

**SPLIT TYPE
ROOM AIR CONDITIONER
WALL MOUNTED^{type}
INVERTER**

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	ASYA24LCC	AOYR24LCC
	ASYA30LCC	AOYR30LCT

Refrigerant
R410A

The model that describes in the text includes the following model.

Description model	Included model
ASYA24LCC	ASYA24LCC
AOYR24LCC	AOYR24LCC AOYR24LCL
ASYA30LCC	ASYA30LCC
AOYR30LCT	AOYR30LCT

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WALL MOUNTED type INVERTER

1 . SPECIFICATIONS

SPECIFICATIONS

MODEL NAME				ASYA24LCC AOYR24LCC	ASYA30LCC AOYR30LCT	
POWER SOURCE			PHASE	Ph	1	1
			FREQUENCY	Hz	50	50
			VOLTAGE	V	230	230
COOLING PERFORMANCE	CAPACITY		kW	7.10 (0.9~8.0)	8.00 (2.9~9.8)	
			Btu /h	24,200 (3,100~27,300)	27,300 (9,900~30,700)	
	POWER CONSUMPTION		kW	2.21 (0.11~2.62)	2.66 (0.58~3.60)	
	EER		kW /kW	3.21	3.01	
			Btu /(h.W)	11.0	10.3	
	RUNNING CURRENT		A	9.7	11.7	
	POWER FACTOR		%	99	99	
	MAXIMUM CURRENT		A	12.0	17.0	
	MOISTURE REMOVAL		L /hr	3.0	3.4	
			Pt /h	6.3	7.2	
	OPERATING NOISE (SOUND PRESSURE)	INDOOR UNIT	HI	dB	47	47
			ME	dB	41	41
			LO	dB	36	36
			QUIET	dB	32	32
OUTDOOR UNIT		dB	52	53		
HEATING PERFORMANCE	CAPACITY		kW	8.10 (0.90~10.6)	9.00 (2.2~11.0)	
			Btu /h	27,600 (3,100~36,200)	30,700 (7,500~37,500)	
	POWER CONSUMPTION		kW	2.24 (0.11~3.68)	2.64 (0.50~4.30)	
	COP		kW /kW	3.62	3.41	
			Btu /(h.W)	12.4	11.6	
	RUNNING CURRENT		A	9.8	11.6	
	POWER FACTOR		%	99	99	
	MAXIMUM CURRENT		A	17.5	19.0	
	OPERATING NOISE (SOUND PRESSURE)	INDOOR UNIT	HI	dB	45	45
			ME	dB	41	41
LO			dB	36	36	
QUIET			dB	32	32	
OUTDOOR UNIT		dB	53	55		
OTHER INDICATION	COMPRESSOR	TYPE	-	Scroll	Rotary	
		OUTPUT	W	1,200	1,700	
	AIR CIRCULATION (FAN MODE)	INDOOR UNIT	m3 /h	1,100	1,100	
			cfm	647	647	
		OUTDOOR UNIT	m3 /h	2,340	3,600	
			cfm	1,377	2,119	
	STARTING CURRENT		A	9.8	11.7	
	MAX PRESSURE	HIGH SIDE	kPa	4,120	4,120	
		LOW SIDE	kPa	1,160	1,160	
	PERMISSIBLE OUTDOOR TEMPERATURE	COOLING	°F	14~115	14~115	
°C			-10~43	-10~43		
HEATING		°F	5~75	5~75		
		°C	-15~24	-15~24		

SPECIFICATIONS

MODEL NAME				ASYA24LCC AOYR24LCC	ASYA30LCC AOYR30LCT	
INSTALLATION	CONNECTING METHOD		-	Flare	Flare	
	PIPE SIZE	LIQUID SIDE	mm	6.35	9.52	
			in.	1/4	3/8	
		GAS SIDE	mm	15.88	15.88	
			in.	5/8"	5/8"	
	STANDARD PIPE LENGTH			m	7.5	7.5
				ft.	25	25
				MAXIMUM PIPE LENGTH		
				ft.	98	164
				CHARGE LESS PIPE LENGTH		
				ft.	49	66
				AMOUNT OF ADDITIONAL CHARGE		
				oz. /ft.	3/16	7/16
				MAXIMUM HEIGHT DIFFERENCE		
			ft.	66	98	
			NUMBER OF WIRE			-
DRAIN HOSE LENGTH			mm	670	670	
			in.	26-3/8	26-3/8	
WEIGHT	NET	INDOOR UNIT	kg	14	14	
			lbs.	31	31	
		OUTDOOR UNIT	kg	44	62	
			lbs.	97	137	
	GROSS (PACKAGING WEIGHT)	INDOOR UNIT	kg	18	18	
			lbs.	40	40	
		OUTDOOR UNIT	kg	48	70	
			lbs.	106	155	
OTHER INDICATION	MAIN UNIT DIMENSIONS	INDOOR UNIT	HEIGHT	mm	320	320
				in.	12-5/8	12-5/8
			WIDTH	mm	998	998
				in.	39-1/4	39-1/4
			DEPTH	mm	228	228
				in.	9	9
		OUTDOOR UNIT	HEIGHT	mm	578	830
				in.	22-3/4	32-5/8
			WIDTH	mm	790	900
				in.	31-1/8"	35-3/8
	DEPTH	mm	315	330		
		in.	12-3/8	13		
	PACKAGE DIMENSIONS	INDOOR UNIT	HEIGHT	mm	319	319
				in.	12-1/2	12-1/2
			WIDTH	mm	1,090	1,090
				in.	42-7/8	42-7/8
			DEPTH	mm	429	429
				in.	16-7/8	16-7/8
		OUTDOOR UNIT	HEIGHT	mm	648	970
				in.	25-1/2	38-1/4
WIDTH			mm	910	1,050	
			in.	35-7/8	41-3/8	
DEPTH	mm	380	445			
	in.	15	17-1/2			
Refrigerant	KIND OF REFRIGERANT		-	R410A	R410A	
	AMOUNT OF CHARGING		kg	1.60	2.10	
			lbs.	3-1/2	4-5/8	

WALL MOUNTED type INVERTER

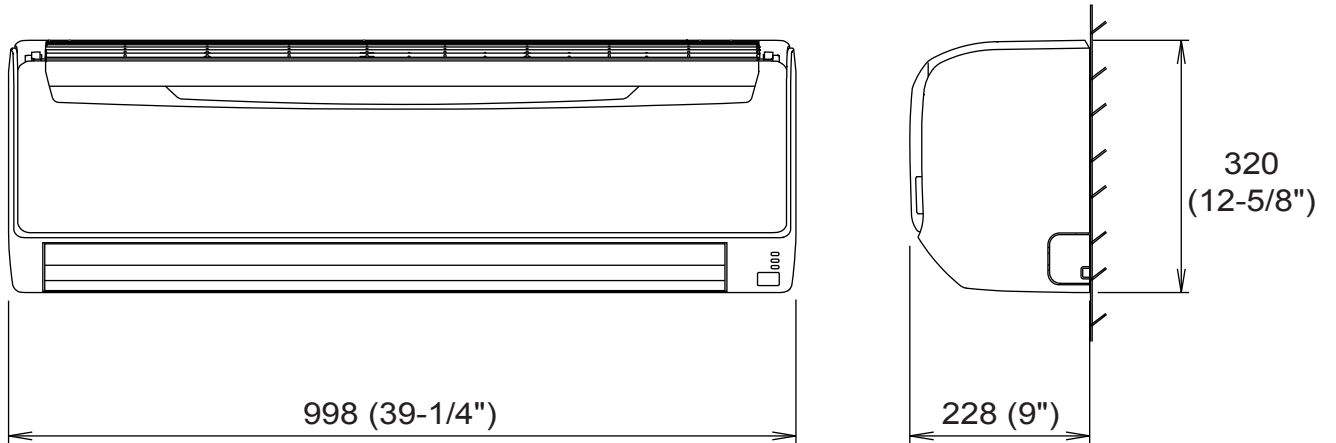
2 . DIMENSIONS

DIMENSIONS

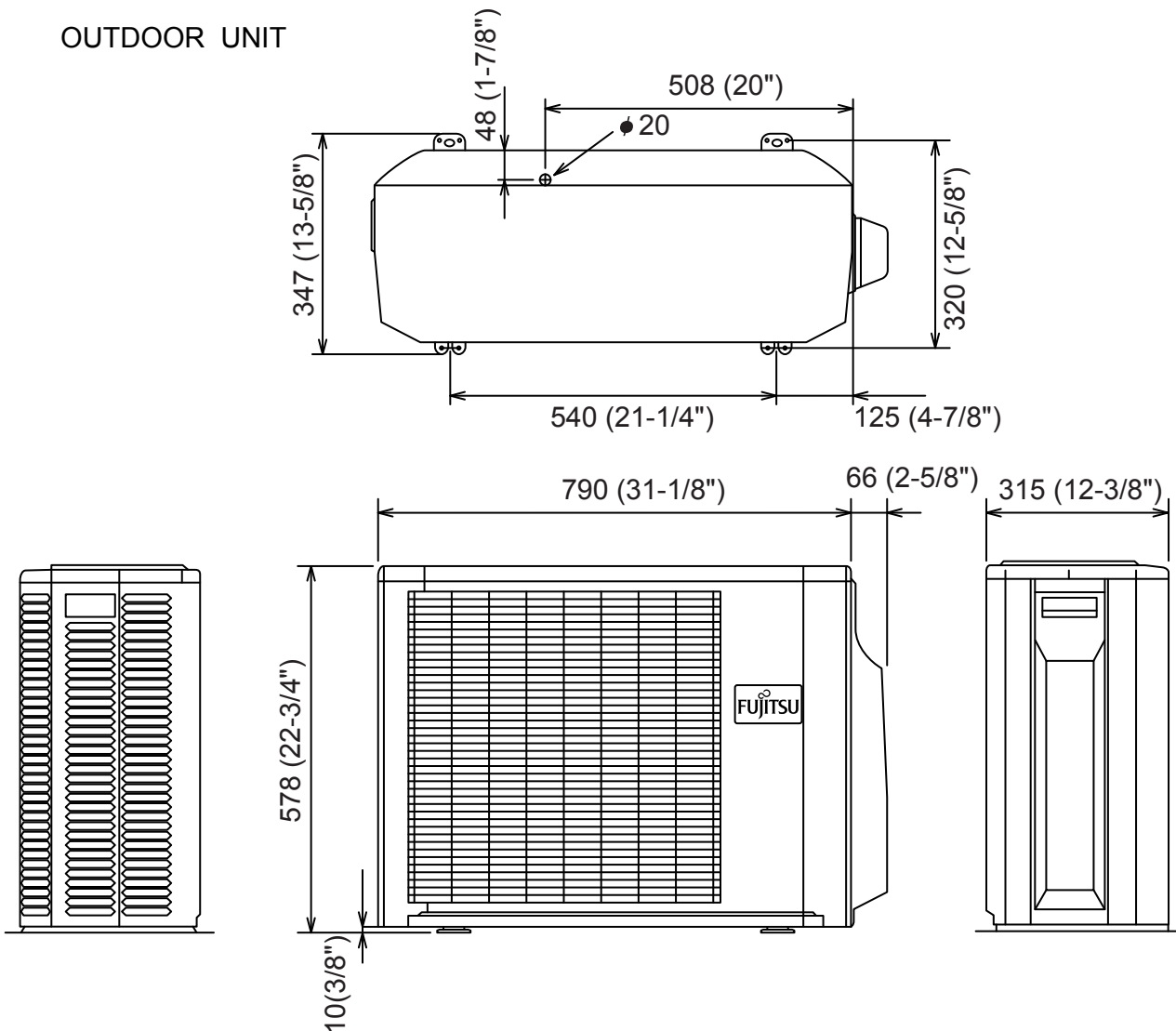
Unit : mm (inch)

Models : ASYA24LCC / AOYR24LCC

INDOOR UNIT



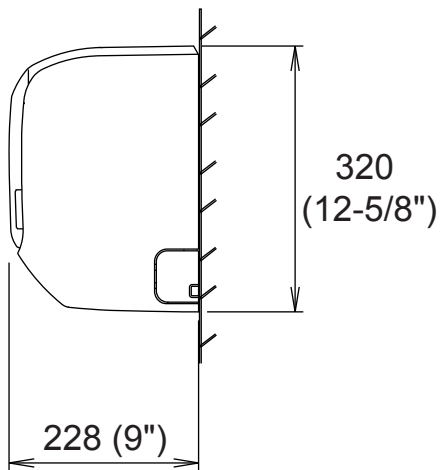
OUTDOOR UNIT



DIMENSIONS

Unit : mm (inch)

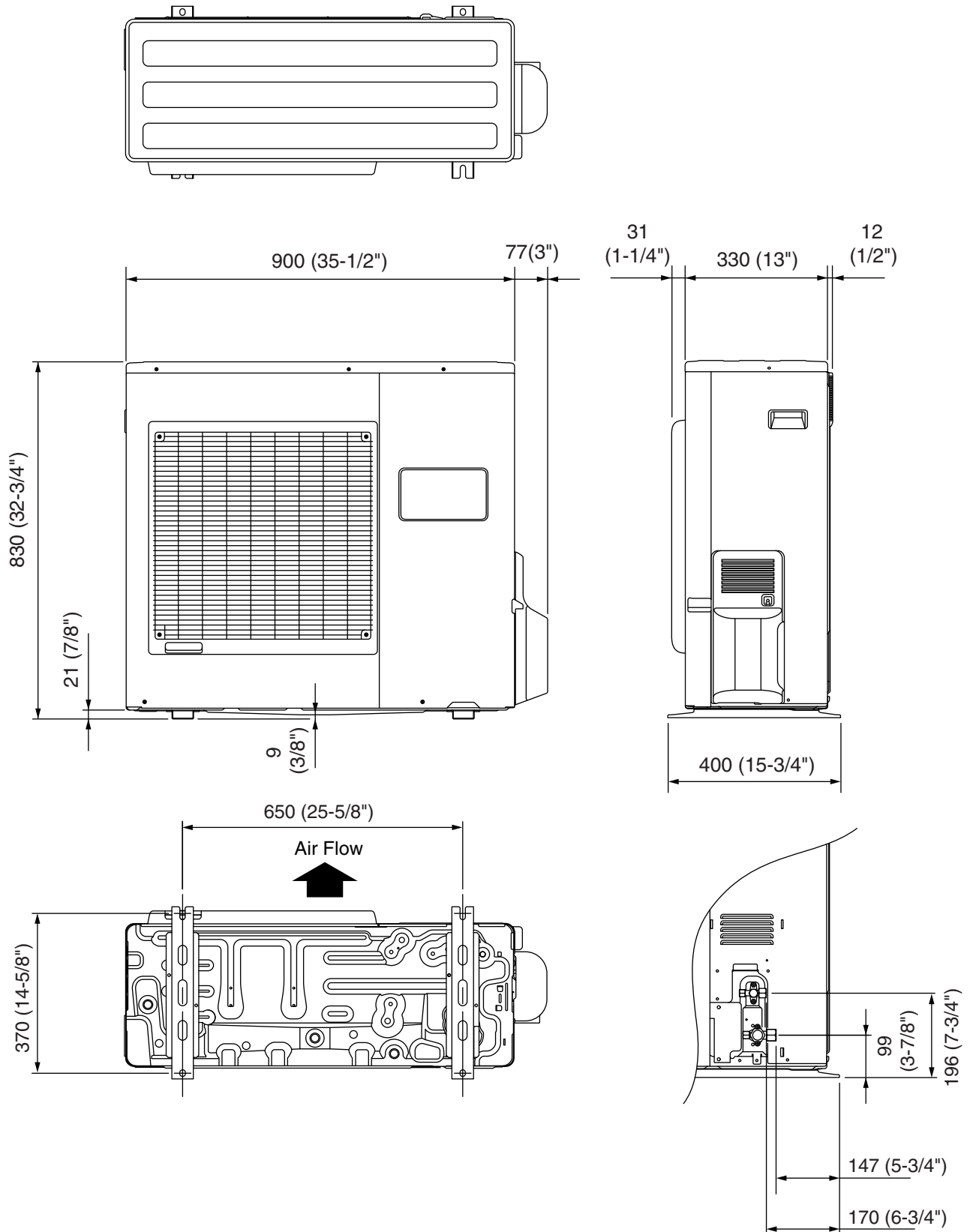
Model : ASYA30LCC



DIMENSIONS

Unit : mm (inch)

Model : AOYR30LCT

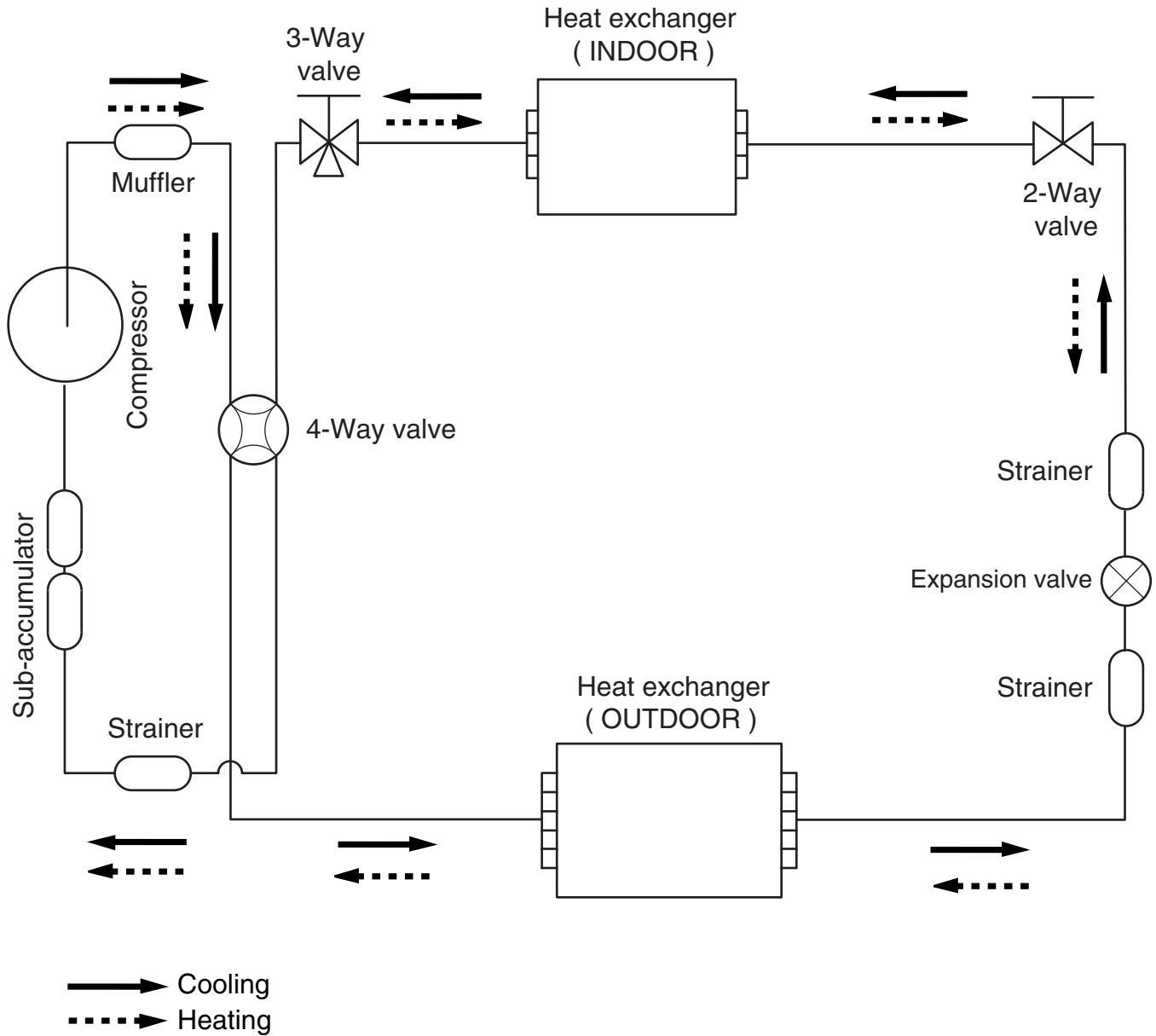


WALL MOUNTED type INVERTER

3 . REFRIGERANT SYSTEM DIAGRAM

REFRIGERANT SYSTEM DIAGRAM

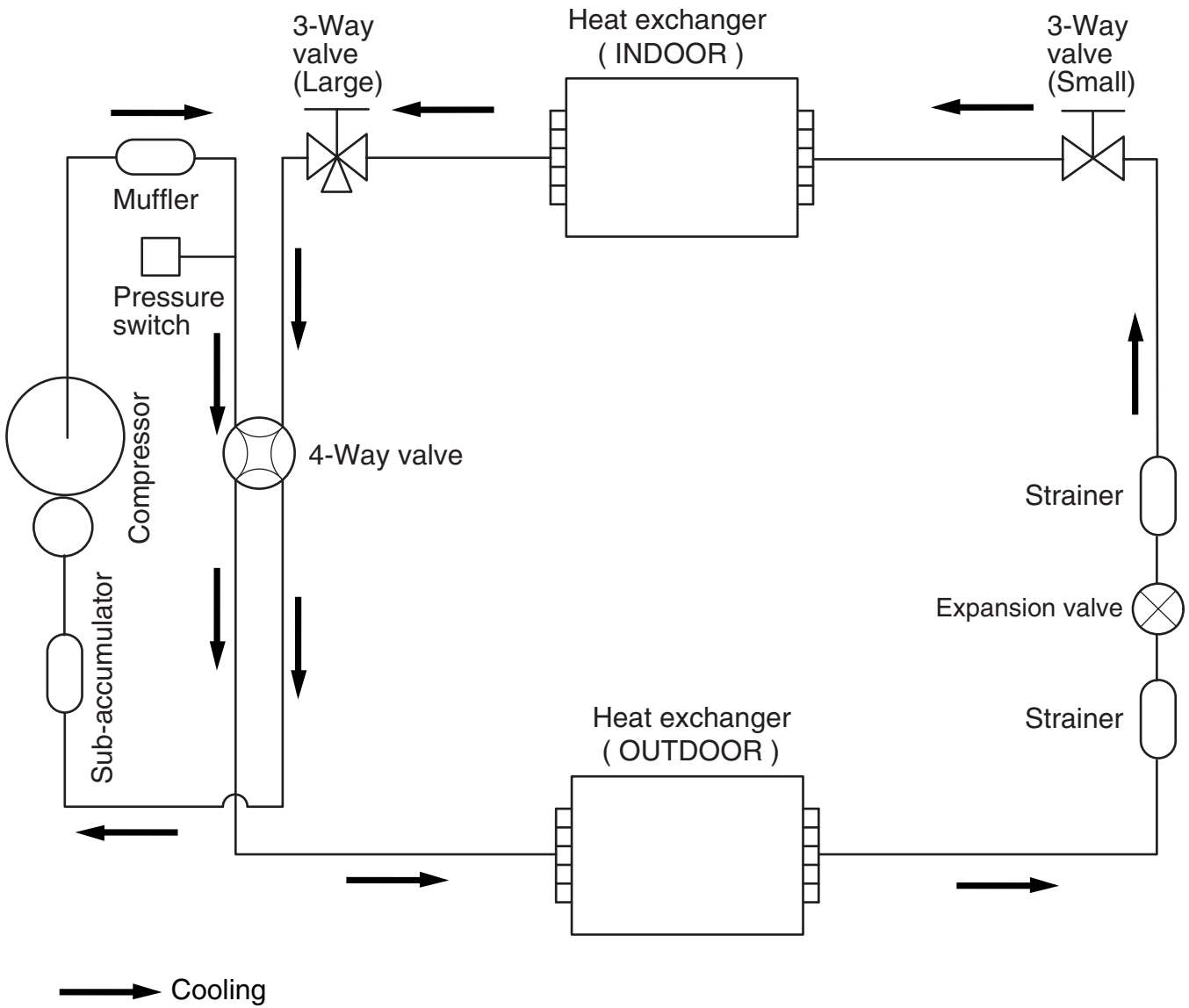
Models : ASYA24LCC / AOYR24LCC



Refrigerant pipe diameter
 Liquid : 1/4" (6.35 mm)
 Gas : 5/8" (15.88 mm)

REFRIGERANT SYSTEM DIAGRAM

Models : ASYR30LCC / AOYR30LCT



Refrigerant pipe diameter
Liquid : 3/8" (9.52 mm)
Gas : 5/8" (15.88 mm)

WALL MOUNTED type INVERTER

4 . CIRCUIT DIAGRAM

WALL MOUNTED type INVERTER

5 . DESCRIPTION OF EACH CONTROL OPERATION

1. COOLING OPERATION

1-1 COOLING CAPACITY CONTROL

A sensor (room temperature thermistor) built in the indoor unit body 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°C higher than a set temperature, the compressor operation frequency will attain to maximum performance.

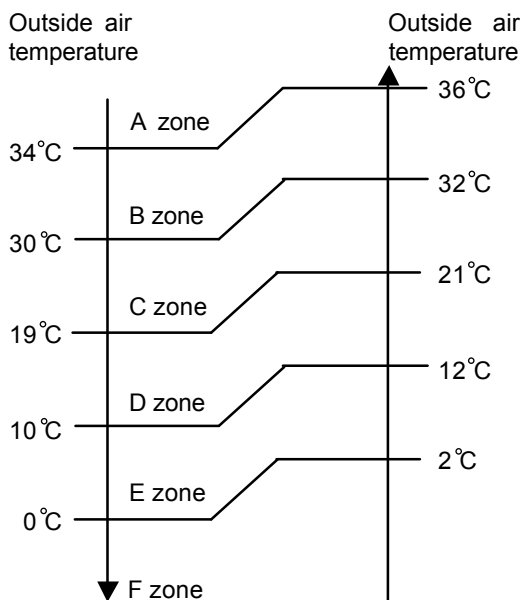
* If the room temperature is 2.5°C lower than a set temperature, the compressor will be stopped.

* When the room temperature is between +2°C to -2.5°C of the setting temperature, the compressor frequency is controlled within the range shown in Table 1. 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 II	maximum frequency I
ASYA24LCC	15Hz	115Hz	80Hz
ASYA30LCC	21Hz	94Hz	67Hz

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



		Hi	Me	Lo	Quiet
24LCC	A zone	115Hz	66Hz	54Hz	34Hz
	B zone	115Hz	66Hz	54Hz	34Hz
	C zone	115Hz	66Hz	54Hz	34Hz
	D zone	58Hz	45Hz	38Hz	24Hz
	E zone	58Hz	45Hz	38Hz	24Hz
	F zone	58Hz	45Hz	38Hz	24Hz
30LCC	A zone	94Hz	64Hz	54Hz	39Hz
	B zone	94Hz	64Hz	54Hz	39Hz
	C zone	73Hz	54Hz	48Hz	39Hz
	D zone	54Hz	48Hz	42Hz	30Hz
	E zone	54Hz	48Hz	42Hz	30Hz
	F zone	54Hz	48Hz	42Hz	30Hz

When the compressor operates for 30 minutes continuously at over the maximum frequency II, the maximum frequency is changed from Maximum Frequency II to Maximum Frequency I. The room temperature is controlled 1°C lower than the setting temperature for 40 minutes after starting the operation.

After 40 minutes, it is controlled based on the normal setting temperature.

2. HEATING OPERATION

2-1 HEATING CAPACITY CONTROL

A sensor (room temperature thermistor) built in the indoor unit body 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 by 3°C than a set temperature, the compressor operation frequency will attain to maximum performance.

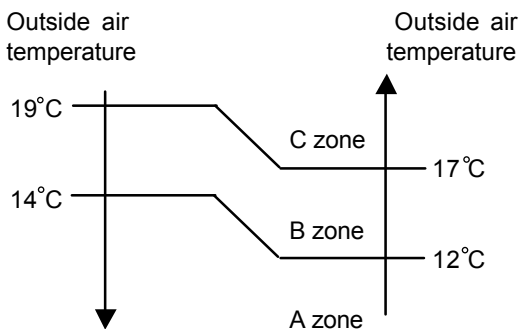
* If the room temperature is higher 2.5°C than a set temperature, the compressor will be stopped.

* When the room temperature is between +2°C to -3°C 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 fan speed mode and the outdoor temperature.

(Table 2 : Compressor Frequency Range)

	minimum frequency	maximum frequency
ASYA24LCC	15Hz	130Hz
ASYA30LCC	21Hz	120Hz

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



		Hi	Me+	Me	Lo	Quiet
24LCC	A zone	130Hz	130Hz	101Hz	75Hz	62Hz
	B zone	130Hz	130Hz	101Hz	75Hz	62Hz
	C zone	130Hz	130Hz	101Hz	57Hz	62Hz
30LCC	A zone	120Hz	120Hz	73Hz	54Hz	39Hz
	B zone	120Hz	120Hz	73Hz	54Hz	45Hz
	C zone	120Hz	120Hz	73Hz	54Hz	45Hz

* The room temperature is controlled 2°C higher than the setting temperature for 60 minutes after starting the operation.

After 60 minutes, it is controlled based on the normal setting temperature.

3. DRY OPERATION

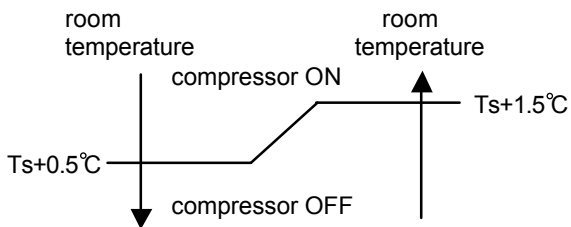
3-1 INDOOR UNIT CONTROL

The compressor rotation frequency shall change according to the temperature, set temperature, and room temperature variation which the room temperature sensor of the indoor unit body has detected as shown in the Table 3. However, after the compressor is driven, the indoor unit shall run at operation frequency of 58Hz, for a minute.

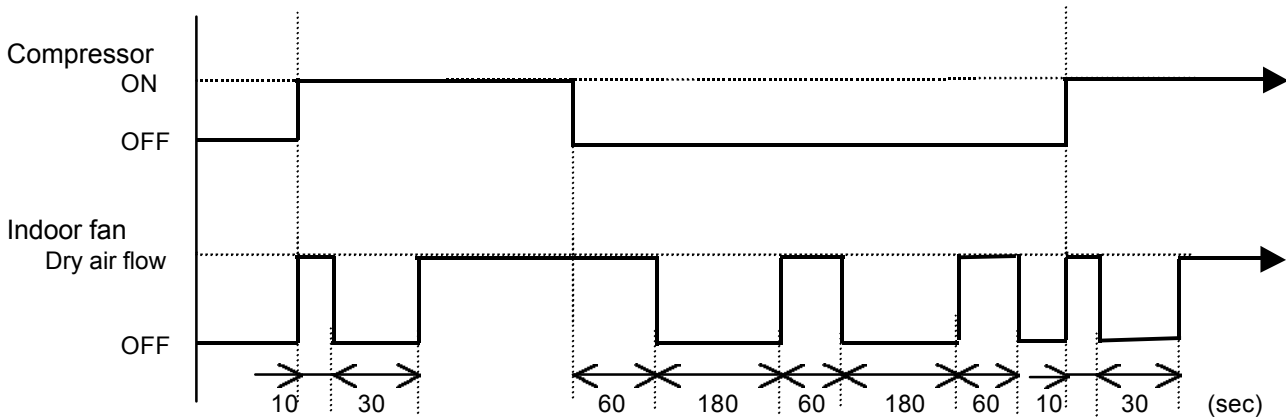
(Table 3 : Compressor frequency)

	Operating frequency
ASYA24LCC	34Hz
ASYA30LCC	39Hz

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



(Fig.4 : Indoor Fan Control)

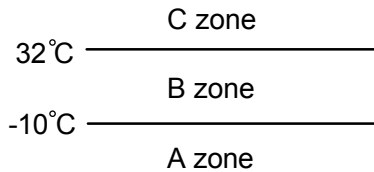


4. AUTO CHANGEOVER OPERATION

When the air conditioner is set to the AUTO mode by remote control, operation starts in the optimum mode from among the HEATING, COOLING, DRY 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°C steps.

- ①. When operation starts, only the indoor and outdoor fans are operated for 1 minute. After 1 minute, the room temperature and outside air temperature are sensed and the operation mode is selected in accordance with the table below.

(Fig.5 : Outside air temperature zone selection)



(Table.4 Operation mode selection table)

Room temperature(TB) \ Outside air temperature (TO)	A zone	B zone	C zone
$TB > TS + 2^{\circ}\text{C}$	Monitoring	Cooling (automatic dry)	Cooling (automatic dry)
$TS + 2^{\circ}\text{C} \geq TB \geq TS - 2^{\circ}\text{C}$	Monitoring	Monitoring	Monitoring
$TB < TS - 2^{\circ}\text{C}$	Heating	Heating	Monitoring

- ②. When COOLING was selected at ①, the air conditioner operates as follows:
- The same operation as COOLING OPERATION of item 1 above is performed.
 - When the room temperature has remained at (set temperature -1°C for 8 minutes, operation is automatically switched to DRY and the same operation as DRY OPERATION of item 3 above is performed.
 - If the room temperature reaches (set temperature +2°C during DRY operation, operation returns to COOLING operation.
- ③. When HEATING was selected at ①, the same operation as HEATING OPERATION of item 2 above 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. INDOOR FAN CONTROL

(1).Fan speed

(Table 5 : Indoor Fan Speed)

ASYA24LCC		
Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1,310
	Me+	1,220
	Me	1,120
	Lo	940
	Quiet	830
	Cool air prevention	650
	S-Lo	250
Cooling Fan	Hi	1,310
	Me	1,120
	Lo	940
	Quiet	830
Dry		830

ASYA30LCC		
Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1,330
	Me+	1,220
	Me	1,120
	Lo	940
	Quiet	830
	Cool air prevention	650
	S-Lo	250
Cooling Fan	Hi	1,330
	Me	1,120
	Lo	940
	Quiet	830
Dry		830

(2).FAN OPERATION

The airflow can be switched in 5 steps such as AUTO, QUIET, LOW, MED, HIGH, while the indoor fan only runs.

When Fan mode is set at (Auto), it operates on (MED) Fan Speed.

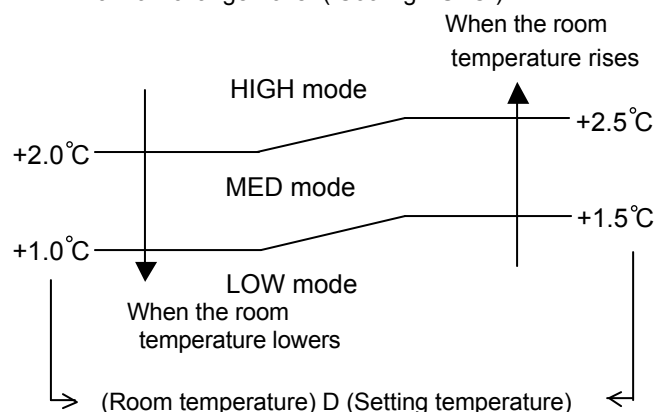
(3).COOLING OPERATION

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure 6.

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

(Fig.6)

airflow change - over (Cooling: AUTO)

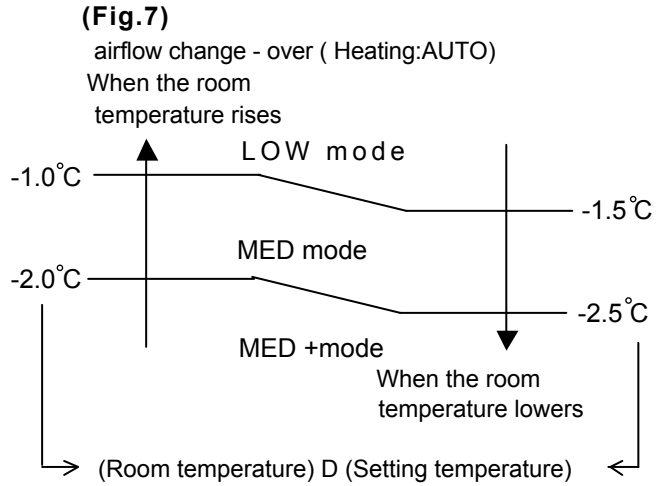


(4). DRY OPERATION

Refer to the table 4.
 During the dry mode operation, the fan speed setting can not be changed.

(5). HEATING OPERATION

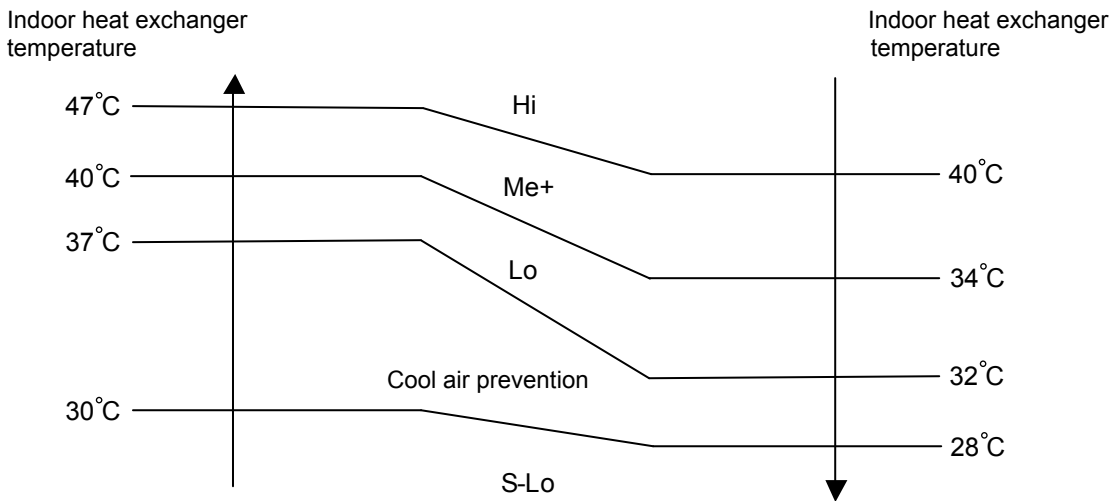
Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure 7.
 On the other hand, if switched [HIGH] ~ [QUIET], the indoor motor will run at a constant airflow of [HEAT] operation modes QUIET, LOW, MED, HIGH, as shown in Table 5.



(6). COOL AIR PREVENTION CONTROL (Heating mode)

The maximum value of the indoor fan speed is set as shown in Figure 8, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

(Fig.8 : Cool Air Prevention Control)



6. OUTDOOR FAN CONTROL

(1). Fan speed

Table 6 : Fan speed (Cooling, Dry)

	Outdoor temperature	Cooling	Dry
ASYA24LCC	Over than 12°C	950/820/670/500rpm	550rpm
	Less than 12°C	400/280/230rpm	400/280/230rpm
ASYA30LCC	Over than 12°C	850/780/700/500rpm	550/450rpm
	Less than 12°C	500/320/250/200rpm	500/320/250/200rpm

Table 7 : Fan speed (Heating)

	Heating
ASYA24LCC	1100/1000/730/670/550/450rpm
ASYA30LCC	900/780/700/550/450rpm

* The outdoor fan speed is changed in the range of the speed shown in the above table, based on the frequency of the compressor.

(When the compressor frequency increases, the outdoor fan speed is also changed to higher speed. If the compressor frequency decreases, the outdoor fan speed is changed to the lower speed as well.)

After starting up the outdoor fan, it operates with the following speed for initial 20 seconds.

Table 8 : Fan speed when starting up Outdoor fan

	Outdoor temperature	Speed
ASYA24LCC	Over than 12°C	500rpm
	Less than 12°C	200rpm
ASYA30LCC	Over than 12°C	500rpm
	Less than 12°C	200rpm

* After operating the defrost control function on heating mode, its speed becomes 1,000rpm regardless of the compressor frequency.

However, it returns to the normal speed control when the defrosting operation does not function for 240 minutes after releasing the defrost operation or when the outdoor temperature sensor detection value becomes higher than 5°C.

7. LOUVER CONTROL

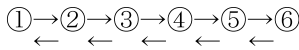
(1). LOUVER CONTROL

When the indoor control interface device receives a control signal light from the remote control, it will actuate, the step motor according to the control signal, and set the louver to each position. In addition, if the air conditioner is stopped, vertical louver will be closed automatically.

Vertical Air Direction Adjustment

(Function Range)

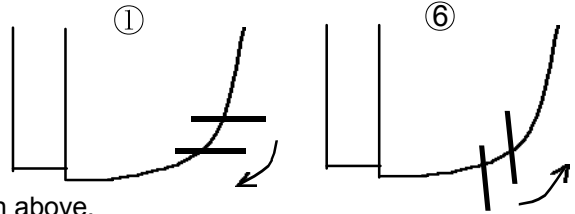
Each time the button is pressed, the air direction range will change as follow:



(Fig 9: Air Direction Range)

(Operation Range)

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

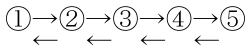


Use the air direction adjustments within the ranges shown above.

Horizontal Air Direction Adjustment

(Function Range)

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



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

- Cooling / Dry mode : Horizontal flow ①
- Heating mode : Downward flow ⑥

- When the temperature of the air being blown out is low at the start of heating operation or during defrosting, the airflow direction temporarily becomes ⑥ to prevent cold air being blown onto the body.
- During use of the Cooling and Dry modes, do not set the Air Flow Direction Louver in the Heating range (④~⑥) for long period of time, since water vapor may condense near the outlet louvers and drop of water may drip from the air conditioner. During the Cooling and Dry modes, if the Air Flow Direction Louvers are left in the heating range for more than 20minutes, they will automatically return to position ③.
- During Monitor operation in AUTO CHANGEOVER mode, the airflow direction automatically becomes ①, the horizontal airflow direction does not change, and it cannot be adjusted.

(2). SWING OPERATION

To select Vertical Airflow Swing Operation

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

(Swinging Range)

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

Heating mode / Fan mode(④~⑥) : ③ ⇔ ⑥

- When the indoor fan is at S-Lo or Stop mode, the swinging operation is interrupted and it stops at either right end or left end.

To select Horizontal Airflow Swing Operation

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

(Swinging Range)

All mode : ① ⇔ ⑤

- When the indoor fan is S-Lo or Stop mode, the swinging operation is interrupted and it stops at either upper end or bottom end.

To select Vertical and Horizontal Airflow Swing Operation

- When the horizontal swing signal is input from remote control, the combination of the vertical and horizontal swing operation is performed.

8. COMPRESSOR CONTROL

(1). OPEARTION FREQUENCY RANGE

The operation frequency of the compressor is different based on the operation mode as shown in the table 9.

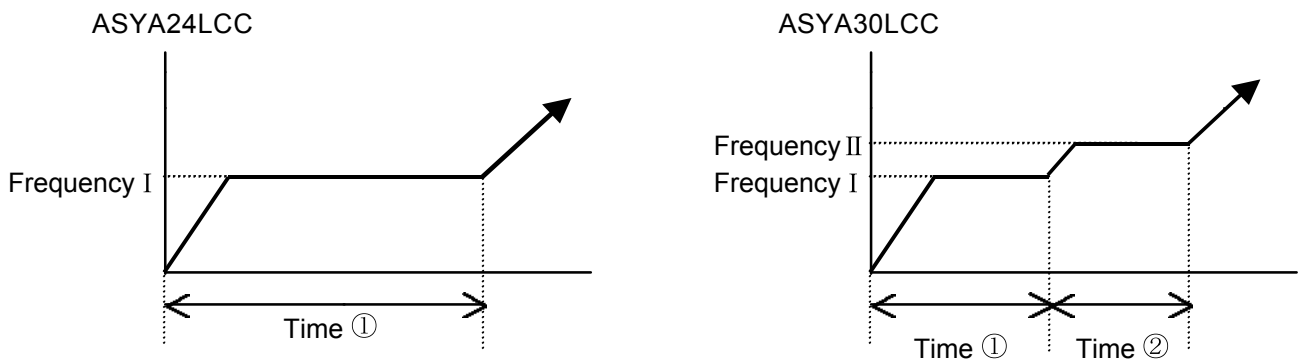
(Table 9 : Compressor Operation Frequency Range)

	Cooling		Heating		Dry
	Min	Max	Min	Max	
ASYA24LCC	15Hz	115Hz	15Hz	130Hz	34Hz
ASYA30LCC	21Hz	94Hz	21Hz	120Hz	39Hz

(2). OPEARTION FREQUENCY CONTROL AT START UP

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

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



(Frequency)

	Frequency I	Frequency II
ASYA24LCC	40Hz	-
ASYA30LCC	40Hz	59Hz

(Time)

	Time ①	Time ②
ASYA24LCC	500sec	-
ASYA30LCC	60sec	40sec

9. TIMER OPEARTION CONTROL

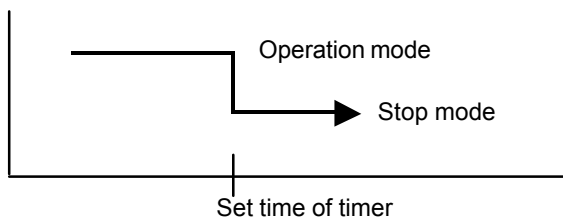
The table 10 shows the available timer setting based on the product model.

(Table 10 : Timer Setting)

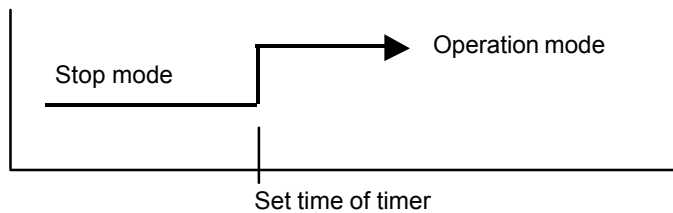
	ON TIMER / OFF TIMER	PROGRAM TIMER	SLEEP TIMER
ASYA24LCC	○	○	○
ASYA30LCC	○	○	○

(1). OFF TIMER AND ON TIMER

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

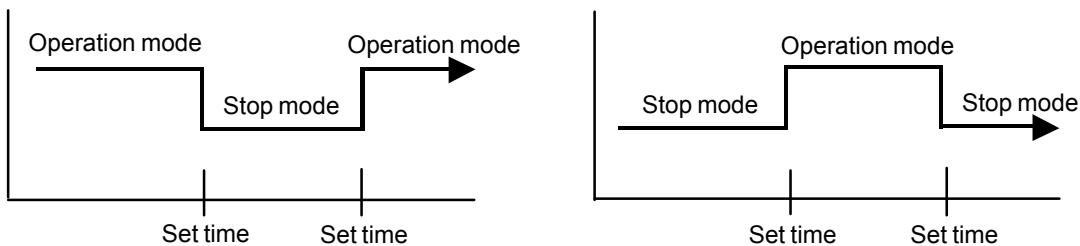


- ON timer : Depending on the difference between the actual room temperature and the set temperature value, the unit will start operation automatically in order to bring the room temperature to the desired set temperature value by the timer previously set.



(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

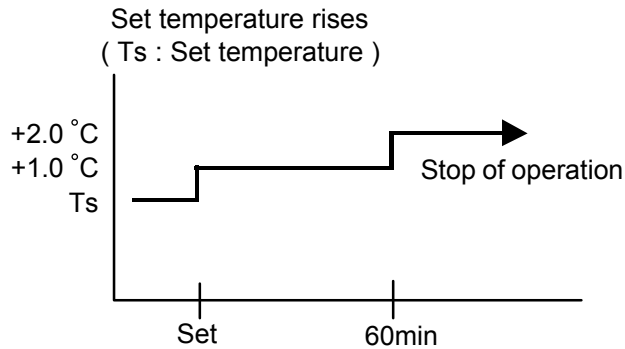
If the sleep is set, the room temperature is monitored and the operation is stopped automatically. If the operation mode or the set temperature is change after the sleep timer is set, the operation is continued according to the changed setting of the sleep timer from that time ON.

In the cooling operation mode

When the sleep timer is set, the setting temperature is increased 1°C.

It increases the setting temperature another 1°C after 1 hour.

After that, the setting temperature is not changed and the operation is stopped at the time of timer setting.

