

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

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	ASU30CLX1	AOU30CLX1
	ASU36CLX1	AOU36CLX1

Refrigerant
R410A

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WALL MOUNTED type INVERTER

1 . DESCRIPTION OF EACH CONTROL OPERATION

1. COOLING OPERATION

1-1 COOLING CAPACITY CONTROL

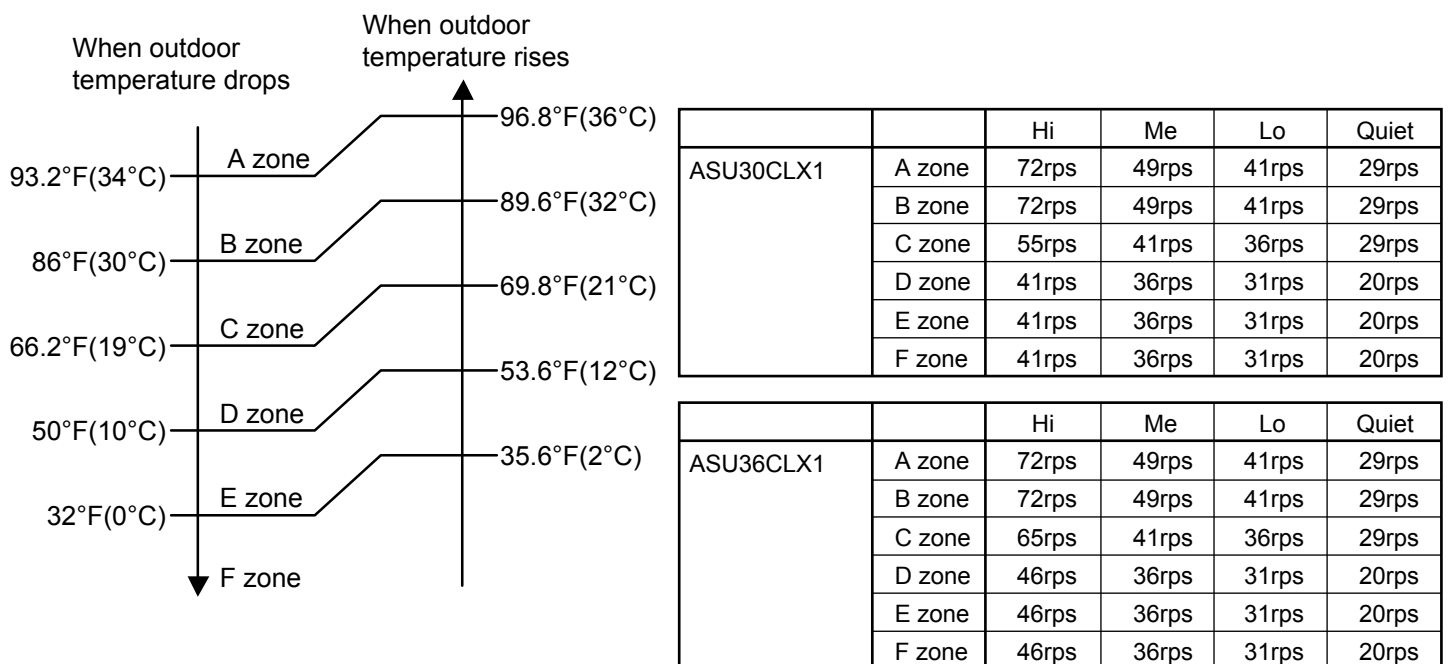
A sensor (room temperature thermistor) built in the indoor unit body will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation speed of the compressor.

- * If the room temperature is 4°F(2°C) higher than a set temperature, the compressor operation speed will attain to maximum performance.
- * If the room temperature is some degrees 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 speed is controlled within the range shown in Table 1. However, the maximum speed is limited in the range shown in Fig.1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor speed range)

	Minimum speed	Maximum speed
ASU30CLX1 ASU36CLX1	16rps	72rps

(Fig.1 : Limit of maximum speed based on outdoor temperature)



2. DRY OPERATION

2-1 INDOOR UNIT CONTROL

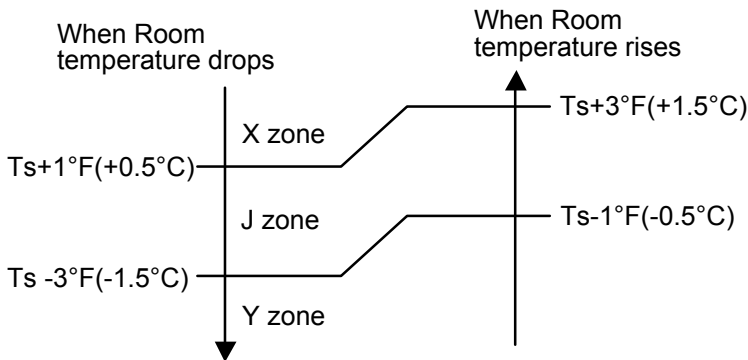
The compressor speed shall change according to the temperature, set temperature, and room temperature variation which the room temperature sensor of the indoor unit body has detected as shown in the Table 2.

However, after the compressor is driven, the indoor unit shall run at operation speed of 51rps, for a minute.

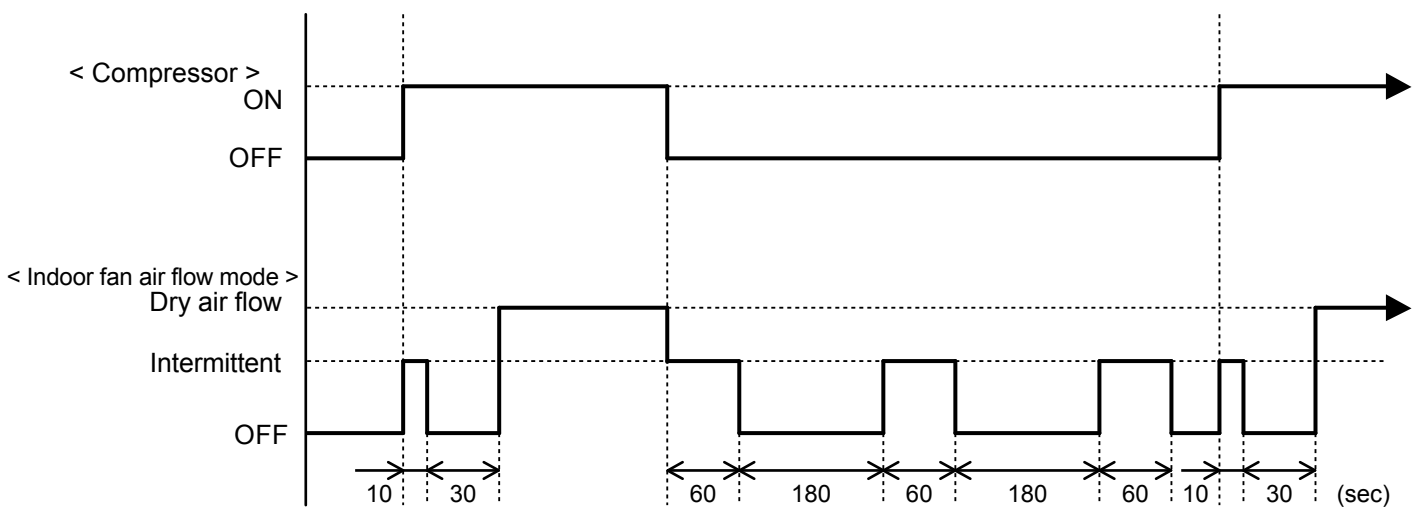
(Table 2 : Compressor speed)

	Operating speed
	ASU30 / 36CLX1
X zone	29rps
J zone	16rps
Y zone	0rps

(Fig.2 : Compressor control based on room temperature)



(Fig.3 : Indoor fan control)

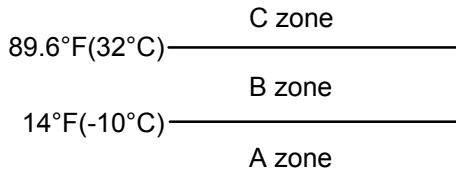


3. AUTO CHANGEOVER OPERATION

When the air conditioner is set to the Auto mode by remote controller, operation starts in the optimum mode from among the 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 outdoor temperature are sensed and the operation mode is selected in accordance with the table below.

(Fig.4 : Outdoor temperature zone selection)



(Table 3 : Operation mode selection table)

Outdoor temperature (Ta) Room temperature (TR)	A zone	B zone	C zone
$TR > Ts + 4^{\circ}\text{F}(+2^{\circ}\text{C})$	COOLING (automatic dry)	COOLING (automatic dry)	COOLING (automatic dry)
$Ts + 4^{\circ}\text{F}(+2^{\circ}\text{C}) \geq TR \geq Ts - 4^{\circ}\text{F}(-2^{\circ}\text{C})$	Monitoring	Monitoring	Monitoring
$TR < Ts - 4^{\circ}\text{F}(-2^{\circ}\text{C})$	Monitoring	Monitoring	Monitoring

- ② When COOLING was selected at ①, the air conditioner operates as follow:
- The same operation as COOLING OPERATION of page 01-01 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 page 01-02 is performed.
 - If the room temperature reaches set temperature +4°F(+2°C) during DRY mode, operation returns to COOLING.
- ③ When the compressor was stopped for 6 consecutive minutes by the temperature control function after the COOLING mode was selected at ① above, operation is switched to Monitoring and the operation mode is selected again.

4. INDOOR FAN CONTROL

1. Fan speed

(Table 4 : Indoor fan speed table)

ASU30CLX1

Operation mode	Air flow mode	Fan Speed
Cooling / Fan	Hi	1480
	Me	1220
	Lo	1020
	Quiet	900
Dry	Quiet	X zone:900
		J zone:850
	Intermittent	850

ASU36CLX1

Operation mode	Air flow mode	Fan Speed
Cooling / Fan	Hi	1560
	Me	1220
	Lo	1020
	Quiet	900
Dry	Quiet	X zone:900
		J zone:850
	Intermittent	850

2. FAN OPERATION

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

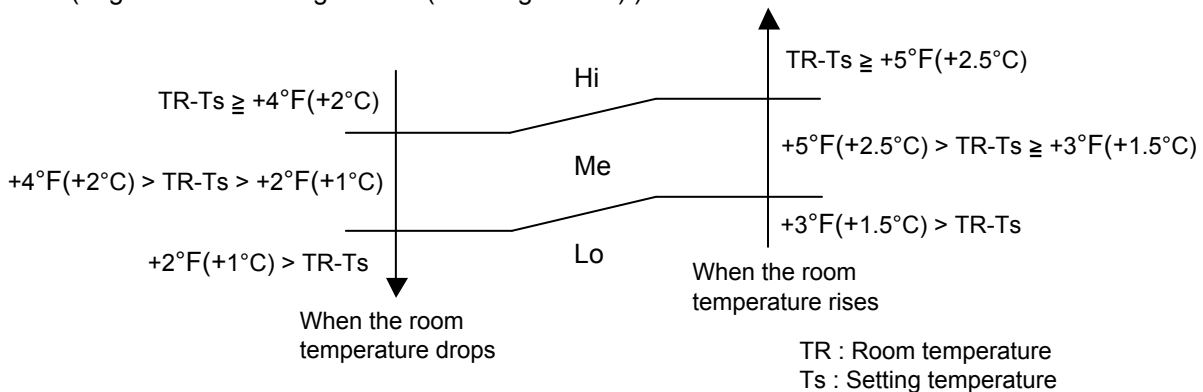
When Fan mode is set at (Auto), it operates on (Me) Fan Speed.

3. COOLING OPERATION

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

On the other hand, if switched in [Hi] ~[Quiet], the indoor motor will run at a constant airflow of [Cooling] operation modes Quiet, Lo, Me, Hi, as shown in Table 4.

(Fig.5 : 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. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

Following table shows the type of the outdoor fan motor. The control method is different between AC motor and DC motor.

(Table 5 : Type of motor)

	AC Motor	DC Motor
ASU30CLX1 ASU36CLX1		○

2. Fan Speed

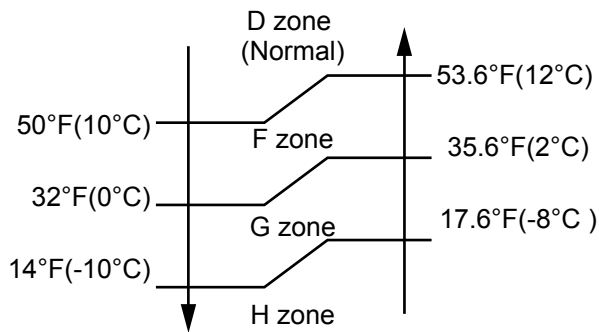
(Table 6 : Outdoor fan speed)

[rpm]

ASU30CLX1 ASU36CLX1	Outdoor temp. zone	Cooling	Dry
	D	850/ 800/ 620/ 500/ 400	550/ 450
F	500/ 320/ 250		
G	300/ 230/ 200		
H	220/ 200		

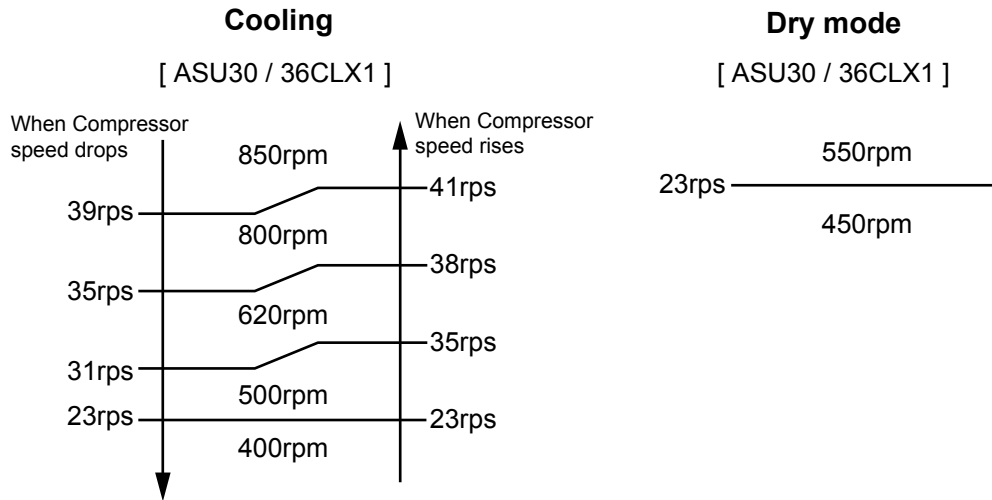
3. Outdoor temperature zone

(Fig. 6 : Outdoor temperature zone)

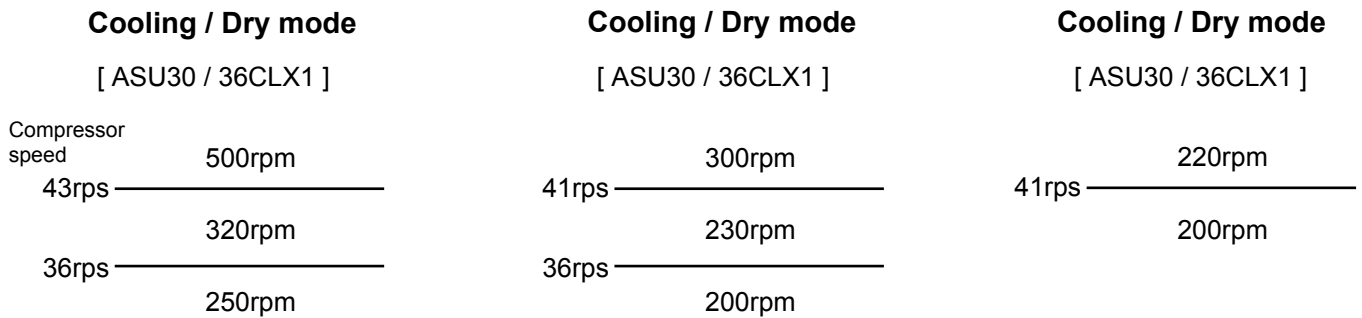


4. Zone control

D zone (Normal operation)



F zone (Low ambient air cooling) G zone (Low ambient air cooling) H zone (Low ambient air cooling)



* When D Zone , it runs at 500rpm for 20 seconds after starting up the outdoor fan.
When F,G and H Zone, it runs at 200rpm for 20 seconds after starting up the outdoor fan.

