

**SPLIT TYPE
ROOM AIR CONDITIONER**

**WALL MOUNTED^{type}
INVERTER**

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	ASU24CL	AOU24CL
	ASU24RL	AOU24RL
	ASU30CLX	AOU30CLX
	ASU36CLX	AOU36CLX



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WALL MOUNTED type INVERTER

1 . SPECIFICATIONS

SPECIFICATIONS

MODEL NAME				ASU24CL AOU24CL	ASU24RL AOU24RL	ASU30CLX AOU30CLX	ASU36CLX AOU36CLX		
POWER SOURCE		PHASE		Ph	1	1	1		
		FREQUENCY		Hz	60	60	60		
		VOLTAGE		V	208-230	208-230	208-230		
COOLING PERFORMANCE	CAPACITY			kW	7.10	7.10	9.00	9.70	
					(1.52~7.62)	(1.52~7.62)	(2.92~9.50)	(2.90~10.0)	
				Btu /h	24,200	24,200	30,700	33,100	
					(5,200~26,000)	(5,200~26,000)	(9,900~32,400)	(9,900~34,100)	
	POWER CONSUMPTION			W	2,310	2,310	3,460	4,040	
					(250~2,620)	(250~2,620)	(580~4,100)	(580~4,330)	
	EER			W /W	3.07	3.07	2.60	2.40	
				Btu /(h.W)	10.5	10.5	8.90	8.20	
	SEER			Btu /(h.W)	18.00	18.00	15.00	15.00	
	RUNNING CURRENT			A	10.1	10.1	15.2	17.7	
	POWER FACTOR			%	99	99	99	99	
	MAXIMUM CURRENT			A	12.0	12.0	18.0	19.0	
	MOISTURE REMOVAL			L /hr	3.0	3.0	4.6	4.8	
				Pt /h	6.3	6.3	9.7	10.1	
	OPERATING NOISE (SOUND PRESSURE)		INDOOR UNIT	HI	dB	47	47	47	49
				ME	dB	41	41	41	41
				LO	dB	36	36	36	36
				QUIET	dB	32	32	32	32
			OUTDOOR UNIT		dB	52	52	53	54
HEATING PERFORMANCE	CAPACITY			kW	-	8.10	-	-	
					-	(1.80~10.6)	-	-	
				Btu /h	-	27,600	-	-	
					-	(4,100~36,200)	-	-	
	POWER CONSUMPTION			W	-	2,470	-	-	
					-	(250~3,870)	-	-	
	COP			W /W	-	3.28	-	-	
				Btu /(h.W)	-	11.2	-	-	
	HSPF			Btu /(h.W)	-	10.00	-	-	
	RUNNING CURRENT			A	-	10.8	-	-	
	POWER FACTOR			%	-	99	-	-	
	MAXIMUM CURRENT			A	-	17.5	-	-	
	OPERATING NOISE (SOUND PRESSURE)		INDOOR UNIT	HI	dB	-	45	-	-
				ME	dB	-	41	-	-
LO				dB	-	36	-	-	
QUIET				dB	-	32	-	-	
OUTDOOR UNIT			dB	-	53	-	-		
OTHER INDICATION	COMPRESSOR	TYPE		-	Scroll	Scroll	Rotary	Rotary	
		OUTPUT		W	1,200	1,200	1,700	1,700	
	AIR CIRCULATION (FAN MODE)	INDOOR UNIT	m3 /h	1,100	1,100	1,110	1,210		
			cfm	647	647	647	706		
		OUTDOOR UNIT	m3 /h	2,340	2,340	3,600	3,600		
			cfm	1,377	1,377	2,119	2,119		
	STARTING CURRENT			A	10.8	10.1	15.2	17.7	
	MINIMUM CIRCUIT AMPACITY			A	21	21	22	22	
	MAXIMUM OVERCURRENT PROTECTION			A	25	25	30	30	
	DESIGN PRESSURE	HIGH SIDE		PSI(MPa)	450(3.10)	450(3.10)	450(3.10)	450(3.10)	
		LOW SIDE		PSI(MPa)	240(1.65)	240(1.65)	240(1.65)	240(1.65)	
	PERMISSIBLE OUTDOOR TEMPERATURE	COOLING	°F		14~115	14~115	14~115	14~115	
			°C		-10~46	-10~46	-10~46	-10~46	
		HEATING	°F		-	5~75	-	-	
			°C		-	-15~24	-	-	

SPECIFICATIONS

MODEL NAME					ASU24CL AOU24CL	ASU24RL AOU24RL	ASU30CLX AOU30CLX	ASU36CLX AOU36CLX
INSTALLATION	CONNECTING METHOD			-	Flare	Flare	Flare	Flare
	PIPE SIZE	LIQUID SIDE	mm	6.35	6.35	9.52	9.52	
			in.	1/4	1/4	3/8	3/8	
		GAS SIDE	mm	15.88	15.88	15.88	15.88	
			in.	5/8"	5/8"	5/8"	5/8	
	STANDARD PIPE LENGTH			m	7.5	7.5	7.5	7.5
				ft.	25	25	25	25
	MAXIMUM PIPE LENGTH			m	30	30	50	50
				ft.	98	98	164	164
	CHARGE LESS PIPE LENGTH			m	15	15	20	20
				ft.	49	49	66	66
	AMOUNT OF ADDITIONAL CHARGE			g /m	20	20	40	40
				oz. /ft.	3/16	3/16	7/16	7/16
	MAXIMUM HEIGHT DIFFERENCE			m	20	20	30	30
				ft.	66	66	98	98
NUMBER OF WIRE			-	4	4	4	4	
DRAIN HOSE LENGTH			mm	670	670	670	670	
			in.	26-3/8	26-3/8	26-3/8	62-3/8	
WEIGHT	NET	INDOOR UNIT		kg	14	14	14	14
				lbs.	31	31	31	31
		OUTDOOR UNIT		kg	44	44	62	62
				lbs.	97	97	137	137
	GROSS (PACKAGING WEIGHT)	INDOOR UNIT		kg	18	18	18	18
				lbs.	40	40	40	40
		OUTDOOR UNIT		kg	48	48	70	70
				lbs.	106	106	155	155
OTHER INDICATION	MAIN UNIT DIMENSIONS	INDOOR UNIT	HEIGHT	mm	320	320	320	320
				in.	12-5/8	12-5/8	12-5/8	12-5/8
			WIDTH	mm	998	998	998	998
				in.	39-1/4	39-1/4	39-1/4	39-1/4
			DEPTH	mm	228	228	228	228
				in.	9	9	9	9
		OUTDOOR UNIT	HEIGHT	mm	578	578	830	830
				in.	22-3/4	22-3/4	32-5/8	32-5/8
			WIDTH	mm	790	790	900	900
				in.	31-1/8"	31-1/8"	35-3/8	35-3/8
			DEPTH	mm	315	315	330	330
				in.	12-3/8	12-3/8	13	13
	PACKAGE DIMENSIONS	INDOOR UNIT	HEIGHT	mm	319	319	319	319
				in.	12-1/2	12-1/2	12-1/2	12-1/2
			WIDTH	mm	1,090	1,090	1,090	1,090
				in.	42-7/8	42-7/8	42-7/8	42-7/8
			DEPTH	mm	429	429	429	429
				in.	16-7/8	16-7/8	16-7/8	16-7/8
		OUTDOOR UNIT	HEIGHT	mm	648	648	970	970
				in.	25-1/2	25-1/2	38-1/4	38-1/4
			WIDTH	mm	910	910	1,050	1,050
				in.	35-7/8	35-7/8	41-3/8	41-3/8
			DEPTH	mm	380	380	445	445
				in.	15	15	17-1/2	17-1/2
Refrigerant	KIND OF REFRIGERANT			-	R410A	R410A	R410A	R410A
	AMOUNT OF CHARGING			kg	1.60	1.60	2.10	2.10
				lbs.	3-1/2	3-1/2	4-5/8	4-5/8

WALL MOUNTED type INVERTER

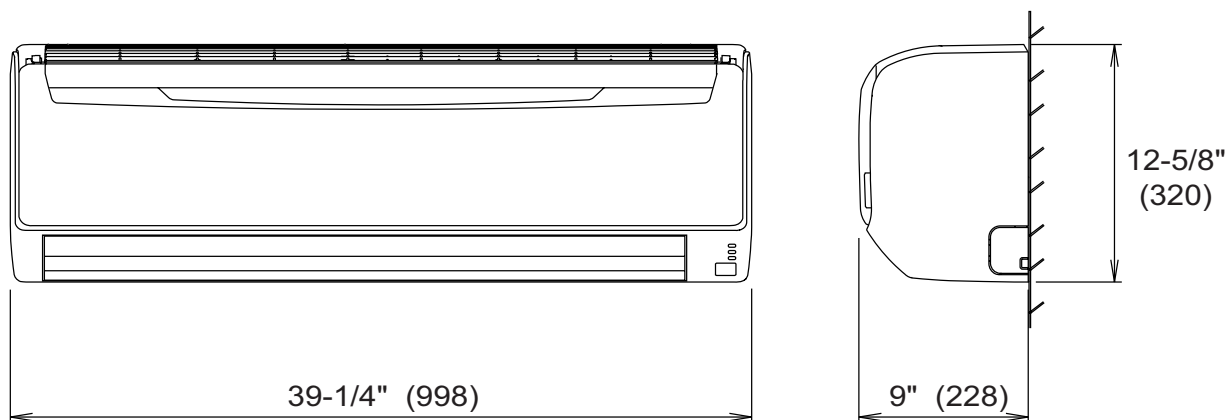
2 . DIMENSIONS

DIMENSIONS

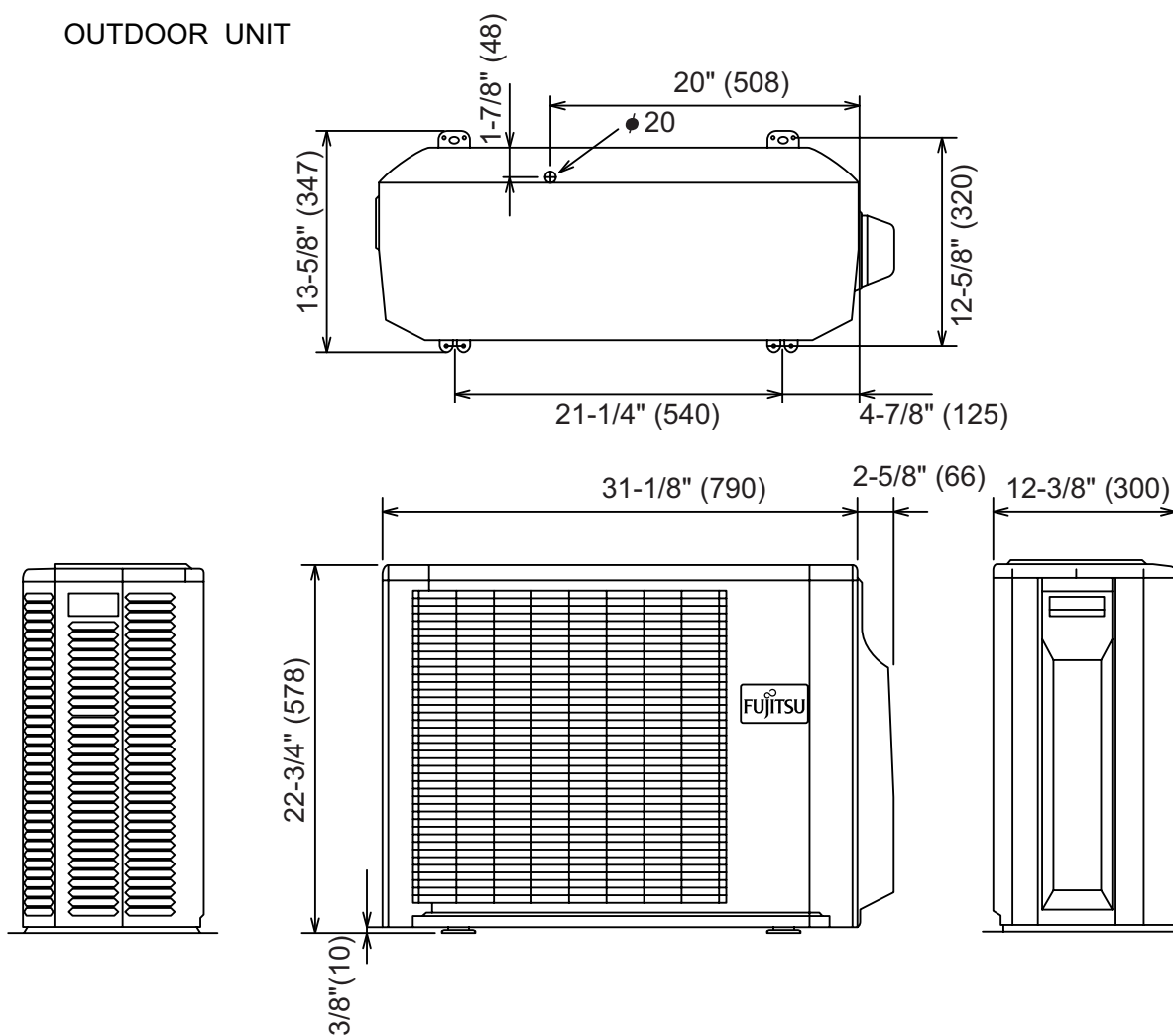
**Models : ASU24CL / AOU24CL
ASU24RL / AOU24RL**

Unit : inch (mm)

INDOOR UNIT



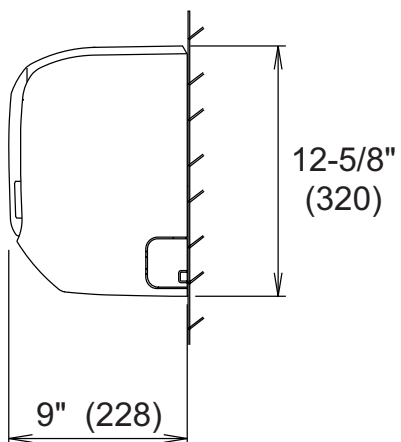
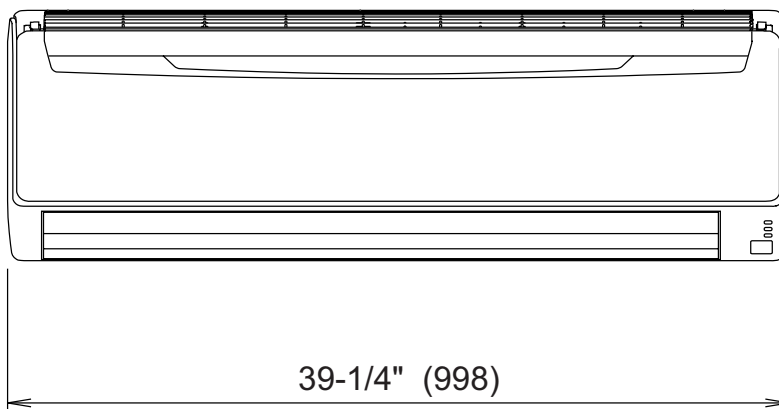
OUTDOOR UNIT



DIMENSIONS

**Models : ASU30CLX
ASU36CLX**

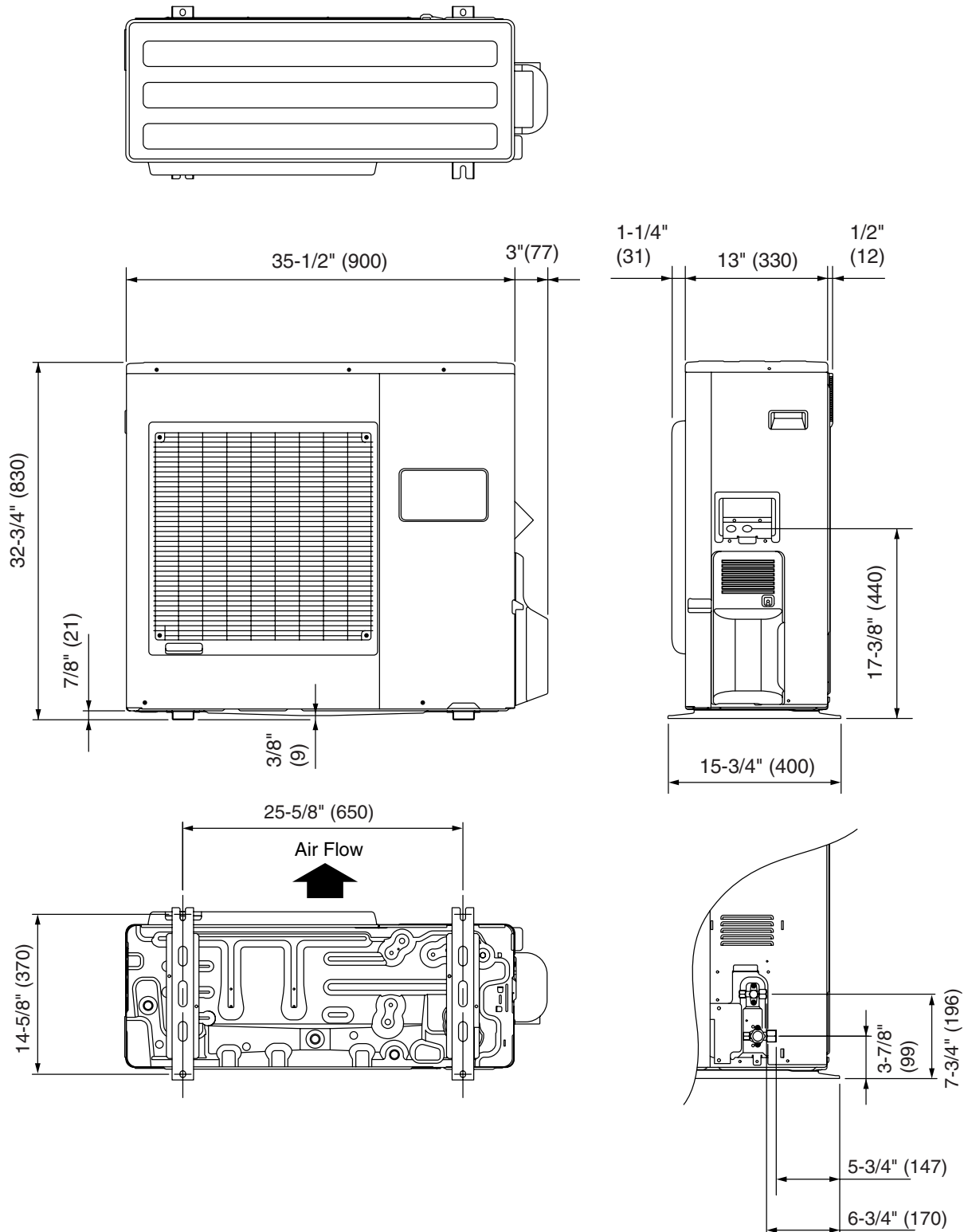
Unit : inch (mm)



DIMENSIONS

Models : AOU30CLX
AOU36CLX

Unit : inch (mm)

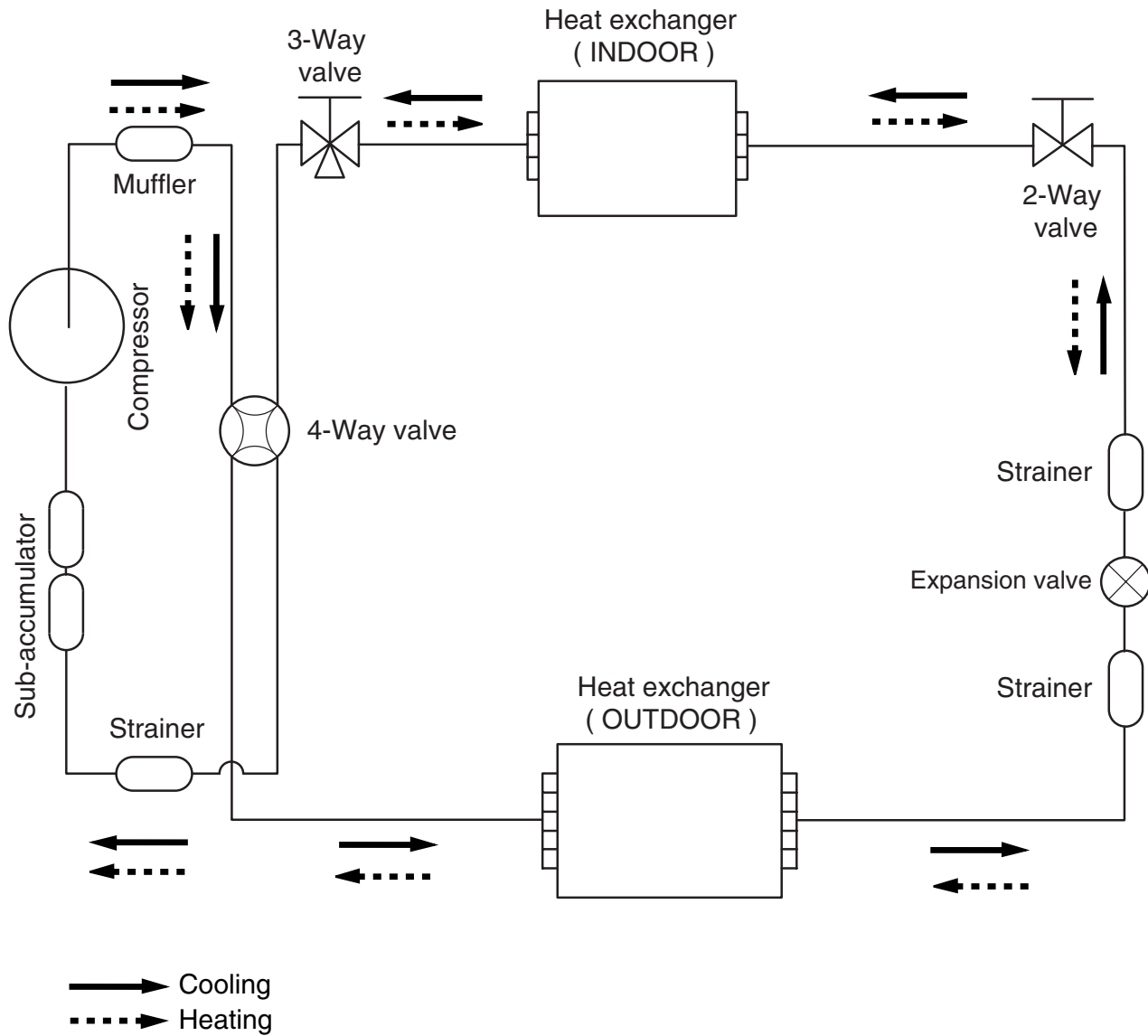


WALL MOUNTED type INVERTER

3 . REFRIGERANT SYSTEM DIAGRAM

REFRIGERANT SYSTEM DIAGRAM

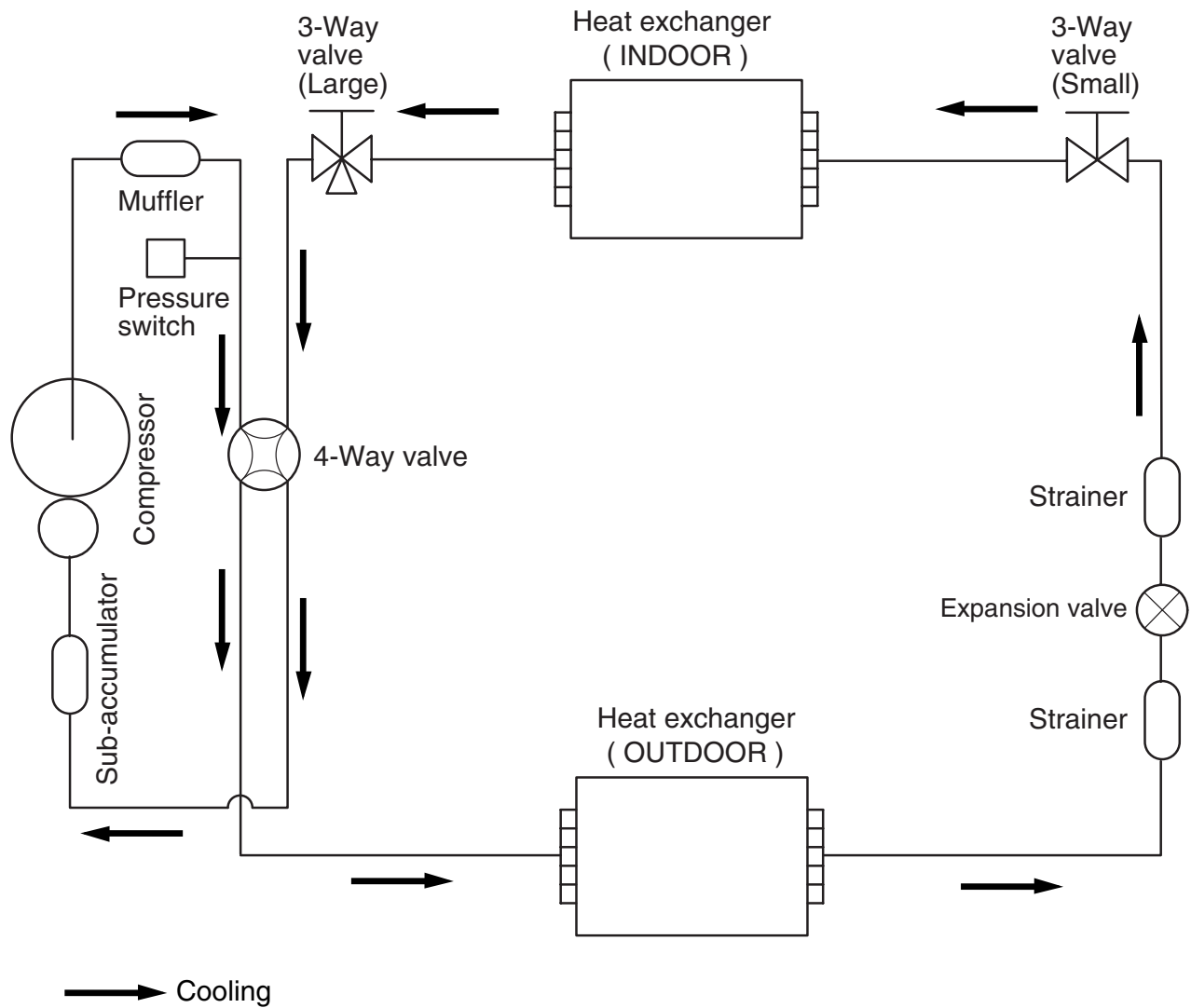
Models : ASU24CL / AOU24CL
ASU24RL / AOU24RL



