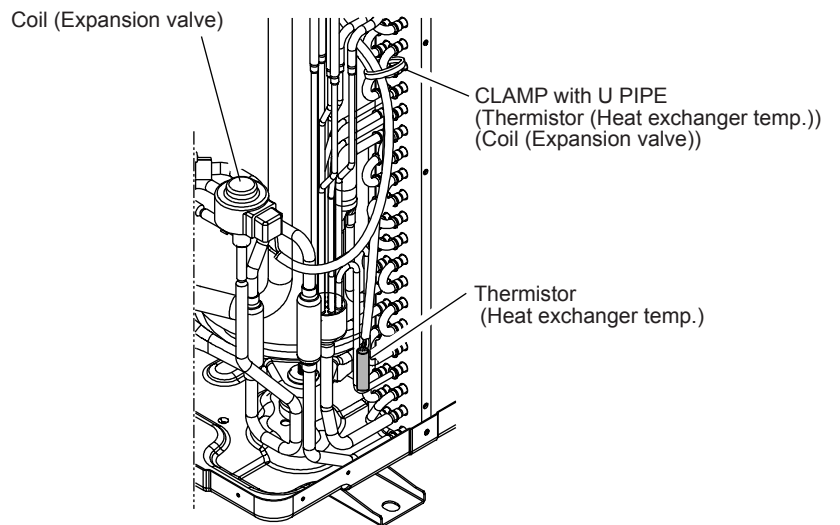
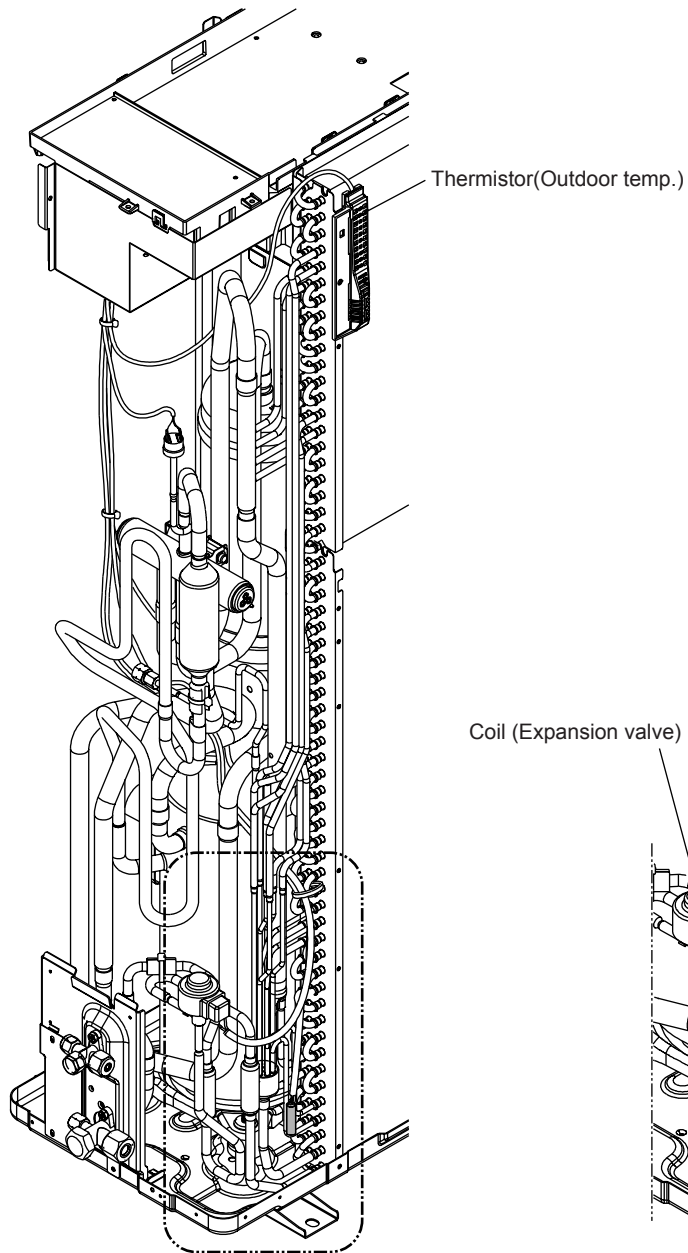




1-2-2 WIRING (For AO*45LJBYL)



ENLARGED DETAIL

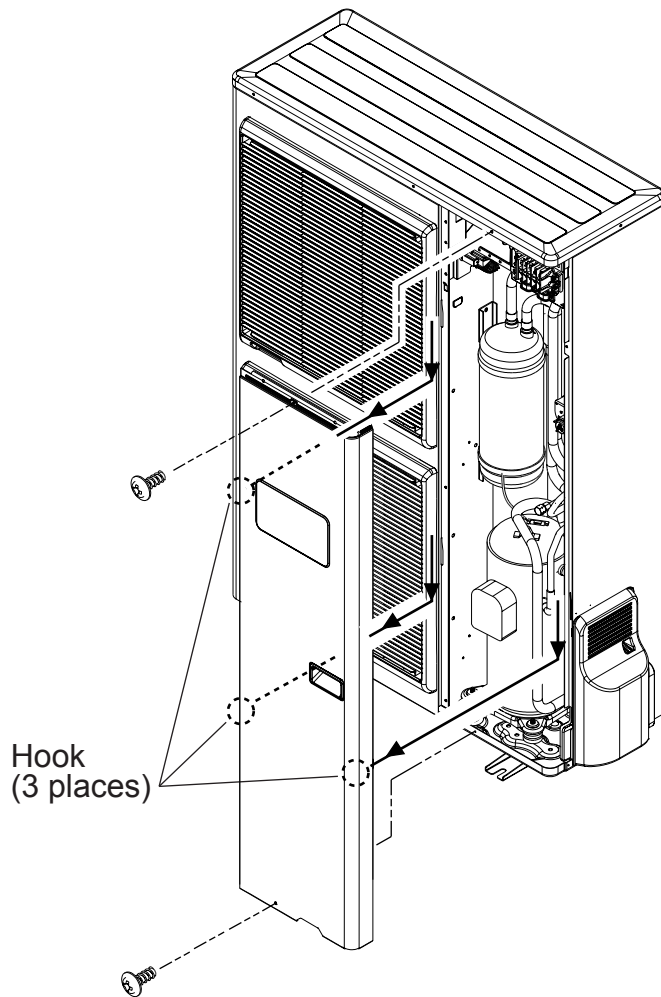


ENLARGED DETAIL

1-2-3 DISASSEMBLY PROCESS (AO*45LJBYL)

1. SERVICE PANEL removal

- Remove the 2 mounting screws.
- Remove the SERVICE PANEL by sliding downward.

