SPLIT TYPE
ROOM AIR CONDITIONER

WALL MOUNTED type
INVERTER

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	AS* A09LEC	AO* R09LECN
	AS* A12LEC	AO* R12LECN

Refrigerant
R410A

FUJITSU GENERAL LIMITED

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Refrigerant
R410A

WALL MOUNTED type
INVERTER

1 . DESCRIPTION OF EACH CONTROL OPERATION

1. COOLING OPERATION

1-1 COOLING CAPACITY CONTROL

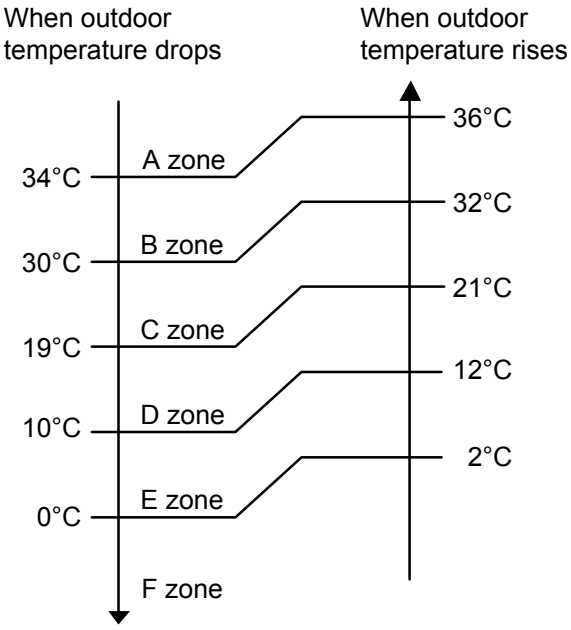
A sensor (room temperature thermistor) built in the indoor unit body will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation speed of the compressor.

* If the room temperature is 2°C higher than a set temperature, the compressor operation speed will attain to maximum performance.
* If the room temperature is 2.5°C lower than a set temperature, the compressor will be stopped.
* When the room temperature is between +2°C to -2.5°C of the setting temperature, the compressor speed is controlled within the range shown in Table1.
  However, the maximum speed is limited in the range shown in Figure 1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor speed range)

	Minimum speed	Maximum speed Ⅱ	Maximum speed Ⅰ
ASYA09LEC	18rps	62rps	64rps
ASYA12LEC	18rps	80rps	96rps

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



		Hi	Me	Lo	Quiet
09LEC	A zone	64rps	50rps	42rps	30rps
	B zone	64rps	50rps	42rps	30rps
	C zone	64rps	50rps	42rps	30rps
	D zone	42rps	35rps	30rps	23rps
	E zone	52rps	45rps	40rps	29rps
	F zone	52rps	45rps	40rps	29rps
12LEC	A zone	96rps	61rps	51rps	33rps
	B zone	96rps	61rps	51rps	33rps
	C zone	96rps	61rps	51rps	33rps
	D zone	57rps	42rps	36rps	27rps
	E zone	57rps	42rps	36rps	27rps
	F zone	57rps	42rps	36rps	27rps

When the compressor operates for 30 minutes continuously at over the maximum speedⅡ, the maximum speed is changed from Maximum speed Ⅰ to Maximum speedⅡ.

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 speed of the compressor.

* If the room temperature is lower by 3°C than a set temperature, the compressor operation speed will attain to maximum performance.

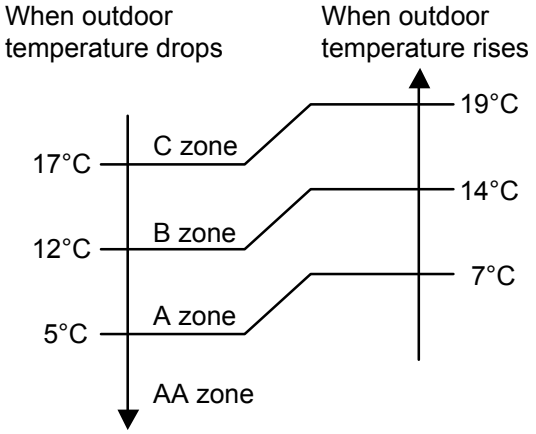
* If the room temperature is higher 2.5°C than a set temperatire, the compressor will be stopped.

* When the room temperature is between +2.5°C to -3°C of the setting temperature, the compressor speed is controlled within the range shown in Table2.
  However, the maximum speed is limited in the range shown in Figure 2 based on the fan speed mode and the outdoor temperature.

(Table 2 : Compressor speed range)

	Minimum speed	Maximum speed
ASYA09LEC	18rps	119rps
ASYA12LEC	18rps	119rps

(Fig.2 : Limit of maximum speed based on outdoor temperature)



		Hi	Me+	Me	Lo	Quiet
09LEC	AA zone	119rps	119rps	85rps	64rps	55rps
	A zone	119rps	119rps	85rps	64rps	55rps
	B zone	119rps	119rps	85rps	64rps	45rps
	C zone	119rps	119rps	85rps	64rps	37rps
12LEC	AA zone	119rps	119rps	96rps	80rps	68rps
	A zone	119rps	119rps	96rps	80rps	68rps
	B zone	119rps	119rps	96rps	80rps	54rps
	C zone	119rps	119rps	96rps	80rps	45rps

* The room temperature is controlled 2°C higher than the setting temperature for 60 minutes after starting the operation.
  After 60 minutes, it is controlled based on the normal setting temperature.

3. DRY OPERATION

3-1 INDOOR UNIT CONTROL

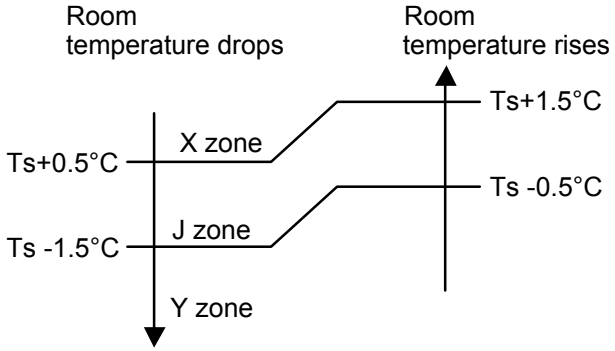
The compressor rotation frequency shall change according to the temperature, set temperature, and room temperature variation which the room temperature sensor of the indoor unit body has detected as shown in the Table 3.
However, after the compressor is driven, the indoor unit shall run at operation frequency of 52rps (for ASYA09LEC) or 61rps (for ASYA12LEC) , for a minute.

(Table 3 : Compressor frequency)

		Operating speed
09LEC	X zone	30rps
	J zone	23rps
	Y zone	0rps

		Operating speed
12LEC	X zone	33rps
	J zone	25rps
	Y zone	0rps

(Fig.3 : Compressor control based on room temperature)

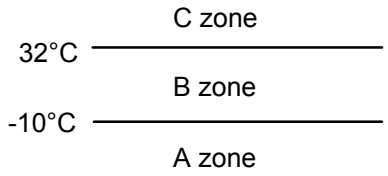


4. AUTO CHANGEOVER OPERATION

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

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

(Fig.4 : Outdoor temperature zone selection)



(Table.4 Operation mode selection table)

Outdoor temperature (TO) / Indoor room temperature (TB)	A zone	B zone	C zone
TB > TS+2°C	Monitoring	Cooling (automatic dry)	Cooling (automatic dry)
TS+2°C ≧TB ≧TS - 2°C	Monitoring	Monitoring	Monitoring
TB<TS- 2°C	Heating	Heating	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 -1°C) for 8 minutes, operation is automatically switched to DRY and the same operation as DRY OPERATION of item 3 above is performed.
- If the room temperature reaches (set temperature +2°C during DRY operation, operation returns to COOLING operation.

③ When HEATING was selected at ① , the same operation as HEATING OPERATION of item 2 above is performed.

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

5. INDOOR FAN CONTROL

1. FAN SPEED

(Table 5 : Indoor fan speed)

▪ ASYA09/12LEC

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1440
	Me+	1370
	Me	1200
	Lo	980
	Quiet	700
	Cool air prevention	600
	S-Lo	480
Cooling	Hi	1440
	Me	1200
	Lo	920
	Quiet	680
Dry		X zone: 680 J zone: 650

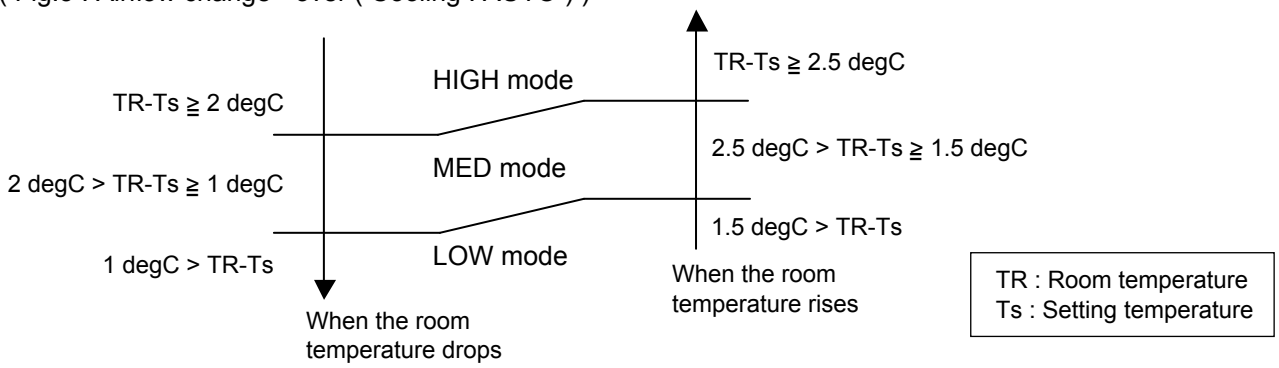
2. FAN OPERATION

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



4. DRY OPERATION

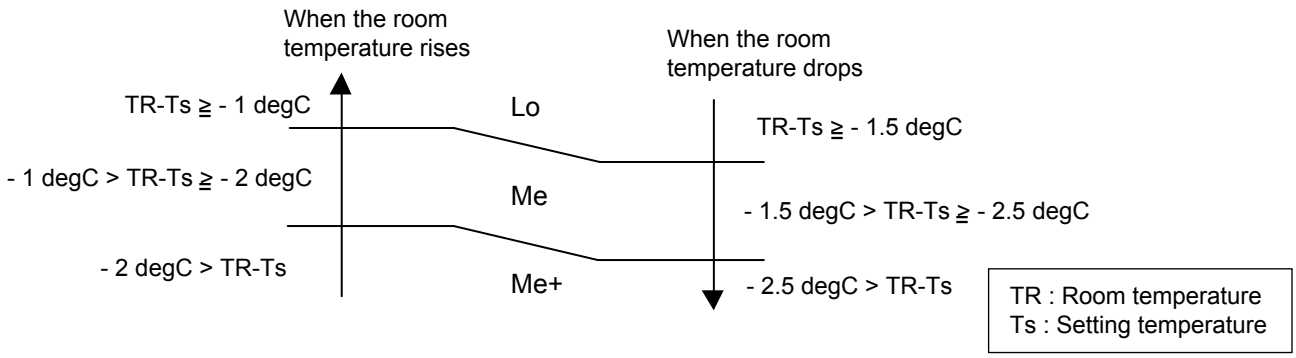
Refer to the Table 5.