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

REFRIGERANT SYSTEM DIAGRAM

Models : ASU30CLX / AOU30CLX
ASU36CLX / AOU36CLX



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

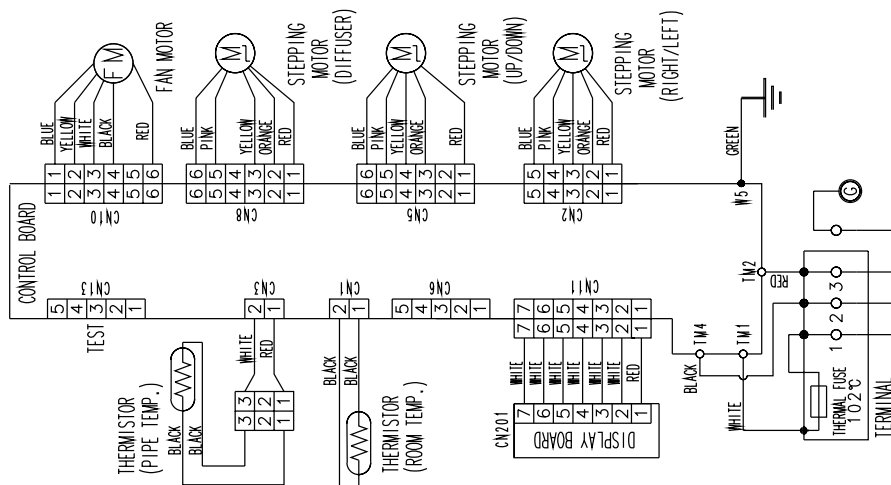
WALL MOUNTED type INVERTER

4 . CIRCUIT DIAGRAM

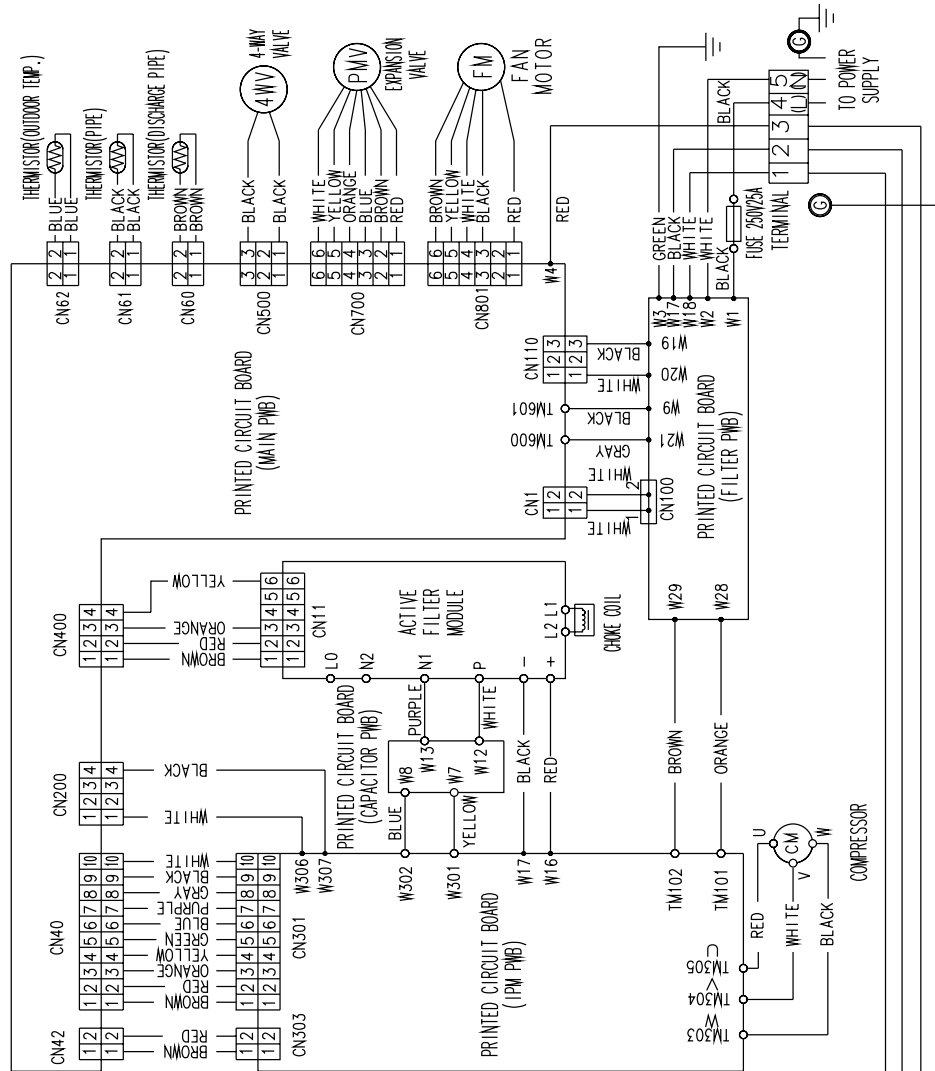
CIRCUIT DIAGRAM

Models : ASU24CL / AOU24CL
ASU24RL / AOU24RL

INDOOR UNIT



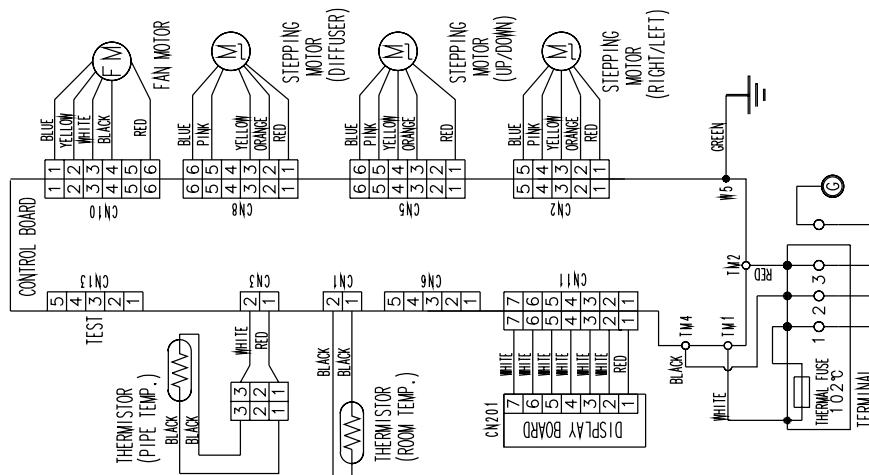
OUTDOOR UNIT



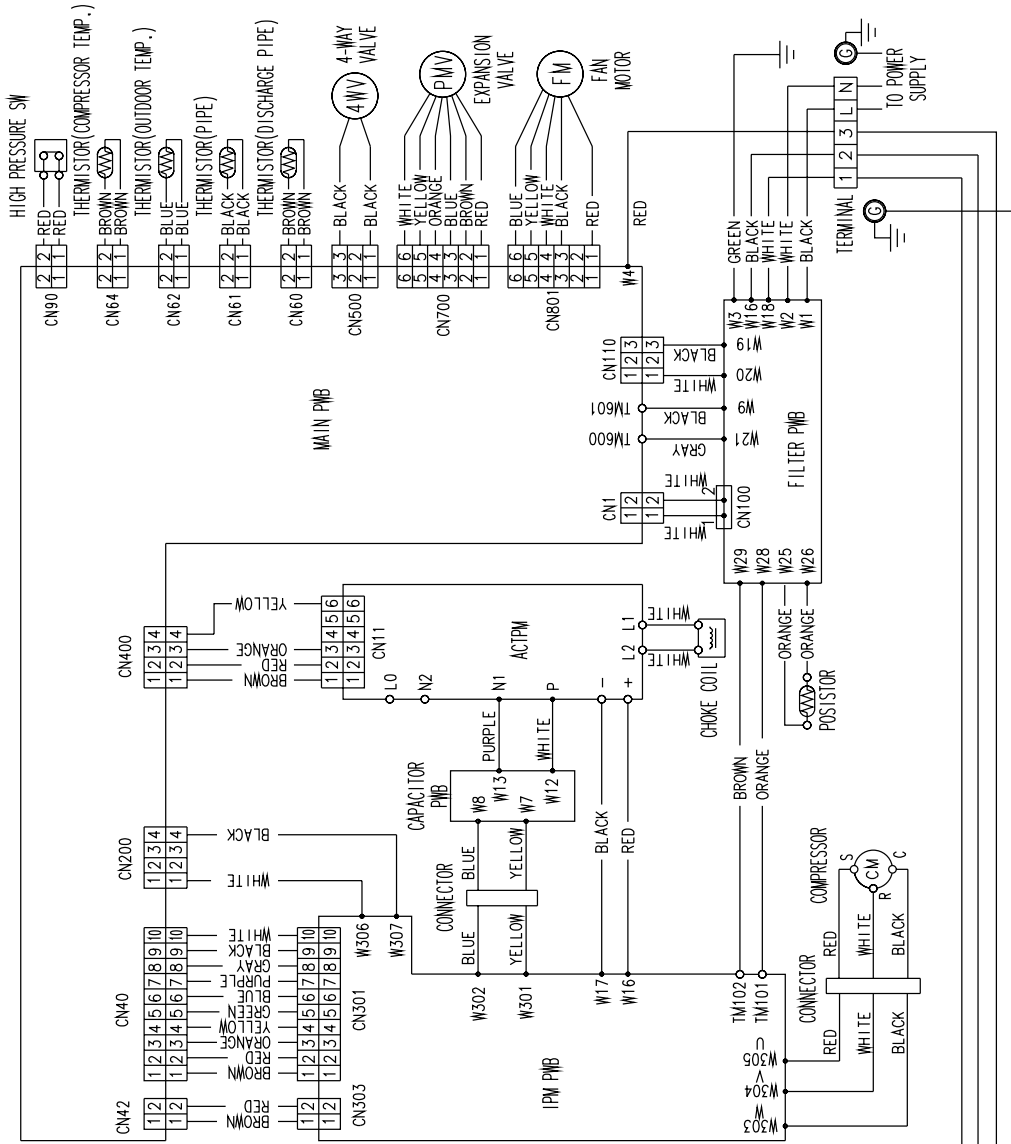
CIRCUIT DIAGRAM

Models : ASU30CLX / AOU30CLX
ASU36CLX / AOU36CLX

INDOOR UNIT



OUTDOOR UNIT



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 4°F (2°C) higher than a set temperature, the compressor operation frequency will attain to maximum performance.

* If the room temperature is 5°F (2.5°C) lower than a set temperature, the compressor will be stopped.

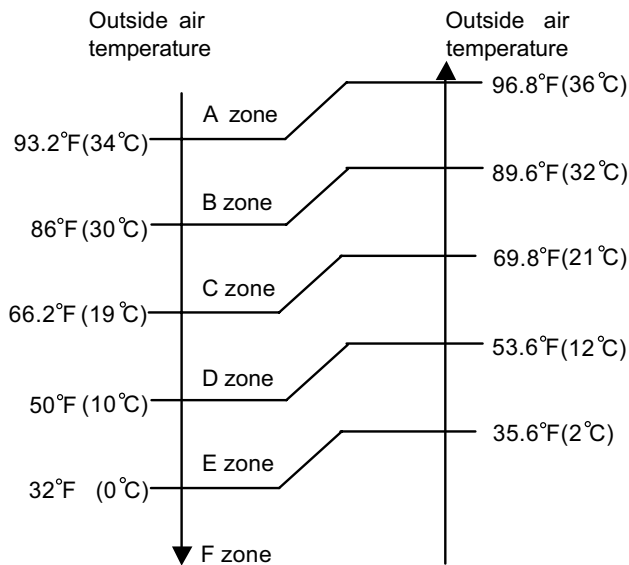
* When the room temperature is between +4°F (+2°C) to -5°F (-2.5°C) of the setting temperature, the compressor frequency is controlled within the range shown in Table1.

However, the maximum frequency is limited in the range shown in Figure 1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor Frequency Range)

	minimum frequency	maximum frequency II	maximum frequency I
ASU24RL	15Hz	115Hz	80Hz
ASU24CL	15Hz	115Hz	80Hz
ASU30CLX	21Hz	94Hz	67Hz
ASU36CLX	21Hz	94Hz	79Hz

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



		Hi	Me	Lo	Quiet
24RL	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
24CL	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
30CLX	A zone	94Hz	64Hz	54Hz	39Hz
	B zone	94Hz	64Hz	54Hz	39Hz
	C zone	73Hz	54Hz	48Hz	30Hz
	D zone	54Hz	48Hz	42Hz	30Hz
	E zone	54Hz	48Hz	42Hz	30Hz
	F zone	54Hz	48Hz	42Hz	30Hz
36CLX	A zone	94Hz	64Hz	54Hz	39Hz
	B zone	94Hz	64Hz	54Hz	39Hz
	C zone	85Hz	54Hz	48Hz	30Hz
	D zone	61Hz	48Hz	42Hz	30Hz
	E zone	61Hz	48Hz	42Hz	30Hz
	F zone	61Hz	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 2°F (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

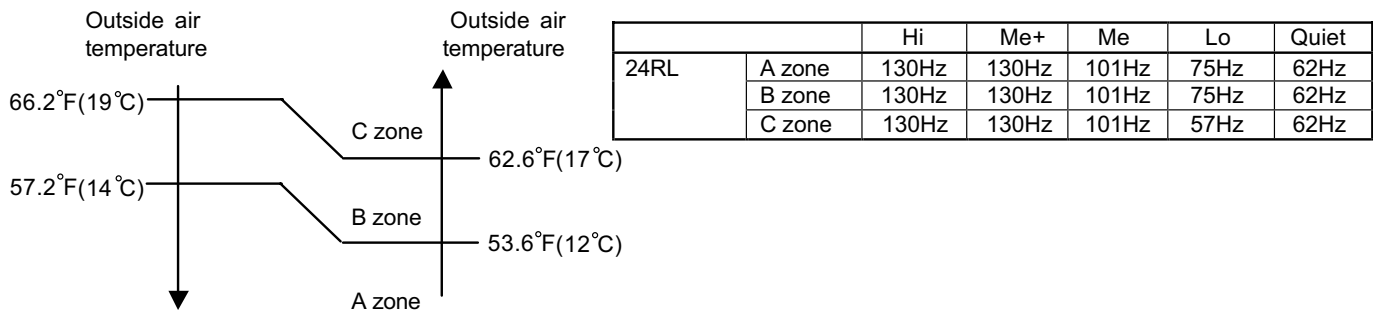
A sensor (room temperature thermistor) built in the indoor unit body will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.

- * If the room temperature is lower by 6°F (3°C) than a set temperature, the compressor operation frequency will attain to maximum performance.
- * If the room temperature is higher 5°F (2.5°C) than a set temperature, the compressor will be stopped.
- * When the room temperature is between +4°F (+2°C) to -6°F (-3°C) of the setting temperature, the compressor frequency is controlled within the range shown in Table 2. 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
ASU24RL	15Hz	130Hz

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



- * The room temperature is controlled 4°F (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

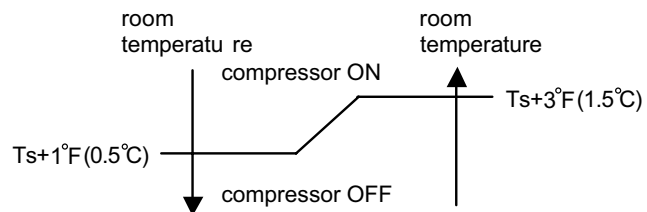
3-1 INDOOR UNIT CONTROL

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.

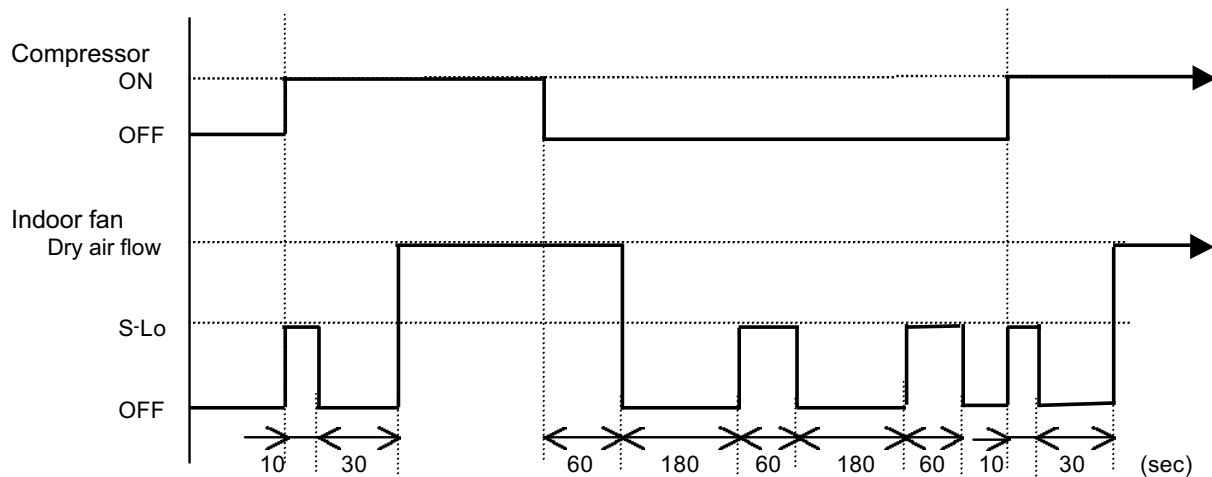
(Table 3 : Compressor frequency)

	Operating frequency
ASU24RL	34Hz
ASU24CL	34Hz
ASU30CLX	39Hz
ASU36CLX	39Hz

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



(Fig.4 : Indoor Fan Control)

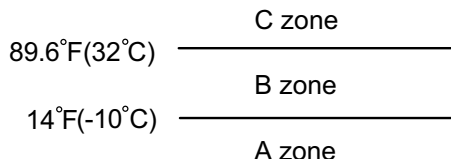


4. AUTO CHANGEOVER OPERATION

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 64°F(18°C) and 88°F(30°C) in 2°F (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)

Outside air temperature (TO) Room temperature(TB)	A zone	B zone	C zone
TB > TS+ 4°F (2°C)	Monitoring	Cooling (automatic dry)	Cooling (automatic dry)
TS+4°F (2°C) ≥ TB ≥ TS- 4°F (2°C)	Monitoring	Monitoring	Monitoring
TB < TS- 4°F (2°C)	*Heating	*Heating	Monitoring

*24CL, 30CLX, 36CLX is Monitoring

- ②. When COOLING was selected at ①, the air conditioner operates as follow:
- The same operation as COOLING OPERATION of item 1 above is performed.
 - When the room temperature has remained at (set temperature - 2°F(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+4°F(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)

ASU24RL		
Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1310
	Me+	1220
	Me	1120
	Lo	940
	Quiet	830
	Cool air prevention	650
	S-Lo	250
Cooling Fan	Hi	1310
	Me	1120
	Lo	940
	Quiet	830
Dry		830

ASU24CL		
Operation mod e	Air flow mode	Speed (rpm)
Cooling Fan	S-Lo	250
	Hi	1310
	Me	1120
	Lo	940
	Quiet	830
Dry		830

ASU30CLX		
Operation mod e	Air flow mode	Speed (rpm)
Cooling Fan	S-Lo	250
	Hi	1330
	Me	1120
	Lo	940
	Quiet	830
Dry		830

ASU36CLX		
Operation mod e	Air flow mode	Speed (rpm)
Cooling Fan	S-Lo	250
	Hi	1430
	Me	1120
	Lo	940
	Quiet	830
Dry		830

When air flow mode set at Quiet, it lighting on Quiet LED.
(Cooling only model)

(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.

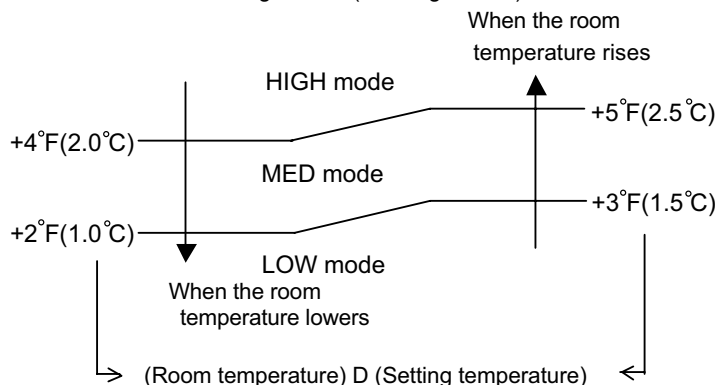
(3).COOLING OPERATION

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

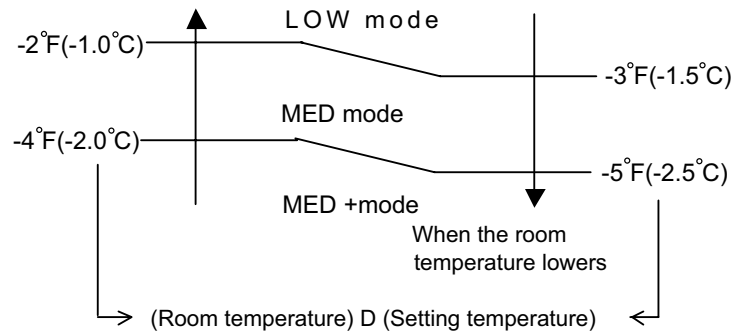
Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure 7.

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.

(Fig.7)

airflow change - over (Heating:AUTO)

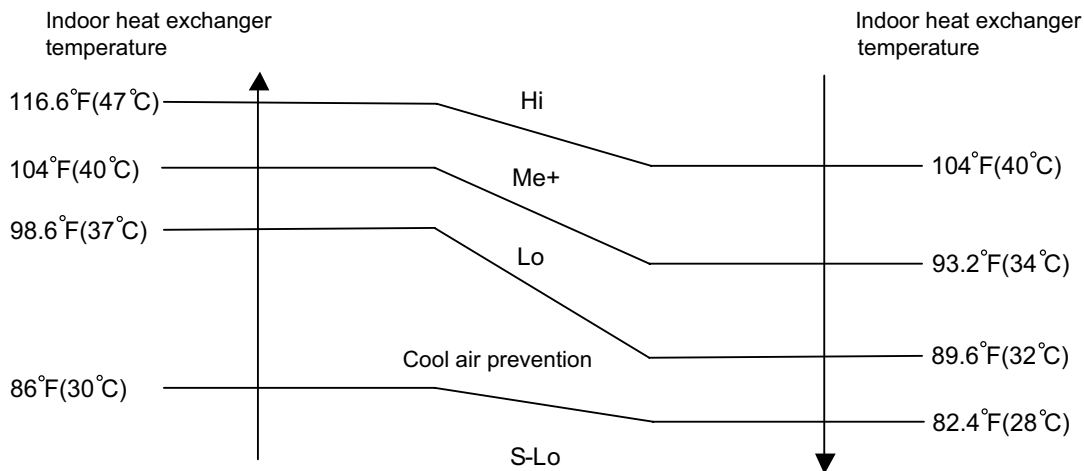
When the room temperature rises



(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
ASU24RL	Over than 53.6°F(12°C)	950/820/670/500rpm	550rpm
	Less than 53.6°F(12°C)	400/280/230rpm	400/280/230rpm
ASU24CL	Over than 53.6°F(12°C)	950/820/670/500rpm	550rpm
	Less than 53.6°F(12°C)	400/280/230rpm	400/280/230rpm
ASU30CLX	Over than 53.6°F(12°C)	850/780/700/500rpm	550/450rpm
	Less than 53.6°F(12°C)	500/320/250/200rpm	500/320/250/200rpm
ASU36CLX	Over than 53.6°F(12°C)	850/780/700/500rpm	550/450rpm
	Less than 53.6°F(12°C)	500/320/250/200rpm	500/320/250/200rpm

Table 7 : Fan speed (Heating)

	Heating
ASU24RL	1100/1000/730/670/550/450rpm

* 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
ASU24RL	Over than 53.6°F(12°C)	500rpm
	Less than 53.6°F(12°C)	200rpm
ASU24CL	Over than 53.6°F(12°C)	500rpm
	Less than 53.6°F(12°C)	200rpm
ASU30CLX	Over than 53.6°F(12°C)	500rpm
	Less than 53.6°F(12°C)	200rpm
ASU36CLX	Over than 53.6°F(12°C)	500rpm
	Less than 53.6°F(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 41°F(5°C).

7. LOUVER CONTROL

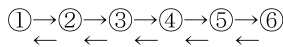
(1). LOUVER CONTROL

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:



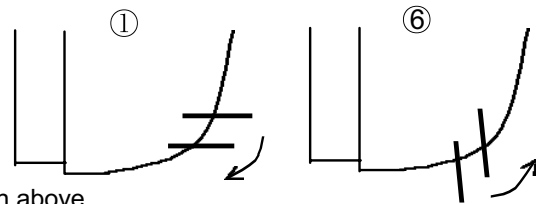
(Operation Range)

Cooling / Dry mode : ①—②—③

Heating mode : ④—⑤—⑥

Fan mode : ①—②—③—④—⑤—⑥

(Fig 9: Air Direction Range)

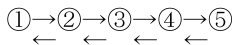


Use the air direction adjustments within the ranges shown above.

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 become ③, 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.

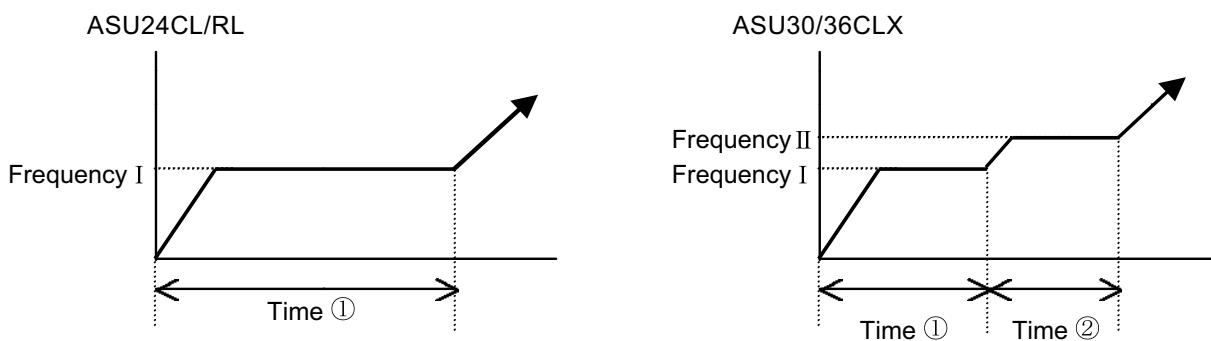
(Table 9 : Compressor Operation Frequency Range)

	Cooling		Heating		Dry
	Min	Max	Min	Max	
ASU24RL	15Hz	115Hz	15Hz	130Hz	34Hz
ASU24CL	15Hz	115Hz	-	-	34Hz
ASU30CLX	21Hz	94Hz	-	-	39Hz
ASU36CLX	21Hz	94Hz	-	-	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
ASU24RL	40Hz	-
ASU24CL	40Hz	-
ASU30CLX	40Hz	59Hz
ASU36CLX	40Hz	59Hz

(Time)

	Time ①	Time ②
ASU24RL	500sec	-
ASU24CL	500sec	-
ASU30CLX	60sec	40sec
ASU36CLX	60sec	40sec

9. TIMER OPERATION CONTROL

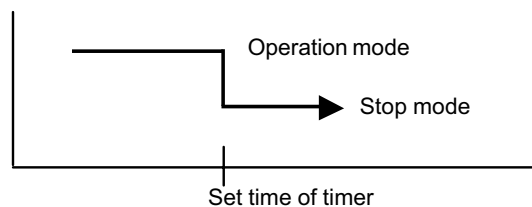
The table 10 shows the available timer setting based on the product model.

(Table 10 : Timer Setting)

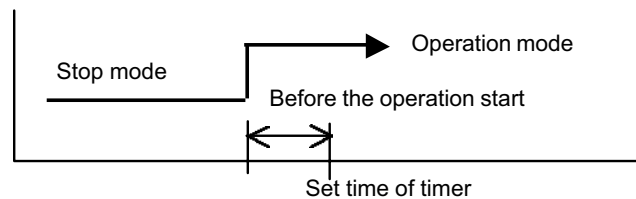
	ON TIMER / OFF TIMER	PROGRAM TIMER	SLEEP TIMER
ASU24RL	○	○	○
ASU24CL	○	○	○
ASU30CLX	○	○	○
ASU36CLX	○	○	○

(1). OFF TIMER AND ON TIMER

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

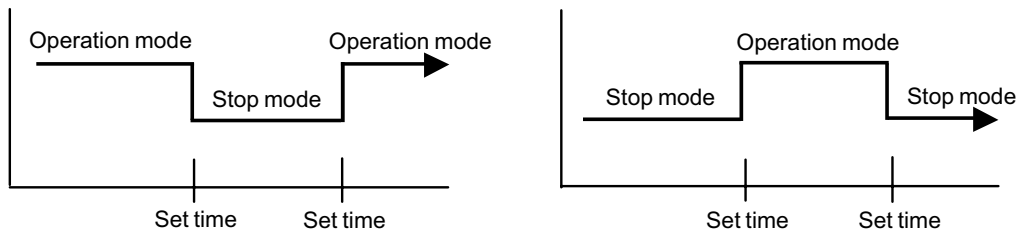


- ON timer : Depending on the difference between the actual room temperature and the set temperature value, the unit will start operation automatically in order to bring the room temperature to the desired set temperature value by the timer previously set.



(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

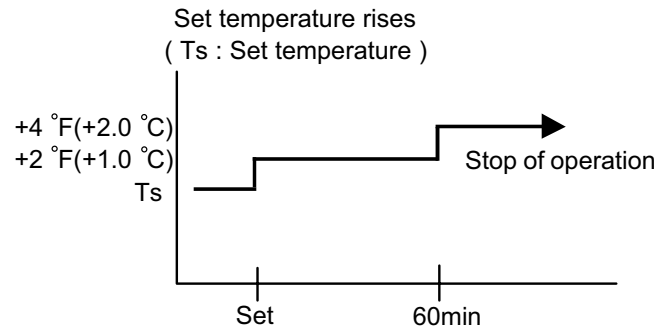
If the sleep is set, the room temperature is monitored and the operation is stopped automatically.
If the operation mode or the set temperature is change after the sleep timer is set, the operation is continued according to the changed setting of the sleep timer from that time ON.

In the cooling operation mode

When the sleep timer is set, the setting temperature is increased $2^{\circ}\text{F}(1^{\circ}\text{C})$.

It increases the setting temperature another $2^{\circ}\text{F}(1^{\circ}\text{C})$ after 1 hour.

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

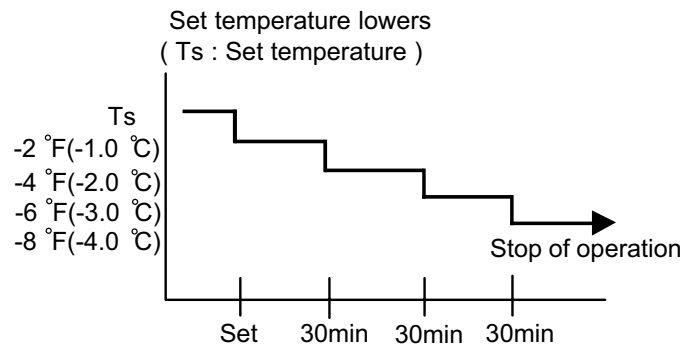


In the heating operation mode

When the sleep timer is set, the setting temperature is decreased $2^{\circ}\text{F}(1^{\circ}\text{C})$.