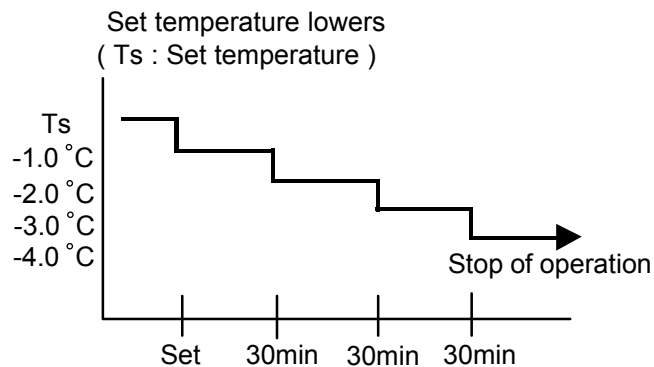


In the heating operation mode

When the sleep timer is set, the setting temperature is decreased 1°C.

It decreases the setting temperature another 1°C every 30 minutes.

Upon lowering 4°C, the setting temperature is not changed and the operation stops at the time of timer setting.



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, the indoor heat exchanger sensor, the outdoor heat exchanger sensor, and the outdoor temperature sensor.

(1) Pulse range of EEV

	Pulse range
ASYA24LCC	60 ~ 480 pulse
ASYA30LCC	40 ~ 480 pulse

(2) The EEV is set up at 480 pulses when the compressor is stopped.

(3) Initialization (Input of 528 pulses toward closing direction) is operated under the following condition.

* When the power is turned on.

* 3 hours has passed since the last initialization, and 3 minutes has passed after the compressor stop.

(If 12 hours has passed since the last initialization, the compressor is compulsorily stopped.)

11. TEST OPERATION CONTROL

Under the condition where the air conditioner runs, press the test operation button of the remote control, 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.

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.

13. FOUR-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 four-way valve is switched in 3 minutes later after the compressor stopped.

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 started with the memorized operation contents.

When the power is interrupted and recovered during timer operation, since the timer operation time is shifted by the time the power was interrupted, an alarm is given by blinking (7 sec ON/2 sec OFF) the indoor unit body timer lamp.

[Operation contents memorized when the power is interrupted]

- Operation mode
- Set temperature
- Set air flow
- Timer mode and timer time
- Set air flow Direction
- Swing

15. MANUAL AUTO OPERATION (Indoor unit body operation)

If MANUAL AUTO Button is set, the operation is controlled as shown in Table 12.

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

(Table 12)

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

16. COMPRESSOR PREHEATING

When the outdoor heat exchanger temperature is lower than temperature I and the heating operation has been stopped for 30 minutes, 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 temperature II or greater, preheating is ended.

(Table 13 : Preheating Operation / Release Temperature)

	Temperature I	Temperature II
ASYA24LCC	5°C	7°C
ASYA30LCC	5°C	7°C

17. COIL DRY OPERATION CONTROL

The coil-dry operation functions by pressing Coil Dry operation button on the remote controller. The coil-dry operation is consisted of 3 cycles of [Fan operation 3 minutes / Heating operation 2 minutes], and Fan operates for 3 minutes at last before ending the air conditioner operation. (It takes 18 minutes to complete the coil-dry operation.)

Following table indicates the indoor unit setting on the coil-dry operation.

(Table 14 : Coil-dry Operating Functions)

	Indoor Fan Speed	Compressor Frequency	Louver Position		Main Unit Indication
			Vertical	Horizontal	
ASYA24LCC	940rpm	27Hz	①	③	Coil-dry indication : ON Other indication : OFF
ASYA30LCC	940rpm	33Hz	①	③	Coil-dry indication : ON Other indication : OFF

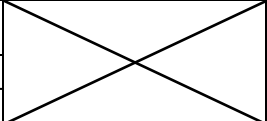
18. DEFROST OPERATION CONTROL

(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 15.

(Table 15 : Condition of starting Defrost Operation)

1 ST time defrosting after starting operation		Compressor operating time			
		Less than 17 minutes	17 to 60 minutes	60 minutes to 4 hours	After 4 hours
		ASYA24LCC	Does not operate	- 9°C	- 5°C
ASYA30LCC	Does not operate	- 9°C	- 5°C	- 3°C	

Defrosting after 2 ND time upon starting operation		Compressor operating time			
		Less than 35 minutes	35 minutes to 4 hours		After 4 hours
		ASYA24LCC	Does not operate		- 6°C
ASYA30LCC	Does not operate	- 6°C	- 3°C		

(2). CONDITION OF THE DEFROST OPERATION COMPLETION

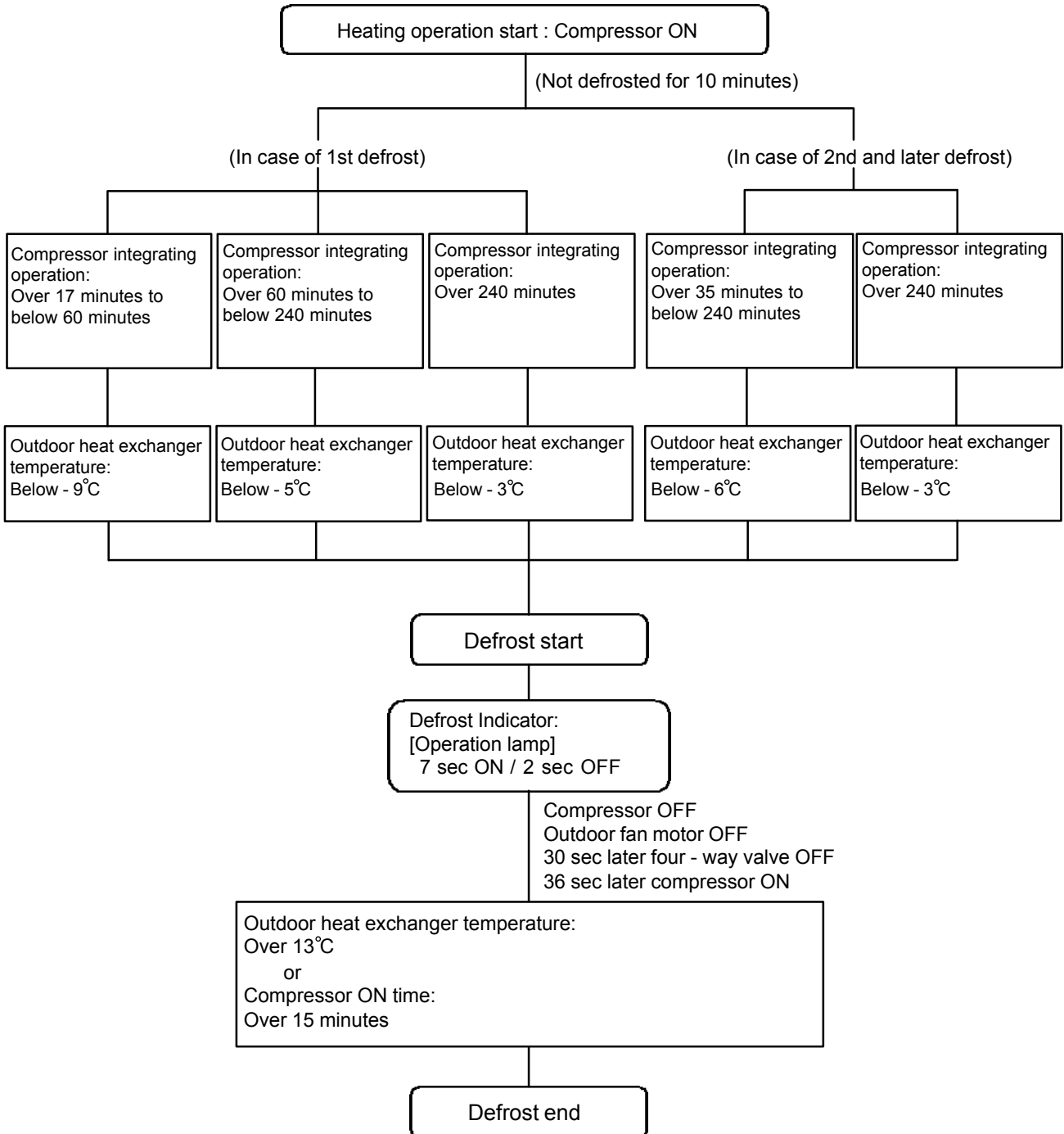
Defrost operation is released when the conditions become as shown in Table 16.

(Table 16 : Defrost Release Condition)

	Release Condition
ASYA24LCC	Outdoor heat exchanger temperature sensor value is higher than 13°C or Compressor operation time has passed 15 minutes.
ASYA30LCC	Outdoor heat exchanger temperature sensor value is higher than 13°C or Compressor operation time has passed 15 minutes.

Defrost Flow Chart

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



19. OFF DEFROST OPERATION CONTROL

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

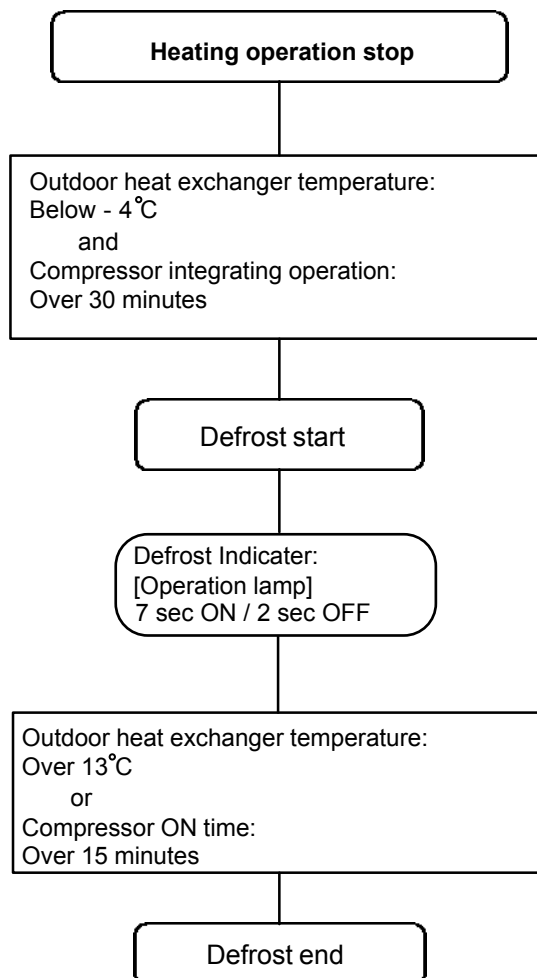
(1). OFF DEFROST OPERATION CONDITION

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

(2). OFF DEFROST END CONDITION

	Release Condition
ASYA24LCC	Outdoor heat exchanger temperature sensor value is higher than 13°C or Compressor operation time has passed 15 minutes.
ASYA30LCC	Outdoor heat exchanger temperature sensor value is higher than 13°C or Compressor operation time has passed 15 minutes.

OFF Defrost Flow Chart



20. VARIOUS PROTECTIONS

(1). DISCHARGE GAS TEMPERATURE OVERRISE PREVENION 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 20 Hz, and it continues to decrease the frequency for 20 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 control of the compressor frequency is released.

When the discharge temperature becomes higher than Temperature III ,the compressor is stopped and the indoor unit LED starts blinking.

(Table 17 : Discharge Temperature Over Rise Prevension Control / Release Temperature)

	Temperature I	Temperature II	Temperature III
ASYA24LCC	104°C	101°C	110°C
ASYA30LCC	104°C	101°C	110°C

(2). CURRENT RELEASE CONTROL

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

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

(Table 18 : Current Release Operation Value / Release Value)

[Heating]

ASYA24LCC	ASYA30LCC
OT (Control / Release) 10.5A / 10.0A	OT (Control / Release) 11.0A / 10.5A
17°C 13.0A / 12.5A	17°C 13.0A / 12.5A
12°C 15.0A / 14.5A	12°C 15.0A / 14.5A
5°C 17.0A / 16.5A	5°C 18.0A / 17.5A

[Cooling / Dry]

ASYA24LCC	ASYA30LCC
OT (Control / Release) 7.0A / 6.5A	OT (Control / Release) 9.0A / 8.5A
46°C 9.5A / 9.0A	50°C 10.0A / 9.5A
40°C 11.5A / 11.0A	46°C 13.0A / 12.5A
	40°C 16.0A / 15.5A

OT : Outdoor Temperature

(3). ANTIFREEZING CONTROL (Cooling and Dry mode)

The compressor frequency is decrease on cooling & dry mode when the indoor heat exchanger temperature sensor detects the temperature lower than Temperature I.

Then, the anti-freezing control is released when it becomes higher than Temperature II.

(Table 19 : Anti-freezing Protection Operation / Release Temperature)

	Outdoor Temperature	Temperature I	Temperature II
ASYA24LCC	Over than 12 °C	4°C	7°C
	Less than 12 °C	4°C	13°C
ASYA30LCC	Over than 12 °C	4°C	7°C
	Less than 12 °C	4°C	13°C

(4). COOLING PRESSURE OVERRISE PROTECTION

When the outdoor unit heat exchange sensor temperature rises to temperature I or greater, the compressor is stopped and trouble display is performed.

(Table 20 : Cooling Pressure Over Rise Protection Function Temperature)

	Temperature I
ASYA24LCC	67°C
ASYA30LCC	67°C

(5). HIGH TEMPERATURE RELEASE CONTROL (HEATING MODE)

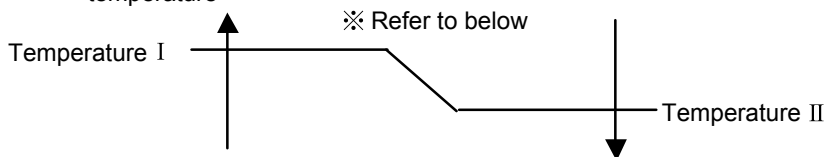
On heating mode, the compressor frequency is controlled as following based on the detection value of the indoor heat exchanger temperature sensor.

(The control system is different depending on the product model)

(Fig 11 : Heating Overload Protection Control)

[Control System I]

Indoor heat exchange temperature



	Temp I	Temp II
ASYA24LCC	53°C	50°C
ASYA30LCC	53°C	50°C

※ Compressor Operation

ASYA24LCC	Over than 15Hz → Frequency down every 60 seconds Less than 15Hz → OFF
ASYA30LCC	Over than 15Hz → Frequency down every 60 seconds Less than 15Hz → OFF

(6). COMPRESSOR TEMPERATURE PROTECTION

When the compressor temperature sensor detects higher than Temperature I in the table below, the compressor is stopped. The protection is released when the compressor temperature sensor detects Temperature II in the table below after 3 minutes of compressor stop.

(Table 22 :Operating Temperature of Compressor Protection)

	Temperature I	Temperature II
ASYA30LCC	120 °C	80 °C

(7). HIGH PRESSURE PROTECTION

When the pressure switch becomes OFF (open : higher than 609.2 psi /4.2 Mpa), the compressor is stopped. It is released when the pressure switch becomes ON (close : lower than 464.1 psi/3.2 Mpa) after 3 minutes of compressor stop.

21. FORCED COOLING OPERATION

The forced cooling operation starts up when MANUAL / AUTO button is pressed more than 10 seconds.

During the forced cooling operation, it keeps operation regardless of detection value of room temperature sensor.

Operation LED and Timer LED light up while the unit is on the forced cooling operation.

The forced cooling operation is released after 60 minutes from starting time.

22. COMPRESSOR STOP CONTROL

When the detection value of outdoor temperature sensor is lower than Temp I in the table below, the compressor is stopped.

(Table 23 : Operation temperature of compressor stop control)

	Temp I	
	Cooling	Heating
ASYA24LCC	-15°C	—
ASYA30LCC	-15°C	—

WALL MOUNTED type INVERTER

6 . REFRIGERANT CAUTION -R410A-

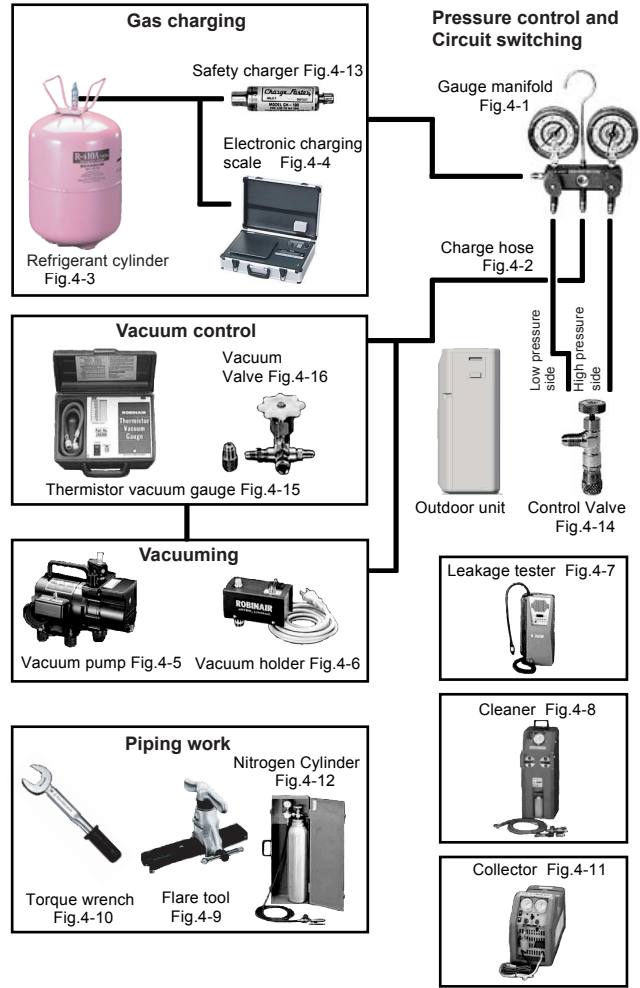
1. R410A TOOLS

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

2. PRECAUTION FOR INSTALLATION

Precaution for installation

Pipe diameter, recommended material and wall thickness

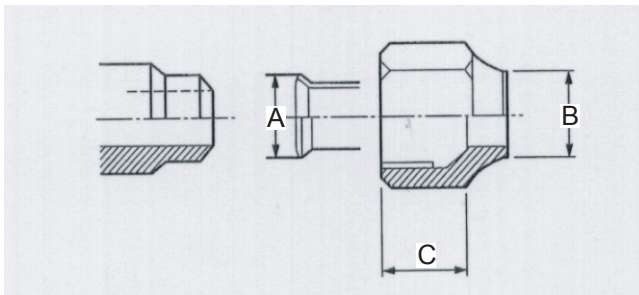
Nominal diameter (in)	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"
Outside diameter (mm)	6.35	9.52	12.70	15.88	19.05	22.22	25.40	28.58	31.75	34.92	38.10
Material	COPPER JIS H3300-C1220T-O or equivalent ¹⁾					COPPER JIS H3300-C1220T-H or equivalent ²⁾					
Wall thickness ³⁾ (mm)	0.8	0.8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

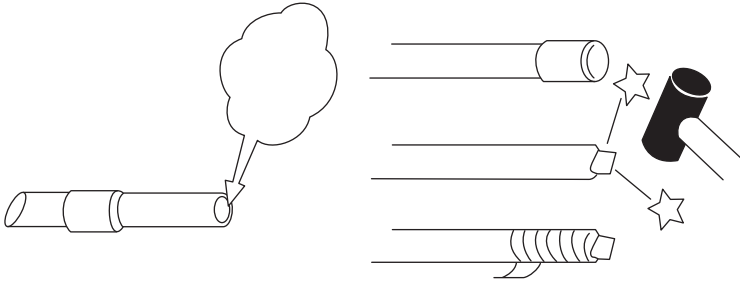


Always use the flare nut that is packed with the product.

Do not use existing (for R22) pipes

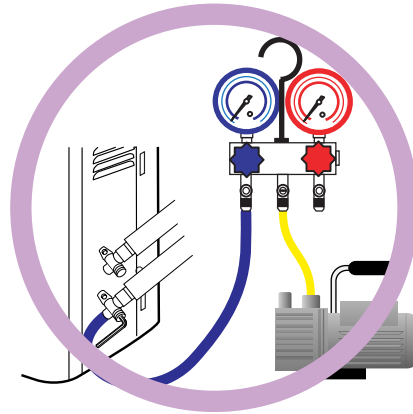
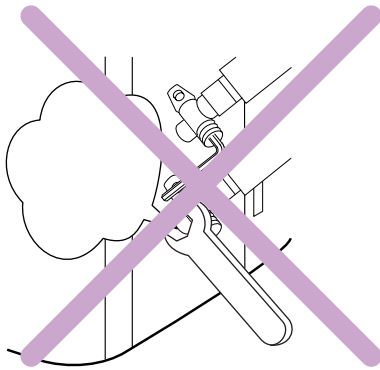
- Be sure to use new pipes when replacing conventional (R22) model with HFC (R407C, R410A) model.
- If you use existing pipes, it may cause resolution of compressor oil by remaining mineral oil.

Be careful not to mix moisture and contamination into the pipe



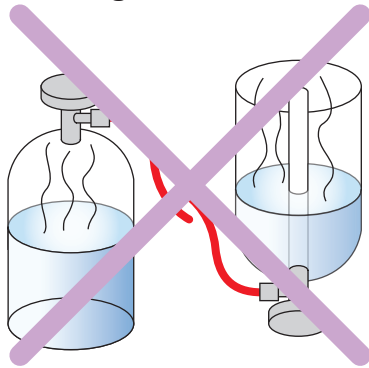
Moisture and contamination in the pipe is a cause of trouble.

Air purge

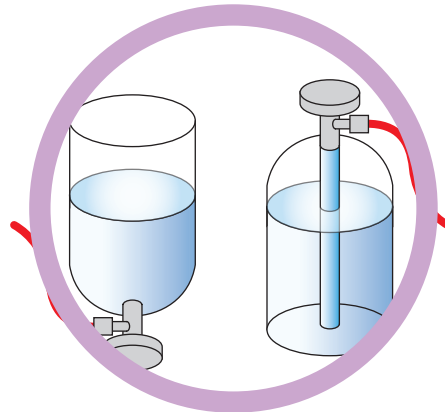


Always use a vacuum pump to purge air.

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.

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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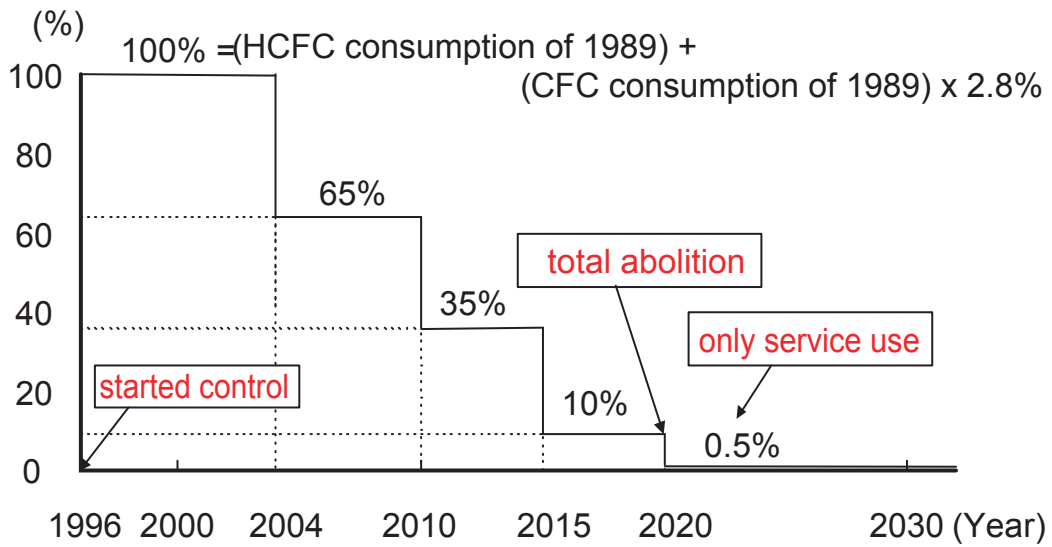
Feature 2 New Refrigerant has Approx 1.6 times higher pressure than previous refrigerant.

<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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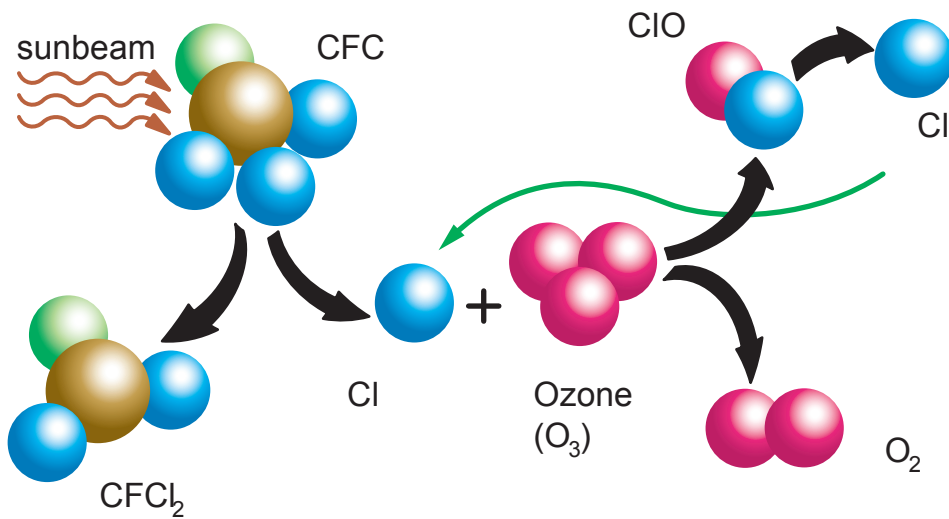
4. NEW REFRIGERANT R410A

* 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

5. DIFFERENCE 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 Increase capacity for 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.

WALL MOUNTED type INVERTER

7 . TROUBLE SHOOTING

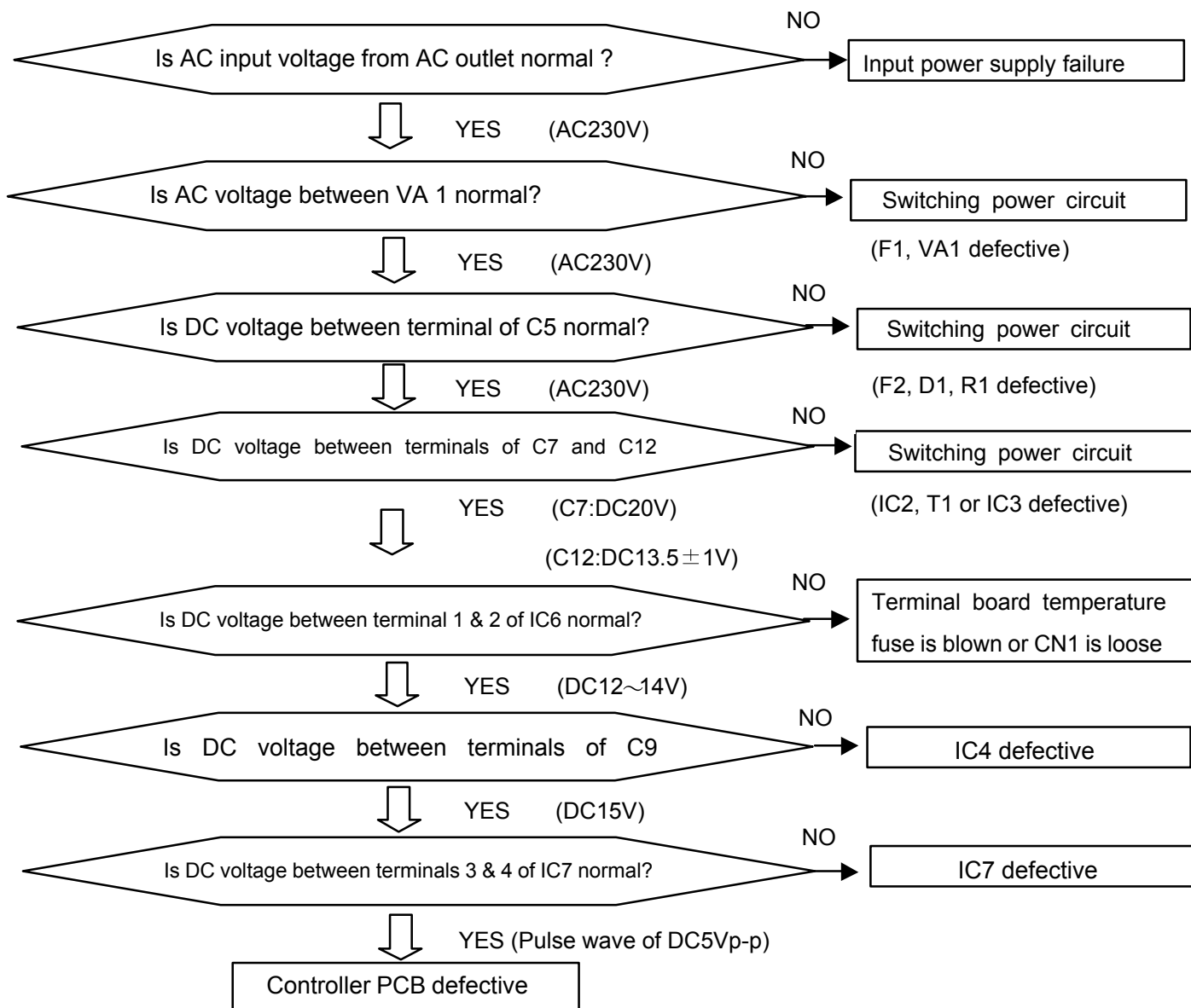
1. When the unit does not operate at all (Operation lamp and Timer lamp do not light up)
2. Self Diagnosis Function (Either Operation lamp or Timer lamp is blinking)
 - * How to operate the self-diagnosis function
 - * Self- diagnosis table and Check points
3. Trouble shooting method
 - * Serial signal check
 - * IPM protection check
 - * Active filter error check
 - * Refrigeration cycle diagnosis

Does not operate at all (Operation Lamp and Timer Lamp do not light up)

[Check Point]

- (1) Is the input power voltage from the exclusive circuit AC outlet normal?
- (2) Is the AC plug inserted to the AC outlet securely and not loose?
- (3) Check if each connector is inserted securely.

[Checking Flow Chart]



SELF-DIAGNOSIS FUNCTION

This function memorizes the self-diagnosis function (lamp display) in the indoor control P.C.Board when trouble occurs.

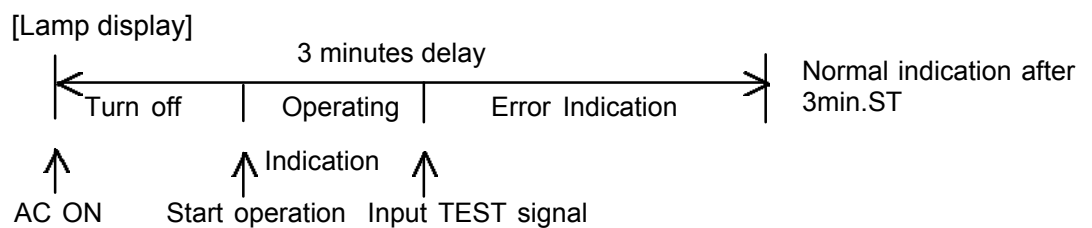
(The memory contents are not destroyed even when the power cord is unplugged from the AC outlet.)

Self-diagnosis function [lamp display] (memory reading)

- (1) When error occurs, it is indicated by blinking [Operation lamp (Red)] and [Timer lamp (Green)].
- (2) Upon pulling out and inserting the AC is on, the starts to operates from remote control.
(At this state, a normal operation indication is performed.)
- (3) By pressing [TEST] button of remote control, indicated only during.

[3 minutes ST].

(3 minutes ST : 3 minutes from the timing AC is ON)



How to erase Memory

- (1) While Error Indication is ON by the self-diagnosis function, the memorized contents can be erased by pressing [Forced Auto Button] on the main unit.
(Indoor unit buzzer beeps 3 seconds.)

Self - diagnosis function and Checking points

Error contents	Error Indication		Wired remote controller	Small Div. Contents (Protection)	Diagnosis Method
	Operation	Timer			
Transmission error	OFF	0.5 sec 2 times	01	Serial reverse transfer error at starting up operation	At the start up, the indoor unit does not receive the signal for 10 consecutive seconds from the time when the power relay was ON. > Permanent stop after 30 seconds. [Diagnosis Point] - Check the indoor/outdoor cable connection (in order). If the cable wiring is not abnormal, measure the voltage of the outdoor unit terminals and diagnose the defective location. (Refer to the after mentioned [Serial Signal Diagnosis] for the voltage measuring method and diagnosis method.)
	OFF	0.5 sec 3 times	01	Serial reverse transfer error during the operation	When the indoor unit does not receive the signal for 10 consecutive seconds during the operation > Permanent stop after 30 seconds. [Diagnosis Point] - Check the indoor/outdoor cable connection (in order). If the cable wiring is not abnormal, measure the voltage of the outdoor unit terminals and diagnose the defective location. (Refer to the after mentioned [Serial Signal Diagnosis] for the voltage measuring method and diagnosis method.)
	OFF	0.5 sec 4 times	13	Serial forward transfer error at starting up operation	The outdoor unit does not receive the signal for 10 consecutive seconds from the time when the power relay was ON. > Outdoor unit stops. [Diagnosis Point] - Check the indoor/outdoor cable connection (in order). If the cable wiring is not abnormal, measure the voltage of the outdoor unit terminals and diagnose the defective location. (Refer to the after mentioned [Serial Signal Diagnosis] for the voltage measuring method and diagnosis method.)
	OFF	0.5 sec 5 times	13	Serial forward transfer error during the operation	When the outdoor unit does not receive the signal for 10 consecutive seconds during the operation > Outdoor unit stops. [Diagnosis Point] - Check the indoor/outdoor cable connection (in order). If the cable wiring is not abnormal, measure the voltage of the outdoor unit terminals and diagnose the defective location. (Refer to the after mentioned [Serial Signal Diagnosis] for the voltage measuring method and diagnosis method.)
	OFF	0.5 sec 8 times	00	Wired remote controller error	When the communication is cut off longer than 1 minutes upon connection. > Compressor , Outdoor fan : OFF (If the communication becomes normal, they automatically resume operation.) [Diagnosis Point] - Check wiring - Controller PCB failure

Indoor unit thermistor error	0.5 sec. 2 times	0.5 sec 2 times	02	Room temperature thermistor defective	The room temperature thermistor detected a abnormal temperature when the power was turned on. > Remote control does not operate. [Diagnosis Point] - Check Thermistor resistance value (Refer to "Thermistor characteristics table"). - Controller PCB defective.
		0.5 sec 3 times	04	Indoor Heat Exchanger Thermistor Error	The detection value of the indoor heat exchanger thermistor is either open or shorted when the power is ON. > Remote control does not operate. [Diagnosis Point] - Check Thermistor resistance value (Refer to "Thermistor characteristics table"). - Controller PCB defective.
Outdoor unit thermistor error	0.5 sec. 3 times	0.5 sec 2 times	0C	Discharge Thermistor Error	The detection value of the discharge thermistor is either open or shorted > Compressor, Outdoor Fan : OFF (It automatically releases when the normal value is detected.) [Diagnosis Point] - Check Thermistor resistance value (Refer to "Thermistor characteristics table"). - Controller PCB defective.
		0.5 sec 3 times	06	Outdoor Heat Exchanger Thermistor Error	The detection value of the outdoor heat exchanger thermistor is open. > Compressor, Outdoor Fan : OFF (It automatically releases when the normal value is detected.) [Diagnosis Point] - Check Thermistor resistance value (Refer to "Thermistor characteristics table"). - Controller PCB defective
		0.5 sec 4 times	0A	Outdoor Temperature Thermistor Error	The detection value of the outdoor temperature thermistor is either open or shorted > Compressor, Outdoor Fan : OFF (It automatically releases when the normal value is detected.) [Diagnosis Point] - Check Thermistor resistance value (Refer to "Thermistor characteristics table"). - Controller PCB defective.
		0.5 sec 8 times	15	Compressor Temperature Thermistor Error	The detection value of the compressor thermistor is either open or shorted > Compressor, Outdoor Fan : OFF (It automatically releases when the normal value is detected.) [Diagnosis Point] - Check Thermistor resistance value (Refer to "Thermistor characteristics table"). - Controller PCB defective

Indoor unit Controller Error	0.5 sec. 4 times	0.5 sec 2 times	20	Forced Auto Switch Error	Forced Auto Switch becomes ON for 10 consecutive seconds. > It indicates the error but the operation continues. [Diagnosis Point] - Check if forced Auto Switch is kept pressed. - Forced Auto Switch defective. - Controller PCB defective.
		0.5 sec 3 times	No Display	Main Relay Error	After 2 minutes 20 seconds of stopping operation, the signal from outdoor unit is received even though the main relay is OFF. > Main Relay OFF continues (Outdoor Unit OFF Command) [Diagnosis Point] - Main Relay defective - Controller PCB defective.
		0.5 sec 4 times	No Display	Power Supply Frequency Detection Error	The power supply frequency can not be recognized after 4 seconds of power ON. > Permanent stop. [Diagnosis Point] - Controller PCB defective.
Outdoor Unit Controller Error	0.5 sec. 5 times	0.5 sec 2 times	17	IPM Protection	Abnormal current value of IPM is detected > Permanent stop. [Diagnosis Point] - Heat radiation is blocked (Inlet/Outlet) - Check if Outdoor Fan is defective (does not rotate). - Controller PCB defective (Refer to after mentioned "IPM diagnosis") - Refrigeration cycle defective (Refer to after mentioned "Refrigeration cycle diagnosis").
		0.5 sec 3 times	18	CT Error	The current value during the operation after 1 minute from starting up the compressor is 0 A. > Permanent stop. [Diagnosis Point] - Check if CT wire is open. - Controller PCB defective.
		0.5 sec 5 times	1A	Compressor Location Error	The compressor speed does not synchronize with the control signal. (Including start up failure of the compressor) > Permanent stop. [Diagnosis Point] - Check if 2 way valve or 3 way valve is left open. - Check the compressor (Winding resistance value, Loose lead wire). - Refrigeration cycle defective (Refer to after mentioned "Refrigerant cycle diagnosis").
		0.5 sec 6 times	1b	Outdoor Fan Error (DC Fan Error)	Either the outdoor fan motor abnormal current or location error was detected. > Permanent stop. [Diagnosis Point] - Fan motor connector loose/ defective contact. - Fan motor defective. - Controller PCB defective.

Indoor Fan Motor Error	0.5 sec. 6 times	0.5 sec 2 times	No Display	Indoor Fan Lock Error	The indoor fan speed is 0 rpm after 56 seconds from starting operation or from the time the fan mode was changed. > Operation stops. (It releases by sending the operation stop signal from the remote controller.) [Diagnosis Point] - Fan motor connector loose/ defective contact. - Fan motor defective. - Controller PCB defective.
		0.5 sec 3 times	No Display	Indoor Fan Speed Error	The indoor fan speed is 1/3 of the target frequency after 56 seconds from starting operation or from the time the fan mode was changed. > Operation stops. (It releases by sending the operation stop signal from the remote controller.) [Diagnosis Point] - Fan motor connector loose/ defective contact. - Fan motor defective. - Controller PCB defective.
Refrigerant Cycle Error	0.5 sec. 7 times	0.5 sec 2 times	OF	Discharge Temperature Error	The discharge temperature error is activated. > Permanent stop. [Diagnosis Point] - Check if 2 way valve or 3 way valve is left open. - Heat radiation is blocked (Inlet/Outlet) - Check if Outdoor Fan is defective (does not rotate). - Refrigeration cycle defective (Refer to after mentioned "Refrigerant cycle diagnosis").
		0.5 sec 3 times	24	Excessive High Pressure Protection on Cooling	Excessive high pressure protection on cooling mode has been activated. > Compressor, Outdoor Fan : OFF (It releases after 3 minute ST) [Diagnosis Point] - Heat radiation is blocked (Inlet/Outlet) - Check if Outdoor Fan is defective (does not rotate). - Refrigeration cycle defective (Refer to after mentioned "Refrigerant cycle diagnosis").
		0.5 sec 5 times	16	Pressure Switch Error	If the pressure switch is open for 10 sec. when the power is turned on > Compressor, Outdoor Fan : OFF When it becomes normal after 10 sec. passed, the operation is resumed based on serial forward transfer signal. [Diagnosis Point] - Check interruption of heat radiation (Air intake / outlet) - Check outdoor fan operation (does not rotate) - Check refrigerant cycle (Refer to "Refrigerant cycle diagnosis" which is described in the later chapter)

Other Error	0.5 sec. 8 times	0.5 sec 2 times	19	Active Filter Error (Permanent Stop)	Output voltage error of Active filter is detected. > Permanent stop. [Diagnosis Point] - Check the wiring connection (Connector is loose/open, Choke coil) - Controller PCB defective (Refer to after mentioned "Active Filter diagnosis")
		0.5 sec 3 times	19	Active Filter Error	Active filter error or instantaneous cut off error is detected. > Compressor, Outdoor Fan : OFF [Diagnosis Point] - Check the wiring connection (Connector is loose/open, Choke coil) - Controller PCB defective (Refer to after mentioned "Active Filter diagnosis") <CAUTION> Even if the unit is normal, it may detect error depending on the power supply voltage condition.
		0.5 sec 4 times	25	PFC Circuit Error	Excessive voltage of DC voltage on PFC circuit in Inverter PCB is detected, or the excessive current in the circuit is detected. > Permanent stop. [Diagnosis Point] - Controller PCB defective

Serial Signal Diagnosis

[Check Point] Check and find out if the cause is at Indoor unit or Outdoor unit.

- * Remove the side cover of Outdoor unit for testing the Outdoor unit connection terminals with a meter.
- * Turn on the power and press [TEST] button of Remote control.

[Checking Flow Chart]

CAUTION: Do not touch the terminals or electrical components to avoid electric shock.

[Check Indoor Unit]

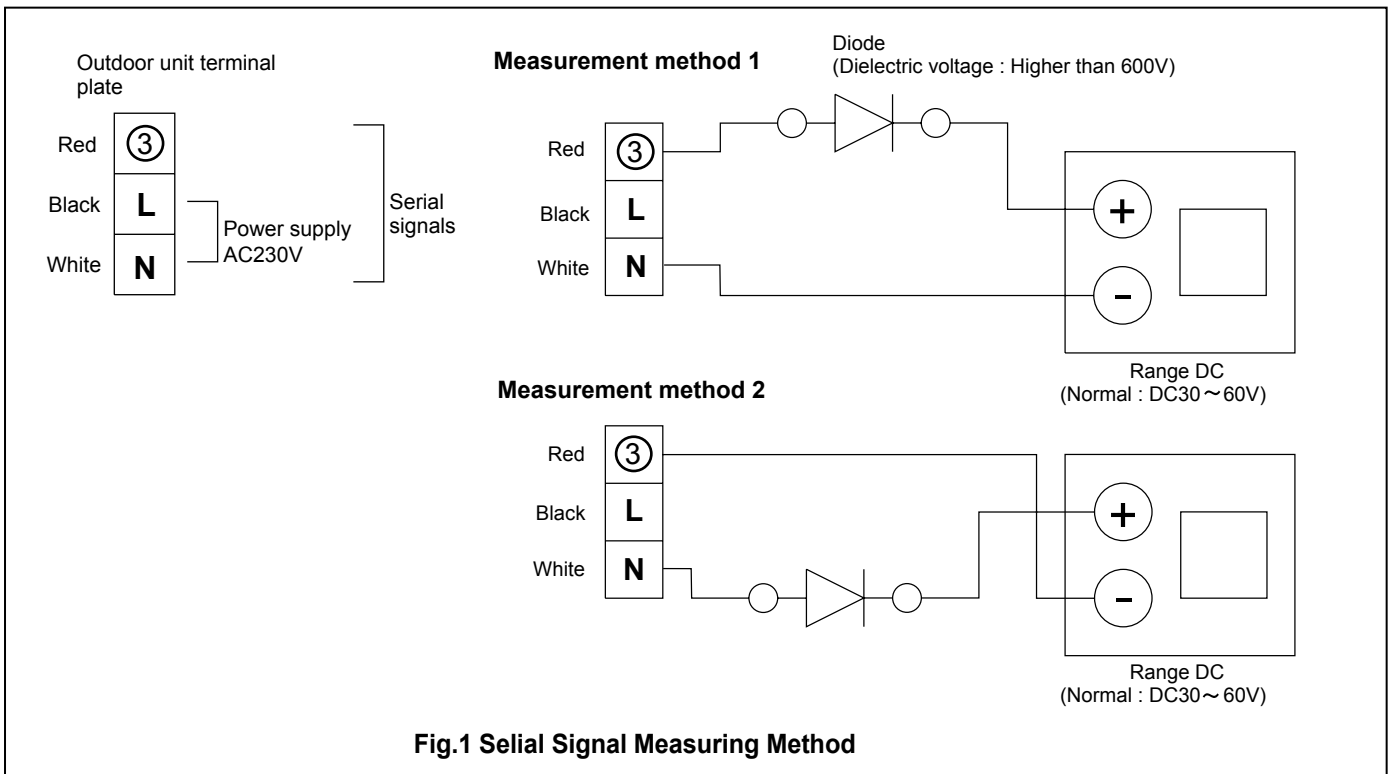
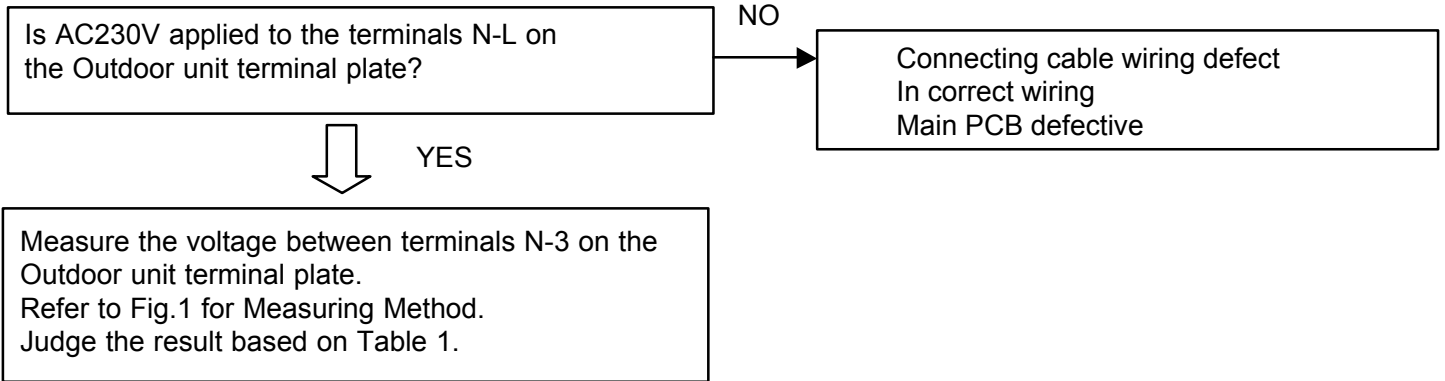


Fig.1 Serial Signal Measuring Method

Table 1: Judgement table

Measurement 1 voltage value	Measurement 2 voltage value	Indoor unit trouble display	Outdoor unit operation	Defective point
0 ~ 5.0V	30 ~60 V	Display	No operation	Indoor unit control PCB defective
30 ~ 60V	0 ~ 5V	Display	No operation	Outdoor unit fuse open (input) Inverter defective

IPM Protection

[Checking Points]

Check the following points and locate the cause in the outdoor unit.