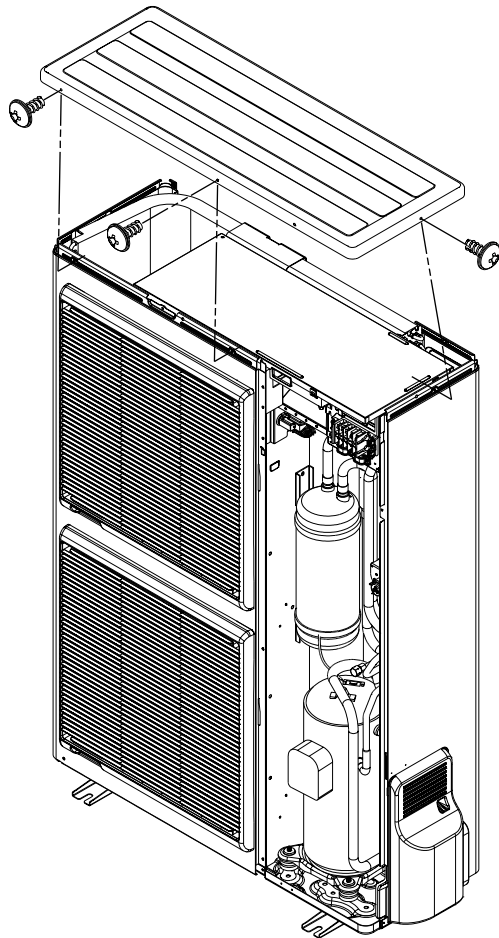


Replaceable Component

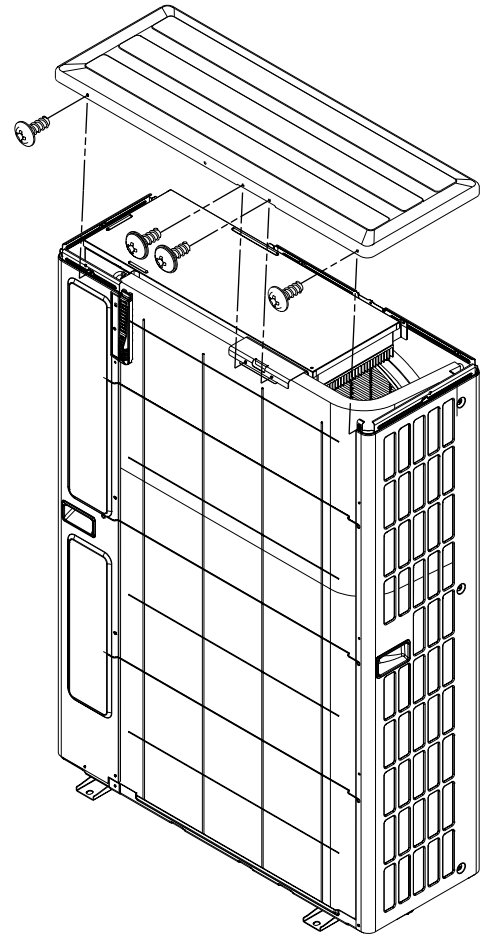
Compressor
Accumulator
4-way valve
Solenoid
Thermistor (Compressor temp.)
Thermistor (Discharge temp.)
Thermistor (Outdoor temp.)
Thermistor (Heat exchanger temp.)
Pressure SW
Coil (Expansion valve)

2. TOP PANEL removal

- Remove the 7 mounting screws.
- Remove the TOP PANEL upward.



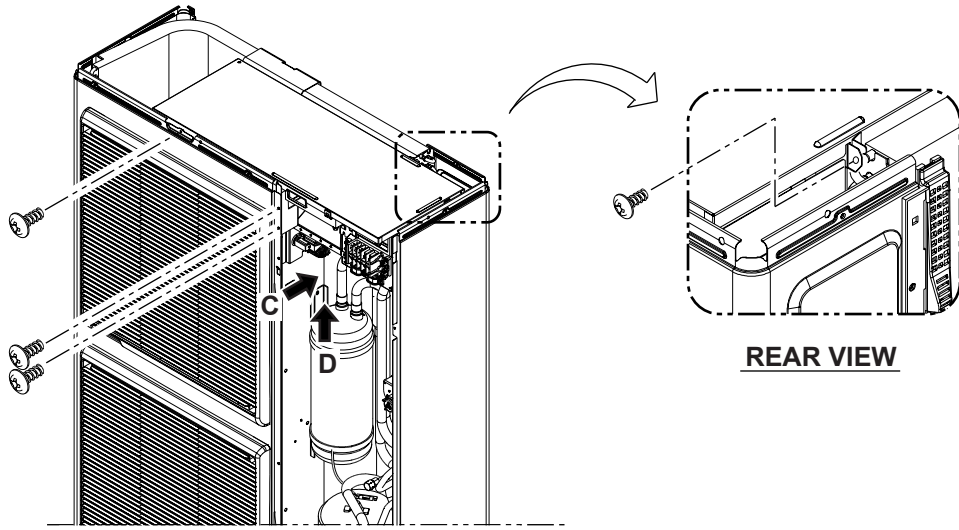
FRONT VIEW



REAR VIEW

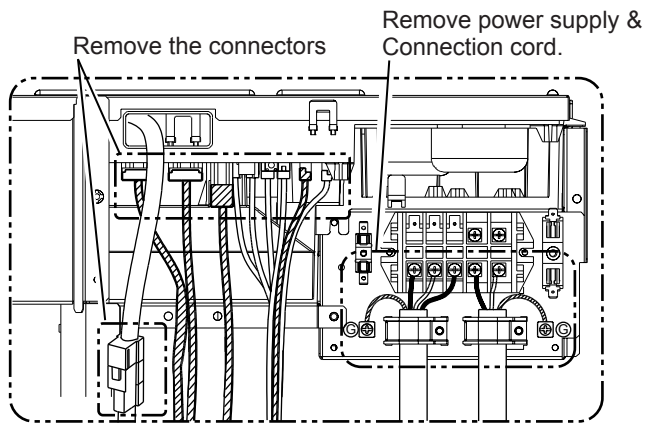
3. INVERTER BOX removal

- Remove the 4 mounting screws.
- Remove the connectors and cords. (Refer to VIEW -C,-D)
- Remove the INVERTER BOX upward.



FRONT VIEW

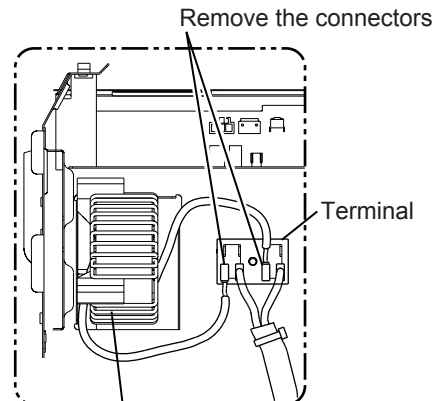
REAR VIEW



Remove the connectors

Remove power supply & Connection cord.

