SPLIT TYPE
ROOM AIR CONDITIONER

DUCT type
INVERTER

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	ARYG72LHTA	AOYG72LRLA
	ARYG90LHTA	AOYG90LRLA

Refrigerant
R410A

FUJITSU GENERAL LIMITED

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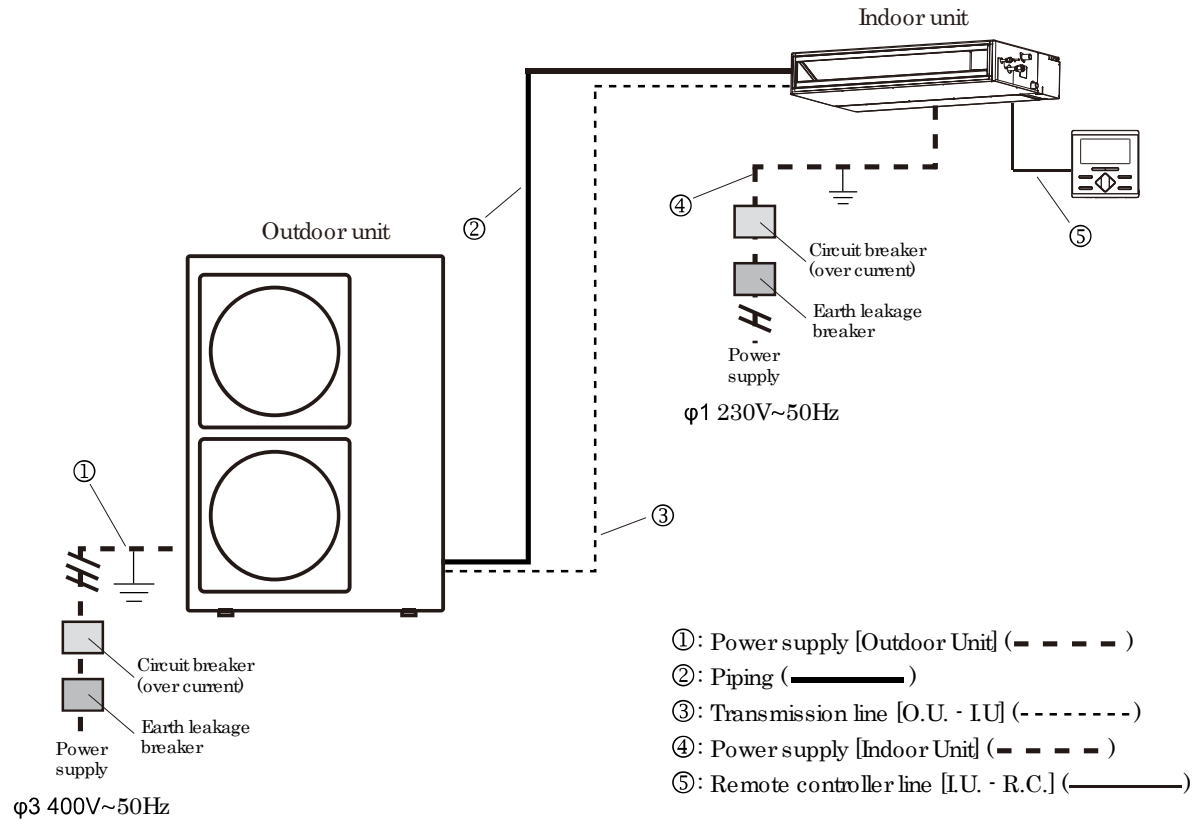
Refrigerant
R410A

DUCT type
INVERTER

1 . DESCRIPTION OF EACH CONTROL OPERATION

1-1. SYSTEM OUTLINE



NOTE :
When checking it, ON-OFF do a power supply of both of indoor unit and outdoor unit.
When power supply ON-OFF doesn't do both of indoor unit and outdoor unit, it doesn't move.

When electricity was supplied only in indoor unit.
LED in control PCB light's and it doesn't move.

When electricity was supplied only in outdoor unit.
There is no lighting up of LED in control PCB, but it's serial error and does't move.

1-2. COOLING OPERATION

1-2-1 COOLING CAPACITY CONTROL

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

* If the room temperature is 6.0 °C higher than a set temperature, the compressor operation frequency will attain to maximum performance.

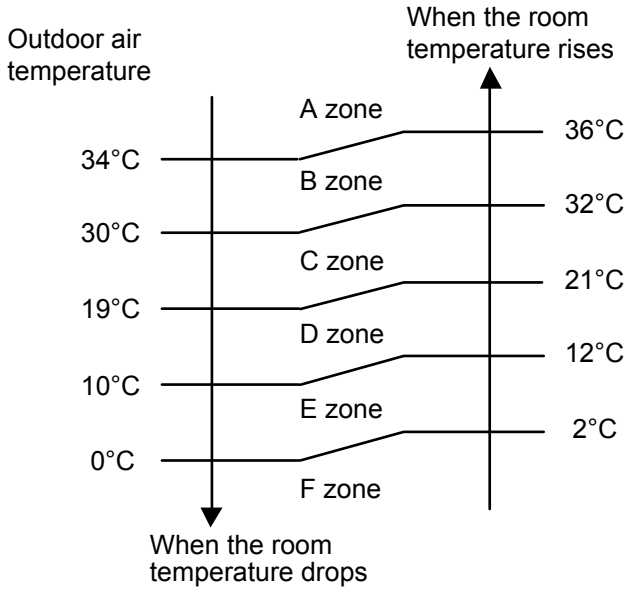
* If the room temperature is 1.0 °C lower than a set temperature, the compressor will be stopped.

* When the room temperature is between +6.0°C to -1.0℃ of the setting temperature, the compressor frequency is controlled within the range shown in Table1. However, the maximum frequency is limited in the range shown in Fig.1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor Frequency Range)

	minimum frequency	maximum frequency
ARYG72LHTA	15rps	81rps
ARYG90LHTA	15rps	90rps

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



Fan speed mode		Hi	Me	Lo	Qu
ARYG72LHTA	A zone	78rps	55rps	53rps	43rps
	B zone	78rps	55rps	53rps	43rps
	C zone	59rps	53rps	45rps	38rps
	D-F zone	53rps	45rps	43rps	33rps
ARYG90LHTA	A zone	84rps	60rps	55rps	43rps
	B zone	84rps	60rps	55rps	43rps
	C zone	66rps	55rps	46rps	38rps
	D-F zone	55rps	46rps	43rps	33rps

1-3. HEATING OPERATION

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

* If the room temperature is lower 6.0°C than a set temperature, the compressor operation frequency will attain to maximum performance.

* If the room temperature is higher 1.0°C than a set temperature, the compressor will be stopped.

* When the room temperature is between +1.0°C to -6.0°C of the setting temperature, the compressor frequency is controlled within the range shown in Table2.