[Cause]

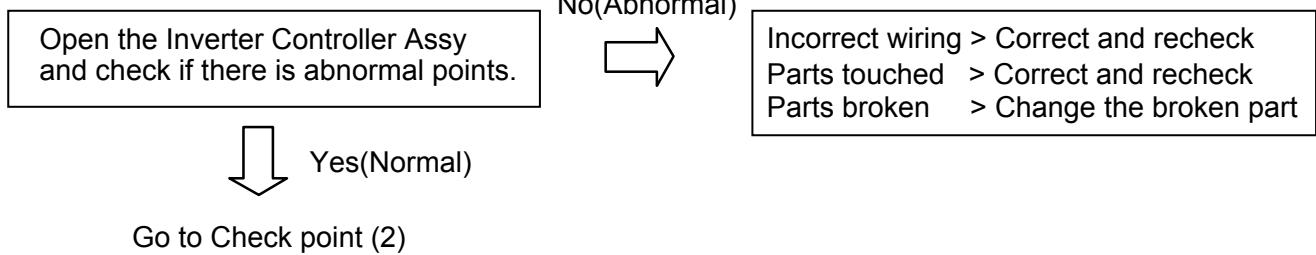
- (1) Compressor failure
- (2) Refrigeration cycle failure
- (3) PC Board defective
- (4) IPM defective
- (5) Incorrect wiring

[First step]

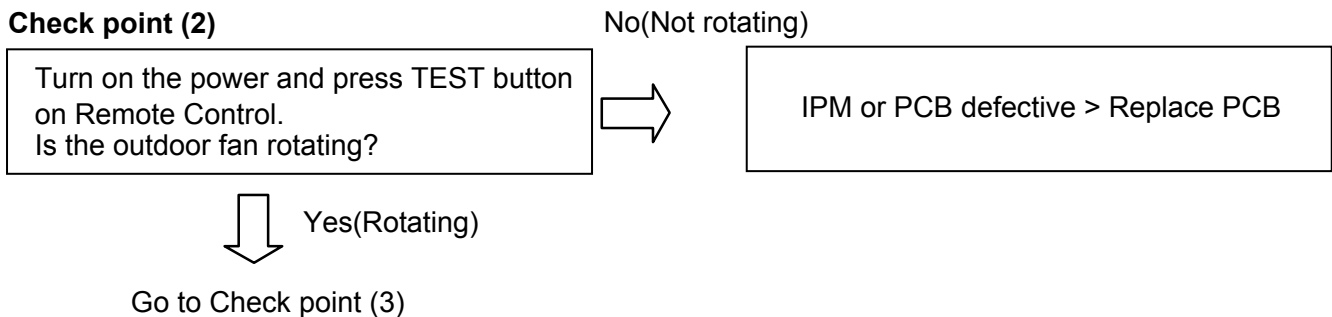
Measure the DC voltage at terminals (between Electrolytic Capacitor and discharge resistance) in the Inverter Controller Assy, and make sure it is lower than DC5V.

If it is higher than 5V, wait until the discharging is over.

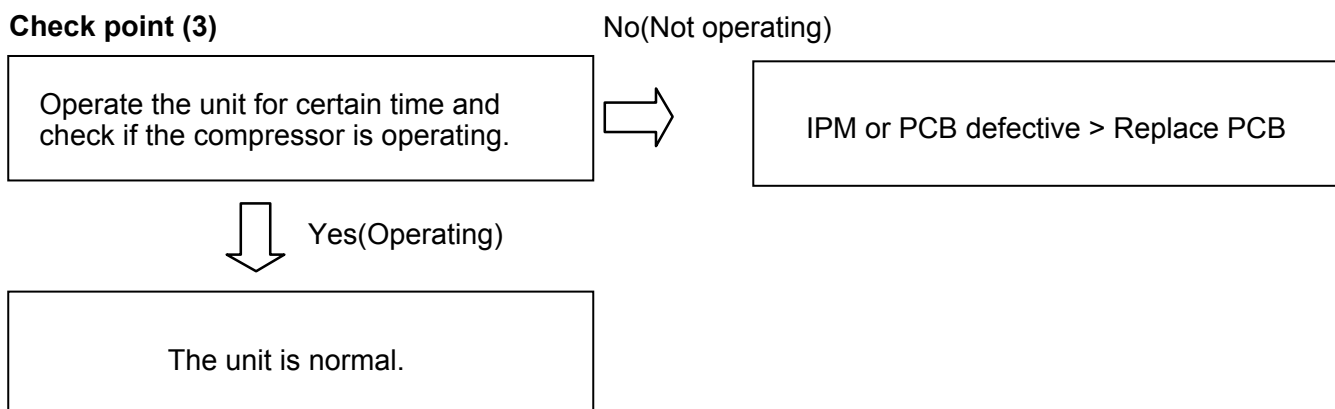
Check point (1)



Check point (2)



Check point (3)



Recheck

Operate the unit for certain time and check if the compressor is operating.

Yes(Operating) > Check completed
No(Not operating) > Return to the start

Active Filter Failure

[Checking points]

Check the following points and locate the cause in the outdoor unit.

[Cause]

- (1) Incorrect wiring
- (2) Active Filter Module defective
- (3) PC Board defective
- (4) DC voltage detection circuit defective

[First Step]

Measure the DC voltage at terminals (between Electrolytic Capacitor and discharge resistance) in the Inverter Controller Assy, and make sure it is lower than DC5V.
If it is higher than 5V, wait until the discharging is over.

Check point (1)

Open the Inverter Controller Assy and check if there is abnormal points.
(Incorrect wiring, Parts touched, Parts broken)

No(Abnormal)



Incorrect wiring > Correct and recheck
Parts touched > Correct and recheck
Parts broken > Change the broken part



Yes(Normal)

Go to Check point (2)

Check point (2)

Turn on the power and press TEST button on Remote Control.
Is the outdoor fan rotating?

No(Not rotating)



ACTPM or PCB defective > Replace Main PCB



Yes(Rotating)

Go to Check point (3)

Check point (3)

Operate the unit for certain time and measure the terminal voltage of the discharge resistance.
Is the DC voltage between 350 to 425V?

No(Out of range)



ACTPM or PCB defective > Replace ACTPM or Main PCB.
(Replace only ACTPM if Main PCB was replaced at Check point (2).)



Yes(Within range)

The unit is normal.

Recheck

Operate the unit for certain time and check if the compressor is operating.

Yes(Operating) > Check completed
No(Not operating) > Return to the start

Trouble Shooting of Refrigerant Cycle

[Diagnosis Table for Defective Component]

○: Item of most possible cause

	IPM Protection	Compressor Location error	Discharge Temperature Error	Cooling High Pressure Protection
Refrigerant leak			○	
Compressor failure(*)	○	○		
EEV failure (*)	○	○	○	○
Thermistor failure (*)	○	○	○	○

(*) Trouble Shooting Method

(1) Checking method of the compressor failure

Insert the AC plug and start up the cooling operation. Input Test operation signal and check if the compressor operates.

If it does not operate, measure the resistance value of compressor windings between U-V, V-W, W-U.

If any of the resistance value between U-V, V-W, W-U is not same as others, the compressor is defective.

Compressor Failure

	NORMAL[ohm]
ASYA24LCC	Compressor Case Temperature at 20degC: U-V 1.147 V-W 1.136 U-W 1.161
ASYA30LCC	Compressor Case Temperature at 20degC: U-V 0.720 V-W 0.726 U-W 0.708

(The above resistance value is a typical value. There is some distribution. As it also changes by the compressor temperature, the measured value may be much different from the above table when measured right after stopping operation.)

(2) Checking method of EEV failure

- Insert the AC plug and start up the operation. Check if the EEV operates just before compressor is turned on. (Touch EEV by hand and check it.)

If it does not operate, check if the coil or connector of EEV is removed or loose.

If it operates, check the discharge thermistor / outdoor heat exchanger thermistor / indoor heat exchanger thermistor. (Refer to (3) for checking method.)

(3) Checking method of Thermistor

- Check each thermistor if it is removed or the connector is loose.

If there is no problem, remove the connector of the thermistor from the PCB and check the resistance value (refer to the thermistor characteristics table).

WALL MOUNTED type INVERTER

8 . APPENDING DATA

1. Jumper setting of Indoor unit and Outdoor unit
2. Outdoor unit Pressure Value and Total Electric Current Curve
3. Thermistor Resistance Values
4. Capacity/Input Data

JP (Jumper) Setting

[Indoor Unit]

ASYA24LCC
ASYA30LCC

- Remote control custom code

When multiple number of indoor units are installed in the same room, erroneous receipt of the signal can be avoided by setting up the remote control custom code separately.

To set up the remote control custom code, always set up the same code on both indoor unit PCB and remote control PCB.

(When the indoor unit PCB is changed to Code B, it can not receive the signal unless remote control PCB is also changed to Code B.)

	Indoor Unit		Remote Control	
	JM8(JP)	JM10(JP)		
Code A (Default)	○	○	○	○
Code B	×	○	×	○
Code C	○	×	○	×
Code D	×	×	×	×

- Auto Restart

It is possible to disengage Auto Restart function if it is not needed.

	Indoor Unit
	JM5 (JP)
With Auto Restart function (Default)	○
Without Auto Restart function	×

- Correct coefficient of Room temperature

Indoor unit		Coefficient		
JM6 (JP)	JM7 (JP)	Cooling	Dry	Heating
○	○	*Default		
×	○	0	0	0
○	×	0	0	4
×	×	-2	-2	4

*Default value changes by the setting temperature and the outside temperature.

[Outdoor Unit]

AOYR24LCC

		JP			
		JM1	JM903	JM902	JM901
24LCC	Normal Preheat	○	×	×	×
	Higher Preheat	×	×	×	×

AOYR30LCT

		JP			
		JM901	JM902	JM903	JM500
30LCT	Normal Preheat	○	○	○	○
	Higher Preheat	○	○	○	×

- it is possible to select the higher or standard level of preheating function.

- When it is set up at the higher level of preheat, the magnetic noise of the compressor becomes higher.

Outdoor Unit Low Pressure Value and Outdoor Total Electric Current Curve (Cooling)

Model Name : ASYA24/30LCC

[Condition]

Ambient Indoor / Outdoor - Same temperature temperature

Refrigerant amount Standard amount

Piping length 7.5m (Height difference 1m)

Power voltage 50Hz - 230V

Operation condition TEST mode (Cooling), Hi Fan, Horizontal direction, Front air flow

Measuring method Measure the low pressure with the pressure meter at the service valve. Measure the outdoor unit overall current with the current clamp meter at Power Cable.

Caution Start operation with the condition of the Indoor Unit air filter clean.

[Constant Frequency Operation Method (Test mode)]

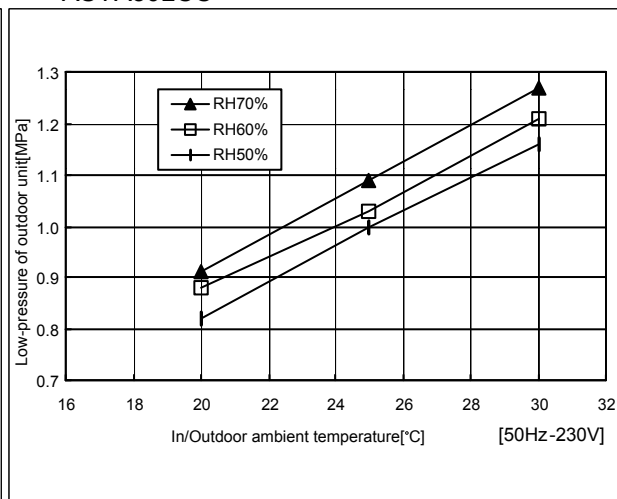
1. Operate on Cooling mode, and press TEST button of remote control.
2. Operate continuously for 30 minutes. (After 60 minutes of operation, Test mode is released automatically.)

(1) Indoor/Outdoor Temperature - Outdoor Low Pressure Curve

ASYA24LCC

Under construction

ASYA30LCC

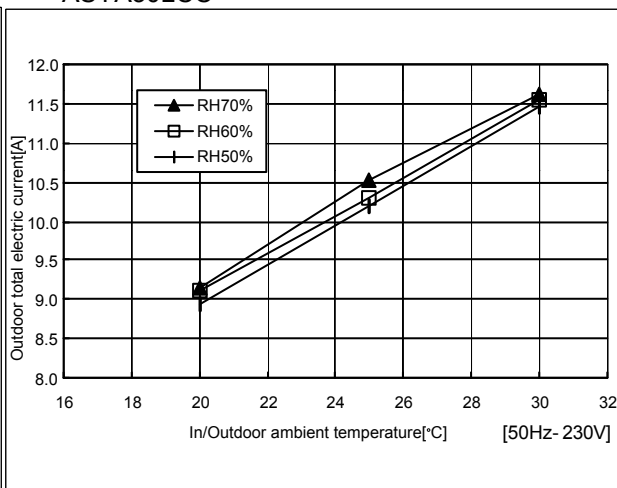


(2) Indoor/Outdoor Temperature - Outdoor Total Electric Current Curve

ASYA24LCC

Under construction

ASYA30LCC



Outdoor Unit High Pressure Value and Outdoor Total Electric Current Curve (Heating)

Model Name : ASYA24/30LCC

[Condition]

Ambient Indoor 15 - 23degC, Outdoor 2 - 12degC
 temperatur

Refrigerant Standard amount
 amount

Piping 7.5m (Height difference 1m)
 length

Power 50Hz - 230V
 voltage

Operation TEST mode (Heating), Hi Fan, Lower direction, Front air flow
 condition

Measuring outdoor unit overall current with the current clamp meter at Power Cable.
 method

Caution Start operation with the condition of the Indoor Unit air filter clean.

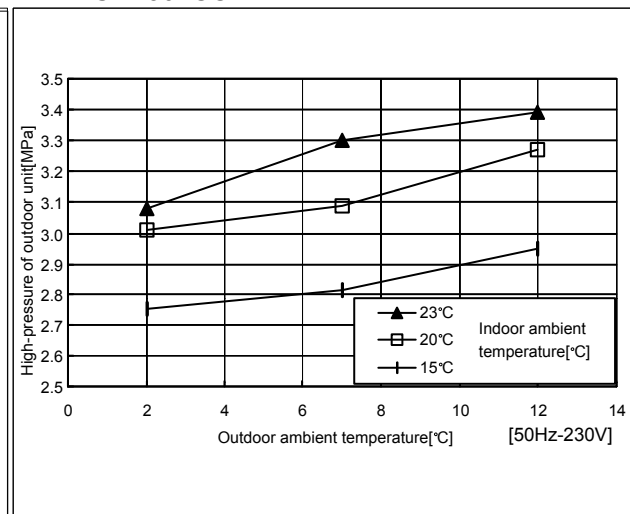
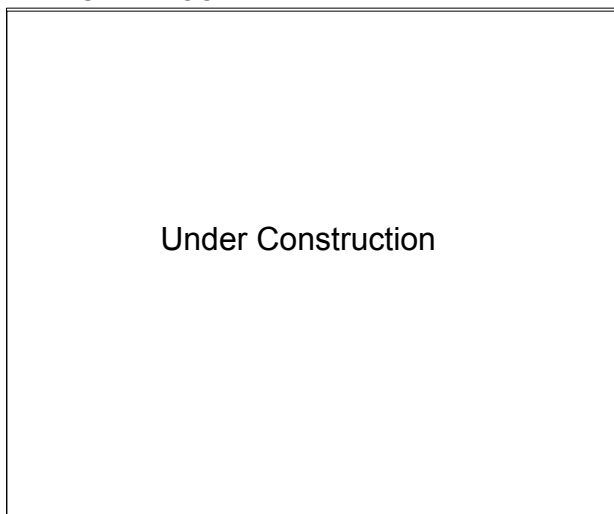
[Constant Frequency Operation Method (Test mode)]

1. Operate on Heating mode, and press TEST button of remote control.
2. Operate continuously for 30 minutes. (After 60 minutes of operation, Test mode is released automatically.)

(1) Indoor/Outdoor Temperature - Outdoor High Pressure Curve

ASYA24LCC

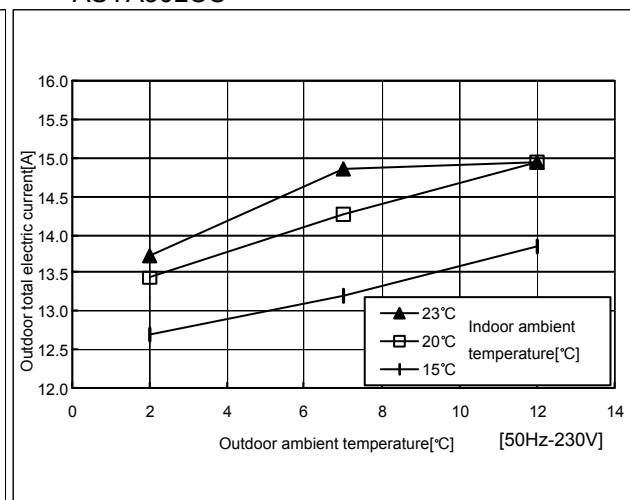
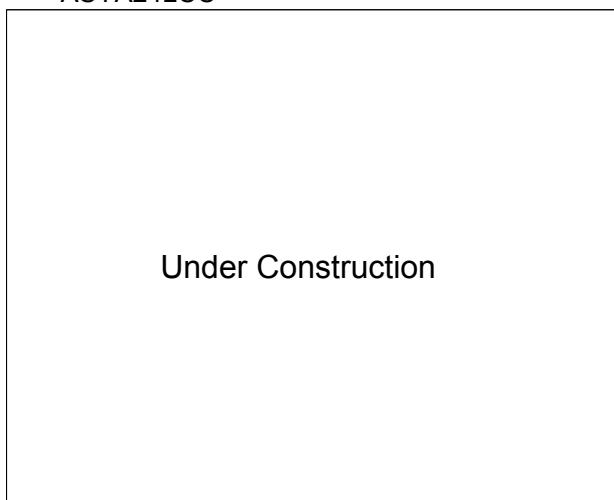
ASYA30LCC



(2) Indoor/Outdoor Temperature - Outdoor Total Electric Current Curve

ASYA24LCC

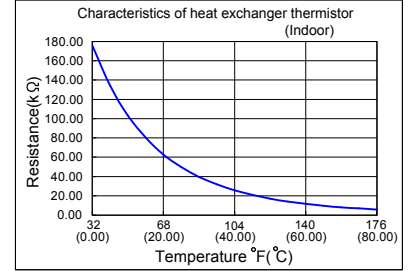
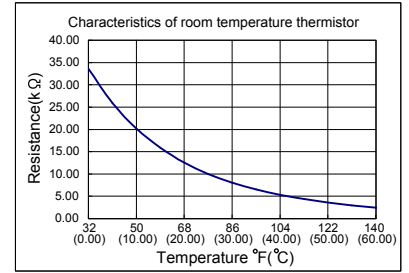
ASYA30LCC



Thermistor resistance values

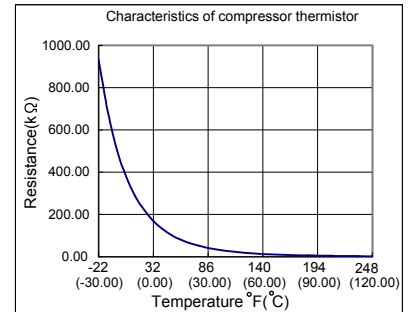
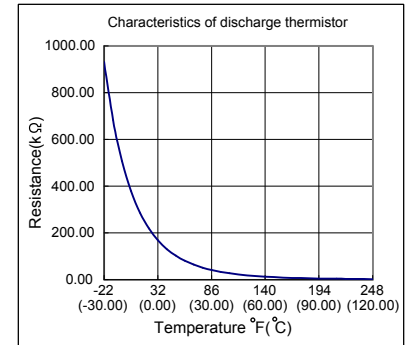
Room temperature thermistor			
Tempe°F	Tempe°C	Resistance(kΩ)	Voltage(V)
32.0	0.00	33.62	1.15
41.0	5.00	25.93	1.39
50.0	10.00	20.18	1.66
59.0	15.00	15.84	1.94
68.0	20.00	12.54	2.22
77.0	25.00	10.00	2.50
86.0	30.00	8.04	2.77
95.0	35.00	6.51	3.03
104.0	40.00	5.30	3.27
113.0	45.00	4.35	3.48
122.0	50.00	3.59	3.68
131.0	55.00	2.98	3.85
140.0	60.00	2.47	4.00
149.0	65.00	2.09	4.14
158.0	70.00	1.76	4.25
167.0	75.00	1.49	4.35
176.0	80.00	1.27	4.44
185.0	85.00	1.09	4.51
194.0	90.00	0.93	4.57
203.0	95.00	0.81	4.63
212.0	100.00	0.70	4.67

Indoor heat exchanger thermistor			
Tempe°F	Tempe°C	Resistance(kΩ)	Voltage(V)
32.0	0.00	176.03	1.10
41.0	5.00	134.23	1.36
50.0	10.00	103.34	1.63
59.0	15.00	80.28	1.92
68.0	20.00	62.91	2.21
77.0	25.00	49.70	2.51
86.0	30.00	39.57	2.79
95.0	35.00	31.74	3.06
104.0	40.00	25.64	3.30
113.0	45.00	20.85	3.53
122.0	50.00	17.06	3.73
131.0	55.00	14.10	3.90
140.0	60.00	11.64	4.55
149.0	65.00	9.69	4.19
158.0	70.00	8.12	4.30
167.0	75.00	6.83	4.40
176.0	80.00	5.78	4.48
185.0	85.00	4.91	4.55
194.0	90.00	4.19	4.61
203.0	95.00	3.59	4.66
212.0	100.00	3.09	4.71



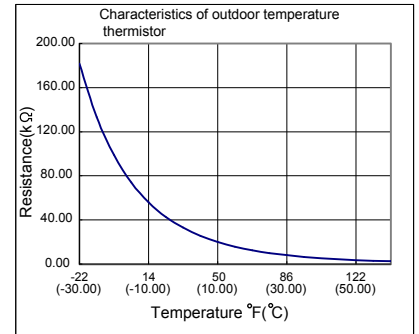
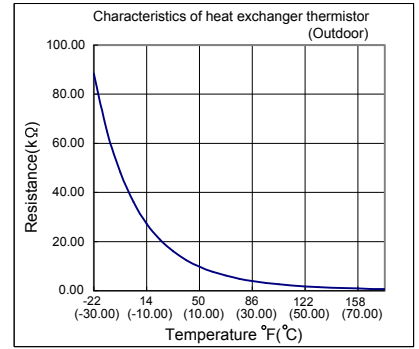
Discharge thermistor			
Tempe°F	Tempe°C	Resistance(kΩ)	Voltage(V)
-22.0	-30.00	931.50	0.07
-13.0	-25.00	683.30	0.09
-4.0	-20.00	506.60	0.13
5.0	-15.00	379.40	0.17
14.0	-10.00	286.90	0.22
23.0	-5.00	219.00	0.28
32.0	0.00	168.60	0.36
41.0	5.00	130.70	0.45
50.0	10.00	102.20	0.56
59.0	15.00	80.51	0.70
68.0	20.00	63.89	0.85
77.0	25.00	51.05	1.01
86.0	30.00	41.07	1.20
95.0	35.00	33.26	1.41
104.0	40.00	27.09	1.62
113.0	45.00	22.20	1.85
122.0	50.00	18.29	2.08
131.0	55.00	15.15	2.31
140.0	60.00	12.62	2.54
149.0	65.00	10.56	2.76
158.0	70.00	8.88	2.97
167.0	75.00	7.50	3.17
176.0	80.00	6.36	3.36
185.0	85.00	5.42	3.53
194.0	90.00	4.64	3.69
203.0	95.00	3.98	3.83
212.0	100.00	3.43	3.96
221.0	105.00	2.97	4.07
230.0	110.00	2.58	4.17
239.0	115.00	2.24	4.26
248.0	120.00	1.96	4.34

Compressor temperature thermistor			
Tempe°F	Tempe°C	Resistance(kΩ)	Voltage(V)
-22.0	-30.00	931.50	0.07
-13.0	-25.00	683.30	0.09
-4.0	-20.00	506.60	0.13
5.0	-15.00	379.40	0.17
14.0	-10.00	286.90	0.22
23.0	-5.00	219.00	0.28
32.0	0.00	168.60	0.36
41.0	5.00	130.70	0.45
50.0	10.00	102.20	0.56
59.0	15.00	80.51	0.70
68.0	20.00	63.89	0.85
77.0	25.00	51.05	1.01
86.0	30.00	41.07	1.20
95.0	35.00	33.26	1.41
104.0	40.00	27.09	1.62
113.0	45.00	22.20	1.85
122.0	50.00	18.29	2.08
131.0	55.00	15.15	2.31
140.0	60.00	12.62	2.54
149.0	65.00	10.56	2.76
158.0	70.00	8.88	2.97
167.0	75.00	7.50	3.17
176.0	80.00	6.36	3.36
185.0	85.00	5.42	3.53
194.0	90.00	4.64	3.69
203.0	95.00	3.98	3.83
212.0	100.00	3.43	3.96
221.0	105.00	2.97	4.07
230.0	110.00	2.58	4.17
239.0	115.00	2.24	4.26
248.0	120.00	1.96	4.34



Outdoor heat exchanger thermistor			
Tempe°F	Tempe°C	Resistance(kΩ)	Voltage(V)
-22.0	-30.00	88.42	0.254
-13.0	-25.00	64.89	0.341
-4.0	-20.00	48.13	0.449
5.0	-15.00	36.07	0.581
14.0	-10.00	27.29	0.741
23.0	-5.00	20.84	0.928
32.0	0.00	16.05	1.14
41.0	5.00	12.45	1.38
50.0	10.00	9.74	1.64
59.0	15.00	7.67	1.91
68.0	20.00	6.09	2.19
77.0	25.00	4.87	2.47
86.0	30.00	3.92	2.74
95.0	35.00	3.17	3.00
104.0	40.00	2.59	3.24
113.0	45.00	2.12	3.46
122.0	50.00	1.75	3.66
131.0	55.00	1.45	3.83
140.0	60.00	1.21	3.99
149.0	65.00	1.01	4.12
158.0	70.00	0.85	4.24
167.0	75.00	0.72	4.34
176.0	80.00	0.61	4.43

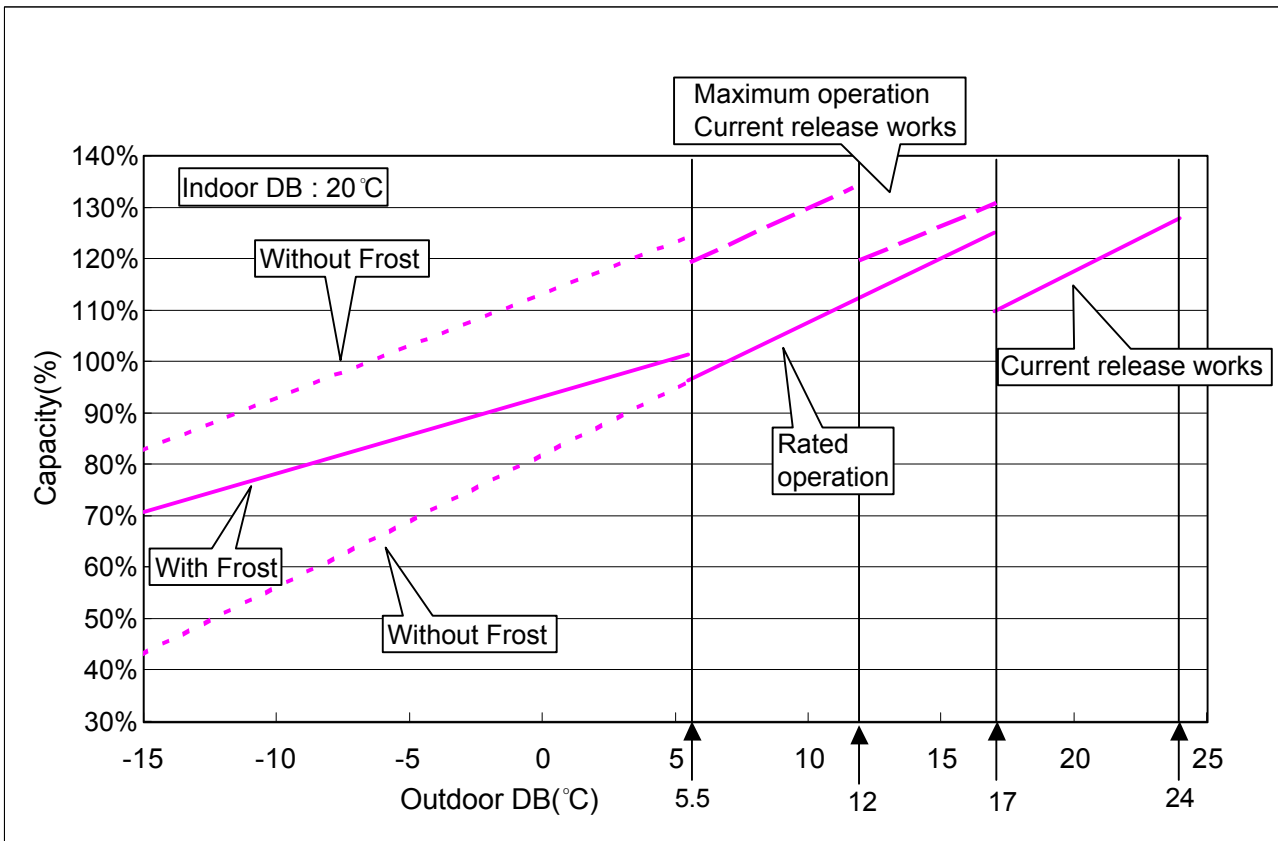
Outdoor temperature thermistor			
Tempe°F	Tempe°C	Resistance(kΩ)	Voltage(V)
-22.0	-30.00	181.60	0.87
-13.0	-25.00	133.30	1.12
-4.0	-20.00	98.86	1.40
5.0	-15.00	74.08	1.70
14.0	-10.00	56.05	2.03
23.0	-5.00	42.80	2.36
32.0	0.00	32.97	2.69
41.0	5.00	25.57	3.00
50.0	10.00	20.00	3.28
59.0	15.00	15.76	3.54
68.0	20.00	12.51	3.77
77.0	25.00	10.00	3.96
86.0	30.00	8.05	4.13
95.0	35.00	6.52	4.27
104.0	40.00	5.31	4.39
113.0	45.00	4.35	4.49
122.0	50.00	3.59	4.57
131.0	55.00	2.97	4.64
140.0	60.00	2.48	4.70
149.0	65.00	2.07	4.74
158.0	70.00	1.74	4.78
167.0	75.00	1.47	4.81
176.0	80.00	1.25	4.84



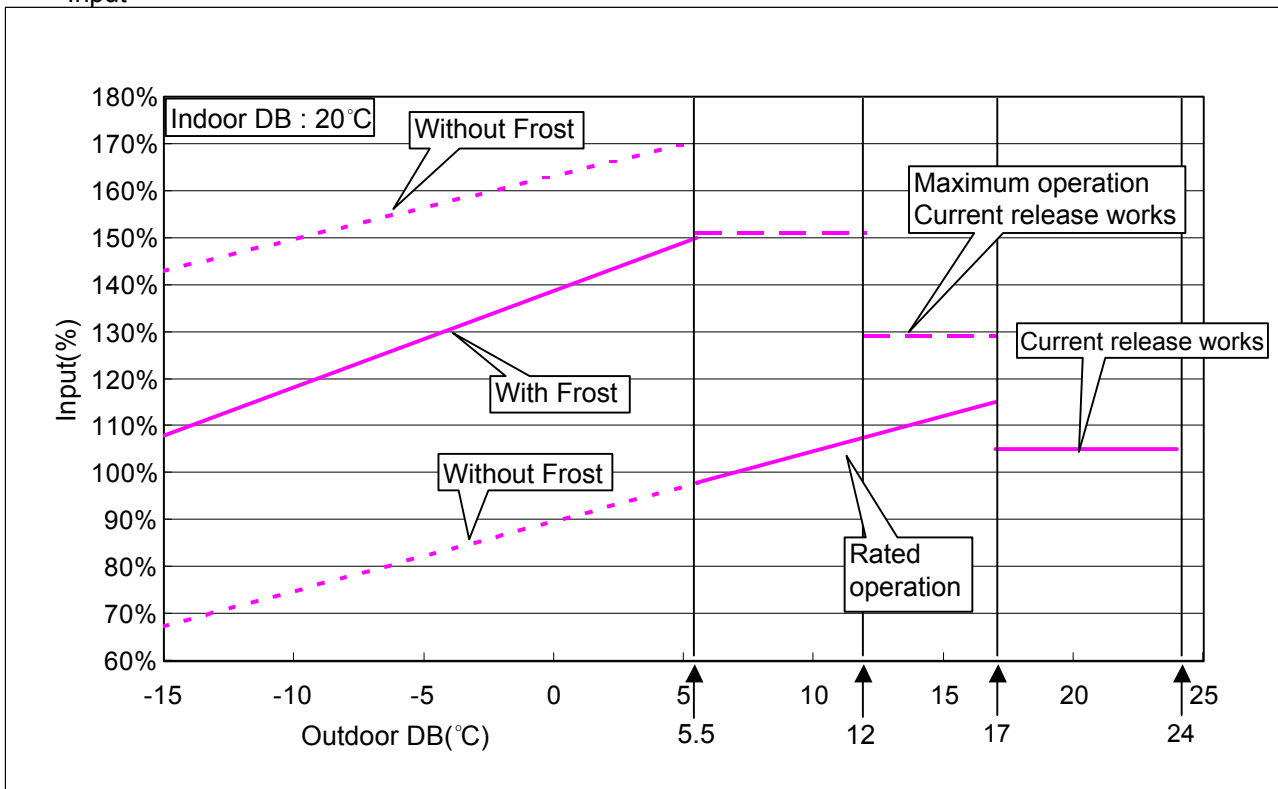
ASYA24LCC Capacity/Input data

(1/2)

Heating
<Capacity>

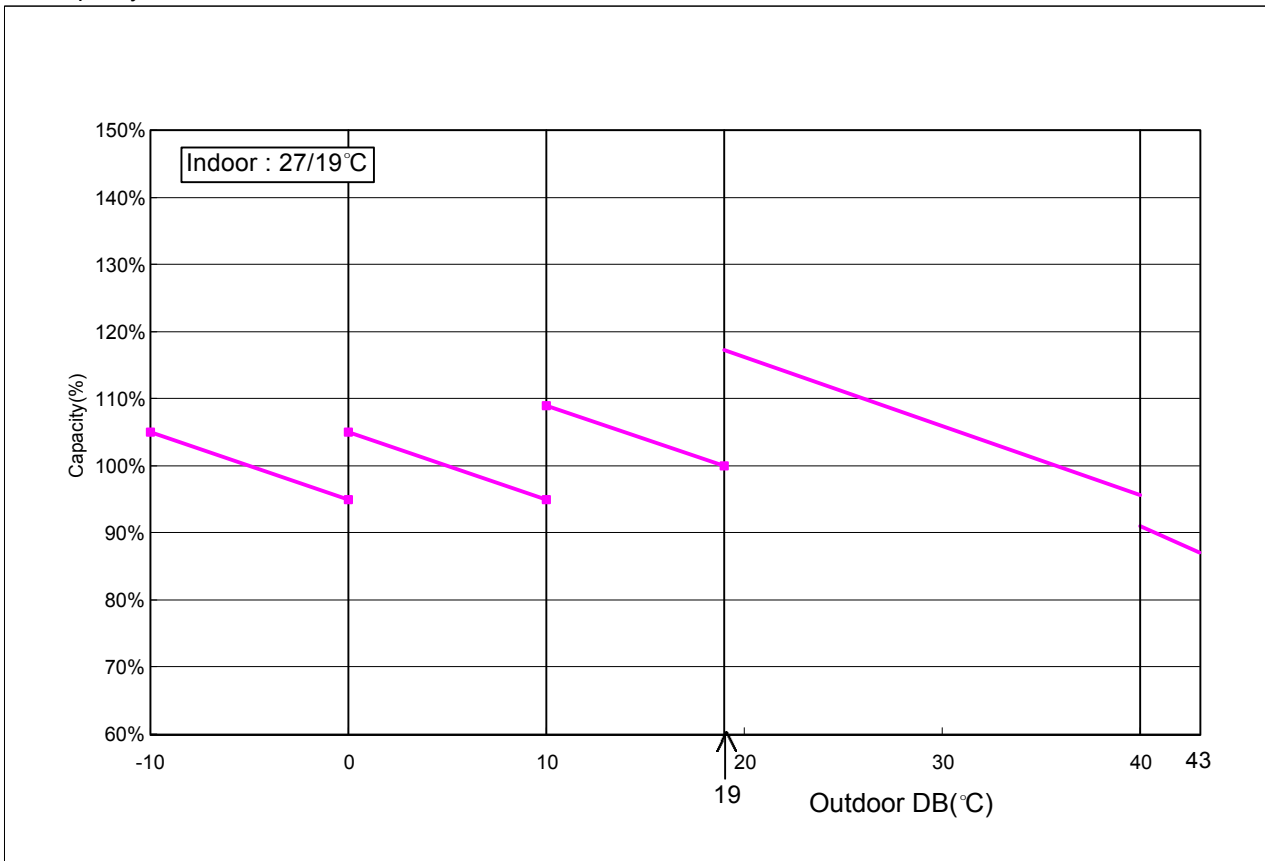


<Input>

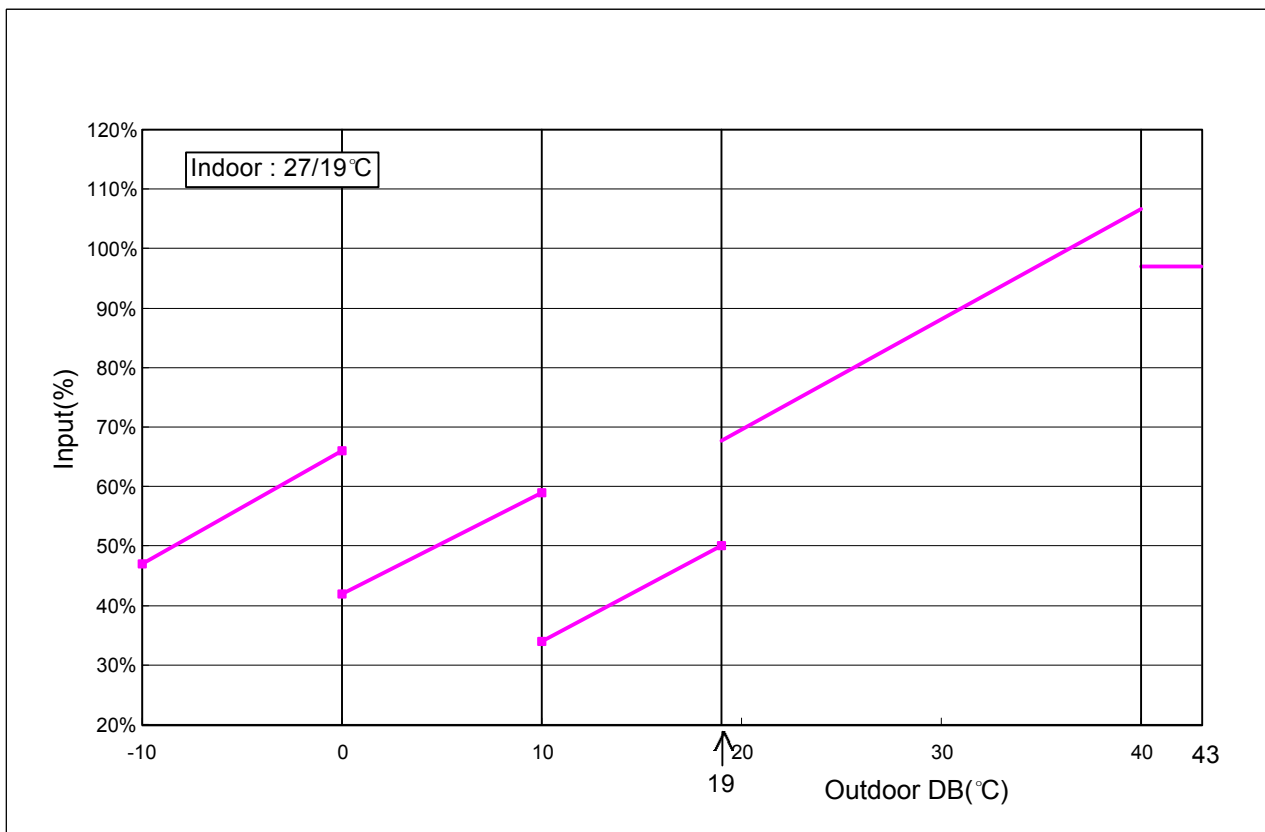


- *Defrosting operation is performed when temperature is less than 5.5 degrees C.
- Frost appears on an outdoor unit heat exchanger at 5.5 or less degrees C.
- *Solid line: Integral capacity/Input containing the defrosting cycle.
- *Dotted line: Capacity/Input which does not contain the defrosting cycle.

Cooling
<Capacity>



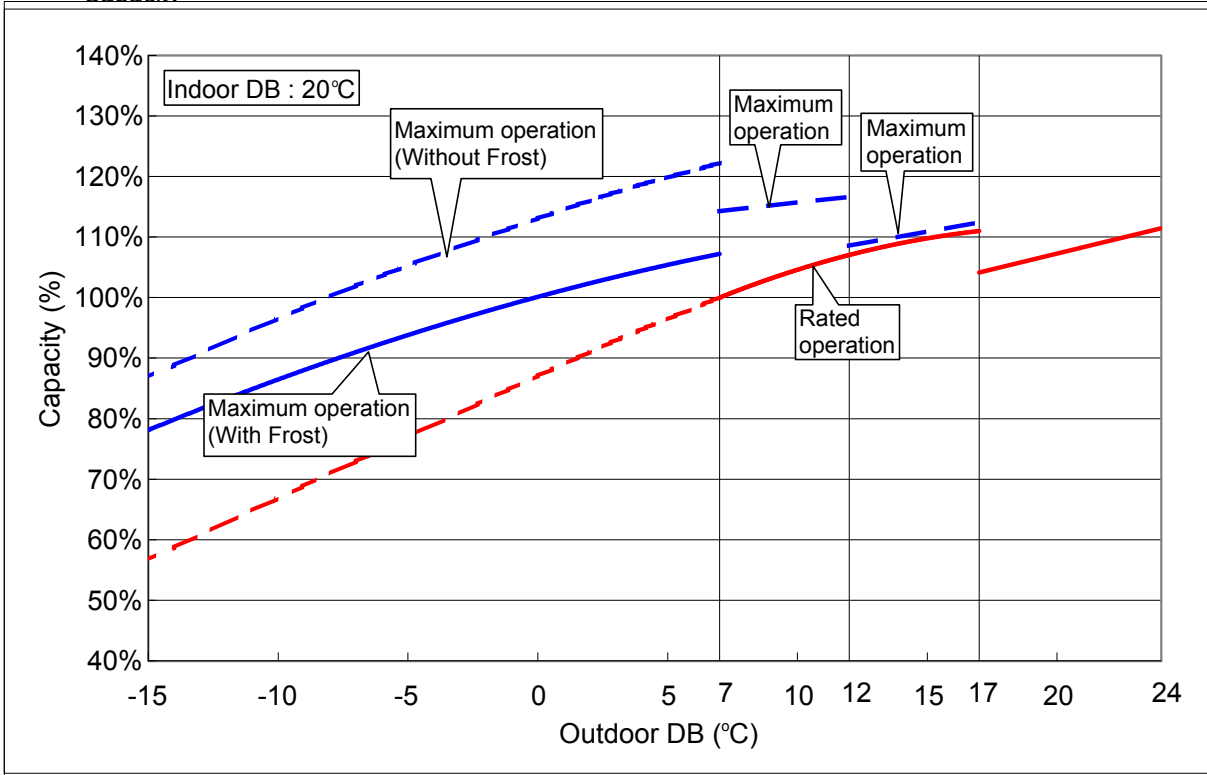
<Input>



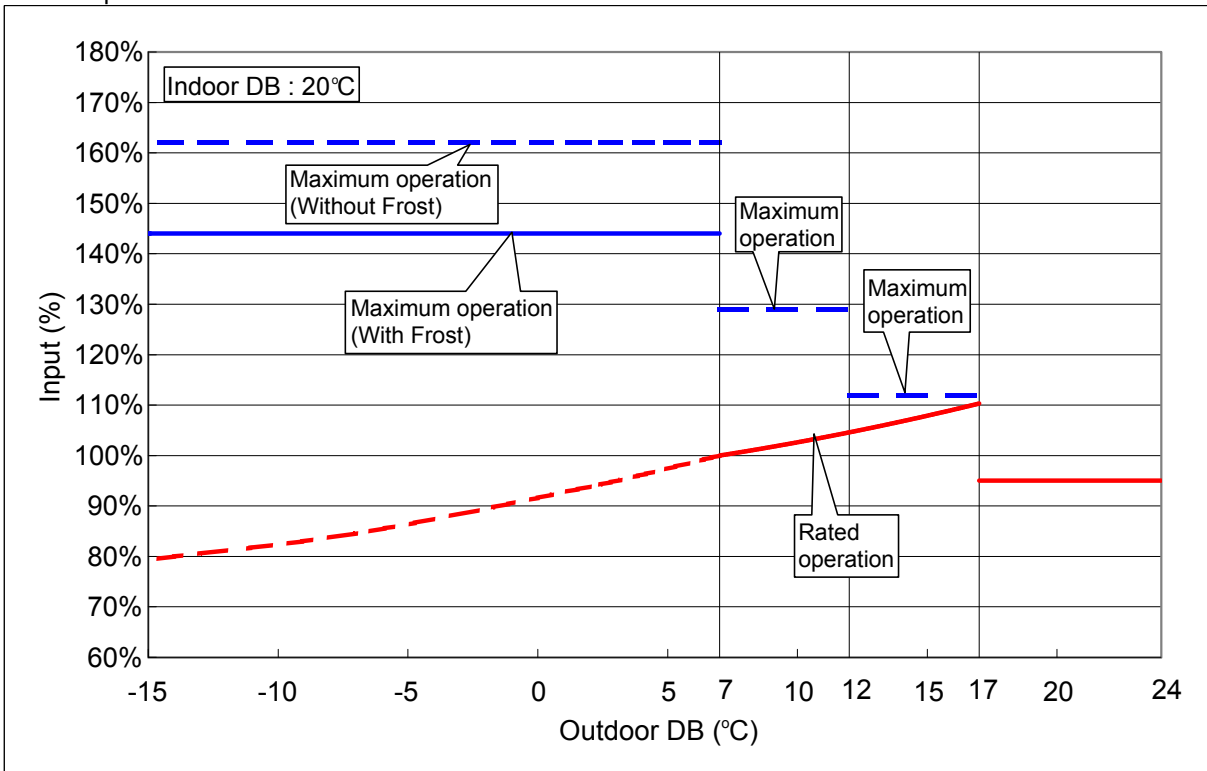
- *Both capacity and input decrease when temperature is 19 or less degrees C, for compressor frequency restrictions operate.
- *Both capacity and input decrease when temperature is 40 or more degrees C, as compressor speed is decreased due to current release protection.
- *Both capacity and input change largely when temperature is 10 or less degrees C, as outdoor fan speed is decreased due to low ambient temperature cooling control.
- *Both capacity and input change more largely at less than 0 degrees C of ambient temperature as outdoor fan speed is decreased further.