VIEW - C

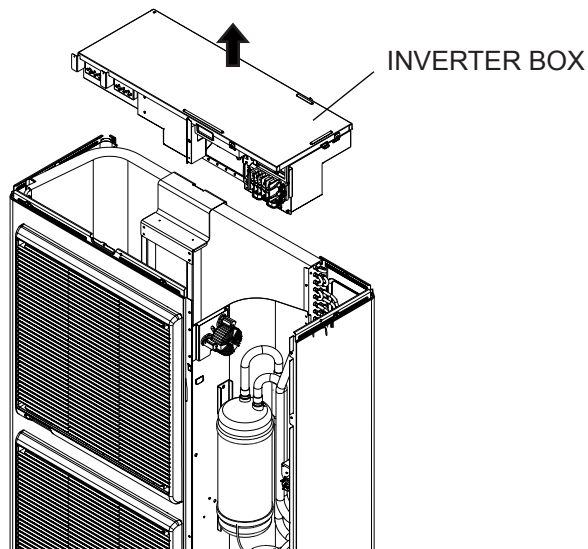


Remove the connectors

Terminal

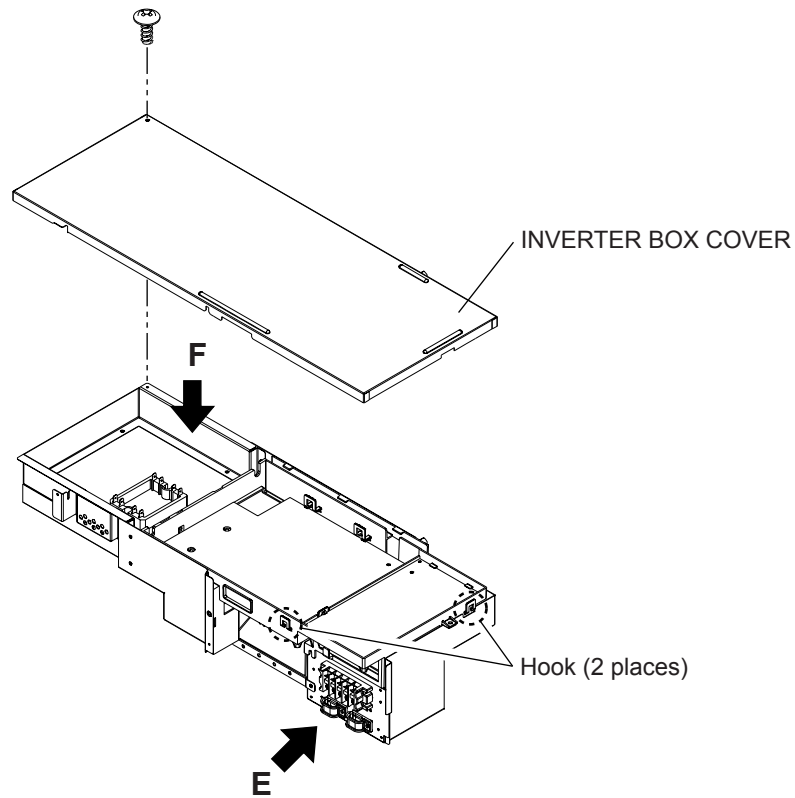
Choke coil

VIEW - D



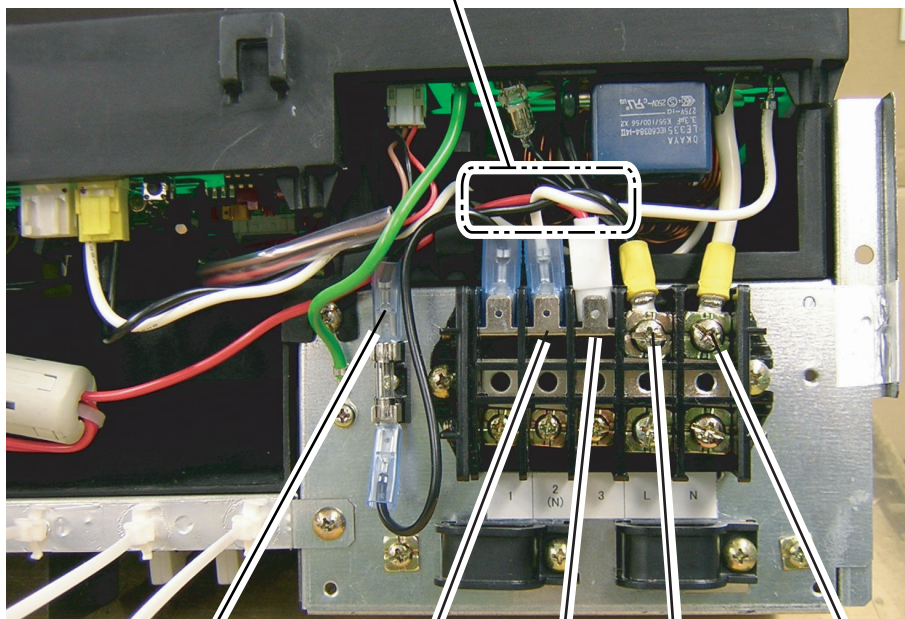
INVERTER BOX

- Remove the 1 mounting screw.
- Remove the INVERTER BOX COVER upward.



-
- Remove the connector and cords.

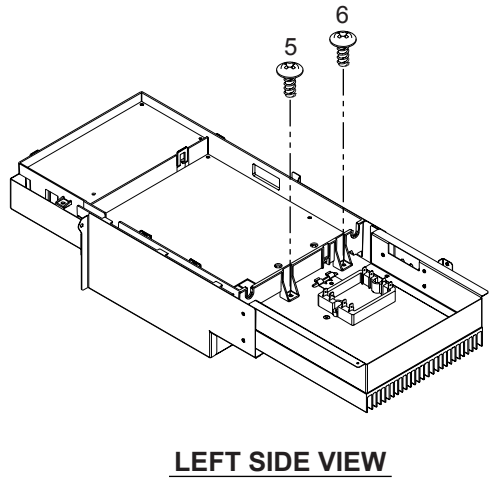
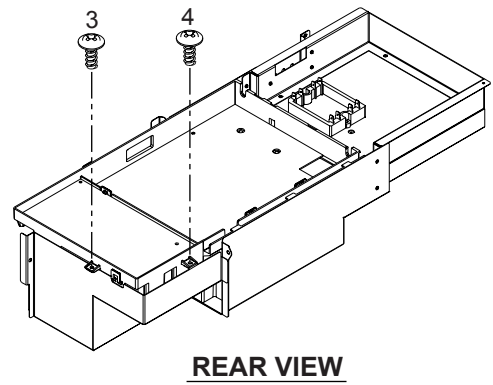
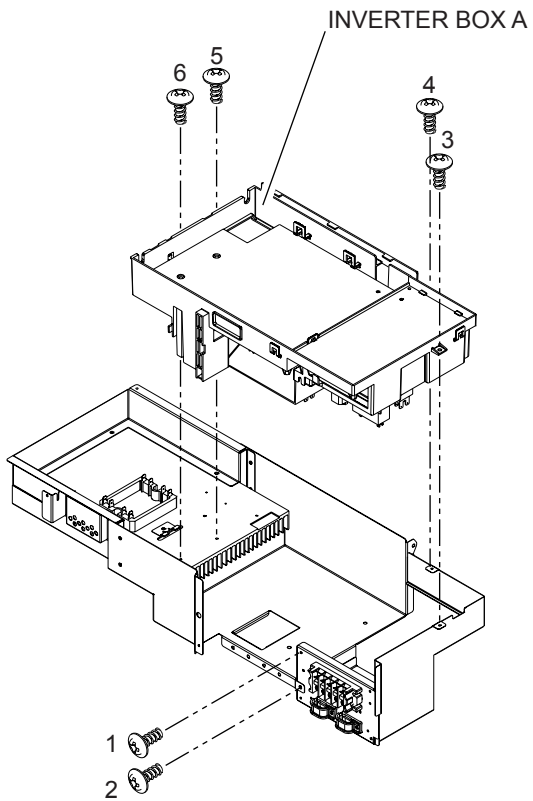
Twist W6 and W7
2 times or more.



W6 (Black) W7 (White) W200 (Red) W1 (Black) W2 (White)

VIEW - E

- Remove the 6 mounting screws.
- Remove the INVERTER BOX A upward.

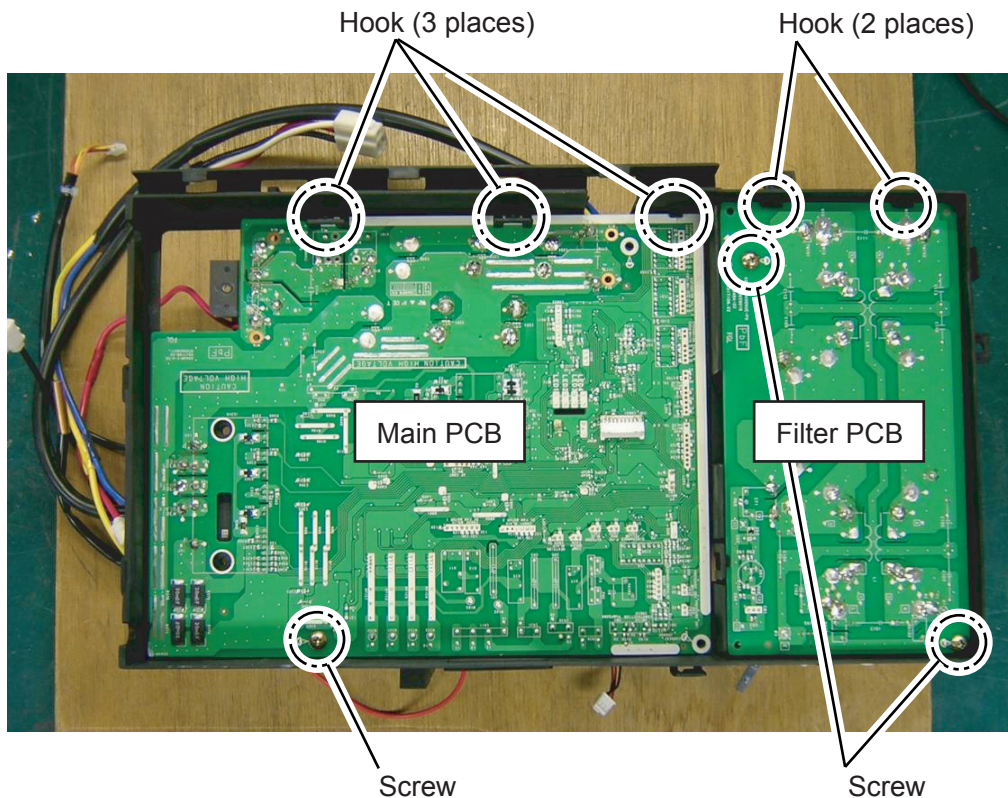


Main PCB

- Remove the 1 mounting screw.
- Remove the Main PCB upward.