(Table 2 : Compressor Frequency Range)

	minimum frequency	maximum frequency
ARYG72LHTA	15rps	81rps
ARYG90LHTA	15rps	90rps

1-4. DRY OPERATION

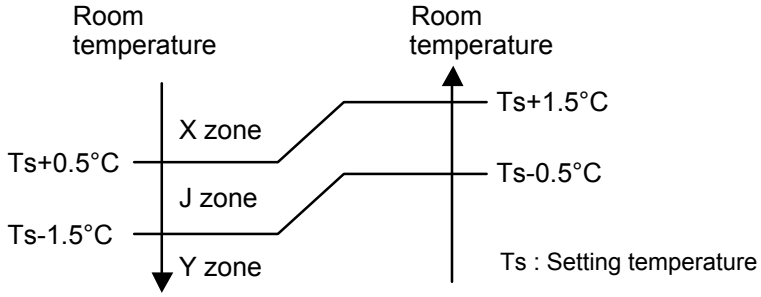
1-4-1 INDOOR UNIT CONTROL

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

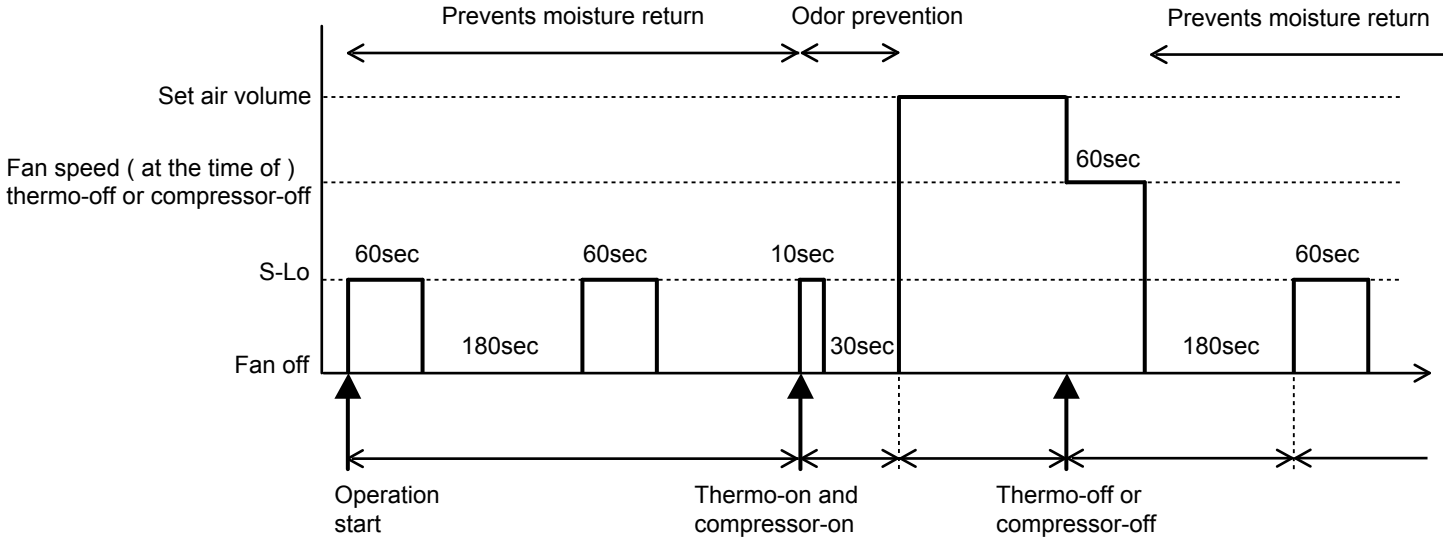
(Table 3 : Compressor frequency)

	Operating frequency
X zone	38rps
J zone	
Y zone	0rps

(Fig.2 : Compressor Control based on Room Temperature)



(Fig.3 : Indoor Fan Control)



1-5. AUTO CHANGEOVER OPERATION

When the air conditioner is set to the Auto mode by remote controller, operation starts in the optimum mode from among the Heating, Cooling, and Monitoring mode. 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 0.5°C (wireless and 2 wire remote controller) or 1.0°C(standard remote controller) steps.

① When operation starts, indoor fan and outdoor fan are operated for around 1 minutes. Room temperature and outdoor temperature are sensed, and the operation mode is selected in accordance with the table below. **<Monitoring mode>**

(Table 4 : Operation mode selection table)

Room temperature (TR)	Operation mode
TR> Ts+2°C	Cooling
Ts+2°C ≧TR ≧ Ts -2°C	*Middle zone
TR < Ts -2°C	Heating

TR : Room temperature
Ts : Setting temperature

*If it's Middle zone, operation mode of indoor unit is selected as below.

(1). Same operation mode is selected as outdoor unit.

If outdoor unit is operating in Cooling and Heating mode, indoor unit will be operated by the same operation mode.

(2). Selected by the outdoor temperature.

If outdoor unit is operating in other than Cooling and Heating mode, indoor unit will be operated according to the outdoor temperature as below.

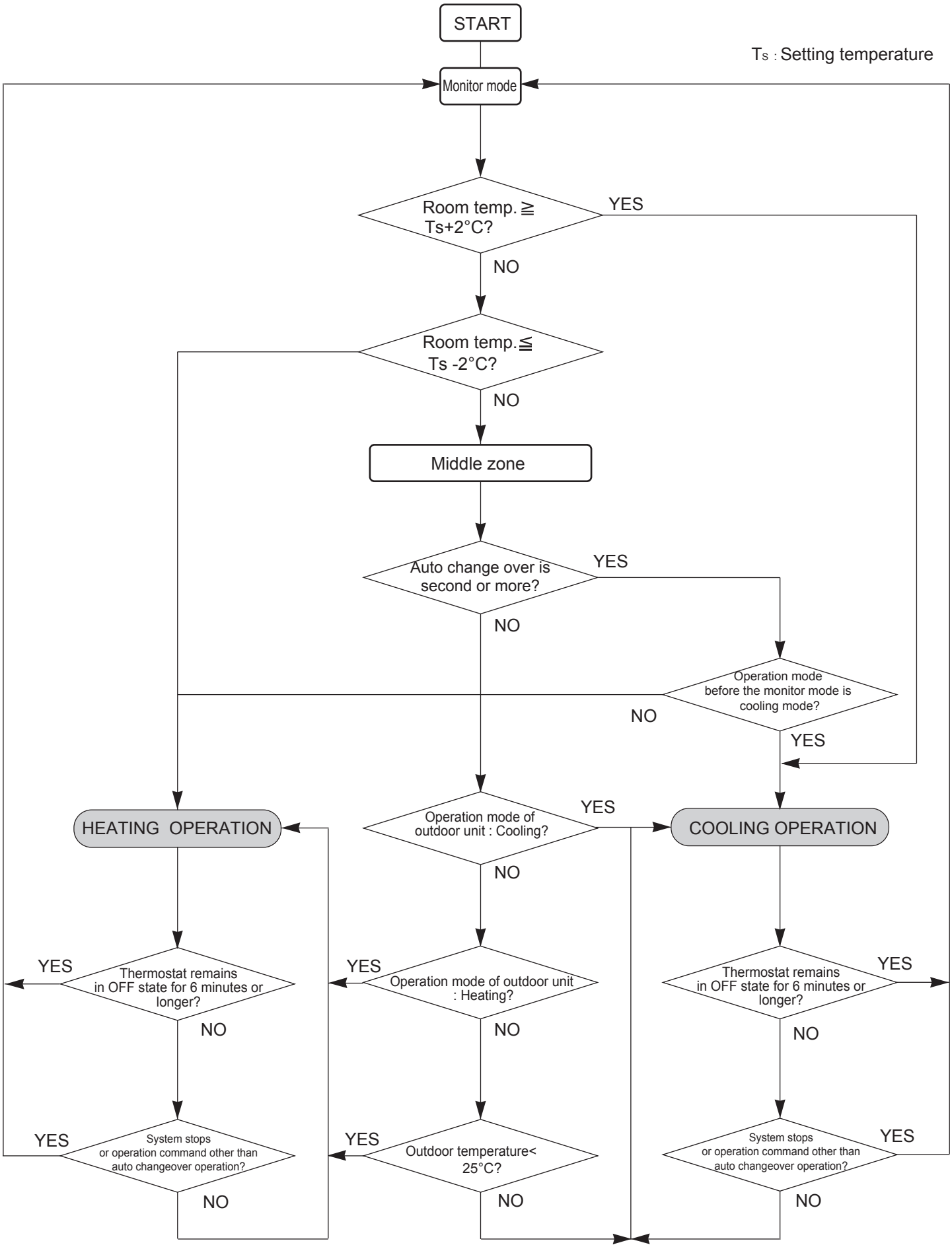
(Fig.4 : Outdoor temperature zone selection)