* The outdoor fan speed mentioned above depends on the compressor speed.
When the compressor speed increases, the outdoor fan speed also changes to the higher speed.
When the compressor speed decreases, the outdoor fan speed also changes to the lower speed.

Outdoor temperature falls, and if it becomes F, G and H zone, rotations of fan speed will fall.
[Prevent dew fly in frigid temperature] (Refer to Fig.6)

6. LOUVER CONTROL

1. VERTICAL LOUVER CONTROL

(Function Range)

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

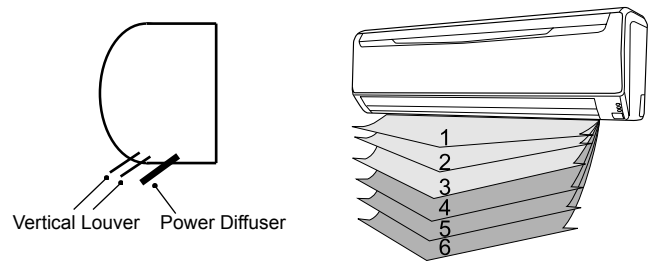
① ⇄ ② ⇄ ③ ⇄ ④ ⇄ ⑤ ⇄ ⑥

(Table8 : Recommended Operation Range)

Cooling / Dry mode ①—②—③

Fan mode ①—②—③—④—⑤—⑥

Fig.7 : Vertical Air Direction Range



Use the air direction adjustments within the ranges shown above.

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

Cooling / Dry mode : Horizontal flow ①

2. HORIZONTAL LOUVER CONTROL

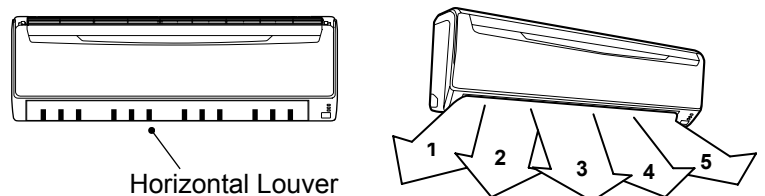
(Function Range)

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

Cooling / Dry mode / Fan mode

① ⇄ ② ⇄ ③ ⇄ ④ ⇄ ⑤

Fig.8 : Horizontal Air Direction Range



3. 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

Fan mode(④~⑥) : ③ ⇄ ⑥

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

※ Only Vertical louver and Horizontal louver swings in the swing operation, Power Diffuser doesn't swing.

7. COMPRESSOR CONTROL

1. OPERATION SPEED RANGE

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

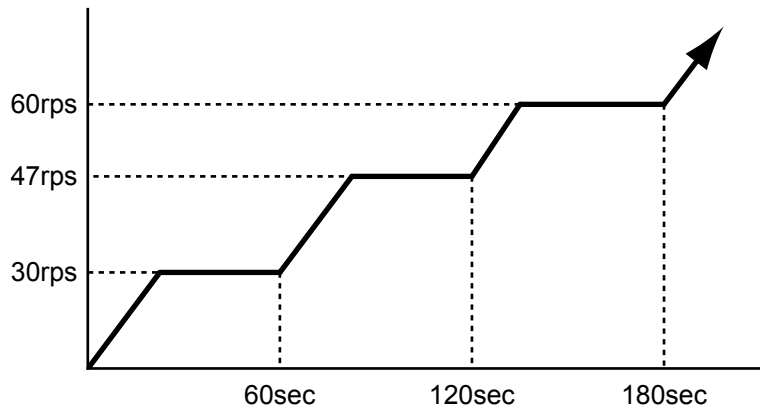
(Table 7 : Compressor operation speed range)

	Dry		Cooling	
	Minimum	Maximum	Minimum	Maximum
ASU30CLX1 ASU36CLX1	16rps	29rps	16rps	72rps

2. OPERATION SPEED CONTROL AT START-UP

The compressor speed soon after the start-up is controlled as shown in the Fig.9.

(Fig.9 : Normal Start-up)



3. LIMITED COMPRESSOR MINIMUM SPEED BY OUTDOOR TEMPERATURE

The minimum speed of compressor is limited by outdoor temperature as shown in the Fig.10

(Fig.10 : Compressor minimum speed limitation)

< Cooling / Dry mode >	
[ASU30 / 36CLX1]	
Minimumcompressor speed	
Outdoor temperature	
100.4°F(38°C)	25 rps
80.6°F(27°C)	16 rps
66.2°F(19°C)	16 rps
50°F(10°C)	16 rps
32°F(0°C)	25 rps
14°F(-10°C)	32 rps
	40 rps

8. TIMER OPEARTION CONTROL

8-1 WIRELESS REMOTE CONTROLLER

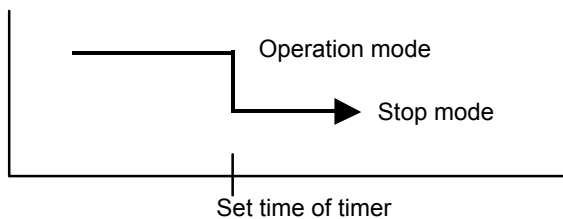
The table 8 shows the available timer setting based on the product model.

(Table 8 : Timer setting)

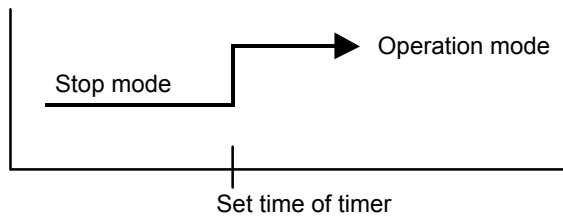
	ON TIMER / OFF TIMER	PROGRAM TIMER	SLEEP TIMER
ASU30 / 36CLX1	○	○	○

1. OPEARTION FREQUENCY RANGE

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

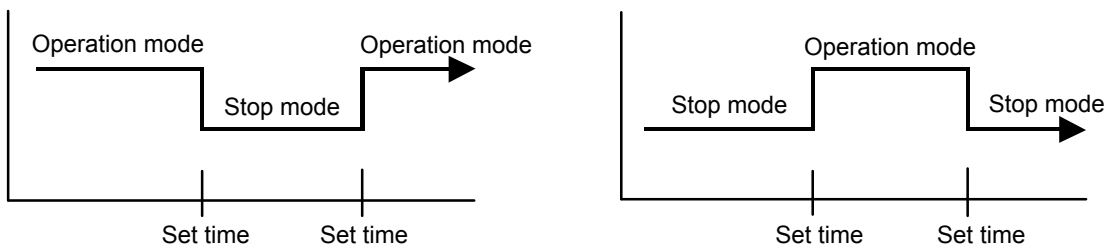


- ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. PROGRAM TIMER

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



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

3. SLEEP TIMER

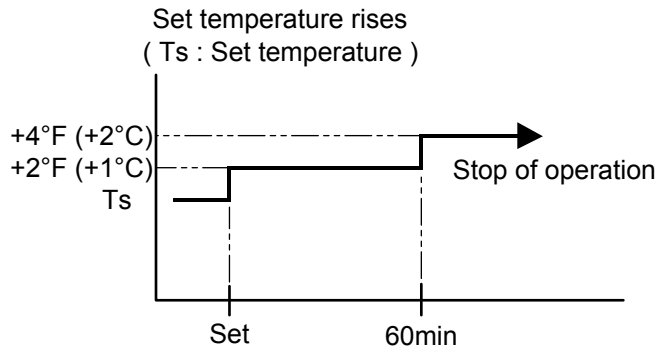
If the sleep is set, the room temperature is monitored and the operation is stopped automatically. If the operation mode or the set temperature is change after the sleep timer is set, the operation is continued according to the changed setting of the sleep timer from that time ON.

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.

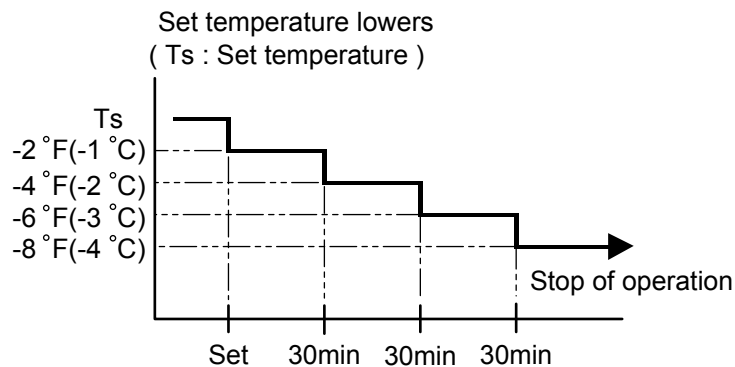


In the heating operation mode

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



8-2 WIRED REMOTE CONTROLLER (OPTION)

The Table 9 shows the available timer setting based on the product model.

(Table 9 : Timer setting)

	ON TIMER / OFF TIMER	WEEKLY TIMER	TEMPERATURE SET BACK TIMER
ASU30 / 36CLX1	○	○	○

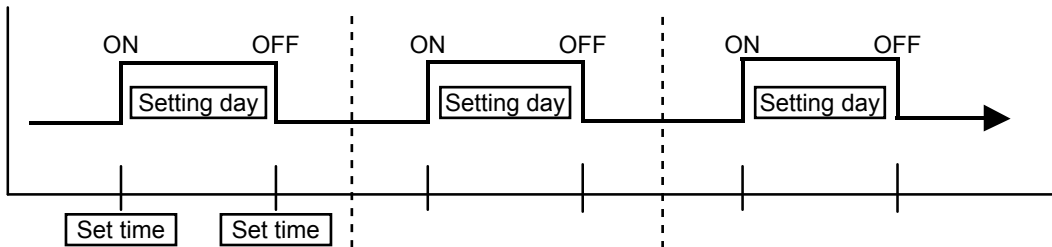
1. ON TIMER / OFF TIMER

Same to 8-1 1.ON TIMER / OFF TIMER and shown in those.

2. WEEKLY TIMER

This timer function can set operation times of the each day of the week.

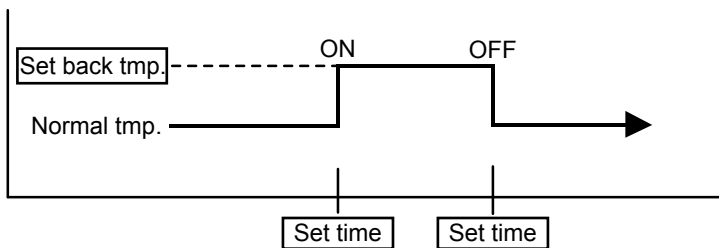
All days can be set together, the weekly timer can be used to repeat the timer setting for all of the days.



3. TEMPERATURE SET BACK TIMER

This timer function can change setting temperature of setting operation times of the each day of the week.

This can be together with other timer setting.



9. 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 Table 10.

The compressor speed, the temperatures detected by the discharge temperature sensor, the indoor heat exchanger sensor, the outdoor heat exchanger sensor, and the outdoor temperature sensor.

(Table 10 : The pulse range of the electronic expansion valve control)

Operation mode	Pulse range
	ASU30 / 36CLX1
Cooling / Dry mode	53 - 480 pulses.

* At the time of supplying the power to the outdoor unit, the initialization of the electronic expansion valve is operated (528 pulses are input to the closing direction).

10. TEST OPERATION CONTROL

[Wireless remote controller]

Under the condition where the air conditioner runs, press the test run 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.

[Wired remote controller (Option)]

If the operation lamp is on, press the Start/Stop button to turn it off.

Press the MODE and FAN buttons at the same time for more than two seconds to start the test operation.

The operation lamp will light up and "o1" will be displayed on the set temperature display.

[Release]

Perform the test operation for 60 minutes.

Pressing the Start/Stop button will stop the test operation.

11. 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.

12. AUTO RESTART

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

13. MANUAL AUTO OPERATION (Indoor unit body operation)

If MANUAL AUTO Button is set, the operation is controlled as shown in Table11.

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

(Table11. Detail of manual auto operation)

	Manual auto operation
OPERATION MODE	Auto changeover
FAN CONT. MODE	Auto
TIMER MODE	Continuous (No timer setting available)
SETTING TEMP.	72.5°F (24°C)
SETTING LOUVER(Horizontal)	Standard
SETTING LOUVER(Vertical)	Standard
DIFFUSER	Standard
SWING	OFF

14. FORCED COOLING OPERATION

If cooling operation is set, the operation is controlled as shown in Table12.