Heating

<Capacity>



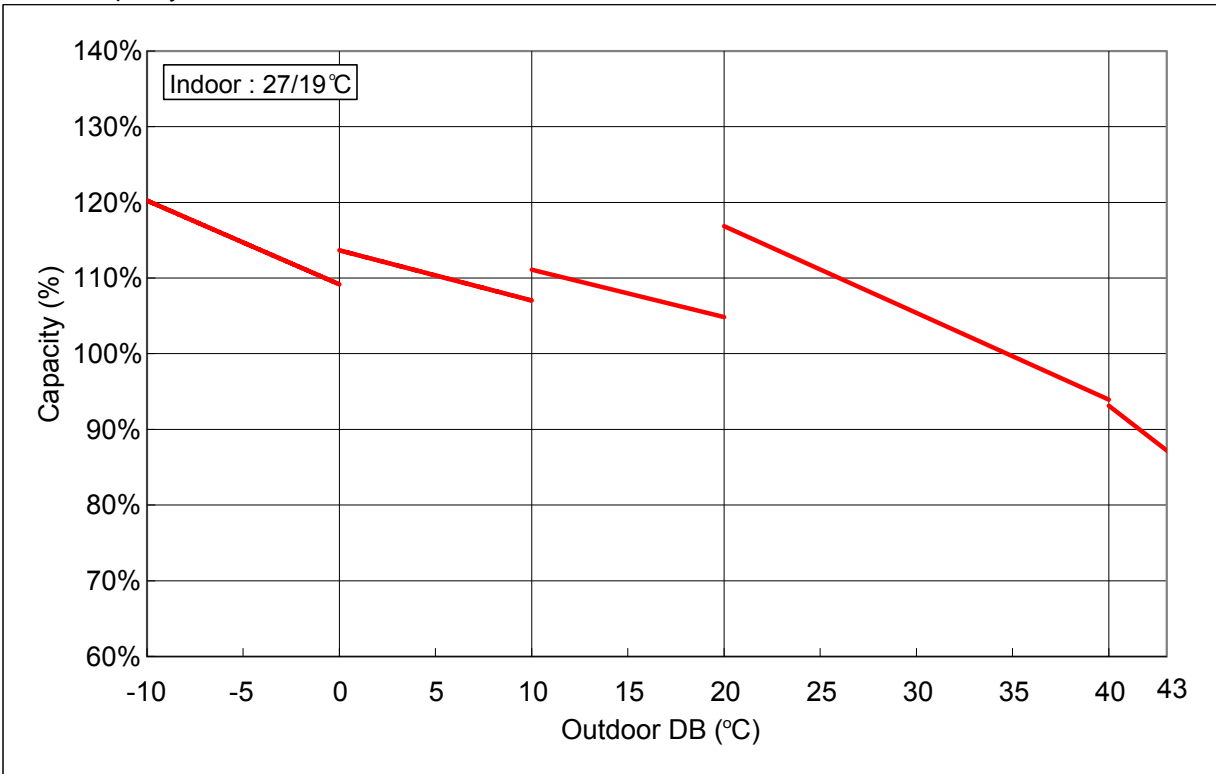
<Input>



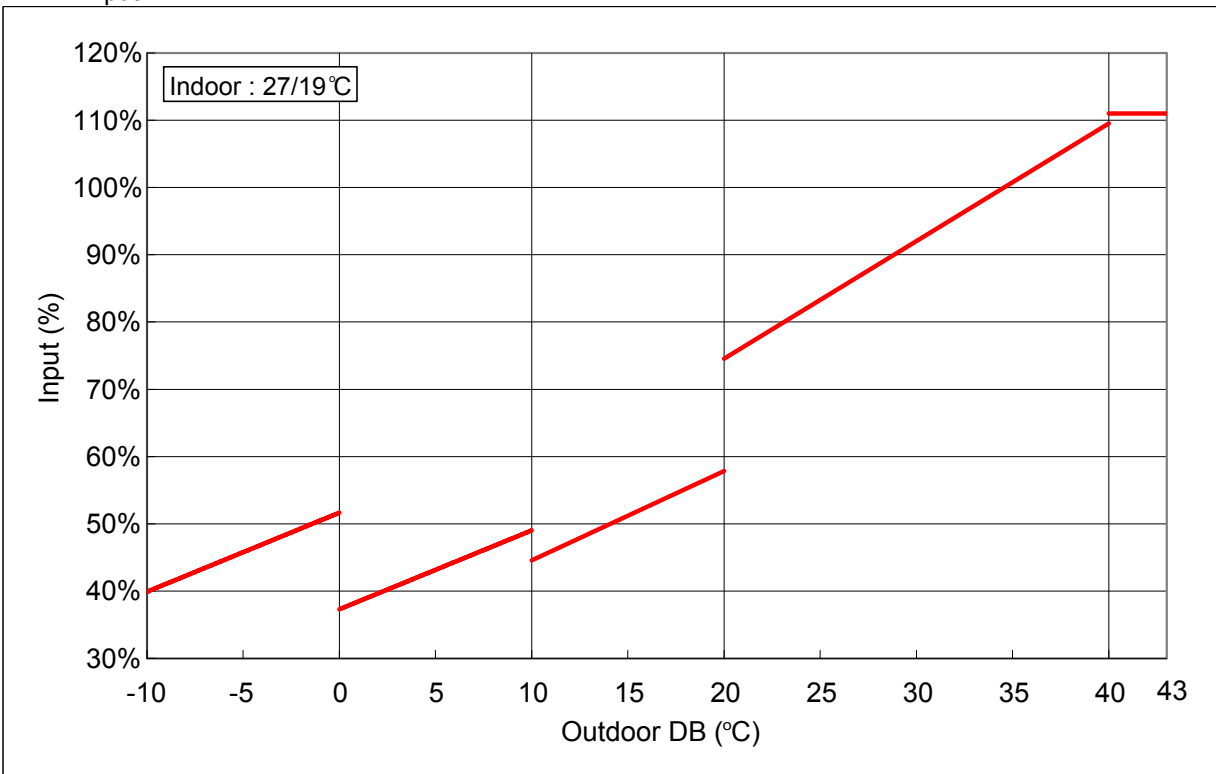
- *Defrosting operation is performed when temperature is less than 7 degrees C.
Frost appears on an outdoor unit heat exchanger at 7 or less degrees C.
- *Solid line: Integral capacity/Input containing the defrosting cycle.
- *Dotted line: Capacity/Input which does not contain the defrosting cycle.
- *The Capacity and the input change as the current limit value varies with the outdoor temperature.

Cooling

<Capacity>



<Input>



*Both capacity and input change largely when temperature is 20 or less degrees C, as outdoor fan speed is decreased due to low ambient temperature cooling control.

*Both capacity and input change more largely at less than 10 degrees C of ambient temperature as outdoor fan speed is decreased further.

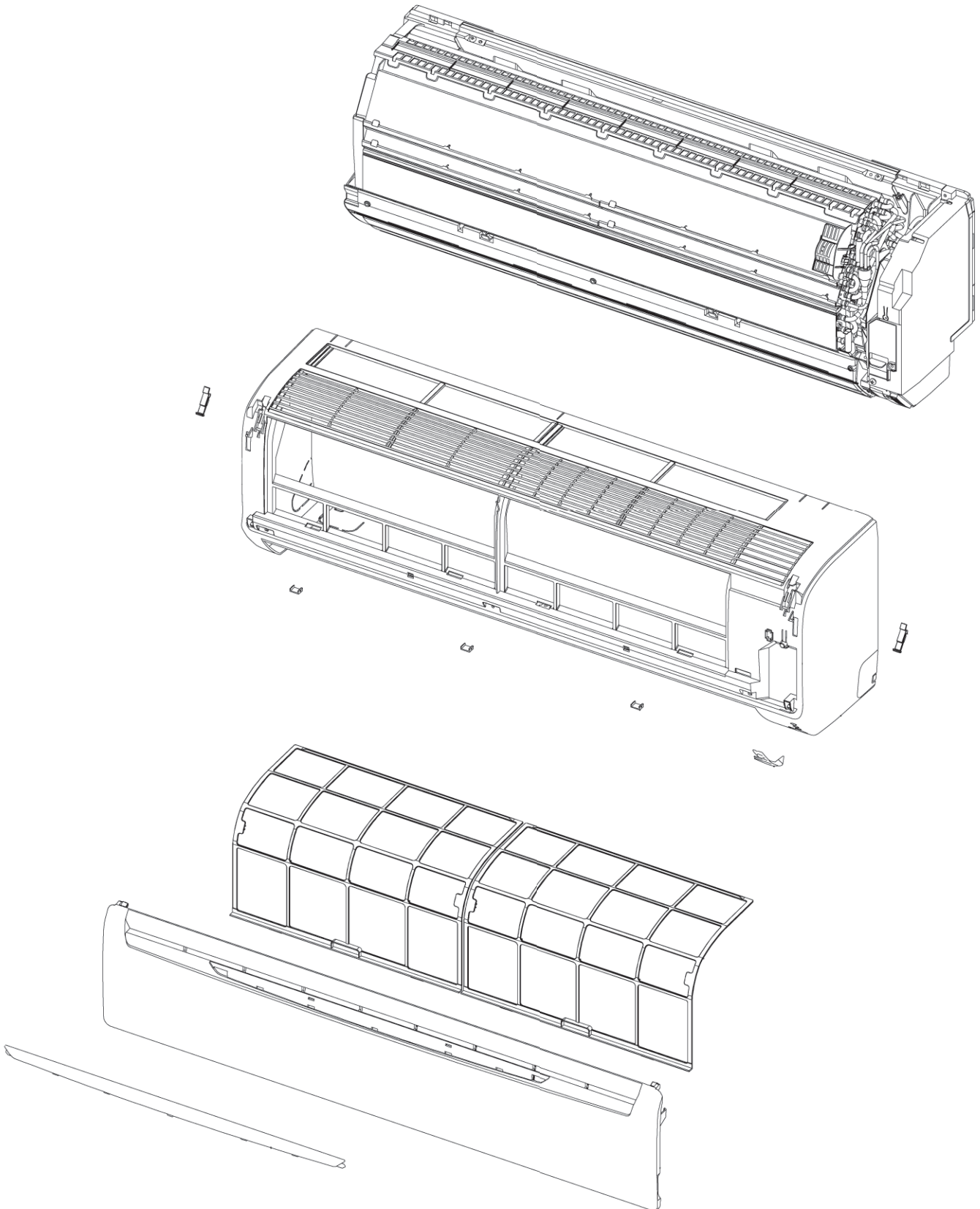
*Both capacity and input change more largely at less than 0 degrees C of ambient temperature as outdoor fan speed is decreased further.

WALL MOUNTED type INVERTER

9 . REPLACEMENT PARTS

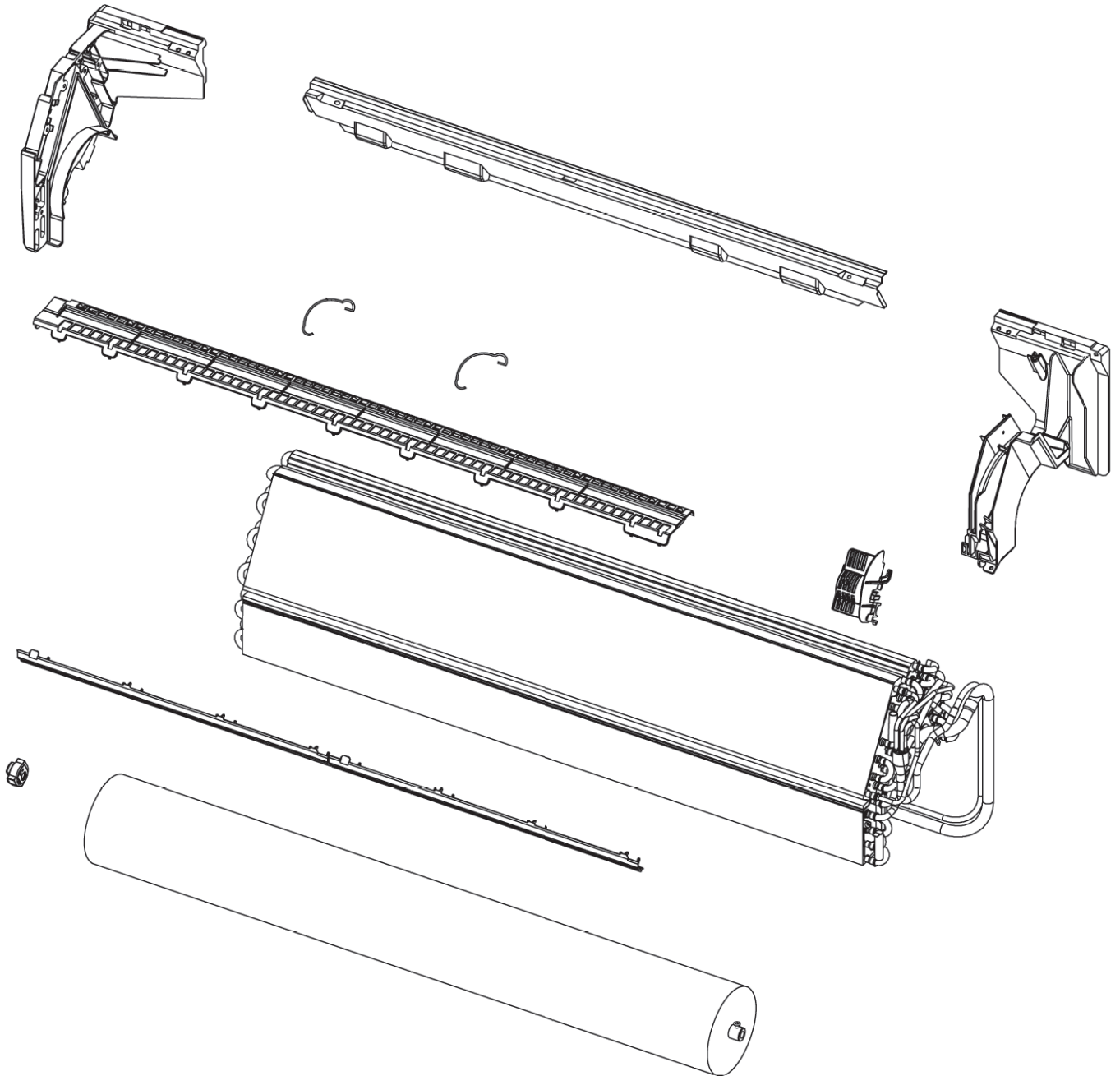
REPLACEMENT PARTS

Models : ASYA24LCC
ASYA30LCC



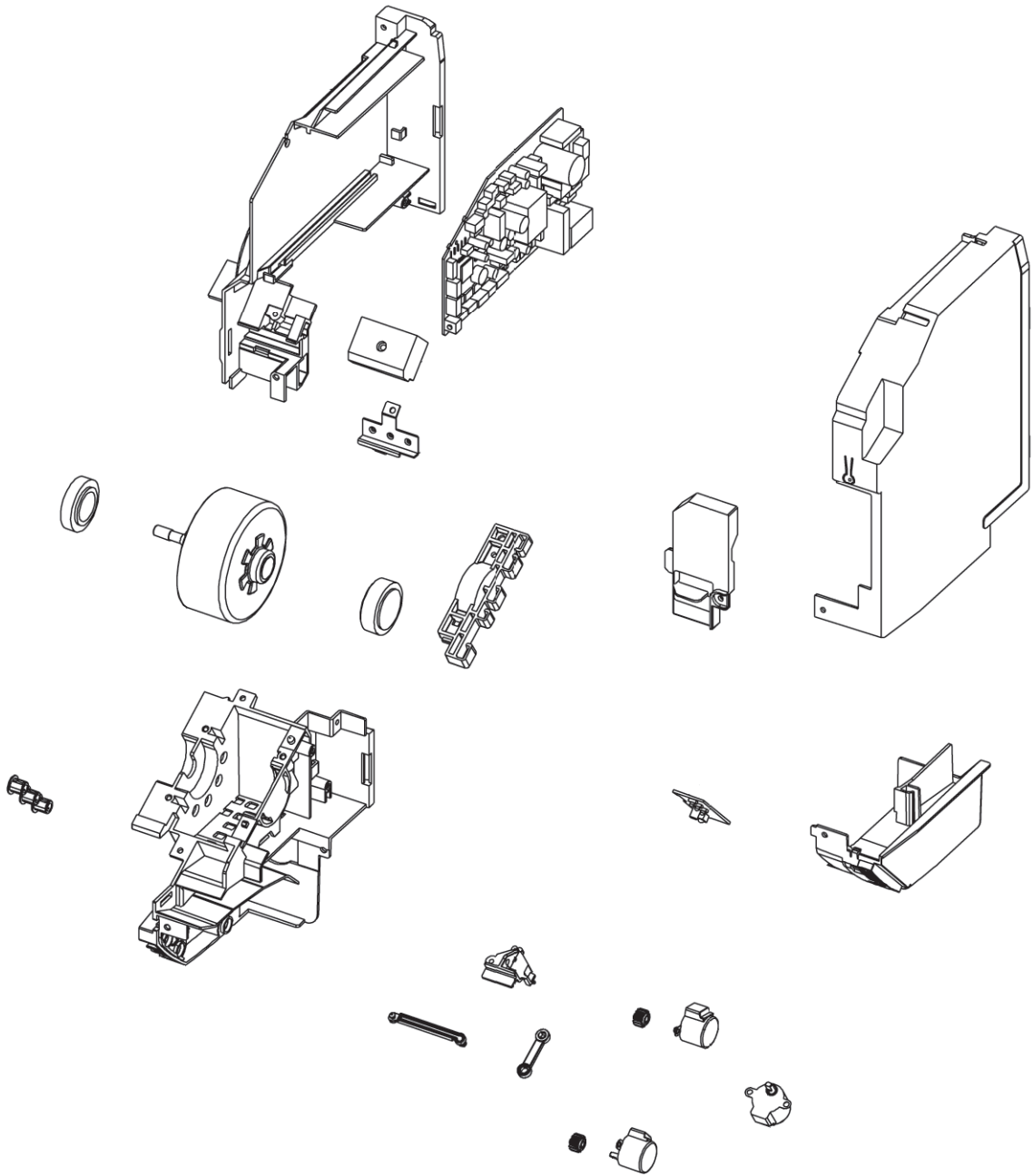
REPLACEMENT PARTS

Model : ASYA24LCC



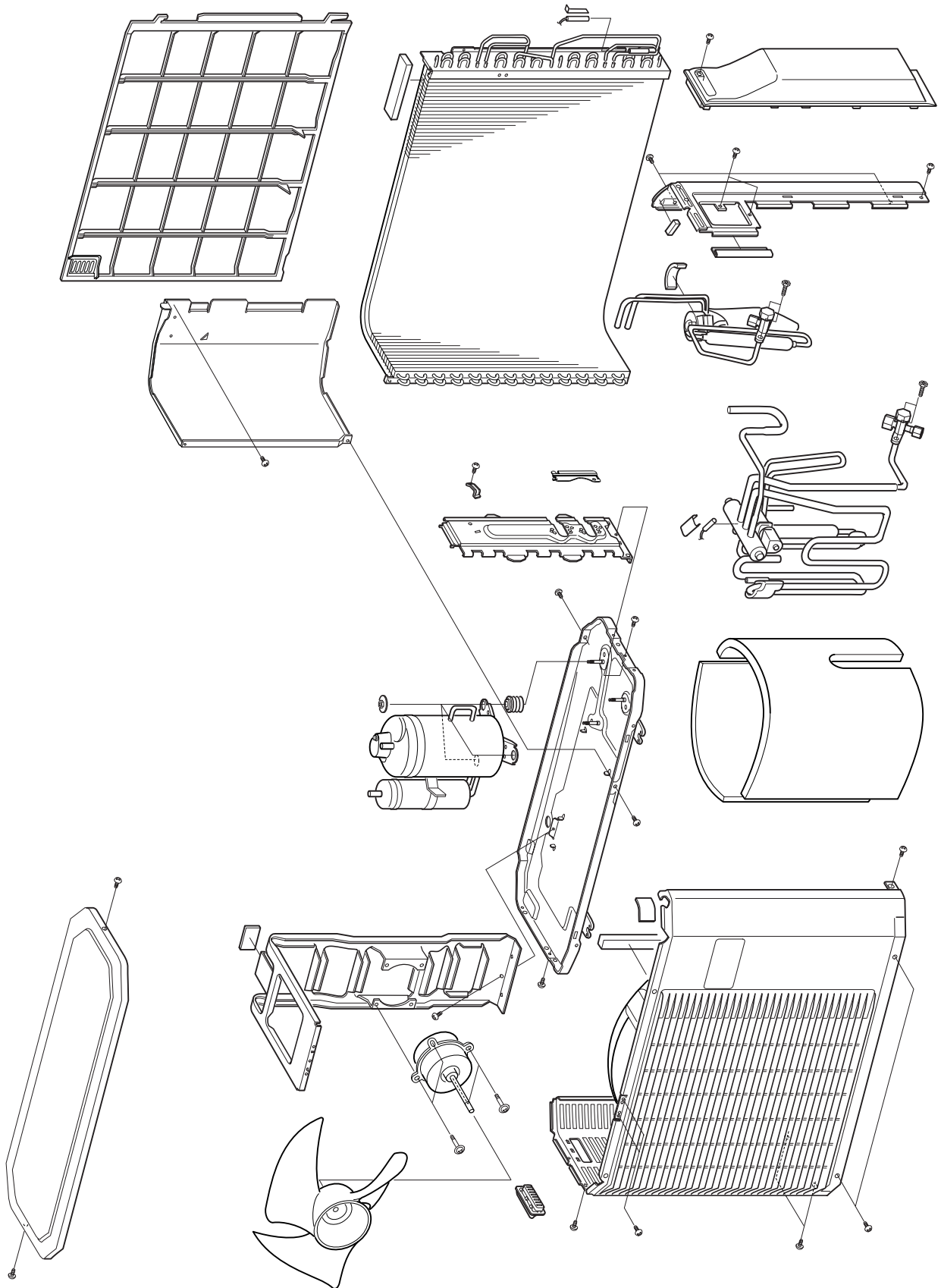
REPLACEMENT PARTS

Models : ASYA24LCC
ASYA30LCC



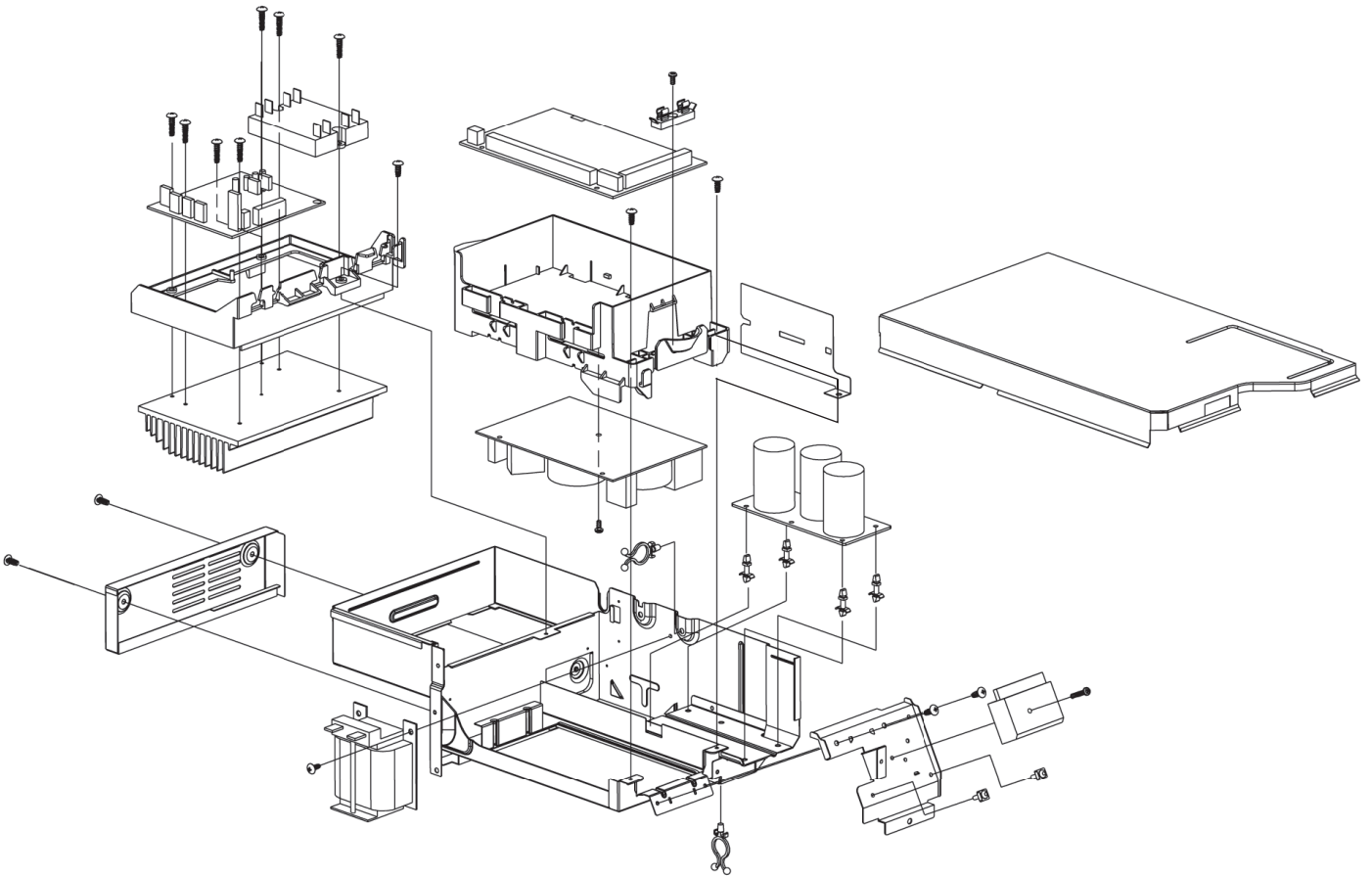
REPLACEMENT PARTS

Model : AOYR24LCC



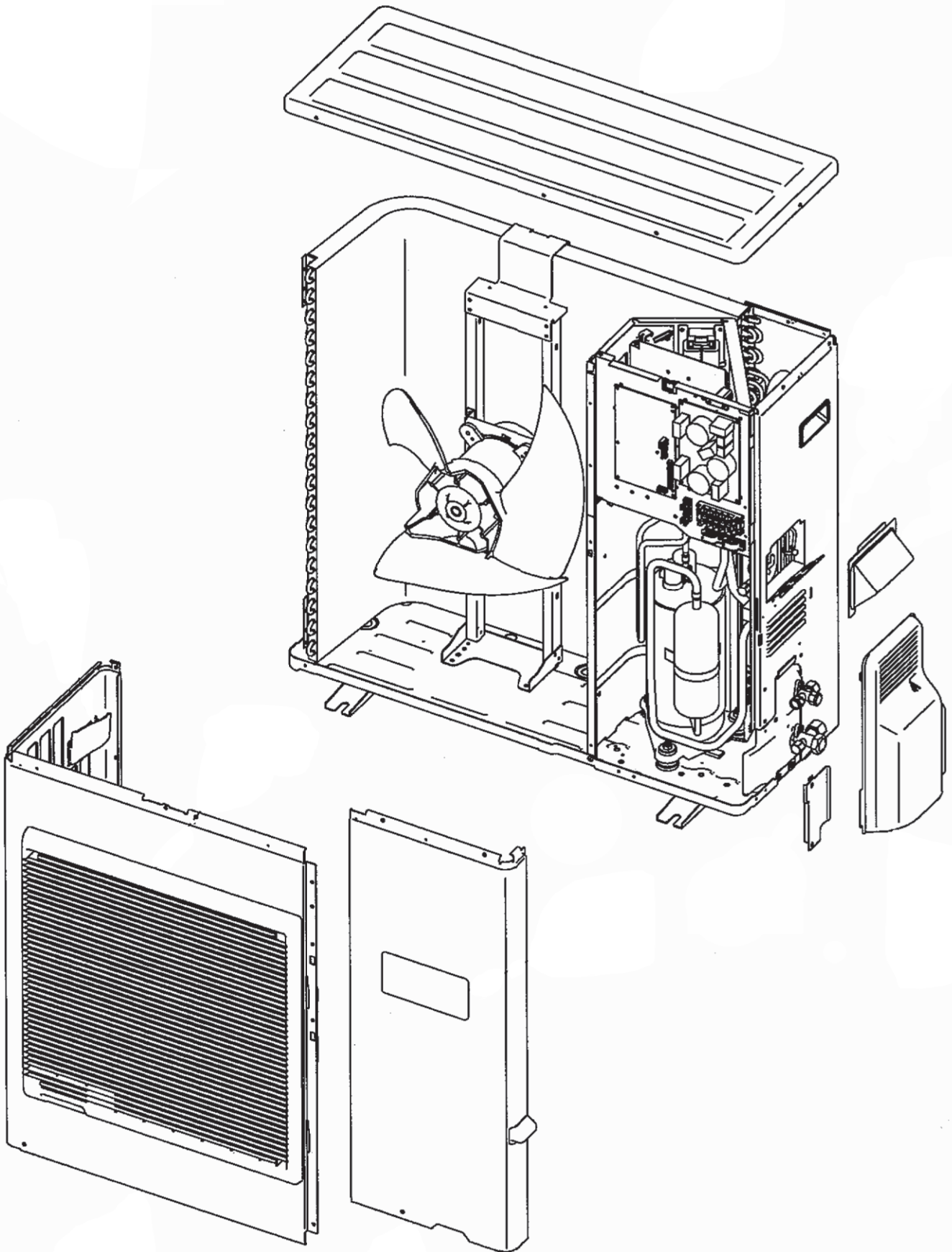
REPLACEMENT PARTS

Model : AOYR24LCC



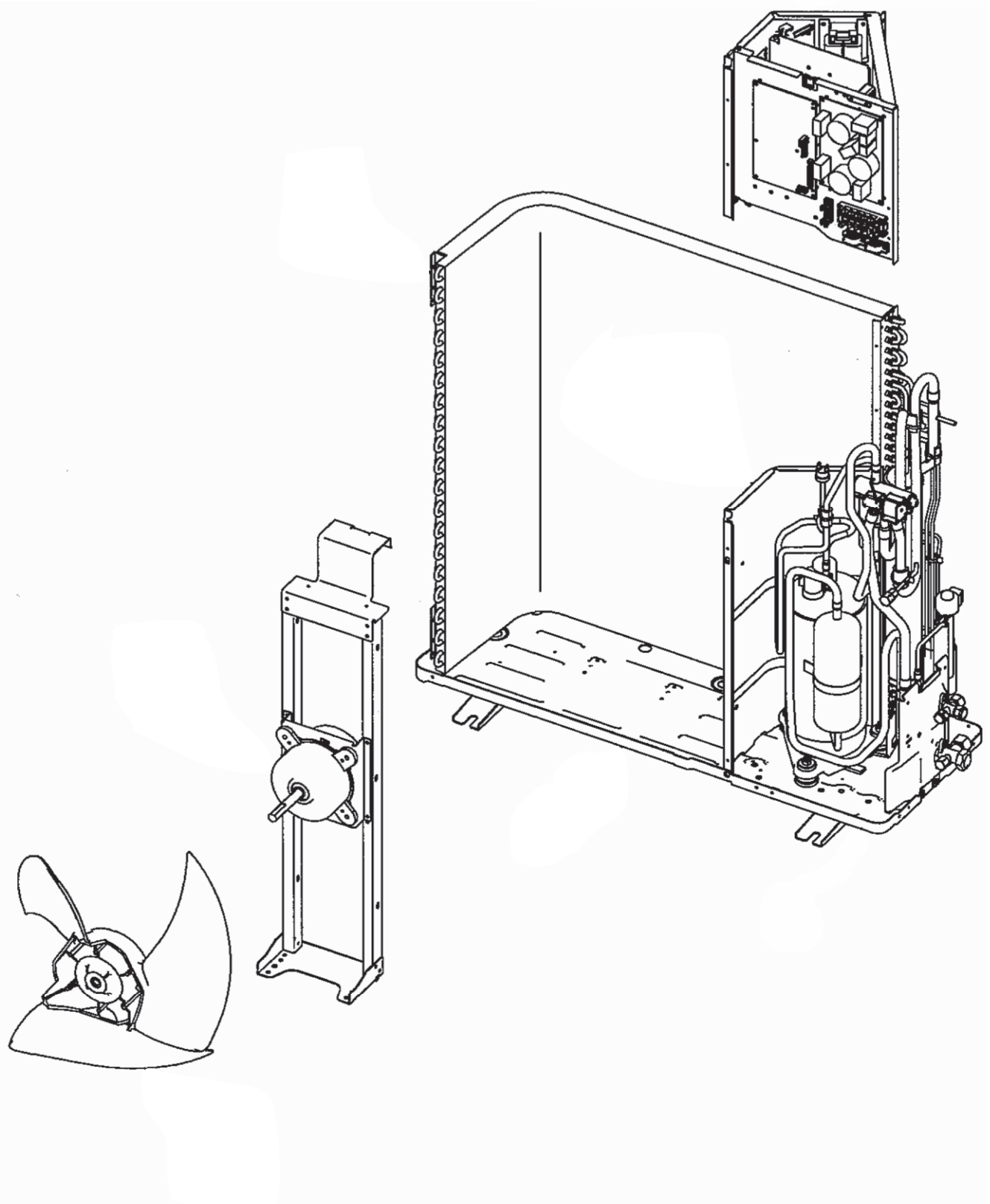
REPLACEMENT PARTS

Model : AOYR30LCT



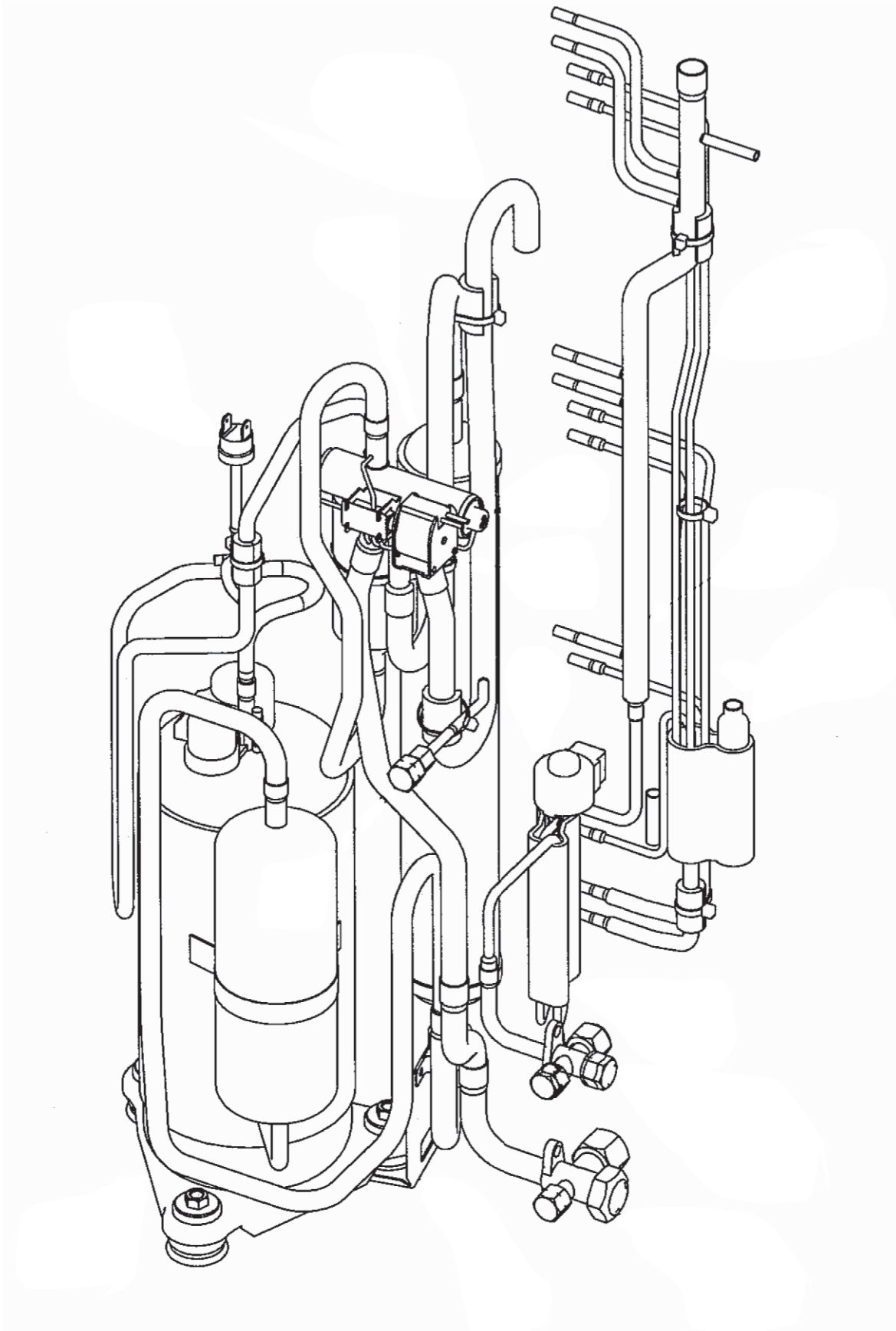
REPLACEMENT PARTS

Model : AOYR30LCT



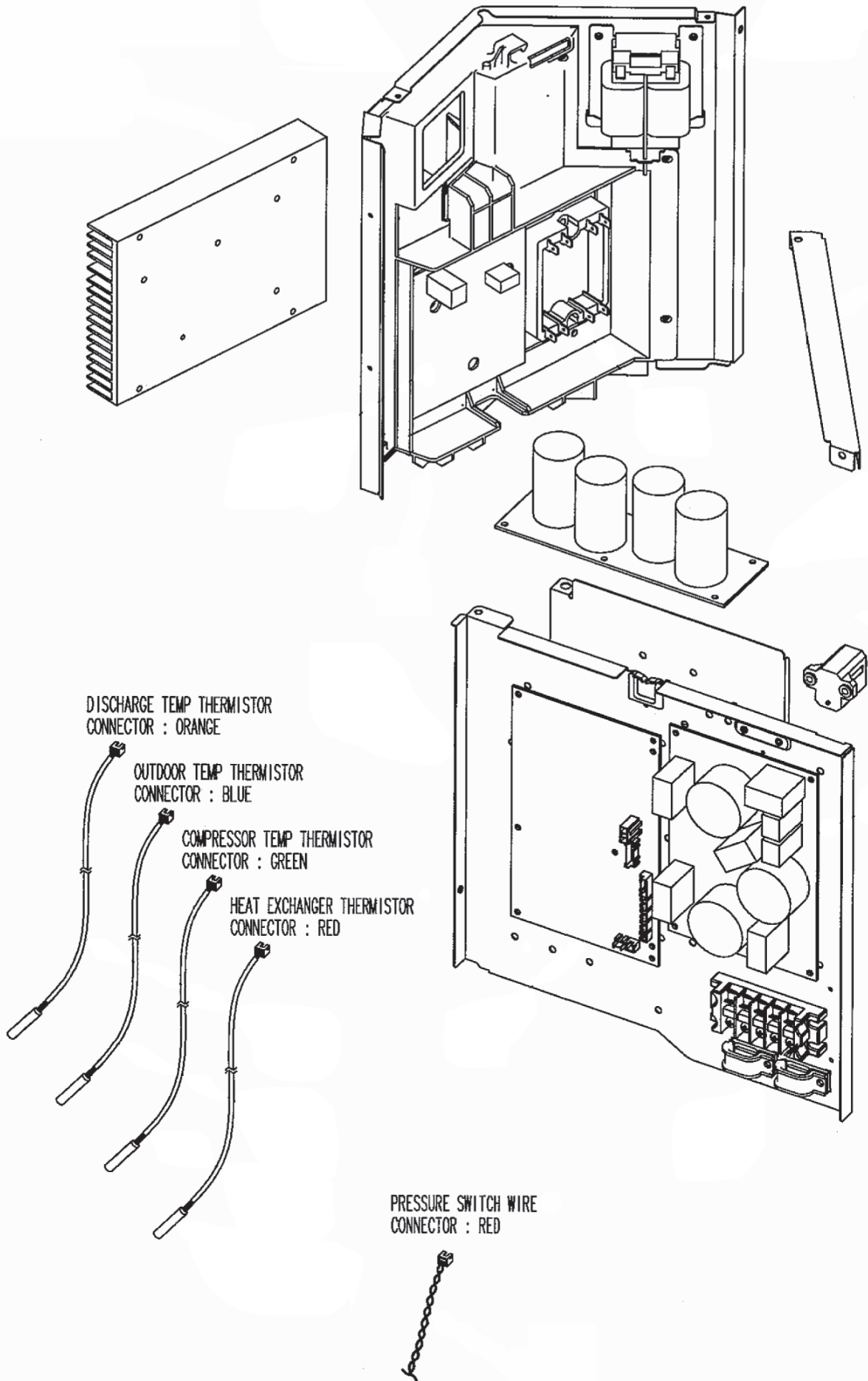
REPLACEMENT PARTS

Model : AOYR30LCT



REPLACEMENT PARTS

Model : AOYR30LCT



REPLACEMENT PARTS

Model : AOYR24LCC

PROCESS Wiring HEAT SINK SUB ASSY

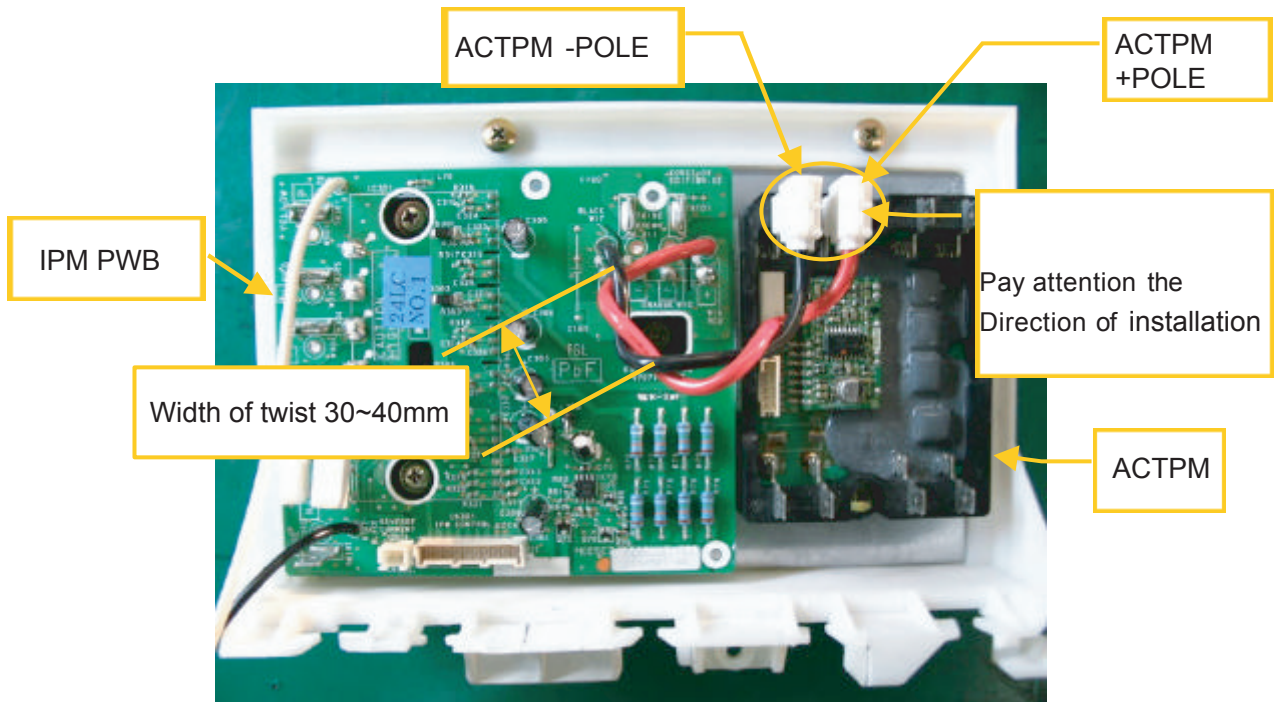
REGULATIONS

Do the twist work with the following combination.
(Twist it 1 time is to twist 360°.)

red (W16) }
black(W17) } two times. (Width of twist.30~40mm)

Connect a wire (red) with terminal to +POLE of ACTPM

Connect a wire (black) with terminal to -POLE of ACTPM



REPLACEMENT PARTS

Model : AOYR24LCC

PROCESS Assemble COIL, CHOKE and WIRE with TERMINAL

REGULATIONS

Like a rough sketch, assemble COIL, CHOKE to CASE (INV)

Like a rough sketch, assemble WIRE with TERMINAL after assembling COIL, CHORK.

(Pay attention to direction of WIRE with TERMINAL.)

Like a rough sketch, twist WIRE with TERMINAL and assemble it certainly.

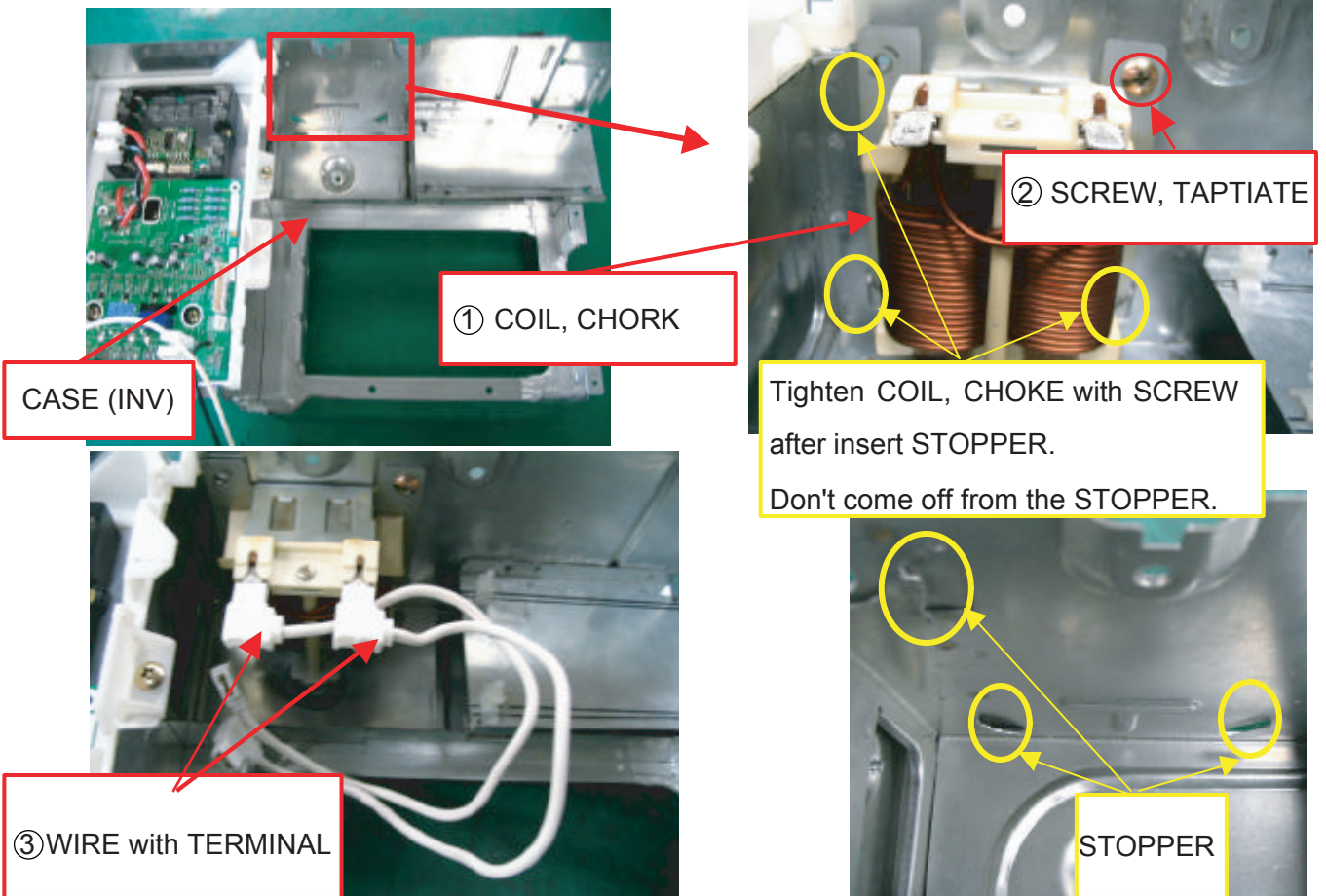
(Twist it 1 time is to twist 360° .)