Temperature	Mode
25°C and over	Cooling
25°C under	Heating

② When the compressor was stopped for 6 consecutive minutes by the temperature control function after the Cooling or Heating mode was selected at ① above, operation is switched to Monitoring and the operation mode is selected again.

③ When the middle zone is selected on the predetermining of the operation mode, the operation mode before the changing to the monitor mode is selected.

■ AUTO CHANGEOVER operation flow chart



1-6. INDOOR FAN CONTROL

1. Fan speed

(Table 5 : Standard of Indoor Fan Speed)

*The following fan speed is a standard value.
(Static pressure : 72Pa)

Operation mode	Air flow mode	Speed (rpm)	
		ARYG72LHTA	ARYG90LHTA
Heating	HIGH	1130	1210
	MED	1040	1100
	LOW	930	990
	Quiet	820	880
Cooling	HIGH	1130	1210
	MED	1040	1100
	LOW	930	990
	Quiet	820	880
	Soft Quiet	720	770
S-Lo		460	510
Dry		820	880

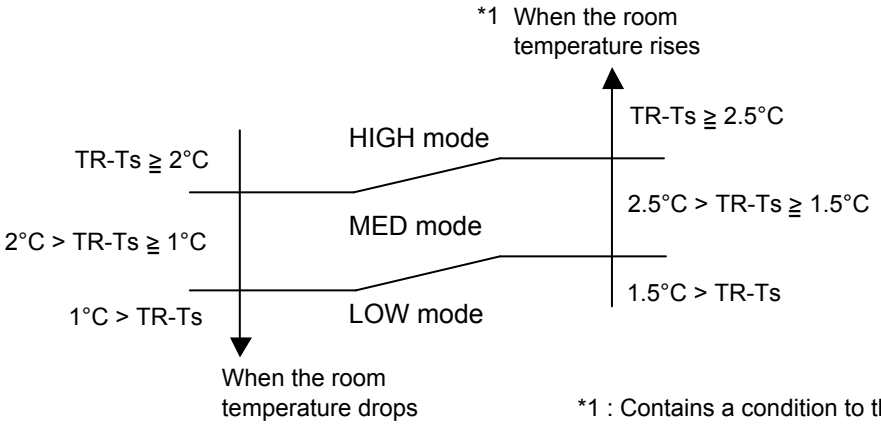
2. FAN OPERATION

The airflow can be switched in 4 steps such as AUTO, QUIET, LOW, MED, HIGH, while the indoor fan only runs.
When [AUTO] is selected, the indoor fan motor runs MED.

3. COOLING OPERATION

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

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



TR : Room temperature
Ts : Setting temperature

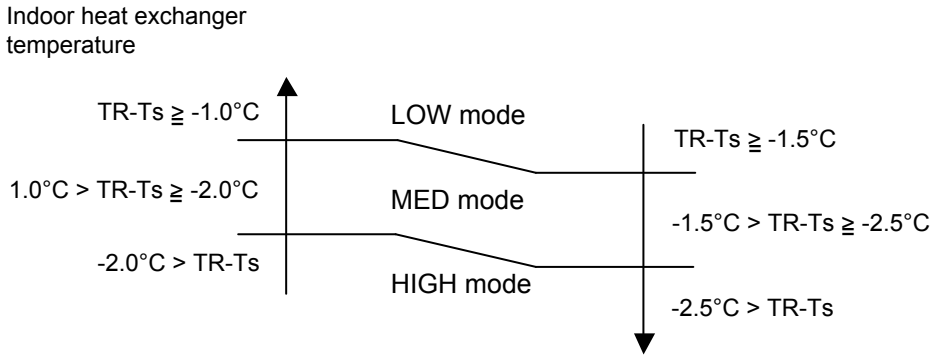
*1 : Contains a condition to the following
1 When the operation mode is set to AUTO mode at the start of operation.
2 When the setting temperature was changed.
3 When the operation mode was changed to COOLING mode.
4 When the airflow mode was changed to AUTO mode.

4. HEATING OPERATION

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

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

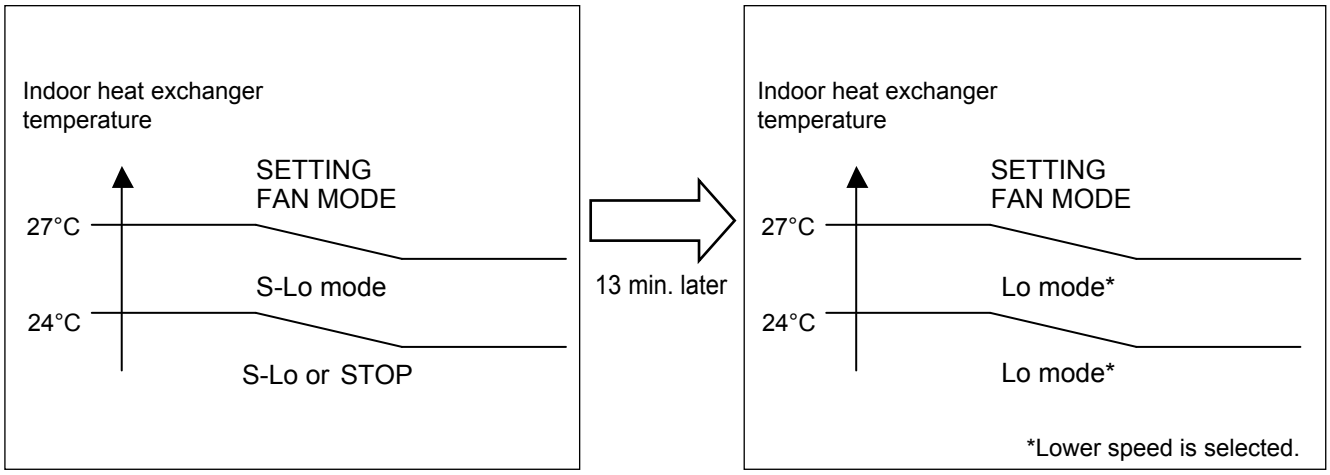
(Fig.6 : Airflow change - over (Heating : AUTO))



5. COOL AIR PREVENTION CONTROL (Heating mode)

The maximum value of the indoor fan speed is set as shown in Fig.7, based on the detected temperature by the indoor heat exchanger sensor on heating mode.
When the compressor does not operate, the indoor fan motor operates [S-Lo] or [Stop] mode.