Filter PCB

- Remove the 2 mounting screws.
- Remove the Filter PCB upward.



1-2-4 ASSEMBLY PROCESS of INVERTER UNIT (For AO*45LJBYL)

1. FILTER PCB

- As shown in Fig.1, assemble FILTER PCB to INVERTER BOX A.
- As shown in Fig.2, pull out the wires of FILTER PCB.

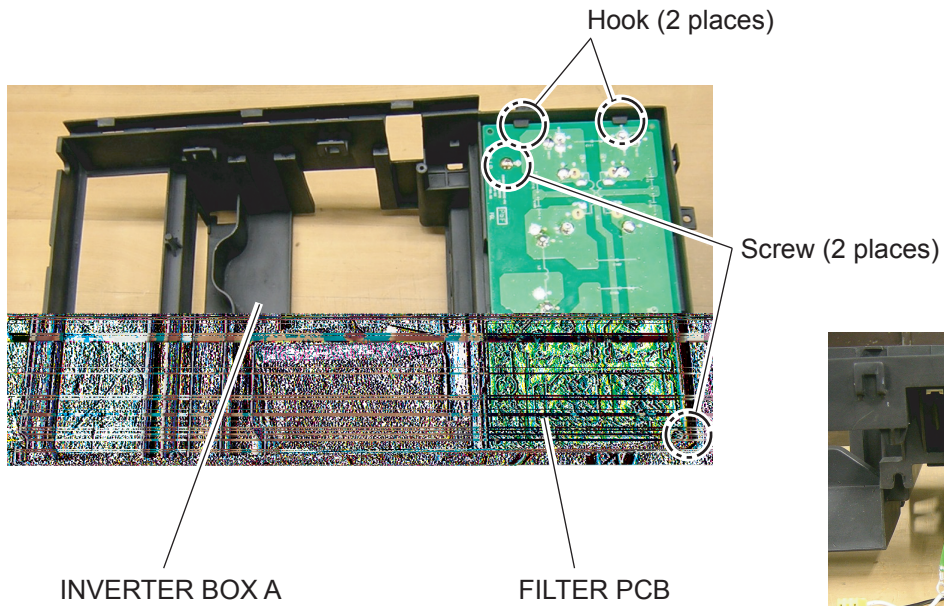
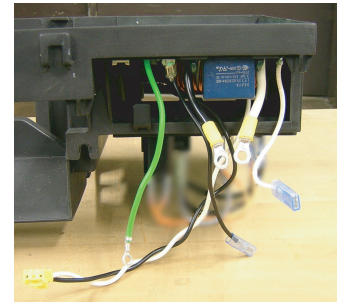
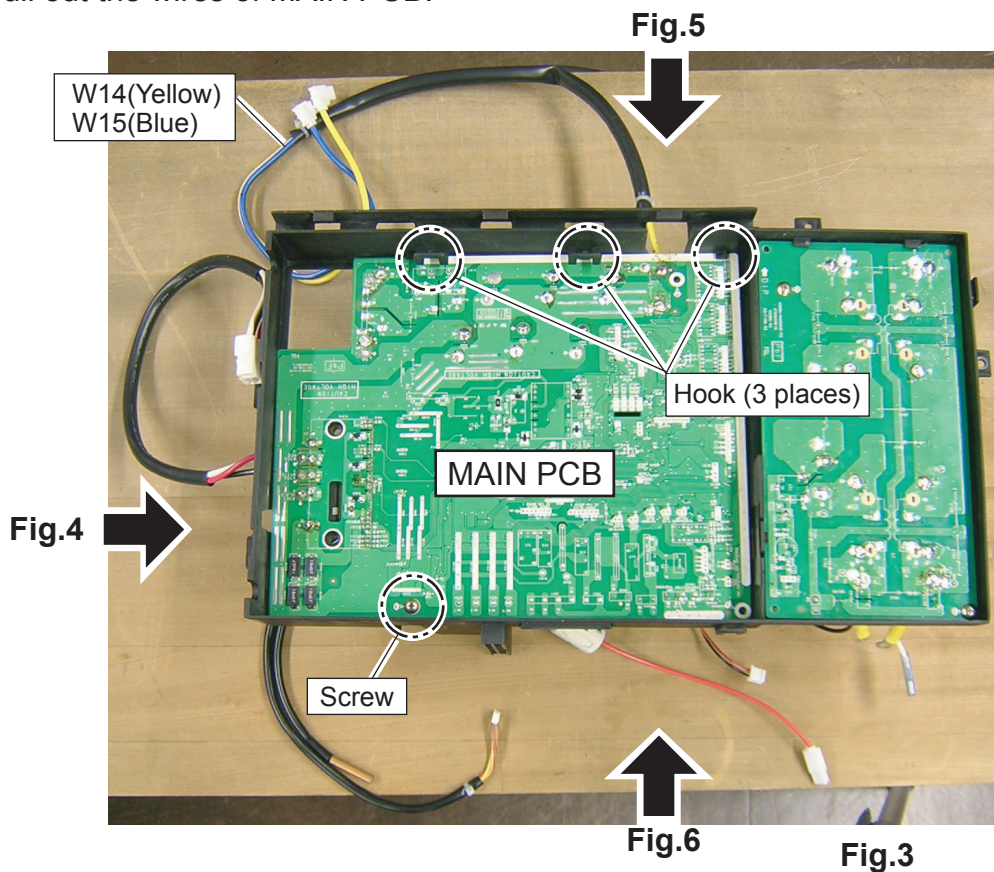


Fig.1



2. MAIN PCB

- As shown in Fig.3, temporarily fix MAIN PCB to INVERTER BOX A.
- After it is temporary fix of MAIN PCB, As shown in the Fig 4 - 6, pull out the wires of MAIN PCB.



- As shown in Fig.4, pull out the wires.

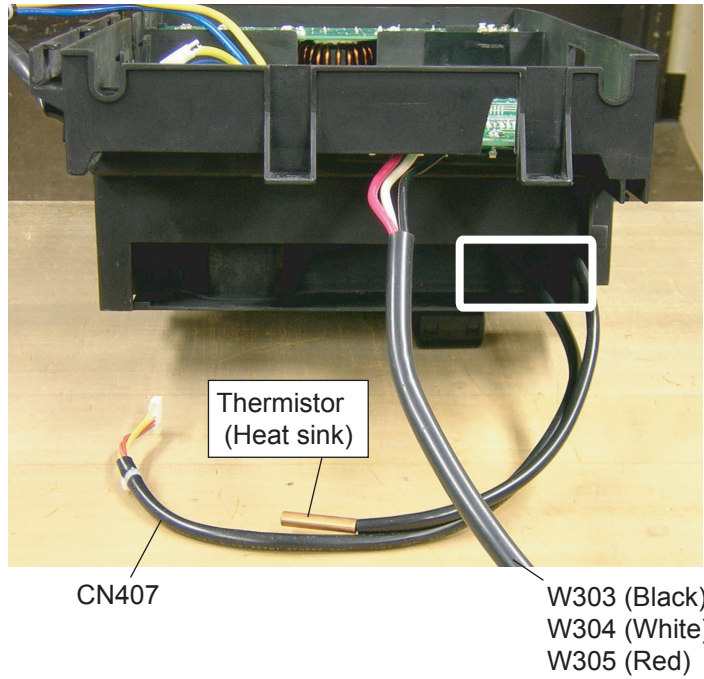


Fig. 4

- As shown in Fig.5, pull out the wires and fix them.