(Table12. Detail of forced cooling operation)

	Forced cooling operation
OPERATION MODE	Cooling
FAN CONT. MODE	Hi
SETTING TEMP.	Room temperature is not controlled
SETTING LOUVER(Horizontal)	Standard
SETTING LOUVER(Vertical)	Standard
DIFFUSER	Standard
SWING	OFF

Forced cooling operation is started when pressing MANUAL AUTO button for 10 seconds or more.

During the forced cooling operation, it operates regardless of room temperature sensor.

Operation LED and timer LED blink during the forced cooling operation. They blink for 1 second ON and 1 second OFF on both operation LED and timer LED (same as test operation).

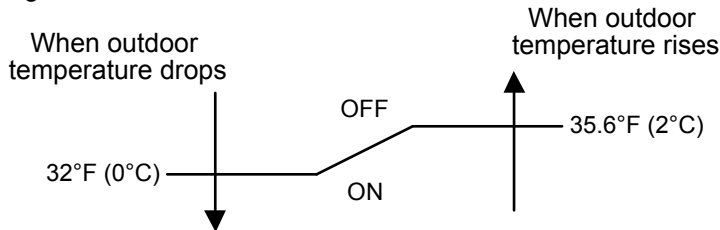
Forced cooling operation is released after 60 minutes of starting operation.

FORCED COOLING OPERATION will start as shown in Table12 .

15. COMPRESSOR PREHEATING

When the outdoor temperature is lower than 32°F (0°C) 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 35.6°F (2°C) or greater, preheating is ended.



16. 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 speed -10rps, and it continues -10rps/120seconds until the temperature becomes lower than Temperature I.

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

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

(Table 13: Discharge temperature over rise prevention control / Release temperature)

	Temperature I	Temperature II	Temperature III
ASU30 / 36CLX1	104°C	101°C	110°C

2. CURRENT RELEASE CONTROL

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

(Table 14 : Current release operation value / Release value)

[Cooling / Dry mode]

ASU30CLX1	
Ta (Control / Release)	
	9.0A / 8.5A
122°F(50°C)	10.0A / 9.5A
114.8°F(46°C)	13.0A / 12.5A
104°F(40°C)	16.0A / 15.5A

Ta : Outdoor Temperature

ASU36CLX1	
Ta (Control / Release)	
	9.0A / 8.5A
122°F(50°C)	10.0A / 9.5A
114.8°F(46°C)	13.0A / 12.5A
104°F(40°C)	16.5A / 16.0A

Ta : Outdoor Temperature

3. ANTIFREEZING CONTROL (Cooling and Dry mode)

The compressor speed 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 15 : Anti-freezing protection operation / Release temperature)

[ASU30 / 36CLX1]

Outdoor temperature	Temperature I	Temperature II
Over than 50°F(10°C) *1 or 53.6°F(12°C) *2	39.2°F(4°C)	44.6°F(7°C)
Less than 50°F(10°C) *1 or 53.6°F(12°C) *2		55.4°F(13°C)

*1. When the temperature rises.

*2. When the temperature drops.

4. COOLING PRESSURE OVERRISE PROTECTION

When the outdoor unit heat exchange sensor temperature rises to 152.6°F(67°C) or greater, the compressor is stopped and trouble display is performed.

5. 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.

When the pressure switch is opened for 10 seconds from power on, all of outdoor unit operation is stopped. The outdoor unit will start up if the pressure switch is returned to ON after 10 seconds has passed.

6. COMPRESSOR TEMPERATURE PROTECTION

When the compressor temperature sensor detects higher than 226.4°F(108°C), the compressor is stopped.

The protection is released when the compressor temperature sensor detects 176°F(80°C) after 3 minutes of compressor stop.

*If this protection operates 2 times within 24 hours, the compressor will stop permanently.

7. THERMISTOR ABNORMAL DETECTION

When the value detected with the thermistor is beyond the range of the following, It is judged as abnormal.

(Table 16 : Detection range of each thermistor)

[ASU30 / 36CLX1]

Thermistor	Detection range
Discharge temperature Compressor temperature	-31°F ~ 302°F (-35°C ~ 150°C)
Outdoor heat exchanger	-40°F ~ 190.4°F (-40°C ~ 88°C)
Outdoor temperature	-40°F ~ 176°F (-40°C ~ 80°C)

WALL MOUNTED type INVERTER

2 . TROUBLE SHOOTING

2. TROUBLE SHOOTING

2-1 ERROR DISPLAY

2-1-1 INDOOR UNIT AND WIRED RMOTE CONTROLLER DISPLAY

1. ERROR DISPLAY

Please refer the blinking pattern as follows.

Indoor Unit : ASU30 / 36CLX1

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

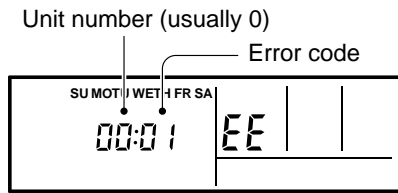
Error contents	Indoor Unit display		Wired Rmote Controller Display (option)	Trouble shooting
	Operation (Red)	Timer (Green)		
Serial error (Serial reverse transfer error)	—	2 times ○ 3 times ○	01	1
Serial error (Serial forward transfer error)	—	4 times ○ 5 times ○	13	2
Wired remote controller error	—	8 times ○	00	3
Room temperature thermistor error	2 times ○	2 times ○	02	4
Indoor heat exchanger temperature thermistor (Middle) error		3 times ○	04	5
Outdoor discharge pipe temperature thermistor error	3 times ○	2 times ○	0C	6
Outdoor heat exchanger temperature thermistor error		3 times ○	06	7
Outdoor temperature thermistor error		4 times ○	0A	8
Compressor thermistor error		8 times ○	15	9
Manual auto switch error	4 times ○	2 times ○	20	10
Power supply frequency detection error		4 times ○	No Display	11
Over current protection	5 times ○	2 times ○	17	12
CT error		3 times ○	18	13
Compressor location detection error		5 times ○	1A	14
Outdoor unit fan error		6 times ○	1b	15
Indoor fan motor lock error	6 times ○	2 times ○	12	16
Indoor fan motor rev. error		3 times ○	12	16
Discharge temperature error	7 times ○	2 times ○	0F	17
Excessive high pressure protection on cooling		3 times ○	24	18
4-way valve error		4 times ○	2c	21
Pressure SW (sensor) error		5 times ○	16	22
Compressor temperature error		6 times ○	2b	23
Active filter error	8 times ○	2 times ○	19	19
		3 times ○		
PFC circuit error		4 times ○	25	24
Model distinction error (Indoor)	●	●	11	20

○ 0.5s ON / 0.5s OFF (Flash) ● 0.1s ON / 0.1s OFF (Flash) — : OFF

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

1. SELF - DIAGNOSIS

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



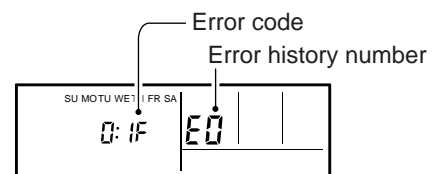
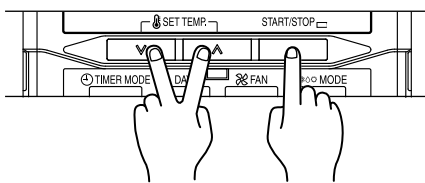
ex. Self-diagnosis check

2. ERROR CODE HISTORY DISPLAY

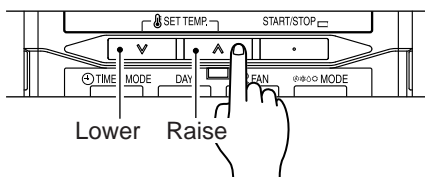
Up to 16 memorized error codes may be displayed for the indoor unit connected to the remote controller.

1. Stop the air conditioner operation.

2. Press the SET TEMP. buttons ∇ , \blacktriangle and START / STOP simultaneously for 3 seconds or more to start the self-diagnosis.



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



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

4. Press the SET TEMP. buttons ∇ , \blacktriangle and START / STOP simultaneously for 3 seconds or more or there is no key input for 60 seconds to stop the display.

2-2 TROUBLE SHOOTING WITH ERROR CODE

Trouble shooting 1
OUTDOOR UNIT Error Method:
Serial Error
(Serial Reverse Transfer Error)

Indicate or Display:

Refer to error code table.

Detective Actuators:

Outdoor Unit Main PCB

Detective details:

When the indoor unit cannot properly receive the serial signal from outdoor unit for 10 seconds or more.

Forecast of Cause:

1. Connection failure 2. External cause 3. Main PCB failure 4. Inverter PCB failure 5. ACTPM failure

Check Point 1-1 : Reset the power and operate

- Does error indication reappear?

YES

Check Point 2 : Check connection

- Check any loose or removed connection line of between indoor unit and outdoor unit.
>> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
- Check connection condition in control unit.
 (If there is loose connector, open cable or mis-wiring)

OK

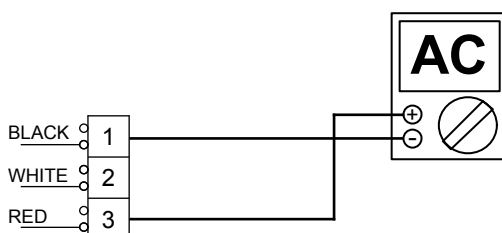
Check Point 3 : Check the voltage of power supply

- Check the voltage of power supply
>> Check if AC187(AC208V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L - N.

OK

Check Point 4 : Check serial signal (Reverse transfer signal)

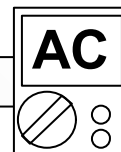
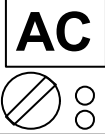
- Check serial signal (Reverse transfer signal)
>> Check if indicated value swings between AC70V and AC130V at outdoor unit terminal 1 - 3.
>> If it is abnormal, Check ACTPM. (PARTS INFORMATION 4)
>> if ACTPM is abnormal, replace it.
>> If it is abnormal, Check Outdoor fan motor. (PARTS INFORMATION 5)
>> If Outdoor fan motor is abnormal, replace Outdoor fan motor and Main PCB.
>> If those are normal, replace Main PCB.



NO

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

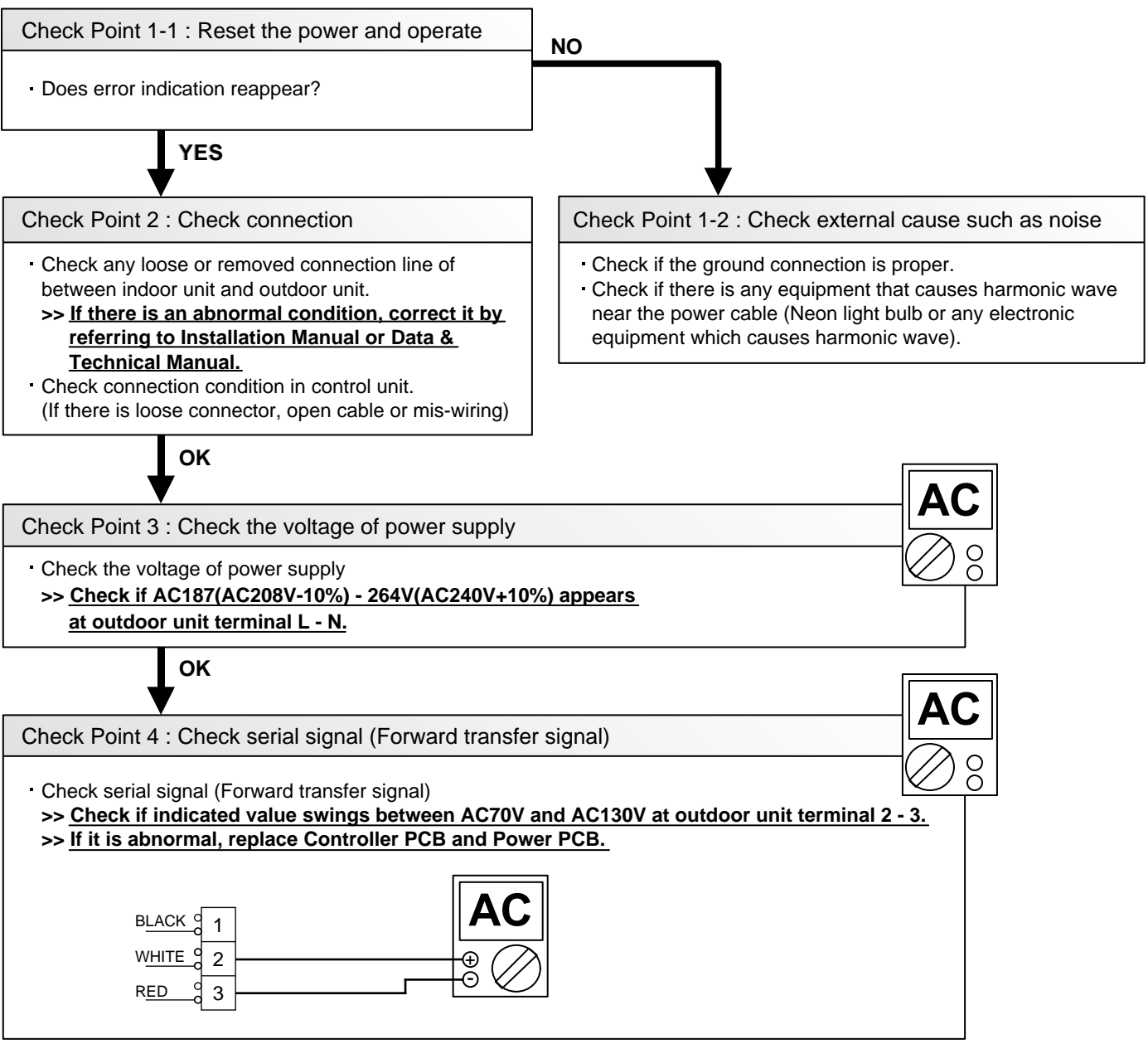
- Check if the ground connection is proper.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).