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 6. On the other hand, if switched in [Hi] ～ [Quiet], the indoor motor will run at a constant airflow of [HEAT] operation modes Quiet, Lo, Me, Hi, as shown in Table 5.

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

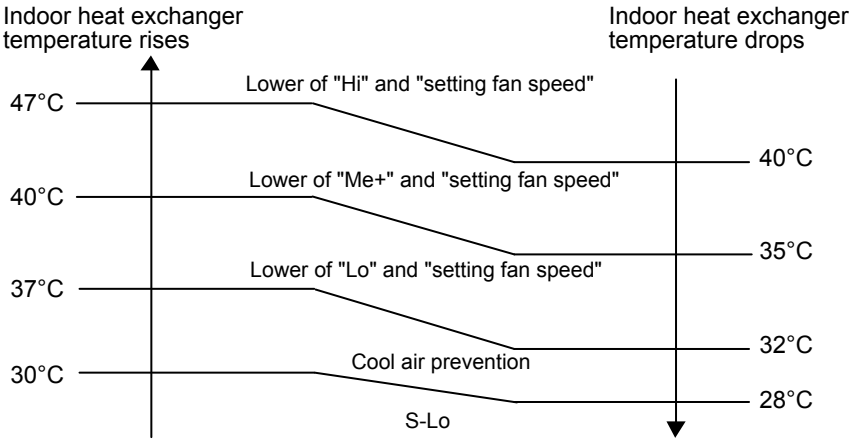


6. COOL AIR PREVENTION CONTROL (Heating mode)

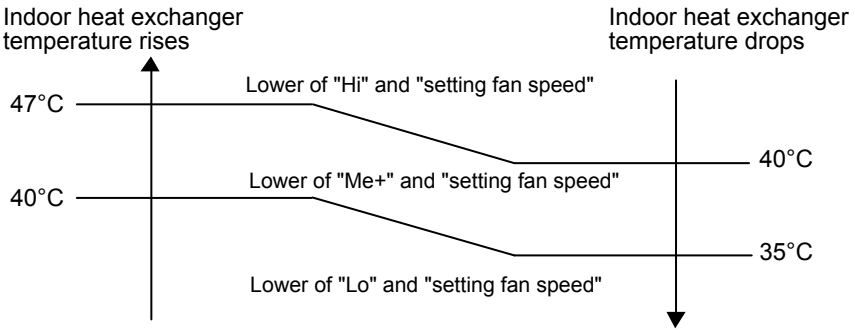
The maximum value of the indoor fan speed is set as shown in Figure 7, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

(Fig.7 : Cool air prevention control)

<Before 7 minutes upon running the compressor>



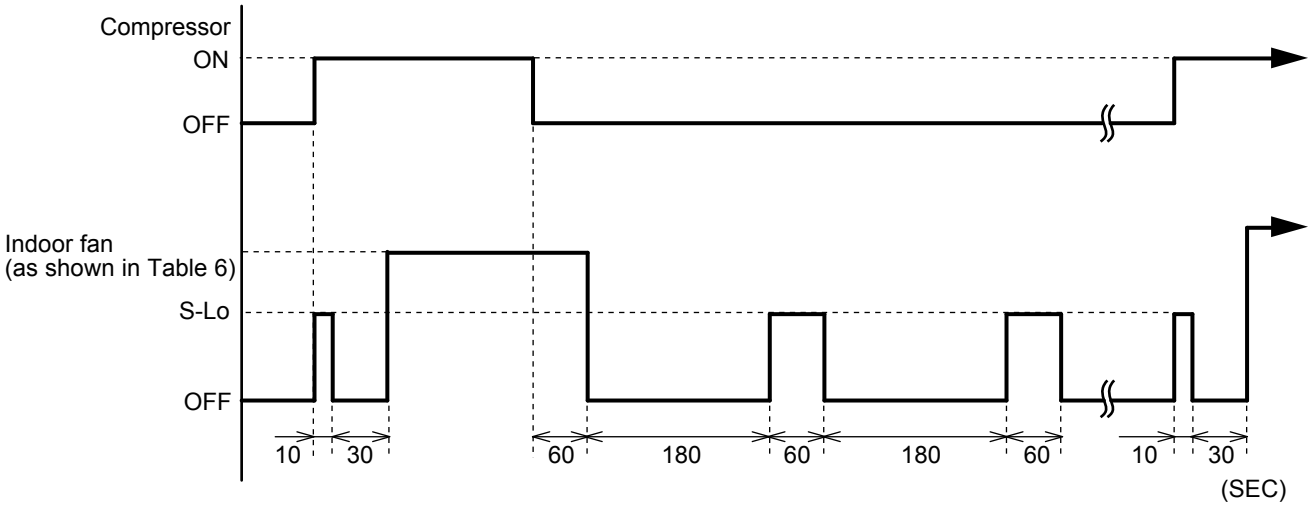
<After 7 minutes upon running the compressor>



7. ECONOMY FAN CONTROL (Dry mode)

Switch the airflow [AUTO] at dry mode, and the indoor fan motor will run as shown in Figure8.

(Fig.8 : Indoor fan control)



(Table 6 : Indoor fan speed)

	X zone	J zone
ASYA09LEC	680rpm	650rpm
ASYA12LEC	680rpm	650rpm

6. 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.

(Table7 : Type of Motor)

	AC Motor	DC Motor
ASYA09/ 12LEC		○

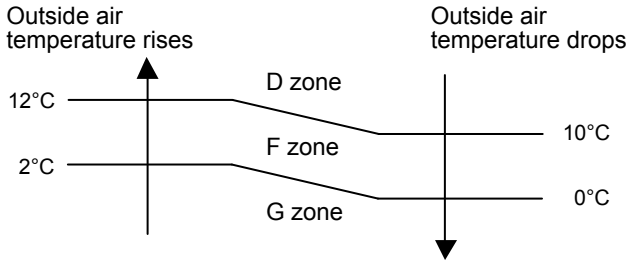
2. Fan Speed

(Table8 : Outdoor fan speed) (rpm)

	Zone ※	Cooling	Heating	Dry
ASYA09LEC	D	850/ 750/ 670/ 500	850/ 750/ 680/ 550/ 450	760/ 470
	F	400/ 280		400/ 280
	G	250/ 200		250/ 200
ASYA12LEC	D	850/ 750/ 670/ 500	900/ 750/ 680/ 550/ 450	760/ 470
	F	400/ 280		400/ 280
	G	250/ 200		250/ 200

※ Refer to Fig.9

(Fig.9 : Outside air temperature zone selection)



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

* After the defrost control is operated on the heating mode, the fan speed keeps at the higher speed as table9 without relating to the compressor frequency.

(Table9 : Outdoor fan speed after the defrost)

ASYA09LEC	850rpm
ASYA12LEC	900rpm

7. LOUVER CONTROL

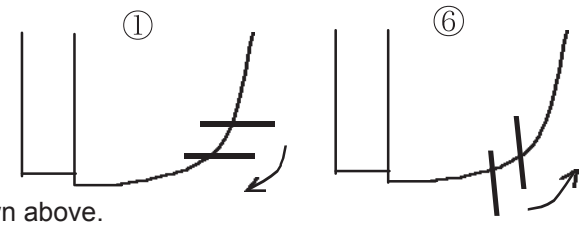
1. VERTICAL LOUVER CONTROL

(Function Range)

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

① ⇄ ② ⇄ ③ ⇄ ④ ⇄ ⑤ ⇄ ⑥

(Fig 10: Air Direction Range)



(Operation Range)

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

Use the air direction adjustments within the ranges shown above.

・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 ① 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 many 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 30minutes, they will automatically return to position ③.

・During Monitor operation in AUTO CHANGEOVER mode, the airflow direction automatically becomes ①, and it cannot be adjusted.

2. 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 ⇔ ③
Heating mode / Fan mode(④～⑥) : ③ ⇔ ⑥

・When the indoor fan is either at S-lo or Stop mode, the swinging operation is interrrupted and the louver stops at the memorized position.

8. COMPRESSOR CONTROL

1. OPERATION SPEED RANGE

The operation speed of the compressor is different based on the operation mode as shown in the table 10.

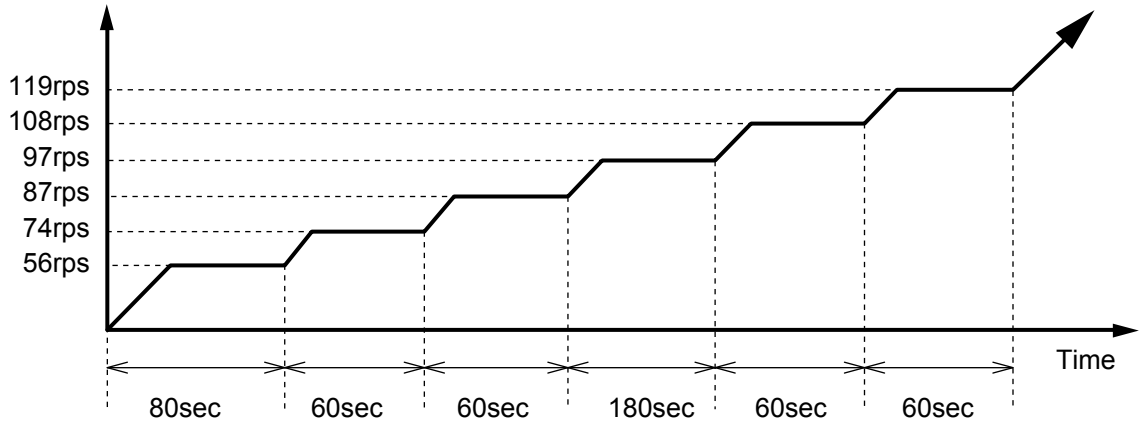
(Table 10 : Compressor operation speed range)

	Cooling		Heating		Dry	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
ASYA09LEC	18rps	64rps	18rps	119rps	23rps	30rps
ASYA12LEC	18rps	96rps	18rps	119rps	25rps	33rps

2. OPERATION SPEED CONTROL AT START UP

The compressor speed soon after the start-up is controlled as shown in the figure 11.