It decreases the setting temperature another $2^{\circ}\text{F}(1^{\circ}\text{C})$ 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
ASU24RL	60 ~ 480 pulse
ASU24CL	60 ~ 480 pulse
ASU30CLX	53 ~ 480 pulse
ASU36CLX	53 ~ 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.	75.2°F(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
ASU24RL	41°F(5°C)	44.6°F(7°C)
ASU24CL	41°F(5°C)	44.6°F(7°C)
ASU30CLX	41°F(5°C)	44.6°F(7°C)
ASU36CLX	41°F(5°C)	44.6°F(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	
ASU24RL	940rpm	27Hz	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
	ASU24RL	Does not operate	15.8°F(- 9°C)	23°F(- 5°C)	26.6°F(- 3°C)

Defrosting after 2 ST time upon starting operation		Compressor operating time			
		Less than 35 minutes	35 minutes to 4 hours		After 4 hours
	ASU24RL	Does not operate	21.2°F(- 6°C)		26.6°F(- 3°C)

(2). CONDITION OF THE DEFROST OPERATION COMPLETION

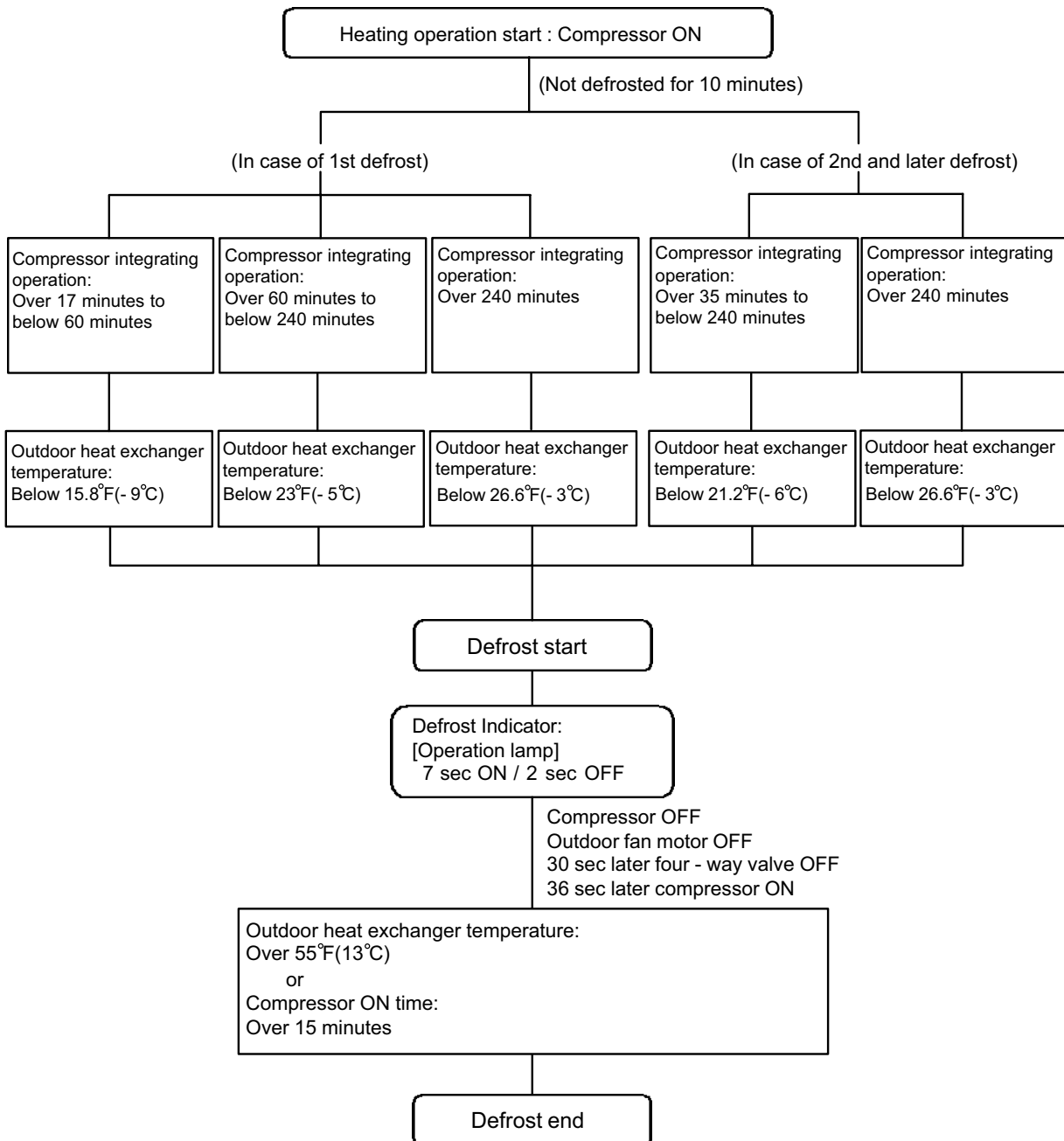
Defrost operation is released when the conditions become as shown in Table 16.

(Table 16 : Defrost Release Condition)

	Release Condition
ASU24RL	Outdoor heat exchanger temperature sensor value is higher than 55°F(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 OPEARTION 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.

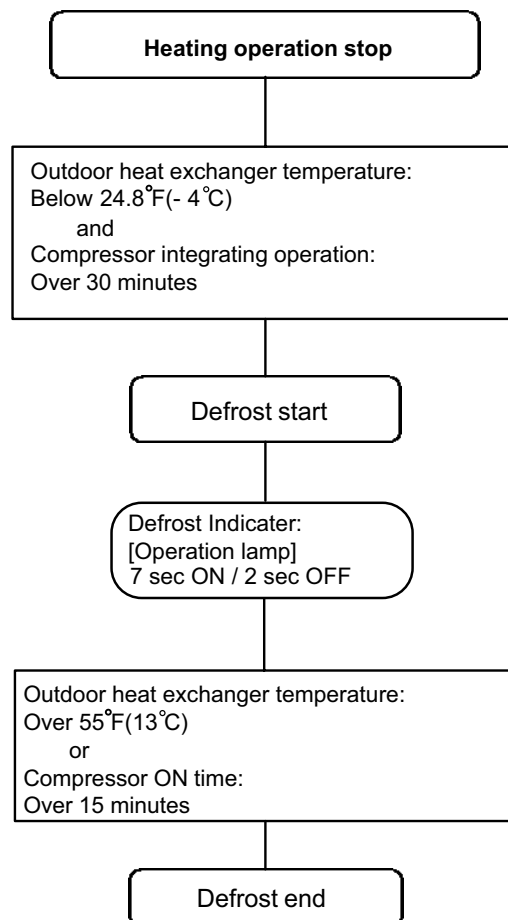
(1). OFF DEFROST OPERATION CONDITION

In heating operation, the outdoor heat exchanger temperature is less than 24.8°F(- 4°C), and compressor operation integrating time lasts for more than 30 minutes.

(2). OFF DEFROST END CONDITION

	Release Condition
ASU24RL	Outdoor heat exchanger temperature sensor value is higher than 55°F(13°C) or Compressor operation time has passed 15 minutes.

OFF Defrost Flow Chart



20. VARIOUS PROTECTIONS

(1). DISCHARGE GAS TEMPERATURE OVERRISE PREVENTION CONTROL

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

When the discharge temperature becomes higher than Temperature I, the compressor frequency is decreased 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 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 Prevention Control / Release Temperature)

	Temperature I	Temperature II	Temperature III
ASU24RL	219.2°F(104°C)	213.8°F(101°C)	230°F(110°C)
ASU24CL	219.2°F(104°C)	213.8°F(101°C)	230°F(110°C)
ASU30CLX	219.2°F(104°C)	213.8°F(101°C)	230°F(110°C)
ASU36CLX	219.2°F(104°C)	213.8°F(101°C)	230°F(110°C)

(2). CURRENT RELEASE CONTROL

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

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

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

[Heating]		[Cooling / Dry]			
ASU24RL		ASU24RL	ASU24CL	ASU30CLX	ASU36CLX
OT (Control / Release)		OT (Control / Release)	OT (Control / Release)	OT (Control / Release)	OT (Control / Release)
62.6°F 10.5A / 10.0A (17°C)		114.8°F 7.0A / 6.5A (46°C)	114.8°F 7.0A / 6.5A (46°C)	122°F 10.0A / 9.5A (50°C)	122°F 10.0A / 9.5A (50°C)
53.6°F 13.0A / 12.5A (12°C)		9.5A / 9.0A	9.5A / 9.0A	11.0A / 10.5A	11.0A / 10.5A
41°F 15.0A / 14.5A (5°C)		104°F 11.5A / 11.0A (40°C)	104°F 11.5A / 11.0A (40°C)	14.5A / 14.0A	14.5A / 14.0A
				104°F 18.0A / 17.5A (40°C)	104°F 18.0A / 17.5A (40°C)

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
ASU24RL	Over than 53.6°F(12 °C)	39.2°F(4°C)	44.6°F(7°C)
	Less than 53.6°F(12 °C)	39.2°F(4°C)	55.4°F(13°C)
ASU24CL	Over than 53.6°F(12 °C)	39.2°F(4°C)	44.6°F(7°C)
	Less than 53.6°F(12 °C)	39.2°F(4°C)	55.4°F(13°C)
ASU30CLX	Over than 53.6°F(12 °C)	39.2°F(4°C)	44.6°F(7°C)
	Less than 53.6°F(12 °C)	39.2°F(4°C)	55.4°F(13°C)
ASU36CLX	Over than 53.6°F(12 °C)	39.2°F(4°C)	44.6°F(7°C)
	Less than 53.6°F(12 °C)	39.2°F(4°C)	55.4°F(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
ASU24RL	152.6°F (67°C)
ASU24CL	152.6°F (67°C)
ASU30CLX	152.6°F (67°C)
ASU36CLX	152.6°F (67°C)

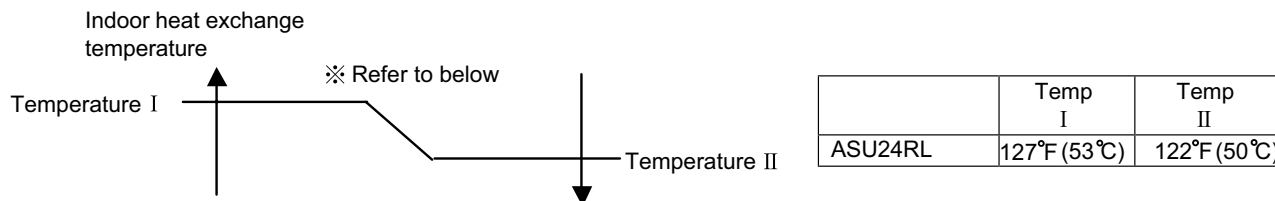
(5). HIGH TEMPERATURE RELEASE CONTROL (HEATING MODE)

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

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

(Fig 11 : Heating Overload Protection Control)

[Control System I]



※ Compressor Operation

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
ASU30CLX	248 °F (120 °C)	176 °F (80 °C)
ASU36CLX	248 °F (120 °C)	176 °F (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
ASU24RL	5°F(-15°C)	-4°F(-20°C)
ASU24CL	5°F(-15°C)	—
ASU30CLX	5°F(-15°C)	—
ASU36CLX	5°F(-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.

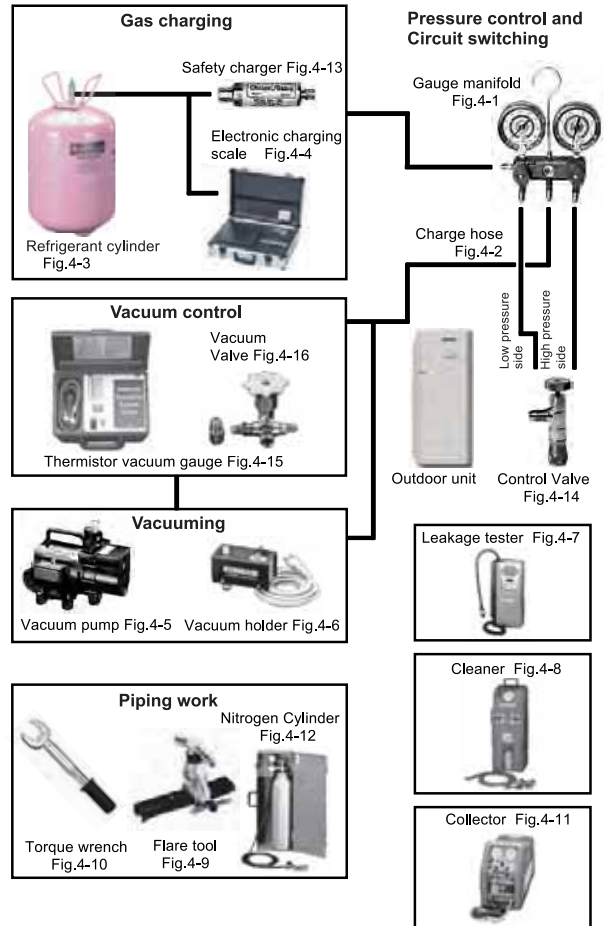
Thermistor vacuum gauge (Fig.4-15)

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

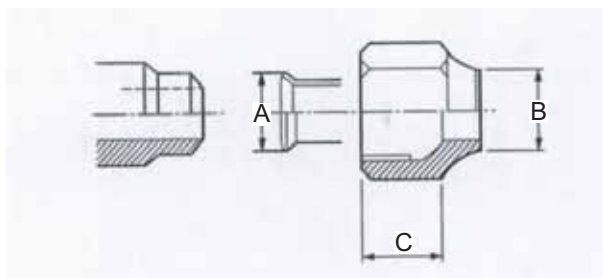
Nominal diameter (in)	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"
Outside diameter (mm)	6.35	9.52	12.70	15.88	19.05	22.22	25.40	28.58	31.75	34.92	38.10
Material	COPPER JIS H3300-C1220T-O or equivalent ¹⁾					COPPER JIS H3300-C1220T-H or equivalent ²⁾					
Wall thickness ³⁾ (mm)	0.8	0.8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

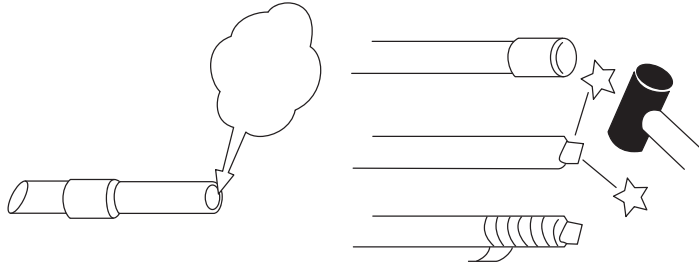


Always use the flare nut that is packed with the product.

Do not use existing (for R22) pipes

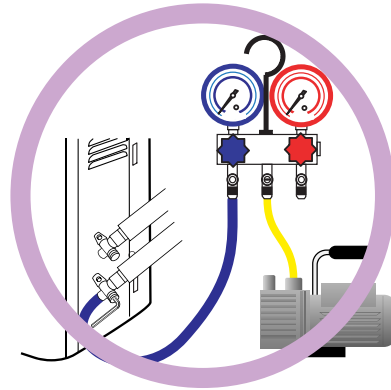
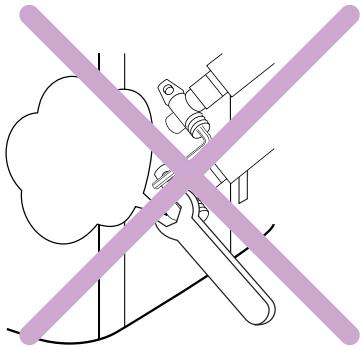
- Be sure to use new pipes when replacing conventional (R22) model with HFC (R407C, R410A) model.
- If you use existing pipes, it may cause resolution of compressor oil by remaining mineral oil.

Be careful not to mix moisture and contamination into the pipe



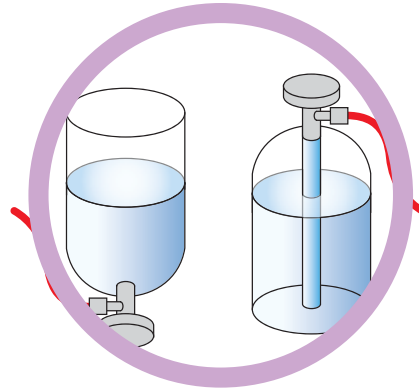
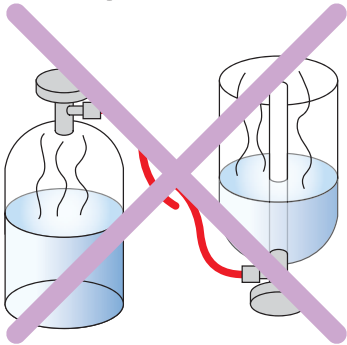
Moisture and contamination
in the pipe is a cause of
trouble.

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.

Refrigerant oil for
New Refrigerant

Synthetic oil

Ether

Esther

※ Previously it was
mineral oil.

Different point from
previous one

- Absorbent character is high.
- Contamination occurs when mixed with the other kind of oil.

Precaution on Tools

- 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.

R410A

R22

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

R410A

High Pressure

※ 1.6 times of R22.

Different point from
previous one

- 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)

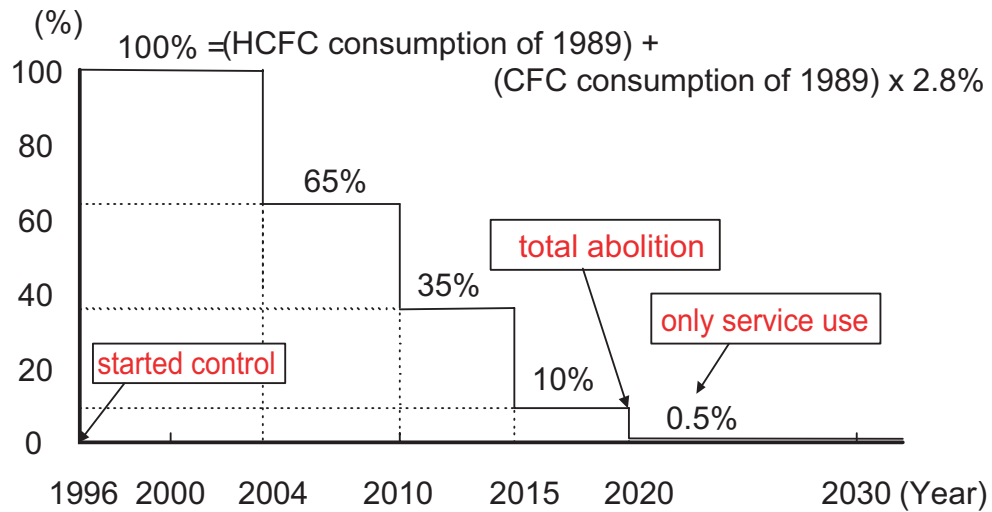
Precaution on Tools

- It requires the gauge manifold and charge hose exclusively for R410A.
 - It requires the flare tool and torque wrench that satisfies New JIS standard.
- ※ Previous flare tool + flare adapter can be used as well.

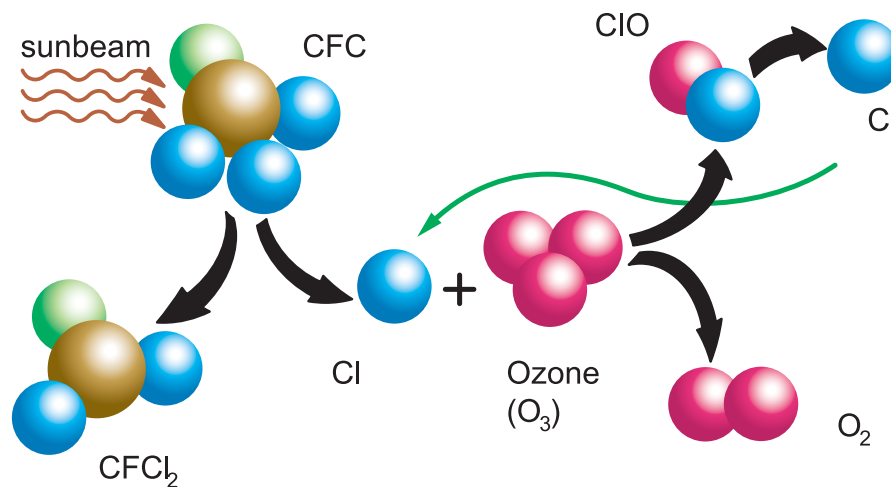
4. NEW REFRIGERANT R410A

* 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	• higher system performance • Near-Azeotropic refrigerant	• similar pressure as R22 (possible to design large equipment)
Disadvantage	• 1.6 times higher pressure than R22 (difficult to design against pressure resistance)	• Zeotropic refrigerant (handle with care)
Suitable for	• Small Air-Conditioners	• 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	52.0
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

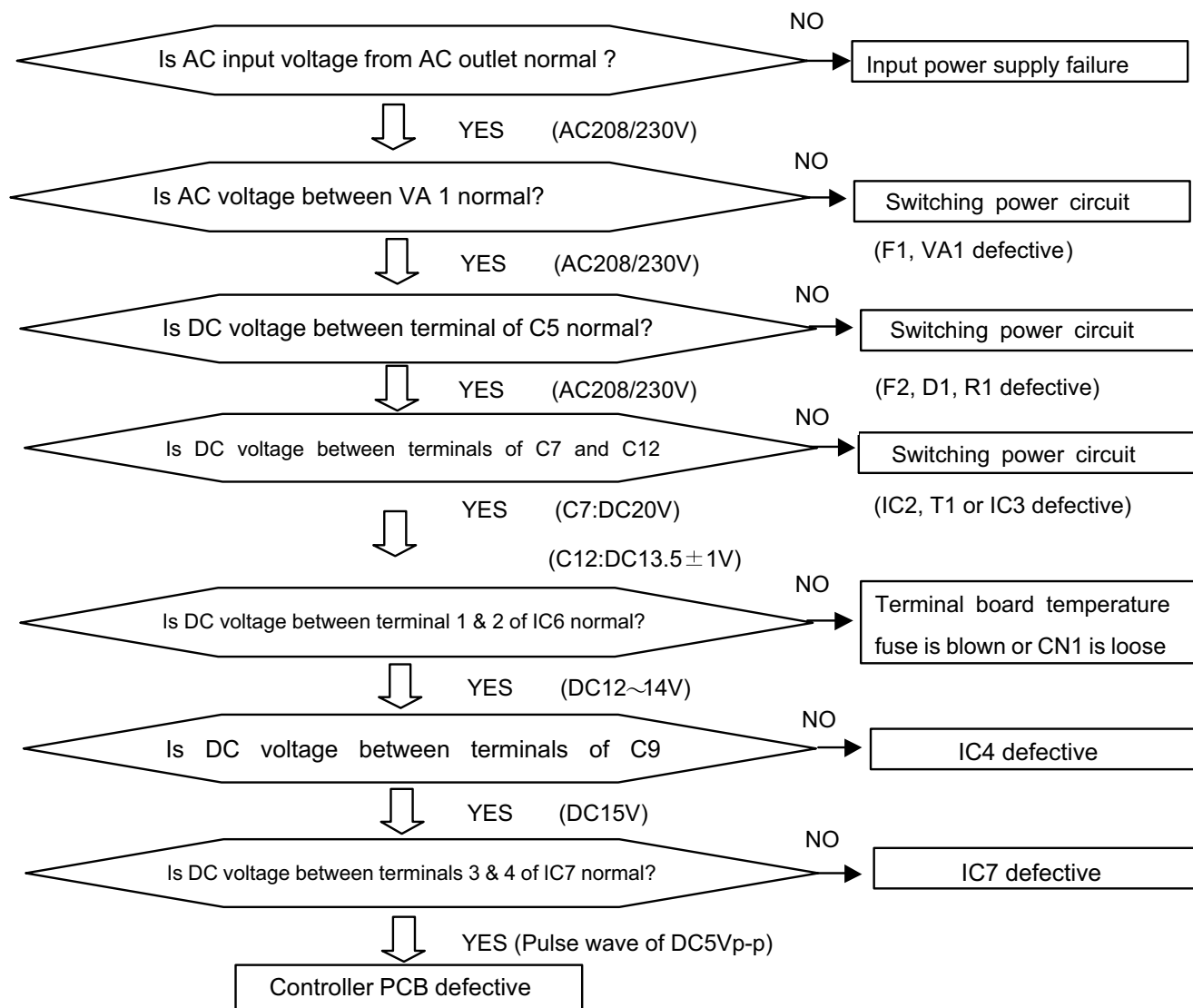
1. When the unit does not operate at all (Operation lamp and Timer lamp do not light up)
2. Self Diagnosis Function (Either Operation lamp or Timer lamp is blinking)
 - * How to operate the self-diagnosis function
 - * Self- diagnosis table and Check points
3. Trouble shooting method
 - * Serial signal 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 in door control P.C.Board when trouble occurs.

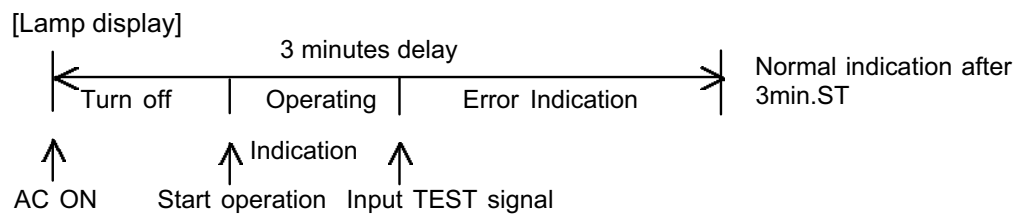
(The memory contents are not destroyed even when the power cord is unplugged from the AC outlet.)

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 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 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.
				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 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.
				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
				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.
				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]

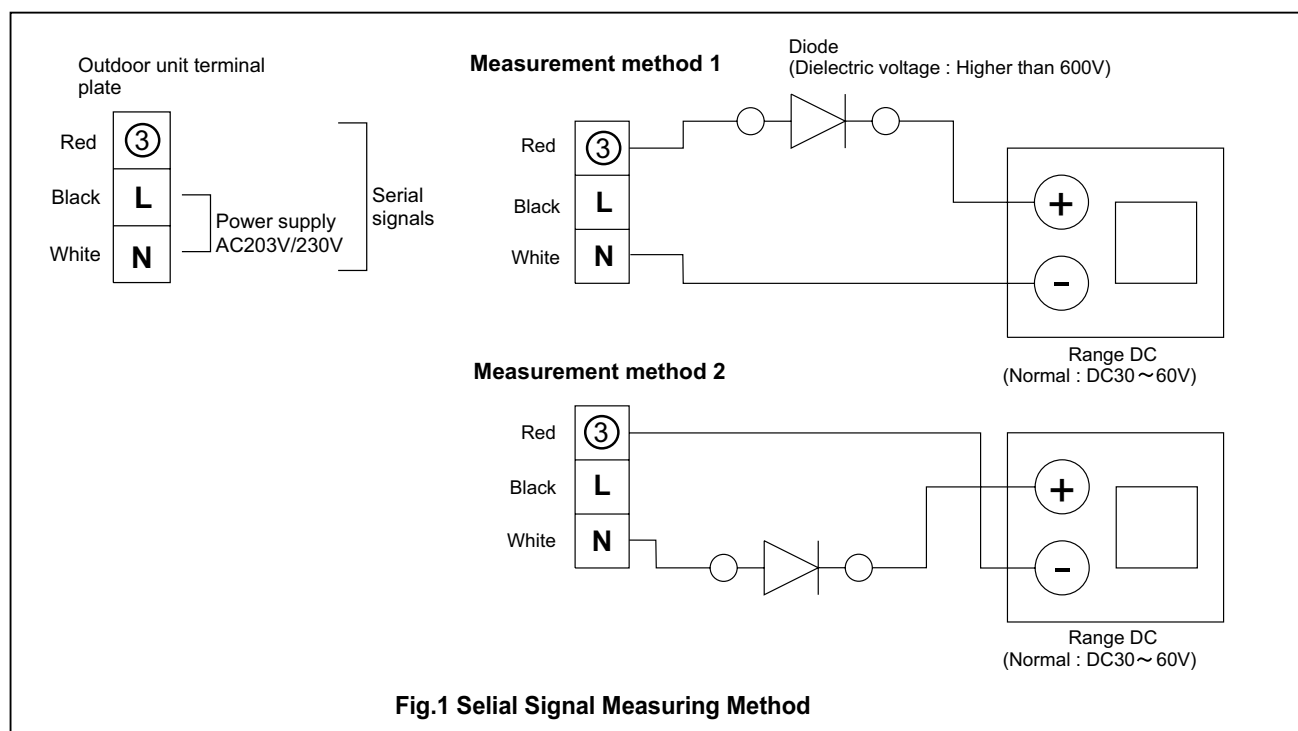
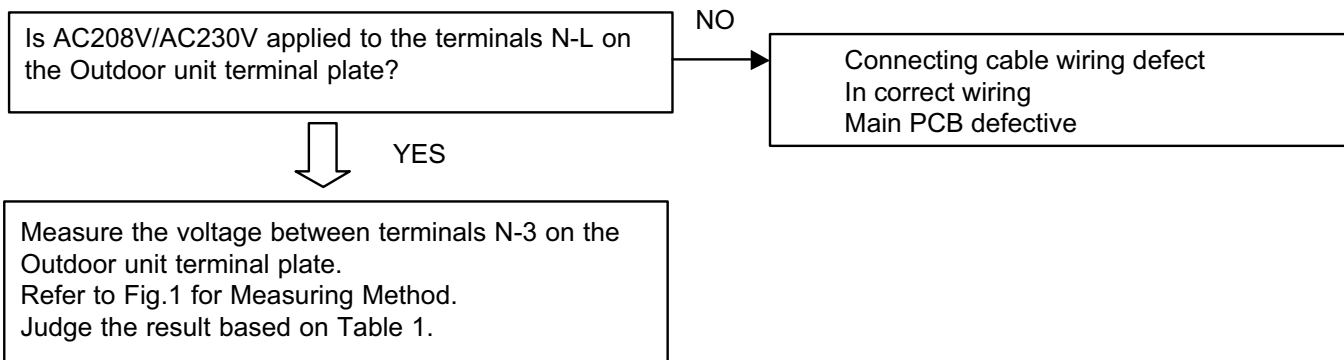


Table 1: Judgement table

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)

Open the Inverter Controller Assy and check if there is abnormal points.