Trouble shooting 2 INDOOR UNIT Error Method: Serial Error (Serial Forward Transfer Error)	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Indoor Unit Controller PCB	Detective details: When the indoor unit cannot properly receive the serial signal from outdoor unit for 10 seconds or more.
---	---

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



Trouble shooting 3 <u>INDOOR UNIT Error Method:</u> Wired Remote Controller Error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Indoor unit Controller PCB Wired Remote Controller(Optional)	<u>Detective details:</u> When the indoor unit cannot properly receive the signal from Wired Remote Controller for 1 minute or more.
---	---

<u>Forecast of Cause:</u> 1. Connection failure 2. Wired Remote Controller failure 3. Controller PCB failure
--

Check Point 1 : Check the connection of terminal

<u>Check & correct the followings.</u> • Check the connection of terminal between Wired Remote Controller and indoor unit, and check if there is a disconnection of the cable.
--



Check Point 2 : Check Wired Remote Controller and Controller PCB

• Check voltage at connector of Wired Remote Controller of Controller PCB. (Power supply to Wired Remote Controller) >> CN6, 1 - 3 pin If it is DC12V, Wired Remote Controller is failure. (Controller PCB is normal) >> <u>Replace Wired Remote Controller (Option)</u> If it is DC 0V, Controller PCB is failure. >> <u>Replace Controller PCB.</u>	
--	--

Trouble shooting 4 INDOOR UNIT Error Method: Room Temperature Thermistor Error	Indicate or Display: Refer to error code table.
---	--

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

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

Check Point 1 : Check connection of connector

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

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



Check Point 2 : Remove connector and check thermistor resistance value								
Thermistor characteristics (Approx. value)								
Temperature (°C)	0	5	10	15	20	25	30	35
Temperature (°F)	32	41	50	59	68	77	86	95
Resistance value (kΩ)	33.6	25.9	20.2	15.8	12.5	10.0	8.04	6.51

Temperature (°C)	40	45	50
Temperature (°F)	104	113	122
Resistance value (kΩ)	5.30	4.35	3.59

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



Check Point 3 : Check voltage of Controller PCB (DC5.0V)	DC
Make sure circuit diagram of indoor unit and check terminal voltage at thermistor (DC5.0V)	
► If the voltage does not appear, replace Controller PCB.	

Trouble shooting 5 INDOOR UNIT Error Method: Indoor Heat Exchanger Temperature Thermistor (Middle) Error	Indicate or Display: Refer to error code table.
---	--

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

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

Check Point 1 : Check connection of connector

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

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



Check Point 2 : Remove connector and check thermistor resistance value										
Thermistor characteristics (Approx. value)										
Temperature (°C)	0	5	10	15	20	25	30	35		
Temperature (°F)	32	41	50	59	68	77	86	95		
Resistance value (kΩ)	176	134	103	80.3	62.9	49.7	39.6	31.7		

Temperature (°C)	40	45	50
Temperature (°F)	104	113	122
Resistance value (kΩ)	25.6	20.8	17.1

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



Check Point 3 : Check voltage of Controller PCB (DC5.0V)		
Make sure circuit diagram of indoor unit and check terminal voltage at thermistor (DC5.0V)		

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

Trouble shooting 6 OUTDOOR UNIT Error Method: Outdoor Discharge Pipe Temperature Thermistor Error	Indicate or Display: Refer to error code table.
--	--

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

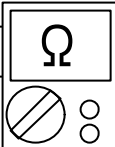
Forecast of Cause :
1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of connector

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

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



Check Point 2 : Remove connector and check thermistor resistance value 


Thermistor characteristics (Approx. value)

Temperature (°C)	0	5	10	15	20	30	40	50	60
Temperature (°F)	32	41	50	59	68	86	95	122	140
Resistance value (kΩ)	168	130	101	79.0	63.0	40.0	26.3	17.8	12.3

Temperature (°C)	70	80	90	100	120
Temperature (°F)	158	176	194	212	248
Resistance value (kΩ)	8.7	6.3	4.6	3.4	2.0

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



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

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

CN64 1 BROWN 2 BROWN 3 THERMISTOR (COMPRESSOR TEMP.)
CN62 1 BLUE 2 BLUE 3 THERMISTOR (OUTDOOR TEMP.)
CN65 1 BLACK 2 BLACK 3 THERMISTOR (HEAT EXCHANGER)
CN63 1 BROWN 2 BROWN 3 THERMISTOR (DISCHARGE PIPE)

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

Trouble shooting 7 OUTDOOR UNIT Error Method: Outdoor Heat Exchanger Temperature Thermistor Error	Indicate or Display: Refer to error code table.
--	--

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

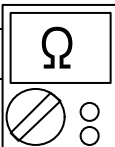
Forecast of Cause :
 1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of connector

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

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




Check Point 2 : Remove connector and check thermistor resistance value 

Thermistor characteristics (Approx. value)

Temperature (°C)	-10	-5	0	5	10	15	20	25	30	35
Temperature (°F)	14	23	32	41	50	59	68	77	86	95
Resistance value (kΩ)	27.8	21.0	16.1	12.4	9.63	7.56	5.98	4.77	3.84	3.11

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



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

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

CN64 BROWN THERMISTOR (COMPRESSOR TEMP.)
 1 2 3
 BROWN
CN62 BLUE THERMISTOR (OUTDOOR TEMP.)
 1 2 3
 BLUE
CN65 BLACK THERMISTOR (HEAT EXCHANGER)
 1 2 3
 BLACK
CN63 BROWN THERMISTOR (DISCHARGE PIPE)
 1 2 3
 BROWN

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

Trouble shooting 8 OUTDOOR UNIT Error Method: Outdoor Temperature Thermistor Error	Indicate or Display: Refer to error code table.
---	--

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

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

Check Point 1 : Check connection of connector

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

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



Check Point 2 : Remove connector and check thermistor resistance value									
Thermistor characteristics (Approx. value)									
Temperature (°C)	-20	-10	-5	0	5	10	15	20	
Temperature (°F)	-4	14	23	32	41	50	59	68	
Resistance value (kΩ)	115	62.3	46.6	35.2	26.9	20.7	16.1	12.6	
Temperature (°C)	30	40	50	60	70				
Temperature (°F)	86	104	122	140	158				
Resistance value (kΩ)	7.97	5.18	3.45	2.36	1.65				
► If Thermistor is either open or shorted, replace it and reset the power.									



Check Point 3 : Check voltage of Main PCB (DC5.0V)		
Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC5.0V)		
	<p>THERMISTOR (COMPRESSOR TEMP.)</p> <p>THERMISTOR (OUTDOOR TEMP.)</p> <p>THERMISTOR (HEAT EXCHANGER)</p> <p>THERMISTOR (DISCHARGE PIPE)</p>	
► If the voltage does not appear, replace Main PCB.		

Trouble shooting 9 OUTDOOR UNIT Error Method: Compressor Thermistor Error	Indicate or Display: Refer to error code table.
--	--

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

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

Check Point 1 : Check connection of connector

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

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



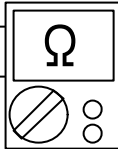
Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	0	5	10	15	20	30	40	50
Temperature (°F)	32	41	50	59	68	86	95	122
Resistance value (kΩ)	168	130	101	79	63	40	26.3	17.8

Temperature (°C)	60	70	80	90	100	120
Temperature (°F)	120	158	176	194	212	248
Resistance value (kΩ)	12.3	8.7	6.3	4.6	3.4	2.0

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



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

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


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



Trouble shooting 10 <u>INDOOR UNIT Error Method:</u> Manual Auto Switch Error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Indoor Unit Controller PCB Manual Auto Switch	<u>Detective details:</u> When the Manual Auto Switch becomes ON for consecutive 30 or more seconds.
--	--

Forecast of Cause :
 1. Manual Auto Switch failure 2. Controller PCB failure

Check Point 1 : Check the Manual Auto Switch	
<ul style="list-style-type: none"> • Check if Manual Auto Switch is kept pressed. • Check ON/OFF switching operation by using a meter. <p>>> <u>If Manual Auto Switch is disabled (on/off switching), replace it.</u></p>	

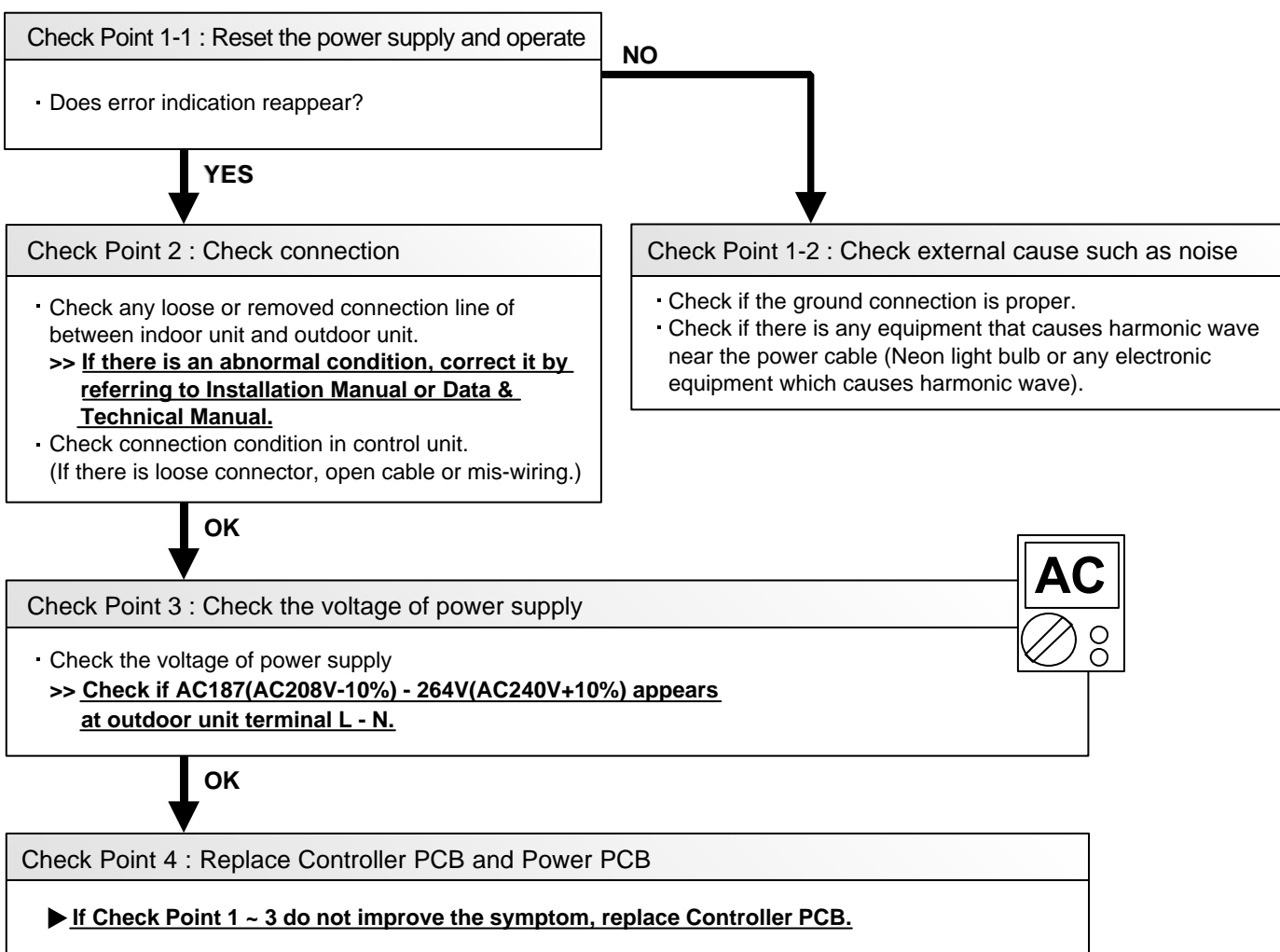


Check Point 2 : Replace Controller PCB
<p>▶ <u>If Check Point 1 do not improve the symptom, replace Controller PCB.</u></p>

Trouble shooting 11 <u>INDOOR UNIT Error Method:</u> Power Supply Frequency Detection Error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Indoor Unit Controller PCB	<u>Detective details:</u> When power frequency is not detected by 4 seconds after power-on.
--	---

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



Trouble shooting 12 <u>OUTDOOR UNIT Error Method:</u> Over Current Protection	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Main PCB Compressor	<u>Detective details:</u> ① When over current flows in Controller PCB, the compressor stops. ② After the compressor restarts, if the same error is repeated within 40sec, the compressor stops reappear. ③ If ① and ② repeats 5 times, the compressor stops permanently.
---	--

<u>Forecast of Cause :</u> 1. Connection failure 2. Outdoor Fan operation failure 3. Outdoor Heat Exchanger clogged 4. Compressor failure 5. Main PCB failure 6. Inverter PCB failure
--

Check Point 1 : Check connections condition in control unit
<ul style="list-style-type: none"> · Check if the terminal connection is loose. · Check if connector is removed. · Check if connector is erroneous connection. · Check if cable is open. <p>>> <u>Upon correcting the removed connector or mis-wiring, reset the power.</u></p>

↓
OK

Check Point 2 : Check Outdoor Heat Exchanger
<ul style="list-style-type: none"> · Is there any obstructing the air flow route? · Is there any clogging of outdoor unit Heat Exchanger? <p>>> <u>If clogged, clear the clog.</u></p>

↓
OK

Check Point 3 : Check Outdoor Fan
<ul style="list-style-type: none"> · Check Outdoor Fan Motor. (Refer to Trouble shooting 15) <p>>> <u>If the Fan Motor is failure, replace it.</u></p>

↓
OK

Check Point 4 : Check Compressor
<ul style="list-style-type: none"> · Compressor check is refer to SERVICE PARTS INFORMATION 2. <p>>> <u>If it is abnormal, replace Compressor.</u></p>