(Fig.11 : Compressor control at start-up)



9. TIMER OPEARTION CONTROL

9-1 WIRELESS REMOTE CONTROLLER

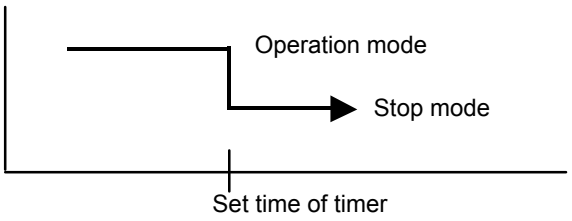
The table 11 shows the available timer setting based on the product model.

(Table 11 : Timer setting)

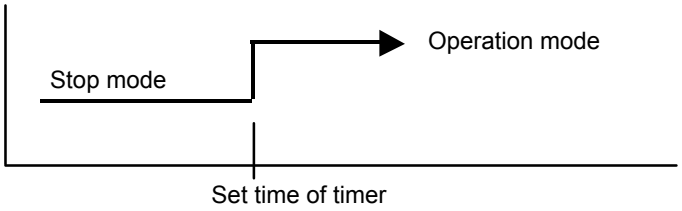
	ON TIMER / OFF TIMER	PROGRAM TIMER	SLEEP TIMER
ASYA09/12LEC	○	○	○

1. OPEARTION FREQUENCY RANGE

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

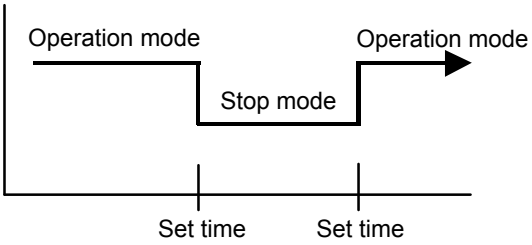


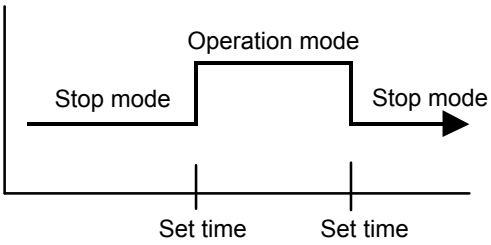
・ON timer : When the clock reaches the set time, the air conditioner will be turned on.



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.

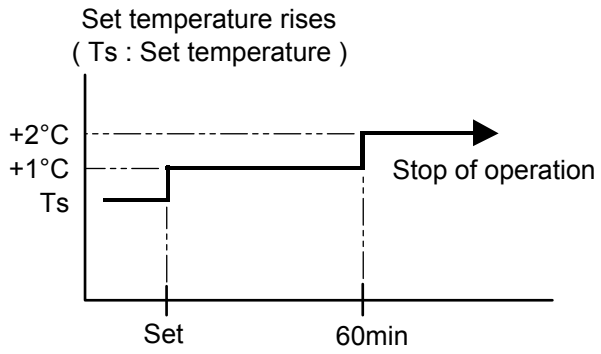
・SLEEP timer operation cannot be combined with ON timer operation.

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.

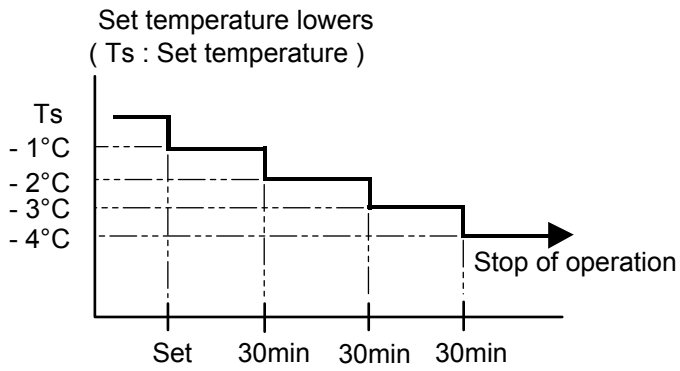
In the cooling operation mode

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



In the heating operation mode

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



9-2 WIRED REMOTE CONTROLLER (OPTION)

The table12 shows the available timer setting based on the product model.

(Table12 : Timer Setting)

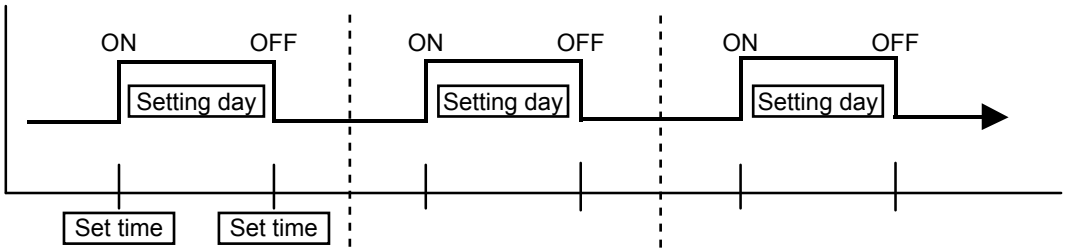
	ON TIMER / OFF TIMER	WEEKLY TIMER	TEMPERATURE SET BACK TIMER
ASYA09/ 12LEC	○	○	○

1. ON TIMER / OFF TIMER

Same to 9-1 1.ON TIMER / OFF TIMER and shown in those.

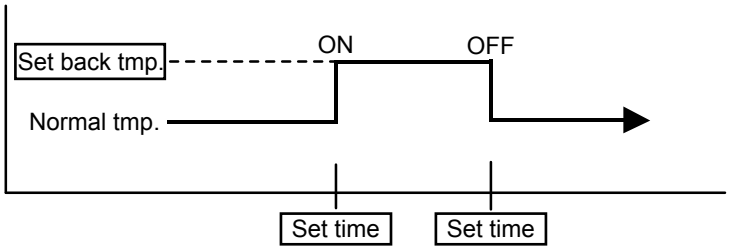
2. WEEKLY TIMER

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.



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.

* The pulse range of the electronic expansion valve control is between 60 to 480 pulses.
* The expansion valve is set at 480 pulses after 110 seconds of stopping compressor.
* 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).

11. 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 Master Control and Fan Control 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.

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

The compressor won't enter operation status for 2 minutes and 20 seconds 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 2 minutes and 20 seconds 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
- Econmy

15. MANUAL AUTO OPERATION (Indoor unit body operation)

If MANUAL AUTO Button is set, the operation is controlled as shown in Table13.
If the remote control is lost or battery power dissipated, this function will work without the remote control.

(Table 13)

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

16. FORCED COOLING OPERATION

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 run operation).
Forced cooling operation is released after 60 minutes of starting operation.
The FORCED COOLING OPERATION will start as shown in Table14.

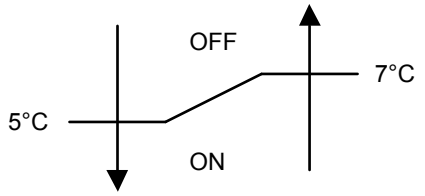
(Table 14)

	Forced cooling operation
OPERATION MODE	Cooling
FAN CONT. MODE	Hi
TIMER MODE	-
SETTING TEMP.	Room Temp is not controlled
SETTING LOUVER	Horizontal
SWING	OFF

17. COMPRESSOR PREHEATING

When the outdoor heat exchanger temperature is lower than 5°C and the all 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 7°C or greater, preheating is ended.

(Fig. 12 : Outdoor heat exchanger temperature)



18. COIL DRY OPERATION CONTROL

The coil-dry operation functions by pressing COIL DRY button on the remote controller.
The coil-dry operation is consisted of Fan operation 50 minutes, Heating operation 3 minutes, and Fan operates for 30 minutes at last before ending the air conditioner operation.

(Table 15 : COIL-DRY Operating Functions)

	Indoor Fan Speed	Compressor Frequency	Louver Position
ASYA09LEC	780rpm	35rps	①
ASYA12LEC	780rpm	39rps	①

19. 10°C HEAT OPERATION

The 10°C HEAT operation functions by pressing 10°C HEAT button on the remote controller.
The 10°C HEAT operation is almost the same operation as below settings.

(Table16)

Mode	Heating
Setting temperature	10°C
Fan mode	AUTO

20. ECONOMY OPERATION

The ECONOMY operation functions by pressing ECONOMY button on the remote controller.
The ECONOMY operation is almost the same operation as below settings.

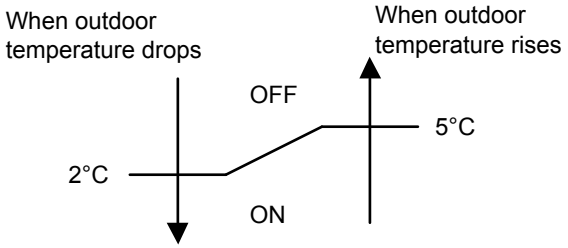
(Table17)

Mode	Cooling/ Dry	Heating
Target temperature	Setting temp.+1°C	Setting temp.-1°C

21. BASE HEATER OPERATION

The base heater is operated as shown in Figure 13.

(Fig.13 : Base heater control)



* When the compressor stops, Base heater is OFF.
* When the outdoor fan motor stops, Base heater is OFF.
* In the cooling mode, Base heater is OFF.
* In the defrost operation, Base heater maintains the same status as before the compressor stops.

22. DEFROST OPERATION CONTROL

1. CONDITION OF STARTING THE DEFROST OPERATION

The defrost operation starts when the outdoor heat exchanger temperature sensor (Tn) detects the temperature lower than the values shown in Table18.

(Table 18 : Condition of starting Defrost Operation)

1ST time defrosting after starting operation	Compressor integrating operation time		
	Less than 20 min.	20 to 60 min.	More than 60 min.
	Does not operate	- 9°C	- 5°C

Defrosting after 2ND time upon starting operation	Compressor integrating operation time	
	Less than 35 min.	More than 35min.
	Does not operate	Tn-Tn10 < - 5deg Tn-Tnb < - 2deg However, Tn ≦ - 6°C

Tn10 : Temperature of continuous operation at 10minutes.
Tnb : Back 5minutes temperature

Integrating defrost (Constant monitoring)	Compressor integrating operation time		
	More than 240 min. (For long continuous operation)	More than 213 min. (For long continuous operation)	Less than 10min.*1 (For intermittent operation)
	- 3°C	- 5°C	OFF count of the compressor 40 times.

*1 : If the compressor continuous operation time is less than 10 minutes, the OFF number of the compressor is counted. If any defrost operated, the compressor OFF count is cleared.