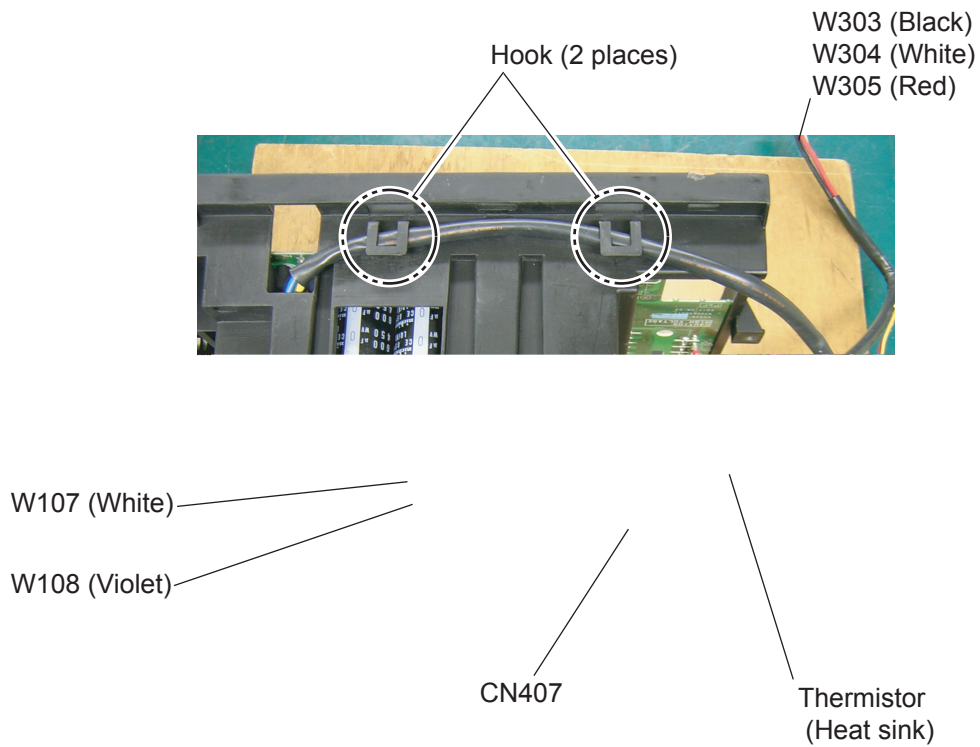
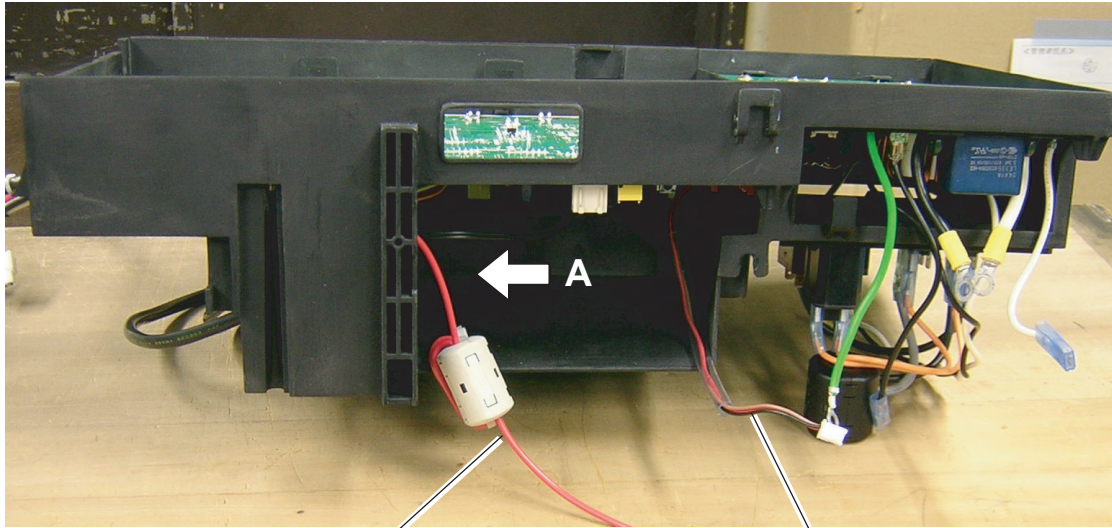


Fig. 5

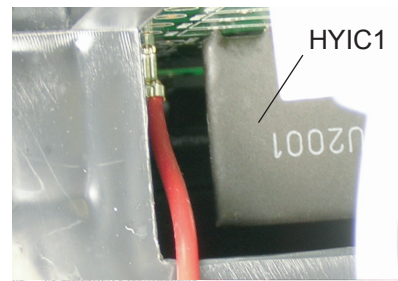
▪ As shown in Fig.6, pull out the wires.



W200 (Red)

CN1 wire with connector

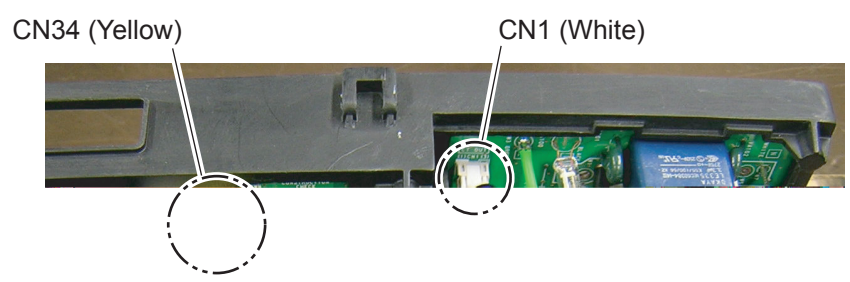
Fig. 6



Don't come in contact with HYIC1.

VIEW - A

▪ As shown in Fig.7, connect wires.



CN34 (Yellow)

CN1 (White)

Fig. 7

▪ As shown in Fig.8, connect wires.