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)



IPM or PCB defective > Replace PCB



Yes(Rotating)

Go to Check point (3)

Check point (3)

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

No(Not operating)



IPM or PCB defective > Replace PCB



Yes(Operating)

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

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]
ASU24RL/24CL	Compressor Case Temperature at 20degC: U-V 1.147 V-W 1.136 U-W 1.161
ASU30CLX/36CLX	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. Thermistor Resistance Values
3. Capacity / Input data

JP (Jumper) Setting

[Indoor Unit]

ASU24RL/24CL
ASU30CLX/36CLX

- 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		
×	○	Lower(Low)	Lower(Low)	Lower
○	×	Lower(Low)	Lower(Low)	Higher
×	×	Lower(High)	Lower(High)	Higher

[Outdoor Unit]

AOU24RL/24CL

		JP			
		JM1	JM903	JM902	JM901
24RL	Normal Preheat	○	×	○	×
	Higher Preheat	×	×	○	×
24CL	Normal Preheat	○	×	○	×
	Higher Preheat	×	×	○	×

AOU30CLX/36CLX

		JP			
		JM1	JM903	JM902	JM901
30CLX	Normal Preheat	○	×	○	○
	Higher Preheat	×	×	○	○
36CLX	Normal Preheat	○	×	○	×
	Higher Preheat	×	×	○	×

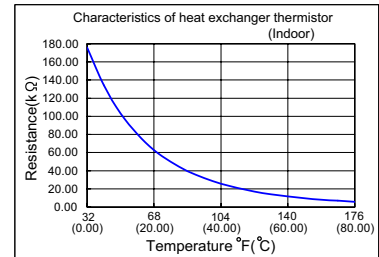
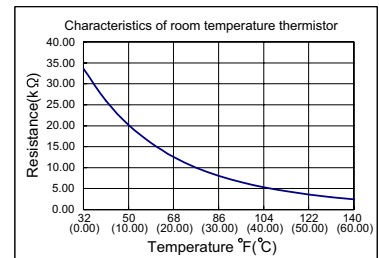
- it is possible to select the higher or standard level of preheating function.

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

Thermistor resistance values

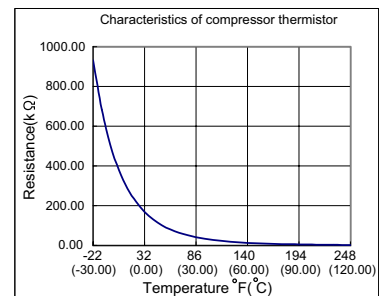
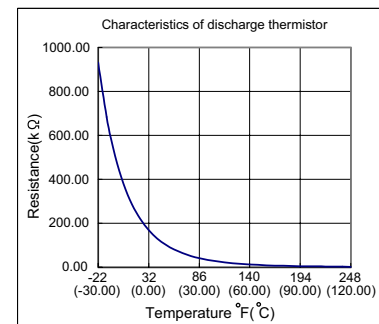
Room temperature thermistor			
Tempe°F	Tempe°C	Resistance(kΩ)	Voltage(V)
32.0	0.00	33.62	1.15
41.0	5.00	25.93	1.39
50.0	10.00	20.18	1.66
59.0	15.00	15.84	1.94
68.0	20.00	12.54	2.22
77.0	25.00	10.00	2.50
86.0	30.00	8.04	2.77
95.0	35.00	6.51	3.03
104.0	40.00	5.30	3.27
113.0	45.00	4.35	3.48
122.0	50.00	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



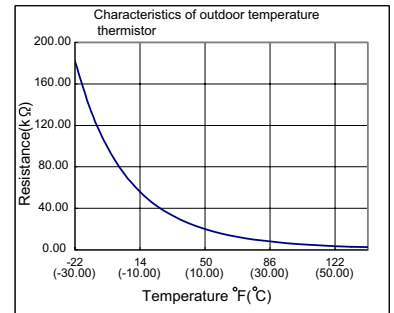
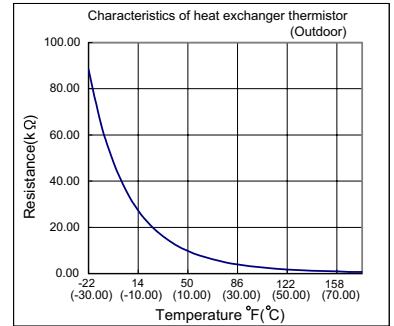
Discharge thermistor			
Tempe°F	Tempe°C	Resistance(kΩ)	Voltage(V)
-22.0	-30.00	931.50	0.07
-13.0	-25.00	683.30	0.09
-4.0	-20.00	506.60	0.13
5.0	-15.00	379.40	0.17
14.0	-10.00	286.90	0.22
23.0	-5.00	219.00	0.28
32.0	0.00	168.60	0.36
41.0	5.00	130.70	0.45
50.0	10.00	102.20	0.56
59.0	15.00	80.51	0.70
68.0	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 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

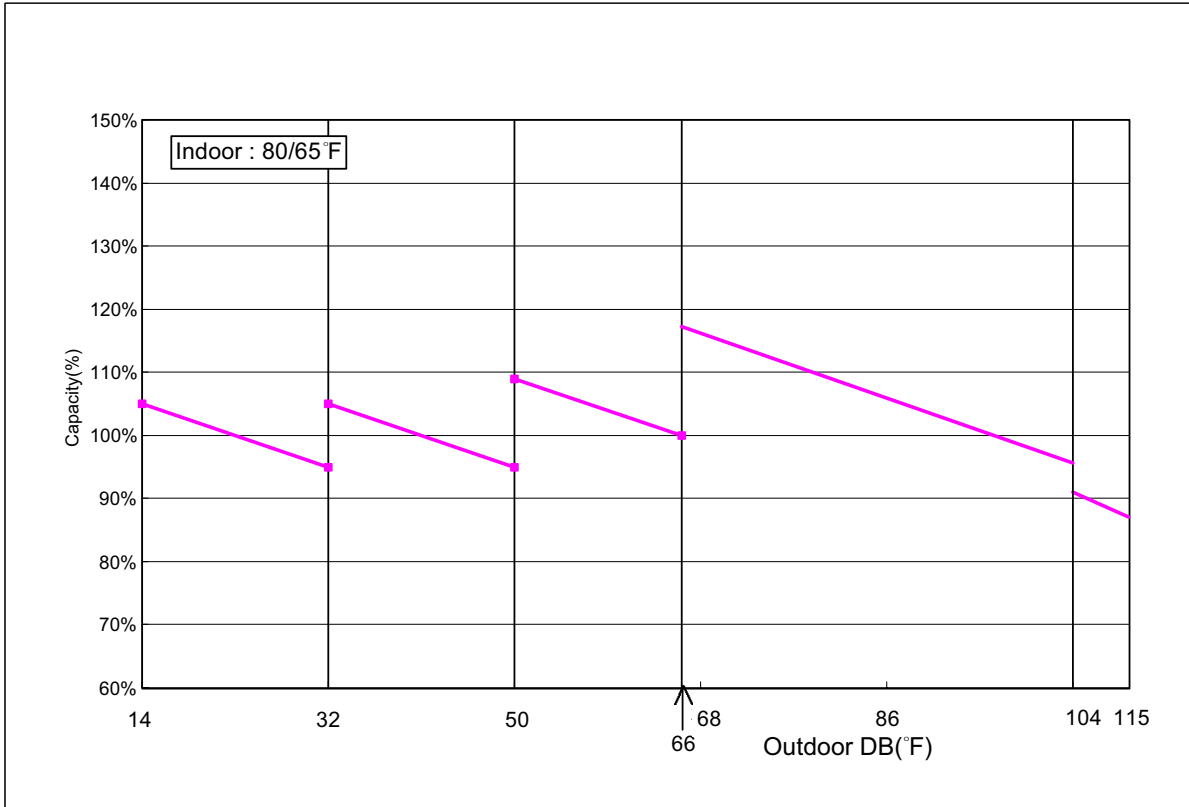


ASU24CL Capacity/Input data

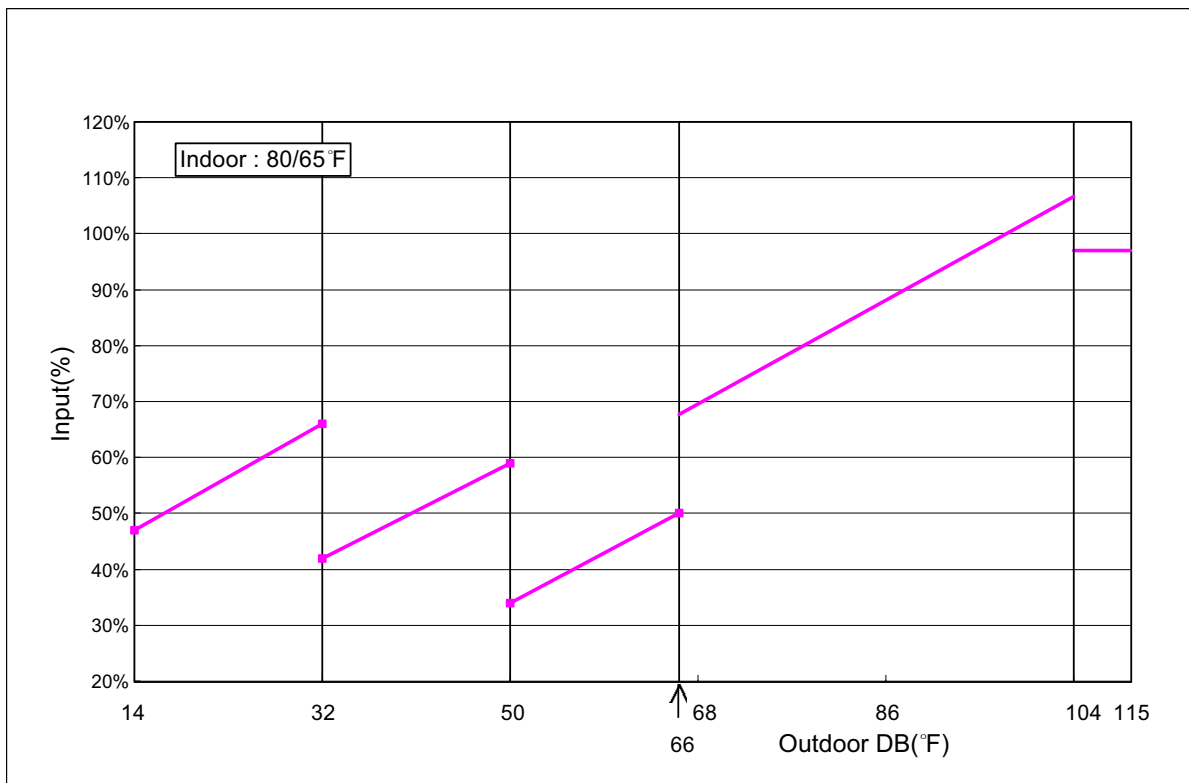
(1/1)

Cooling

<Capacity>



<Input>



*Both capacity and input decrease when temperature is 66 or less degrees F, for compressor frequency restrictions operate.

*Both capacity and input decrease when temperature is 104 or more degrees F, as compressor speed is decreased due to current release protection.

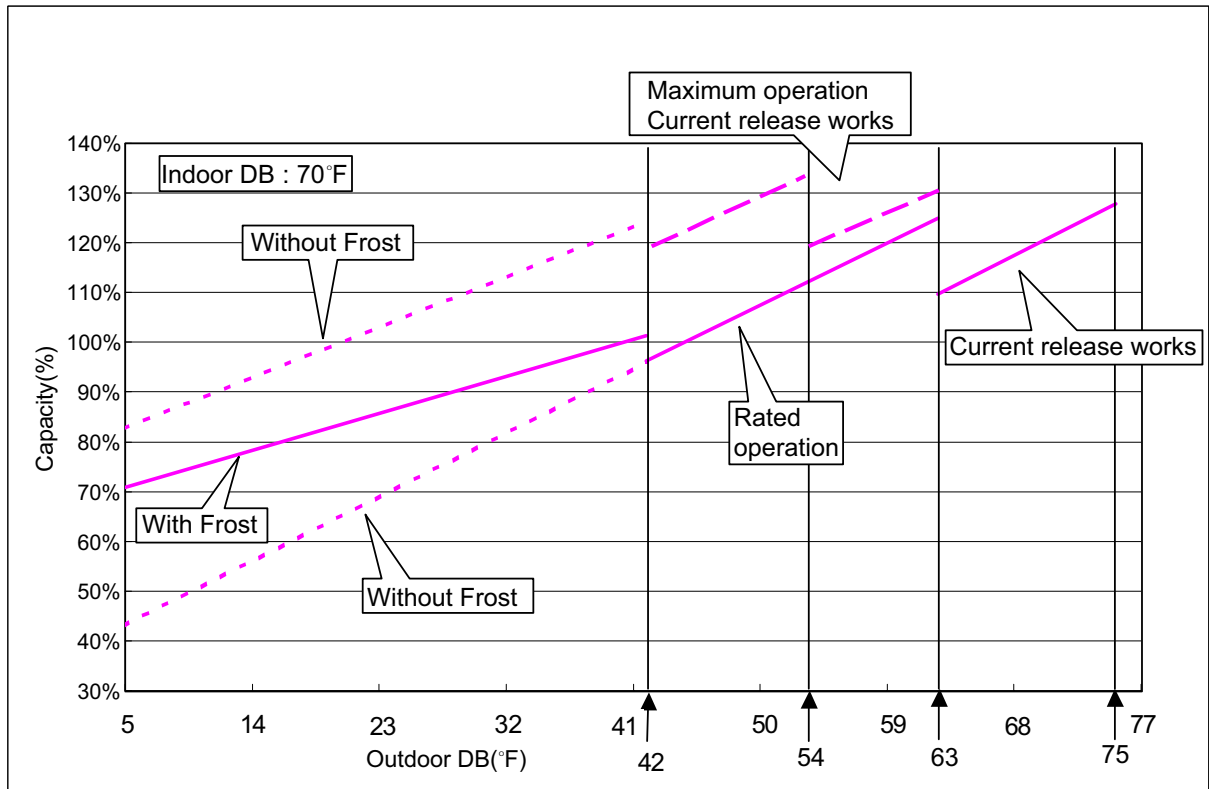
*Both capacity and input change largely when temperature is 50 or less degrees F, as outdoor fan speed is decreased due to low ambient temperature cooling control.

*Both capacity and input change more largely at less than 32 degrees F of ambient temperature as outdoor fan speed is decreased further.

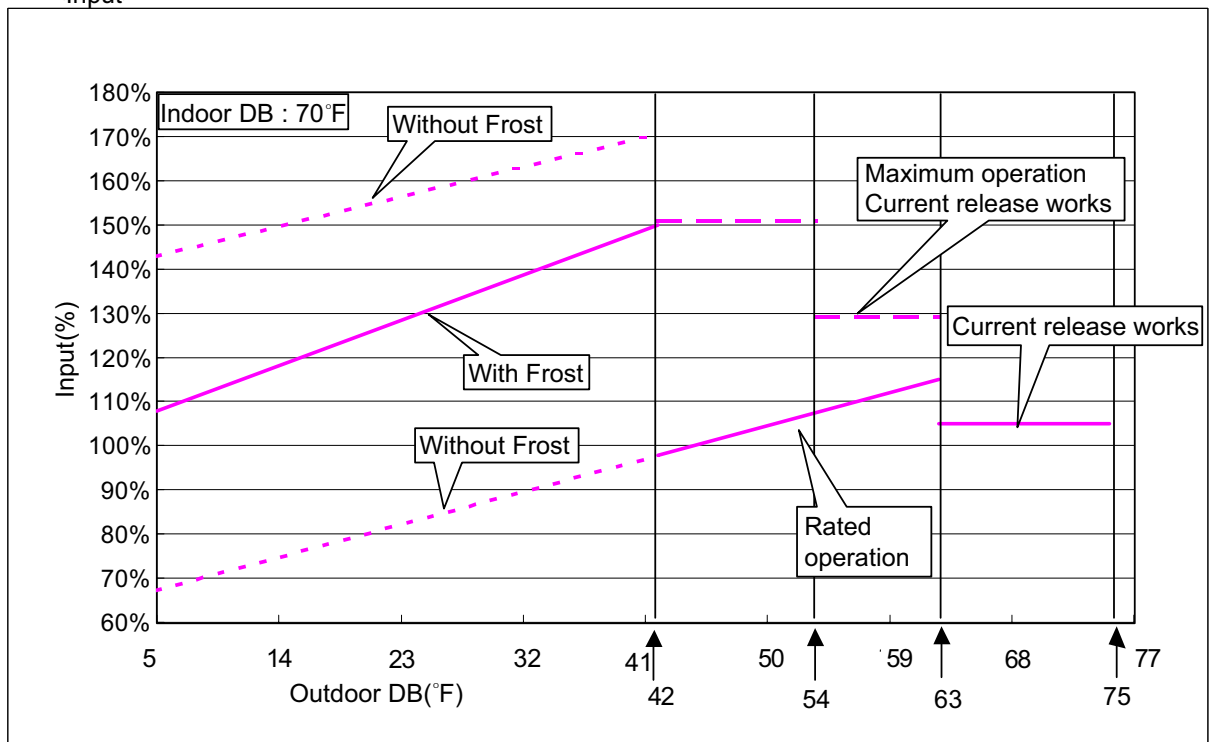
ASU24RL Capacity/Input data

(1/2)

Heating
<Capacity>



<Input>



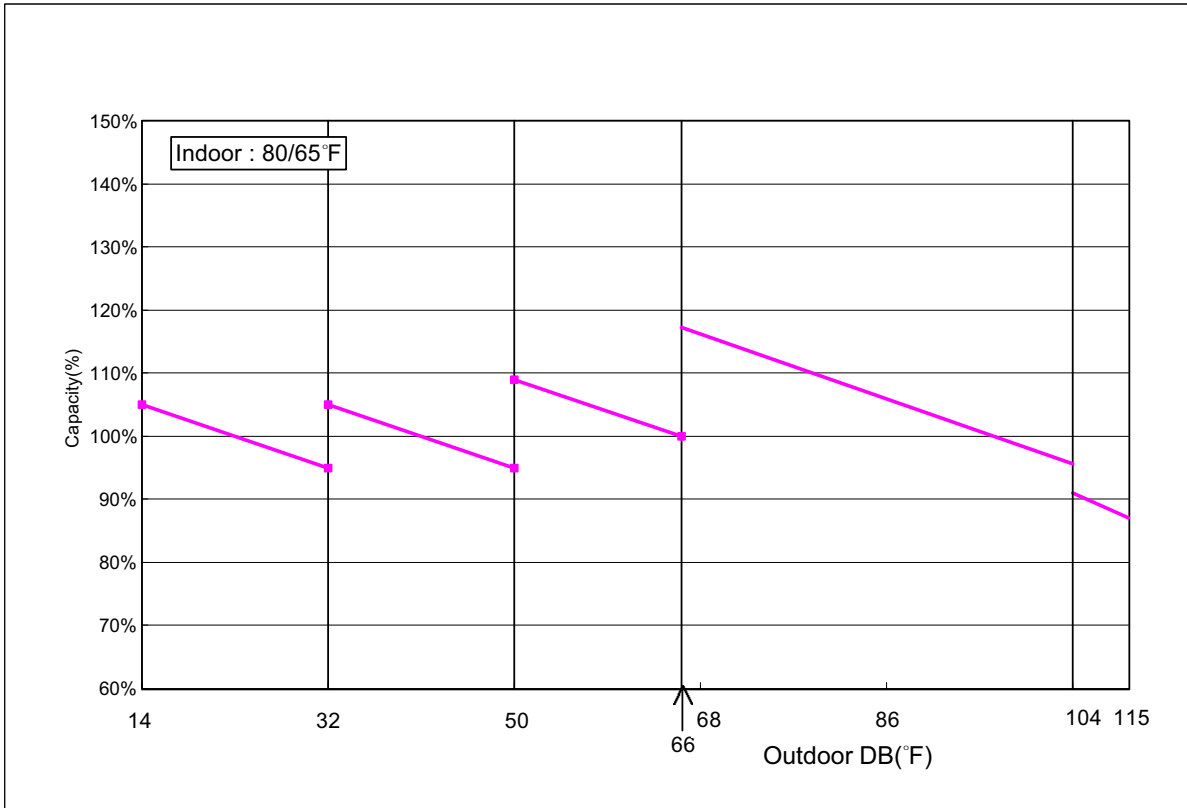
*Defrosting operation is performed when temperature is less than 42 degrees F.

Frost appears on an outdoor unit heat exchanger at 42 or less degrees F.

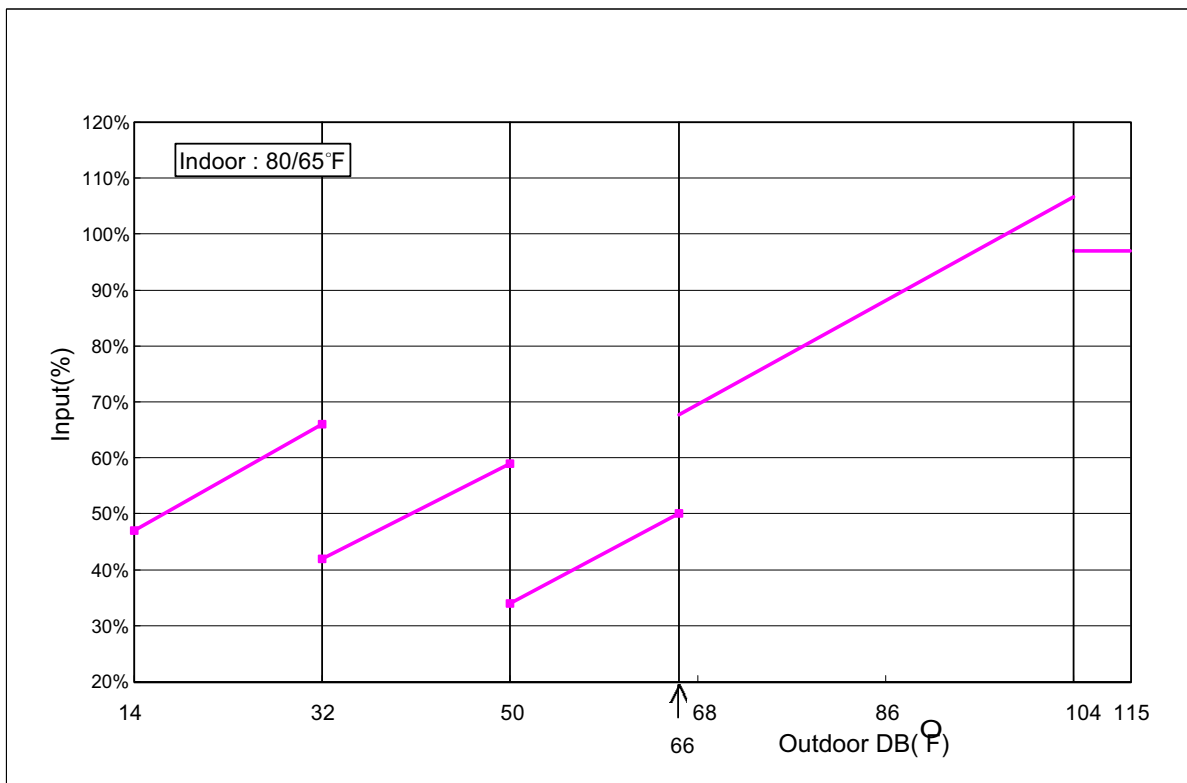
*Solid line: Integral capacity/Input containing the defrosting cycle.

*Dotted line: Capacity/Input which does not contain the defrosting cycle.

Cooling
<Capacity>



<Input>



*Both capacity and input decrease when temperature is 66 or less degrees F, for compressor frequency restrictions operate.

*Both capacity and input decrease when temperature is 104 or more degrees F, as compressor speed is decreased due to current release protection.

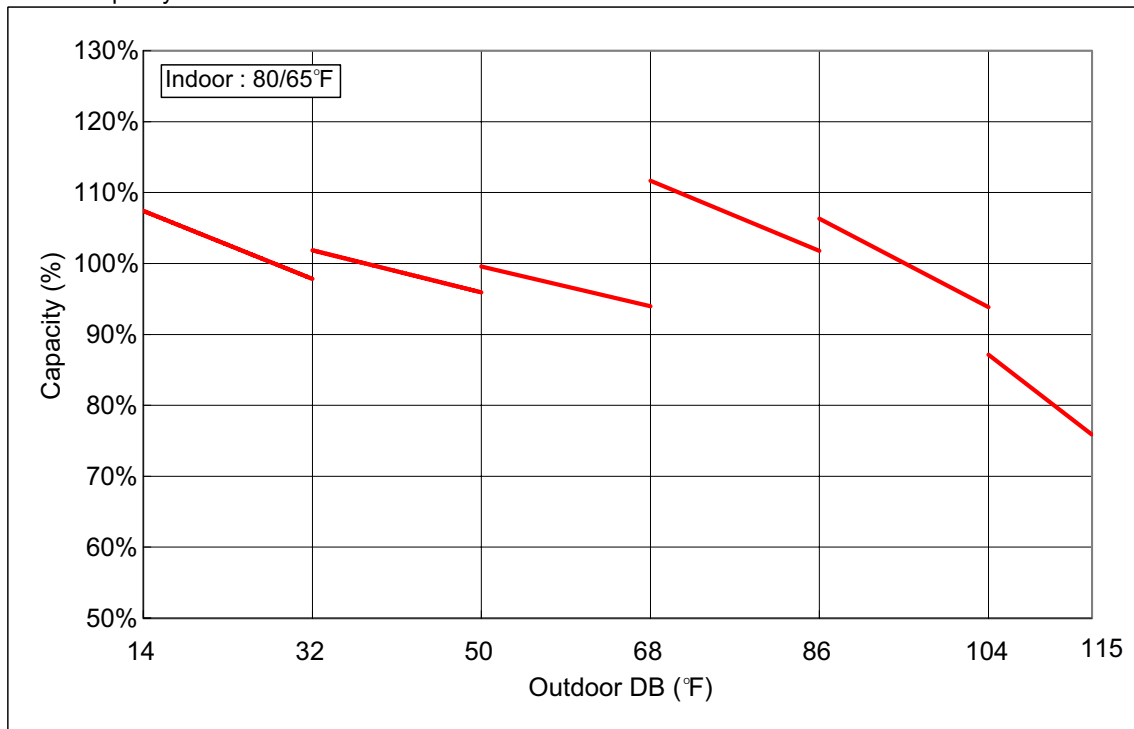
*Both capacity and input change largely when temperature is 50 or less degrees F, as outdoor fan speed is decreased due to low ambient temperature cooling control.

*Both capacity and input change more largely at less than 32 degrees F of ambient temperature as outdoor fan speed is decreased further.

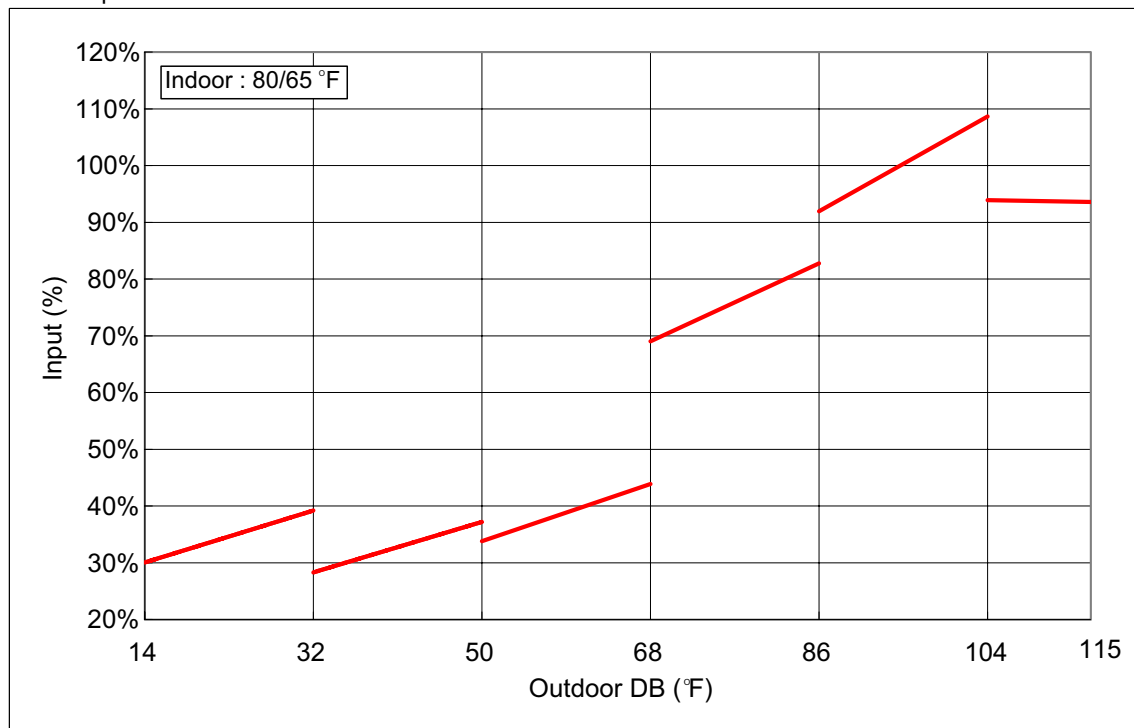
ASU30CLX Capacity/Input data

Cooling

<Capacity>



<Input>



*Both capacity and input decrease when temperature is 68 or less degrees F, for compressor frequency restrictions operate.

*Both capacity and input change largely when temperature is 50 or less degrees F, as outdoor fan speed is decreased due to low ambient temperature cooling control.