Five times (Width of twist. 40~50mm)

① COIL, CHOKE

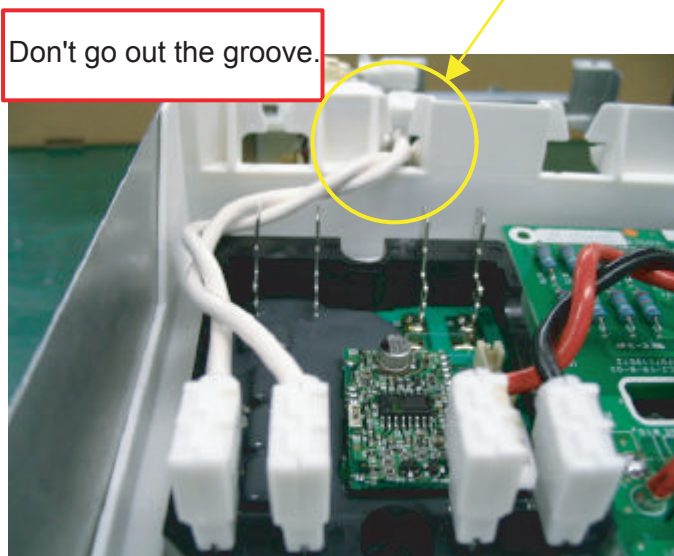
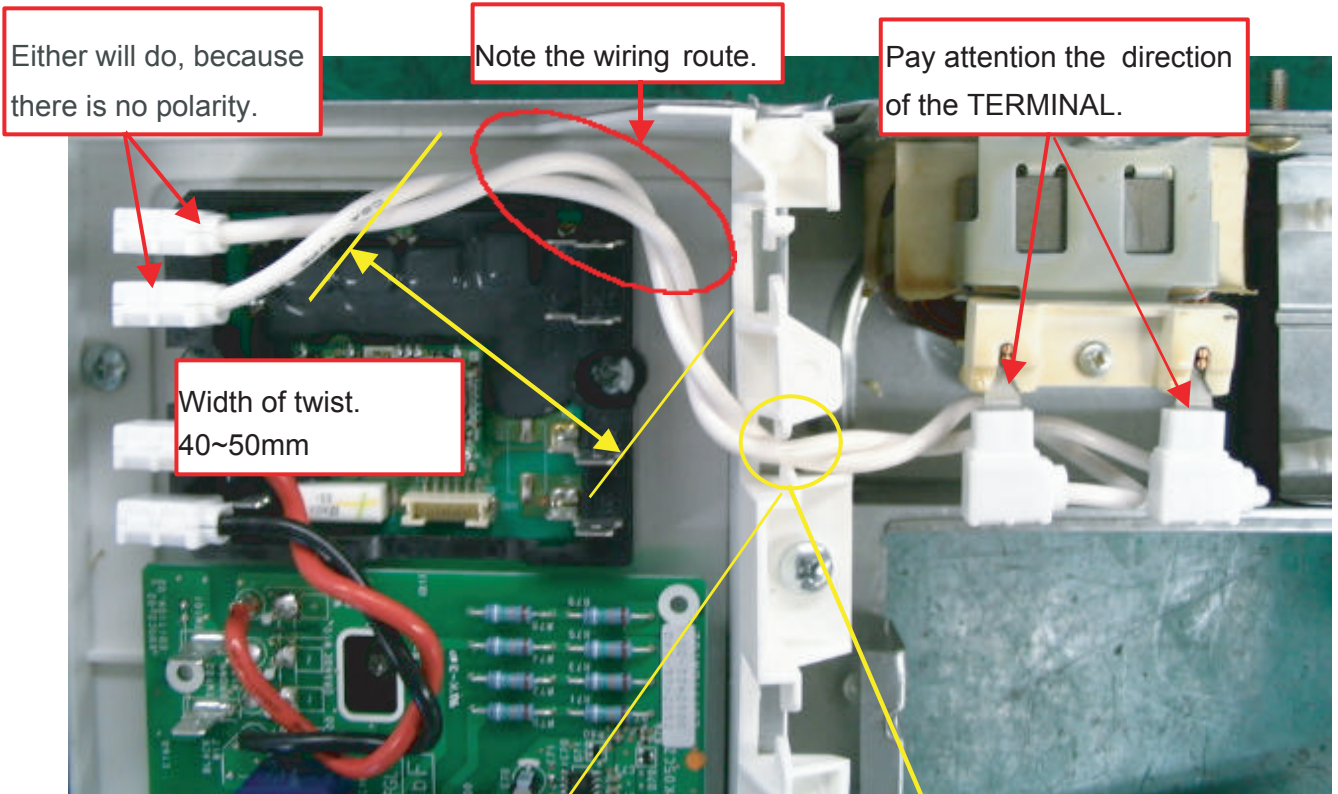
② SCREW, TAPTITE

③ WIRE with TERMINAL

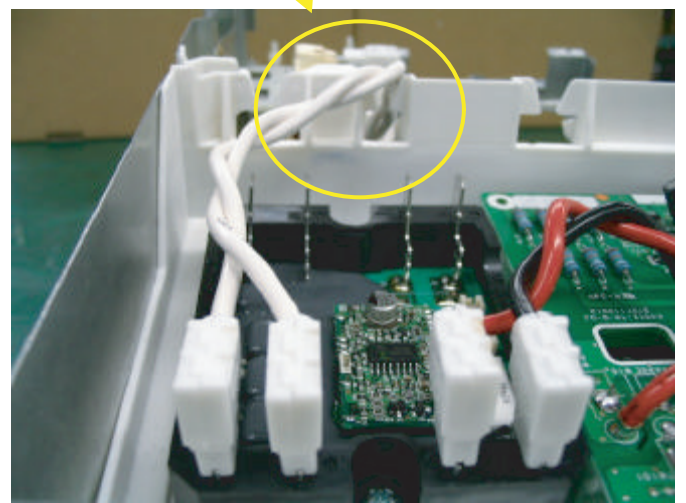


REPLACEMENT PARTS

Model : AOYR24LCC



OK



NG

REPLACEMENT PARTS

Model : AOYR24LCC

PROCESS Assemble PWB ASSY(CAPACITOR) and Wiring

① PWB ASSY (K05DG CAPACITOR)

REGULATIONS

② BINDER M

Like figure 1, assemble PWAB ASSY (CAPACITOR) to the SPACER

Pay attention to direction of the PWAB ASSY, when assembling PWAB ASSY

(Have the wire with the terminal (white W12, purple W13) on the REACTOR side.)

Do the twist work with the following combination. (Twist it 1 time is to twist 360°.)

white W12 }
purple W13 } three times

blue W7 }
yellow W8 } six times

Like figure 2, wire lead wire. Insert TERMINAL in CONTACT certainly.

Be sure to fasten by WIRE CLAMPER after wiring.

Fit the wire in the groove firmly.

Fasten the wire with BINDER M.

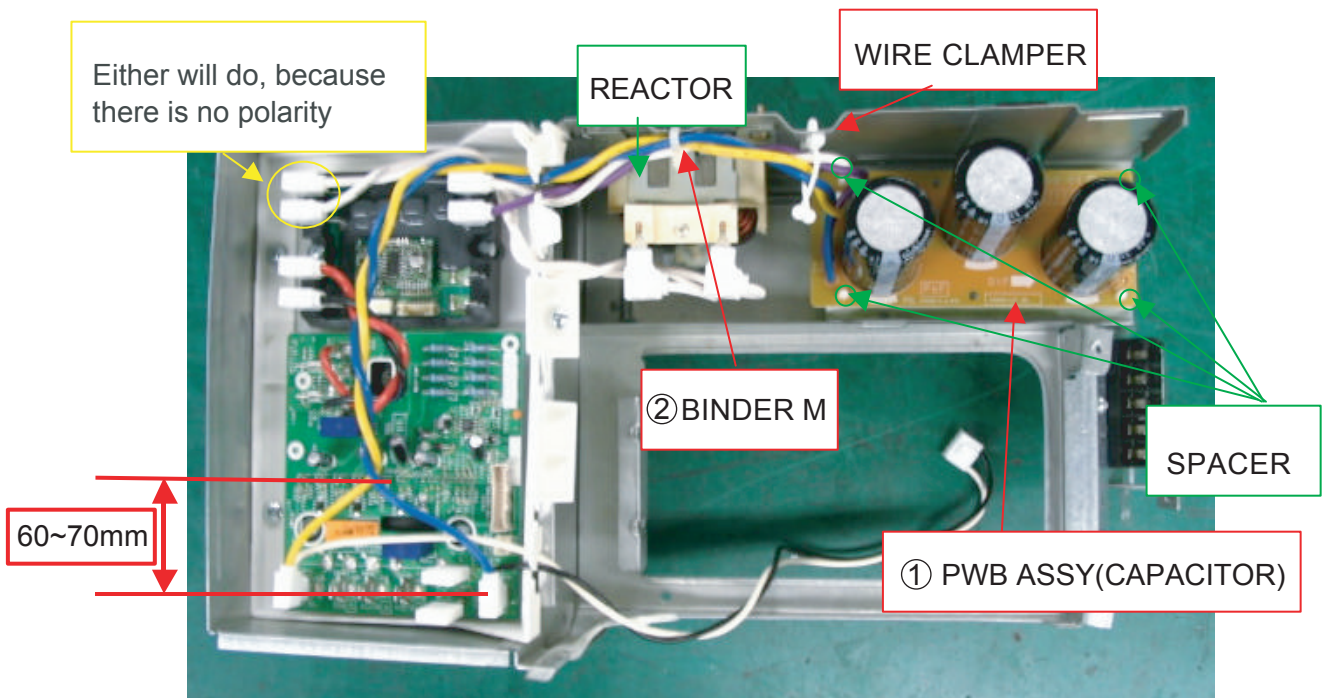
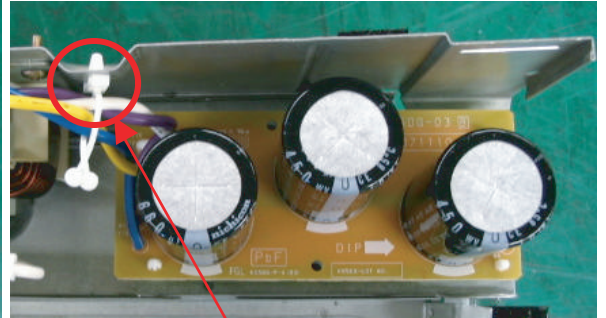
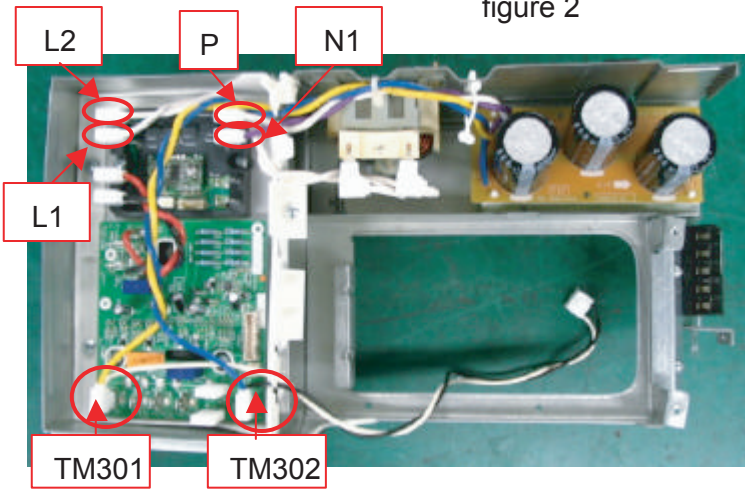


Figure 1

REPLACEMENT PARTS

Model : AOYR24LCC

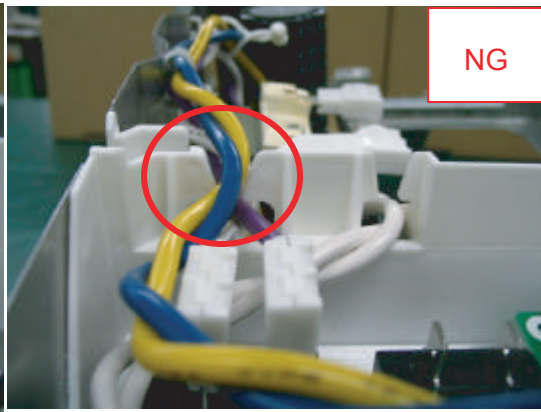
figure 2



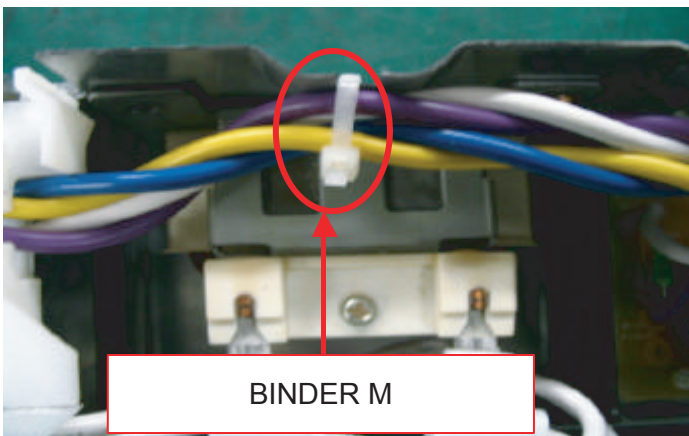
Fix WIRE into WIRE CLAMPER firmly.



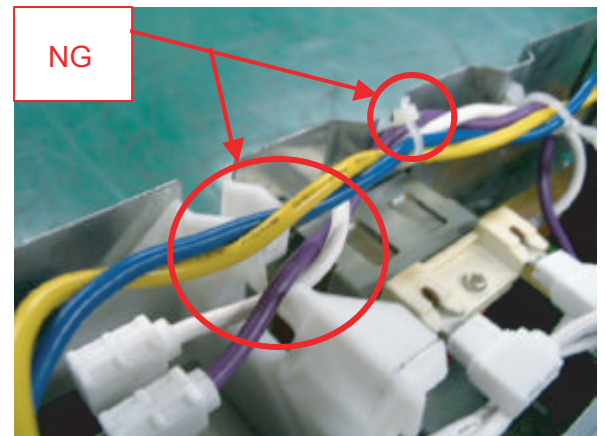
Fix WIRE into groove firmly.



NG



BINDER M



NG

Like a rough sketch, bind BINDER M
Don't upturn the cut end of BINDER M and
don't bind outside CASE (INVERTER)

REPLACEMENT PARTS

Model : AOYR24LCC

PROCESS Wiring lead wire of PWB (FILTER)

REGULATIONS

Like a rough sketch, twist lead wire

Do the twist work with the following combination. (Twist it 1 time is to twist 360°.)

Width of twist. 40~50mm

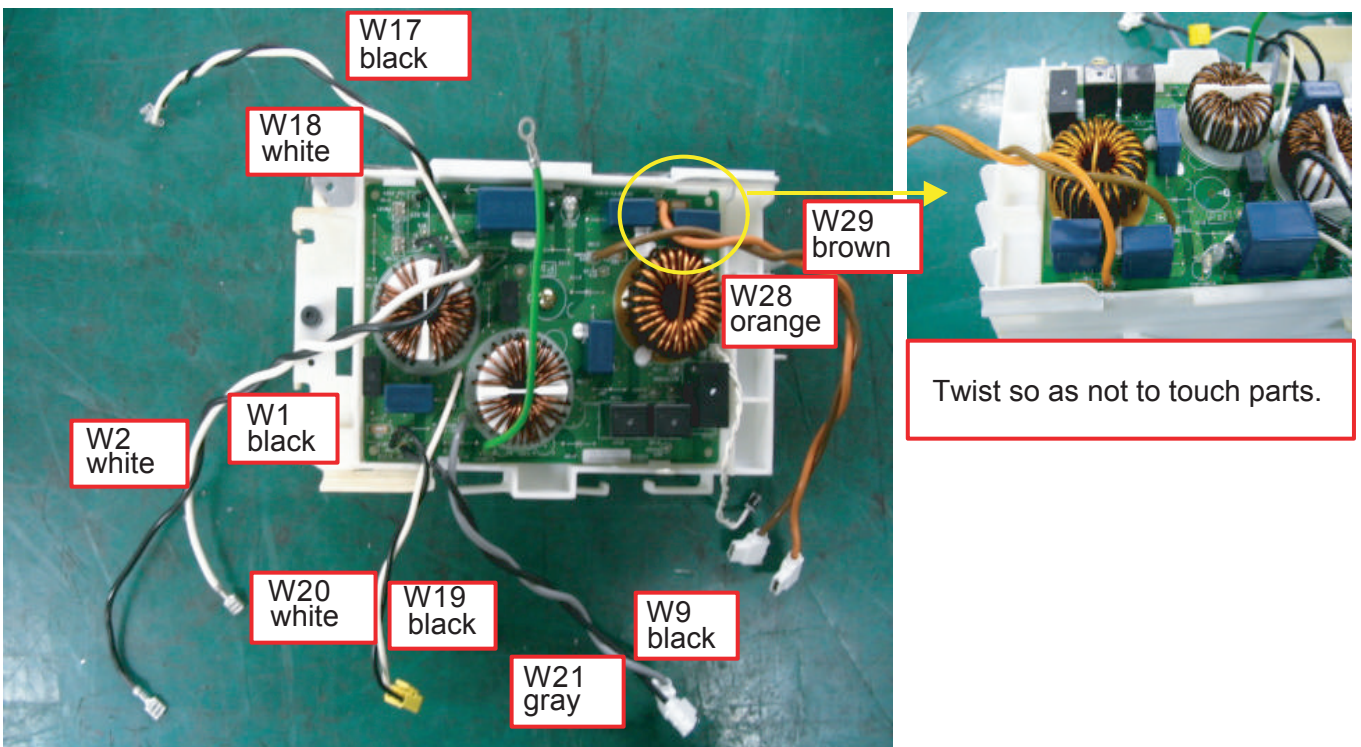
black W17 }
white W18 } Three times

black W1 }
white W2 } One time

brown W29 }
orange W28 } Four times

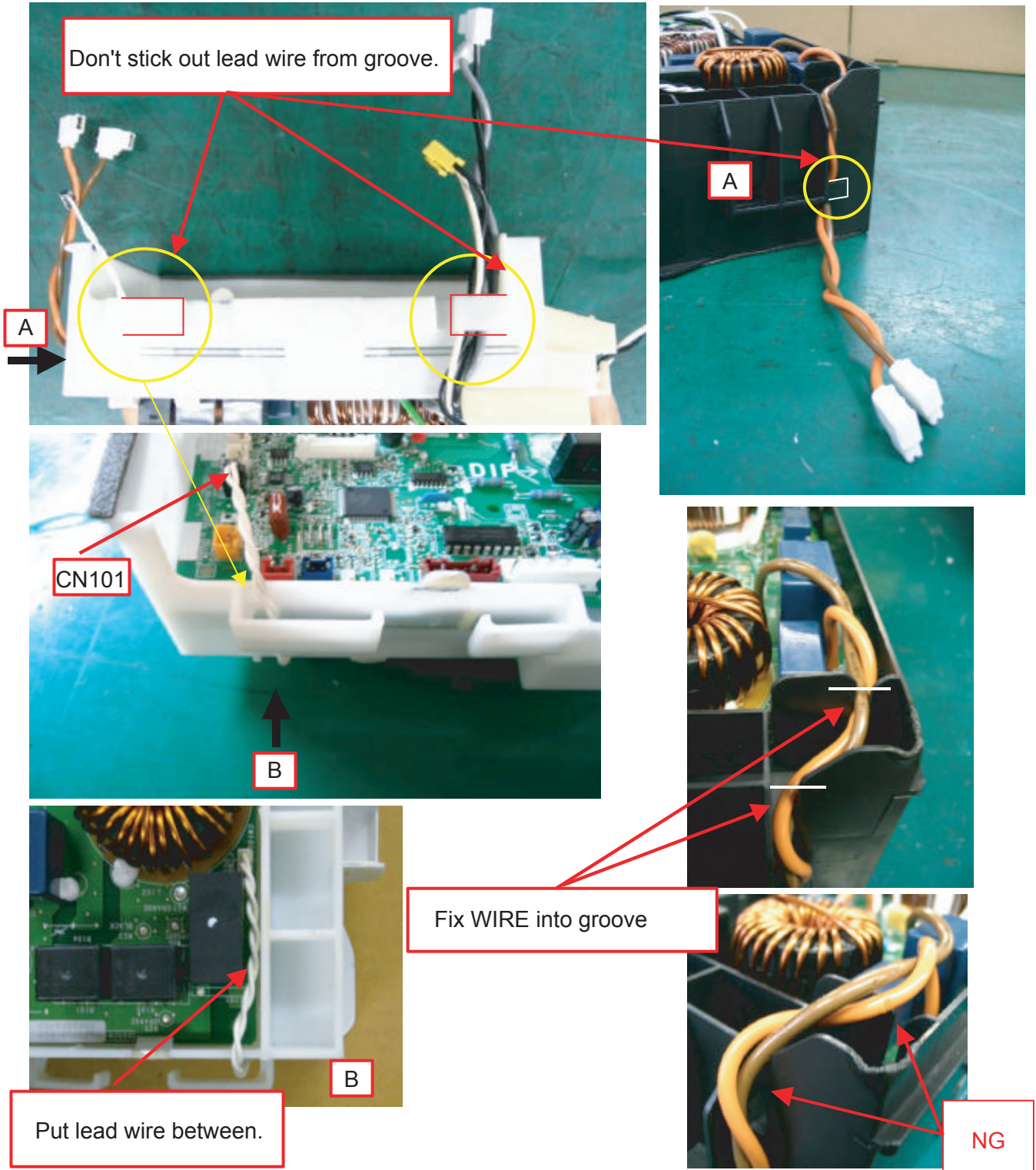
black W9 }
gray W21 } Three times

black W19 }
white W20 } Two times



REPLACEMENT PARTS

Model : AOYR24LCC



REPLACEMENT PARTS

Model : AOYR24LCC

PROCESS Assemble PWB SUB ASSY (FILTER) to CASE (INV)

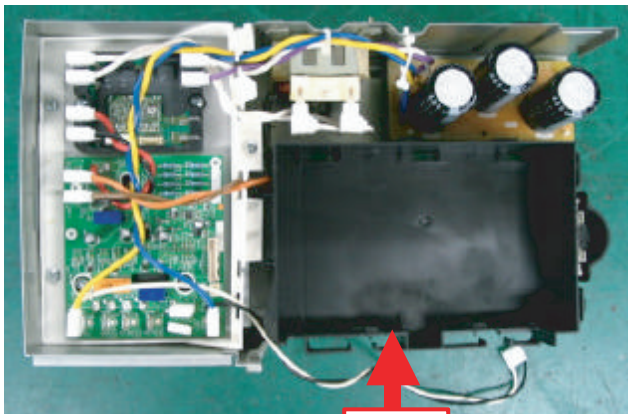
REGULATIONS

① SCREW, TAPPING

Pay attention so as not to fasten lead wire, when assembling PWB SUB ASSY (FILTER) to CASE (INV)

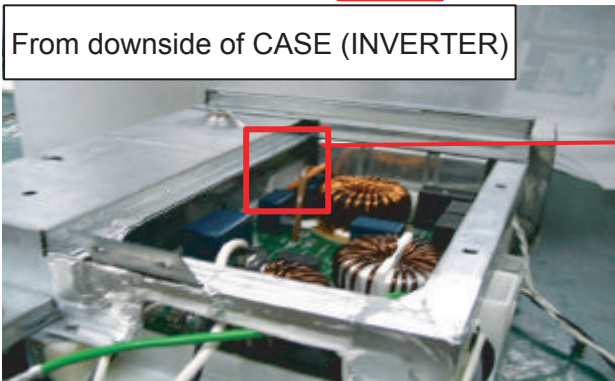
Like figure 1, connect lead wire of orange W28 and brown W29.

Insert STOPPER shown circle of figure A into inside of CASE (INV)



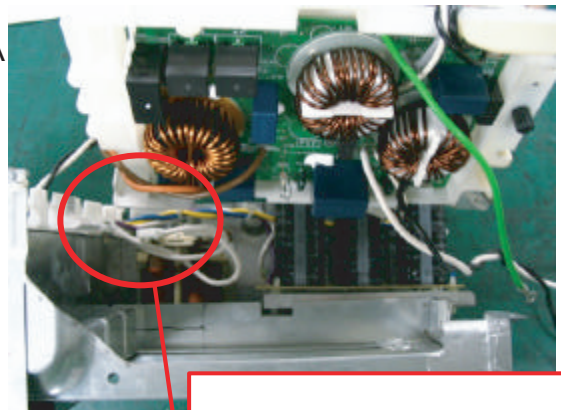
A VIEW

From downside of CASE (INVERTER)



Pay attention so as not to fasten lead wire

figure A



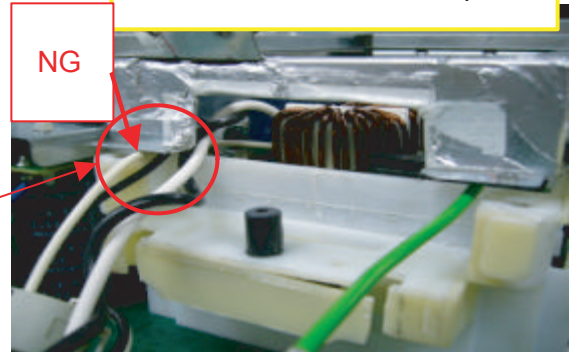
Insert into inside of CASE(INV)

Stopper



lead wire must not touch parts.

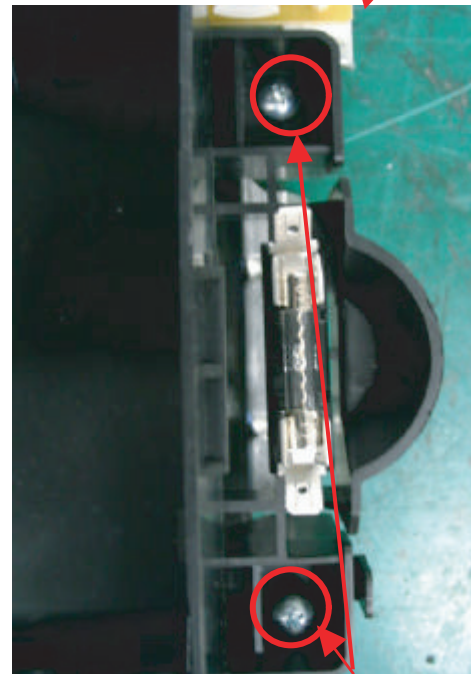
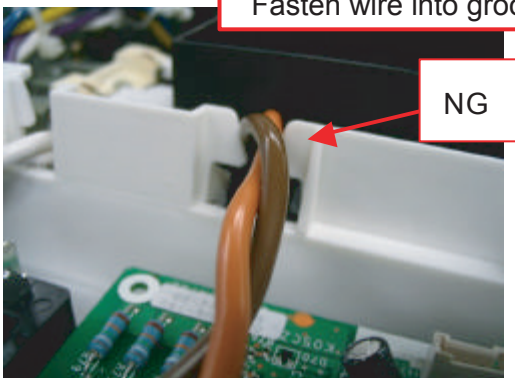
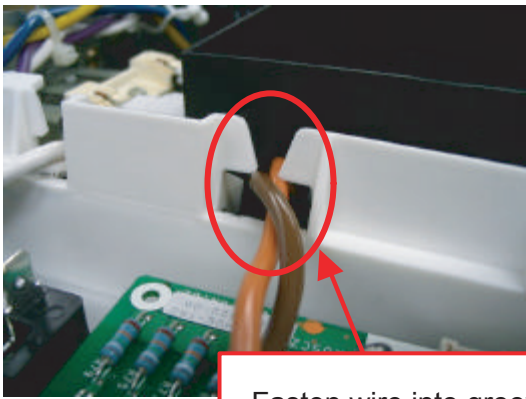
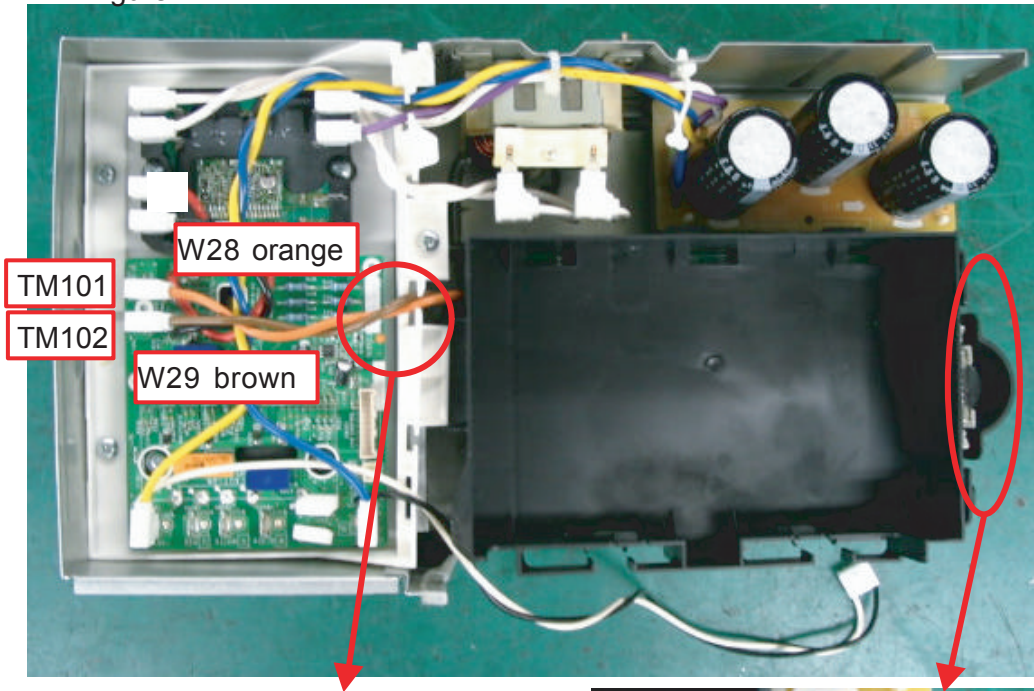
NG



REPLACEMENT PARTS

Model : AOYR24LCC

figure 1



REPLACEMENT PARTS

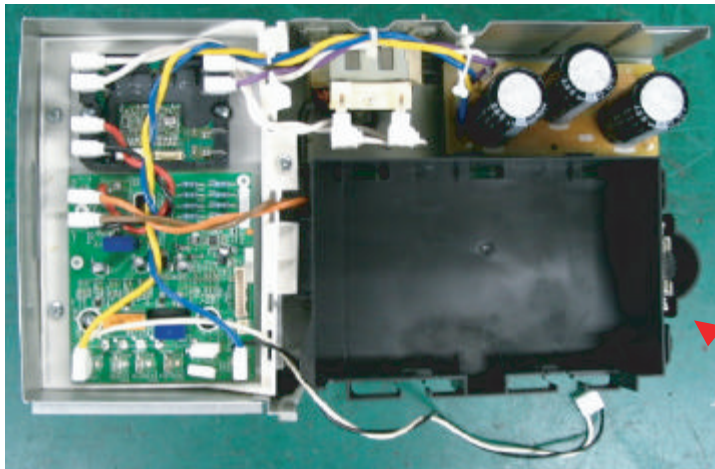
Model : AOYR24LCC

PROCESS Assemble PWB ASSY

REGULATIONS

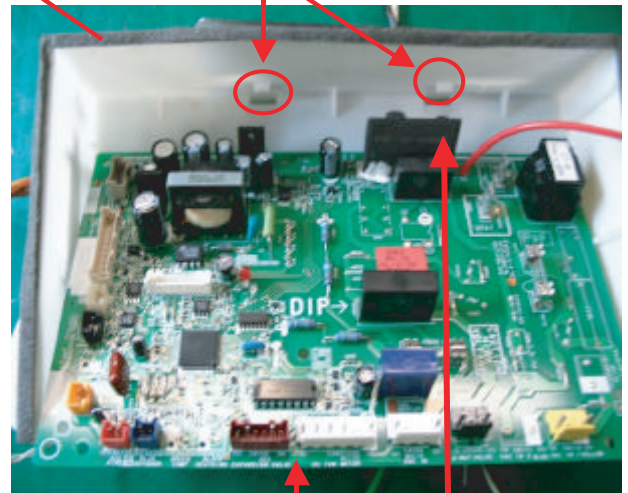
① PWB ASSY (K05CU) MAIN

Like a rough sketch, assemble PWB ASSY (MAIN) to PWB HOLDER



Insert PWB in nail of this side accurately.

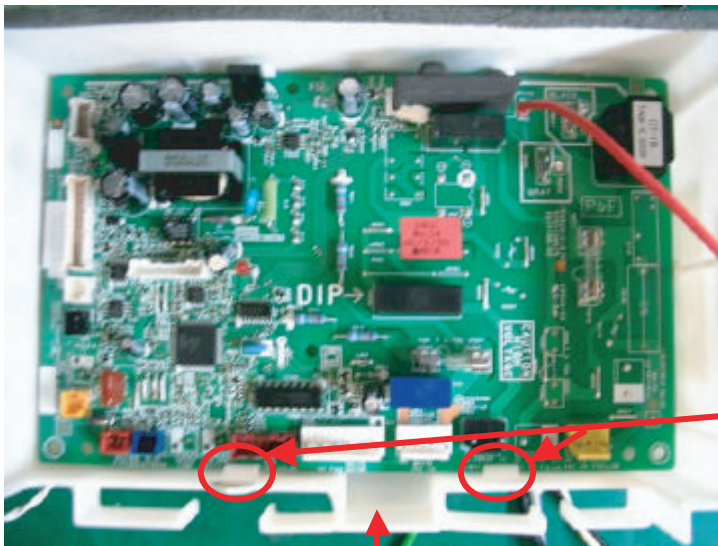
PWB HOLDER



Hold it in nail of this side certainly.

Don't knock it in CASE, when fitting PWB.

PWB ASSY (MAIN)



Widen when fitting PWB.

REPLACEMENT PARTS

Model : AOYR24LCC

PROCESS Wiring lead wire

REGULATIONS

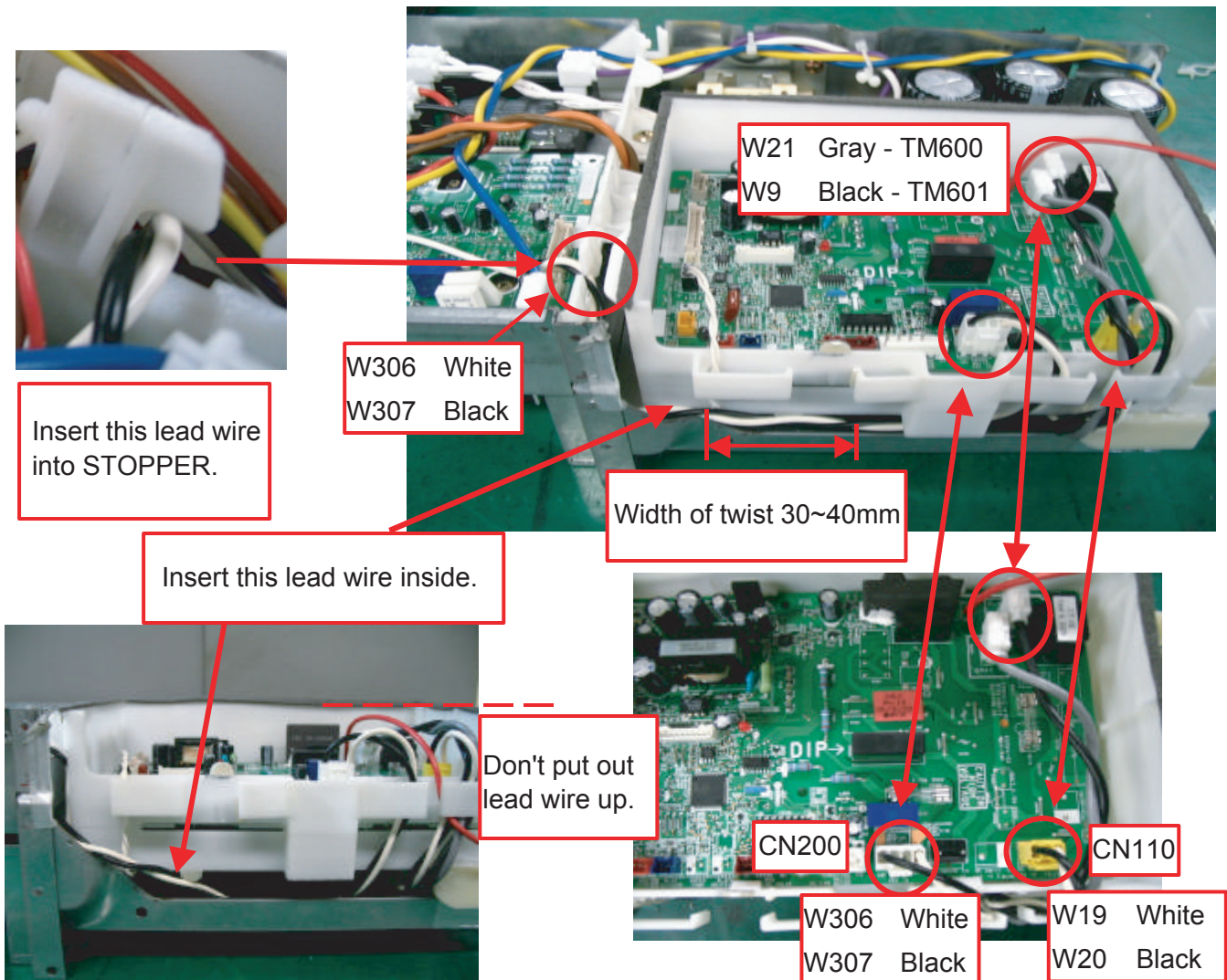
Like a rough sketch, wire lead wire.

Do the twist work with the following combination.

(Twist it 1 time is to twist 360°.)

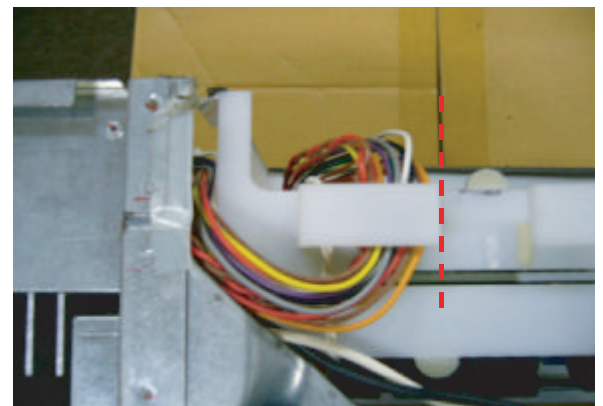
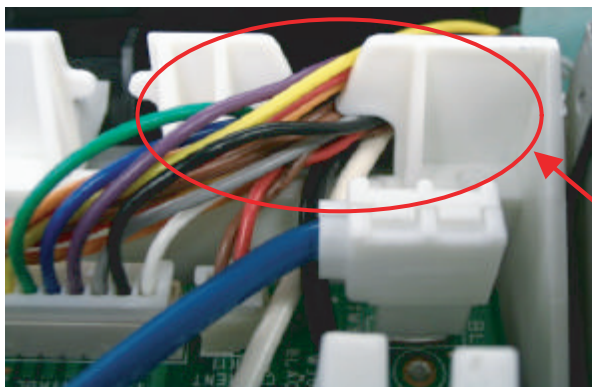
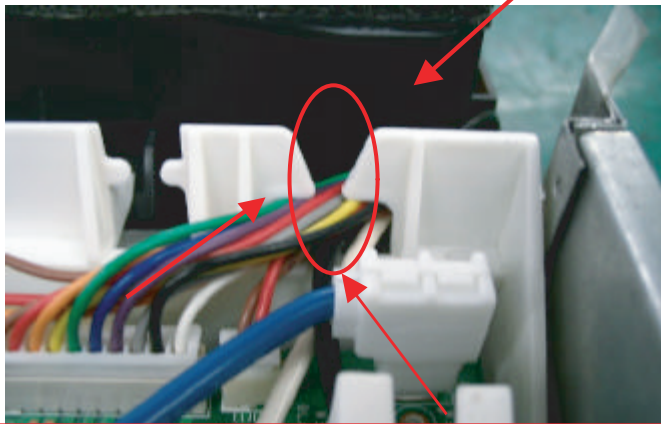
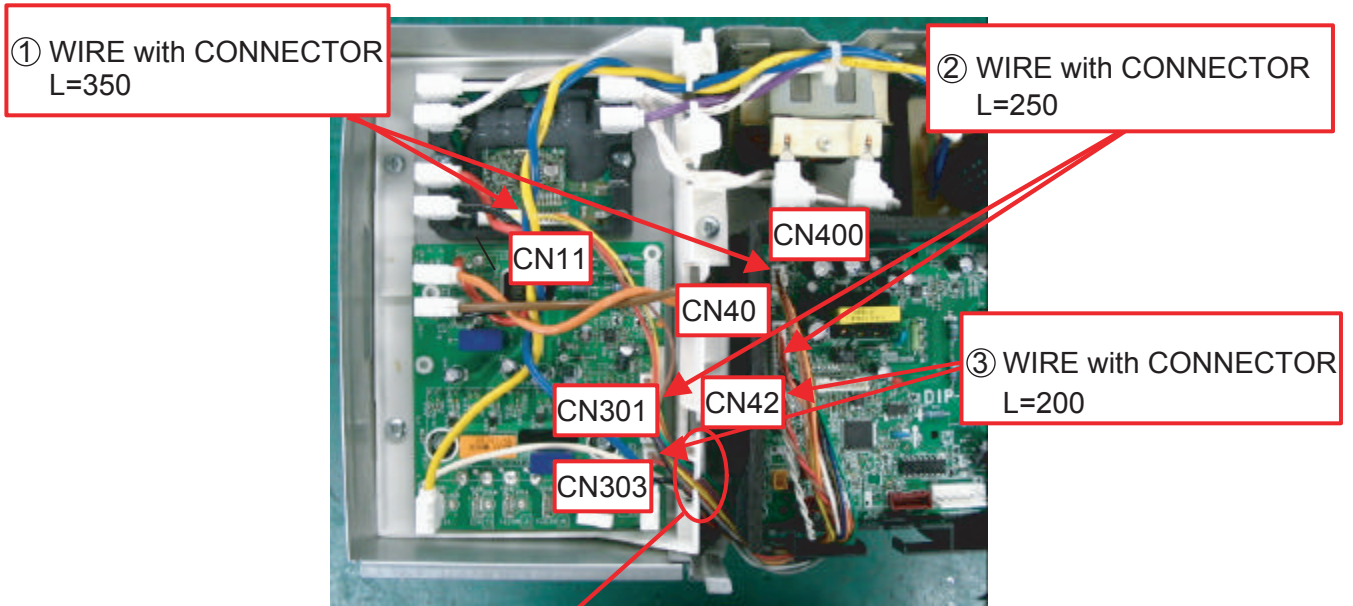
White (W306) } Six times. (Width of twist. 30~40mm)
 Black (W307)

- ① WIRE with CONNECTOR L=350
- ② WIRE with CONNECTOR L=250
- ③ WIRE with CONNECTOR L=200



REPLACEMENT PARTS

Model : AOYR24LCC



Wire must not stick out from STOPPER

To stick out is NG

REPLACEMENT PARTS

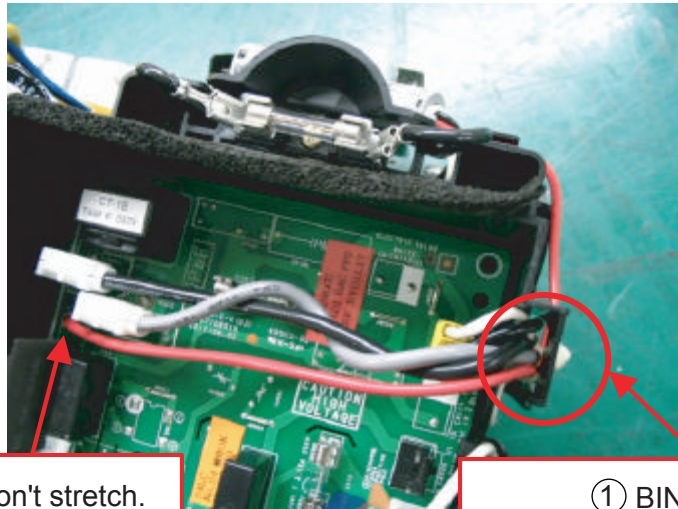
Model : AOYR24LCC

PROCESS Wiring CABLE

REGULATIONS

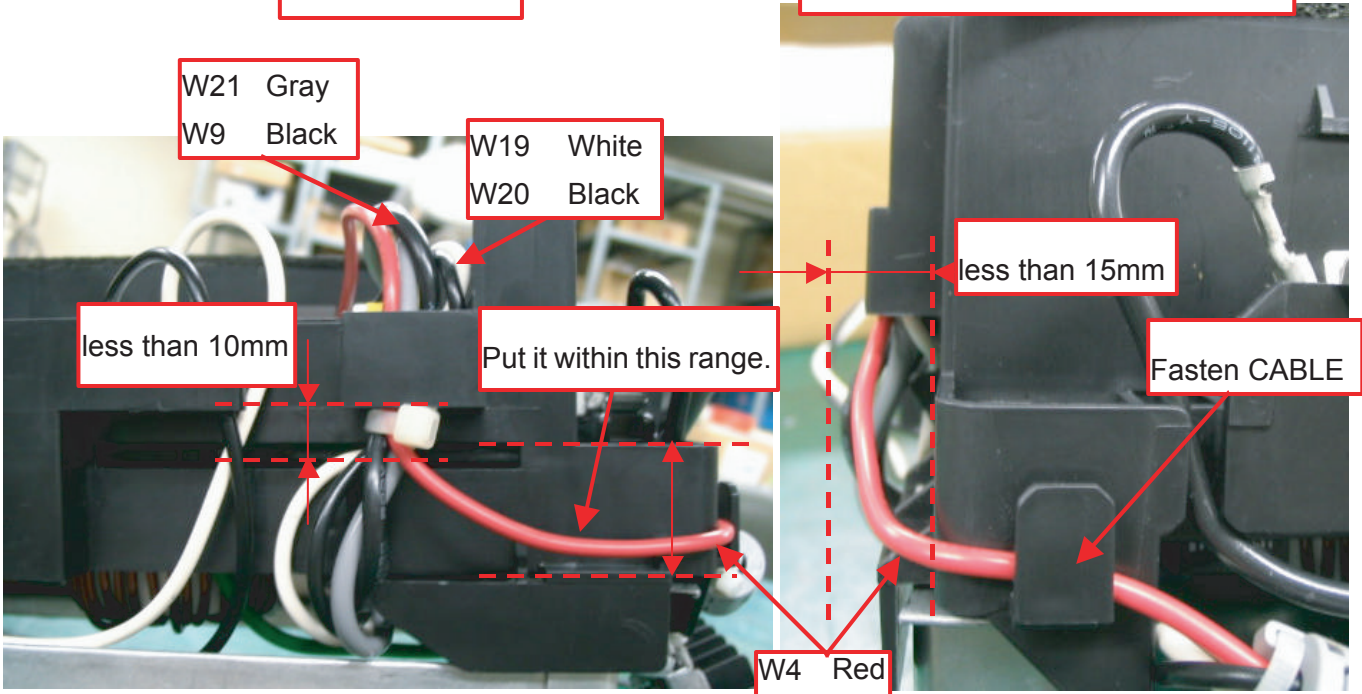
Like a rough sketch, fasten HARNESS by BINDER

① BINDER C



Don't stretch.

① BINDER C



W21 Gray
W9 Black

W19 White
W20 Black

less than 10mm

Put it within this range.

less than 15mm

Fasten CABLE

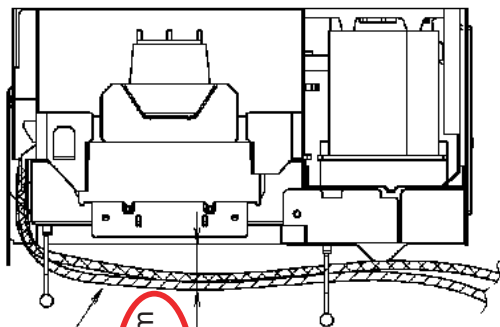
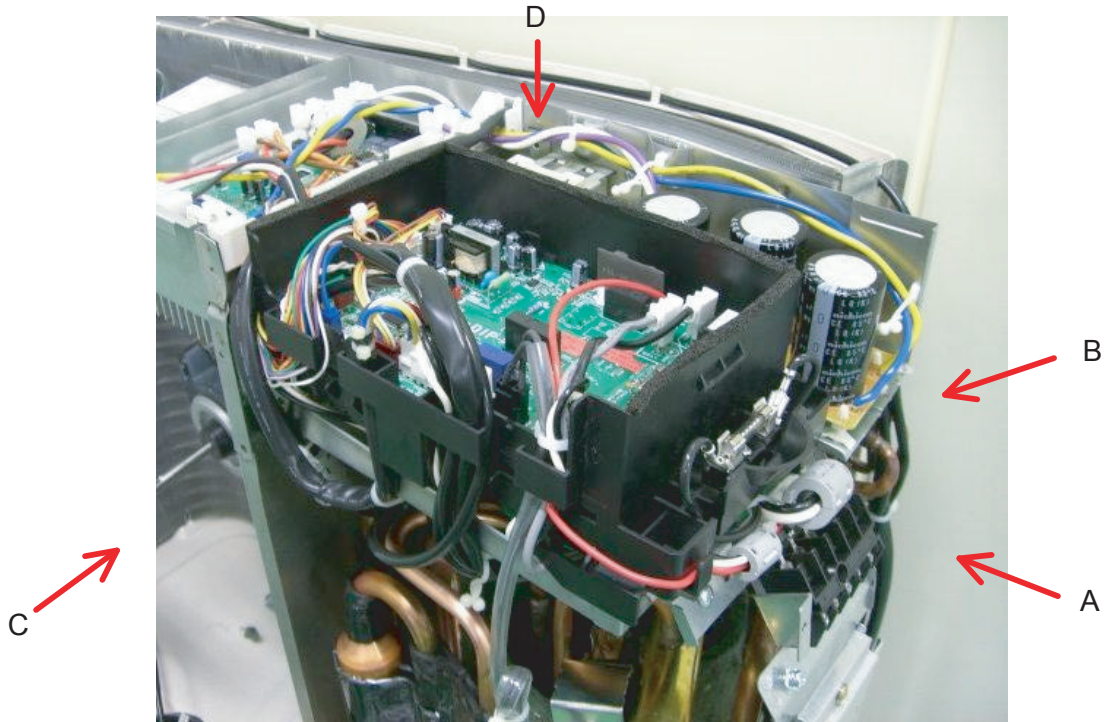
W4 Red

REPLACEMENT PARTS

Model : AOYR24LCC

PROCESS Arrangement of lead wires to be connected to the inverter assembly.