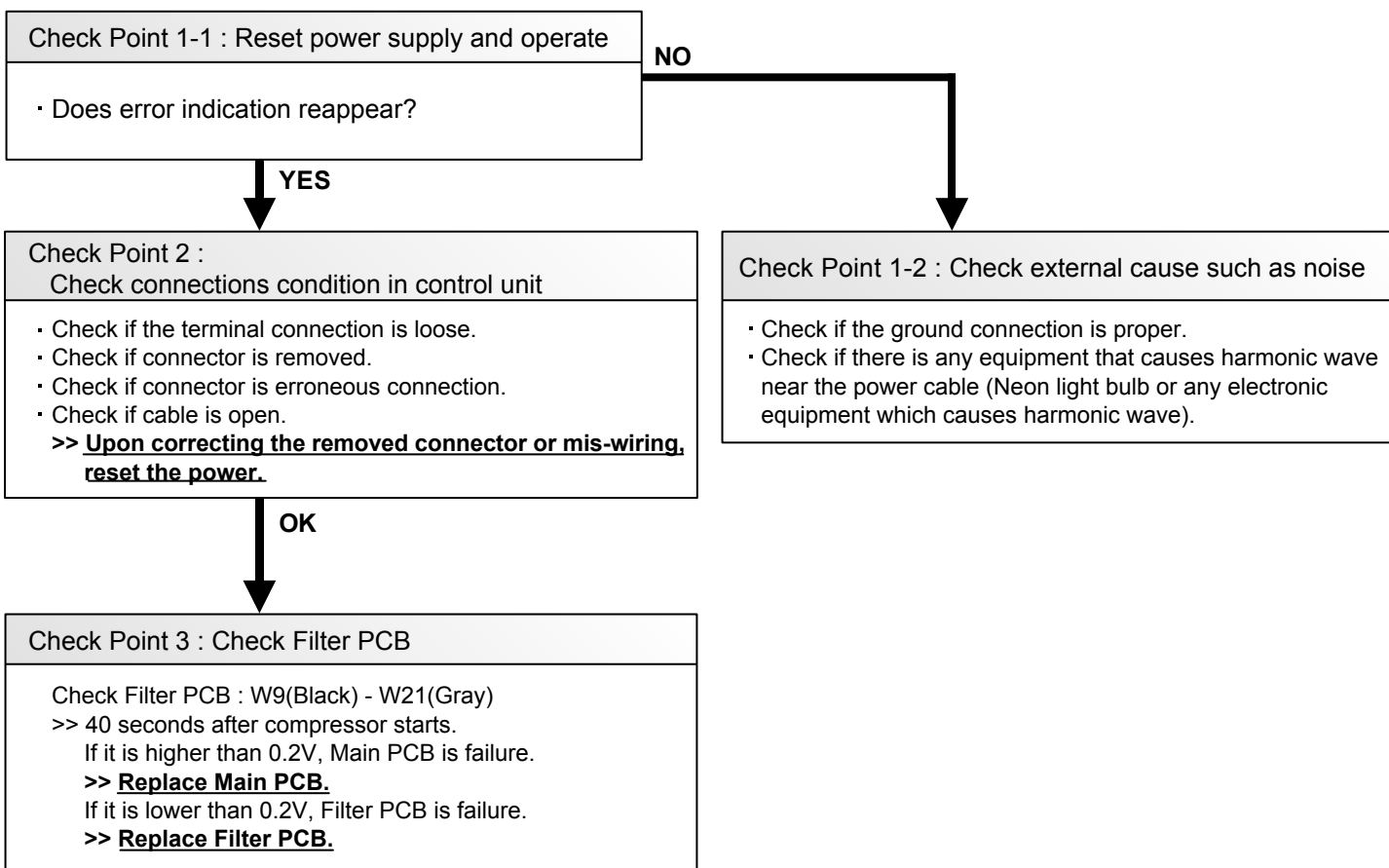
↓
OK

Check Point 5 : Replace Main PCB
<p>▶ <u>If Check Point 1 ~ 4 do not improve the symptom, replace Main PCB or Inverter PCB.</u></p>

Trouble shooting 13 <u>OUTDOOR UNIT Error Method:</u> CT Error	<u>Indicate or Display:</u> Refer to error code table.
--	--

<u>Detective Actuators:</u> Outdoor Unit Main PCB Outdoor Unit Filter PCB	<u>Detective details:</u> · After compressor runs for 1 minute or more, and while it runs in 56rps or more. · When outdoor current value (A/D data) of Input Current Sensor has detected [00H].
--	--

<u>Forecast of Cause :</u> 1. Connection failure 2. External cause 3. Filter PCB failure 4. Main PCB failure



Trouble shooting 14 <u>OUTDOOR UNIT Error Method:</u> Compressor Location Detection Error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Inverter PCB	<u>Detective details:</u> When "compressor location detection error" is detected consecutively 5 times, within 40 seconds after start-up.
---	---

<u>Forecast of Cause :</u> 1. Connector connection failure 2. Inverter PCB failure 3.Main PCB failure 4.Compressor failure

Check Point 1 : Check connections condition in control unit
<ul style="list-style-type: none"> • Check if the terminal connection is loose. • Check if connector is removed. • Check if connector is erroneous connection. • Check if cable is open. <p>>> <u>Upon correcting the removed connector or mis-wiring, reset the power.</u></p>



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

Trouble shooting 15 <u>OUTDOOR UNIT Error Method:</u> Outdoor Unit Fan Error	<u>Indicate or Display:</u> Refer to error code table.
---	---

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

<u>Forecast of Cause:</u> 1. Fan Motor failure 2. Motor protection by surrounding temperature rise 3. Main PCB failure
--

Check Point 1 : Check rotation of Fan
<ul style="list-style-type: none"> • Check if the Fan Motor is lock. (Can the Fan be rotated by hand when operation is off.) • Check the Fan loosening. (Lock-nut loosening, defective propeller fan) <p>>> <u>If Fan Motor or bearing is abnormal, replace it.</u></p>



Check Point 2 : Check ambient temp. around motor
<ul style="list-style-type: none"> • Check excessively high temperature around the motor. (If there is any surrounding equipment that causes heat) <p>>> <u>Upon the temperature coming down, restart operation.</u></p>



Check Point 3 : Check output voltage of Main PCB	DC 														
<ul style="list-style-type: none"> • Check outdoor unit circuit diagram and the voltage. (Measure at Main PCB side connector) <p>>>1 pin(Red) - 4 pin(Black) DC250V ~ 400V >>4 pin(Black) - 5 pin(White) DC15V ±2V</p>															
<p style="text-align: center;">FAN MOTOR</p> <p style="text-align: center;">FM</p> <p style="text-align: center;">RED BLACK WHITE YELLOW BROWN</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> </table> <p style="text-align: center;">CN800</p>	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
1	2	3	4	5	6	7									
1	2	3	4	5	6	7									
▶ <u>If the voltage is not correct, replace Main PCB.</u>															

Trouble shooting 16 <u>INDOOR UNIT Error Method:</u> Indoor Fan Motor Lock Error Indoor Fan Motor Rev. Error	<u>Indicate or Display:</u> Refer to error code table.
---	---

<u>Detective Actuators:</u> Indoor Unit Controller PCB Indoor Fan Motor	<u>Detective details:</u> When the condition that actual rev. of Indoor Fan is 1/3 or less. Or the condition of fan speed is 0rpm is continued more than 56 seconds.
--	---

<u>Forecast of Cause:</u> 1. Fan Motor failure 2. Motor protection by surrounding temperature rise 3. Controller PCB failure
--

Check Point 1 : Check rotation of Fan
<ul style="list-style-type: none"> · Check if the Fan Motor is lock. (Can the Fan be rotated by hand when operation is off.) · Check the Fan loosening. (Lock-nut loosening, defective propeller fan) <p>>> <u>If Fan Motor or bearing is abnormal, replace it.</u></p>



Check Point 2 : Check ambient temp. around motor
<ul style="list-style-type: none"> · Check excessively high temperature around the motor. (If there is any surrounding equipment that causes heat) <p>>> <u>Upon the temperature coming down, restart operation.</u></p>

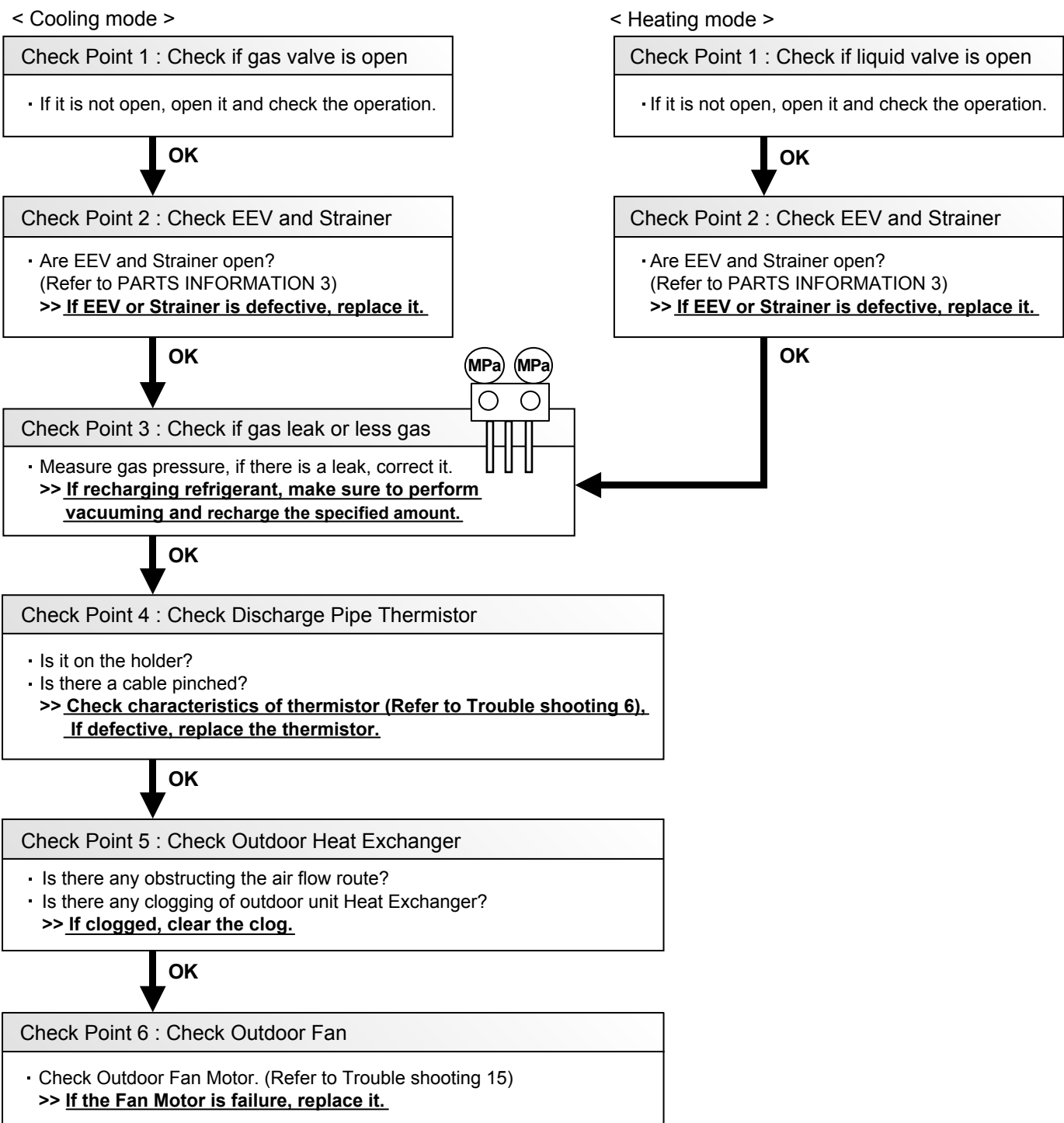


Check Point 3 : Replace Controller PCB
<p>▶ <u>If Check Point 1, 2 do not improve the symptom, replace Controller PCB.</u></p>

Trouble shooting 17 OUTDOOR UNIT Error Method: Discharge Temperature Error	Indicate or Display: Refer to error code table.
---	--

Detective Actuators: Outdoor Unit Main PCB Discharge Pipe Temperature Thermistor	Detective details: When the discharge temperature becomes higher than 239°F(115°C). When detecting it 2 times within 24 hours, the compressor stops.
---	---

Forecast of Cause : 1. Valve is close 2. EEV failure 3. Gas leak, less 4. Discharge Thermistor failure 5. Outdoor Fan operation failure 6. Outdoor Heat Exchanger clogged
--



Trouble shooting 18 <u>OUTDOOR UNIT Error Method:</u> Excessive High Pressure Protection On Cooling	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Main PCB Outdoor Fan Motor Heat Exchanger Temp. Thermistor Outdoor unit EEV	<u>Detective details:</u> In cooling operation, after 1 minute or more compressor starts, when outdoor heat exchanger temperature is 154.4°F (68 °C) and above.
---	---

<u>Forecast of Cause :</u>	
1. Connection failure 3. Outdoor Heat Exchanger clogged	2. Outdoor Fan operation failure 4. Thermistor failure 5. EEV failure 6. Main PCB failure

Check Point 1 : Check connections condition in control unit
<ul style="list-style-type: none"> · Check if the terminal connection is loose. · Check if connector is removed. · Check if connector is erroneous connection. · Check if cable is open. <p>>> <u>Upon correcting the removed connector or mis-wiring, reset the power.</u></p>



Check Point 2 : Check Outdoor Heat Exchanger
<ul style="list-style-type: none"> · Is there any obstructing the air flow route? · Is there any clogging of outdoor unit Heat Exchanger? <p>>> <u>If clogged, clear the clog it.</u></p>



Check Point 3 : Check Outdoor Fan
<ul style="list-style-type: none"> · Check Outdoor Fan Motor. (Refer to Trouble shooting 15) <p>>> <u>If the Fan Motor is failure, replace it.</u></p>



Check Point 4 : Check Thermistor
<ul style="list-style-type: none"> · Check Thermistor. (Refer to Trouble shooting 7) <p>>> <u>If the Thermistor is failure, replace it.</u></p>



Check Point 5 : Check EEV
<ul style="list-style-type: none"> · Check EEV. (PARTS INFORMATION 3) <p>>> <u>If the EEV is failure, replace it.</u></p>



Check Point 6 : Replace Main PCB
<p>▶ <u>If Check Point 1 ~ 5 do not improve the symptom, replace Main PCB.</u></p>

Trouble shooting 19 OUTDOOR UNIT Error Method: Active Filter Error	Indicate or Display: Refer to error code table.
---	--

Detective Actuators: Outdoor Unit Main PCB Outdoor Unit ACTPM PCB	Detective details: <ul style="list-style-type: none"> · Inverter low voltage protection · Inverter overvoltage protection
--	---

Forecast of Cause :
1. Connector connection failure 2. Inverter PCB failure 3. ACTPM failure 4. Main PCB failure

Check Point 1 : Check connections condition in control unit

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

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



Check Point 2 : Check Filter PCB

- Check if Protector is open(F100).
▶ **If Protector is open, replace it.**
- Check Varistor(VA100 - VA101).
▶ **If Varistor is defective, there is a possibility of an abnormal power supply. Check the correct power voltage and replace Filter PCB.**



Check Point 3 : Check ACTPM

- Check ACTPM (**PARTS INFORMATION 4**).
- ▶ **If ACTPM is abnormal, replace it.**