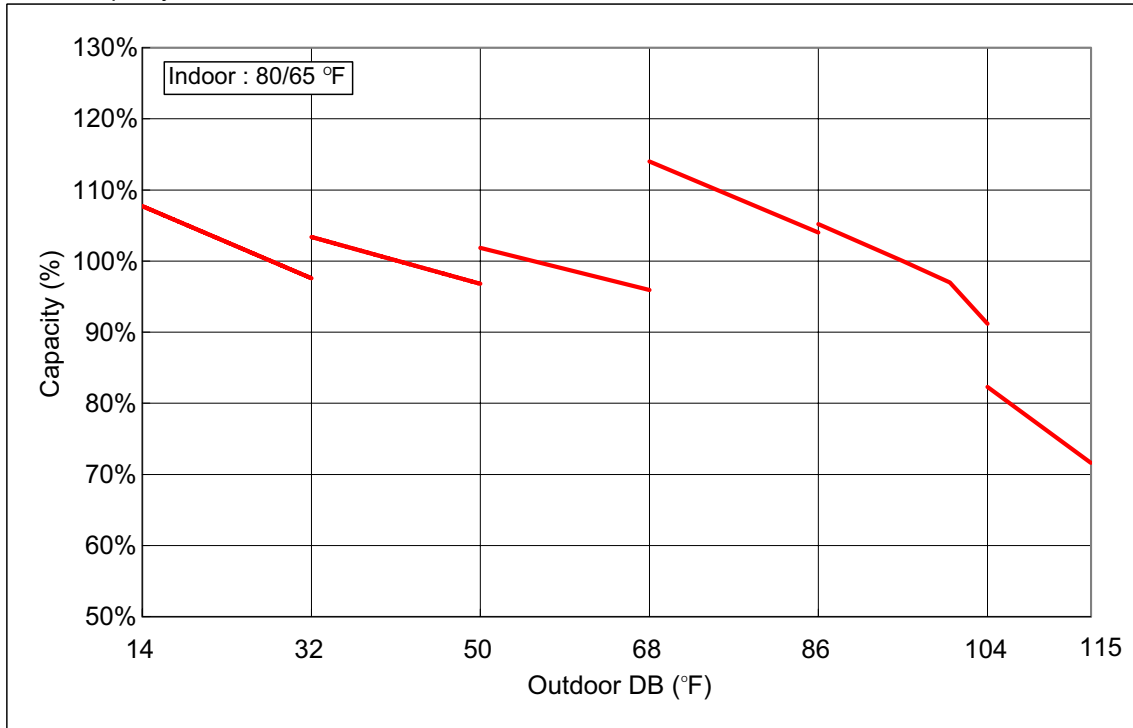
*Both capacity and input change more largely at less than 32 degrees F of ambient temperature as outdoor fan speed is decreased further.

*Both capacity and input decrease when temperature is 104 or more degrees F, as compressor speed is decreased due to current release protection.

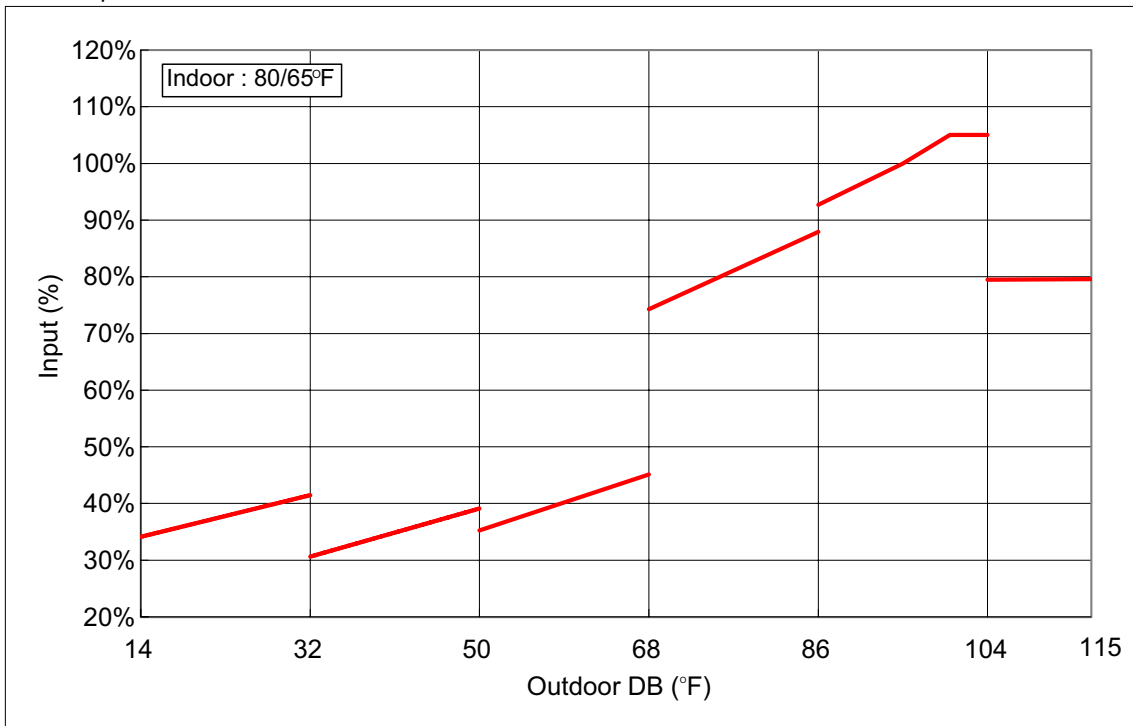
ASU36CLX Capacity/Input data

Cooling

<Capacity>



<Input>



*Both capacity and input decrease when temperature is 68 or less degrees F, for compressor frequency restrictions operate.

*Both capacity and input change largely when temperature is 50 or less degrees F, as outdoor fan speed is decreased due to low ambient temperature cooling control.

*Both capacity and input change more largely at less than 32 degrees F of ambient temperature as outdoor fan speed is decreased further.

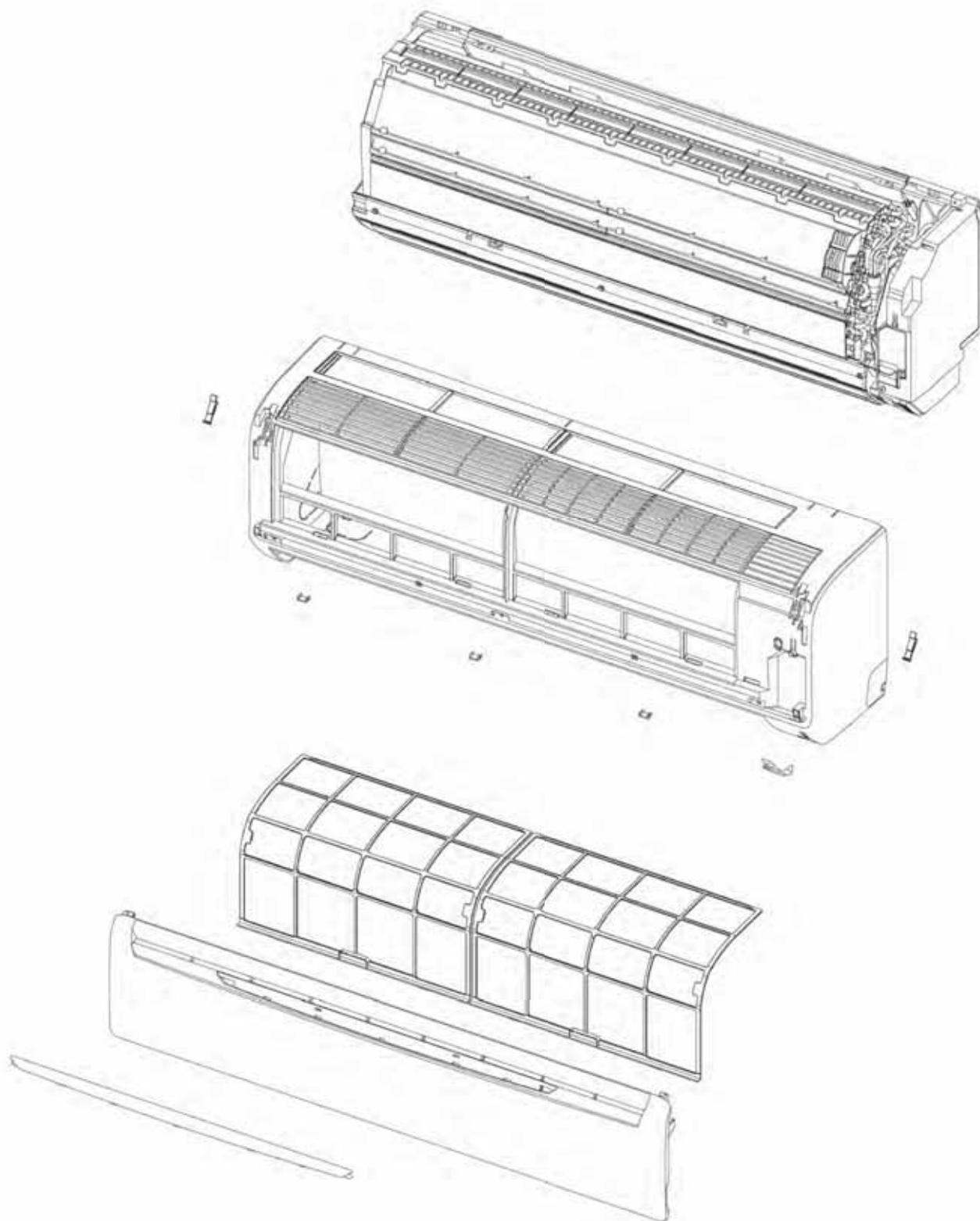
*Both capacity and input decrease when temperature is 104 or more degrees F, as compressor speed is decreased due to current release protection.