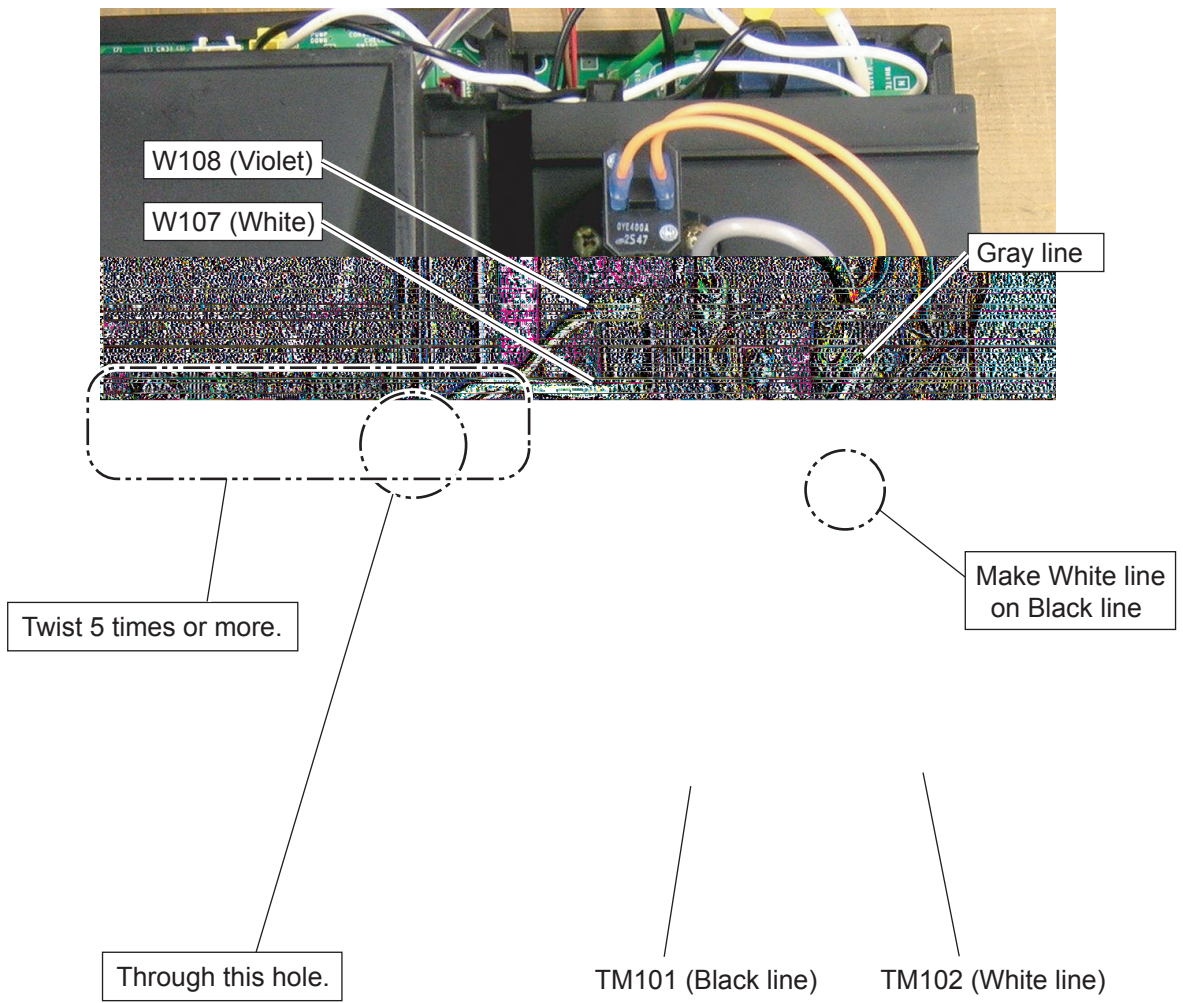


Fig. 8

- As shown in Fig.9, fix the wire to INVERTER BOX A.

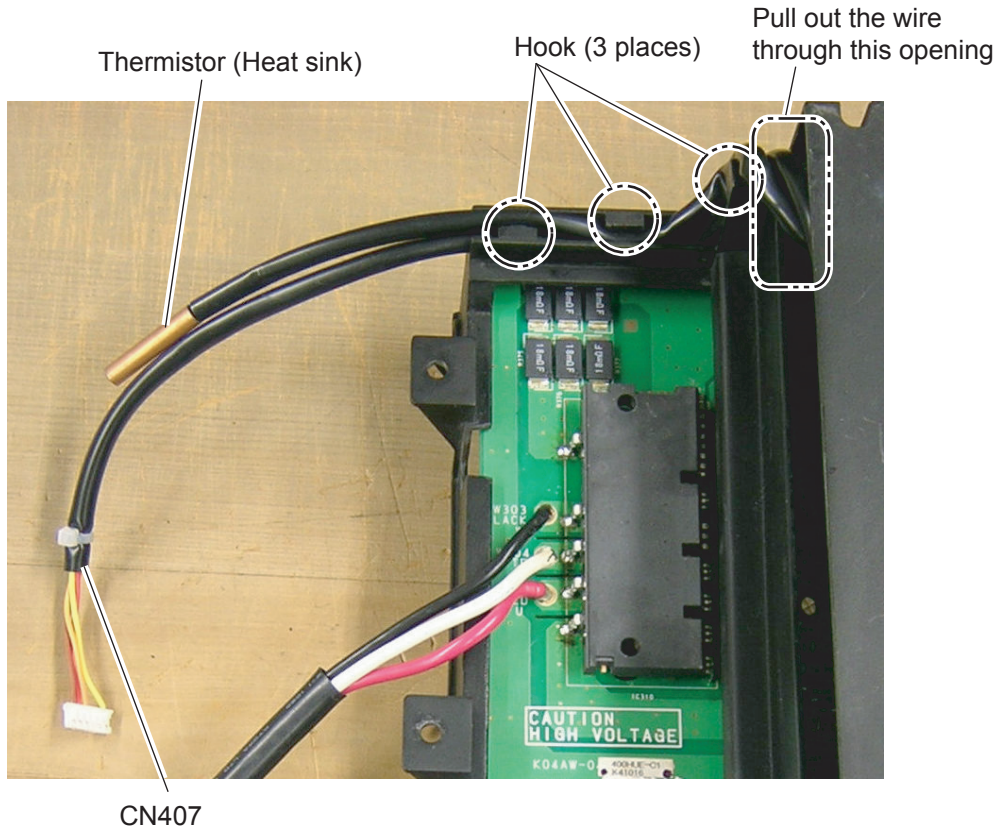


Fig. 9

- As shown in the figures, set wire with connector and bind it to INVERTER BOX A.

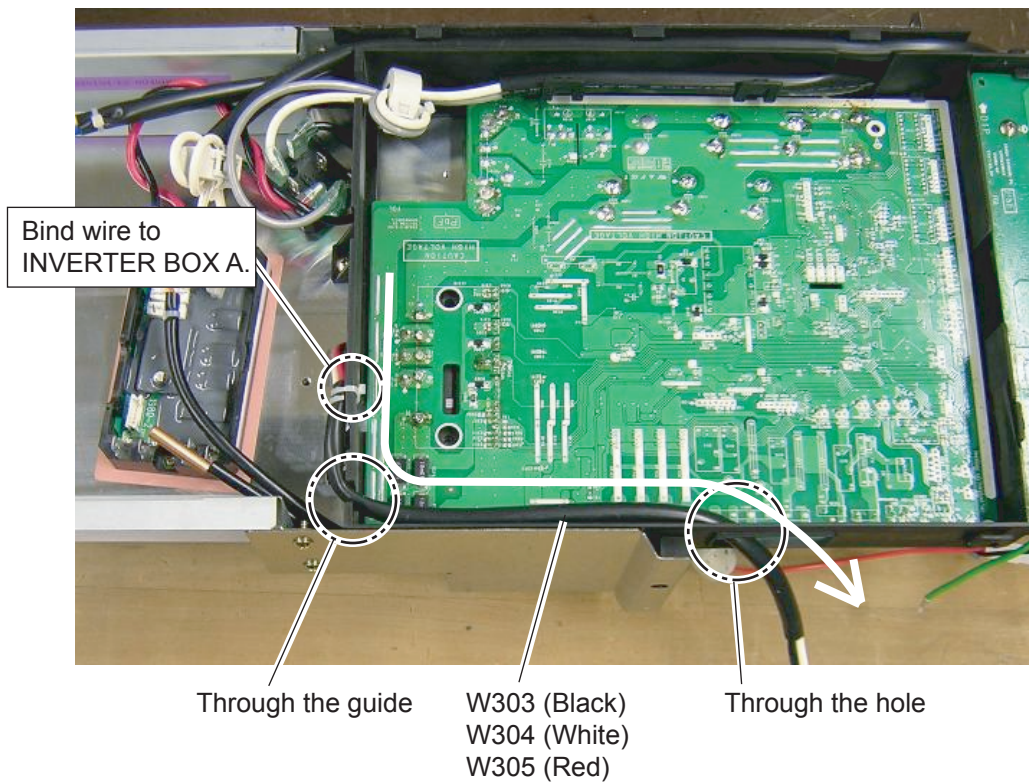
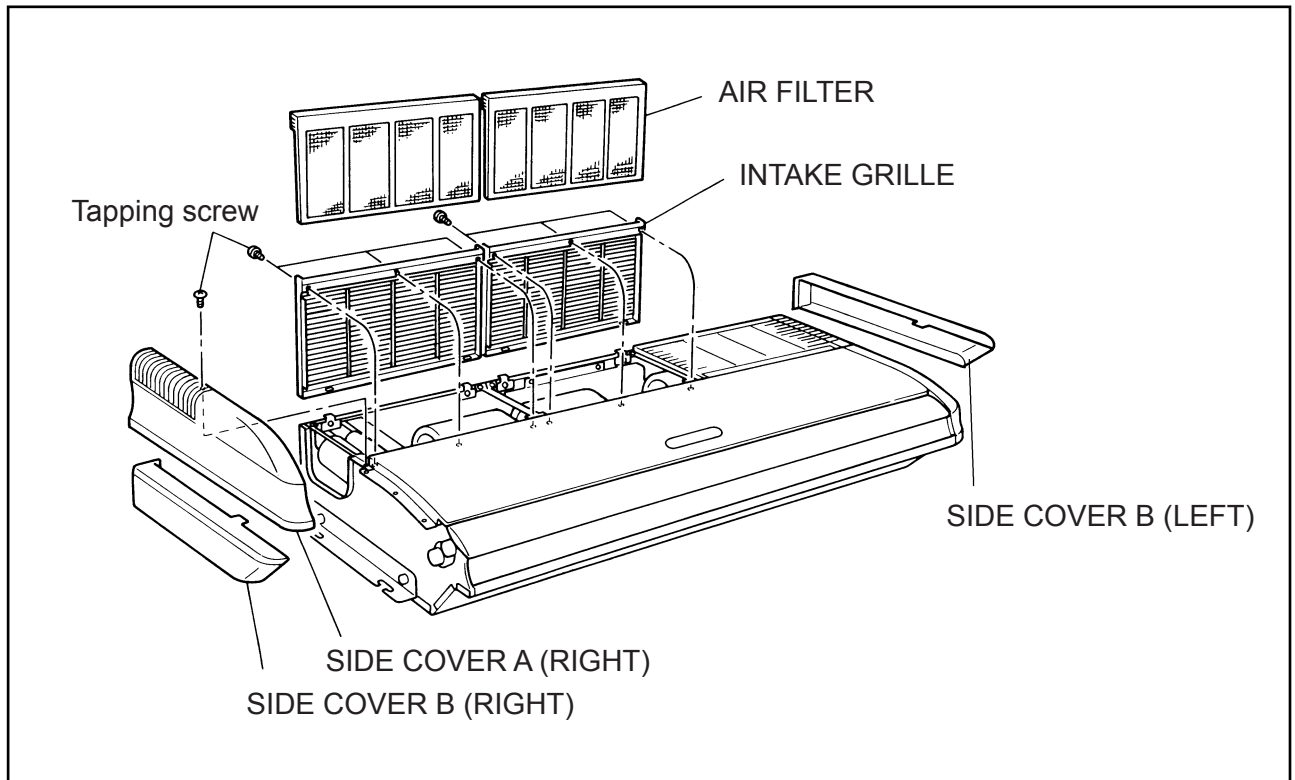