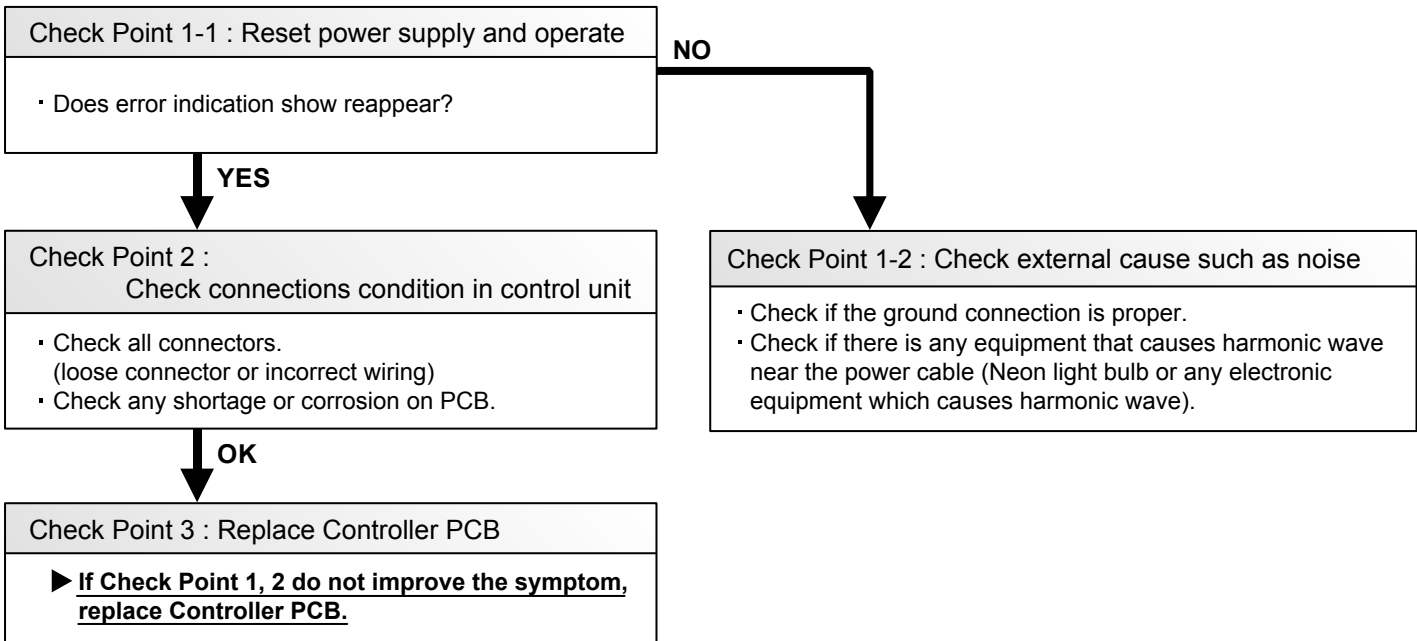
Check Point 4 : Replace Main PCB

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

Trouble shooting 20 <u>INDOOR UNIT Error Method:</u> Model Distinction Error (Indoor)	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Indoor Unit Controller PCB	<u>Detective details:</u> When power is on and there is some below case. 1. When model information of EEPROM is incorrect 2. When the access to EEPROM failed
--	---

<u>Forecast of Cause:</u> 1. External cause 2. Defective for connection in controller unit 3. Controller PCB failure
--



Trouble shooting 21 <u>OUTDOOR UNIT Error Method:</u> 4-way valve error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Inverter PCB Circuit 4-way valve	<u>Detective details:</u> When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops. <ul style="list-style-type: none"> ▪ Cooling or Dry operation [Indoor heat exchanger temp.] - [Room temp.] > 20°F(10°C) If the same operation is repeated 5 times, the compressor stops permanently.
--	---

<u>Forecast of Cause :</u> 1. Connector connection failure 2. Thermistor failure 3. Coil failure 4. 4-way valve failure 5. Inverter PCB failure
--

Check Point 1 : Check connection of Connector
<ul style="list-style-type: none"> ▪ Check if connector is removed. ▪ Check erroneous connection. ▪ Check if thermistor cable is open. >><u>Upon correcting the removed connector or mis-wiring, reset the power.</u>



Check Point 2 : Check each thermistor
<ul style="list-style-type: none"> ▪ Isn't it fallen off the holder? ▪ Is there a cable pinched? >> <u>Check characteristics of thermistor, If defective, replace the thermistor</u>



Check Point 3 : Check the solenoid coil and 4-way valve
<p>[Solenoid coil]</p> <ul style="list-style-type: none"> ▪ Remove CN500 from PCB and check the resistance value of coil. Resistance value is about 1.4kΩ >><u>If it is Open or abnormal resistance value, replace Solenoid Coil.</u> <p>[4-way valve]</p> <ul style="list-style-type: none"> ▪ Check each piping temperature, and the location of the valve by the temperature difference. >><u>If the value location is not proper, replace 4-way valve.</u>



Check Point 4 : Replace Inverter PCB
▶ <u>If Check Point 1- 3 do not improve the symptom, replace Inverter PCB.</u>

Trouble shooting 22 OUTDOOR UNIT Error Method: Pressure SW (Sensor) Error	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Outdoor Unit Main PCB Pressure Sensor	Detective details: 30 seconds or more after power-on, when pressure sensor detection value detects the condition below continuously for 30 seconds or more. • $P_s \geq 4.2$ [MPa]
---	---

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

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



Check Point 2 : Check output voltage of Main PCB	DC 										
<ul style="list-style-type: none"> • Check voltage of Main PCB. (Measure at Main PCB side connector) <p>>>1 pin(Red) - 2 pin(Red) DC5V ± 5%</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <table style="border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;">CN90</td> <td style="border-right: 1px solid black; padding: 2px 5px;">1</td> <td style="padding: 2px 5px;">1</td> <td style="padding: 2px 5px;">RED</td> <td rowspan="2" style="border: 1px solid black; padding: 2px 5px;">PS</td> <td rowspan="2" style="padding: 2px 5px;">PRESSURE SENSOR</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;"></td> <td style="border-right: 1px solid black; padding: 2px 5px;">2</td> <td style="padding: 2px 5px;">2</td> <td style="padding: 2px 5px;">RED</td> </tr> </table> </div> <p>▶ If the voltage is not correct, replace Main PCB.</p>	CN90	1	1	RED	PS	PRESSURE SENSOR		2	2	RED	
CN90	1	1	RED	PS			PRESSURE SENSOR				
	2	2	RED								



Check Point 3 : Replace Pressure Sensor
▶ If Check point 1 do not improve the symptom, replace Main PCB.

Trouble shooting 23 OUTDOOR UNIT Error Method: Compressor Temperature Error	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Outdoor Unit Main PCB Compressor Temperature Thermistor	Detective details: When the compressor temperature becomes 226.4°F (108°C) or more, the compressor is stopped. if the compressor temperature becomes 176°F(80°C) and 3minutes has passed, the compressor restarts. When it repeats 2times within 24hours, the compressor stops permanently.
---	---

Forecast of Cause : 1. Valve is close 2. EEV failure 3. Gas leak, less 4. Compressor Thermistor failure 5. Outdoor Fan failure 6. Outdoor heat exchanger clogged

< Cooling mode >

Check Point 1 : Check if gas valve is open

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

↓ OK

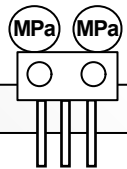
Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
(Refer to PARTS INFORMATION 3)
>> If EEV or Strainer is defective, replace it.

↓ OK

Check Point 3 : Check if gas leak or less gas

- Measure Gas pressure, if there is a leak, correct it.
>> If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.



↓ OK

Check Point 4 : Check Compressor Temperature Thermistor

- Is it on the holder?
- Is there a cable pinched?
- >> Check characteristics of thermistor (Refer to Trouble shooting 9). If defective, replace the thermistor.**

↓ OK

Check Point 5 : Check Outdoor Heat Exchanger

- Is there any obstructing the air flow route?
- Is there any clogging of outdoor unit Heat Exchanger?
>> If clogged, clear the clog.

↓ OK

Check Point 6 : Check Outdoor Fan

- Check Outdoor Fan Motor. (Refer to Trouble shooting 15)
>> If the Fan Motor is failure, replace it.

→ OK

Check Point 7 : Replace Main PCB

- ▶ If Check Point 1 ~ 6 do not improve the symptom, replace Main PCB.**

Trouble shooting 24 <u>OUTDOOR UNIT Error Method:</u> PFC circuit error	<u>Indicate or Display:</u> Refer to error code table.
--	---

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

<u>Forecast of Cause :</u> 1. External cause 2. Connector connection failure 3. Inverter PCB failure
--

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



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



Check Point 3 : Replace Inverter PCB
▶ <u>If Check Point 1, 2 do not improve the symptom, replace Inverter PCB.</u>

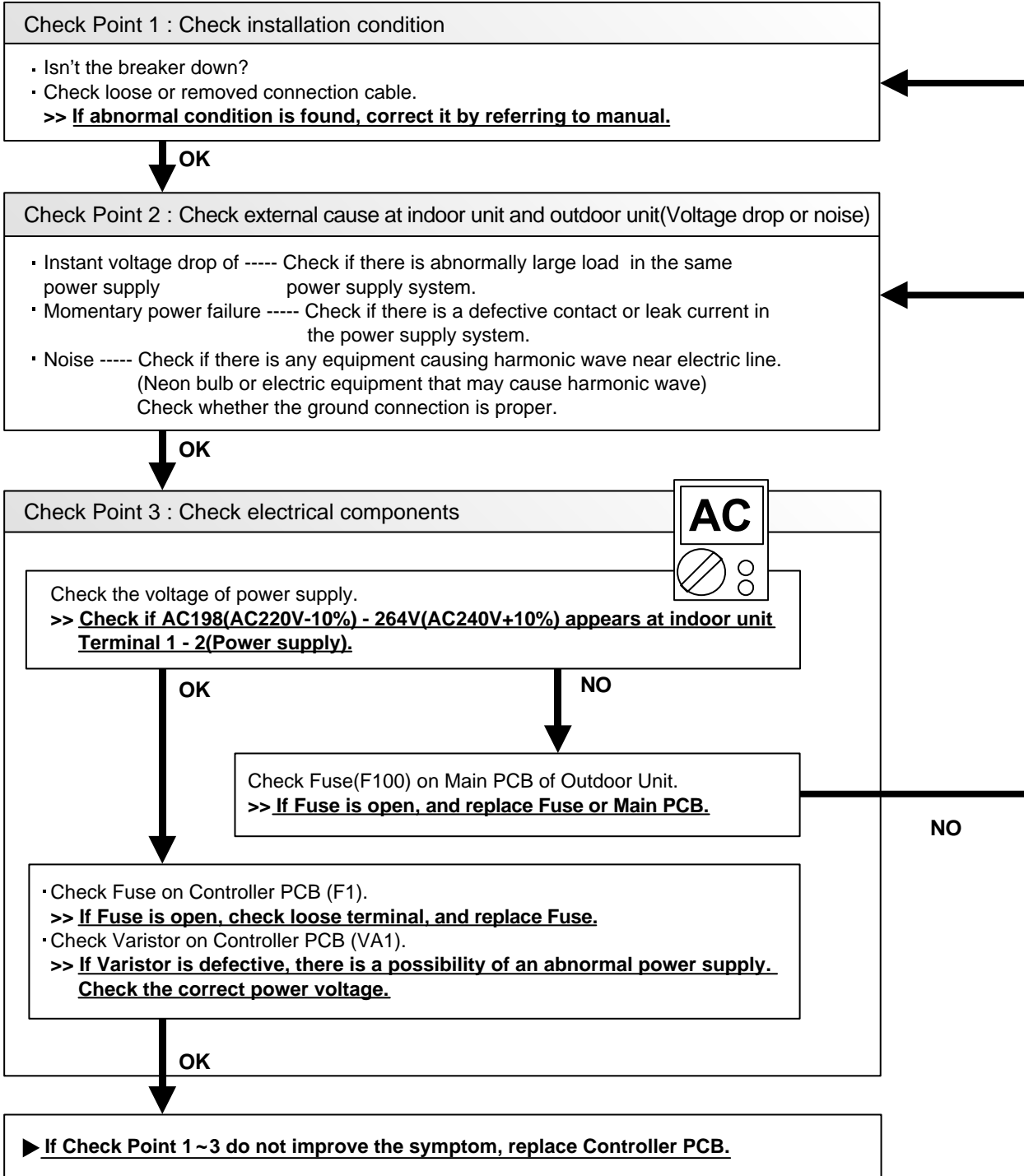
2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 25

Indoor Unit - No Power

Forecast of Cause:

1. Power supply failure
2. External cause
3. Electrical components defective



Trouble shooting 26

Outdoor Unit - No Power

Forecast of Cause:

1. Power supply failure
2. External cause
3. Electrical components defective

Check Point 1 : Check installation condition

- Isn't the breaker down?
 - Check loose or removed connection cable.
- >> **If abnormal condition is found, correct it by referring to manual.**

↓ OK

Check Point 2 : Check external cause at indoor unit and outdoor unit(Voltage drop or noise)

- Instant voltage drop of ----- Check if there is a abnormally large load in the same power supply system.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply system.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave)
Check whether the ground connection is proper.

↓ OK

Check Point 3 : Check electrical components

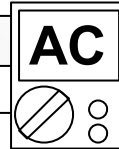
- Check the voltage of power supply.
>> **Check if AC187(AC208V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L - N.**

↓ OK

- Check Fuse(F201) on Main PCB.
>> **If Fuse is open, check loose terminal, and replace Fuse.**
- Check Varistor on Filter PCB (VA100 - 101).
>> **If Varistor is defective, there is a possibility of an abnormal power supply. Check the correct power voltage.**

↓ OK

- ▶ **If Check Point 1 ~ 3 do not improve the symptom, replace Filter PCB, Main PCB, Inverter PCB(IPM) and ACTPM.**



NO

Trouble shooting 27

No Operation (Power is ON)

Forecast of Cause:

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

Check Point 1 : Check indoor and outdoor installation condition

- Indoor unit - Check incorrect wiring between indoor unit - remote controller, or terminals between indoor units.
Or, check if there is an open cable connection.
- Are these indoor unit, outdoor unit, and remote controller suitable model numbers to connect?
>> If there is some abnormal condition, correct it by referring to manual.