WALL MOUNTED type INVERTER

9 . REPLACEMENT PARTS

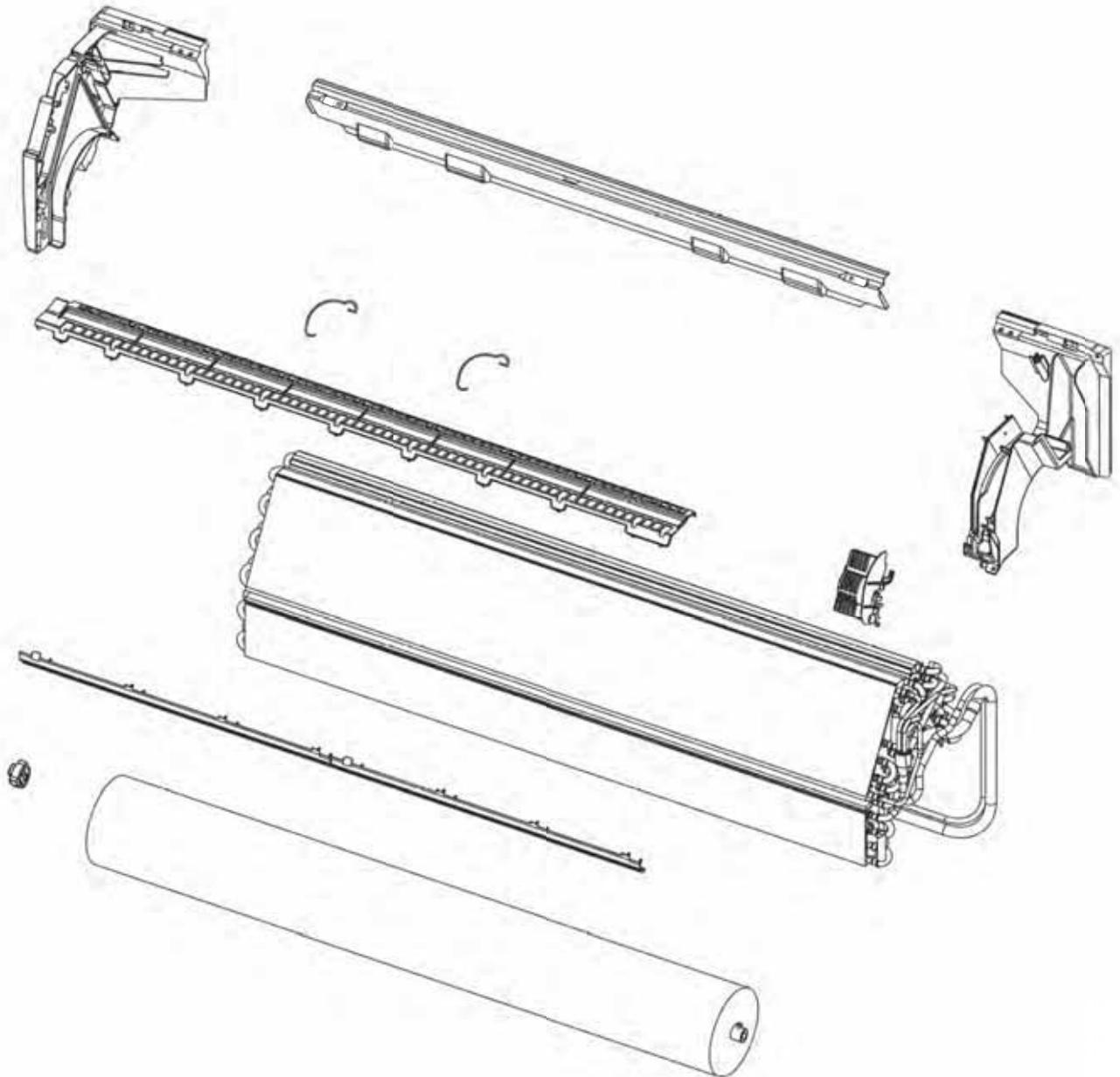
REPLACEMENT PARTS

Models : ASU24CL
ASU24RL
ASU30CLX
ASU36CLX



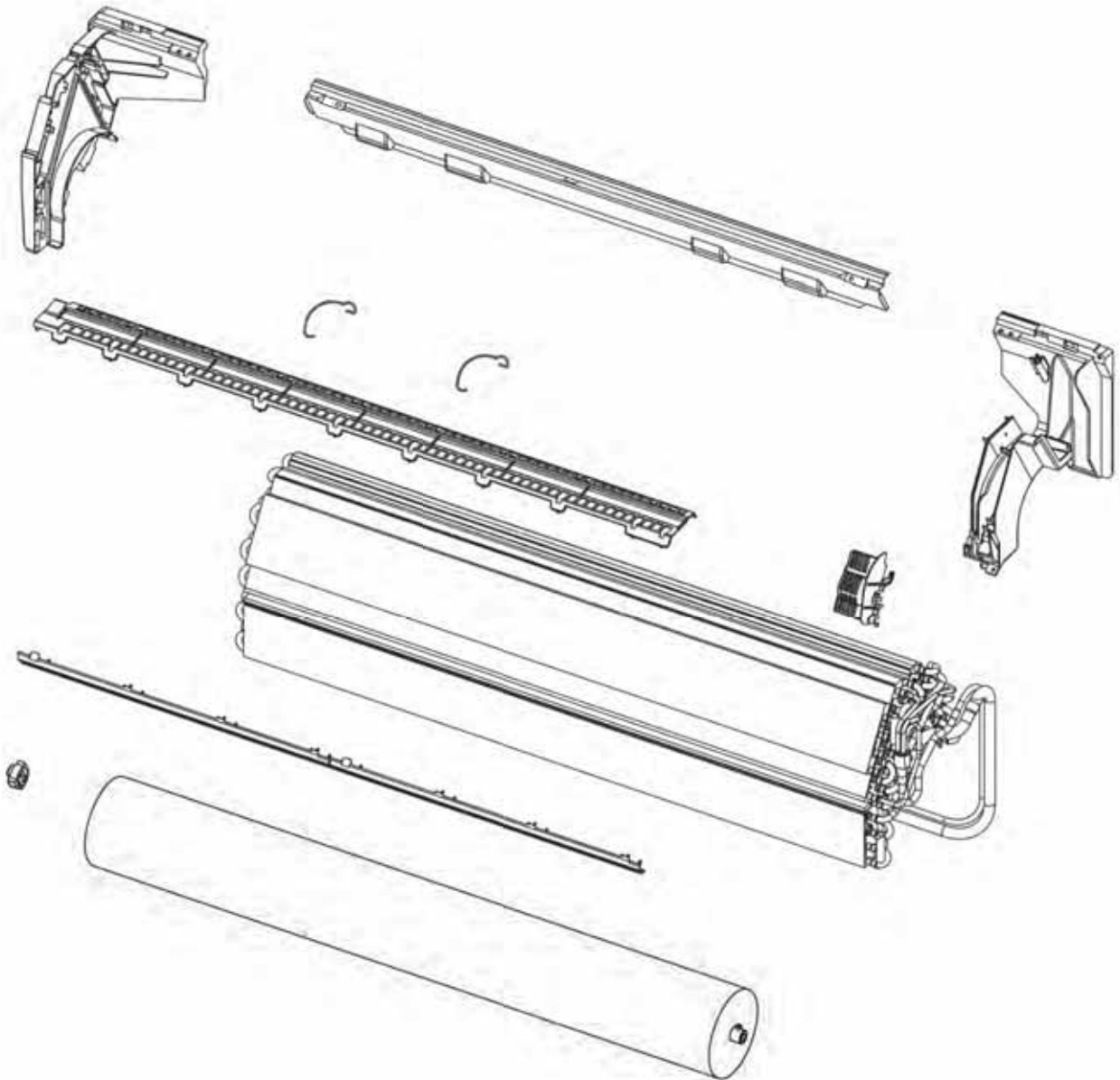
REPLACEMENT PARTS

Models : ASU24CL
ASU24RL



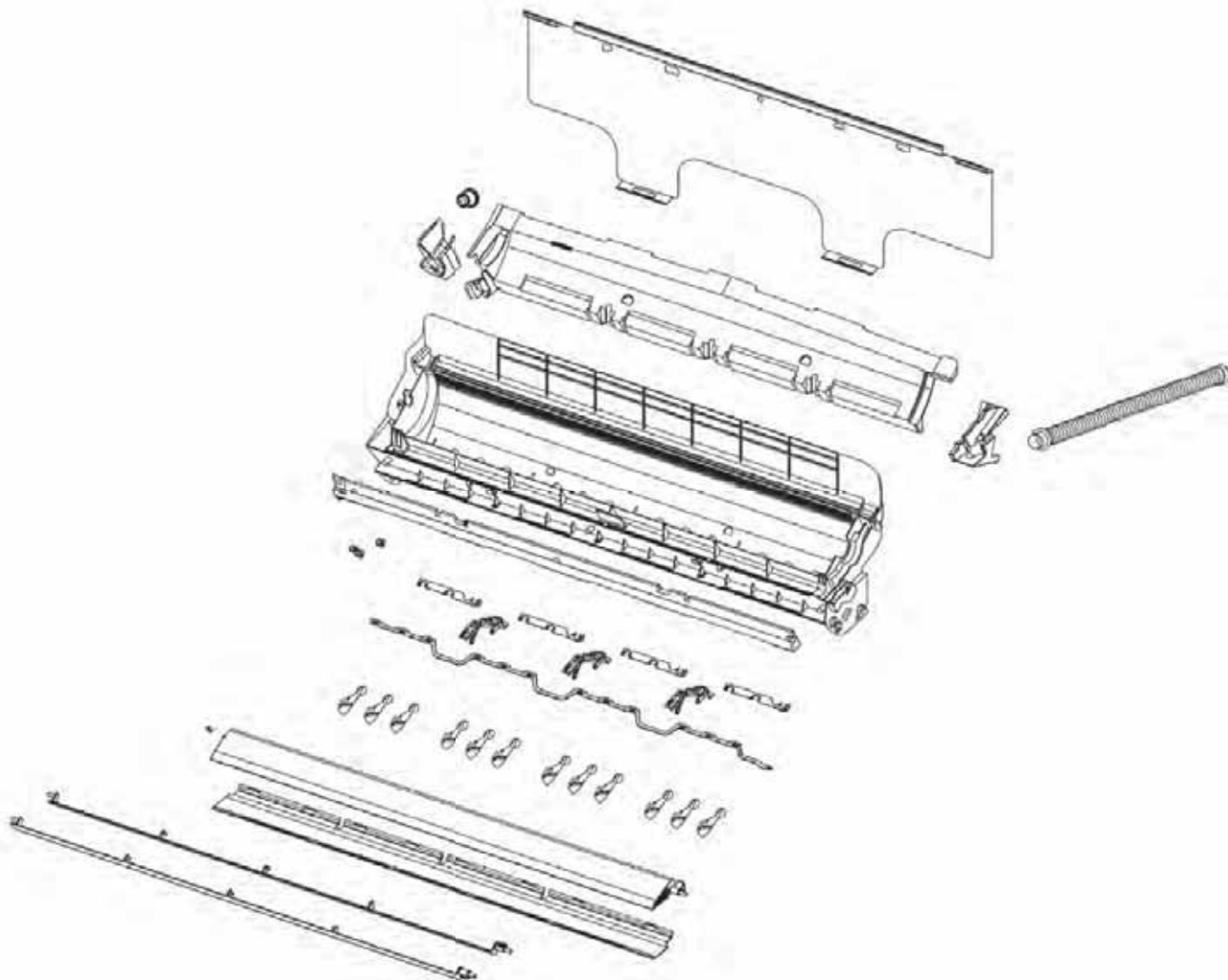
REPLACEMENT PARTS

Models : ASU30CLX
ASU36CLX



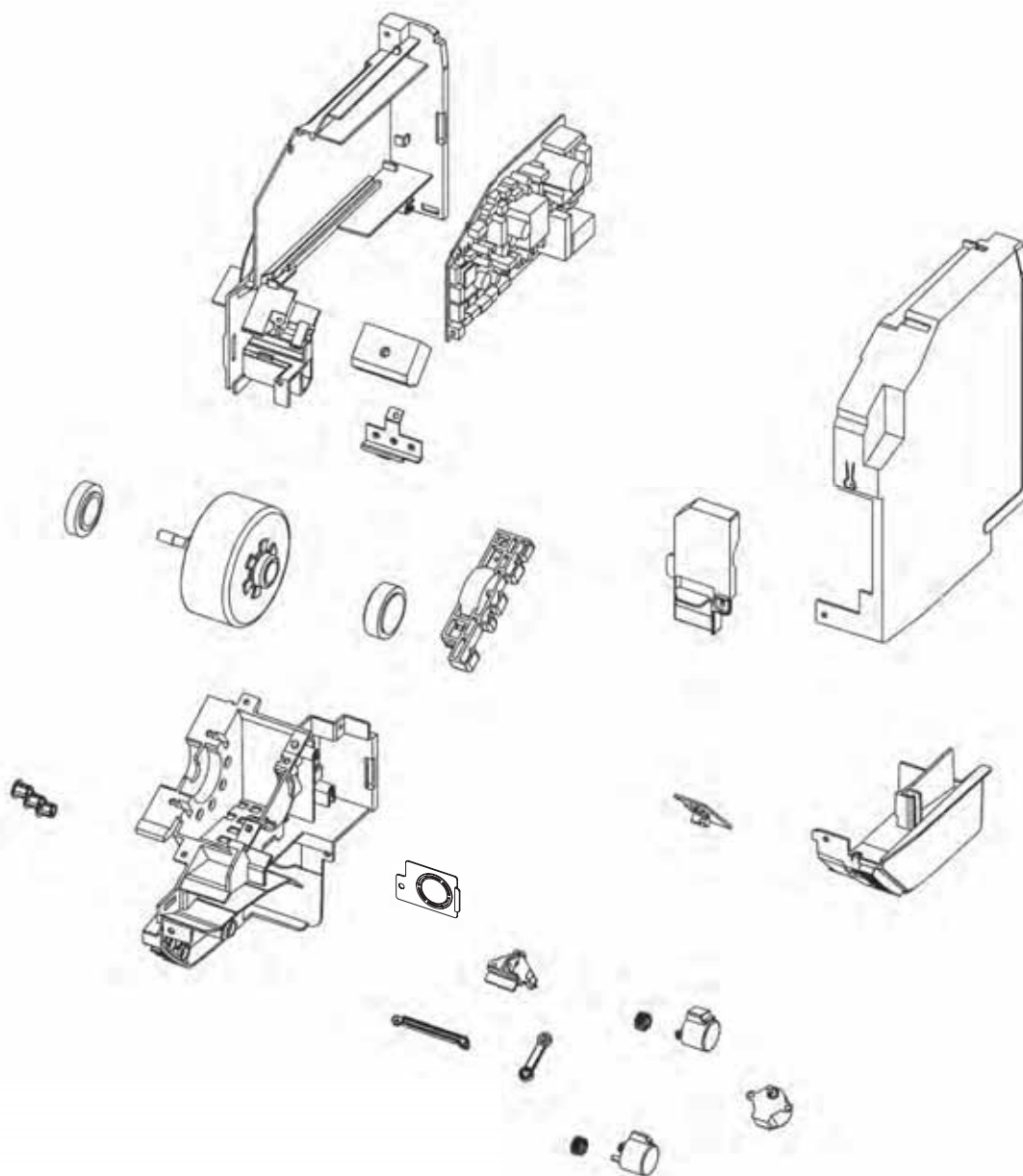
REPLACEMENT PARTS

Models : ASU24CL
ASU24RL
ASU30CLX
ASU36CLX



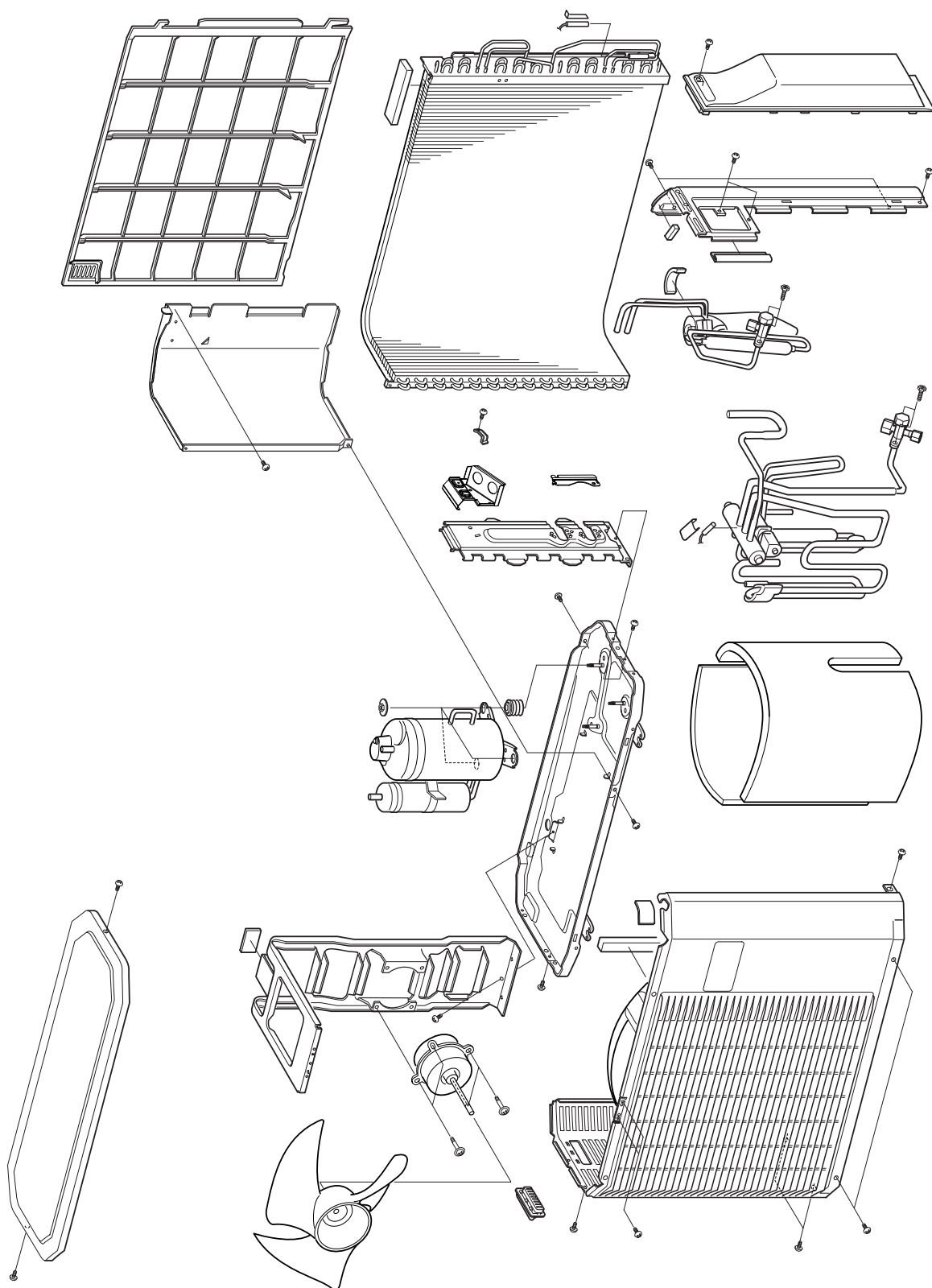
REPLACEMENT PARTS

Models : ASU24CL
ASU24RL
ASU30CLX
ASU36CLX



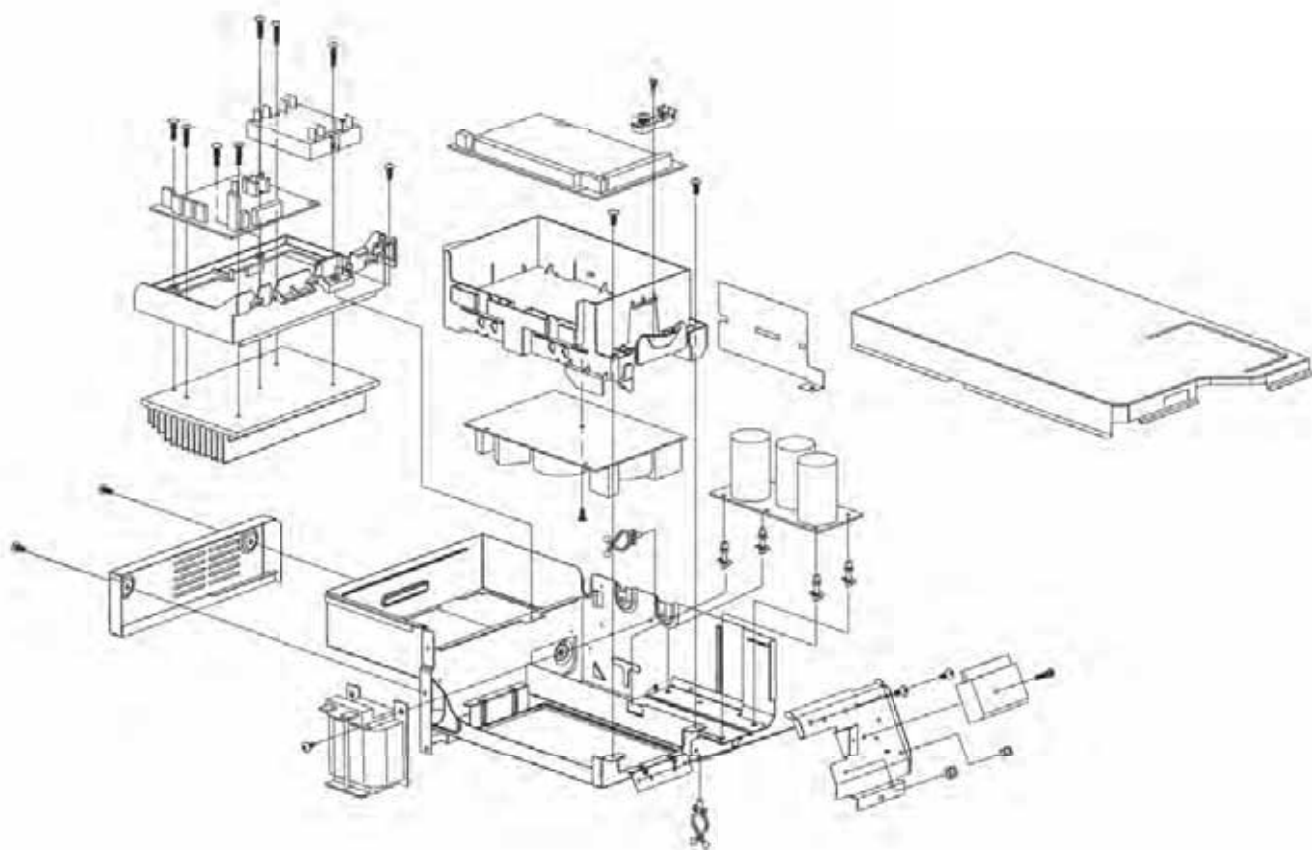
REPLACEMENT PARTS

Models : AOU24CL
AOU24RL



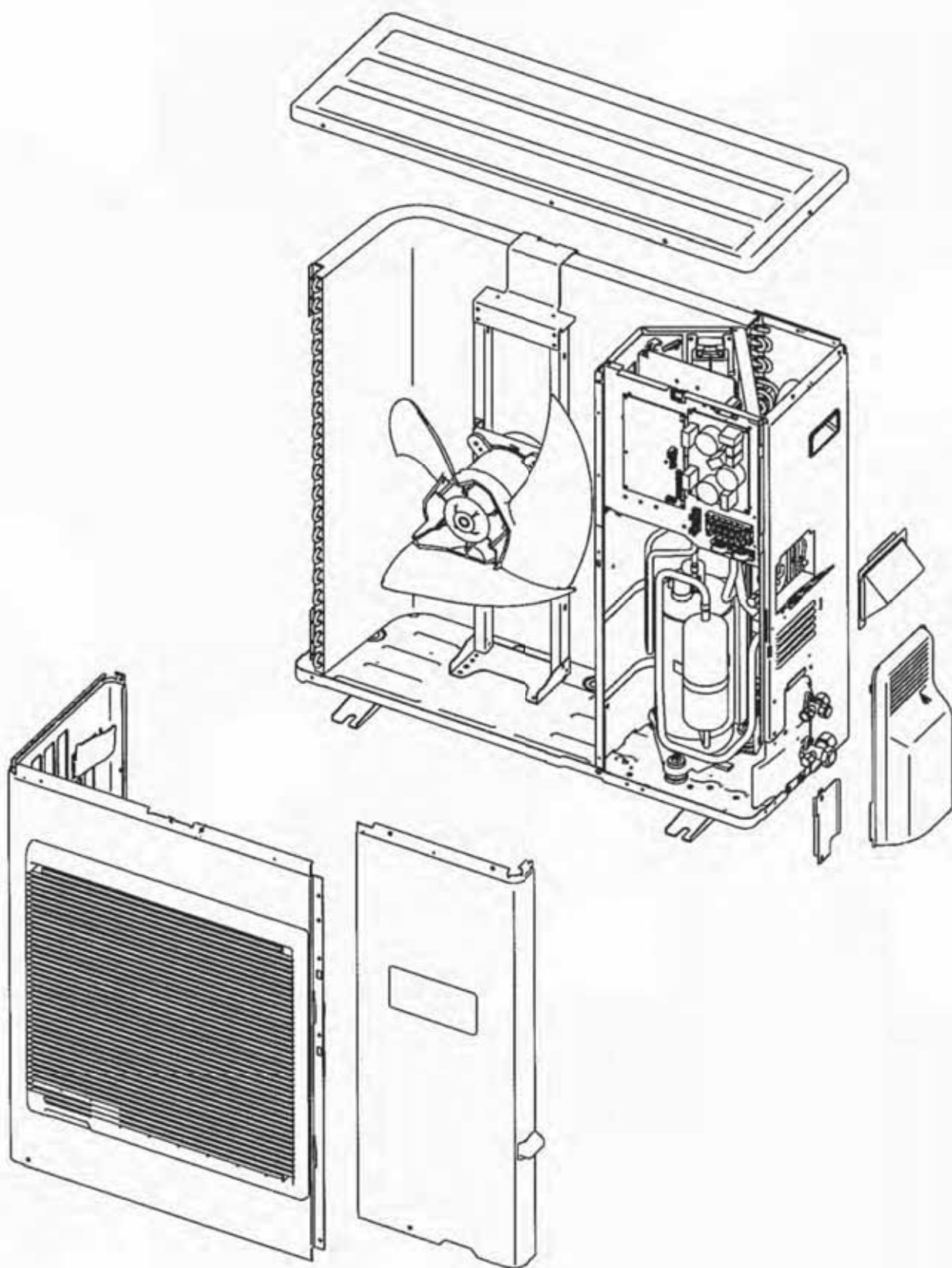
REPLACEMENT PARTS

Models : AOU24CL
AOU24RL



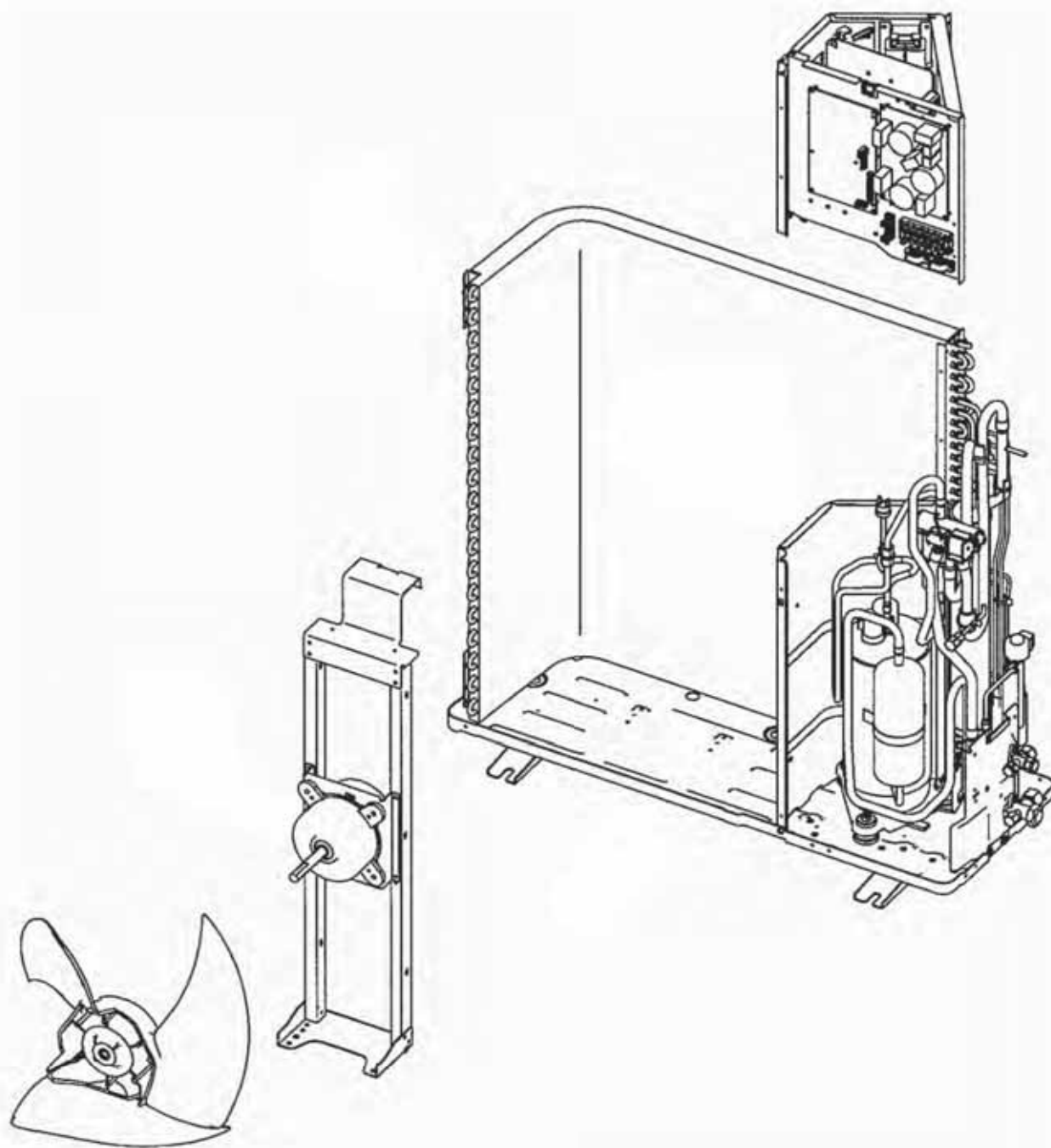
REPLACEMENT PARTS

Models : AOU30CLX
AOU36CLX



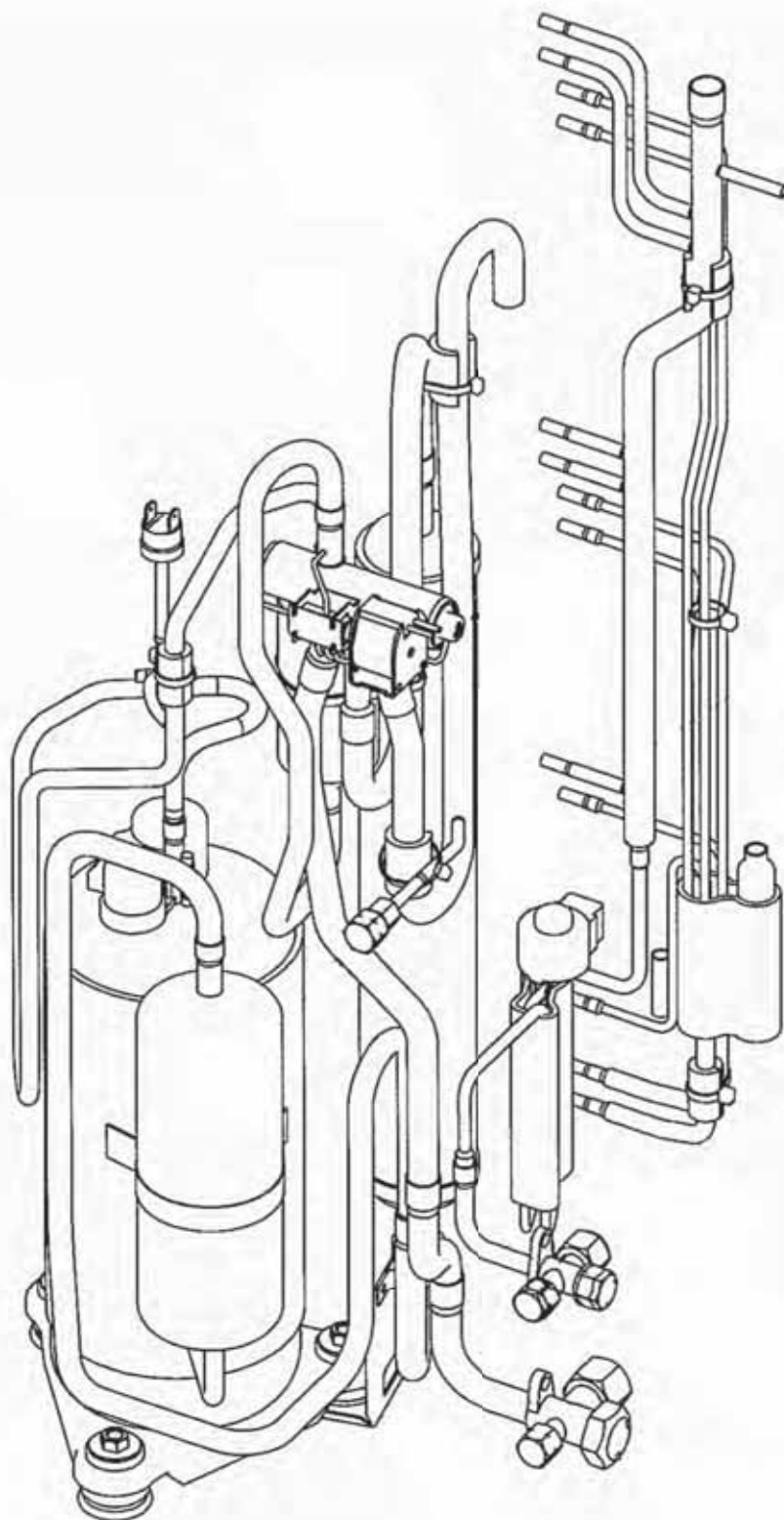
REPLACEMENT PARTS

Models : AOU30CLX
AOU36CLX



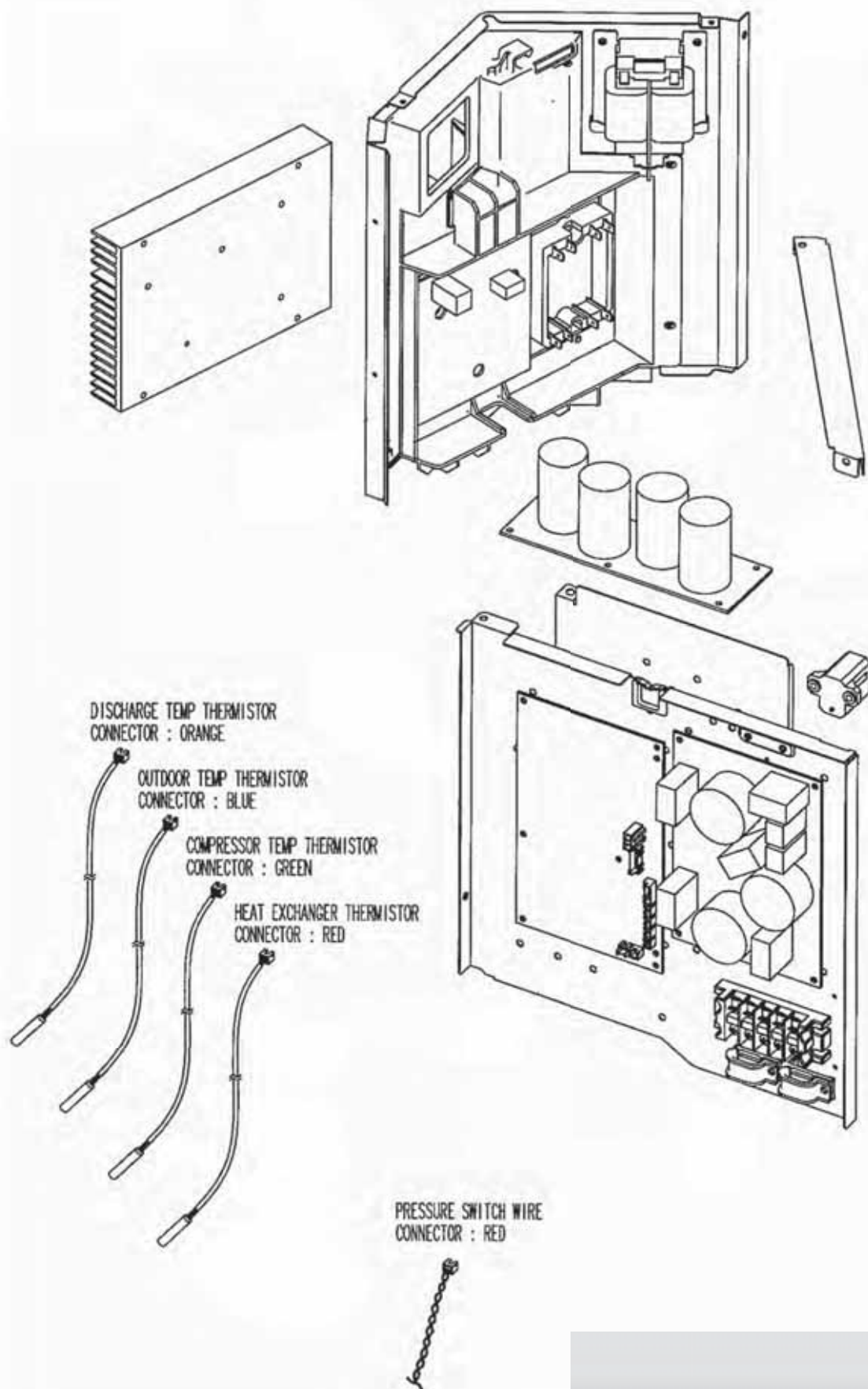
REPLACEMENT PARTS

Models : AOU30CLX
AOU36CLX



REPLACEMENT PARTS

Models : AOU30CLX
AOU36CLX

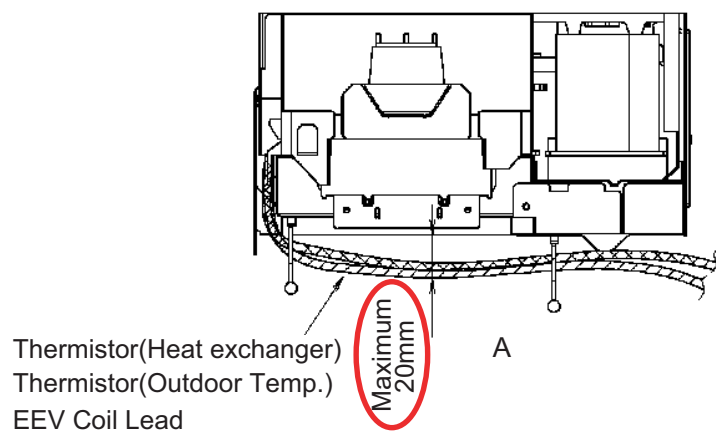
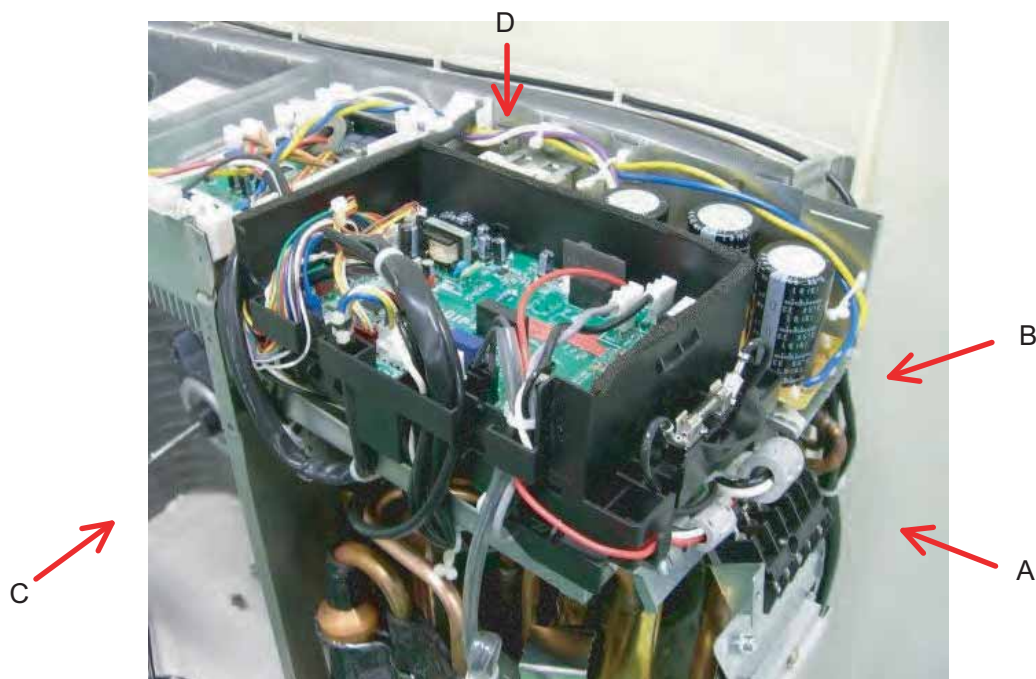


REPLACEMENT PARTS

Models : AOU24CL
AOU24RL

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

① BINDER

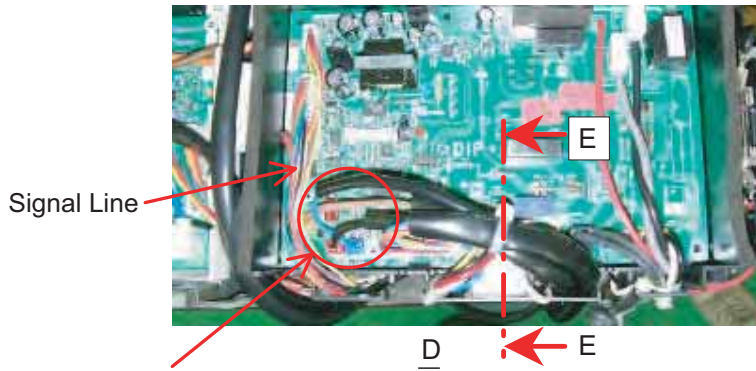


Pass the lead wire underneath the piping.

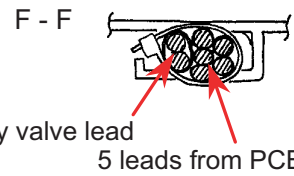
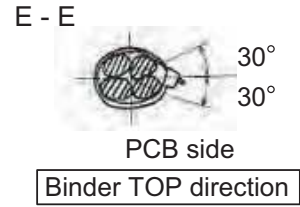
REPLACEMENT PARTS

**Models : AOU24CL
AOU24RL**

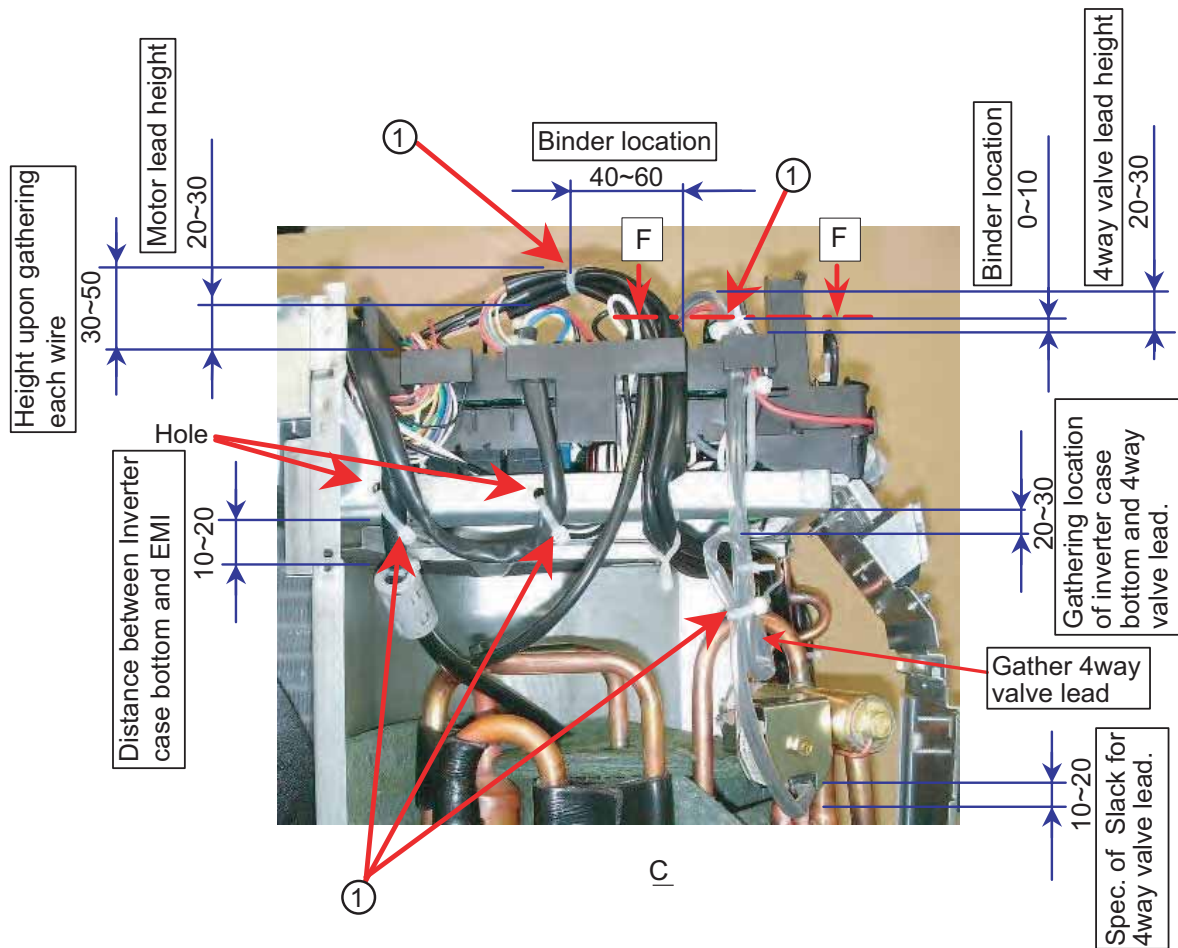
PROCESS ATTACHMENT OF INVERTER ASSY



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



Gather lead wires with the binder.