(Fig.7 : Cool Air Prevention Control)



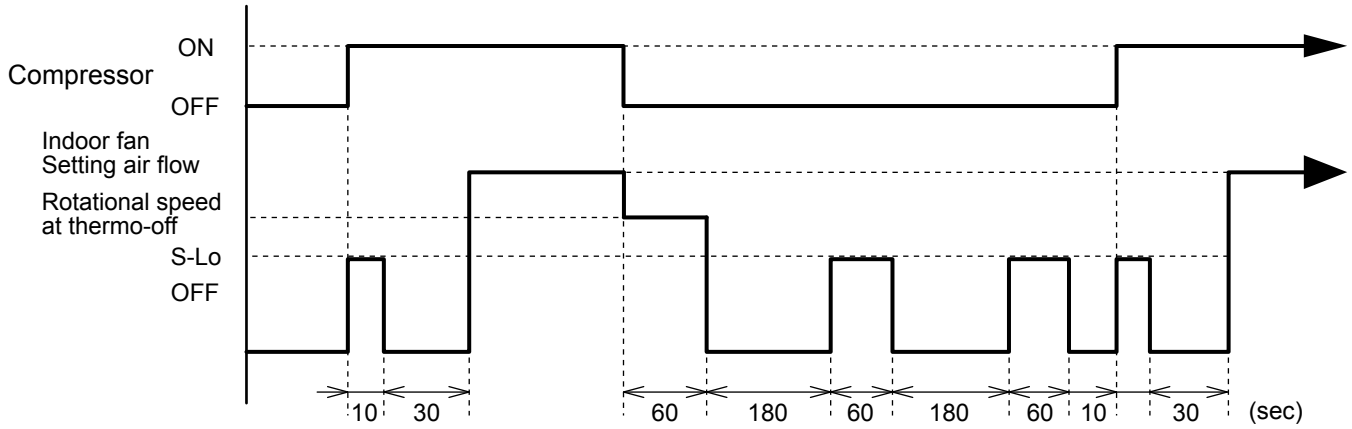
6. DRY OPERATION

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

7. FAN CONTROL FOR ENERGY SAVING

When the air flow setting except AUTO mode, the indoor fan motor will run as shown in Fig.8.

(Fig 8 : Indoor Fan Control)



Indoor unit fan control for energy saving for cooling

Enables or disables the power-saving function by controlling the indoor unit fan rotation when the outdoor unit is stopped during cooling operation.

Function number	Setting value	Setting description	Factory setting
49	00	Disable	
	01	Enable	
	02	Remote controller	♦

00: When the outdoor unit is stopped, the indoor unit fan operates continuously following the setting on the remote controller.

01: When the outdoor unit is stopped, the indoor unit fan operates intermittently at a very low speed.

02: Enable or disable this function by remote controller setting.

NOTES:

- As the factory setting, this setting is initially inactivated.
- Set to "00" or "01" when connecting a remote controller that cannot set the Fan control for energy saving function or connecting a network converter.
  To confirm if the remote controller has this setting, refer to the operating manual of each remote controller.

1-7. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

Following table shows the fan speed of the outdoor unit.

(Table 6 : Fan speed of the outdoor unit)

		Cooling	Heating
AOYG72LRLA	Upper fan	780/ 680/ 660/ 590/ 520/ 450/ 440/ 380/ 300 rpm	680/ 660/ 590/ 520/ 450/ 440/ 380/ 300 rpm
	Lower fan	740/ 680/ 660/ 510/ 400/ 330/ 300 rpm	680/ 660/ 510/ 400/ 330/ 300 rpm
AOYG90LRLA	Upper fan	780/ 730/ 660/ 590/ 520/ 450/ 440/ 380/ 300 rpm	780/ 730/ 660/ 590/ 520/ 450/ 440/ 380/ 300 rpm
	Lower fan	740/ 690/ 660/ 510/ 400/ 330/ 300 rpm	740/ 690/ 660/ 510/ 400/ 330/ 300 rpm

* The outdoor fan speed changes in the range mentioned above depending on the compressor frequency and outdoor temperature.
(When the compressor frequency and outdoor temperature increase, the outdoor fan speed also changes to the higher speed.
When the compressor frequency and outdoor temperature decrease, the outdoor fan speed also changes to the lower speed.)

* The compressor and the fan start-up at the same time, and the fan stops after the compressor stops and 60 seconds has passed.

* The fan doesn't operates fan 10 seconds after the fan stops.

* After operating the defrost control function on heating mode except economy operation, its speed becomes 780(Upper) / 740(Lower)(90). 680(Upper) /680(Lower)(72) regardless of the compressor speed.
However, it returns to the normal speed control when the defrosting operation does not function for 240 minutes after releasing the defrost operation or when the outdoor temperature sensor detection value becomes higher than 5°C.

* It runs at 500rpm for 20 seconds after starting up the outdoor fan.
However, the fan operates at 300rpm when the initial rotation speed is 300rpm or less.

1-8. COMPRESSOR CONTROL

1. OPERATION FREQUENCY RANGE

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

(Table 7 : Compressor Operation Frequency Range)

	Cooling		Heating	
	Min	Max	Min	Max
ARTG72LHTA	15rps	81rps	15rps	81rps
ARTG90LHTA	15rps	90rps	15rps	90rps

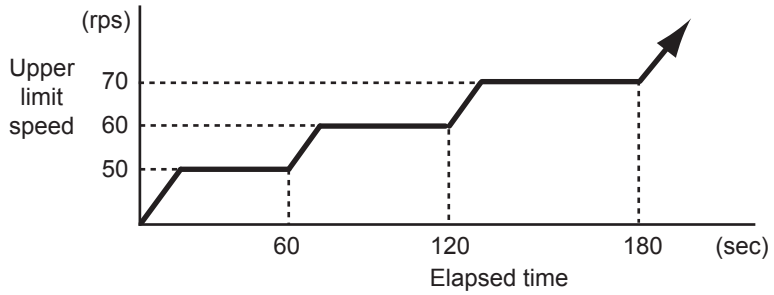
2. OPERATION FREQUENCY CONTROL AT START UP