OK

- Is there loose or removed serial communication line of between indoor unit and outdoor unit?

OK

Check Point 2 : Check external cause at indoor unit and outdoor unit(Voltage drop or noise)

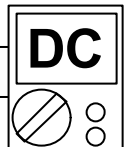
- Instant voltage drop of power supply ----- Check if there is abnormally large load in the same power supply system.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply system.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line.
(Neon bulb or electric equipment that may cause harmonic wave)
Check whether the ground connection is proper.

OK

Check Point 3 : Check electrical components at indoor unit and outdoor unit

- Check voltage at CN6 on Controller PCB.
>> If it is DC12V, Wired Remote Controller is failure. >> Replace Wired Remote Controller(Optional)
>> If it is DC 0V, Controller PCB is failure. >> Replace Controller PCB

>> If Check Point 1, 2 do not improve the symptom, replace control parts of outdoor unit.



Trouble shooting 28

No Cooling

Forecast of Cause:

1. Indoor unit error
2. Outdoor unit error
3. Effect by surrounding environment
4. Connection pipe / Connection wire failure
5. Refrigeration cycle failure

Check Point 1 : Check indoor unit

- Does indoor unit Fan run on high fan?
- Is Air Filter dirty?
- Is Heat Exchanger clogged?
- Check if energy save function is operated.



Check Point 2 : Check outdoor unit operation

- Is outdoor unit is operating?
(If not, refer to Trouble shooting 23)
- Is there any obstructing the air flow route?
- Is there any clogging on outdoor unit Heat Exchanger?
- Is the valve open?



Check Point 3 : Check site condition

- Is capacity of indoor unit fitted to room size?
- Any windows open? Or direct sunlight?



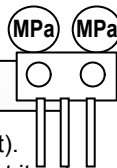
Check Point 4 : Check indoor unit / outdoor unit installation condition

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



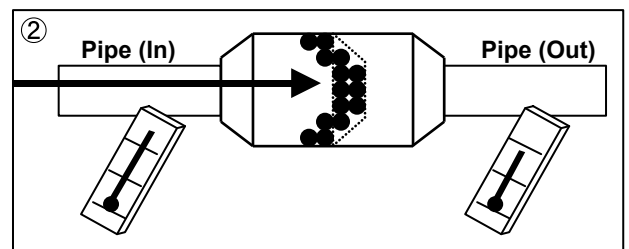
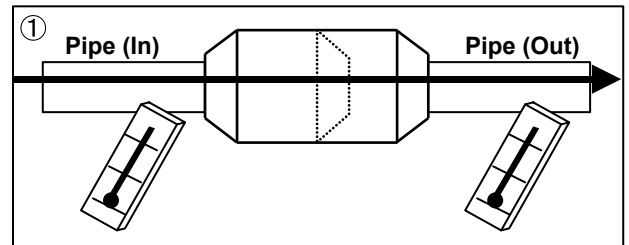
Check Point 5 : Check refrigeration cycle

- Check if Strainer is clogged (Refer to the figure at right).
- Measure gas pressure and if there is a leakage, correct it.
>> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.
- Check EEV
- Check Compressor



Attention

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



Trouble shooting 29

Abnormal Noise

Forecast of Cause :

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

Diagnosis method when abnormal noise is occurred

- Abnormal noise is coming from indoor unit.
(Check and correct followings)

- Is main unit installed in stable condition?
- Is the installation of air suction grille and front panel normal?

OK

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

- Abnormal noise is coming from outdoor unit.
(Check and correct followings)

- Is main unit installed in stable condition?
- Is Fan Guard installed normally?

OK

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

OK

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

OK

- Is Compressor locked?
>> Check Compressor

Trouble shooting 30

Water Leaking

Forecast of Cause:

1. Erroneous installation
2. Drain hose failure

Diagnosis method when water leak occurs

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

OK

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

OK

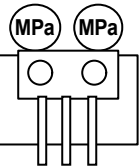
- Is Fan rotating?
>> Check Fan Motor

Diagnosis method when water is spitting out.

- Is the filter clogged?

OK

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

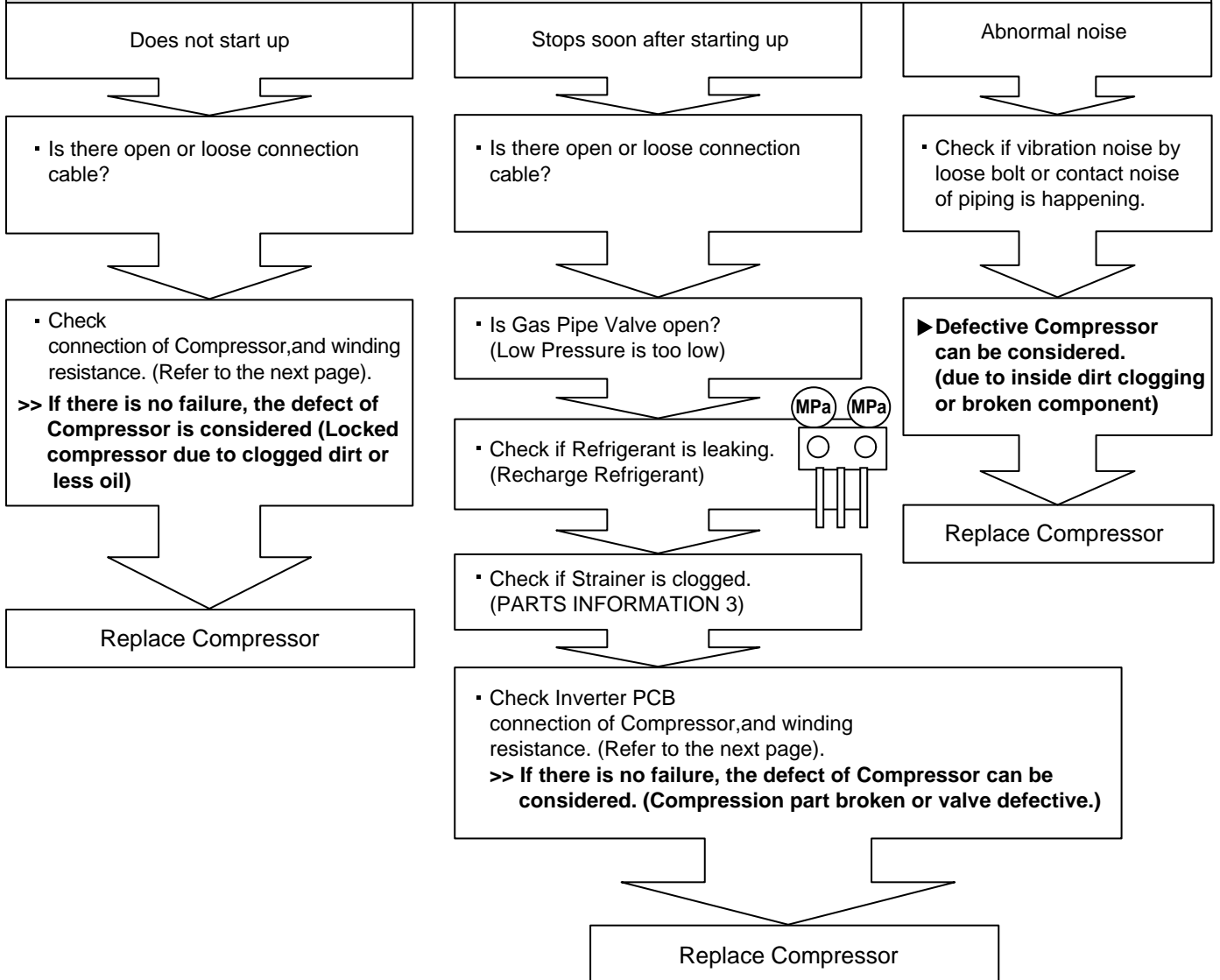


2-4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

Diagnosis method of Compressor (If outdoor unit LED displays error, refer to Trouble shooting)

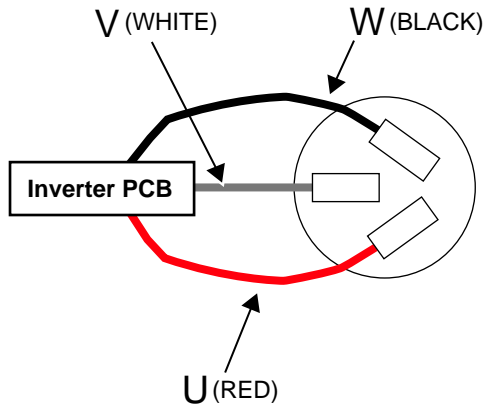


SERVICE PARTS INFORMATION 2

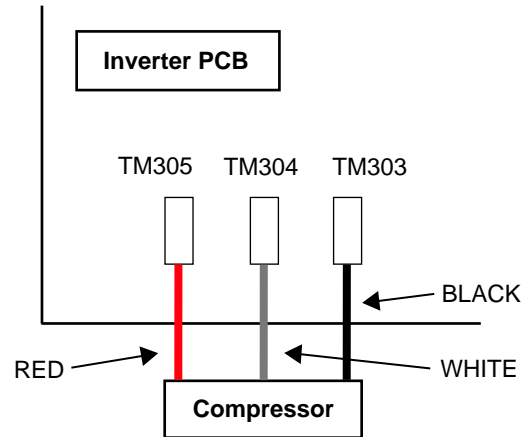
Inverter Compressor

Check Point 1 : Check connection

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

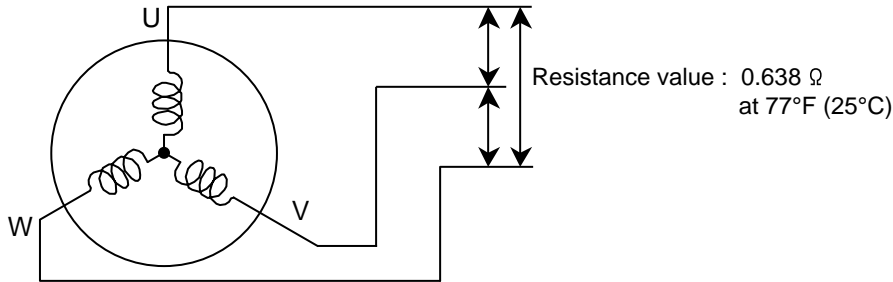


- Check connection of Inverter PCB (Loose or incorrect wiring)



Check Point 2 : Check winding resistance

- Check winding resistance of each terminal
▶ **If the resistance value is 0 Ω or infinite, replace Compressor.**



Check Point 3 : Replace Inverter PCB

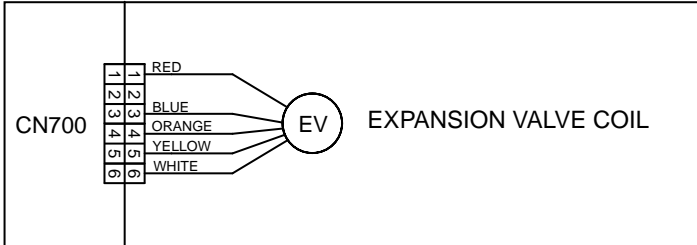
- ▶ **If Check Point 1, 2 do not improve the symptom, replace Inverter PCB.**

SERVICE PARTS INFORMATION 3

Outdoor Unit Electronic Expansion Valve (EEV)

Check Point 1 : Check Connections

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



Check Point 2 : Check coil of EEV

- Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	$46 \Omega \pm 4 \Omega$ at 68°F (20°C)
Yellow - Red	
Orange - Red	
Blue - Red	

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

Check Point 3 : Check voltage from Main PCB.



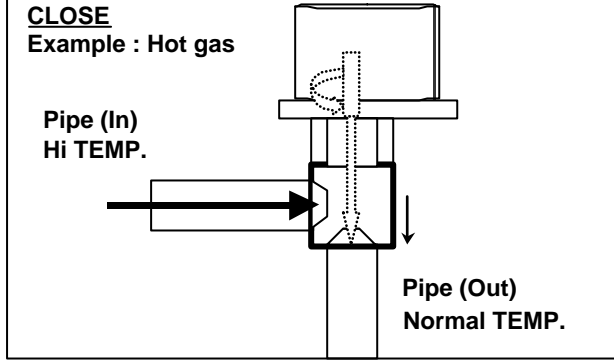
- Remove Connector and check Voltage (DC12V)
► **If it does not appear, replace Main PCB.**

Check Point 4 : Check Noise at start up

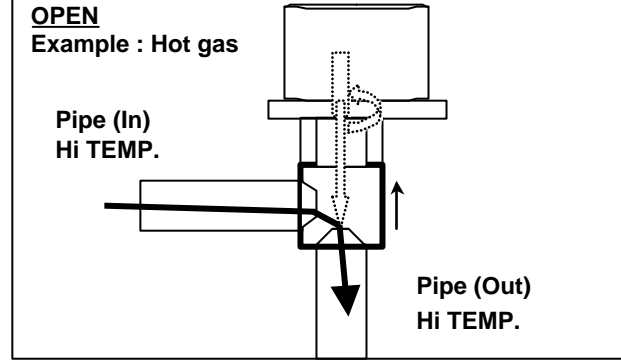
- Turn on Power and check operation noise.
► **If an abnormal noise does not show, replace Main PCB.**

Check Point 5 : Check opening and closing operation of valve

When valve is closed,
it has a temp. difference between Inlet and outlet.

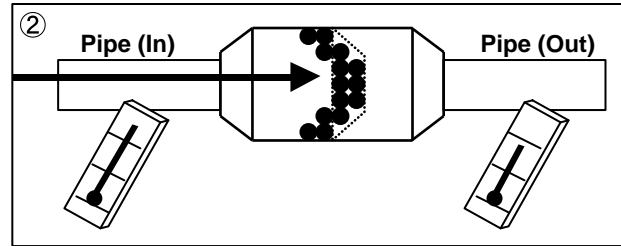
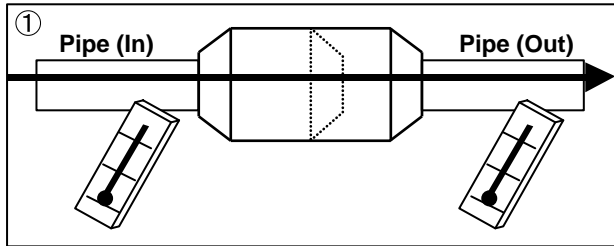


If it is open,
it has no temp. difference between inlet and outlet.