2. CONDITION OF THE DEFROST OPERATION COMPLETION

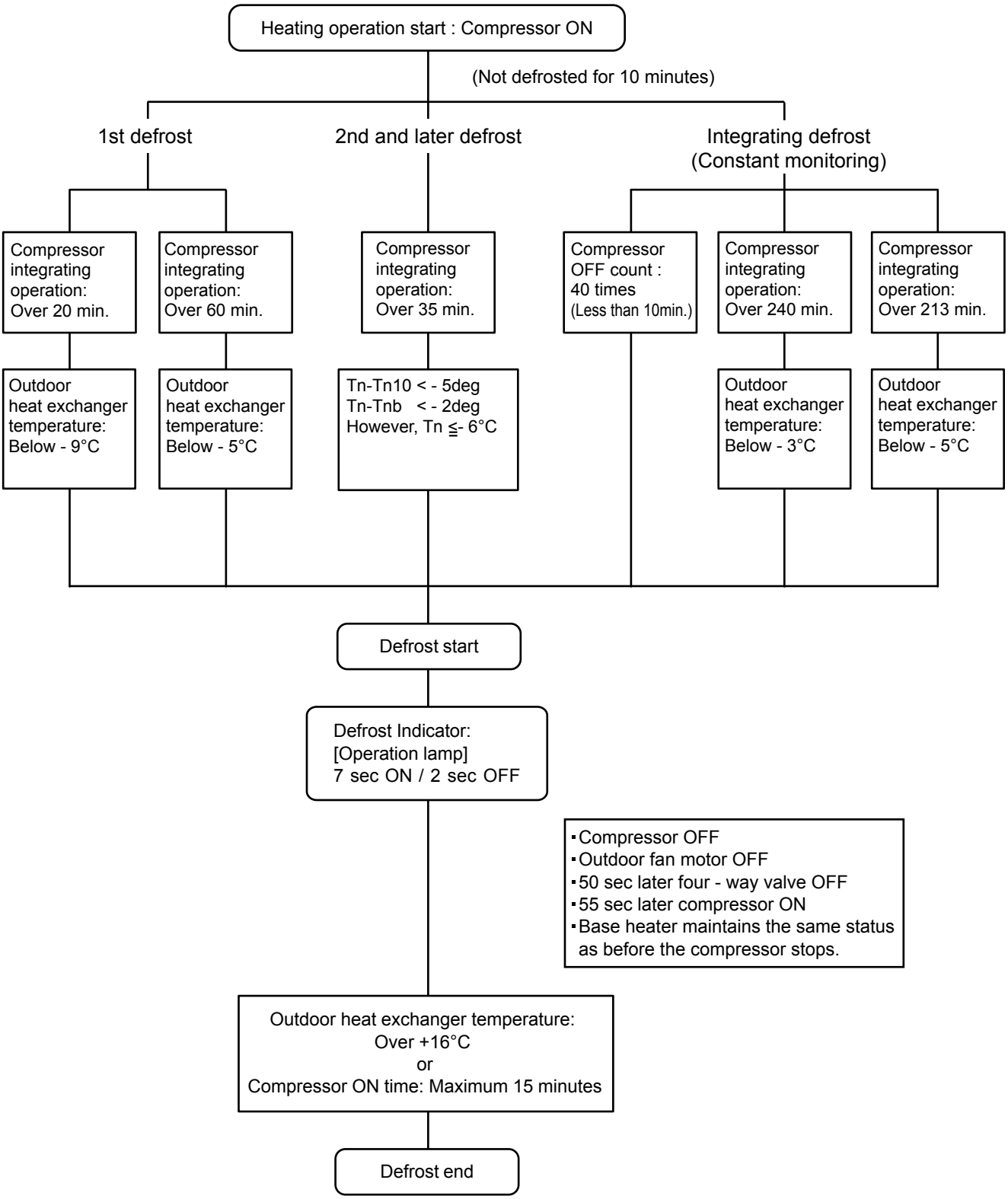
Defrost operation is released when the conditions become as shown in Table19.

(Table19 : Defrost Release Condition)

Release Condition
Outdoor heat exchanger temperature sensor value is higher than +16°C or Compressor operation time has passed 15 minutes.

3. Defrost Flow Chart

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



23. 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.

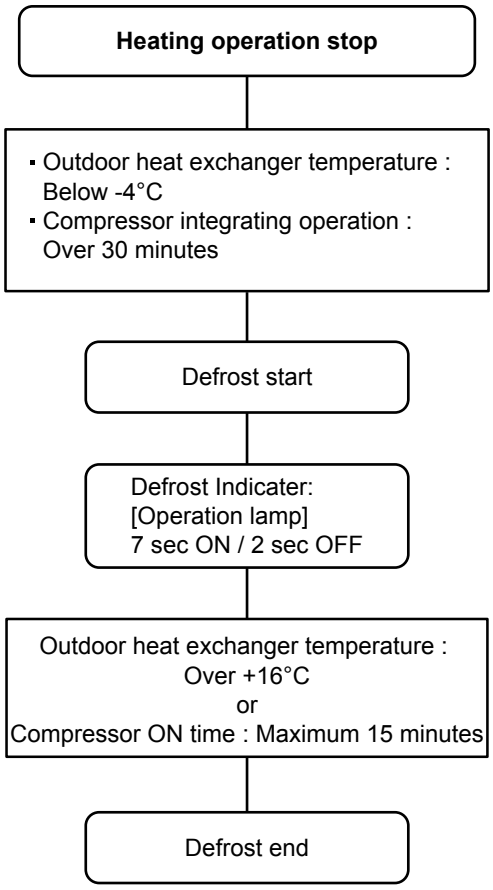
1. OFF DEFROST OPERATION CONDITION

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

2. OFF DEFROST END CONDITION

Release Condition
Outdoor heat exchanger temperature sensor value is higher than +16°C or Compressor operation time has passed 15 minutes.

OFF Defrost Flow Chart



24. VARIOUS PROTECTIONS

1. DISCHARGE GAS TEMPERATURE OVERRISE PREVENSION CONTROL

The discharge discharge thermistor will detect discharge gas temperature.

1-1. When the discharge temperature becomes higher than Temperature Ⅰ, the compressor speed is decreased 20rps, and it continues to decrease the speed for 20rps every 120seconds until the temperature becomes lower than Temperature Ⅰ.
When the discharge temperature becomes lower than Temperature Ⅱ, the protection control of the compressor speed is released.
However, if this protection repeats and the instruction speed of the compressor falls below 18rps, the compressor will be stopped.

1-2. When the discharge temperature becomes higher than Temperature Ⅲ , the compressor is stopped. If the above protection stop repeats 2 times, system will be stopped permanently, and the indoor unit LED starts error indication.

(Table 20 : Discharge Temperature Over Rise Prevension Control / Release Temperature)

	Temperature Ⅰ	Temperature Ⅱ	Temperature Ⅲ
ASYA09/12LEC	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 velue 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 21 : Current Release Operation Value / Release Value)

[Heating]

ASYA09LEC	
OT (Control / Release)	
	6.5A / 6.0A
17°C	
	8.0A / 7.5A
12°C	
	8.0A / 7.5A
5°C	
	8.0A / 7.5A

OT : Outdoor Temperature

ASYA12LEC	
OT (Control / Release)	
	6.5A / 6.0A
17°C	
	8.0A / 7.5A
12°C	
	8.5A / 8.0A
5°C	
	9.5A / 9.0A

OT : Outdoor Temperature

[Cooling]

ASYA09LEC	
OT (Control / Release)	
	3.5A / 3.0A
46°C	
	4.0A / 3.5A
42°C	
	5.5A / 5.0A

OT : Outdoor Temperature

ASYA12LEC	
OT (Control / Release)	
	4.0A / 3.5A
46°C	
	5.0A / 4.5A
42°C	
	6.5A / 6.0A

OT : Outdoor Temperature

3. ANTIFREEZING CONTROL (Cooling and Dry mode)

The compressor speed is decreased on cooling & dry mode when the indoor heat exchanger temperature sensor detects the temperature lower than 4°C .
Then, the anti-freezing control is released when it becomes higher than Release temperature A.

(Table 22 : Anti-freezing protection operation / Release temperature)

Outdoor temperature zone	Release temperature A
A, B , C, D	7°C
E, F	13°C

4. COOLING PRESSURE OVERRISE PROTECTION

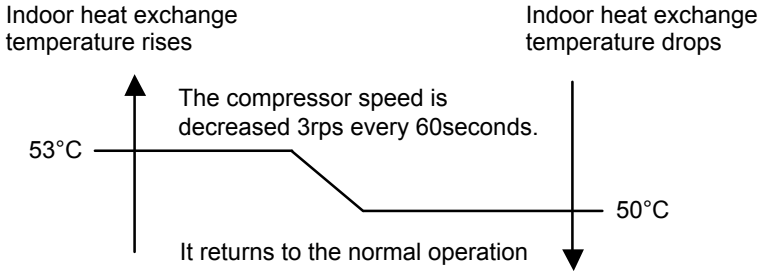
When the outdoor unit heat exchange sensor temperature rises to 67°C or greater, the compressor is stopped.
Then the compressor will be restarted after 3 minutes ST.

5. HIGH TEMPERATURE RELEASE CONTROL (HEATING MODE)

In heating mode, the compressor speed is controlled based on the detection value of the indoor heat exchanger temperature sensor.

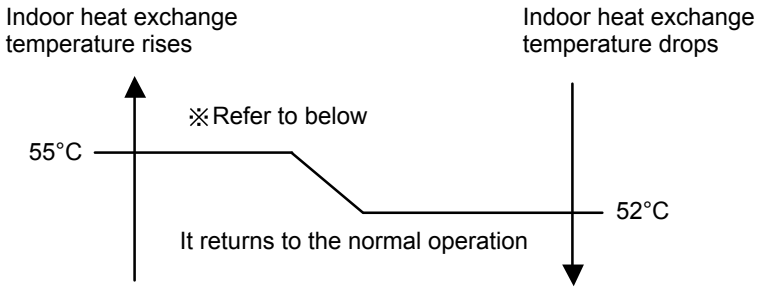
5-1. HIGH TEMPERATURE RELEASE CONTROL of Outdoor Unit

[Control System]



5-2. HIGH TEMPERATURE RELEASE CONTROL of Indoor Unit

[Control System]



[ASYA09LEC]

※Compressor operation

57rps or more ⇒ 55rps
35 ~ 55rps ⇒ Rotational speed down every 120 sec
28 ~ 33rps ⇒ 23rps
18 ~ 23rps ⇒ OFF

[ASYA12LEC]

※Compressor operation

48rps or more ⇒ 45rps
39 ~ 45rps ⇒ Rotational speed down every 120 sec
27 ~ 36rps ⇒ 25rps
18 ~ 25rps ⇒ OFF

Refrigerant
R410A

WALL MOUNTED type
INVERTER

2 . TROUBLE SHOOTING

2. TROUBLE SHOOTING

2-1 ERROR DISPLAY

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

1. ERROR DISPLAY
   Please refer the blinking pattern as follows.
   Indoor Unit : AS*A09LEC, AS*A12LEC

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

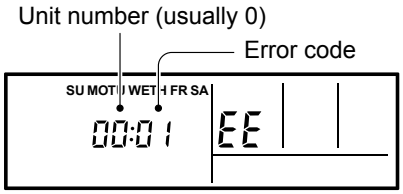
Error contents	Indoor Unit display			Wired Remote Controller Display (option)	Trouble shooting
	Operation (Green)	Timer (Orange)	Coil Dry (Yellow)		
Serial error (Serial reverse transfer error)	—	2 times 3 times ○	—	01	1
Serial error (Serial forward transfer error)	—	4 times 5 times ○	—	13	2
Wired remote 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
Manual auto switch error	4 times ○	2 times ○	—	20	9
Main relay welded error		3 times ○	—	No Display	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 ditection 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	
Discharge temperature error	7 times ○	2 times ○	—	0F	17
Exessive high pressure protection on cooling		3 times ○	—	24	18
4-way valve error		4 times ○	—	2C	19
PFC circuit error	8 times ○	4 times ○	—	25	20
Model distinction error (Indoor)	●	●	—	11	21

○ 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 authoilzed service personnel.