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

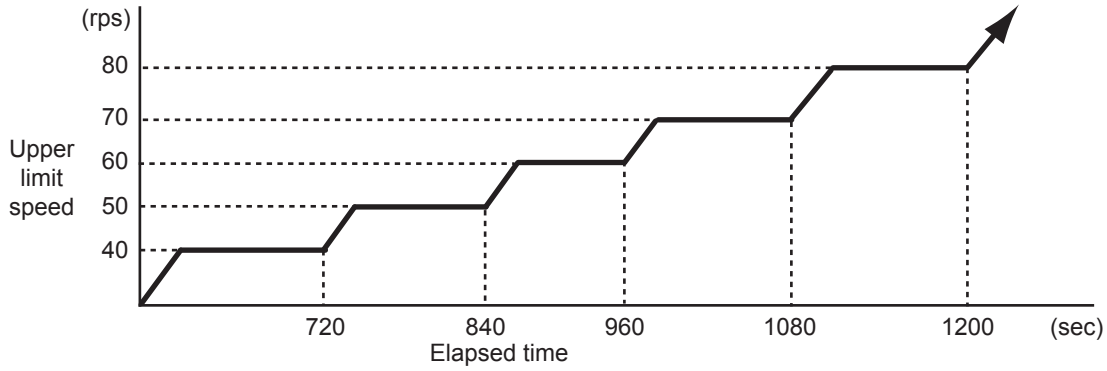
(Fig.9 : Compressor Control at Start-up)

< Normal start-up >

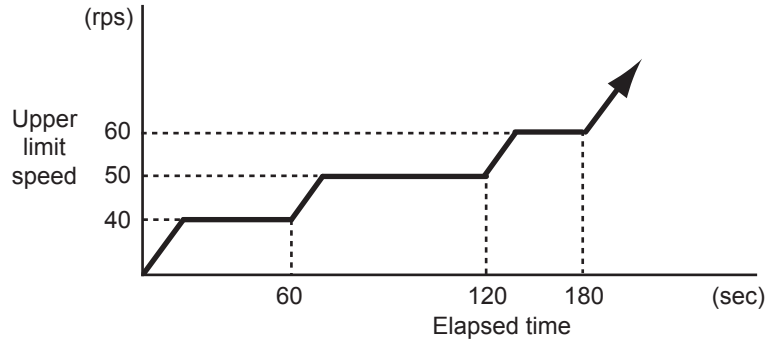
Immediate start-up after power-ON (cooling)



Immediate start-up after power-ON (Hearting Ta < 10°C)



Immediate start-up after power-ON (Hearting Ta ≧ 10°C)



Ta : Outdoor temperature

1-9. ELECTRONIC EXPANSION VALVE CONTROL

The most proper opening of the electronic expansion valve is calculated and controlled under the present operating condition based on the following values.
The compressor frequency, the temperatures detected by the discharge temperature sensor and the outdoor temperature sensor.

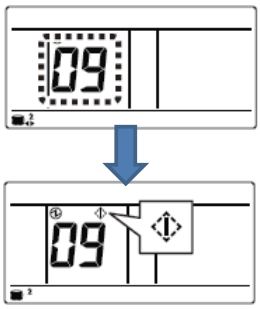
AOYG72/90LRLA	The pulse range of the electronic expansion valve control is 50 ~ 500 pulses (Cooling) and 50 ~ 500 pulses (Heating).

* 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).

1-10. TEST OPERATION CONTROL

▪ With Wired Remote Controller

With “Monitor Mode Screen” displayed, press and hold the [MENU] button, [<] button and [ENTER] button simultaneously for at least 2 seconds.
Setting item selection screen is displayed.
Select the number”09” of the item to be set with the [<] or [>] button, press the [ENTER] button to switch to the Setting Screen.
The test operation screen is displayed.
Press the [ENTER] button to test operation begins.
Test operation is completed after about an hour.
The test run will automatically end is approximately 60 min.



▪ With Wireless Remote Controller

Under the condition where the air conditioner runs, press the TEST RUN button, and the test operation control mode will appear.
During test running, the operation lamp and timer lamp of the air conditioner body twinkle simultaneously.
Set the test operation mode, and the compressor will continue to run regardless of whether the room temperature sensor detects.
The test operation mode is released if 60 minutes have passed after setting up the test operation.

1-11. PREVENT TO RESTART FOR 3 MINUTES (3 MINUTES ST)

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

1-12. 4-WAY VALVE EXTENSION SELECT

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

1-13. AUTO RESTART

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

[Operation contents memorized when the power is interrupted]

- Operation mode
- Set temperature
- Set air flow
- Timer mode and timer time (set by wireless remote controller)
- 10°C HEAT (set by wireless remote controller)
- ECONOMY
- Fan saving setting
- Each central setting

1-14. PUMP DOWN

⚠ WARNING

Never touch electrical components such as the terminal blocks except the button on the display board. It may cause a serious accident such as electric shock.

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

⚠ CAUTION

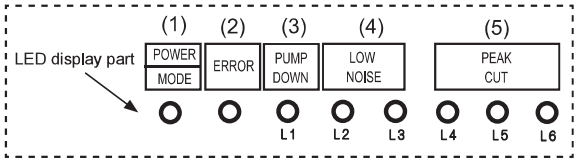
Perform the pump down operation before disconnecting any refrigerant pipe or electric cable.

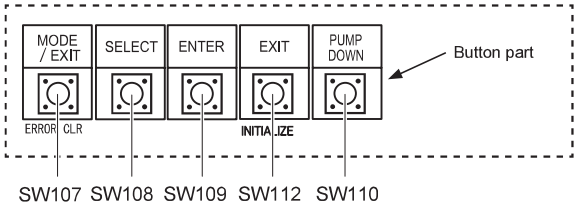
Collect refrigerant from the service port or the 3-way valve if pump down cannot be performed.

In case of a group control system installation, do not turn the power off pump down is completed in all outdoor units.
(Group control system installation described in "SPECIAL INSTALLATION METHODS" in the installation manual of the indoor unit.)

Please check the refrigerant circuit for any leaks before starting the pump down operation.
Do not proceed with the pump down operation if there is no refrigerant left in the circuit due to bent or broken piping.

- Operate "PUMP DOWN" button on the display board in the manner described below.





14.1. Preparation for pump down

- Confirm that the power is off, and then open the service panel.

14.2. Pump down procedure

(1) Check the 3-way valves (both the liquid side and gas side) are opened.

(2) Turn the power on.

POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
●	○	○	○	○	○	○	○

Sign "○": Lights off, "●": Lights on

(3) Press "PUMP DOWN" button for 3 seconds or more after 3 minutes after power on.

POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
●	○	●	○	○	●	●	●

Sign "○": Lights off, "●": Lights on
LED display lights on as shown in the above figure, and the fans and the compressor start operating.

- If the "PUMP DOWN" button is pressed while the compressor is operating, the compressor will stop, then start again in about 3 minutes.

(4) LED display will change as shown below about 3 minutes after the compressor starts. Fully close the 3-way valve on the liquid pipe side at this stage.

POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
●	○	●	○	○	○	●	●

Sign "○": Lights off, "●": Lights on

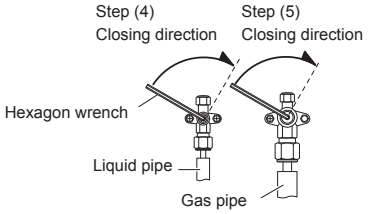
- If the valve on the liquid pipe side is not closed, the pump down cannot be performed.

(5) When LED display changes as shown in the below figure, close the 3-way valve on the gas pipe side tightly.

POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
●	○	●	○	○	○	○	●

Sign "○": Lights off, "●": Lights on

- If the valve on the gas pipe side is not closed, refrigerant may flow into the piping after the compressor stops.



(6) LED display changes after 1 minute as shown in the figure below.

POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
●	○	●	○	○	○	○	○

Sign "○": Lights off, "●": Lights on
Fans and compressor stop automatically.

- If the pump down is successfully completed (the above LED display is shown), the outdoor unit remains stopped until the power is turned off.

(7) Turn the power off.

POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
○	○	○	○	○	○	○	○

Sign "○": Lights off
PUMP DOWN is completed.

(Note)

- To stop pump down, press the "PUMP DOWN" button again.
- To start the pump down again after the compressor is automatically stopped due to an error, turn the power off and open the 3-way valves. Wait 3 minutes, turn the power on and start the pump down again.
- When starting the operation after completion of the pump down, turn the power off, and then open the 3-way valves. Wait 3 minutes, turn the power on and perform a test run in the "COOL" operation mode.
- If an error occurs, recover the refrigerant from service port.

1-15. COMPRESSOR PREHEATING

When the outdoor temperature is lower than 60°C and the all operation mode has been stopped for 30 minutes, Turn on the belt heater power.
(By heating the compressor, warm air is quickly discharged when operation is started.)
When operation was started and when the outdoor temperature rises to 65°C or greater, preheating is ended.

1-16. 10°C HEAT OPERATION

*Wireless Remote Control Unit (Option) Only

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

(Table9)

Mode	Heating
Setting temperature	10°C
Fan mode	AUTO

1-17. 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.

(Table10)

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

1-18. DEFROST OPERATION CONTROL

1. CONDITION OF STARTING THE DEFROST OPERATION

The defrost operation starts as shown in the following Table 11, 12, and 13.

(Table 11 : Condition of 1st defrost operation)

	Compressor integrating operation time		
1st defrost after starting operation	Less than 22 minutes	More than 22 minutes	More than 62 minutes
	Does not operate	Outdoor heat exchanger temp. Below -9°C	Outdoor heat exchanger temp. Below -5°C

(Table 12 : Condition of 2nd defrost operation)

	Compressor integrating operation time	
From 2nd and later defrost after starting operation	Less than 35 minutes	More than 35 minutes
	Does not operate	Outdoor heat exchanger temp. Below -10°C

(Table 13 : Condition of Integrating defrost operation)

	Compressor integrating operation time	
Integratingdefrost (Constant monitoring)	More than 240 minutes (For long continuous operation)	Less than 10 minutes * (For intermittent operation)
	Outdoor heat exchanger temp. Below -3°C	OFF count of the compressor 40 times

*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 becomes as shown in Table 14.

(Table 14 : Condition of defrost release)

Release Condition
After compressor operation time passed for 1 minute, when a high-pressure sensor detected more than 2.09MPag. or Compressor operation time has passed 15 minutes.

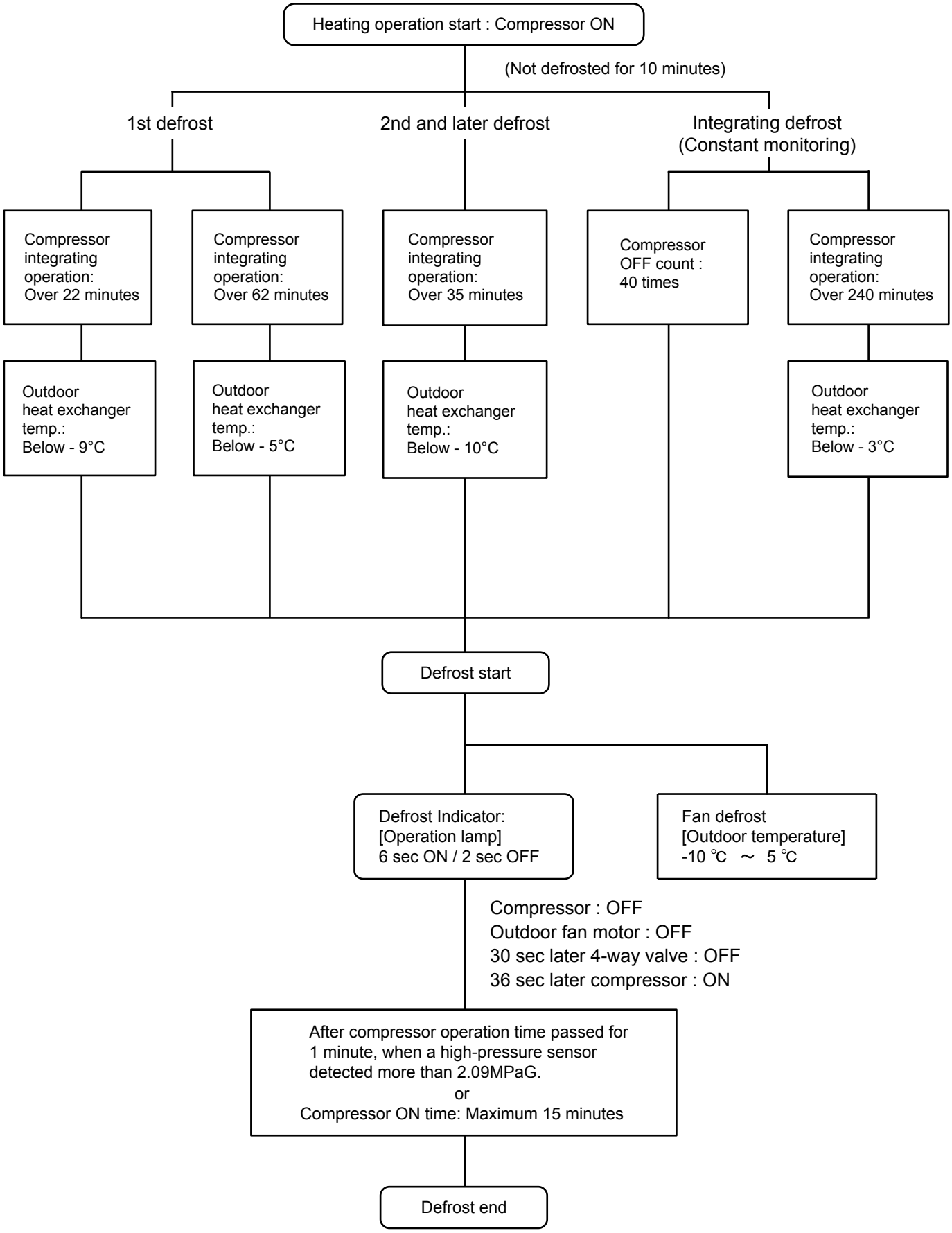
3. CONDITION OF THE FAN'S DEFROST OPERATION STARTING

Outdoor temperature

-10 ℃ ～ 5.0 ℃ (The time of a defrost movement judgment.)