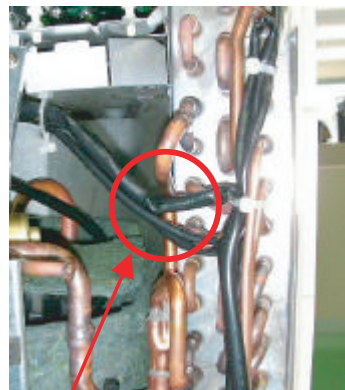
① BINDER



Thermistor(Heat exchanger)
Thermistor(Outdoor Temp.)
EEV Coil Lead

Maximum
20mm

A



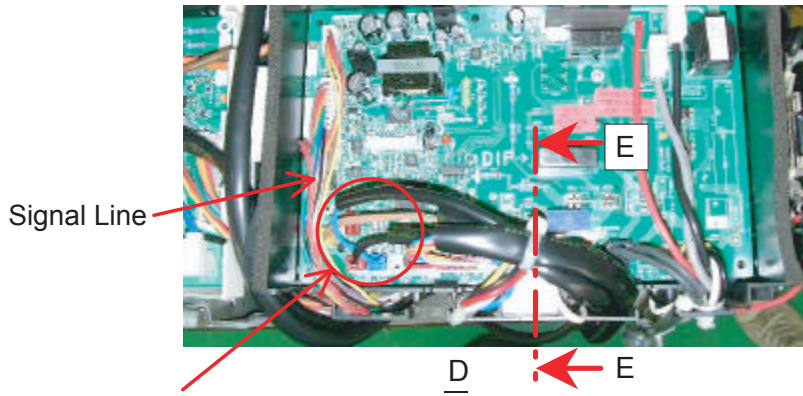
B

Pass the lead wire underneath
the piping.

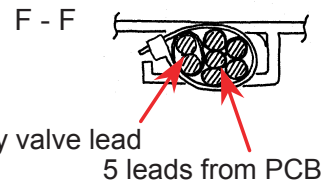
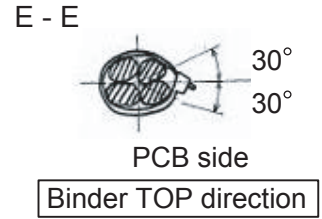
REPLACEMENT PARTS

Model : AOYR24LCC

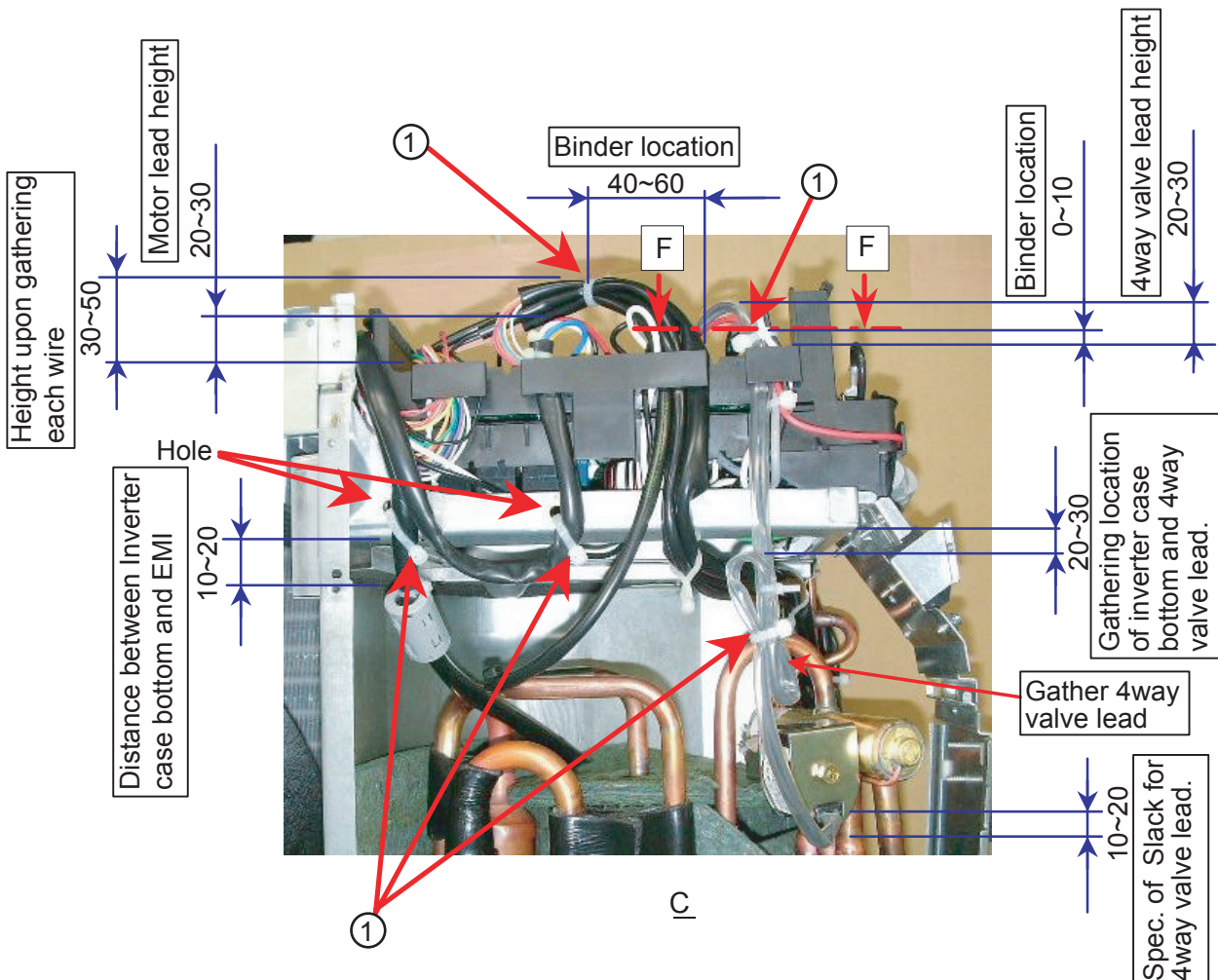
PROCESS ATTACHMENT OF INVERTER ASSY



Do not let each thermistor lead wires (discharge, outdoor temperature, heat exchanger) step over the signal wire.



Gather lead wires with the binder.

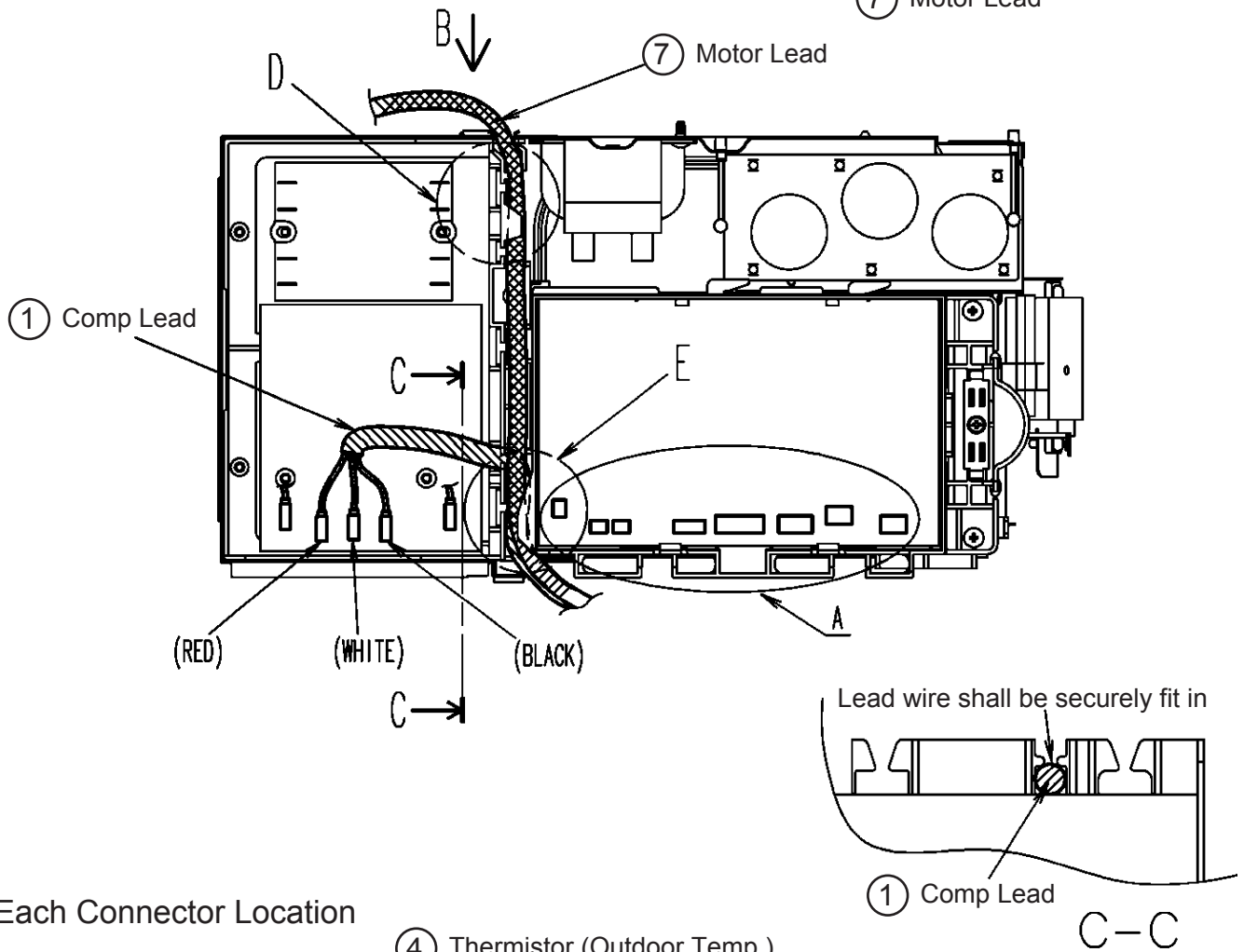


REPLACEMENT PARTS

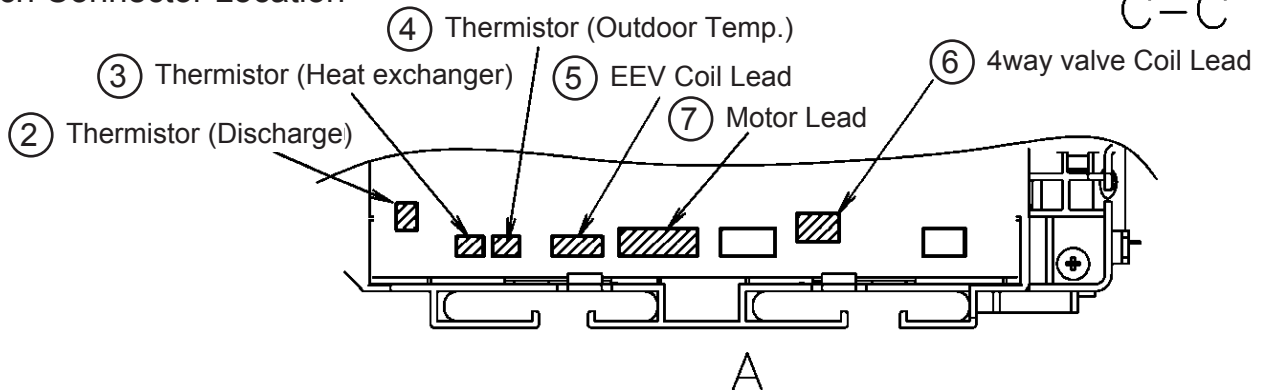
Model : AOYR24LCC

PROCESS Installation of wire to Inverter assy

- ① Comp Lead
- ② Thermistor (Discharge)
- ③ Thermistor (Heat exchanger)
- ④ Thermistor (Outdoor Temp.)
- ⑤ EEV Coil Lead
- ⑥ 4way valve Coil Lead
- ⑦ Motor Lead



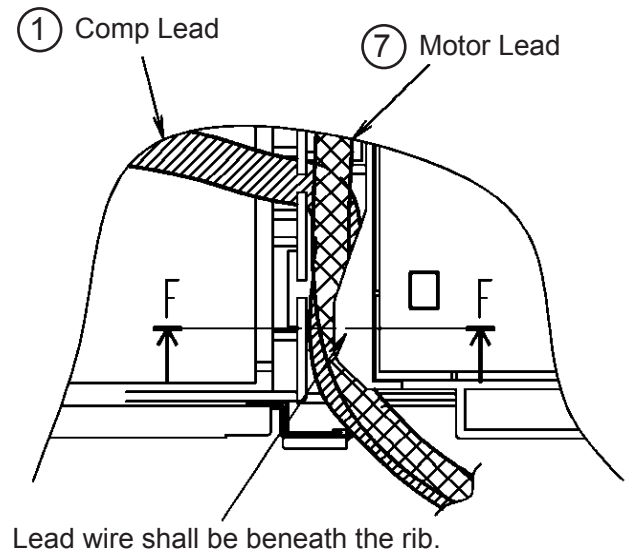
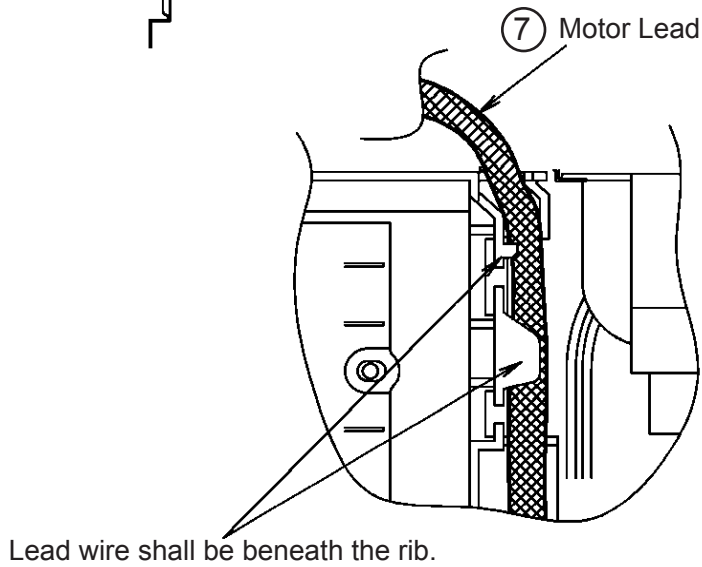
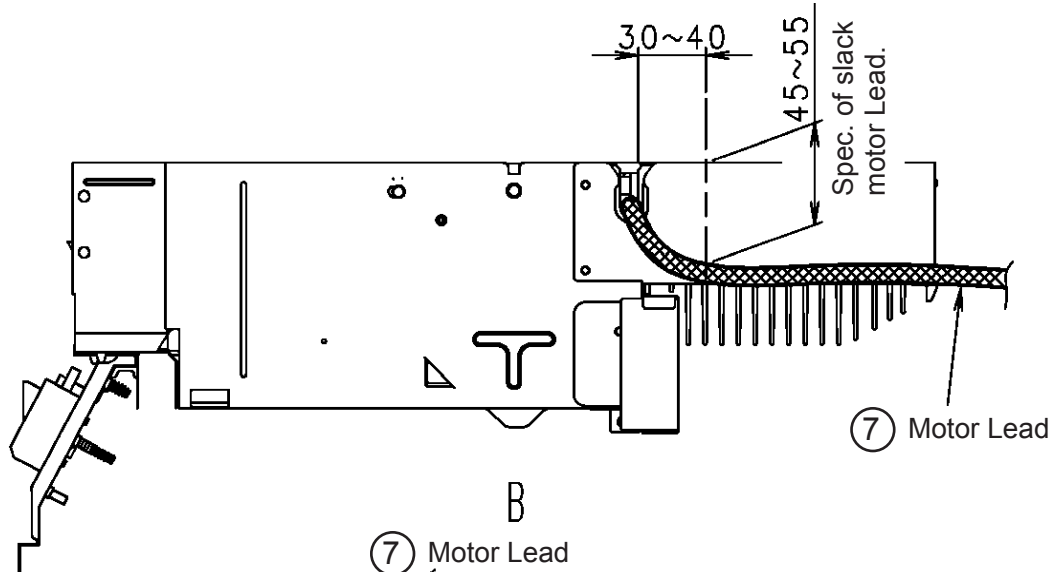
Each Connector Location



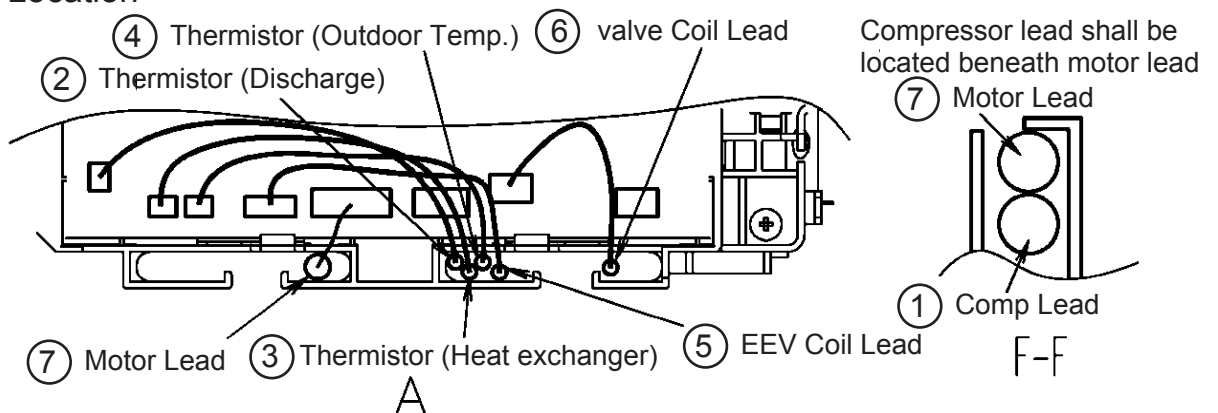
REPLACEMENT PARTS

Model : AOYR24LCC

PROCESS Installation of wire to Inverter Assy



Each Lead Location



REPLACEMENT PARTS

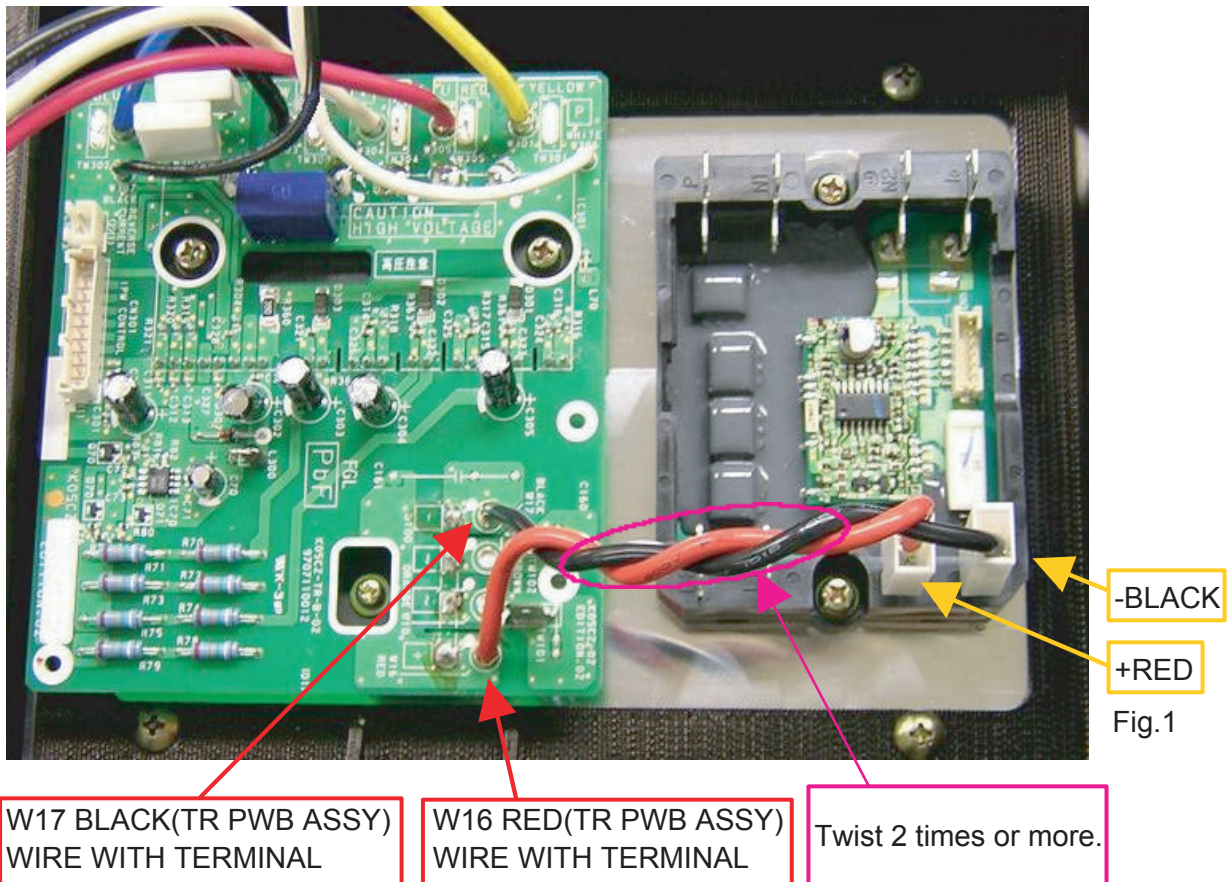
Model : AOYR30LCT

PROCESS Connect WIRE WITH TERMINAL
(TR PWB ASSY), ACTPM

REGULATIONS

As shown in Fig.1, connect wires.

A right picture shows the example of two times of the twist.



REPLACEMENT PARTS

Model : AOYR30LCT

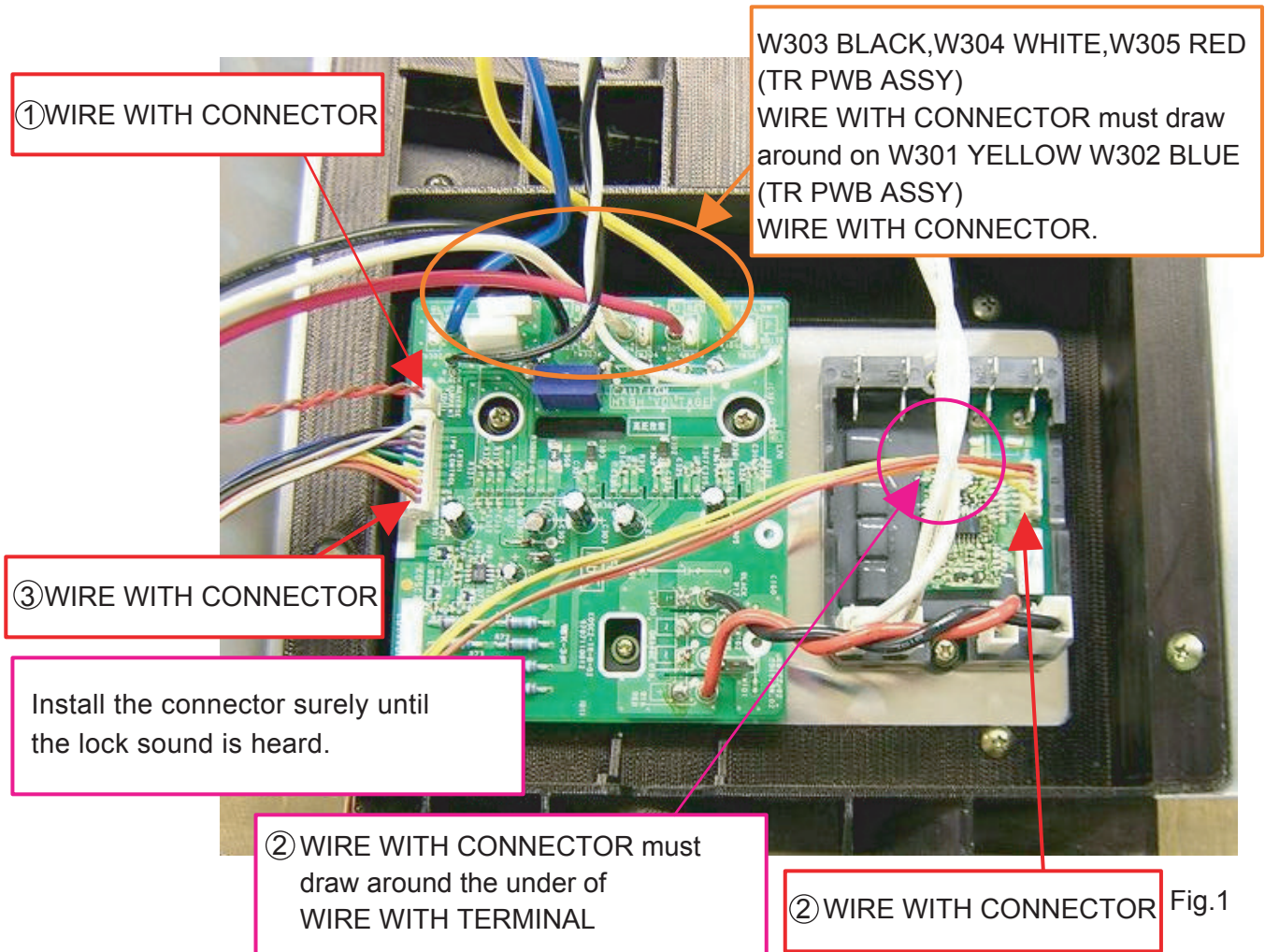
PROCESS Assemble wires (TR PWB ASSY)

REGULATIONS

As shown in Fig.1, assemble wires to TR PWB ASSY.

Install the connector surely until the lock sound is heard.

- ① WIRE WITH CONNECTOR
- ② WIRE WITH CONNECTOR
- ③ WIRE WITH CONNECTOR



REPLACEMENT PARTS

Model : AOYR30LCT

PROCESS Assemble EMI FILTER (TR PWB ASSY)

REGULATIONS

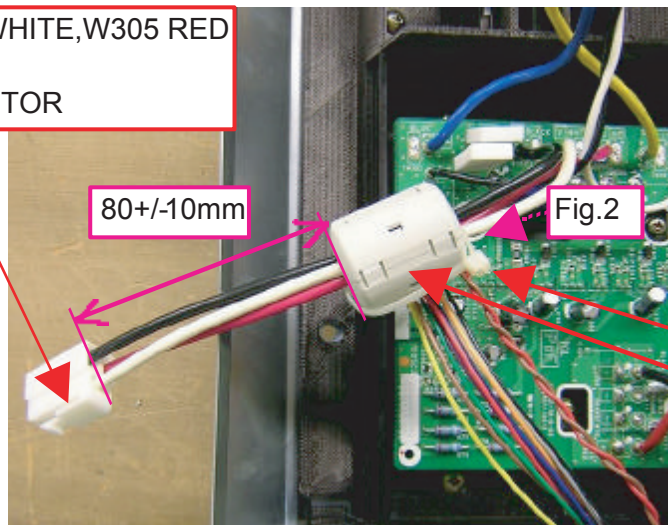
As shown in fig.1, assemble EMI FILTER.

① EMI FILTER

As shown in fig.2, certainly fix EMI FILTER to wires by BINDER.

② BINDER M

W303 BLACK,W304 WHITE,W305 RED
(TR PWB ASSY)
WIRE WITH CONNECTOR



80+/-10mm

Fig.2

② BINDER M

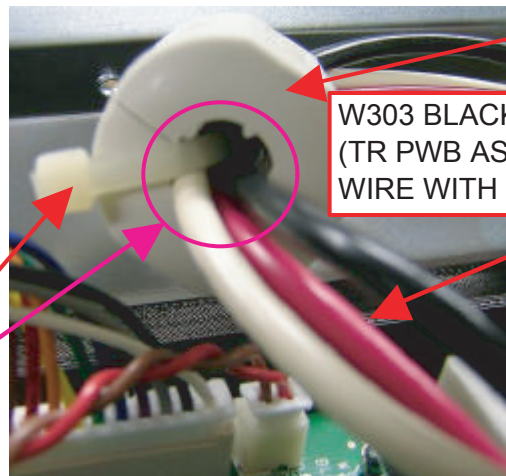
① EMI FILTER

Fig.1

① EMI FILTER RFC 10 must pass
W303 BLACK, W304 WHITE,
W305 RED (TR PWB ASSY).

② BINDER M

Certainly fix EMI FILTER
to wires by BINDER.



① EMI FILTER

W303 BLACK,W304 WHITE,W305 RED
(TR PWB ASSY)
WIRE WITH CONNECTOR

Fig.2

REPLACEMENT PARTS

Model : AOYR30LCT

PROCESS Assemble EMI FILTER (TERMINAL)

REGULATIONS

As shown in Fig.3, assemble EMI FILTER.

Certainly fix EMI FILTER to wires by BINDER.

A right picture shows the example of two times of the twist.

- ① EMI FILTER
- ② BINDER M

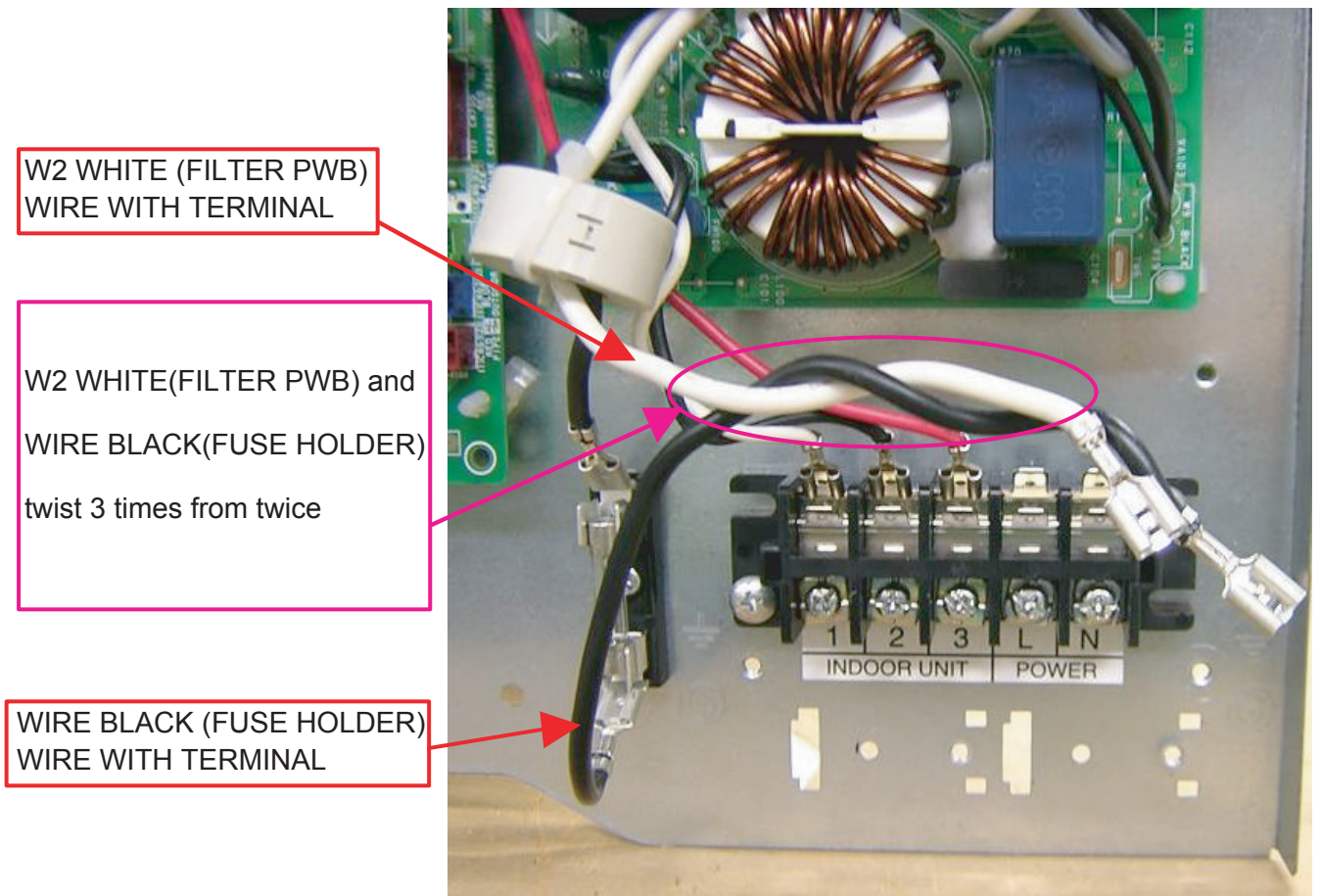
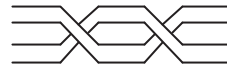


Fig.1

REPLACEMENT PARTS

Model : AOYR30LCT

REGULATIONS

As shown in Fig.2, connect WIRE WITH TERMINAL.

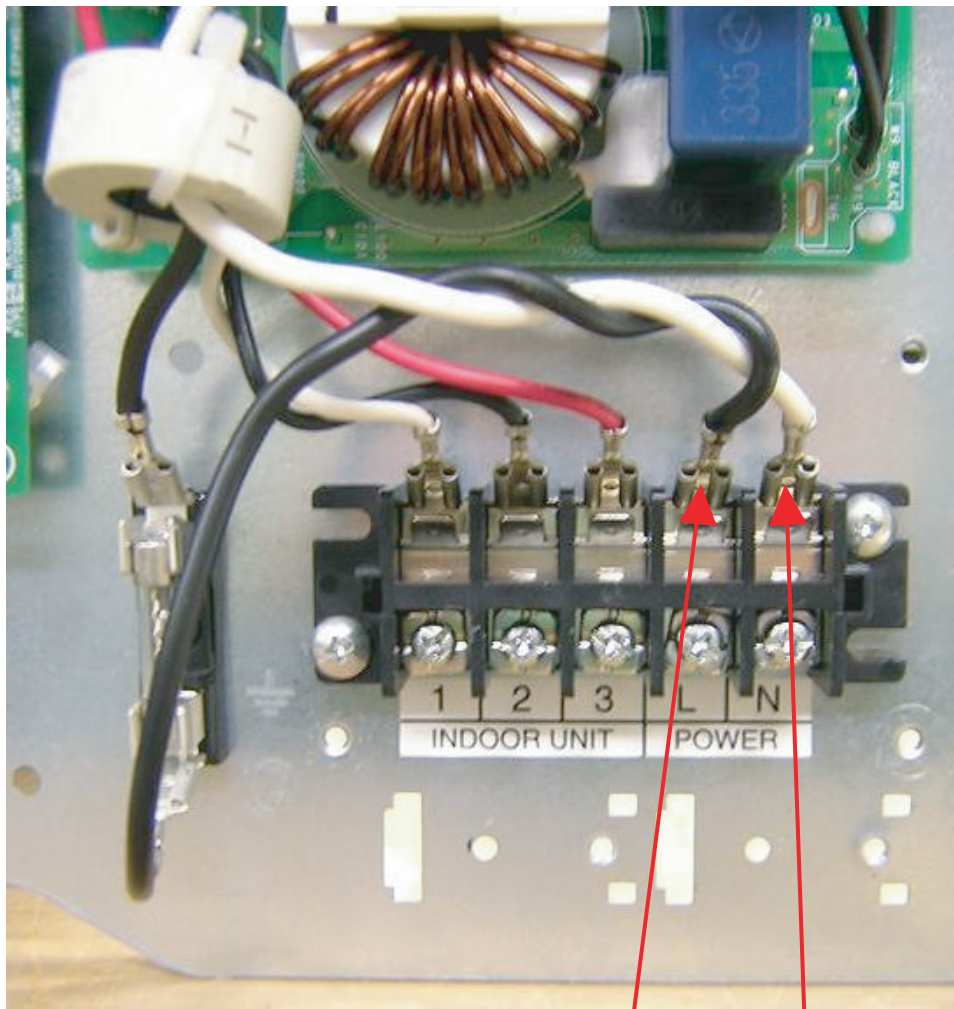


Fig.2

WIRE BLACK (FUSE HOLDER)
WIRE WITH TERMINAL

W2 WHITE (FILTER PWB)
WIRE WITH TERMINAL

REPLACEMENT PARTS

Model : AOYR30LCT

REGULATIONS

As shown in Fig.1, assemble EMI FILTER.

Certainly fix EMI FILTER to wires by BINDER.

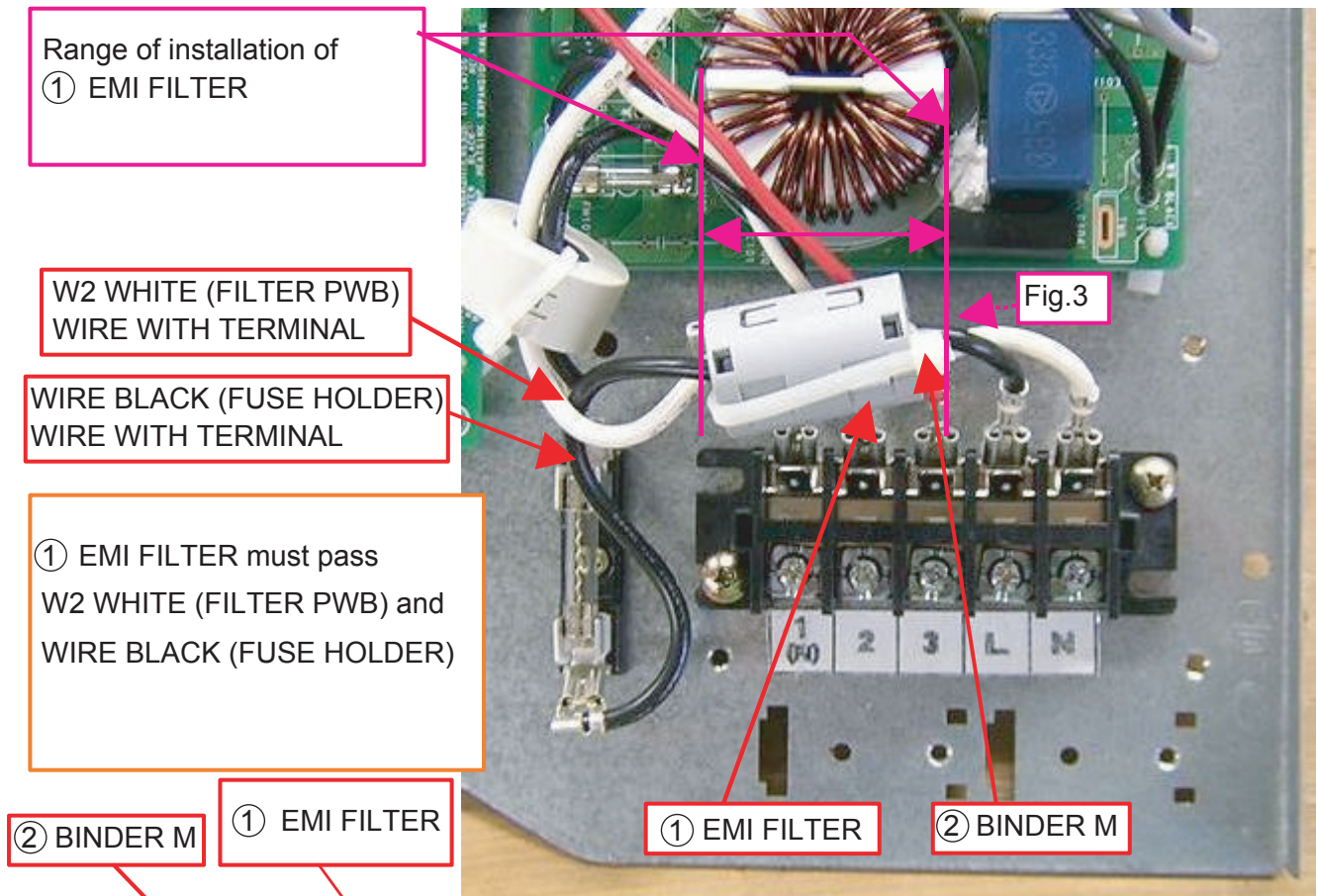
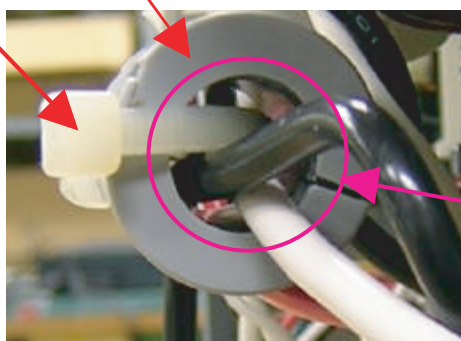


Fig.3



Certainly fix EMI FILTER
to wires by BINDER.

Fig. 4

REPLACEMENT PARTS

Model : AOYR30LCT

PROCESS Connect wires
(PWB ASSY(FILTER),PWB ASSY(MAIN))

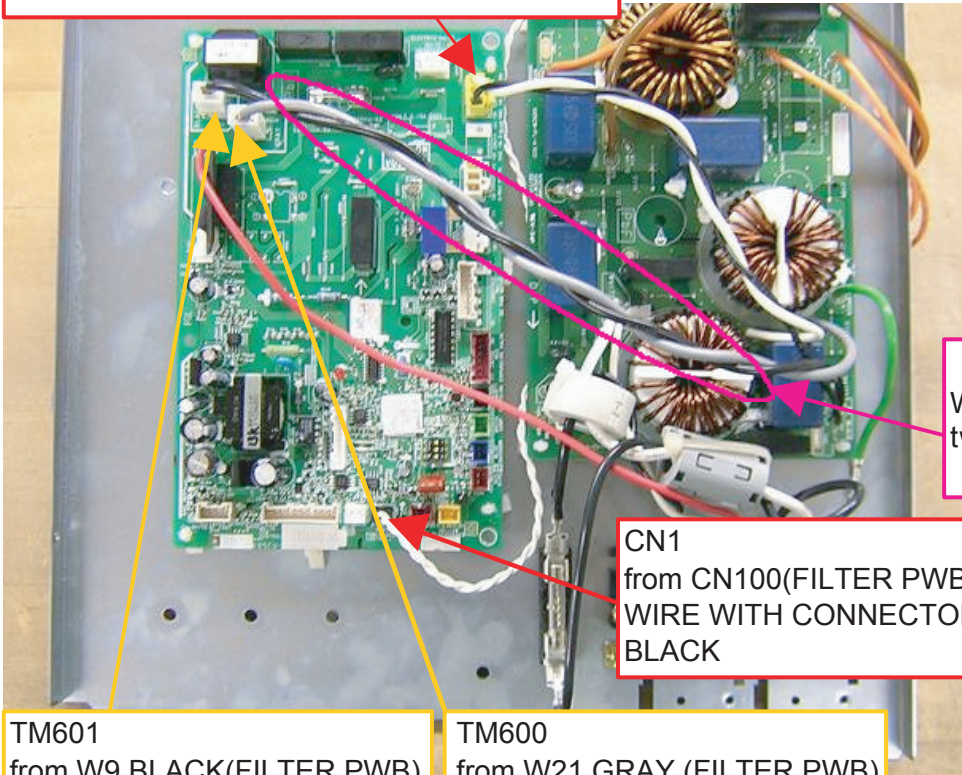
REGULATIONS

As shown in Fig.1, connect wires.

A right picture shows the example of two times of the twist.



CN110
from W19 BLACK W20 WHITE(FILTER PWB)
WIRE WITH CONNECTOR
YELLOW



W9 and W21
twist 9 times form 6 times

CN1
from CN100(FILTER PWB)
WIRE WITH CONNECTOR
BLACK

TM601
from W9 BLACK(FILTER PWB)
WIRE WITH TERMINAL

TM600
from W21 GRAY (FILTER PWB)
WIRE WITH TERMINAL

Fig.1

REPLACEMENT PARTS

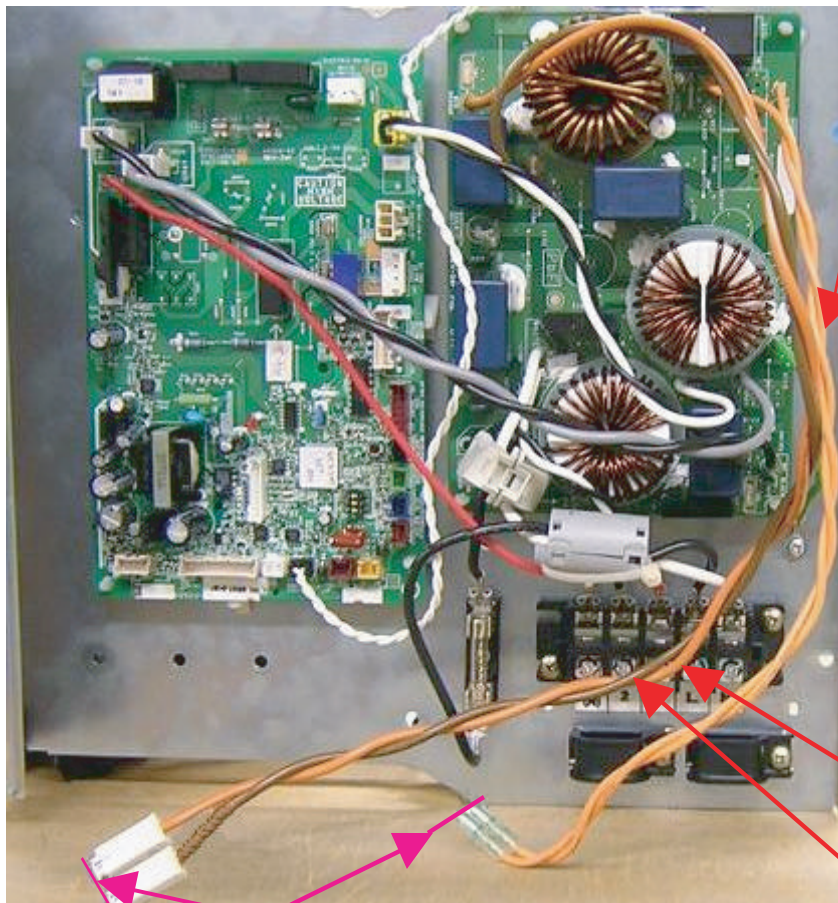
Model : AOYR30LCT

PROCESS Connect WIRE WITH TERMINAL
(THERMISTOR)

REGULATIONS

As shown Fig.3, connect wires.

A right picture shows the example of two times of the twist.



W25 ORANGE W26 ORANGE
(FILTER PWB)
WIRE WITH TERMINAL

W25 and W26 must do the twist
13 times from 10 times

W28 and W29 must do the twist
13 times from 10 times

W28 ORANGE (FILTER PWB)
WIRE WITH TERMINAL

W29 BROWN(FILTER PWB)
WIRE WITH TERMINAL

The point must become complete in each wire
that does the twist.

Fig.1

REPLACEMENT PARTS

Model : AOYR30LCT

REGULATIONS

As shown Fig.3, connect wires.

W25,W26,W28,W29(FILTER PWB)
Pass WIRE WITH TERMINAL through
EDGE SADDLE.

Draw around CN100(FILTER PWB)
WIRE WITH CONNECTER as shown in figure.