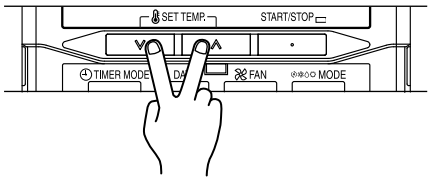
ex. Self-diagnosis check

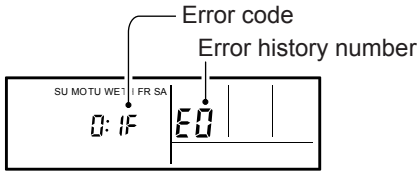
2. ERROR CODE HISTORY DISPLAY

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

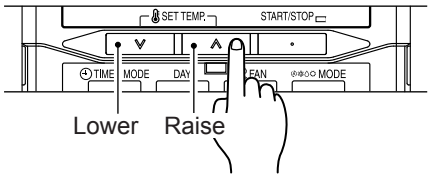
1. Stop the air conditioner operation.

2. Press the SET TEMPERATURE buttons ∨, ∧ 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 TEMPERATURE buttons ∨, ∧ 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 Outdoor unit Fan motor	**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. Outdoor unit Fan motor failure

Check Point 1-1 : Reset the power and operate

・Does error indication reappear?

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).

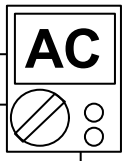
YES ↓

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 ↓

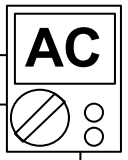
Check Point 3 : Check the voltage of power supply



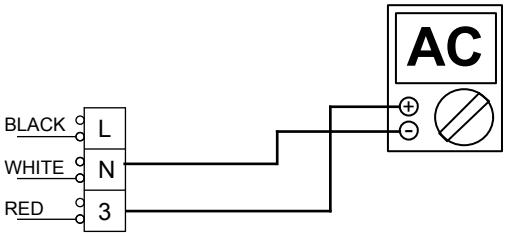
・Check the voltage of power supply
>> Check if AC198(AC220V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L - N.

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 N - 3.
>> If it is abnormal, check Outdoor unit fan motor. (PARTS INFORMATION 5)
>> If Outdoor unit fan motor is abnormal, replace Outdoor unit fan motor and Main PCB.
>> If Outdoor unit fan motor is normal, replace Main PCB.



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 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. Controller PCB failure 4. Outdoor unit Main PCB

Check Point 1-1 : Reset the power and operate

・Does error indication reappear?

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).

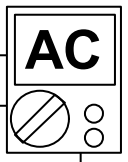
YES ↓

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 ↓

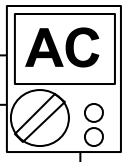
Check Point 3 : Check the voltage of power supply



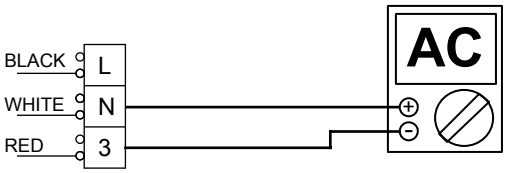
・Check the voltage of power supply
>> Check if AC198(AC220V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L - N.

OK ↓

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



・Check serial signal (Forward transfer signal)
>> Check if indicated value swings between AC70V and AC130V at outdoor unit terminal N - 3.
>> If it is abnormal, replace Controller PCB.
>> If it is abnormal, replace Outdoor unit Main PCB.



Trouble shooting 3 **INDOOR UNIT Error Method:** **Wired Remote Controller Error**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Indoor unit Controller PCB Wired Remote Controller (Option)	**Detective details:** When the indoor unit cannot properly receive the signal from Wired Remote Controller for 1 minute or more.

Forecast of Cause:

1. Connection failure 2. Wired Remote Controller failure 3. Controller PCB failure

Check Point 1 : Check the connection of terminal

Check & correct the followings.

・Check the connection of terminal between Wired Remote Controller and indoor unit, and check if there is a disconnection of the cable.

OK

Check Point 2 : Check Wired Remote Controller and Controller PCB

・Check Voltage at CN305 (terminal 1-3) of UTY-XCBXE (Communication kit). (Power supply to Remote Control)

>> If it is DC13V, Remote Control is failure. (Controller PCB is normal) >> Replace Remote Control
>> If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB

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.

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-10	-5	0	5	10	15	20	25
Resistance value (kΩ)	58.2	44.0	33.6	25.9	20.2	15.8	12.5	10.0

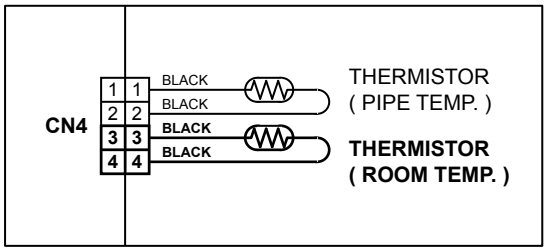
Temperature (°C)	30	35	40	45
Resistance value (kΩ)	8.0	6.5	5.3	4.3

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

OK

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 and execute the check operation again.**

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 (MID) thermistor	**Detective details:** When Heat exchanger (MID) 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.

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-5	0	5	10	15	20	25	30
Resistance value (kΩ)	233.2	176.0	134.2	103.3	80.3	62.9	49.7	39.6

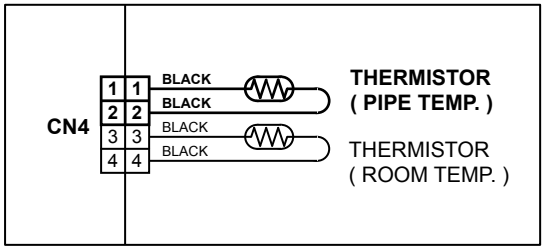
Temperature (°C)	35	40	45	50	55	60	65
Resistance value (kΩ)	31.7	25.6	20.8	17.1	14.1	11.6	9.7

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

OK

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 and execute the check operation again.**

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

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Discharge pipe temperature thermistor	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.

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-30	-20	-10	-5	0	5	10	15	20
Resistance value (kΩ)	1013.1	531.6	292.9	221.1	168.6	129.8	100.9	79.1	62.5

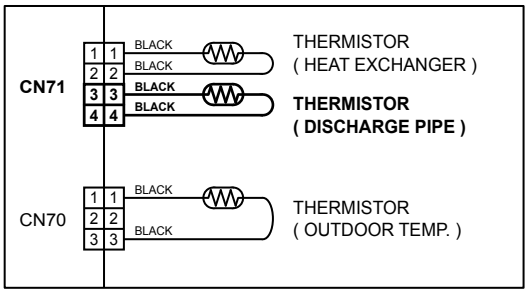
Temperature (°C)	30	40	50	60	70	80	90	100	120
Resistance value (kΩ)	40.0	26.3	17.8	12.3	8.7	6.3	4.6	3.4	2.0

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

OK

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

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



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

Trouble shooting 7 **OUTDOOR UNIT Error Method:** **Outdoor 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 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. Inverter 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.

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-30	-20	-10	-5	0	5	10	15	20	25
Resistance value (kΩ)	95.6	50.3	27.8	21.0	16.1	12.4	9.6	7.6	6.0	4.8

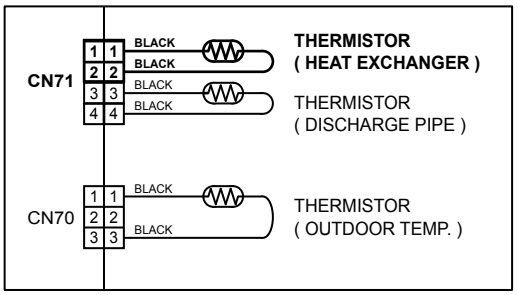
Temperature (°C)	30	35	40	45	50	60	70	80
Resistance value (kΩ)	3.8	3.1	2.5	2.1	1.7	1.2	0.8	0.6

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

OK

Check Point 3 : Check voltage of Inverter 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 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. Inverter 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.

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-30	-20	-10	-5	0	5	10	15
Resistance value (kΩ)	224.3	115.2	62.3	46.6	35.2	26.9	20.7	16.1

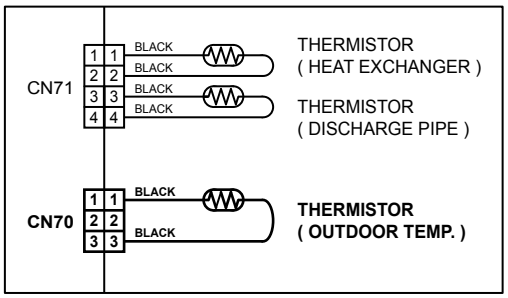
Temperature (°C)	20	30	40	50	60	70	80
Resistance value (kΩ)	12.6	8.0	5.2	3.5	2.4	1.6	1.2

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

OK

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

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

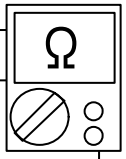


▶ **If the voltage does not appear, replace Main PCB.**

Trouble shooting 9 **INDOOR UNIT Error Method:** **Manual Auto Switch Error**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Indoor unit Controller PCB Indicator PCB Manual Auto Switch	**Detective details:** When the Manual Auto Switch becomes ON for consecutive 10 or more seconds.

Forecast of Cause :

1. Manual Auto Switch failure 2. Controller PCB and Indicator PCB failure



Check Point 1 : Check the Manual Auto Switch

・Check if Manual Auto Switch is kept pressed.
・Check ON/OFF switching operation by using a meter.
>> If Manual Auto Switch is disabled (on/off switching), replace it.