3. Defrost Flow Chart

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



1-19. OFF DEFROST OPEARTION CONTROL

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

1. OFF DEFROST OPERATION CONDITION

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

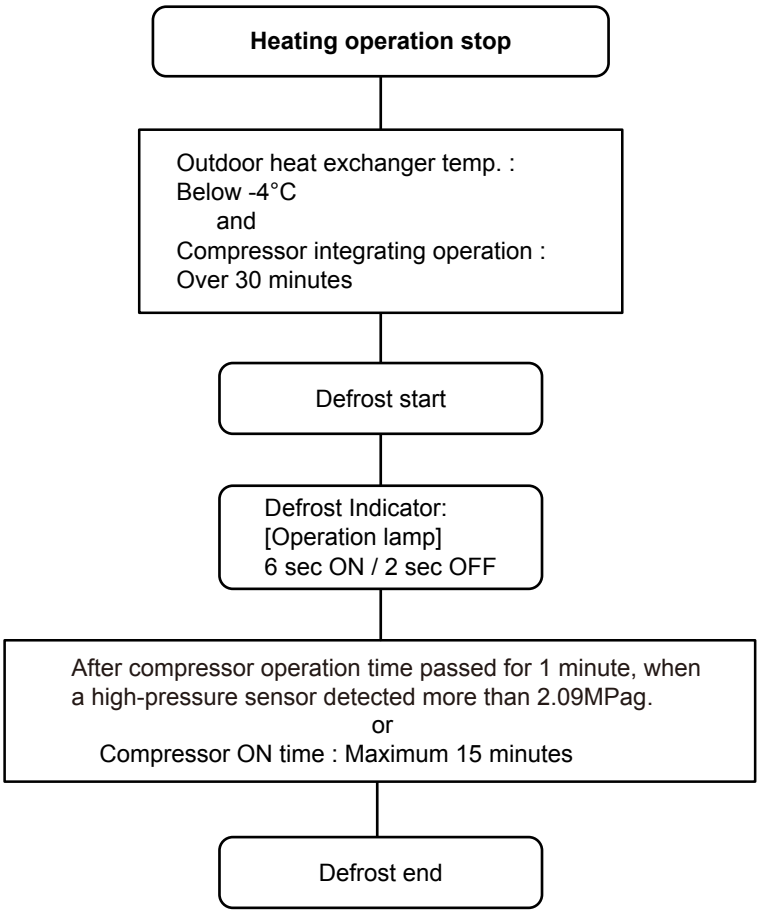
2. OFF DEFROST RELEASE CONDITION

OFF defrost operation is released when the conditions becomes as shown in Table 15.

(Table 15 : OFF Defrost Release Condition)

Release Condition
After compressor operation time passed for 1 minute, when a high-pressure sensor detected more than 2.09MPag. or Compressor operation time has passed 15 minute

OFF Defrost Flow Chart



1-20. VARIOUS PROTECTIONS

1. DISCHARGE GAS TEMPERATURE OVERRISE PREVENTION CONTROL

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

When the discharge temperature becomes higher than Temperature Ⅰ ,the compressor frequency is decreased 10rps(72/90) and it continues to decrease the frequency for 10rps every 120 seconds until the temperature becomes lower than Temperature Ⅰ .

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

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

(Table16 : Discharge Temperature Over Rise Prevention Control / Release Temperature)

	Temperature Ⅰ	Temperature Ⅱ	Temperature Ⅲ
ARYG72LHTA ARYG90LHTA	105°C	101°C	115°C

2. CURRENT RELEASE CONTROL

The compressor frequency is controlled so that the outdoor unit input current does not exceeds the current limit value that was set up with the outdoor temperature.
The compressor frequency returns to the designated frequency of the indoor unit at the time when the frequency becomes lower than the release value.

[Cooling]

(Control / Release)

<table>
<tr><td></td><td colspan="11">Outdoor unit fan speed (UP / LO)</td></tr>
<tr><td>AOYG72LRLA</td><td>780/740rpm</td><td>680/680rpm</td><td>680/680rpm</td><td>660/660rpm</td><td>590/510rpm</td><td>520/400rpm</td><td>440/330rpm</td><td>380/300rpm</td><td>300/300rpm</td><td>450/ 0rpm</td><td>300/ 0rpm</td></tr>
<tr><td>AOYG90LRLA</td><td>780/740rpm</td><td>780/740rpm</td><td>730/690rpm</td><td>660/660rpm</td><td>590/510rpm</td><td>520/400rpm</td><td>440/330rpm</td><td>380/300rpm</td><td>300/300rpm</td><td>450/ 0rpm</td><td>300/ 0rpm</td></tr>
<tr><td>49°C ≦ Ta</td><td colspan="11">5.9A/4.9A</td></tr>
<tr><td>46°C ≦ Ta < 49°C</td><td colspan="3" rowspan="3">11.0A/10.0A</td><td colspan="3" rowspan="14">9.8A/8.8A</td><td colspan="5" rowspan="14">8.2A/7.2A</td></tr>
<tr><td>43°C ≦ Ta < 46°C</td></tr>
<tr><td>40°C ≦ Ta < 43°C</td></tr>
<tr><td>38°C ≦ Ta < 40°C</td><td colspan="3" rowspan="11">13.6A/12.6A</td></tr>
<tr><td>31°C ≦ Ta < 38°C</td></tr>
<tr><td>25°C ≦ Ta < 31°C</td></tr>
<tr><td>19°C ≦ Ta < 25°C</td></tr>
<tr><td>13°C ≦ Ta < 19°C</td></tr>
<tr><td>7°C ≦ Ta < 13°C</td></tr>
<tr><td>0°C ≦ Ta < 7°C</td></tr>
<tr><td>-5°C ≦ Ta < 0°C</td></tr>
<tr><td>-10°C ≦ Ta < -5°C</td></tr>
<tr><td>-15°C ≦ Ta < -10°C</td></tr>
<tr><td>Ta < -15°C</td></tr>
</table>

Ta : Outdoor Temperature

[Heating]

(Control / Release)