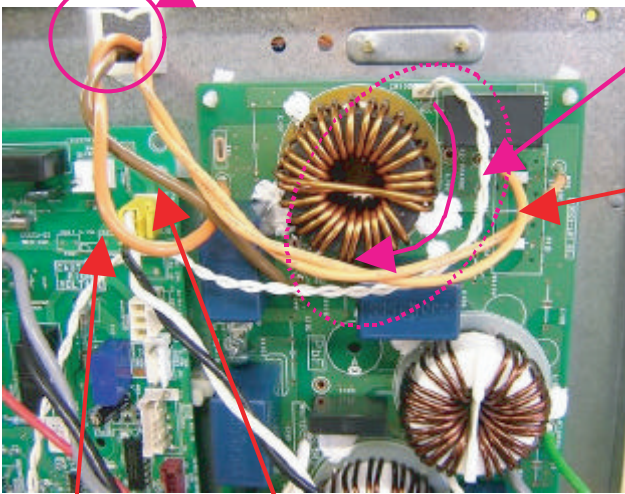


Fig.2

W25 ORANGE W26 ORANGE (FILTER PWB)
WIRE WITH TERMINAL

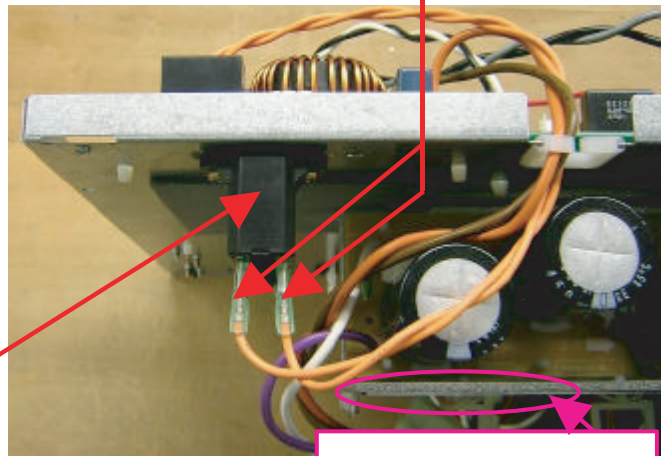


Fig.3

THERMISTOR

W29 BROWN(FILTER PWB)
WIRE WITH TERMINAL

W28 ORANGE (FILTER PWB)
WIRE WITH TERMINAL

The wire must not pass
on CASE(PWB)AS

REPLACEMENT PARTS

Model : AOYR30LCT

PROCESS Connect wires.
(PWB ASSY(CAPACITOR),TR PWB ASSY,etc)

REGULATIONS

As shown in Fig.1, connect wires.

A right picture shows the example of two times of the twist.

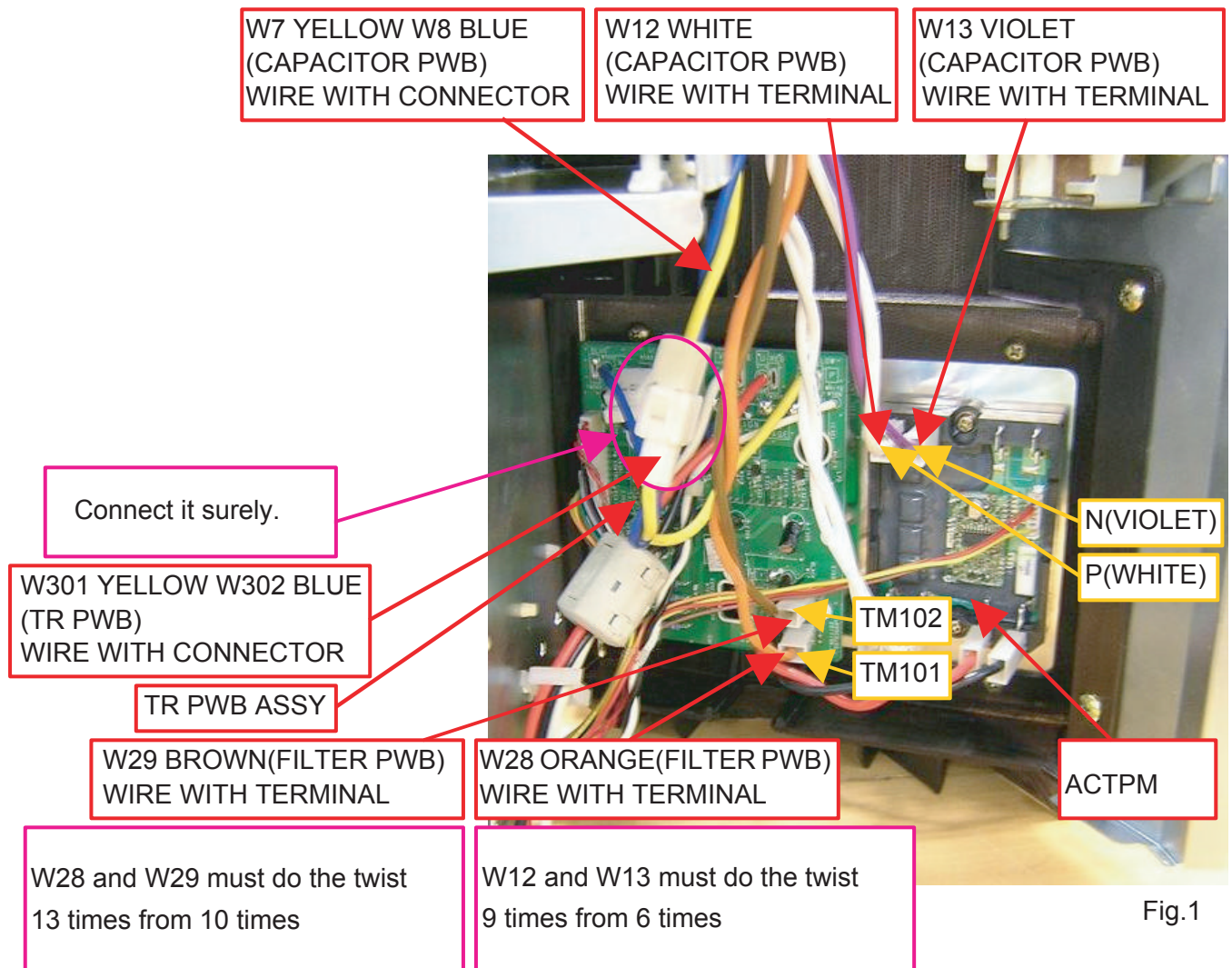
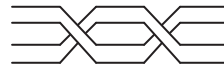
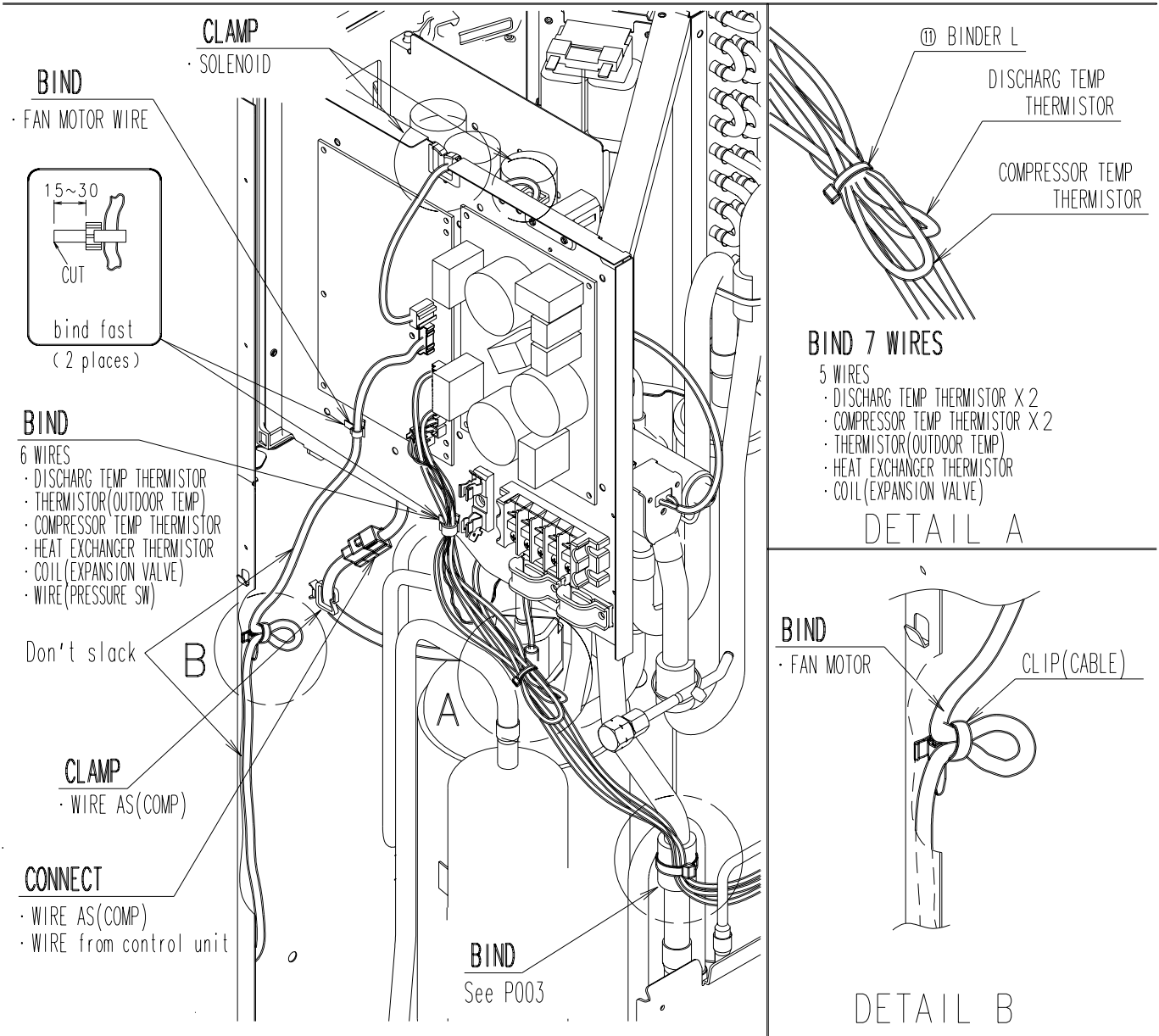


Fig.1

REPLACEMENT PARTS

Model : AOYR30LCT

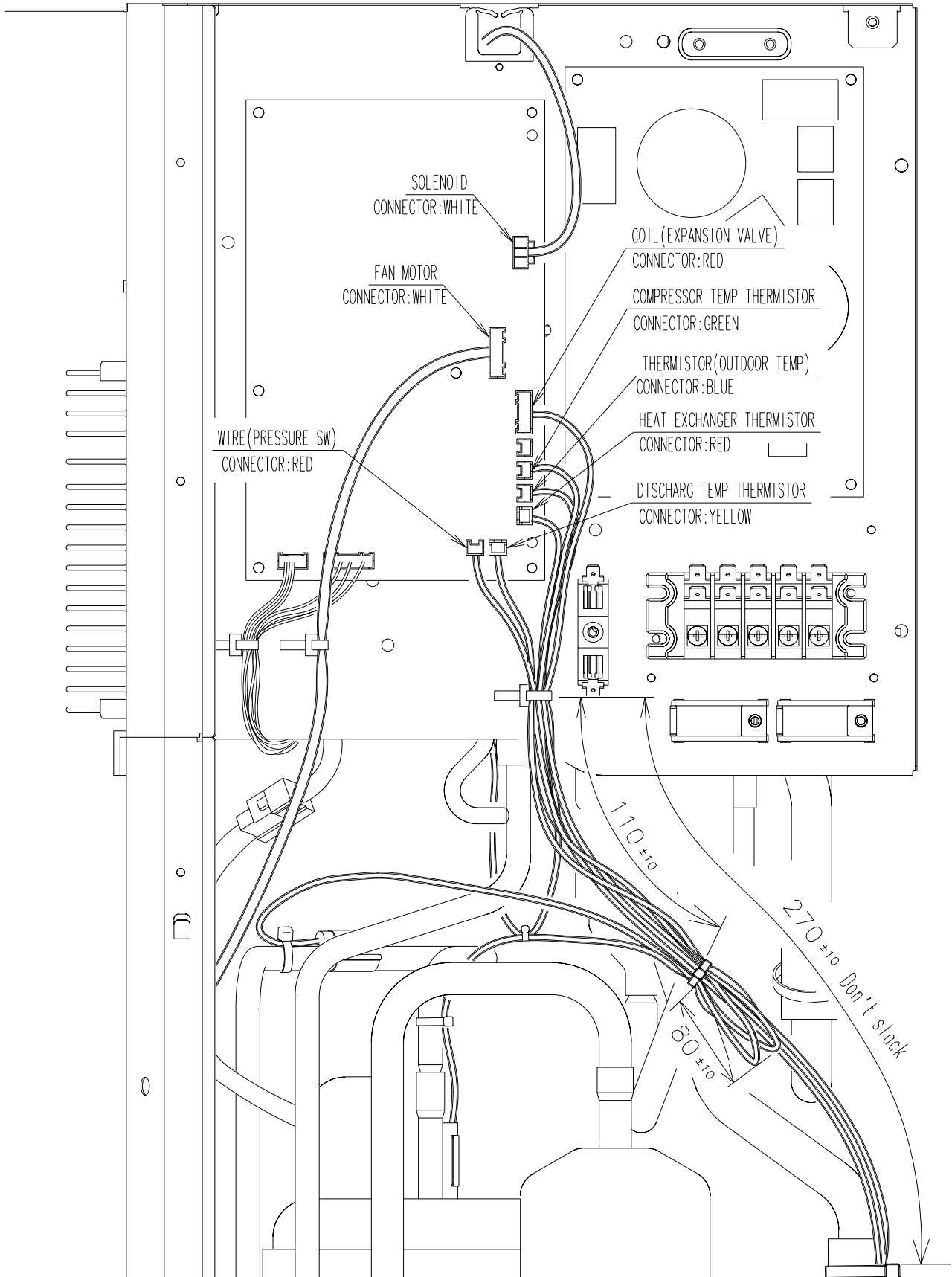
PROCESS Wiring



REPLACEMENT PARTS

Model : AOYR30LCT

PROCESS Wiring



REPLACEMENT PARTS

Model : AOYR30LCT

PROCESS Wiring

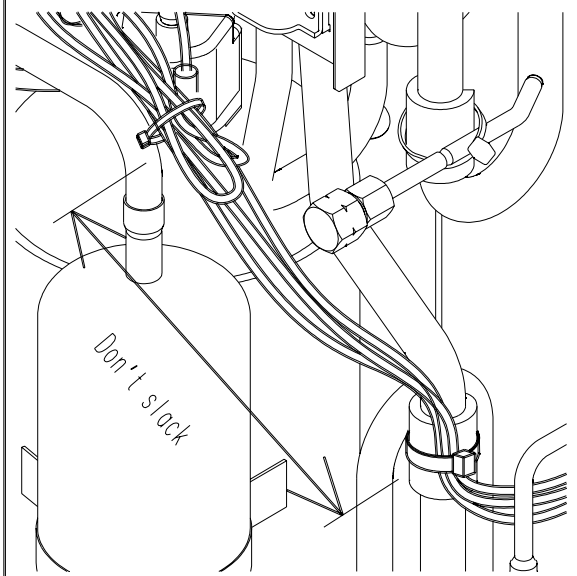
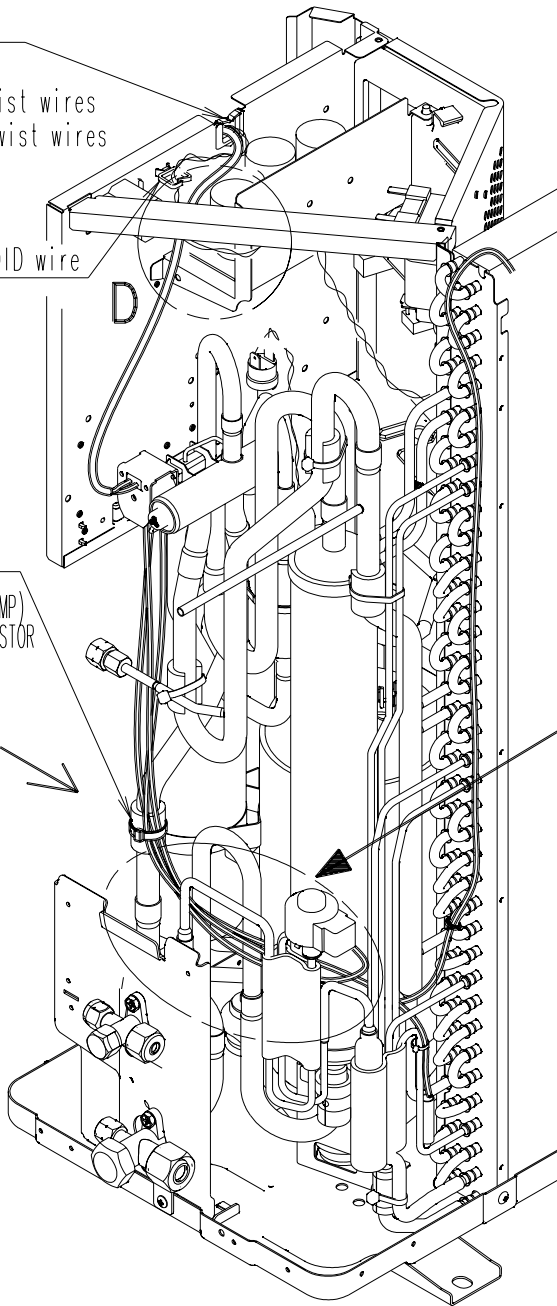
CLAMP

- SOLENOID
- ORENCE, BROWN twist wires
- ORENCE, ORANGE twist wires

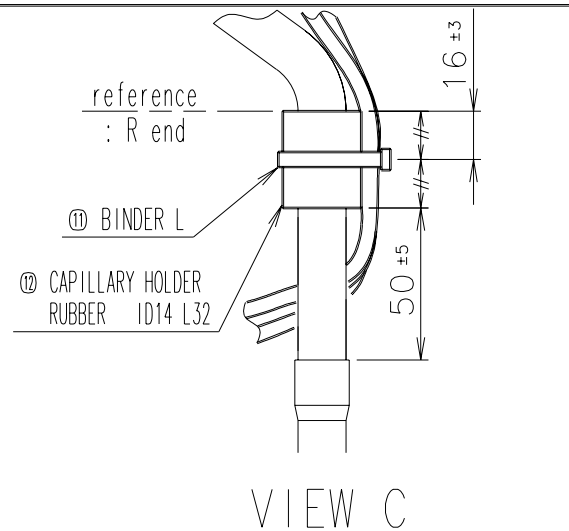
Don't clamp SOLENOID wire

BIND

- THERMISTOR (OUTDOOR TEMP)
- HEAT EXCHANGER THERMISTOR
- COIL (EXPANSION VALVE)



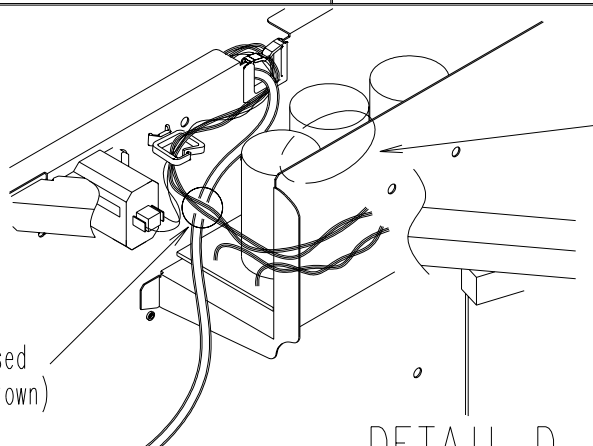
Adjust thremistor wirings in this area.



VIEW C



Wiring of SOLENOID; wire must be passed under the twisted-wire (orange and brown)



DETAIL D



Don't hang the wirings on this edge.

WALL MOUNTED type INVERTER

10 . INSTALLATION MANUAL

SPLIT TYPE ROOM AIR CONDITIONER INSTALLATION MANUAL

(PART NO. 9315342010-01)

This air conditioner uses new refrigerant HFC (R410A).

- The basic installation work procedures are the same as conventional refrigerant (R22) models. However, pay careful attention to the following points:
- Since the working pressure is 1.6 times higher than that of conventional refrigerant (R22) models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant (R22) 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 (R22) 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 (R22) models. Also, when storing the piping, securely seal the opening 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 (-1 to 38 bar) for high pressure. -0.1 to 3.8 MPa (-1 to 38 bar) 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/10m. 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 R22, 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.

CONNECTION PIPE REQUIREMENT

Nominal diameter	Outer diameter	Thickness	Maximum length	Maximum height (between indoor and outdoor)
1/4in	6.35mm	0.8mm	30m(99ft)	20m(66ft)
5/8in	15.88mm	1.0mm		

WARNING

- Do not use the existing (for R22) piping and flare nuts.
 - If the existing materials are used, the pressure inside the refrigerant cycle will rise and cause breakage, injury, etc. (Use the special R410A materials.)
- When installing and relocating the air conditioner, do not mix gases other than the specified refrigerant (R410A) to enter the refrigerant cycle.
 - If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause breakage, injury, etc.

CAUTION

When installing pipes shorter than 3m, sound of the outdoor unit will be transferred to the indoor unit, which will cause large operating sound or some abnormal sound.

For authorized service personnel only.

WARNING

- For the room air conditioner to operate satisfactorily, install it as outlined in this installation manual.
- Connect the indoor unit and outdoor unit with the air conditioner piping and cords available standards parts. This installation manual describes the correct connections using the standard accessories and the parts specified in this installation manual.
- Have installation work done by authorized service personnel only.
- Do not use an extension cord.
- Do not turn on the power until all installation work is complete.

- 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 manual because it is used when the air conditioner is serviced or moved.
- The maximum length of the piping is 30 m. The maximum height difference of the piping is 20 m, if the units are further apart than these, correct operation can not be guaranteed.

STANDARD ACCESSORIES

The following installation accessories are supplied. Use them as required.

One set of following parts are necessary in installation of this product.

Name and Shape	Q'ty	Name and Shape	Q'ty
Wall hook bracket	1	Cloth tape	1
Remote control unit	1	Tapping screw (big)	8
		Tapping screw (small)	2
Battery	2	Air cleaning filter	2
		Air cleaning filter frame	2
Remote control unit holder	1		
Drain pipe	1	Insulation (Drain hose)	1

Name	
Connection pipe assembly	
Connection cord	
Wall pipe	
Decorative tape	
Vinyl tape	
Wall cap	
Saddle	
Drain hose	
Tapping screws	
Sealant	

ELECTRICAL REQUIREMENT

- Electric wire size and fuse capacity:

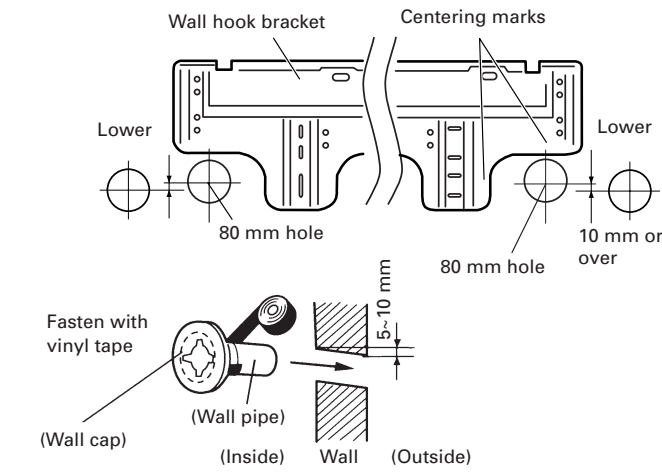
MODEL	24,000 BTU class	
Power supply cord (mm ²)	MAX.	4.0
	MIN.	3.5
Connection cord (mm ²)	MAX.	2.5
	MIN.	1.5
Fuse capacity (A)	30	

- Install the disconnect device with a contact gap of at least 3 mm nearby the units. (Both indoor unit and outdoor unit)
- Always make the air conditioner power supply a special branch circuit and provide a special breaker.
- Always use H07RN-F or equivalent as the power supply cord and the connection cord.

INDOOR UNIT

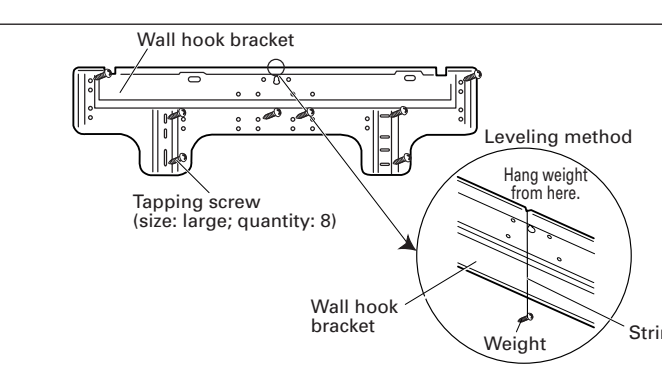
CUTTING THE HOLE IN THE WALL FOR THE CONNECTING PIPING

- Cut a 80 mm diameter hole in the wall at the position shown in the figure.
- When cutting the wall hole at the inside of the wall hook bracket, cut the hole to a point of intersection of center marks. When cutting the wall hole at the outside of the wall hook bracket, cut the hole at a point of 10mm below.
- Cut the hole so that the outside end is lower (5 to 10 mm) than the inside end.
- Always align the center of the wall hole. If misaligned, water leakage will occur.
- Cut the wall pipe to match the wall thickness, stick it into the wall cap, fasten the cap with vinyl tape, and stick the pipe through the hole. (The connection pipe is supplied in the installation set.)
- For left piping and right piping and center piping, cut the hole a little lower so that drain water will flow freely.



INSTALLING THE WALL HOOK BRACKET

- Install the wall hook bracket so that it is correctly positioned horizontally and vertically. If the wall hook bracket is tilted, water will drip to the floor.
- Install the wall hook bracket so that it is strong enough to withstand the weight of an adult.
 - Fasten the wall hook bracket to the wall with 6 or more screws through the holes near the outer edge of the bracket.
 - Check that there is no rattle at the wall hook bracket.



WARNING

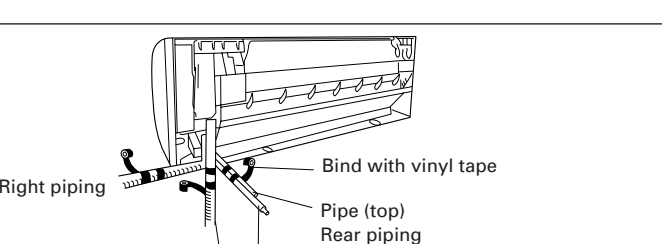
If the wall pipe is not used, the cord interconnecting the indoor and outdoor units may touch metal and cause electric leakage.

CAUTION

Install the wall hook bracket horizontally and perpendicularly.

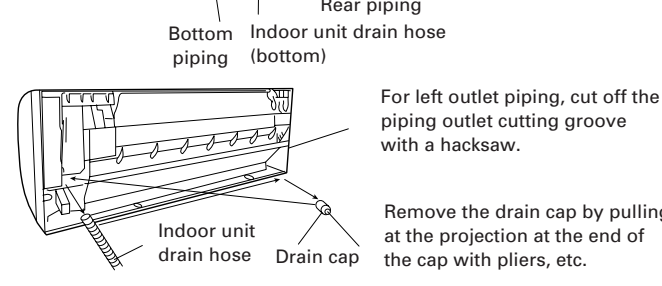
FORMING THE DRAIN HOSE AND PIPE

- (Rear piping, Right piping, Bottom piping)
- Install the indoor unit piping in the direction of the wall hole and bind the drain hose and pipe together with vinyl tape.
 - Install the piping so that the drain hose is at the bottom.
 - Wrap the pipes of the indoor unit that are visible from the outside with decorative tape.



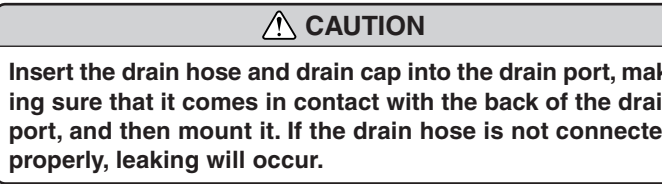
[For Left rear piping, Left piping]

Interchange the drain cap and the drain hose.



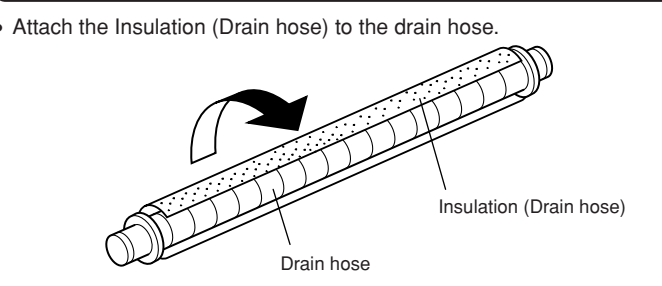
CAUTION

- In order to align the drain hose and drain cap, be sure to insert securely and vertically. Incline insertion will cause water leakage.
- When inserting, be sure not to attach any material besides water. If any other material is attached, it will cause deterioration and water leakage.
- After removing drain hose, be sure not to forget mounting drain cap.
- Be sure to fix the drain hose with tape to the bottom of piping.
- Prevent drain water frozen under low temperature environment.
 - When installing indoor unit's drain hose outdoors, necessary measure for frost protection should be taken to prevent drain water freeze.
 - Under low temperature environment (when outdoor temperature under 0 °C), after cooling operation is executed, water in the drain hose could be frozen.
 - Once drain water is frozen, the drain hose will be blocked and water leakage may be resulted for indoor unit.



CAUTION

Insert the drain hose and drain cap into the drain port, making sure that it comes in contact with the back of the drain port, and then mount it. If the drain hose is not connected properly, leaking will occur.



SELECTING THE MOUNTING POSITION

Decide the mounting position with the customer as follows:

- 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.
 - Install the unit near an electric outlet or special branch circuit.
 - 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.

- OUTDOOR UNIT**
 - 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 air flow.)
 - Do not install the unit where a strong wind blows or where it is very dusty.
 - Do not install the unit where people pass.
 - Take your neighbors into consideration so that they are not disturbed by air blowing into their windows or by noise.
 - Provide the space shown in the figure so that the air flow is not blocked. Also for efficient operation, leave open three of the four directions front, rear, and both sides.

WARNING

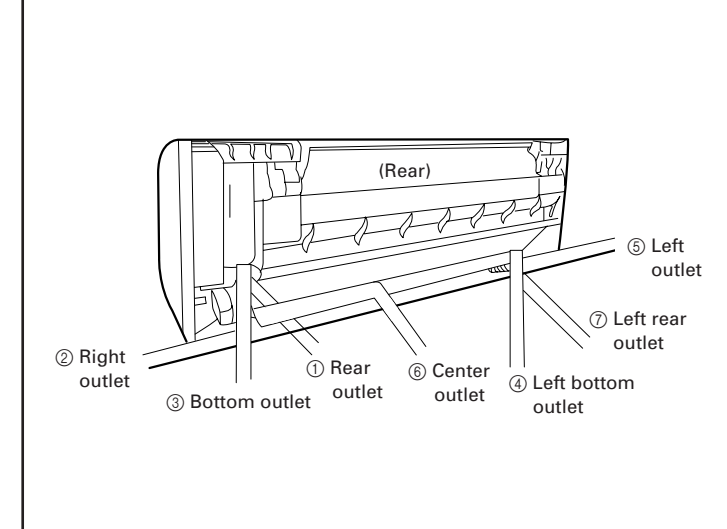
Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

CAUTION

- Do not install where there is the danger of combustible gas leakage.
- Do not install near heat sources.
- If children under 10 years old may approach the unit, take preventive measures so that they can not reach the unit.
- Install the indoor unit on the wall where the height from the floors more than 230 cm.

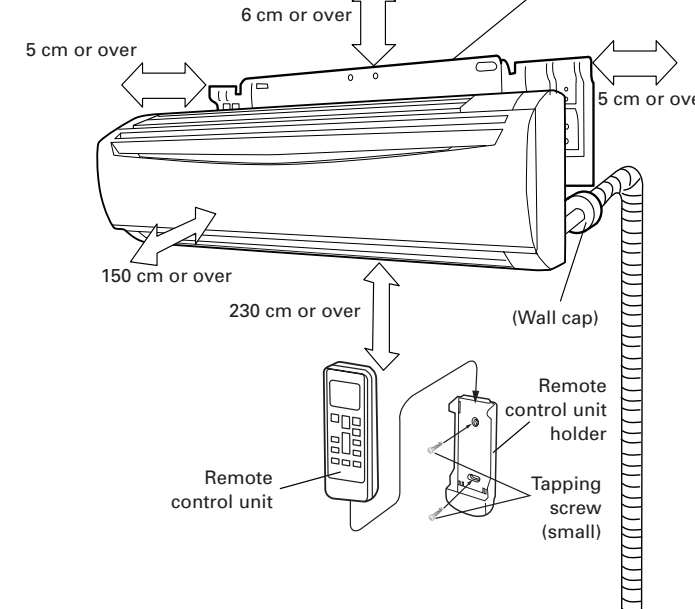
Indoor unit piping direction

The piping can be connected in the 7 directions in the figure. When the piping is connected in direction ②, ③, ④ or ⑤, cut along the piping groove in the side of the front panel with a hacksaw.

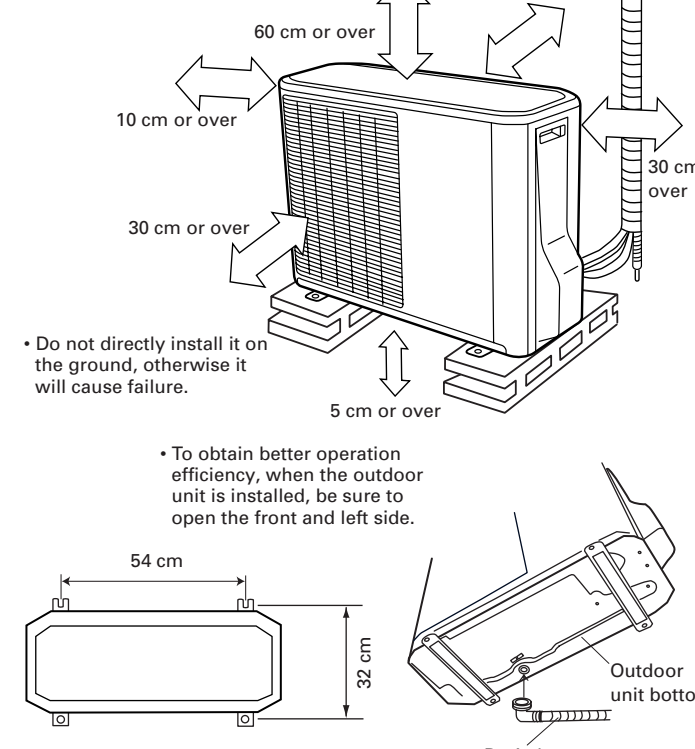


INSTALLATION DIAGRAM OF INDOOR AND OUTDOOR UNITS

(INDOOR UNIT)

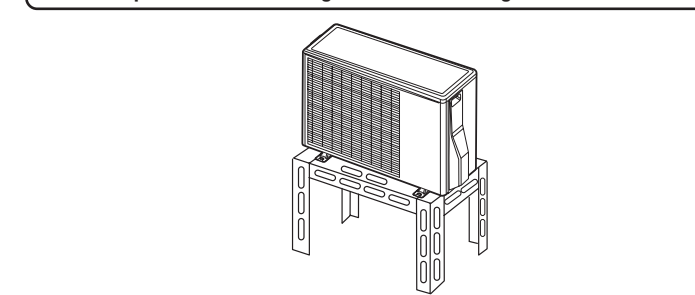


(OUTDOOR UNIT)



CAUTION

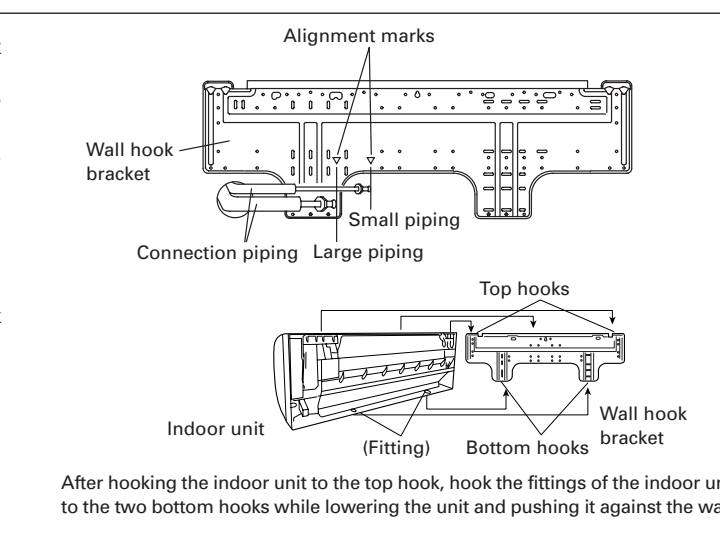
- When the outdoor temperature is 0 °C or less, do not use the accessory drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extremely cold weather. (Reverse cycle model only.)
- In the area with heavy snowfall, if the intake and outlet of outdoor unit is blocked with snow, it might become difficult to get warm and it is likely to cause of the breakdown. Please construct a canopy and a pedestal or place the unit on a high stand (local configured).



- For left piping and left rear piping, align the marks on the wall hook bracket and shape the connection pipe.
- Bend the connection piping at the bend radius of 100 mm or more and install no more than 35 mm from the wall.
- After passing the indoor piping and drain hose through the wall hole, hang the indoor unit on the hooks at the top and bottom of the wall hook bracket.

(Installing the indoor unit)

- Hang the indoor unit from the hooks at the top of the wall hook bracket.
- Insert the spacer, etc. between the indoor unit and the wall hook bracket and separate the bottom of the indoor unit from the wall.

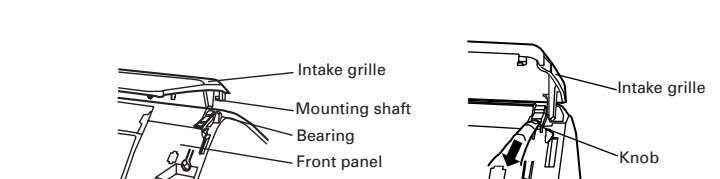


After hooking the indoor unit to the top hook, hook the fittings of the indoor unit to the two bottom hooks while lowering the unit and pushing it against the wall.

FRONT PANEL REMOVAL AND INSTALLATION

THE INTAKE GRILLE REMOVAL

- Open the intake grille.
- Pull down the knob.
- Lift the intake grille upward, until the axle at the top of the intake grille is removed.



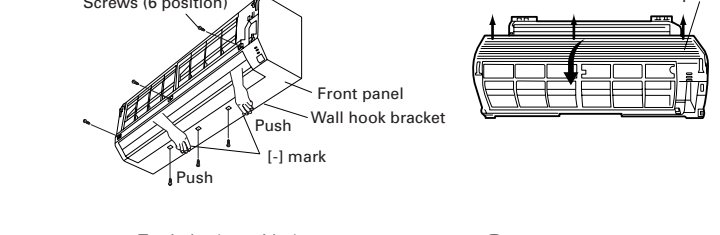
THE INTAKE GRILLE INSTALLATION

- The fixing axle of the intake grille is installed on the Panel.
- Lay down the intake grille.



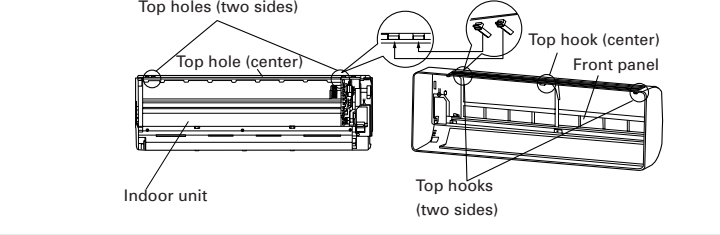
THE FRONT PANEL REMOVAL

- Remove six screws. (Reference the intake grille removal.)
- The thumb is hung on the lower part as shown in the figure, and it pulls to the front, pushing [-] mark, and bottom hooks (two position) is removed from wall hook bracket.
- The front panel is pulled to the front, raising the upper surface, and a front panel is removed.



THE FRONT PANEL INSTALLATION

- Firstly, fit the lower part of the front panel, and insert top and bottom hooks. (Three top sides)
- Six screws is attached.
- The intake grille is attached.



CAUTION

Install the front panel and INTAKE GRILLE securely. If installation is imperfect, the front panel or INTAKE GRILLE may fall off and cause injury.

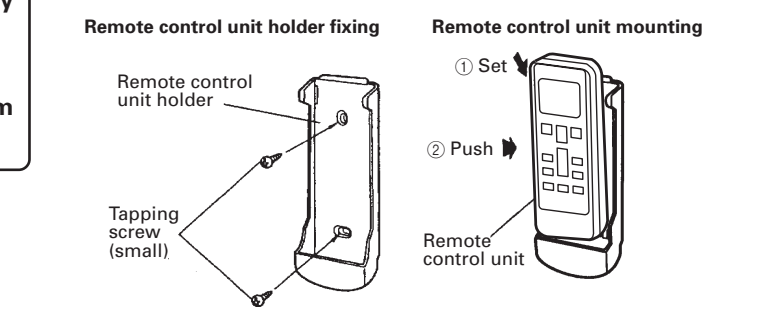
REMOTE CONTROL UNIT INSTALLATION

CAUTION

- Check that the indoor unit correctly receives the signal from the remote control unit, then install the remote control unit holder.
 - Always use a special branch circuit and install a special receptacle to supply power to the room air conditioner.
 - Use a circuit breaker and receptacle matched to the capacity of the air conditioner.
- 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 with a distance of 7 m between the remote control unit and the photocell as the criteria. However, when installing the remote control unit, check that it operates positively.
- Install the remote control unit holder to a wall, pillar, etc. with the tapping screw.



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 switching, and other remote control unit operations.
- Air filter removal and cleaning, and how to use the air louvers.
- Give the operating and installation manuals to the customer.

PUMP DOWN OPERATION (FORCED COOLING OPERATION)

To avoid discharging refrigerant into the atmosphere at the time of relocation or disposal, recover refrigerant by doing the cooling operation or forced cooling operation according to the following procedure. (When the cooling operation cannot start in winter, and so on, start the forced cooling operation.)

- Do the air purging of the charge hose by connecting the charging hose of gauge manifold to the charging port of 3 way valve and opening the low-pressure valve slightly.
- Close the valve stem of 2 way valve completely.
- Start the cooling operation or following forced cooling operation.

When using the remote control unit Press the TEST RUN button after starting the cooling operation by the remote control unit. The operation indicator lamp and timer indicator lamp will begin to flash simultaneously during test run. When using the MANUAL AUTO button of the indoor unit (The remote control unit is lost, and so on.) Keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. (The forced cooling operation cannot start if the MANUAL AUTO button is not kept on pressing for more than 10 seconds.)

- Close the valve stem of 3 way valve when the reading on the compound pressure gauge becomes 0.05-0 MPa (0.5-0 kgf/cm²).
- Stop the operation.
 - Press the START/STOP button of the remote control unit to stop the operation.
 - Press the MANUAL AUTO button when stopping the operation from indoor unit side. (It is not necessary to press on keeping for more than 10 seconds.)

CAUTION

During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping. Do not remove the connection pipe while the compressor is in operation with 2 way or 3 way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.

POWER

WARNING

- The rated voltage of this product is 230 V AC 50 Hz.
- Before turning on the power, check if the voltage is within the 220 V -10 % to 240 V +10 % range.
- Always use a special branch circuit and install a special receptacle to supply power to the room air conditioner.
- Use a circuit breaker and receptacle matched to the capacity of the air conditioner.
- Do not extend the power cord.
- Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
- Install a leakage circuit breaker in accordance with the related laws and regulations and electric company standards.

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

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).

CAUTION

- Match the terminal block numbers and connection cord colors with those of the outdoor unit. (If the insulator is chafed, electric leakage may occur.)
- Connect the connection cords firmly to the terminal block. 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.)
- Securely earth the power cord plug.
- Do not use the earth screw for an external connector. Only use for interconnection between two units.

OUTDOOR UNIT

OUTDOOR UNIT INSTALLATION

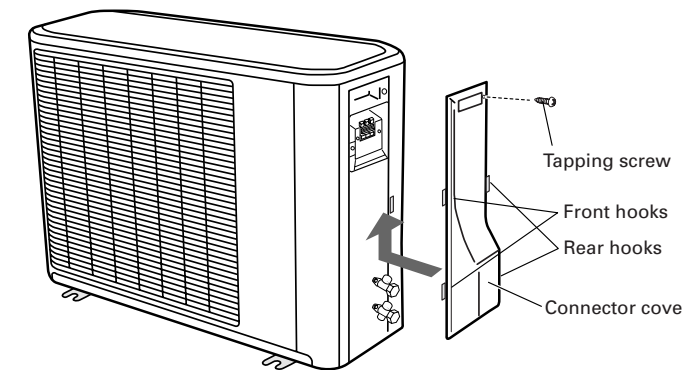
- Set the unit on a strong stand, such as one made of concrete blocks to minimize shock and vibration.
- Do not set the unit directly on the ground because it will cause trouble.

Connector cover removal

- Remove the tapping screws.

Installing the connector cover

- 1) After inserting the two front hooks, then insert the rear hook.
- 2) Tighten the tapping screws.



WARNING

- 1) Install the unit where it will not be tilted by more than 5°.
- 2) When installing the outdoor unit where it may be exposed to strong wind, fasten it securely.

AIR PURGE

Always use a vacuum pump to purge the air. Refrigerant for purging the air is not charged in the outdoor unit at the factory.

Close the high pressure side valve of the gauge manifold fully and do not operate it during the following work.

1. Check if the piping connections are secure.
2. Check that the stems of 2-way valve and 3-way valve are closed fully.
3. Connect the gauge manifold charge hose to the charging port of the 3-way valve (side with the projection for pushing in the valve core).
4. Open the low pressure side valve of the gauge manifold fully.
5. Operate the vacuum pump and start pump down.
6. Slowly loosen the flare nut of the 3-way valve and check if air enters, then retighten the flare nut. (When the flare nut is loosened the operating sound of the vacuum pump changes and the reading of the compound pressure gauge goes from minus to zero.)
7. Pump down the system for at least 15 minutes, then check if the compound pressure gauge reads -0.1 MPa (-76 cmHg, -1 bar).
8. At the end of pump down, close the low pressure side gauge of the gauge manifold fully and stop the vacuum pump.
9. Slowly loosen the valve stem of the 3-way valve. When the compound pressure gauge reading reaches 0.1-0.2 MPa, retighten the valve stem and disconnect the charge hose from the 3-way valve charging port. (If the stem of the 3-way valve is opened fully before the charge hose is disconnected, it may be difficult to disconnect the charge hose.)

Additional charge

Refrigerant suitable for a piping length of 15 m is charged in the outdoor unit at the factory. When the piping is longer than 15 m, additional charging is necessary. For the additional amount, see the table below.

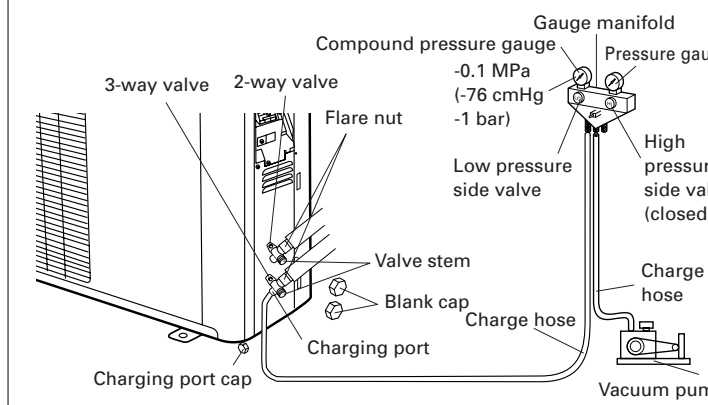
Pipe length	20 m	25 m	30 m
Additional refrigerant	100 g	200 g	300 g

CAUTION

- 1) Refrigerant must not be discharged into atmosphere.
- 2) After connecting the piping, check the joints for gas leakage with gas leak detector.

10. Fully open the valve stems of the 2-way valve and 3-way valve using a hexagon wrench. (After the valve stem begins to turn, turn it with a torque of less than 2.9 N·m (30 kgf·cm) until it stops turning.)