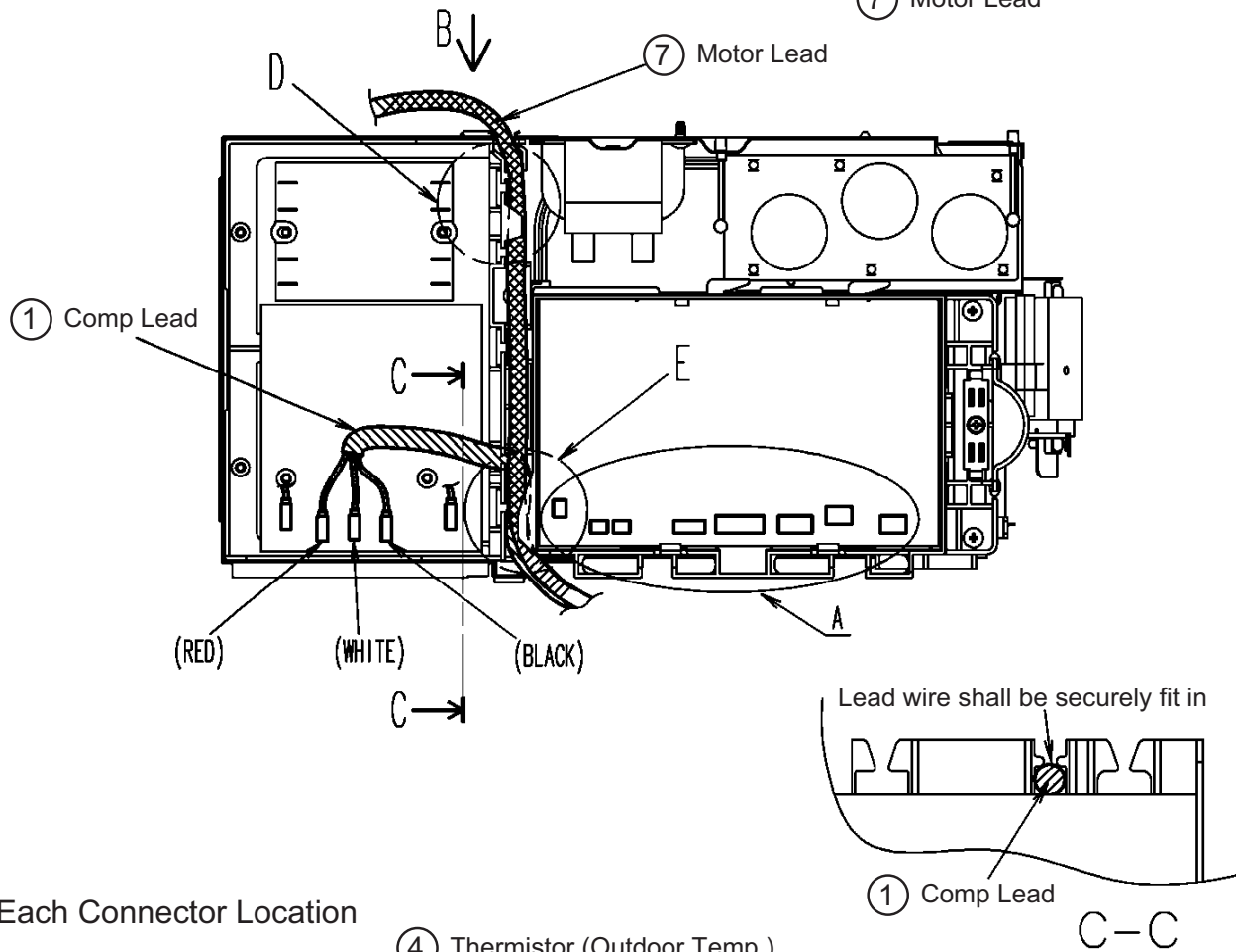


REPLACEMENT PARTS

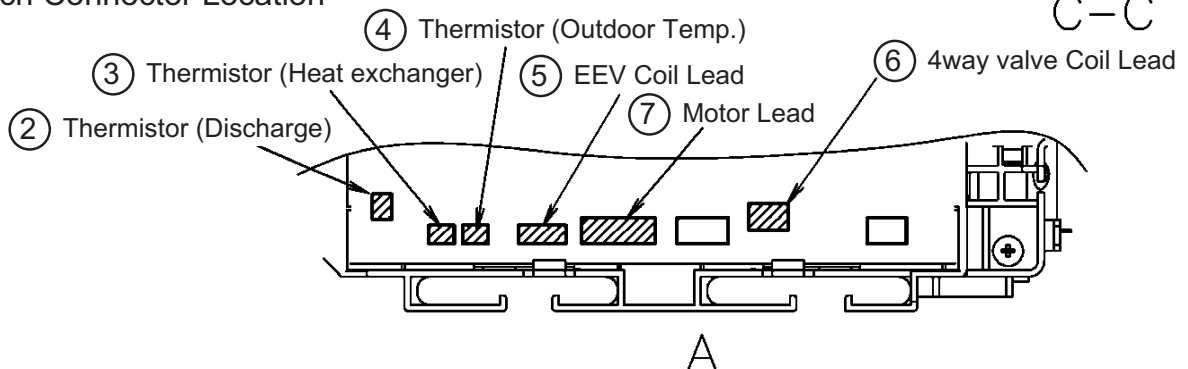
Models : AOU24CL
AOU24RL

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



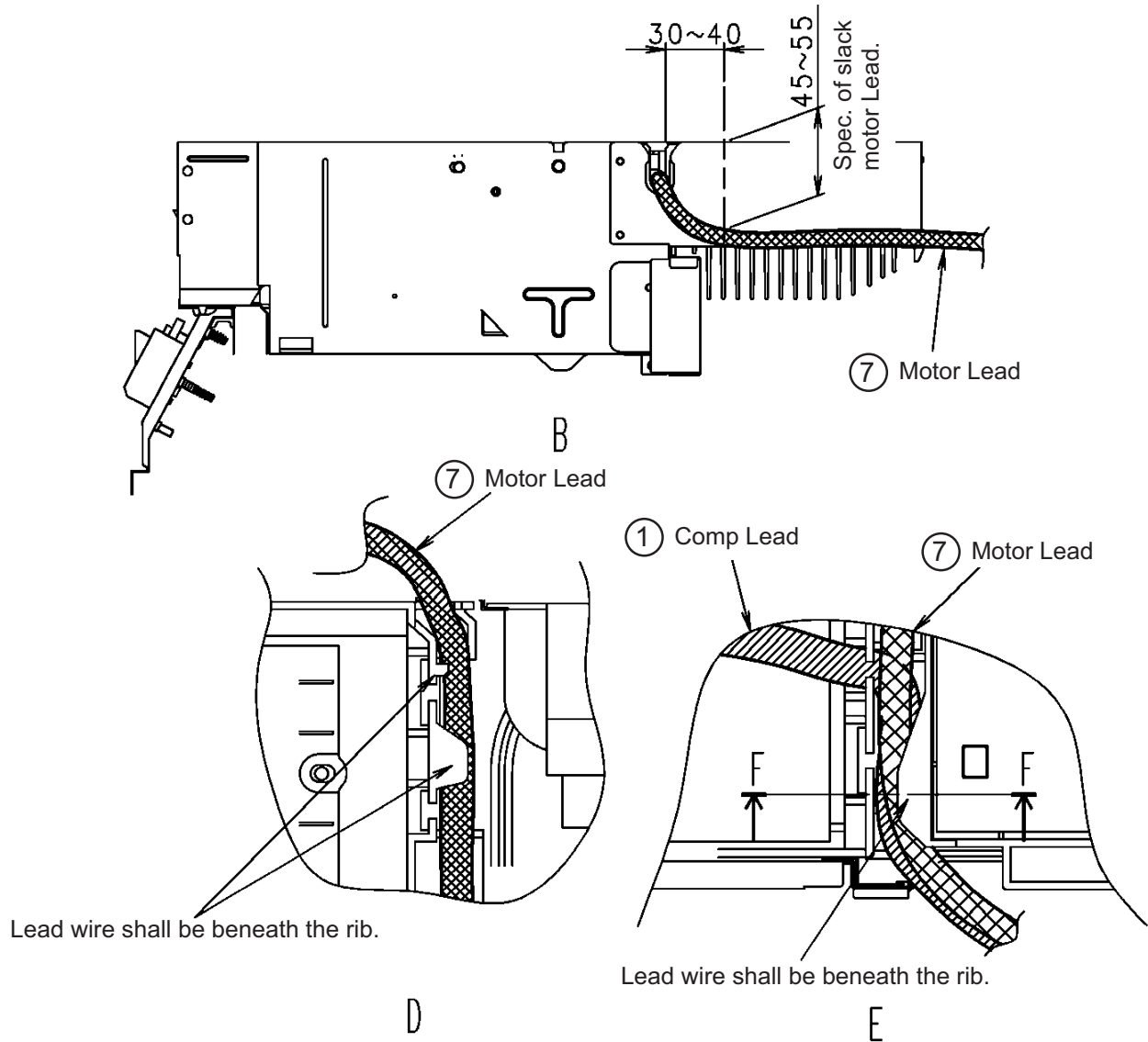
Each Connector Location



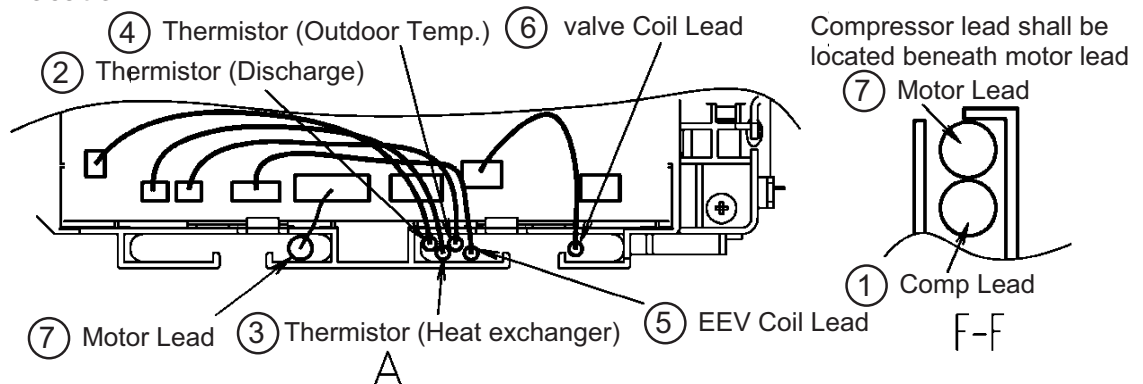
REPLACEMENT PARTS

Models : AOU24CL
AOU24RL

PROCESS Installation of wire to Inverter assy



Each Lead Location



REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

PROCESS Assemble wires (COIL,CHOKE)

① WIRE WITH TERMINAL

REGULATIONS

As shown in Fig.1, assemble wires to COIL,CHOKE and ACTPM

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

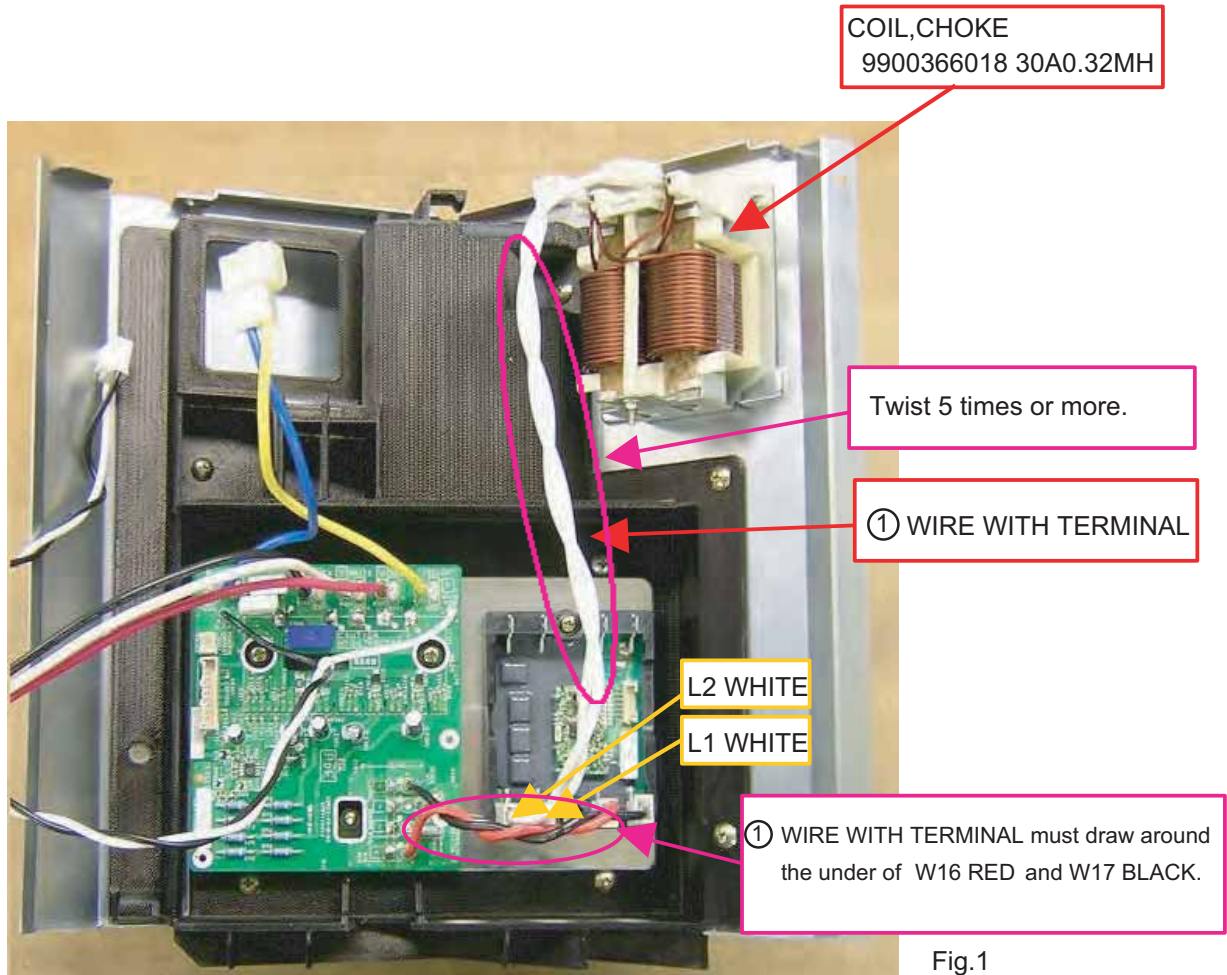
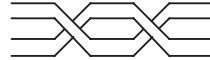


Fig.1

REPLACEMENT PARTS

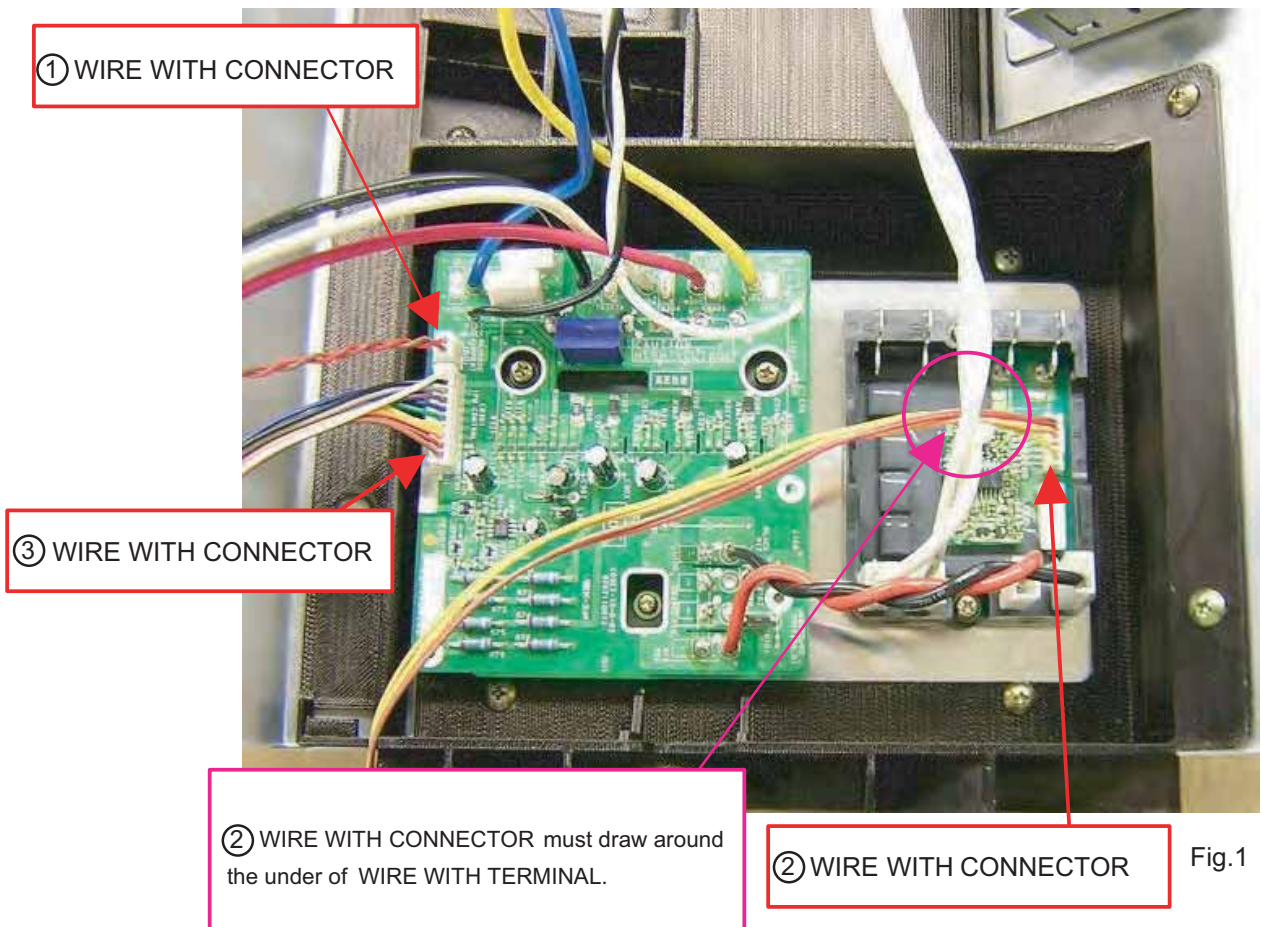
**Models : AOU30CLX
AOU36CLX**

PROCESS Assemble wires (TR PWB ASSY)

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

REGULATIONS

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



REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

PROCESS Assemble EMI FILTER (TERMINAL)

①EMI FILTER ZCAT21321130

②BINDER M

REGULATIONS

As shown in Fig.1, assemble EMI FILTER.

Certainly fix EMI FILTER to wires by BINDER.

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

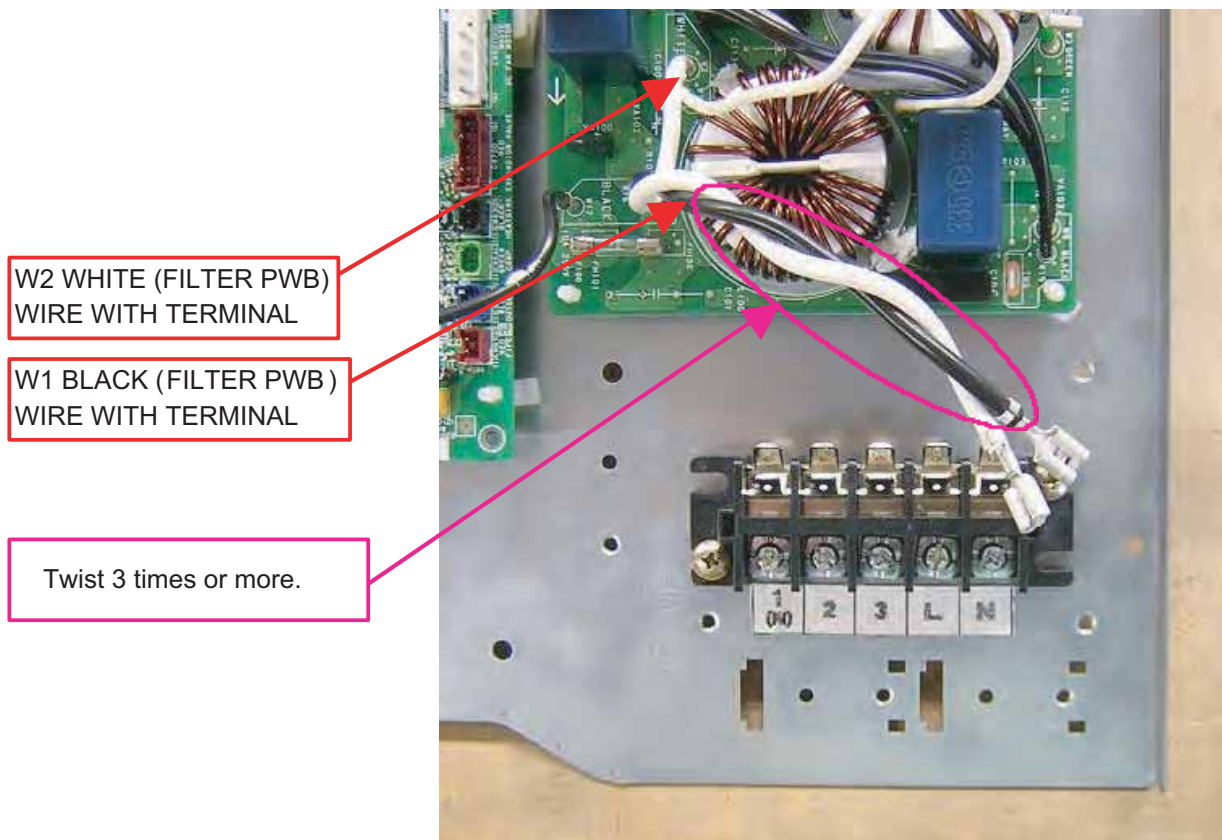
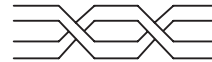


Fig.1

REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

REGULATIONS

As shown in Fig.1, assemble EMI FILTER.
Certainly fix EMI FILTER to wires by BINDER.

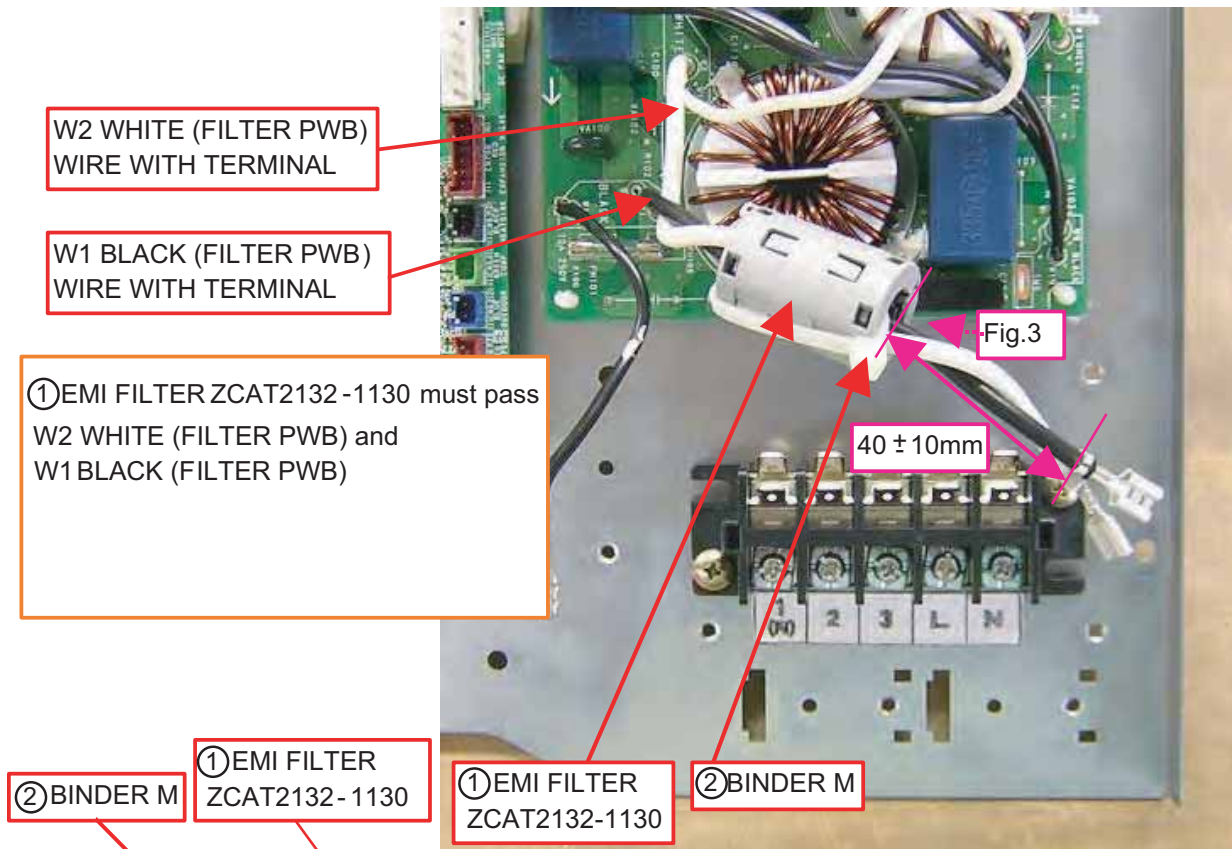


Fig.2

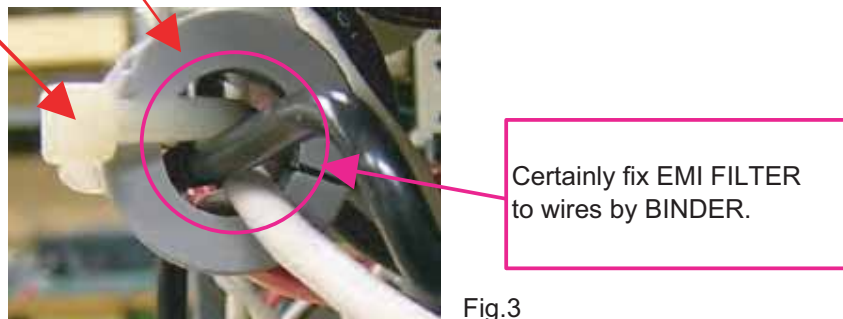


Fig.3

REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

REGULATIONS

As shown in Fig.4, connect WIRE WITH TERMINAL.

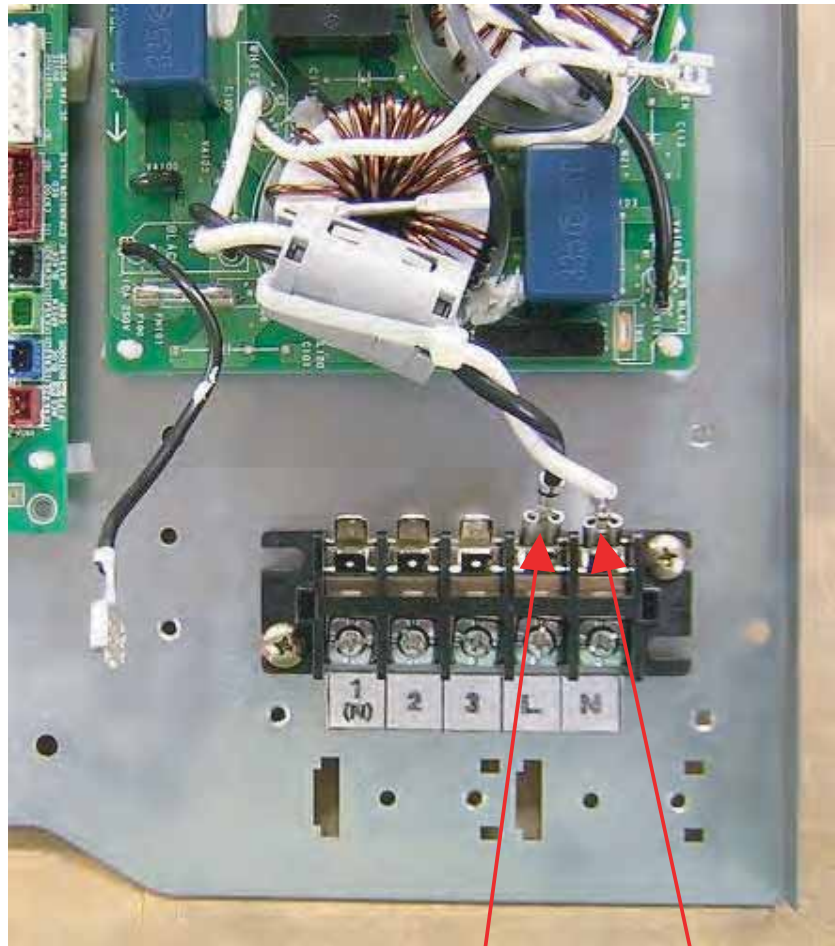


Fig.4

W1 BLACK (FILTER PWB)
WIRE WITH TERMINAL

W2 WHITE (FILTER PWB)
WIRE WITH TERMINAL

REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

PROCESS Connect wires. (TERMINAL)

REGULATIONS

As shown in Fig . 2, connect wires.

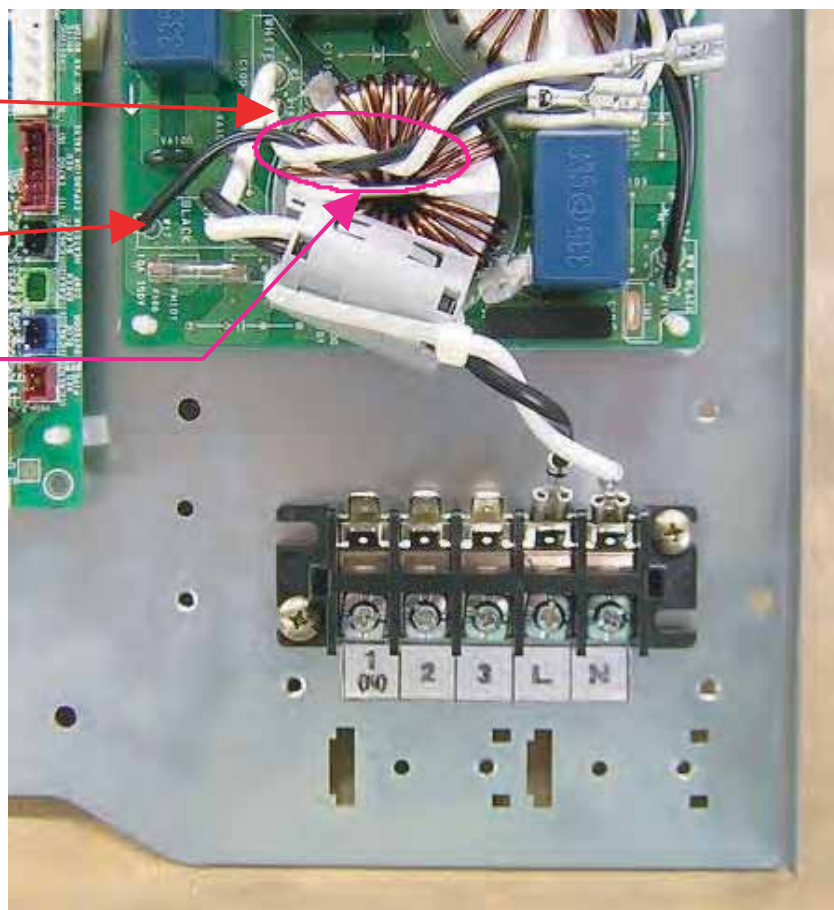
A right picture shows the example of two times of the twist.



W18 WHITE(FILTER PWB)
WIRE WITH TERMINAL

W17 BLACK(FILTER PWB)
WIRE WITH TERMINAL

Twist 3 times or more.