OK

Check Point 2 : Replace Inverter PCB

▶ **If Check Point 1 do not improve the symptom, replace Controller PCB and Indicator PCB and execute the check operation again.**

Trouble shooting 10 **OUTDOOR UNIT Error Method:** **Main relay welded error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Indoor unit Controller PCB Power code assy*1	When the signal from the outdoor unit is input after 2min.20sec. from the time of operation stop under the Main relay is OFF condition.

Forecast of Cause :

1. Power code assy*1 2. Main PCB failure 3. Controller PCB failure

Check Point 1 : Replace Main PCB

▶ **Change Main PCB.**

OK

Check Point 2 : Replace Controller PCB

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

OK

Check Point 3 : Replace Power code assy*1

▶ **If Check Point 2 do not improve the symptom, replace Power code assy.**

*1: Power code assy consists of Terminal, Relay, Thermal fuse, and Power code.

Trouble shooting 11 **INDOOR UNIT Error Method:** **Power Supply Frequency Detection Error**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Indoor unit Controller PCB	**Detective details:** 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

Check Point 1-1 : Reset the power supply and operate

・Does error indication reappear?

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).

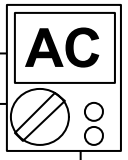
YES ↓

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 AC198(AC220V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L - N.

OK ↓

Check Point 4 : Replace Controller PCB

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

Trouble shooting 12 **OUTDOOR UNIT Error Method:** **Over Current Protection**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Outdoor unit Main PCB Compressor	**Detective details:** ① When over current flows in Inverter 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.

Forecast of Cause :

1. Connection failure
2. Outdoor fan operation failure
3. Outdoor heat exchanger clogged
4. Compressor failure
5. 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.

OK

Check Point 2 : 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 3 : Check Outdoor fan

- Check Outdoor fan motor. (Refer to Trouble shooting 15)

>> If the Fan motor is failure, replace it.

OK

Check Point 4 : Replace Main PCB

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

OK

Check Point 5 : Replace Compressor

▶ **If Check Point 4 do not improve the symptom, replace Compressor.**

Trouble shooting 13 **OUTDOOR UNIT Error Method:** **CT Error**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Outdoor unit Main PCB	**Detective details:** When Input Current Sensor has detected 0A, while Inverter Compressor is operating at higher than 56rps, after 1minute upon starting the Compressor. (Except during the defrost operation)

Forecast of Cause :

1. Connection failure 2. External cause 3. Main PCB failure

Check Point 1-1 : Reset power supply and operate

・Does error indication reappear?

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).

YES ↓

Check Point 2 : 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.

OK ↓

Check Point 3 : Replace Main PCB

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

Trouble shooting 14 **OUTDOOR UNIT Error Method:** **Compressor Location Detection Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Compressor	① While running the compressor, if the detected rotor location is out of phase with actual rotor location more than 90°, the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ② repeats 5 times, the compressor stops permanently.

Forecast of Cause :

1. Defective connection of electric components 2. Main PCB failure 3. Compressor failure

Check Point 1 : Check Noise from Compressor

・Turn on Power and check operation noise.

▶ **If an abnormal noise show, replace Compressor.**

OK

Check Point 2 : Check connection of around the Compressor components

For Compressor Terminal, Main PCB

・Check if connector is removed.
・Check erroneous connection.
・Check if cable is open.
(Refer to PARTS INFORMATION 2)

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

OK

Check Point 3: Replace Main PCB

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

OK

Check Point 4: Replace Compressor

▶ **If Check Point 3 do not improve the symptom, replace Compressor.**

Trouble shooting 15 **OUTDOOR UNIT Error Method:** **Outdoor Unit Fan Error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause:

1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Main PCB failure
4. Outdoor unit fan motor failure

Check Point 1 : Check rotation of Fan

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

OK

Check Point 2 : Check ambient temp. around motor

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

OK

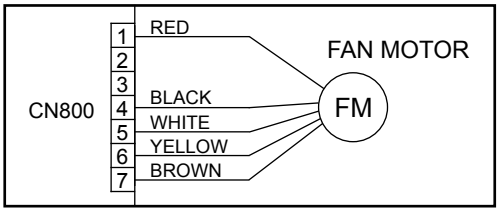
Check Point 3 : Check Outdoor unit fan motor

・Check Outdoor unit fan motor. **(PARTS INFORMATION 5)**
>>If Outdoor Fan Motor is abnormal, replace Outdoor fan motor and Main PCB.

OK

Check Point 4 : Check Output Voltage of Main PCB

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



Read wire	DC voltage
Red - Black	280V ±10%
White - Black	15 ±1.5V

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

Trouble shooting 16 **INDOOR UNIT Error Method:** **Indoor Fan Motor Lock Error** **Indoor Fan Motor Rev. Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Indoor unit fan motor	When the condition that actual frequency of Indoor Fan is below 1/3 of target frequency or 0rps is continued more than 56 seconds.

Forecast of Cause:

1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by surrounding temperature rise
4. Control PCB failure 5. Indoor unit fan motor failure

Check Point 1 : Check rotation of Fan

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

OK

Check Point 2 : Check ambient temp. around motor

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

OK

Check Point 3 : Check Indoor unit fan motor

・Check Indoor unit fan motor. (PARTS INFORMATION 4)
>>If Indoor unit fan motor is abnormal, replace Indoor unit fan motor.

OK

Check Point 4 : Replace Controller PCB

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

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

Detective Actuators:	**Detective details:**
Discharge temperature thermistor Outdoor unit Main PCB	"Protection stop by "discharge temperature ≧ 110degC during compressor operation"" generated 2 times within 24 hours.

Forecast of Cause :
1. 3-way valve not opened
2. EEV defective, strainer clogged
3. Outdoor unit operation failure, foreign matter on heat exchanger
4. Discharge temperature thermistor failure
5. Insufficient refrigerant
6. Main PCB failure

<Cooling operation>

Check Point 1 : Check if 3-way valve(gas side) is open.
- If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

↓ **OK**

Check Point 2 : Check the EEV, strainer
- EEV open?
- Strainer clogging check (Refer to PARTS INFORMATION 3)

↓ **OK**

<Heating operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.
- If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

↓ **OK**

Check Point 2 : Check the EEV, strainer
- EEV open?
- Strainer clogging check (Refer to PARTS INFORMATION 3)

↓ **OK**

Check Point 3 : Check the outdoor unit fan,heat exchanger
- Check for foreign object at heat exchanger
- Check if fan can be rotated by hand.
- Motor check (PARTS INFORMATION 5)

↓ **OK**

Check Point 4 : Check the discharge thermistor
- Discharger thermistor characteristics check (Check by disconnecting thermistor from PCB.)

  * For the characteristics of the thermistor, refer to the "Trouble shooting 6".

↓ **OK**

Check Point 5 : Check the refrigerant amount
- Leak check

↓ **OK**

Check Point 6 : Replace Main PCB

▶ **If Check Point 1- 5 do not improve the symptom, replace Main PCB.**

Trouble shooting 18 **OUTDOOR UNIT Error Method:** **Excessive High Pressure Protection On Cooling**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Outdoor unit Main PCB Outdoor unit fan motor Heat exchanger temp. thermistor Outdoor unit EEV	**Detective details:** In cooling operation, after 1 minute or more compressor starts, when outdoor heat exchanger temperature is 67 °C and above.

Forecast of Cause :

1. Connection failure
2. Outdoor fan operation failure
3. Outdoor heat exchanger clogged
4. Thermistor failure
5. EEV failure
6. 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.

OK

Check Point 2 : 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 cloge it.

OK

Check Point 3 : Check Outdoor Fan

- Check Outdoor fan motor. (Refer to Trouble shooting 15)

>> If the Fan Motor is failure, replace it.

OK

Check Point 4 : Check Thermistor

- Check Thermistor. (Refer to Trouble shooting 7)

>> If the Thermistor is failure, replace it.

OK

Check Point 5 : Check EEV

- Check EEV. (PARTS INFORMATION 3)

>> If the EEV is failure, replace it.

OK

Check Point 6 : Replace Main PCB

▶ **If Check Point 1 ~ 5 do not improve the symptom, replace Main PCB.**

Trouble shooting 19 **OUTDOOR UNIT Error Method:** **4-way valve error**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Outdoor unit Main PCB Heat exchanger temperature thermistor Room temperature thermistor 4-way valve	**Detective details:** When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops. ・Cooling or Dry operation [Indoor heat exchanger temp.] - [Room temp.] > 10degC ・Heating operation [indoor heat exchanger temp.] - [room temp.] < -10degC If the same operation is repeated 5 times, the compressor stops permanently.

Forecast of Cause :

1. Connector connection failure 2. Thermistor failure 3. Coil failure 4. 4-way valve failure
5. Main PCB failure

Check Point 1 : Check connection of Connector

・Check if connector is removed.
・Check erroneous connection.
・Check if thermistor cable is open.
>>Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Check each thermistor

・Isn't it fallen off the holder?
・Is there a cable pinched?

>> Check characteristics of thermistor (Refer to Trouble shooting 4, 5), If defective, replace the thermistor.

OK

Check Point 3 : Check the solenoid coil and 4-way valve

[Solenoid coil]
・Remove CN30 from PCB and check the resistance value of coil.
Resistance value is about 1.4kΩ .
>>If it is Open or abnormal resistance value, replace Solenoid Coil.

[4-way valve]
・Check each piping temperature,
and the location of the valve by the temperature difference.
>>If the value location is not proper, replace 4-way valve.

OK

Check Point 4 : Replace Main PCB

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

Trouble shooting 20 **OUTDOOR UNIT Error Method:** **PFC circuit error**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Outdoor unit Main PCB	**Detective details:** 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.

Forecast of Cause :

1. External cause 2. Connector connection failure 3. Main PCB failure

Check Point 1 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

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

OK

Check Point 2 : Check connection of Connector

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

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

OK

Check Point 3 : Replace Main PCB

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

Trouble shooting 21 **INDOOR UNIT Error Method:** **Model Distinction Error (Indoor)**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB	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

Forecast of Cause:

1. External cause 2. Defective for connection of electric components 3. Controller PCB failure

Check Point 1-1 : Reset power supply and operate

・Does error indication show reappear?

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).

YES ↓

Check Point 2 : Check indoor unit electric components

・Check all connectors.
(loose connector or incorrect wiring)
・Check any shortage or corrosion on PCB.

OK ↓

Check Point 3 : Replace Controller PCB

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

2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 22

Indoor 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 Installation Manual or Data & Technical Manual.

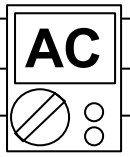
OK

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

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

OK

Check Point 3 : Check electrical components



Check the voltage of power supply.

>> Check if AC198(AC220V-10%) - 264V(AC240V+10%) appears at indoor unit Terminal L - N (Power supply).