11. Firmly tighten the 2-way valve and 3-way valve blank cap and the charging port cap.



	Tightening torque
Blank cap (2-way valve)	20 to 25 N·m (200 to 250 kgf·cm)
Blank cap (3-way valve)	30 to 35 N·m (300 to 350 kgf·cm)
Charging port cap	10 to 12 N·m (100 to 120 kgf·cm)

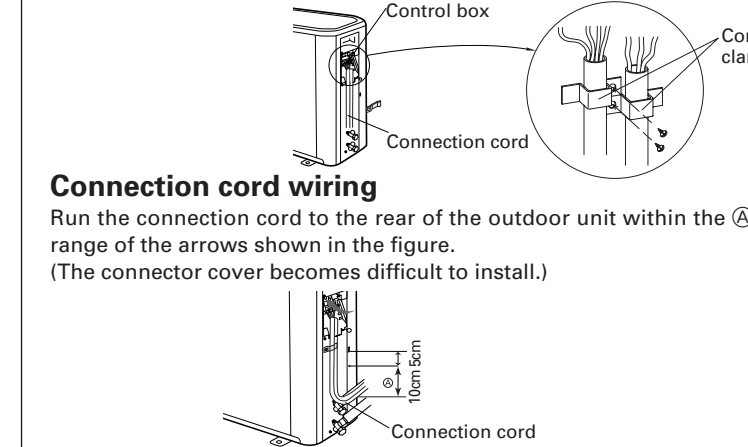
CAUTION

- 1) When adding refrigerant, add the refrigerant from the charging port at the completion of work.
- 2) The maximum length of the piping is 30 m. If the units are further apart than this, correct operation can not be guaranteed.

Between 15 m and 30 m, when using a connection pipe other than that in the table, charge additional refrigerant with 20g/1 m as the criteria.

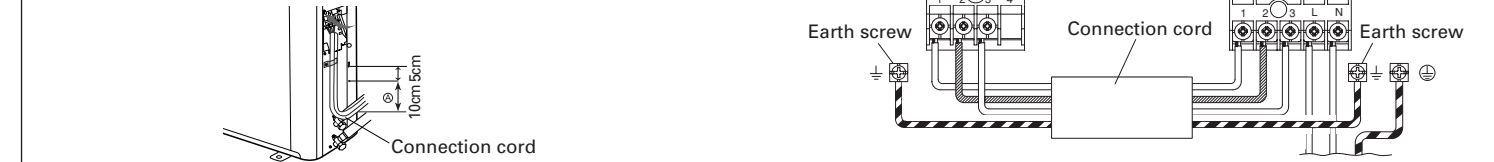
OUTDOOR UNIT WIRING

- 1) Remove the outdoor unit connector cover.
- 2) Bend the end of the cord as shown in the figure.
- 3) Connect the end of the connection cord fully into the terminal block.
- 4) Fasten the sheath with a cord clamp.
- 5) Install the connector cover.



Connection cord wiring

Run the connection cord to the rear of the outdoor unit within the range of the arrows shown in the figure. (The connector cover becomes difficult to install.)



CAUTION

- 1) Match the terminal block numbers and connection cord colors with those of the indoor unit. Erroneous wiring may cause burning of the electric parts.
- 2) Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.
- 3) Always fasten the outside covering of the connection cord with the cord clamp. (If the insulator is chafed, electric leakage may occur.)
- 4) Securely earth the power cord plug.
- 5) Do not use the earth screw for an external connector. Only use for interconnection between two units.

FINISHING

- 1) Insulate between pipes.
 - For rear, right, and bottom piping, overlap the connection pipe heat insulation and indoor unit pipe heat insulation and bind them with vinyl tape so that there is no gap.
 - For left and left rear piping and center piping, butt the connection pipe heat insulation and indoor unit pipe heat insulation together and bind them with and vinyl tape so that there is no gap.
 - For left and left rear piping and center piping, wrap the area which accommodates the rear piping housing section with cloth tape.
 - For left and left rear piping and center piping, bind the connection cord to the top of the pipe with vinyl tape.
 - For left and left rear piping and center piping, bundle the piping and drain hose together by wrapping them with cloth tape over the range within which they fit into the rear piping housing section.
- 2) Temporarily fasten the connection cord along the connection pipe with vinyl tape. (Wrap to about 1/3 the width of the tape from the bottom of the pipe so that water does not enter.)
- 3) Fasten the connection pipe to the outside wall with saddles, etc.
- 4) Fill the gap between the outside wall pipe hole and the pipe with sealer so that rain water and wind cannot blow in.
- 5) Fasten the drain hose to the outside wall, etc.



TEST RUNNING

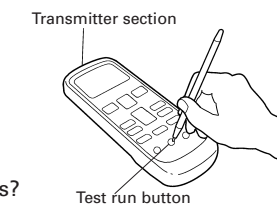
- Perform test operation and check items 1 and 2 below.
- For the test operation method, refer to the operating manual.
- The outdoor unit may not operate, depending on the room temperature. In this case, press the test run button on the remote control unit while the air conditioner is running. (Point the transmitter section of the remote control unit toward the air conditioner and press the test run button with the tip of a ball-point pen, etc.)
- To end test operation, press the remote control unit START/STOP button. (When the air conditioner is run by pressing the test run button, the OPERATION indicator lamp and TIMER indicator lamp will simultaneously flash slowly.)

1. INDOOR UNIT

- 1) Is operation of each button on the remote control unit normal?
- 2) Does each lamp light normally?
- 3) Do the air flow-direction louver operate normally?
- 4) Is the drain normal?

2. OUTDOOR UNIT

- 1) Is there any abnormal noise and vibration during operation?
- 2) Will noise, wind, or drain water from the unit disturb the neighbors?
- 3) Is there any gas leakage?



SPLIT TYPE ROOM AIR CONDITIONER INSTALLATION MANUAL

(PART No. 9315342027-01)

This air conditioner uses new refrigerant HFC (R410A).

The basic installation work procedures are the same as conventional refrigerant (R22) models. However, pay careful attention to the following points:

- Since the working pressure is 1.6 times higher than that of conventional refrigerant (R22) models, some of the piping and installation and service tools are special. (See the table below.) Especially, when replacing a conventional refrigerant (R22) 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 (R22) 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 (R22) models. Also, when storing the piping, securely seal the opening 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 (-1 to 53 bar) for high pressure. -0.1 to 3.8 MPa (-1 to 38 bar) 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/10m. 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 R22, 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.

CONNECTION PIPE REQUIREMENT

Nominal diameter	Outer diameter	Thickness	Maximum length	Maximum height (between indoor and outdoor)
3/8in	9.52mm	0.8mm	50m(165ft)	30m(99ft)
5/8in	15.88mm	1.0mm		

WARNING

- Do not use the existing (for R22) piping and flare nuts.
 - If the existing materials are used, the pressure inside the refrigerant cycle will rise and cause breakage, injury, etc. (Use the special R410A materials.)
- When installing and relocating the air conditioner, do not mix gases other than the specified refrigerant (R410A) to enter the refrigerant cycle.
 - If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause breakage, injury, etc.

CAUTION

When installing pipes shorter than 5m, sound of the outdoor unit will be transferred to the indoor unit, which will cause large operating sound or some abnormal sound.

For authorized service personnel only.

WARNING

- For the room air conditioner to operate satisfactorily, install it as outlined in this installation manual.
- Connect the indoor unit and outdoor unit with the air conditioner piping and cords available standards parts. This installation manual describes the correct connections using the standard accessories and the parts specified in this installation manual.
- Have installation work done by authorized service personnel only.
- Do not use an extension cord.
- Do not turn on the power until all installation work is complete.

- 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 manual because it is used when the air conditioner is serviced or moved.
- The maximum length of the piping is 50 m. The maximum height difference of the piping is 30 m, if the units are further apart than these, correct operation can not be guaranteed.

STANDARD ACCESSORIES

The following installation accessories are supplied. Use them as required.

Name and Shape	Q'ty	Name and Shape	Q'ty
Wall hook bracket	1	Cloth tape	1
Remote control unit	1	Tapping screw (big)	8
Battery	2	Tapping screw (small)	2
Remote control unit holder	1	Air cleaning filter	2
Drain pipe	1	Air cleaning filter frame	2
Drain cap	2	Insulation (Drain hose)	1
		Insulation (seal)	1

One set of following parts are necessary in installation of this product.

Name	MAX.	MIN.
Connection pipe assembly	4.0	3.5
Connection cord	2.5	1.5
Wall pipe	30	
Decorative tape		
Vinyl tape		
Wall cap		
Saddle		
Drain hose		
Tapping screws		
Sealant		
M10 bolt, nut		

ELECTRICAL REQUIREMENT

- Electric wire size and fuse capacity:

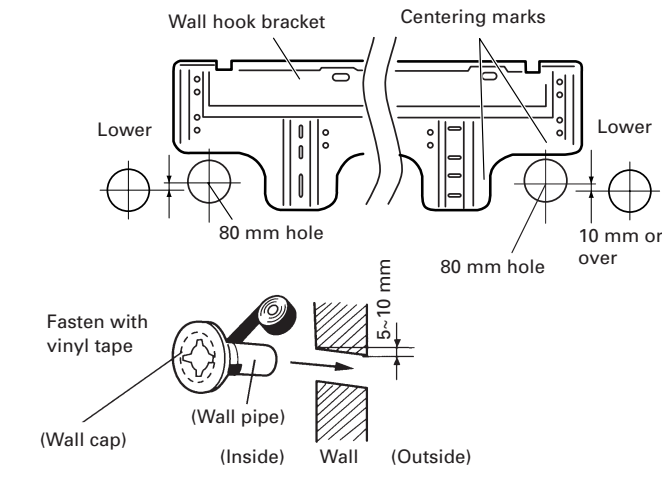
Power supply cord (mm ²)	MAX.	MIN.
Connection cord (mm ²)	4.0	3.5
Fuse capacity (A)	2.5	1.5
	30	

- Install the disconnect device with a contact gap of at least 3 mm nearby the units. (Both indoor unit and outdoor unit)
- Always make the air conditioner power supply a special branch circuit and provide a special breaker.
- Always use H07RN-F or equivalent as the power supply cord and the connection cord.

INDOOR UNIT

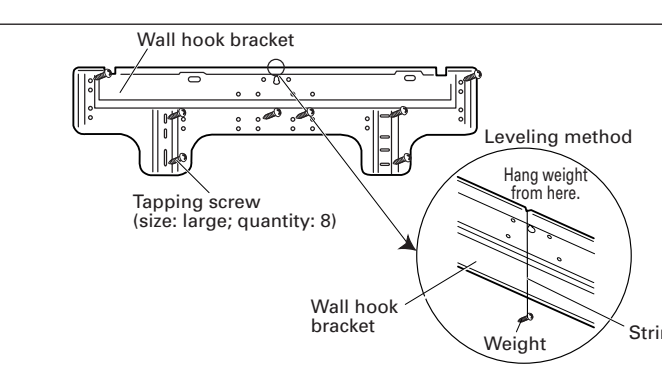
CUTTING THE HOLE IN THE WALL FOR THE CONNECTING PIPING

- Cut a 80 mm diameter hole in the wall at the position shown in the figure.
- When cutting the wall hole at the inside of the wall hook bracket, cut the hole to a point of intersection of center marks.
- Cut the hole so that the outside end is lower (5 to 10 mm) than the inside end.
- Always align the center of the wall hole. If misaligned, water leakage will occur.
- Cut the wall pipe to match the wall thickness, stick it into the wall cap, fasten the cap with vinyl tape, and stick the pipe through the hole. (The connection pipe is supplied in the installation set.)
- For left piping and right piping and center piping, cut the hole a little lower so that drain water will flow freely.



INSTALLING THE WALL HOOK BRACKET

- Install the wall hook bracket so that it is correctly positioned horizontally and vertically. If the wall hook bracket is tilted, water will drip to the floor.
- Install the wall hook bracket so that it is strong enough to withstand the weight of an adult.
 - Fasten the wall hook bracket to the wall with 6 or more screws through the holes near the outer edge of the bracket.
 - Check that there is no rattle at the wall hook bracket.

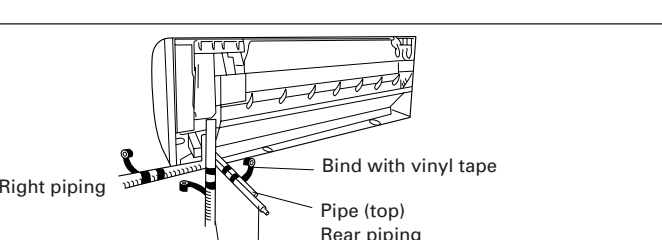


WARNING
If the wall pipe is not used, the cord interconnecting the indoor and outdoor units may touch metal and cause electric leakage.

CAUTION
Install the wall hook bracket horizontally and perpendicularly.

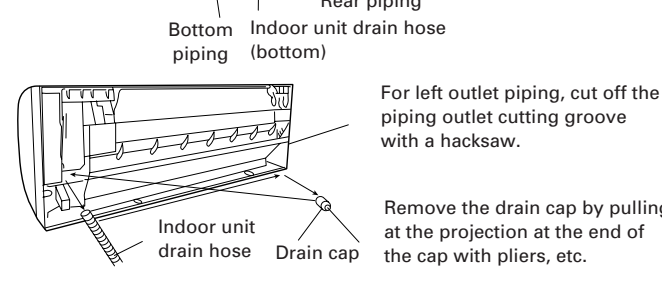
FORMING THE DRAIN HOSE AND PIPE

- Install the indoor unit piping in the direction of the wall hole and bind the drain hose and pipe together with vinyl tape.
- Install the piping so that the drain hose is at the bottom.
- Wrap the pipes of the indoor unit that are visible from the outside with decorative tape.

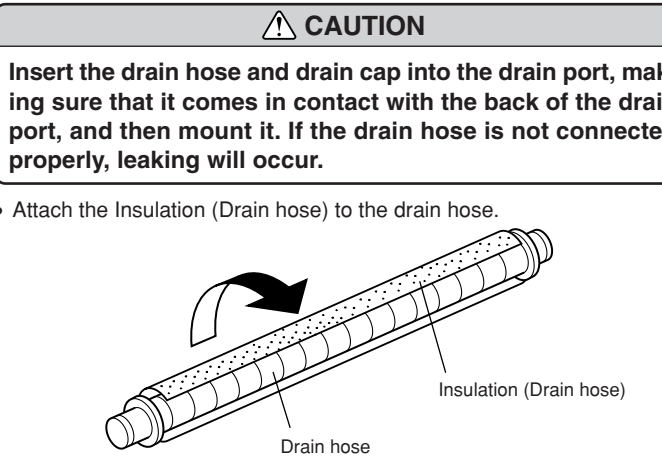


[For Left rear piping, Left piping]

Interchange the drain cap and the drain hose.



- In order to align the drain hose and drain cap, be sure to insert securely and vertically. Incline insertion will cause water leakage.
- When inserting, be sure not to attach any material besides water. If any other material is attached, it will cause deterioration and water leakage.
- After removing drain hose, be sure not to forget mounting drain cap.
- Be sure to fix the drain hose with tape to the bottom of piping.
- Prevent drain water frozen under low temperature environment.
 - When installing indoor unit's drain hose outdoors, necessary measure for frost protection should be taken to prevent drain water frozen.
 - Under low temperature environment (when outdoor temperature under 0 °C), after cooling operation is executed, water in the drain hose could be frozen.
 - Once drain water is frozen, the drain hose will be blocked and water leakage may be resulted for indoor unit.



SELECTING THE MOUNTING POSITION

Decide the mounting position with the customer as follows:

- 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.
 - Install the unit near an electric outlet or special branch circuit.
 - 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.

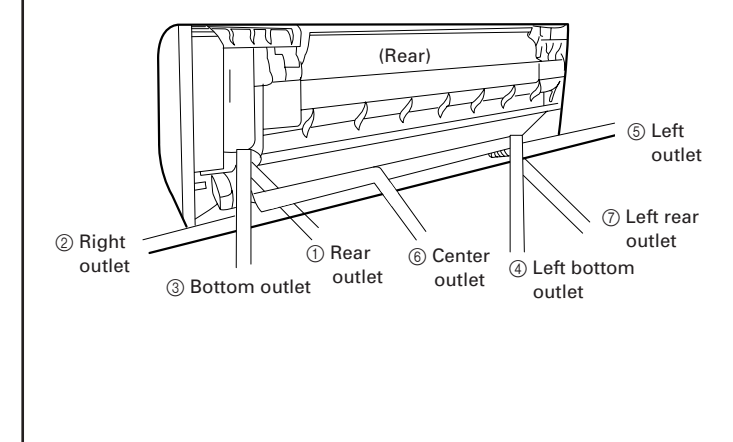
- OUTDOOR UNIT**
 - If possible, do not install the unit where it will be exposed to direct sunlight. (If necessary, install a blind that does not interfere with the air flow.)
 - Do not install the unit where a strong wind blows or where it is very dusty.
 - Do not install the unit where people pass.
 - Take your neighbors into consideration so that they are not disturbed by air blowing into their windows or by noise.
 - Provide the space shown in the figure so that the air flow is not blocked. Also for efficient operation, leave open three of the four directions front, rear, and both sides.

WARNING
Install at a place that can withstand the weight of the indoor and outdoor units and install positively so that the units will not topple or fall.

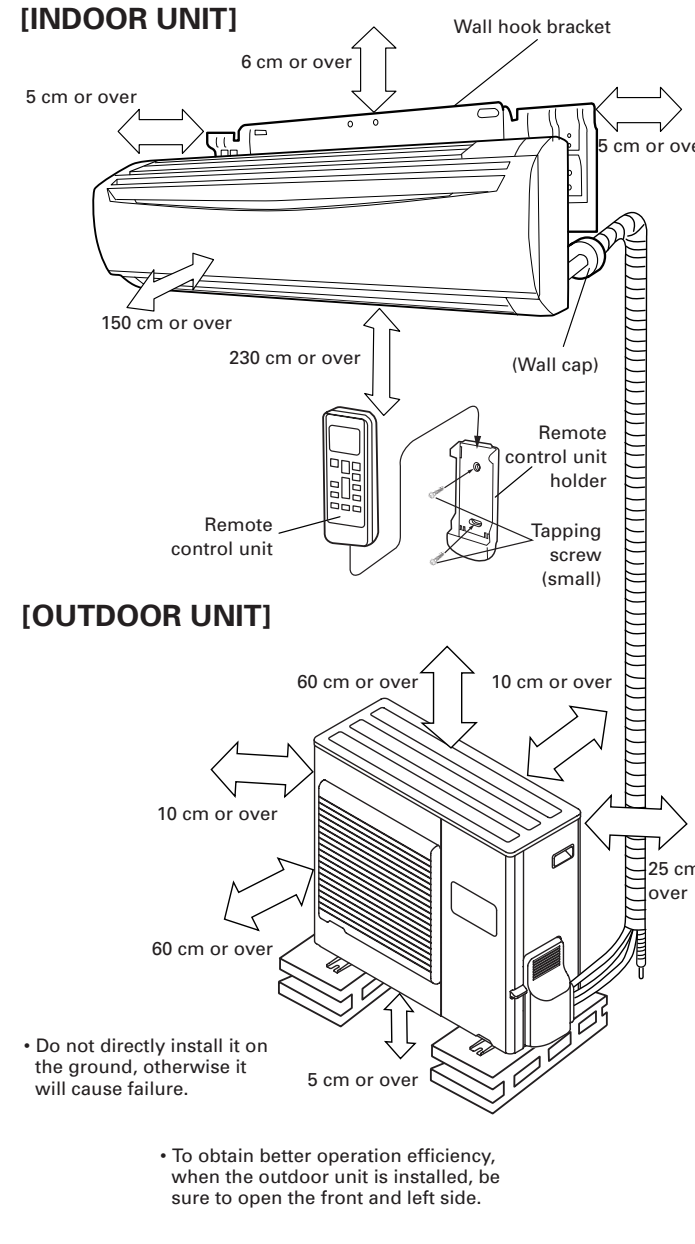
- Do not install where there is the danger of combustible gas leakage.
- Do not install near heat sources.
- If children under 10 years old may approach the unit, take preventive measures so that they can not reach the unit.
- Install the indoor unit on the wall where the height from the floors more than 230 cm.

Indoor unit piping direction

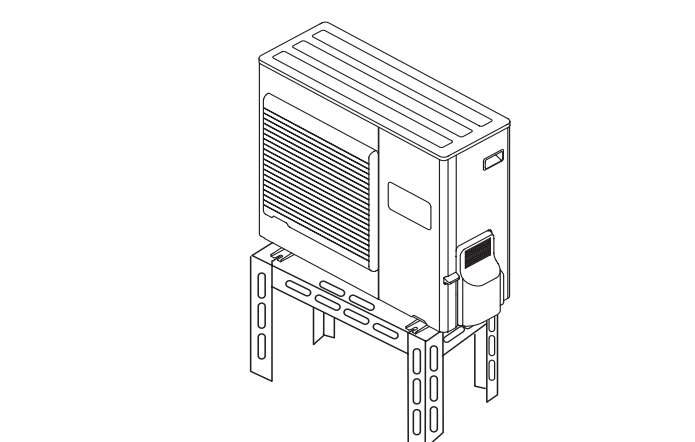
The piping can be connected in the 7 directions in the figure. When the piping is connected in direction ②, ③, ④ or ⑤, cut along the piping groove in the side of the front panel with a hacksaw.



INSTALLATION DIAGRAM OF INDOOR AND OUTDOOR UNITS

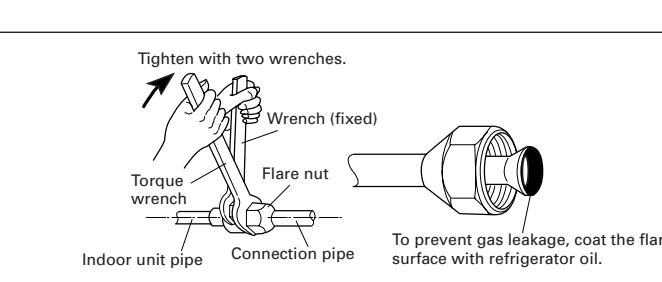


- When the outdoor temperature is 0 °C or less, do not use the accessory drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extremely cold weather. (Reverse cycle model only)
- In the area with heavy snowfall, if the intake and outlet of outdoor unit is blocked with snow, it might become difficult to get warm and it is likely to cause of the breakdown. Please construct a canopy and a pedestal or place the unit on a high stand (local configured).



CONNECTING THE PIPING CONNECTION

- Install the outdoor unit wall cap (supplied with the optional installation set or procured at the site) to the wall pipe.
- Connect the outdoor unit and indoor unit piping.
- After matching the center of the flare surface and tightening the nut hand tight, tighten the nut to the specified tightening torque with a torque wrench.



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 onto the pipe and flare the pipe with a flaring tool.
- 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 (for R22) flare tool.
- When using the conventional flare tool, always use an allowance adjustment gauge and secure the A dimension shown in the table.

Flare nut	Tightening torque	L dimension
9.52 mm dia.	30 to 42 N·m (300 to 420 kgf·cm)	1.8 to 2.0mm
15.88 mm dia.	63 to 75 N·m (630 to 750 kgf·cm)	2.2 to 2.4mm

Pipe outside diameter	A (mm)
Flash tool for Conventional (R22) flare tool	
φ 9.52 mm (3/8")	0 to 0.5 1.0 to 1.5 1.5 to 2.0
φ 15.88 mm (5/8")	0 to 0.5 1.0 to 1.5 1.5 to 2.0

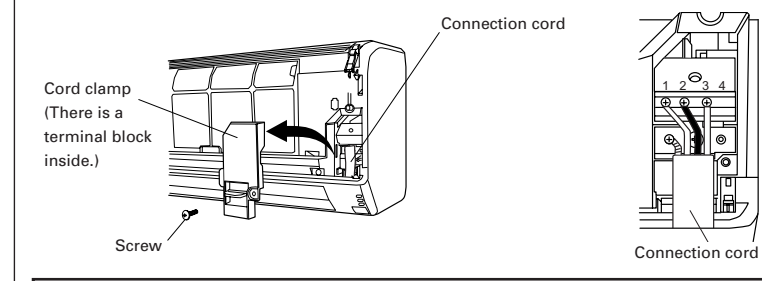
BENDING PIPES

- When bending the pipe, be careful not to crush it.
- To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150mm or over.
- If the copper pipe is bend the pipe or pulled to often, it will become stiff. Do not bend the pipes more than three times at one place.

INDOOR UNIT WIRING

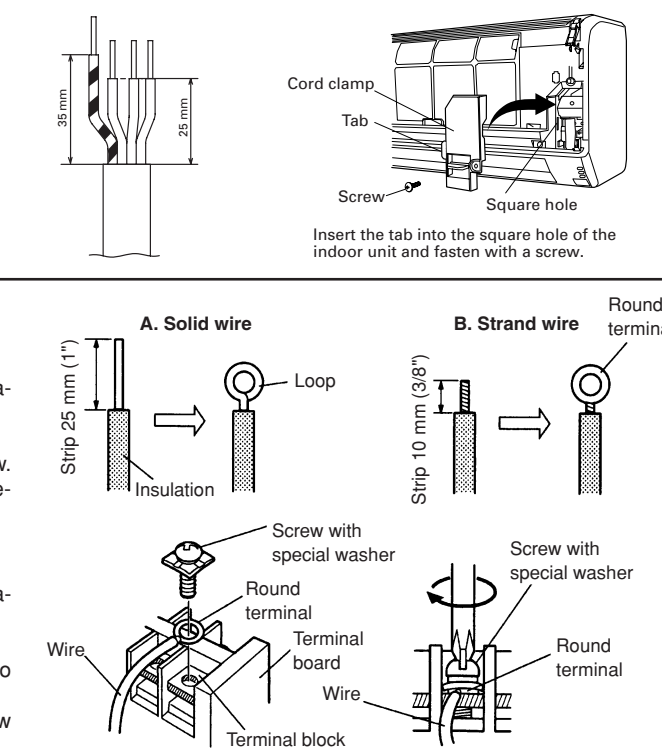
- Remove the cord clamp.
- Bend the end of the connection cord as shown in the figure.
- Connect the end of the connection cord fully into the terminal block.
- Fasten the connection cord with a cord clamp.

- Fasten a flare nut with a torque wrench as instructed in this manual. If fastened too tight, the flare nut may be broken after a long period of time and cause a leakage of refrigerant.
- During installation, make sure that the refrigerant pipe is attached firmly before you run the compressor. Do not operate the compressor under the condition of refrigerant piping not attached properly with 3-way valves open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.



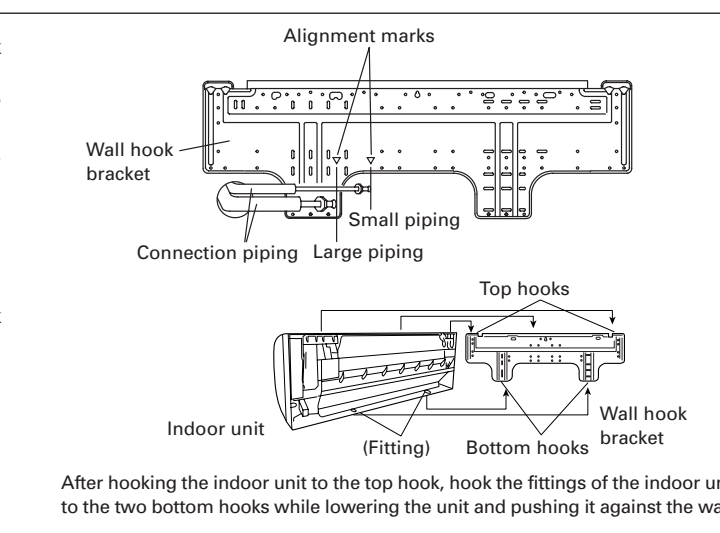
HOW TO CONNECT WIRING TO THE TERMINALS

- A. For solid core wiring (or F-cable)**
 - Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 25 mm (1") to expose the solid wire.
 - Using a screwdriver, remove the terminal screw(s) on the terminal board.
 - Using pliers, bend the solid wire to form a loop suitable for the terminal screw.
 - 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**
 - Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to about 10 mm (3/8") to expose the strand wiring.
 - Using a screwdriver, remove the terminal screw(s) on the terminal board.
 - Using a round terminal fastener or pliers, securely clamp a round terminal cap each stripped wire end.
 - Position the round terminal wire, and replace and tighten the terminal screw using a screwdriver.



- Match the terminal block 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 block. 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.)
- Securely earth the power cord plug.
- Do not use the earth screw for an external connector. Only use for interconnection between two units.

- For left piping and left rear piping, align the marks on the wall hook bracket and shape the connection pipe.
- Bend the connection piping at the bend radius of 100 mm or more and install no more than 35 mm from the wall.
- After passing the indoor piping and drain hose through the wall hole, hang the indoor unit on the hooks at the top and bottom of the wall hook bracket.

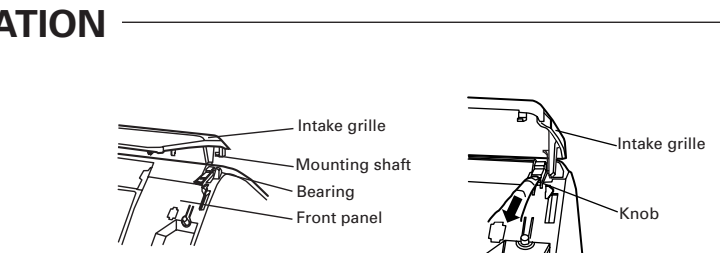


- Remove intake grille.
 - Remove intake grille.
 - Lift the intake grille upward, until the axle at the top of the intake grille is removed.
- (Installing the indoor unit)**
- Hang the indoor unit from the hooks at the top of the wall hook bracket.
 - Insert the spacer, etc. between the indoor unit and the wall hook bracket and separate the bottom of the indoor unit from the wall.

FRONT PANEL REMOVAL AND INSTALLATION

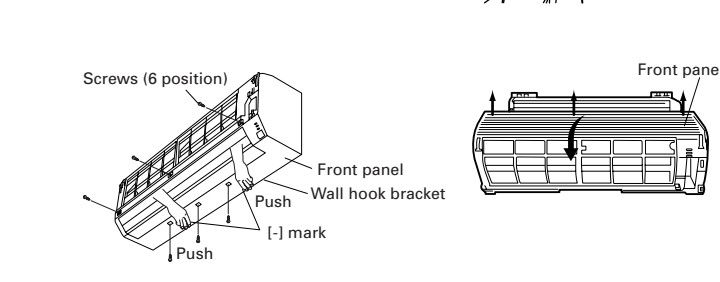
THE INTAKE GRILLE REMOVAL

- Open the intake grille.
- Pull down the knob.
- Lift the intake grille upward, until the axle at the top of the intake grille is removed.



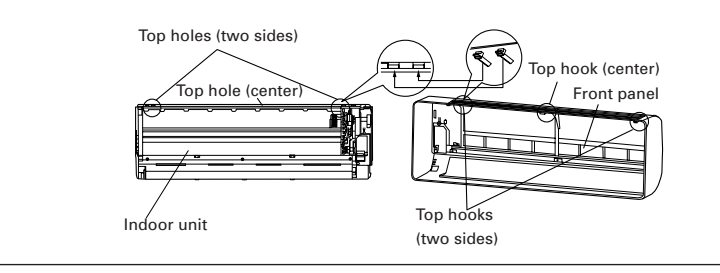
THE INTAKE GRILLE INSTALLATION

- The fixing axle of the intake grille is installed on the Panel.
- Lay down the intake grille.



THE FRONT PANEL REMOVAL

- Remove intake grille. (Reference the intake grille removal.)
- Remove six screws.
- The thumb is hung on the lower part as shown in the figure, and it pulls to the front, pushing [-] mark, and bottom hooks (two position) is removed from wall hook bracket.
- The front panel is pulled to the front, raising the upper surface, and a front panel is removed.



THE FRONT PANEL INSTALLATION

- Firstly, fit the lower part of the front panel, and insert top and bottom hooks. (Three top sides)
- Six screws is attached.
- The intake grille is attached.

CAUTION

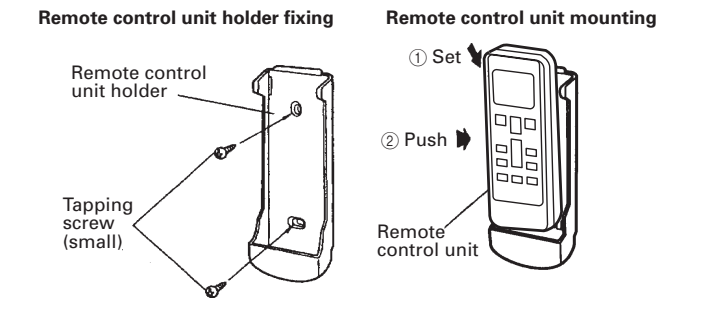
Install the front panel and INTAKE GRILLE securely. If installation is imperfect, the front panel or INTAKE GRILLE may fall off and cause injury.

REMOTE CONTROL UNIT INSTALLATION

- Check that the indoor unit correctly receives the signal from the remote control unit, then install the remote control unit holder.
 - 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 with a distance of 7 mm between the remote control unit and the photocell as the criteria. However, when installing the remote control unit, check that it operates positively.
- Install the remote control unit holder to a wall, pillar, etc. with the tapping screw.



CAUTION

During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping. Do not remove the connection pipe while the compressor is in operation with 3 way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.

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 switching, and other remote control unit operations.
 - Air filter removal and cleaning, and how to use the air louvers.
 - Give the operating and installation manuals to the customer.

PUMP DOWN OPERATION (FORCED COOLING OPERATION)

- To avoid discharging refrigerant into the atmosphere at the time of relocation or disposal, recover refrigerant by doing the cooling operation or forced cooling operation according to the following procedure. (When the cooling operation cannot start in winter, and so on, start the forced cooling operation.)
- Do the air purging of the charge hose by connecting the charging hose of gauge manifold to the charging port of 3 way valve (large) and opening the low-pressure valve slightly.
 - Close the valve stem of 3 way valve (small) completely.
 - Start the cooling operation or following forced cooling operation.
 - When using the remote control unit Press the TEST RUN button after starting the cooling operation by the remote control unit.
 - The operation indicator lamp and timer indicator lamp will begin to flash simultaneously during test run.
 - When using the MANUAL AUTO button of the indoor unit (The remote control unit is lost, and so on.) Keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds. (The forced cooling operation cannot start if the MANUAL AUTO button is not kept on pressing for more than 10 seconds.)
 - Close the valve stem of 3 way valve (large) when the reading on the compound pressure gauge becomes 0.05-0 MPa (0.5-0 kgf/cm²).
 - Stop the operation.
 - Press the START/STOP button of the remote control unit to stop the operation.
 - Press the MANUAL AUTO button when stopping the operation from indoor unit side. (It is not necessary to press on keeping for more than 10 seconds.)

CAUTION
During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping. Do not remove the connection pipe while the compressor is in operation with 3 way valve open. This may cause abnormal pressure in the refrigeration cycle that leads to breakage and even injury.

POWER

- The rated voltage of this product is 230 V AC 50 Hz.
- Before turning on the power, check if the voltage is within the 220 V -10 % to 240 V +10 % range.
- Always use a special branch circuit and install a special receptacle to supply power to the room air conditioner.
- Use a circuit breaker and receptacle matched to the capacity of the air conditioner.
- Do not extend the power cord.
- Perform wiring work in accordance with standards so that the air conditioner can be operated safely and positively.
- Install a leakage circuit breaker in accordance with the related laws and regulations and electric company standards.

- 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

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).

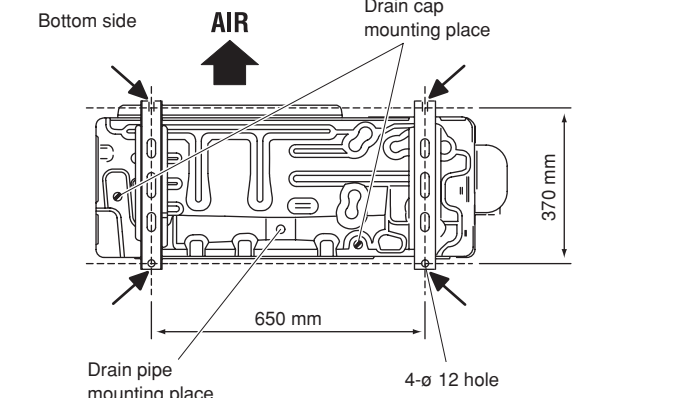
OUTDOOR UNIT

OUTDOOR UNIT INSTALLATION

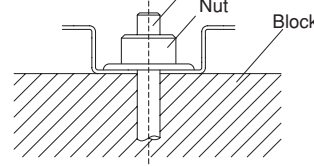
WARNING

- 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.

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



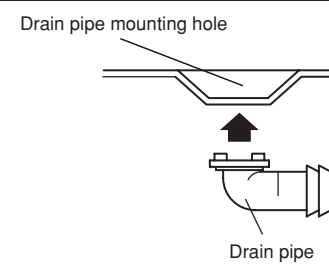
- Fix securely with bolts on a solid block. (Use 4 sets of commercially available M10 bolt, nut and washer.)



- 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

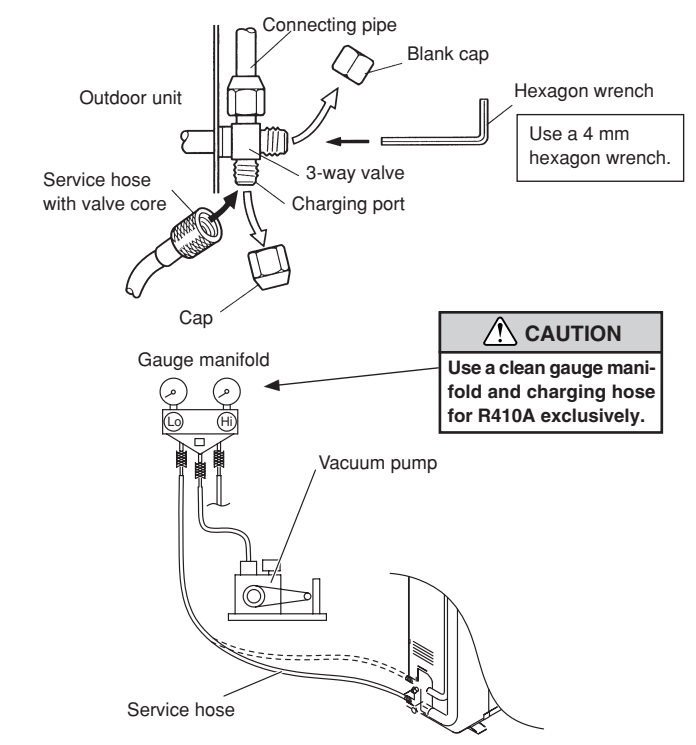
When the outdoor temperature is 0 °C or less, do not use the accessory drain pipe and drain cap. If the drain pipe and drain cap are used, the drain water in the pipe may freeze in extremely cold weather. (Reverse cycle model only)



AIR PURGE

- 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 3-way valves with a hexagon wrench [Torque: 6-7 N·m (60 to 70 kgf·cm)].
- Tighten the blank caps of the 3-way valve to the specified torque.

Tightening torque		
Blank cap	9.52 mm (3/8 in.)	20 to 25 N·m (200 to 250 kgf·cm)
Charging port cap	15.88 mm (5/8 in.)	30 to 35 N·m (300 to 350 kgf·cm)
		10 to 12 N·m (100 to 120 kgf·cm)



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.
- 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.
- When adding refrigerant, add the refrigerant from the charging port at the completion of work.
- The maximum length of the piping is 50 m. If the units are further apart than this, correct operation can not be guaranteed.

Pipe length	30 m	40 m	50 m
Additional refrigerant	400 g	800 g	1200 g

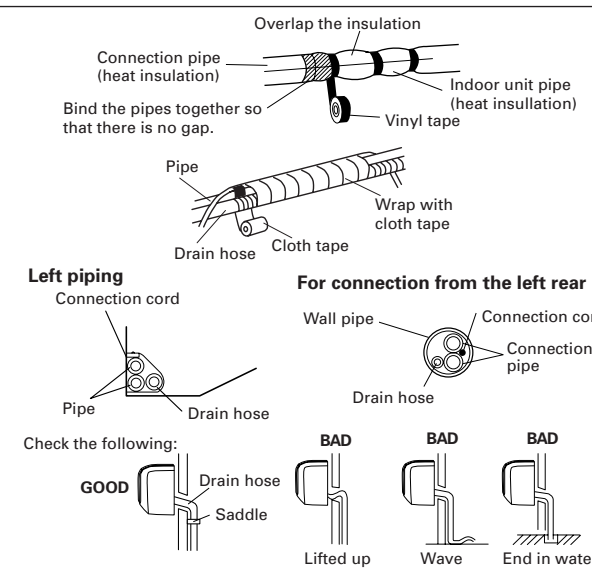
Between 20 m and 50 m, when using a connection pipe other than that in the table, charge additional refrigerant with 40g/1 m as the criteria.

Additional charge

Refrigerant suitable for a piping length of 20 m is charged in the outdoor unit at the factory. When the piping is longer than 20 m, additional charging is necessary. For the additional amount, see the table below.

FINISHING

- Insulate between pipes.
 - For rear, right, and bottom piping, overlap the connection pipe heat insulation and indoor unit pipe heat insulation and bind them with vinyl tape so that there is no gap.
 - For left and left rear piping and center piping, butt the connection pipe heat insulation and indoor unit pipe heat insulation together and bind them with and vinyl tape so that there is no gap.
 - For left and left rear piping and center piping, wrap the area which accommodates the rear piping housing section with cloth tape.
 - For left and left rear piping and center piping, bind the connection cord to the top of the pipe with vinyl tape.
 - For left and left rear piping and center piping, bundle the piping and drain hose together by wrapping them with cloth tape over the range within which they fit into the rear piping housing section.
- Temporarily fasten the connection cord along the connection pipe with vinyl tape. (Wrap to about 1/3 the width of the tape from the bottom of the pipe so that water does not enter.)
- Fasten the connection pipe to the outside wall with saddles, etc.
- Fill the gap between the outside wall pipe hole and the pipe with sealer so that rain water and wind cannot blow in.
- Fasten the drain hose to the outside wall, etc.



TEST RUNNING

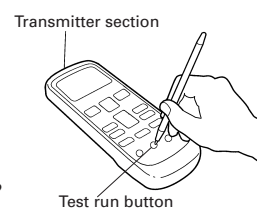
- Perform test operation and check items 1 and 2 below.
- For the test operation method, refer to the operating manual.
- The outdoor unit may not operate, depending on the room temperature. In this case, press the test run button on the remote control unit while the air conditioner is running. (Point the transmitter section of the remote control unit toward the air conditioner and press the test run button with the tip of a ball-point pen, etc.)
- To end test operation, press the remote control unit START/STOP button. (When the air conditioner is run by pressing the test run button, the OPERATION indicator lamp and TIMER indicator lamp will simultaneously flash slowly.)

1. INDOOR UNIT

- Is operation of each button on the remote control unit normal?
- Does each lamp light normally?
- Do the air flow-direction louver operate normally?
- Is the drain normal?

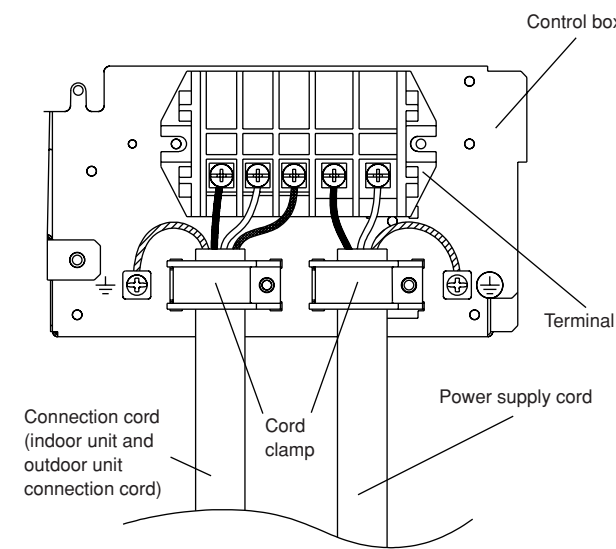
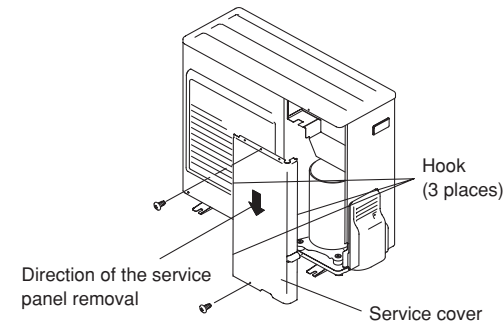
2. OUTDOOR UNIT

- Is there any abnormal noise and vibration during operation?
- Will noise, wind, or drain water from the unit disturb the neighbors?
- Is there any gas leakage?

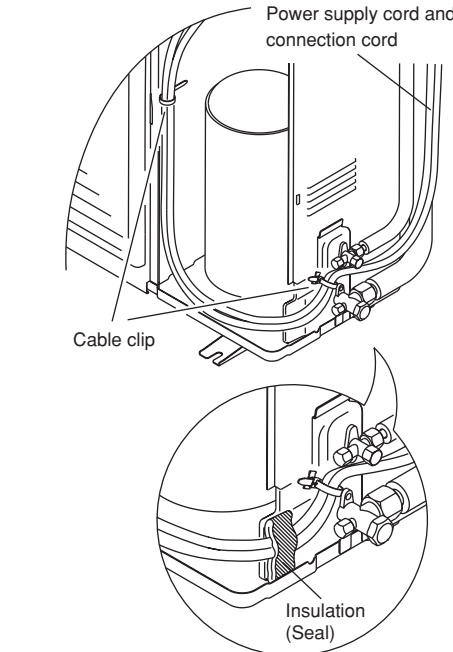
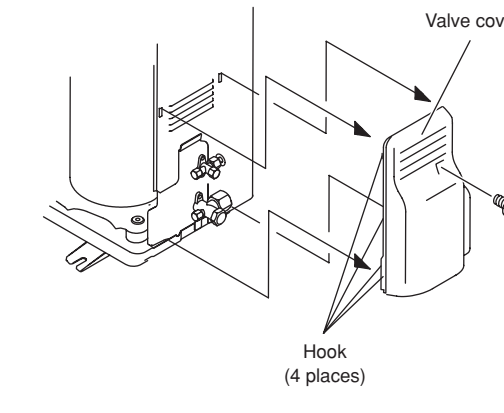
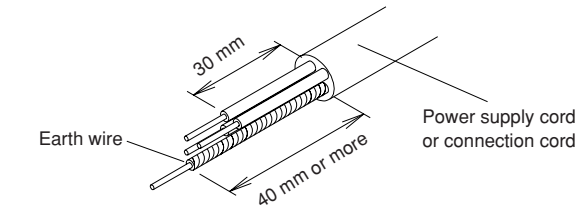


ELECTRICAL WIRING (OUTDOOR UNIT)

- Service cover removal
 - Remove the two mounting screws.
 - Remove the service cover by pushing downwards.
- Valve cover removal
 - Remove the one mounting screw.
 - Remove the valve cover by sliding upward.
- Connect the power supply cord and the connection cord to terminal.
- Fasten the power supply cord and connection cord with cord clamp.
- 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).
- Put the service cover and valve cover back after completion of the work.



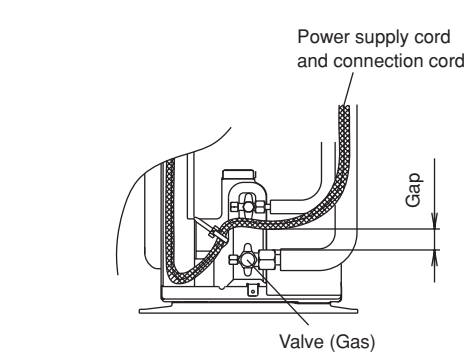
Keep the earth wire longer than the other wires.



CAUTION

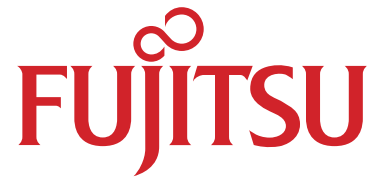
When connecting the power supply cord, make sure that the phase of the power supply matches with the phase of the terminal board. If the phases do not match, the compressor will rotate in reverse and will not be able to compress.

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



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.



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