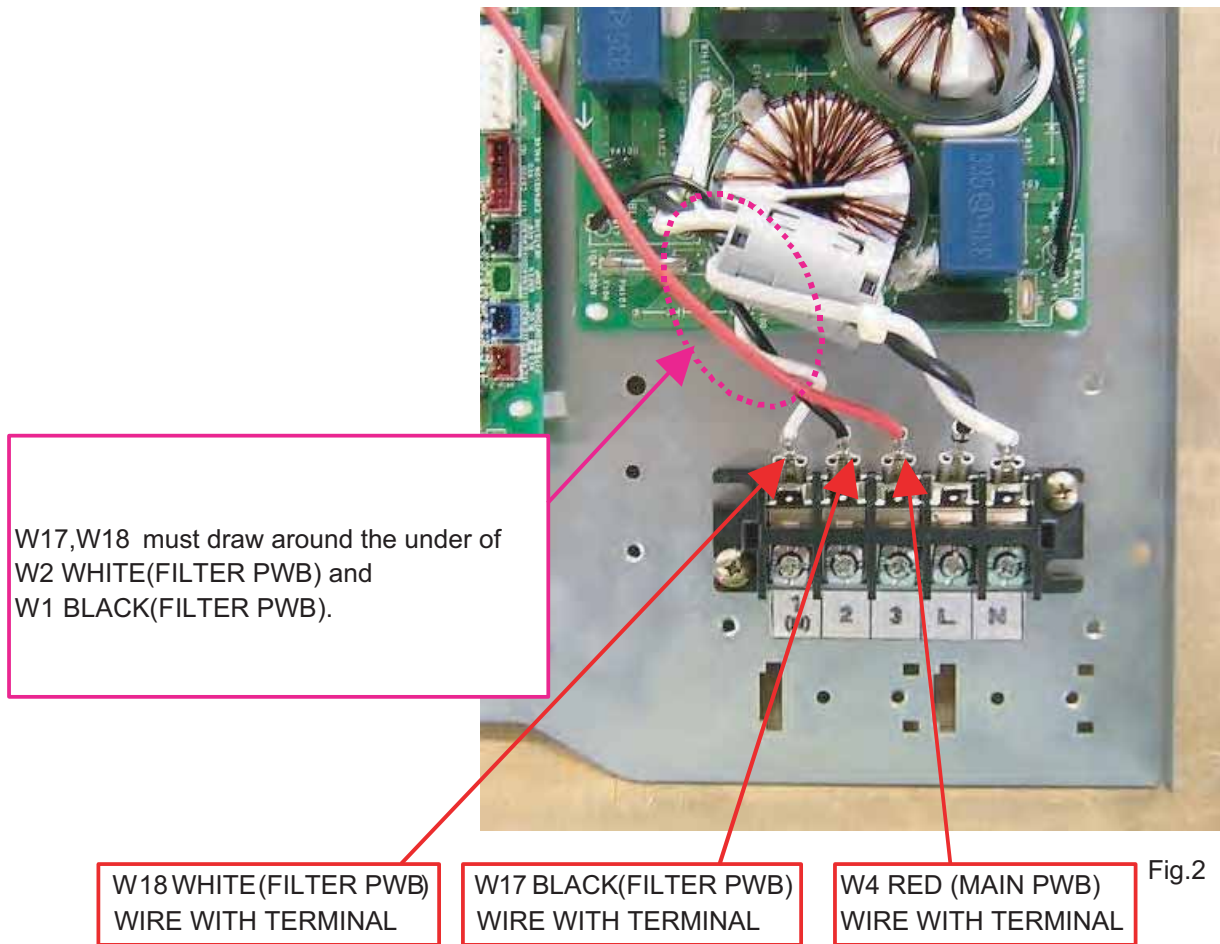


REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

REGULATIONS

As shown in Fig. 2, connect wires.



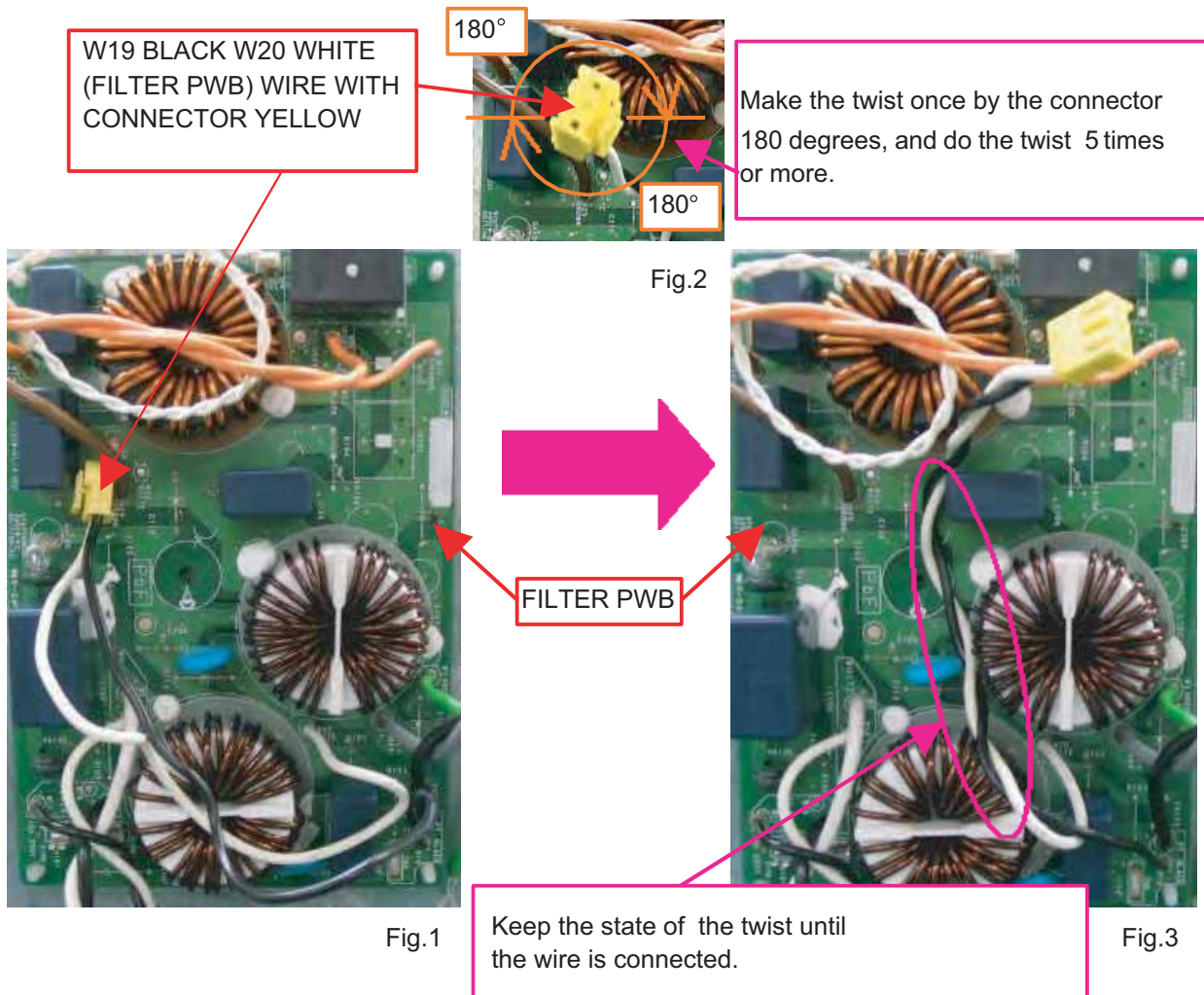
REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

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

REGULATIONS

As shown in Fig. 3, twist wires.



REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

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.

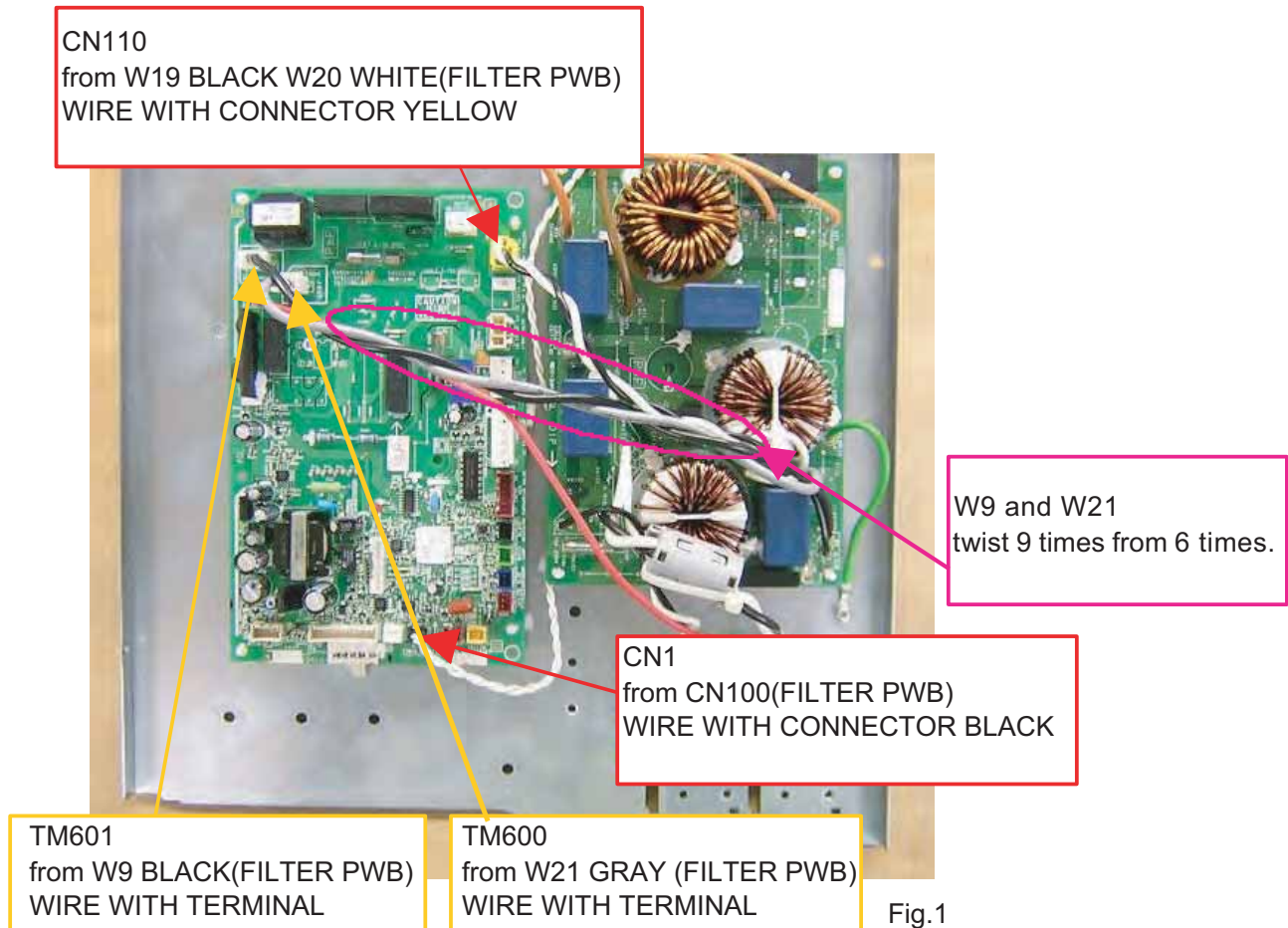


Fig.1

REPLACEMENT PARTS

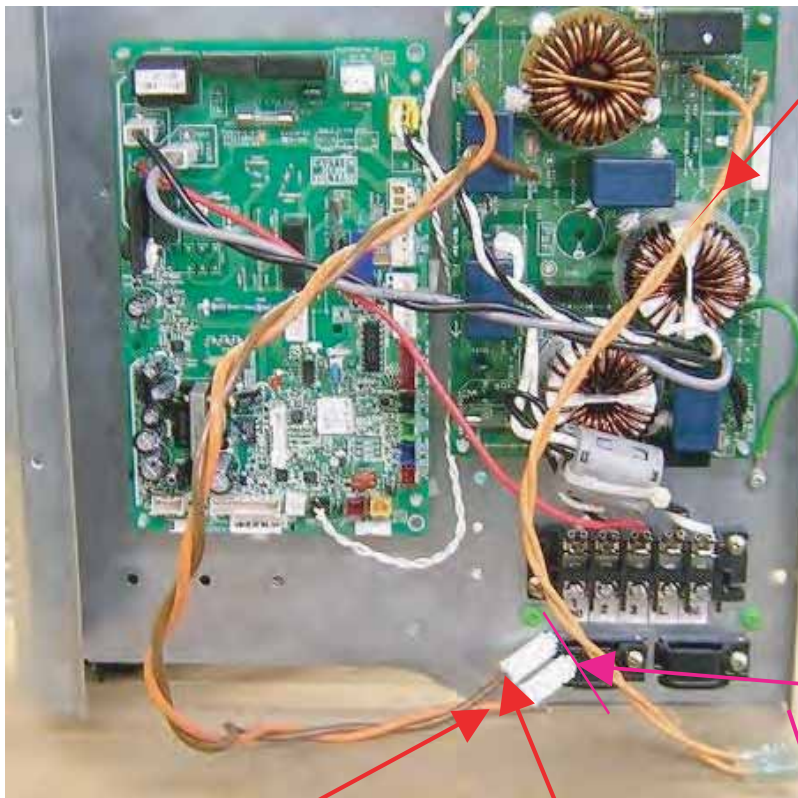
**Models : AOU30CLX
AOU36CLX**

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

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

Fig.1

W28 ORANGE (FILTER PWB)
WIRE WITH TERMINAL

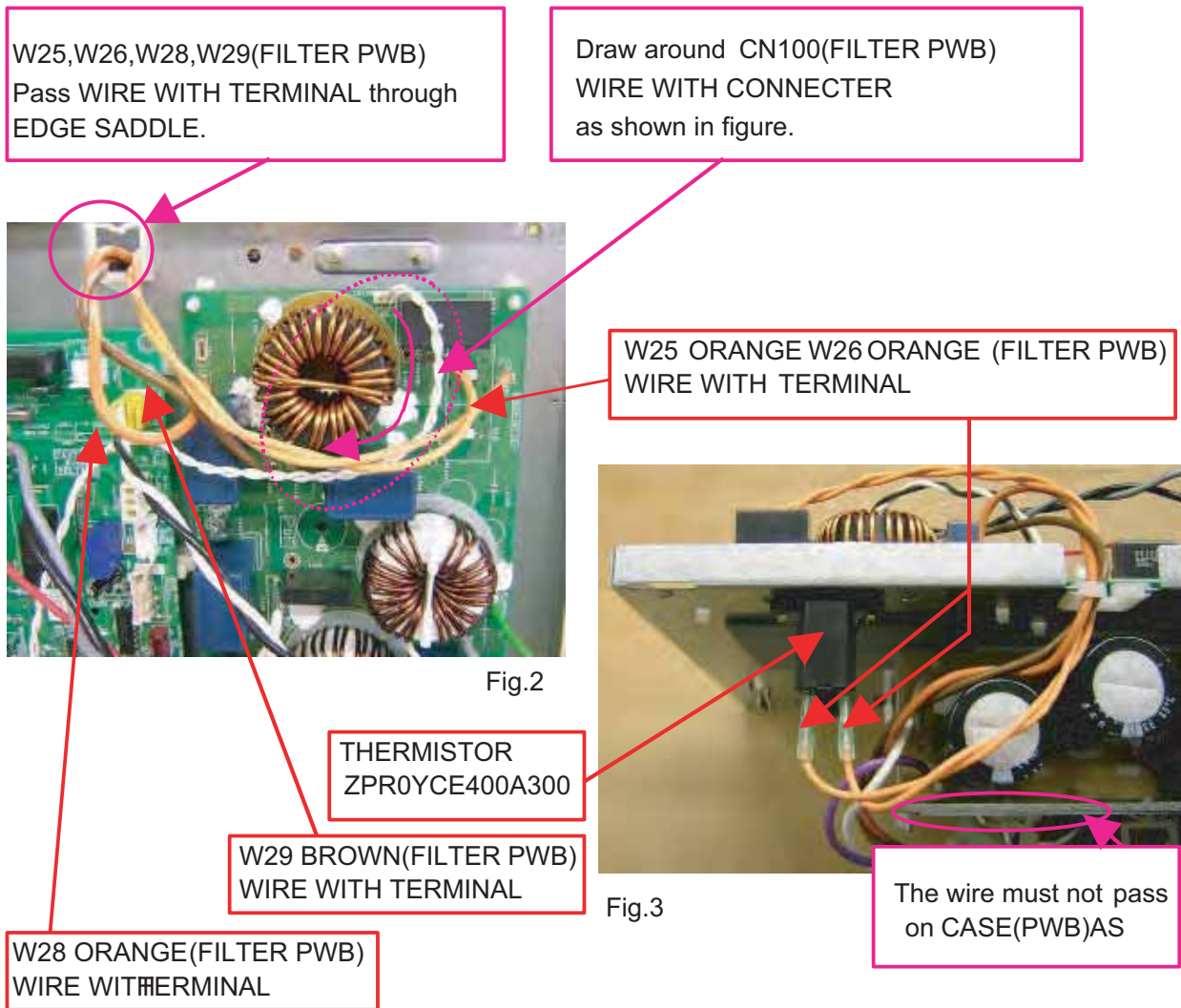
W29 BROWN(FILTER PWB)
WIRE WITH TERMINAL

REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

REGULATIONS

As shown Fig. 3, connect wires.



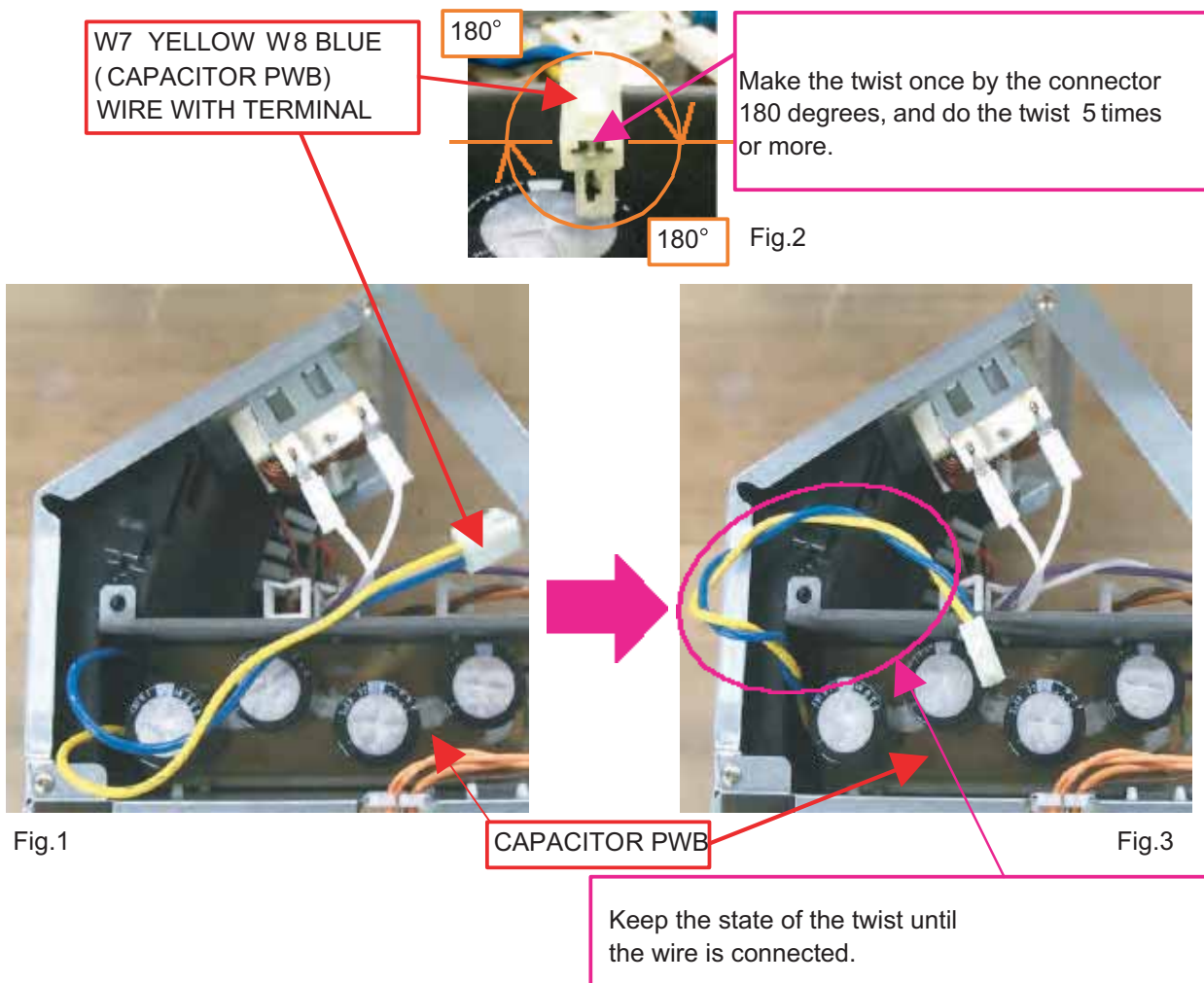
REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

PROCESS Fix the wires to CASE(PWB)AS.
(PWB ASSY(CAPACITOR),ACTL)

REGULATIONS

As shown in Fig. 3, twist wires.



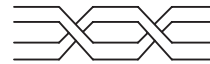
REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

REGULATIONS

As shown in Fig. 5, assemble PWB ASSY (CAPACITOR).

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



Confirm whether to fill regulations
at the twist.

must pass the under of
the fingernail of CASE(HEATSINK).

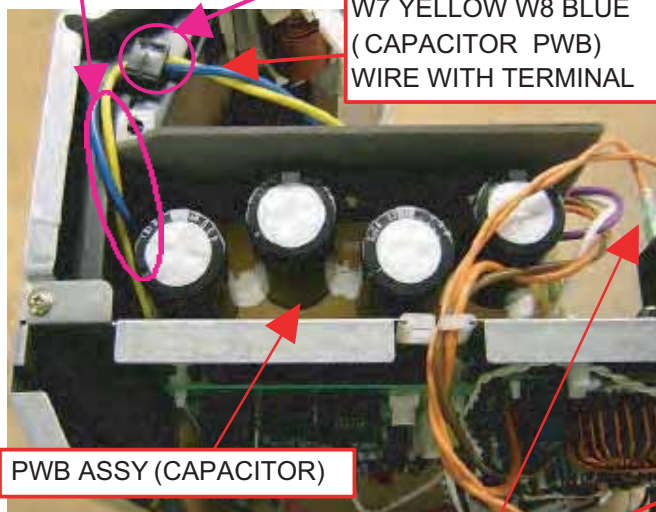


Fig. 4



Fig.5

W12 WHITE W13 VIOLET
(CAPACITOR PWB)
WIRE WITH TERMINAL

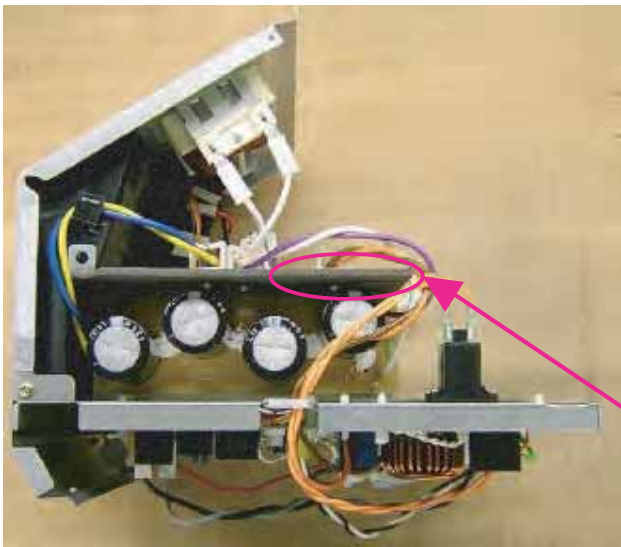
W12 and W13(CAPACITOR PWB) WIRE WITH
TERMINAL must do the twist six times or more.

REPLACEMENT PARTS

**Models : AOU30CLX
AOU36CLX**

REGULATIONS

Pass each wire through CLIP(CABLE) as shown in fig.7 .



Each wire must keep the state of the twist until being connected.

Each wire must not pass on CASE(PWB)AS

Fig. 6

W7 YELLOW W8 BLUE
(CAPACITOR PWB)
WIRE WITH TERMINAL

W12 WHITE W13 VIOLET
(CAPACITOR PWB)
WIRE WITH TERMINAL

W28 ORANGE W29 BROWN
(FILTER PWB)
WIRE WITH TERMINAL

WIRE WITH TERMINAL

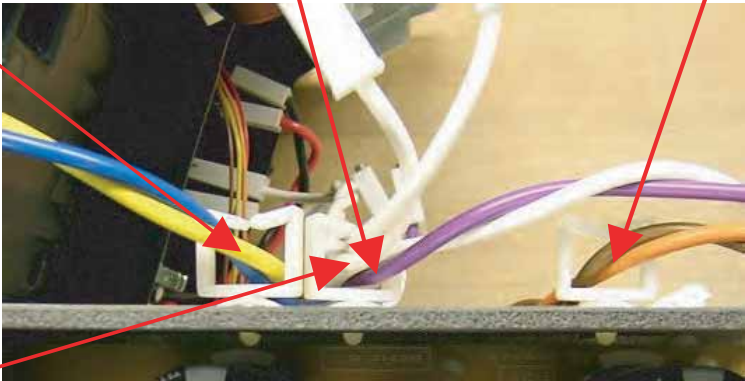


Fig. 7

REPLACEMENT PARTS

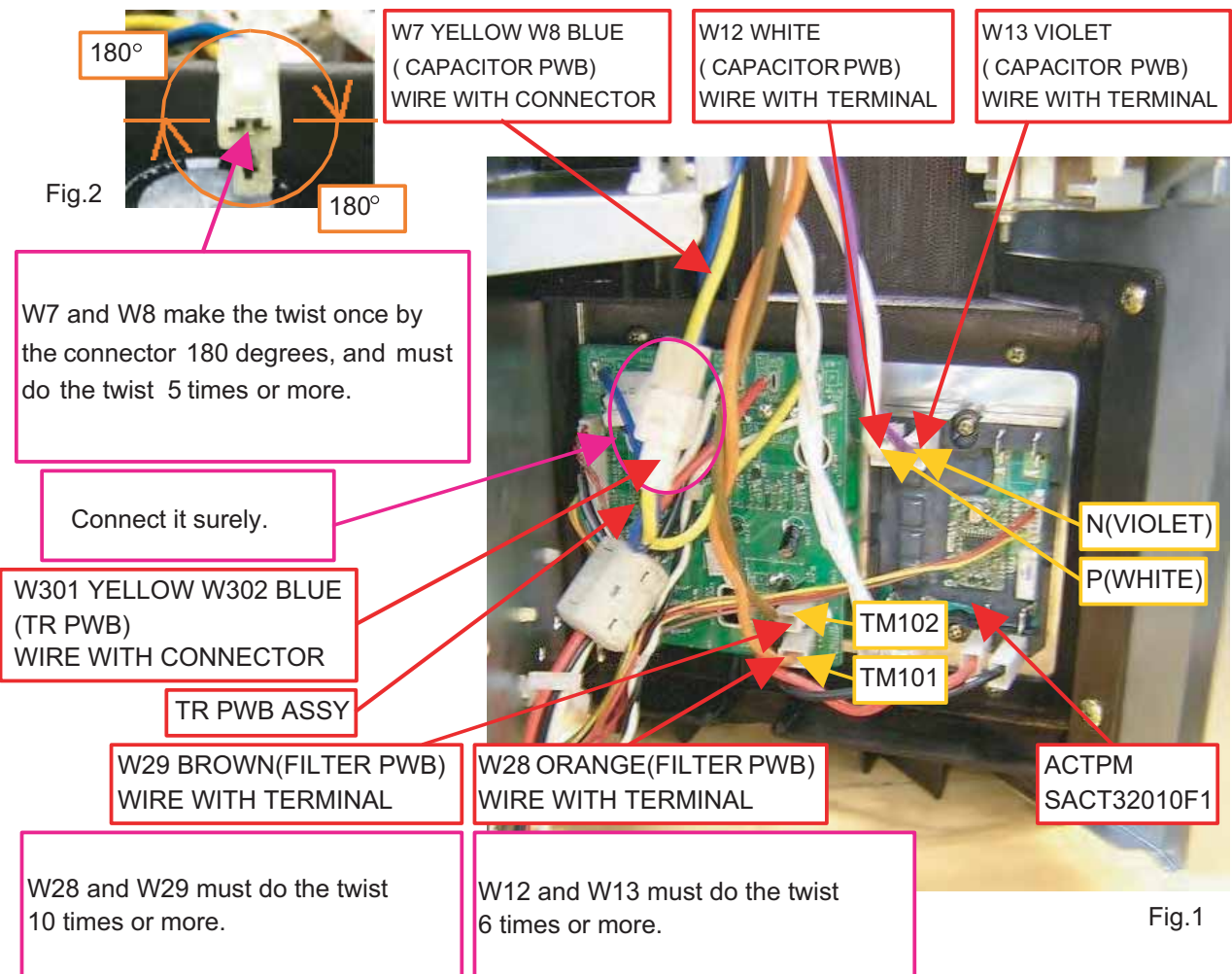
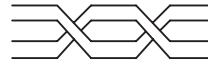
**Models : AOU30CLX
AOU36CLX**

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.



WALL MOUNTED type INVERTER

10 . INSTALLATION MANUAL



⚠ 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.

- 1 CAUTION**

(1) Check that the indoor unit correctly receives the signal from the remote control unit, then install the remote control unit holder.
- (2) Select the remote control unit holder installation site by paying careful attention to the following:

 - Avoid places in direct sunlight
 - Avoid places that may be affected by the heat from a stove, etc.

[illegible]



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