Check Point 6 : Check Strainer

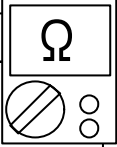
Strainer normally does not have temperature difference between inlet and outlet as shown in ① ,
but if there is a difference as shown in ② , there is a possibility of inside clogged. In this case, replace Strainer.



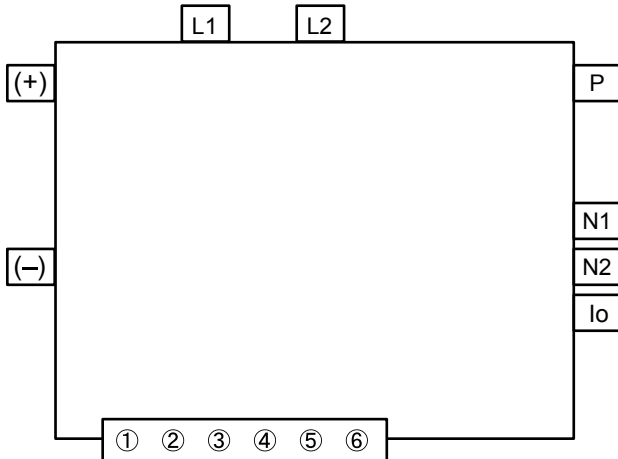
SERVICE PARTS INFORMATION 4

Active Filter Module

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



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



Check the open or short-circuit

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

Check the diode

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

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

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

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

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



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

SERVICE PARTS INFORMATION 5

Outdoor Fan Motor

Check Point 1 : Check rotation of Fan

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

Check Point 2 : Check resistance of Outdoor fan motor

- Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Earth terminal)
- >>If they are short-circuited (below 300 k Ω), replace Outdoor fan motor and Main PCB.**

Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3	No function
4 (Black)	Earth terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed comand (Vsp)
7 (Brown)	Feed back (FG)

WALL MOUNTED type INVERTER

3 . 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

JP (Jumper) Setting

[Indoor Unit]

ASU30 / 36CLX1

- 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)	J4(JP)
Code A (Default)	○	○	○
Code B	×	○	×

- 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

$$\text{Corrected room temperature (Tr)} = \text{Detected temperature by sensor (Tb)} - (\text{Correction coefficient})$$

Indoor unit		Correction coefficient
JM6 (JP)	JM7 (JP)	Cooling / Dry
○	○	+2°F (+1°C) : Default
×	○	0°F (0°C) : Slightly Temp Overshoot
○	×	0°F (0°C) : Slightly Temp Overshoot
×	×	-4°F (-2°C) : Temp Overshoot

[Outdoor Unit]

		JP			
		JM101	JM102	JM103	JM2
AOU30CLX1	Normal Preheat	○	○	×	○
AOU36CLX1	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 : ASU30 / 36CLX1

[Condition]

Ambient Indoor / Outdoor - Same temperature temperature

Refrigerant Standard amount amount

Piping 7.5m (Height difference 1m) length

Power 60Hz - 230V voltage

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

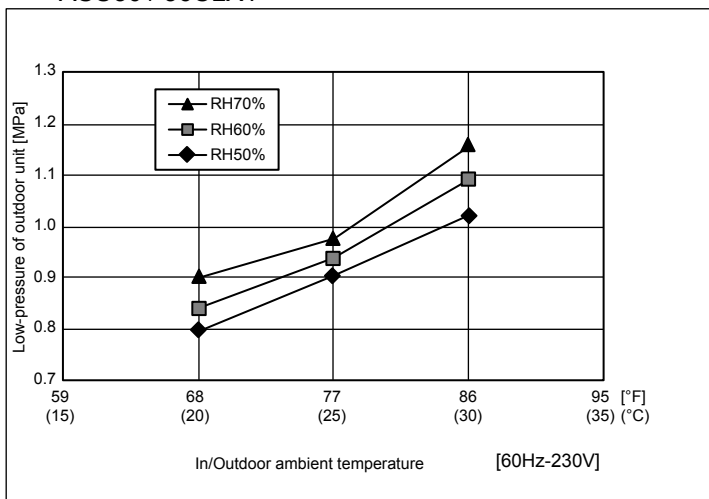
Measuring Measure the low pressure with the pressure meter at the service valve. Measure the outdoor method unit overall current with the current clamp meter at Power Cable.

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

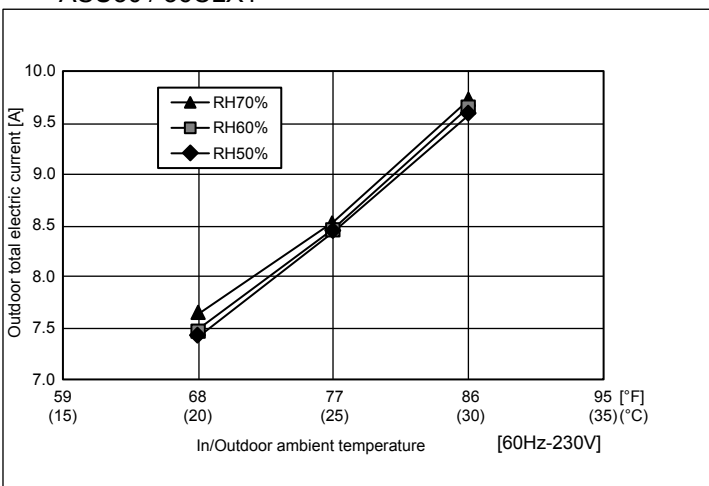
[Constant Frequency Operation Method (Test mode)]

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 ASU30 / 36CLX1



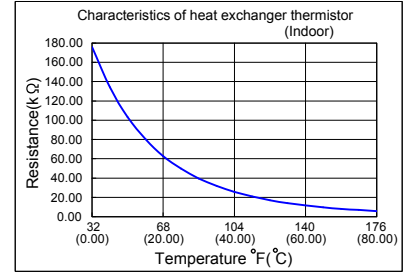
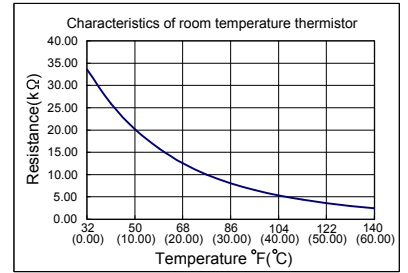
(2) Indoor/Outdoor Temperature - Outdoor Total Electric Current Curve ASU30 / 36CLX1



Thermistor resistance values

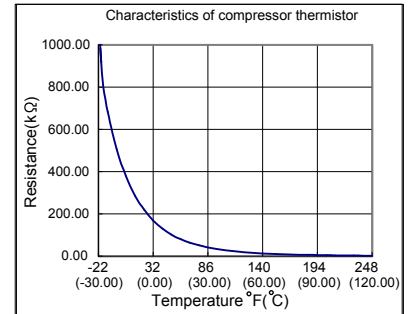
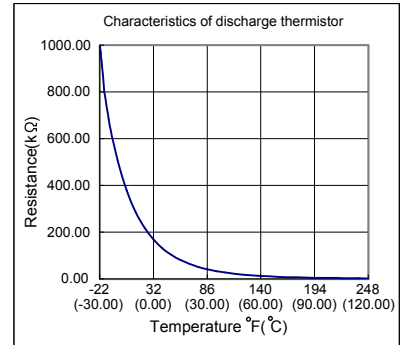
Room temperature thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
32.0	0.0	33.62	1.15
41.0	5.0	25.93	1.39
50.0	10.0	20.18	1.66
59.0	15.0	15.84	1.94
68.0	20.0	12.54	2.22
77.0	25.0	10.00	2.50
86.0	30.0	8.04	2.77
95.0	35.0	6.51	3.03
104.0	40.0	5.30	3.27
113.0	45.0	4.35	3.48
122.0	50.0	3.59	3.68
131.0	55.0	2.98	3.85
140.0	60.0	2.47	4.00
149.0	65.0	2.09	4.14
158.0	70.0	1.76	4.25
167.0	75.0	1.49	4.35
176.0	80.0	1.27	4.44
185.0	85.0	1.09	4.51
194.0	90.0	0.93	4.57
203.0	95.0	0.81	4.63
212.0	100.0	0.70	4.67

Indoor heat exchanger thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
32.0	0.0	176.03	1.10
41.0	5.0	134.23	1.36
50.0	10.0	103.34	1.63
59.0	15.0	80.28	1.92
68.0	20.0	62.91	2.21
77.0	25.0	49.70	2.51
86.0	30.0	39.57	2.79
95.0	35.0	31.74	3.06
104.0	40.0	25.64	3.30
113.0	45.0	20.85	3.53
122.0	50.0	17.06	3.73
131.0	55.0	14.10	3.90
140.0	60.0	11.64	4.05
149.0	65.0	9.69	4.19
158.0	70.0	8.12	4.30
167.0	75.0	6.83	4.40
176.0	80.0	5.78	4.48
185.0	85.0	4.91	4.55
194.0	90.0	4.19	4.61
203.0	95.0	3.59	4.66
212.0	100.0	3.09	4.71



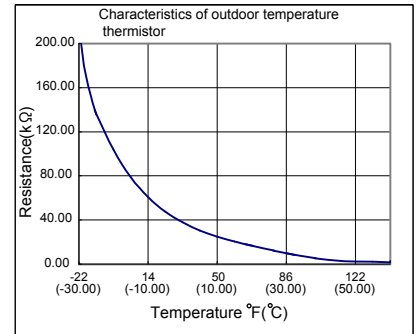
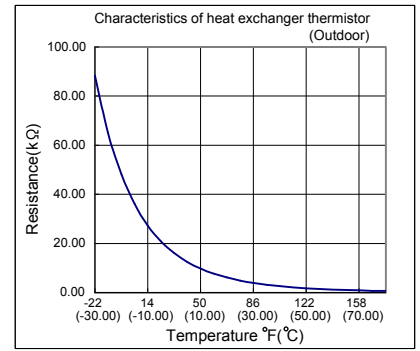
Discharge thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	1075.95	0.06
-13.0	-25.0	771.62	0.08
-4.0	-20.0	560.69	0.11
5.0	-15.0	412.49	0.15
14.0	-10.0	307.02	0.20
23.0	-5.0	231.05	0.27
32.0	0.0	175.70	0.34
41.0	5.0	134.90	0.44
50.0	10.0	104.59	0.55
59.0	15.0	81.79	0.69
68.0	20.0	64.50	0.84
77.0	25.0	51.27	1.01
86.0	30.0	41.07	1.20
95.0	35.0	33.13	1.41
104.0	40.0	26.91	1.63
113.0	45.0	22.01	1.86
122.0	50.0	18.10	2.10
131.0	55.0	14.98	2.32
140.0	60.0	12.47	2.55
149.0	65.0	1044	2.77
158.0	70.0	8.78	2.98
167.0	75.0	7.42	3.18
176.0	80.0	6.31	3.37
185.0	85.0	5.38	3.54
194.0	90.0	4.61	3.69
203.0	95.0	3.97	3.83
212.0	100.0	3.43	3.96
221.0	105.0	2.98	4.07
230.0	110.0	2.59	4.17
239.0	115.0	2.26	4.26
248.0	120.0	1.99	4.34

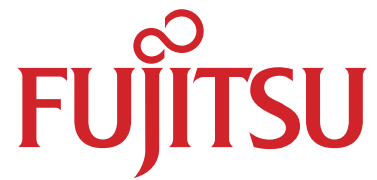
Compressor temperature thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	1013.11	0.06
-13.0	-25.0	729.09	0.09
-4.0	-20.0	531.56	0.12
5.0	-15.0	392.31	0.16
14.0	-10.0	292.91	0.16
23.0	-5.0	221.09	0.21
32.0	0.0	168.60	0.28
41.0	5.0	129.84	0.36
50.0	10.0	100.91	0.46
59.0	15.0	79.12	0.57
68.0	20.0	62.55	0.71
77.0	25.0	49.84	0.86
86.0	30.0	40.01	1.03
95.0	35.0	32.35	1.23
104.0	40.0	26.34	1.43
113.0	45.0	21.58	1.65
122.0	50.0	17.79	1.88
131.0	55.0	14.75	2.11
140.0	60.0	12.30	2.34
149.0	65.0	10.32	2.57
158.0	70.0	8.70	2.79
167.0	75.0	7.36	3.19
176.0	80.0	6.27	3.37
185.0	85.0	5.36	3.54
194.0	90.0	4.60	3.69
203.0	95.0	3.96	3.83
212.0	100.0	3.43	3.96
221.0	105.0	2.98	4.07
230.0	110.0	2.60	4.17
239.0	115.0	2.27	4.26
248.0	120.0	2.00	4.33



Outdoor heat exchanger thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	88.42	0.25
-13.0	-25.0	64.89	0.34
-4.0	-20.0	48.13	0.45
5.0	-15.0	36.07	0.58
14.0	-10.0	27.29	0.74
23.0	-5.0	20.84	0.93
32.0	0.0	16.05	1.14
41.0	5.0	12.45	1.38
50.0	10.0	9.74	1.64
59.0	15.0	7.67	1.91
68.0	20.0	6.09	2.19
77.0	25.0	4.87	2.47
86.0	30.0	3.92	2.74
95.0	35.0	3.17	3.00
104.0	40.0	2.59	3.24
113.0	45.0	2.12	3.46
122.0	50.0	1.75	3.66
131.0	55.0	1.45	3.83
140.0	60.0	1.21	3.99
149.0	65.0	1.01	4.12
158.0	70.0	0.85	4.24
167.0	75.0	0.72	4.34
176.0	80.0	0.61	4.43

Outdoor Temperature thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	224.33	0.73
-13.0	-25.0	159.71	0.97
-4.0	-20.0	115.24	1.25
5.0	-15.0	84.21	1.56
14.0	-10.0	62.28	1.90
23.0	-5.0	46.58	2.26
32.0	0.0	35.21	2.61
41.0	5.0	26.88	2.94
50.0	10.0	20.72	3.25
59.0	15.0	16.12	3.52
68.0	20.0	12.64	3.76
77.0	25.0	10.00	3.97
86.0	30.0	7.97	4.14
95.0	35.0	6.40	4.28
104.0	40.0	5.18	4.41
113.0	45.0	4.21	4.51
122.0	50.0	3.45	4.59
131.0	55.0	2.85	4.65
140.0	60.0	2.36	4.71
149.0	65.0	1.97	4.76
158.0	70.0	1.65	4.79
167.0	75.0	1.39	4.83
176.0	80.0	1.18	4.85





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