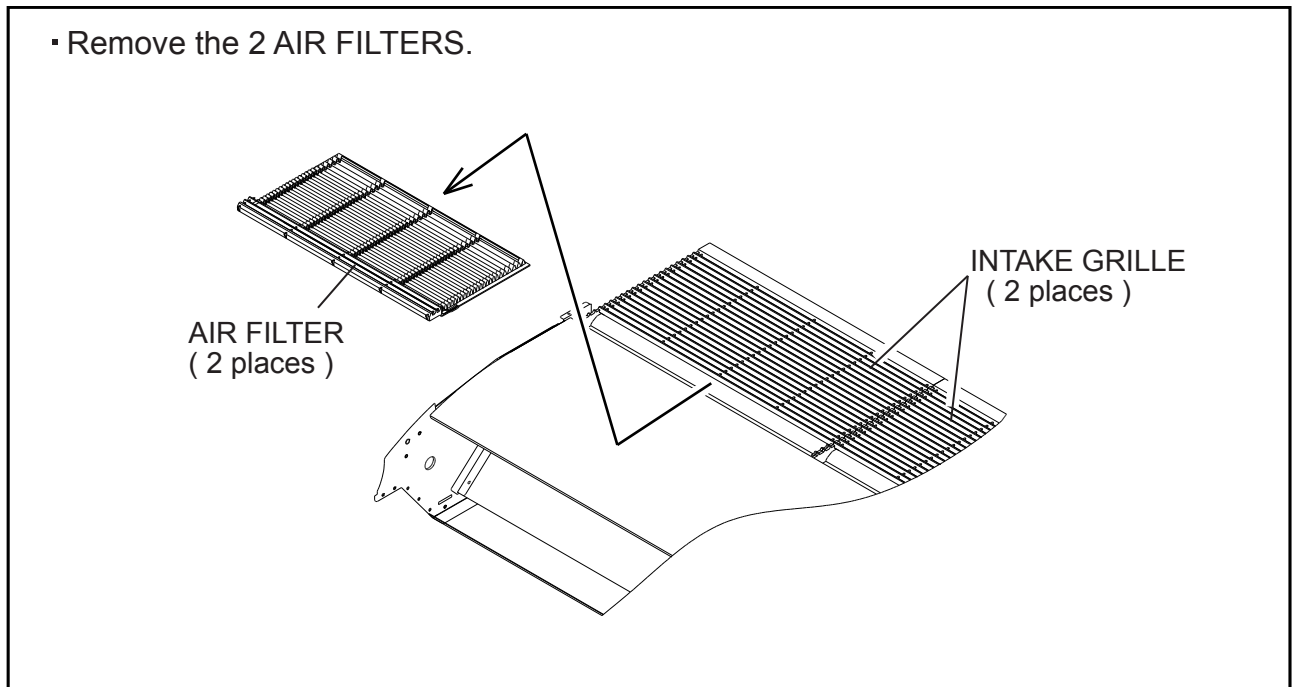
Fig. 10

2. REPLACEMENT PARTS (For INDOOR UNIT)

2-1 PARTS LAYOUT DRAWING

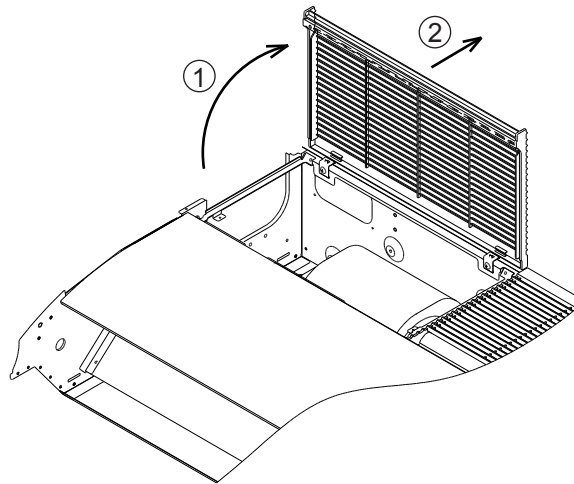
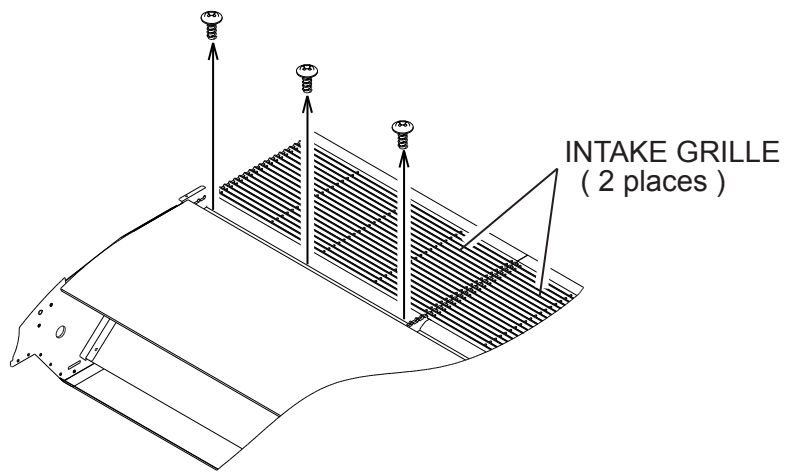