NO

OK

- Check Fuse on Controller PCB (F1).

>> If Fuse is open, check loose terminal, and replace Fuse.

- Check Varistor on Controller PCB (VA1).

>> If Varistor is defective, there is a possibility of an abnormal power supply. Check the correct power voltage.

Trouble shooting 23

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 Installation Manual or Data & Technical Manual.

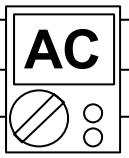
OK

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

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

OK

Check Point 3 : Check electrical components



Check the voltage of power supply.

>> Check if AC198(AC220V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L - N.

NO

OK

- Check Fuse(F201) on terminal board.

>> If Fuse is open, check loose terminal, and replace Fuse.

- Check Varistor on Main PCB (VA1 - 2).

>> 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 Main PCB,

Trouble shooting 24

No Operation (Power is ON)

Forecast of Cause:

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

Check Point 1 : Check indoor and outdoor installation condition

- Indoor unit - Check incorrect wiring between Indoor unit - Remote control.
  Or, check if there is an open cable connection.
- Are these Indoor unit, Outdoor unit, and Remote control suitable model numbers to connect?

>> If there is some abnormal condition, correct it by referring to Installation manual and Data & Technical Manual.

OK

Turn off Power and check/ correct followings.

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

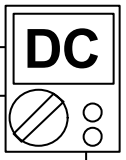
OK

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

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

OK

Check Point 3 : Check Wired Remote Controller and Controller PCB



- Check Voltage at CN305 (terminal 1-3) of UTY-XCBXE (Communication kit).
  (Power supply to Remote Control)

>> If it is DC13V, Remote Control is failure. (Controller PCB is normal) >> Replace Remote Control
>> If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB

>> If the symptom does not change by above Check 1, 2, 3, replace Main PCB of Outdoor unit.

Trouble shooting 25

No Cooling / No Heating

Forecast of Cause:

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

OK

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 Hert Exchanger?
- Is the valve open?

OK

Check Point 3 : Check site condition

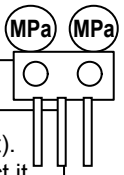
- Is capacity of indoor unit fitted to room size?
- Any windows open? Or direct sunlight?

OK

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.
  >> <u>If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.</u>

OK

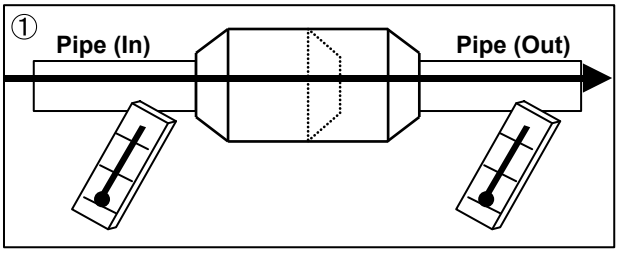


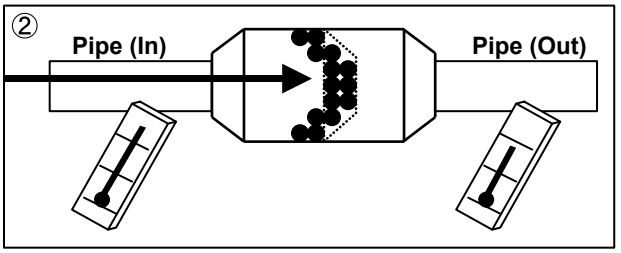
Check Point 5 : Check refrigeration cycle

- Check if Strainer is clogged (Refer to the figure at right).
- Measure gas pressure and if there is a leakage, correct it.
  >> <u>When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.</u>
- Check EEV (PARTS INFORMATION 3)
- Check Compressor (PARTS INFORMATION 1,2)
- Check Heater Unit (PARTS INFORMATION 6)

<u>Attention</u>

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 26

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 27

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

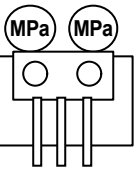
- Is Fan rotating?
  >> Check Fan Motor

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)

Does not start up

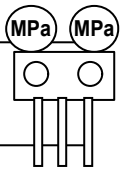
- Is there open or loose connection cable?
- Check connection of Compressor,and winding resistance. (Refer to the next page).

>> If there is no failure, the defect of Compressor is considered (Locked compressor due to clogged dirt or less oil)

Replace Compressor

Stops soon after starting up

- Is there open or loose connection cable?
- Is Gas Pipe Valve open? (Low Pressure is too low)
- Check if Refrigerant is leaking. (Recharge Refrigerant)



- Check if Strainer is clogged. (PARTS INFORMATION 3)
- Check Inverter PCB connection of Compressor,and winding resistance. (Refer to the next page).

>> If there is no failure, the defect of Compressor can be considered. (Compression part broken or valve defective.)

Replace Compressor

Abnormal noise

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

▶Defective Compressor can be considered. (due to inside dirt clogging or broken component)

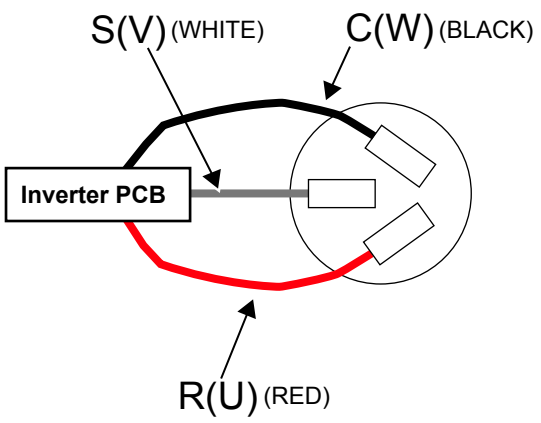
Replace Compressor

SERVICE PARTS INFORMATION 2

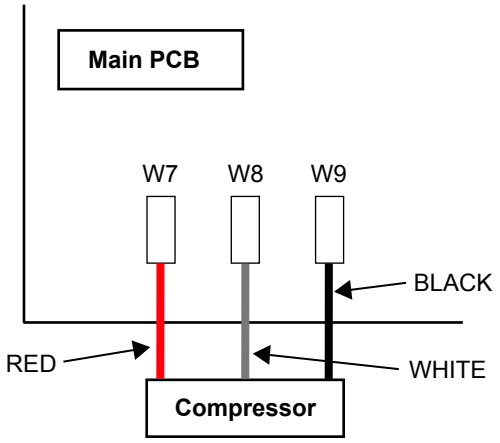
Inverter Compressor

Check Point 1 : Check connection

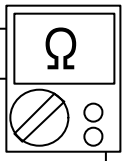
・Check terminal connection of Compressor
(Loose or incorrect wiring)



Check connection of Main PCB
(Loose or incorrect wiring)

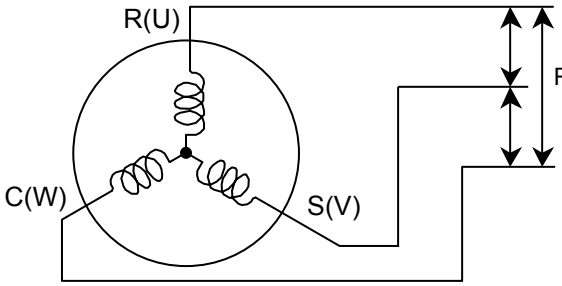


Check Point 2 : Check winding resistance



・Check winding resistance of each terminal

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



Resistance value : 0.71 Ω
(at 20°C)

Check Point 3 : Replace Inverter PCB

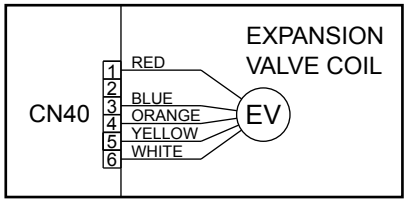
▶**If Check Point 1, 2 do not improve the symptom, replace Inverter PCB.**

SERVICE PARTS INFORMATION 3

Outdoor unit Electronic Expansion Valve
(EEV)

Check Point 1 : Check Connections

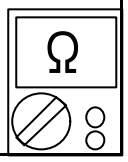
・Check connection of connector
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV

・Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	**46**Ω ± **4**Ω at 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.**

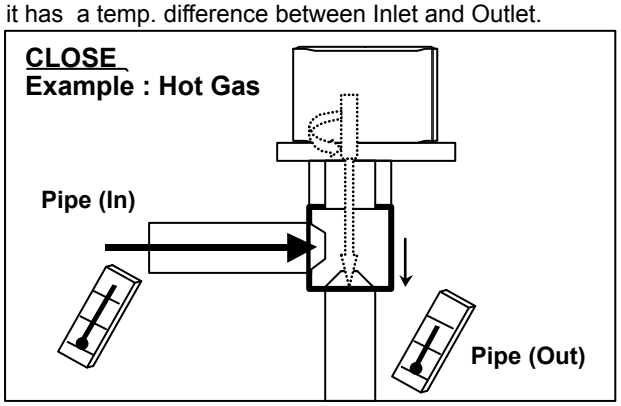
Check Point 4 : Check Noise at start up

・Turn on Power and check operation noise.

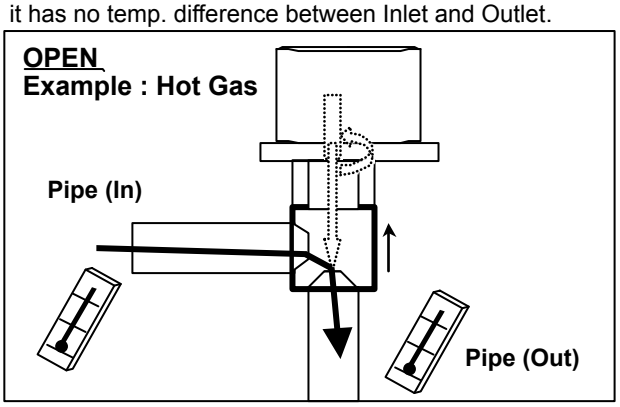
▶ **If an abnormal noise does not show, replace Main PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

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

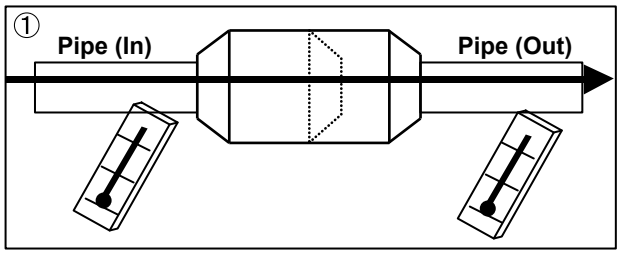


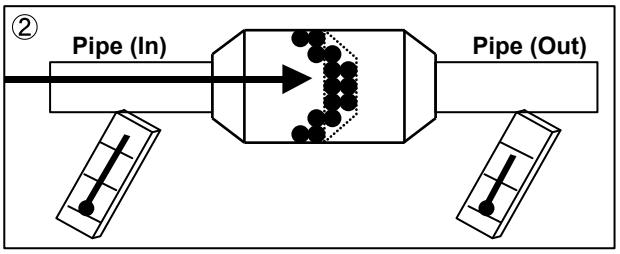
If it is open,
it has no temp. difference between Inlet and Outlet.