1. AIR FILTER removal



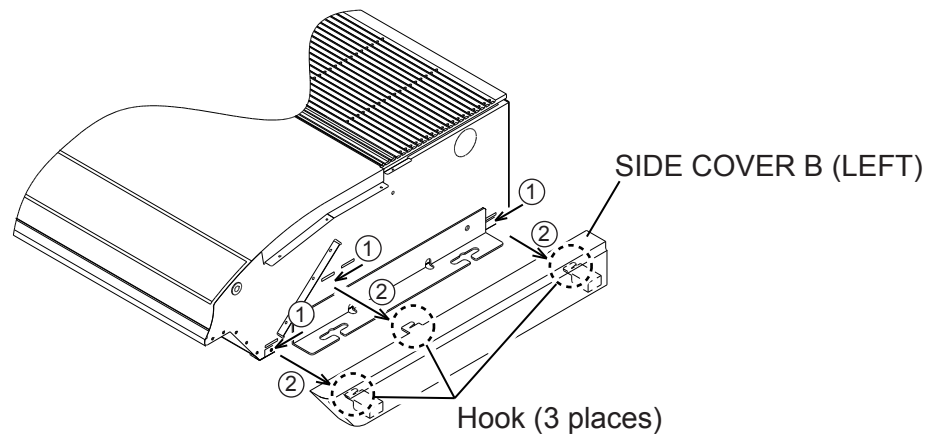
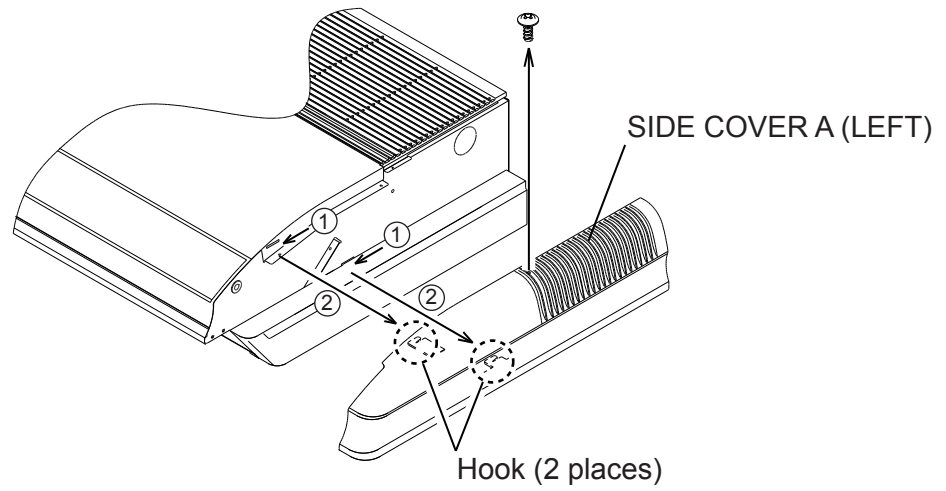
2. INTAKE GRILLE removal

- Remove the 6 mounting screws.
- Remove the 2 INTAKE GRILLES.



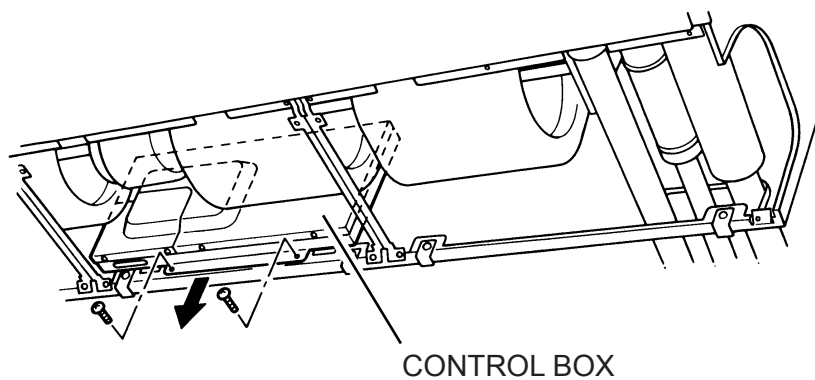
3. SIDE COVER removal

- Remove the 2 mounting screws.(Left side and Right side)
- Remove the SIDE COVER A and B.

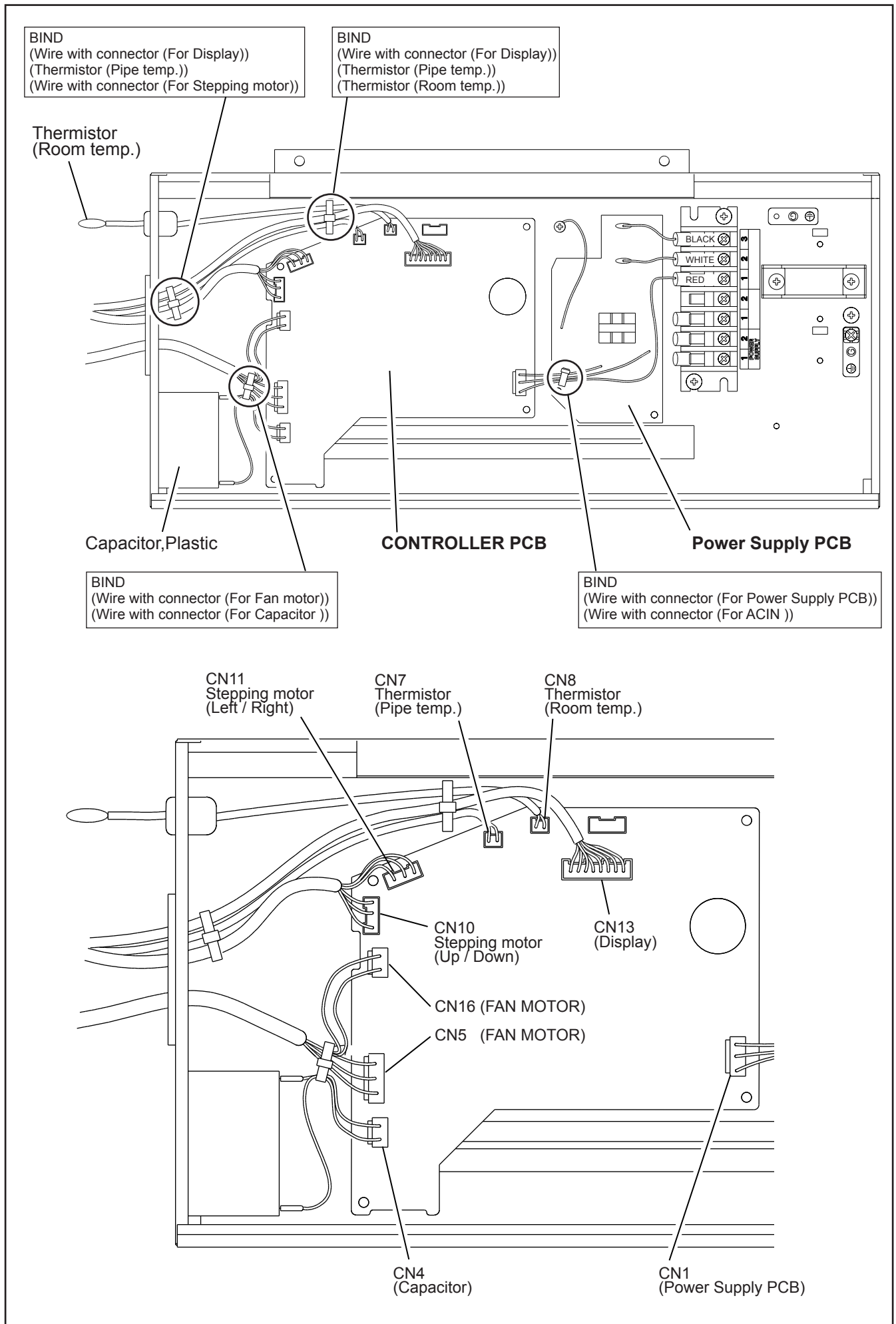


4. CONTROL BOX removal

- Remove the 2 mounting screws.
- Pull the CONTROL BOX downward.



6. Wiring and Parts layout





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