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

Indoor unit 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 Indoor Fan Motor

・Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Earth terminal)
>>If they are short-circuited (below 300 kΩ), replace Indoor fan motor and Controller PCB.

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

SERVICE PARTS INFORMATION 5

Outdoor unit 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 kΩ), replace Outdoor fan motor and Main PCB.

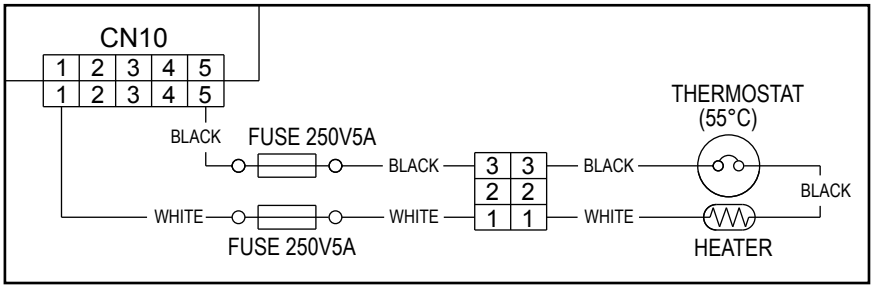
Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3	No function
4 (Black)	Earth terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown)	Feed back (FG)

SERVICE PARTS INFORMATION 6

Heater Unit

Check Point 1 : Check Connections

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



Check Point 2 : Check electrical components

・Check Check Fuses.
>> If Fuse is open, check connection, and replace Fuse.

Check Point 3 : Check Heater wire.

・Remove connector, check resistance of Heater wire.

Read wire	Resistance value
Black - White	321 ~ 366 Ω

▶ **If Resistance value is abnormal, replace Heater Unit.**

Refrigerant
R410A

WALL MOUNTED type
INVERTER

3 . APPENDING DATA

3-1. FUNCTION SETTING

3-1-1 INDOOR UNIT

- Follow the instructions in the Local Setup Procedure, which is supplied with the remote control, in accordance with the installed condition.
  After the power is turned on, perform the Function Setting on the remote control.
- The settings may be selected between the following two: Function Number or Setting Value.
- Settings will not be changed if invalid numbers or setting values are selected.

1-1. Setting the Cooling Room Temperature Correction

Depending on the installed environment, the room temperature sensor may require a correction. The settings may be selected as shown in the table below.

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	Standard	30	00
	Slightly lower control		01

1-2. Setting the Heating Room Temperature Correction

Depending on the installed environment, the room temperature sensor may require a correction. The settings may be selected as shown in the table below.

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	Standard	31	00
	Lower control		01
	Slightly warmer control		02
	Warmer control		03

1-3. Setting the Auto Restart

Enable or disable automatic system restart after a power outage.

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	Yes	40	00
	No		01

1-4. Setting the Indoor room temperature sensor switching function (Only for Wired remote controller)

The following settings are needed when use the control by Wired remote controller temperature sensor.

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	No	42	00
	Yes		01

* If setting value is "00" : Room temperature is controlled by the indoor unit temperature sensor.
* If setting value is "01" : Room temperature is controlled by remote controller unit sensor.

1-5. Setting the Remote controller signal code

Change the indoor unit Signal Code, depending on the remote controllers.

(◆. . . Factory setting)

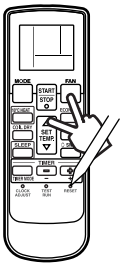
	Setting Description	Function Number	Setting Value
◆	A	44	00
	B		01
	C		02
	D		03

3-1-2 Procedures to change the Function Setting for wireless RC

- This procedure changes to the function settings used to control the indoor unit according to the installation conditions. Incorrect settings can cause the indoor unit malfunction.
- After the power is turned on, perform the "FUNCTION SETTING" according to the installation conditions using the remote controller.
- Settings will not be changed if invalid numbers or setting values are selected.

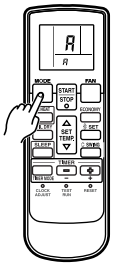
Entering the Function Setting Mode

- While pressing the FAN button and SET TEMP.(▲) simultaneously, press the RESET button to enter the function setting mode.



Selecting the Function Number and Setting Value

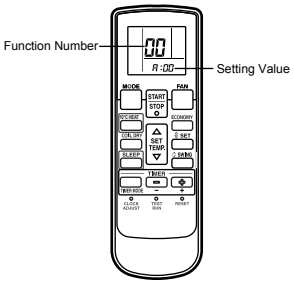
(1) Press the MODE button, and proceed to Fanction Number and Setting Value.
(There is no necessity for setting remote control signal code. Because signal code is setting by Fanction Number and Setting Value.)



(2) Press the SET TEMP. (▲) (▼) buttons to select the Function Number.
(Press the MODE button to switch between the left and right digits.)

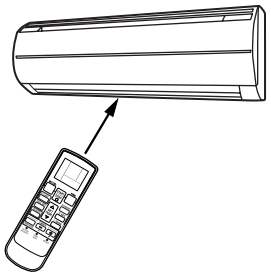
(3) Press the FAN button to proceed to Setting Value.
(Press the FAN button again to return to the Function Number selection.)

(4) Press the SET TEMP. (▲) (▼) buttons to select the Setting Value.
(Press the MODE button to switch between the left and right digits.)



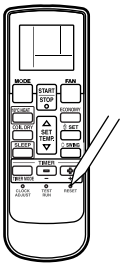
(5) Press the TIMER MODE button. It makes a signal to indoor unit.
(Indoor unit recognize the setting.)

(6) Press the START/STOP button. It makes a signal to indoor unit.
(Indoor unit run the setting.)



(7) Press the RESET button to cancel the function setting mode.

(8) After completing the FUNCTION SETTING, be sure to turn of the power and turn it on again.



⚠ CAUTION
After turning off the power, wait 10 seconds or more before turning on it again. **The FUNCTION SETTING doesn't become effective if it doesn't do so.**

Custom code setting for remote controller

(1) Press the MODE button for more then 5 seconds.

(2) Press the SET TEMP. (▲) (▼) buttons to change the signal code between A→b→c→d.
Match the code on the display to the air conditioner signal code. (initially set to A)

(3) Press the MODE button. (Return to normal display)

⚠ CAUTION
If you change the setting of Fanction Number and Setting Value after setting custom code in remote controller, please set custom code in remote controller again. The remote control unit resets to signal code A when the batteries in the remote control unit are replaced. If you use a signal code other than signal code A, reset the signal code after replacing the batteries. If you do not know the air conditioner signal code setting, try each of the signal codes (A→b→c→d) until you find the code which operates the air conditioner.

3-2. Thermistor Resistance Values

3-2-1 INDOOR UNIT

Room temperature thermistor		
Temp (℃)	Resistance(kΩ)	Voltage(V)
-10.0	58.2	0.73
-5.0	44.0	0.93
0.0	33.6	1.15
5.0	25.9	1.39
10.0	20.2	1.66
15.0	15.8	1.94
20.0	12.5	2.22
25.0	10.0	2.50
30.0	8.0	2.77
35.0	6.5	3.03
40.0	5.3	3.27
45.0	4.3	3.48

Indoor heat exchanger thermistor		
Temp (℃)	Resistance(kΩ)	Voltage(V)
-5.0	233.2	0.88
0.0	176.0	1.10
5.0	134.2	1.36
10.0	103.3	1.63
15.0	80.3	1.92
20.0	62.9	2.21
25.0	49.7	2.51
30.0	39.6	2.79
35.0	31.7	3.06
40.0	25.6	3.30
45.0	20.8	3.53
50.0	17.1	3.73
55.0	14.1	3.90
60.0	11.6	4.05
65.0	9.7	4.19

3-2-2 OUTDOOR UNIT

Discharge thermistor		
Temp (℃)	Resistance(kΩ)	Voltage(V)
-30.0	1013.1	0.06
-25.0	729.1	0.09
-20.0	531.6	0.12
-15.0	392.3	0.16
-10.0	292.9	0.21
-5.0	221.1	0.28
0.0	168.6	0.36
5.0	129.8	0.46
10.0	100.9	0.57
15.0	79.1	0.71
20.0	62.5	0.86
25.0	49.8	1.03
30.0	40.0	1.23
35.0	32.4	1.43
40.0	26.3	1.65
45.0	21.6	1.88
50.0	17.8	2.11
55.0	14.8	2.34
60.0	12.3	2.57
65.0	10.3	2.79
70.0	8.7	3.00
75.0	7.4	3.19
80.0	6.3	3.37
85.0	5.4	3.54
90.0	4.6	3.69
95.0	4.0	3.83
100.0	3.4	3.96
105.0	3.0	4.07
110.0	2.6	4.17
115.0	2.3	4.26
120.0	2.0	4.33

Outdoor heat exchanger thermistor		
Temp (℃)	Resistance(kΩ)	Voltage(V)
-30.0	95.6	0.24
-25.0	68.9	0.32
-20.0	50.3	0.43
-15.0	37.2	0.57
-10.0	27.8	0.73
-5.0	21.0	0.92
0.0	16.1	1.14
5.0	12.4	1.39
10.0	9.6	1.65
15.0	7.6	1.93
20.0	6.0	2.21
25.0	4.8	2.49
30.0	3.8	2.77
35.0	3.1	3.02
40.0	2.5	3.26
45.0	2.1	3.48
50.0	1.7	3.67
55.0	1.4	3.85
60.0	1.2	4.00
65.0	1.0	4.13
70.0	0.8	4.25
75.0	0.7	4.35
80.0	0.6	4.43

Outdoor temperature thermistor		
Temp (℃)	Resistance(kΩ)	Voltage(V)
-30.0	224.3	0.73
-25.0	159.7	0.97
-20.0	115.2	1.25
-15.0	84.2	1.56
-10.0	62.3	1.90
-5.0	46.6	2.26
0.0	35.2	2.61
5.0	26.9	2.94
10.0	20.7	3.24
15.0	16.1	3.52
20.0	12.6	3.76
25.0	10.0	3.96
30.0	8.0	4.14
35.0	6.4	4.28
40.0	5.2	4.40
45.0	4.2	4.50
50.0	3.5	4.59
55.0	2.8	4.65
60.0	2.4	4.71
65.0	2.0	4.76
70.0	1.6	4.79
75.0	1.4	4.83
80.0	1.2	4.85

FUJITSU

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