<table>
<tr><td></td><td colspan="11">Outdoor unit fan speed (UP / LO)</td></tr>
<tr><td>AOYG72LRLA</td><td>680/680rpm</td><td>680/680rpm</td><td>680/680rpm</td><td>660/660rpm</td><td>590/510rpm</td><td>520/400rpm</td><td>440/330rpm</td><td>380/300rpm</td><td>300/300rpm</td><td>450/ 0rpm</td><td>300/ 0rpm</td></tr>
<tr><td>AOYG90LRLA</td><td>780/740rpm</td><td>780/740rpm</td><td>730/690rpm</td><td>660/660rpm</td><td>590/510rpm</td><td>520/400rpm</td><td>440/330rpm</td><td>380/300rpm</td><td>300/300rpm</td><td>450/ 0rpm</td><td>300/ 0rpm</td></tr>
<tr><td>24°C ≦ Ta</td><td colspan="3" rowspan="12">11.8A/10.8A</td><td rowspan="12">13.6A/12.6A</td><td rowspan="12">9.8A/8.8A</td><td rowspan="2">8.2A/7.2A</td><td colspan="3" rowspan="2">7.8A/6.8A</td><td colspan="3" rowspan="3">6.5A/5.5A</td></tr>
<tr><td>20°C ≦ Ta < 24°C</td></tr>
<tr><td>16°C ≦ Ta < 20°C</td><td colspan="4" rowspan="10">8.5A/7.5A</td></tr>
<tr><td>12°C ≦ Ta < 16°C</td></tr>
<tr><td>5°C ≦ Ta < 12°C</td></tr>
<tr><td>- 1°C ≦ Ta < 5°C</td></tr>
<tr><td>- 7°C ≦ Ta < - 1°C</td><td colspan="3" rowspan="8">7.8A/6.8A</td></tr>
<tr><td>-10°C ≦ Ta < - 7°C</td></tr>
<tr><td>-15°C ≦ Ta < -10°C</td></tr>
<tr><td>-20°C ≦ Ta < -15°C</td></tr>
<tr><td>-25°C ≦ Ta < -20°C</td></tr>
<tr><td>Ta < -25°C</td></tr>
</table>

Ta : Outdoor Temperature

3. ANTIFREEZING CONTROL (Cooling and Dry mode)

The compressor frequency is decrease on cooling & dry mode when the indoor heat exchanger temperature sensor detects the temperature lower than Temperature Ⅰ.
Then, the anti-freezing control is released when it becomes higher than Temperature Ⅱ.

(Table 18 : Anti-freezing Protection Operation / Release Temperature)

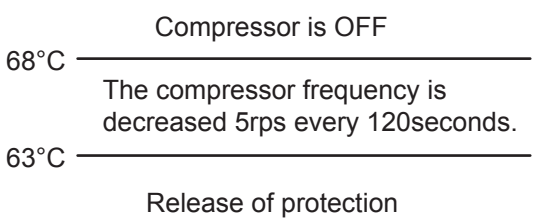
Outdoor temperature	Temperature Ⅰ	Temperature Ⅱ
Over than 10°C *1 or 12°C *2	4°C	7°C
Less than 10°C *1 or 12°C *2		13°C

*1. When the temperature rises.
*2. When the temperature drops.

4. COOLING PRESSURE OVER RISE PROTECTION

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

(Fig.11 : Cooling Pressure Over Rise Protection Control)

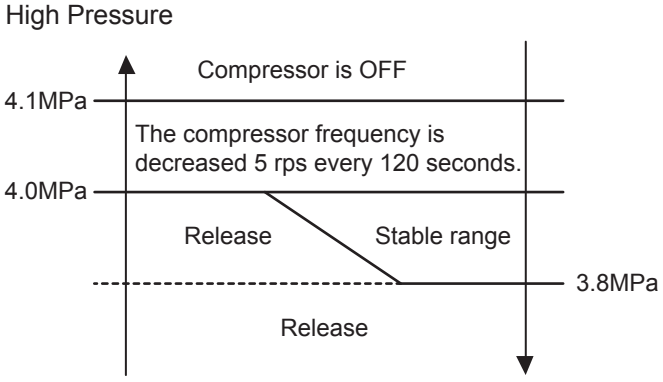


5. HIGH PRESSURE OVER RISE PROTECTION

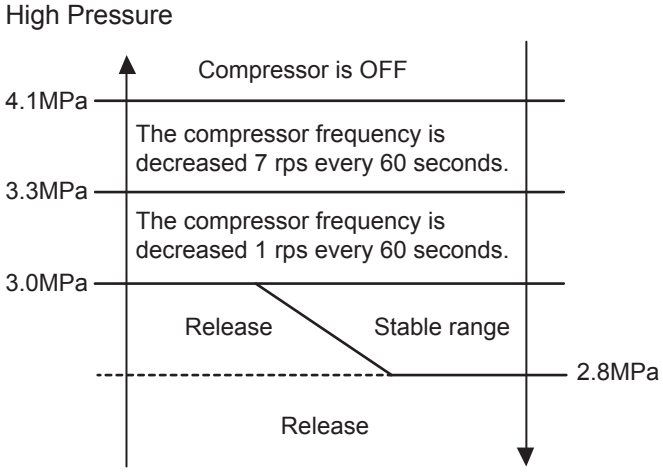
The compressor frequency is controlled as following based on the detection value of the high pressure sensor.

(Fig 12 : High Pressure Over Rise Protection Control)

[Cooling mode]



[Heating mode]



6. HIGH PRESSURE PROTECTION

When the pressure switch becomes OFF (Open : higher than 4.2 MPa),
the compressor is stopped.
It is released when the pressure switch becomes ON (Close : lower than 3.2 MPa)
after 3 minutes of compressor stop.

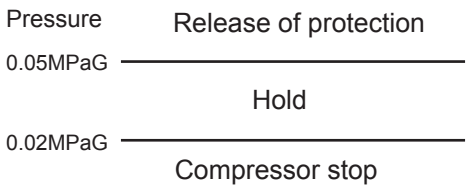
7. LOW PRESSURE PROTECTION CONTROL (For Cooling mode)

7-1. Low Pressure Protection 1

<After the compressor start-up and 1 minute has passed>

(a).The detected value of pressure sensor is 0.02MPaG or less, continues for 5 minutes, the compressor is stopped.
(b). When 7 minutes has passed and low pressure sensor detects value is more than 0.05MPaG after the protection stop by (a), the compressor restarts.
(c).When the protection (a) operates 5 times within 2 hours after the restart by (b),
the error is displayed and the compressor stops. **[Permanent stop]**

(Fig 13 : Low pressure protection 1)

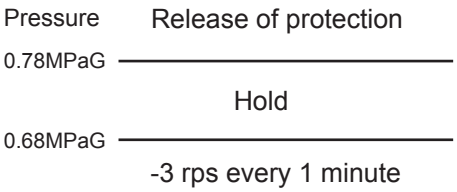


7-2. Low Pressure Protection 2

<After the compressor start-up and 10 minutes has passed>

(a).When the low pressure value becomes 0.68MPaG or less continues for 1 minute, the compressor speed -3 rps.
(b). When the low pressure value becomes 0.68MPaG or less after the protection (a), the compressor continues speed -3 rps every 1 minute until the detected value becomes more than 0.68MPaG.
(c). When the low pressure value becomes more than 0.78MPaG, this protection is released.

(Fig 14 : Anti freezing protection)



8. Fan motor over temperatuer protection

- When satisfy the following conditions, the protection works.
  a) After the 90 seconds from the fan operation, detect less than 300 rpm for 10 seconds.
  b) IPM trip protection works.
  c) Current overload protection works.

  When detecting the above condtion, recheck the condition after 6 minutes.
  When count the twice, the protection works
- Protection contents
  Reduce the static pressure 20 Pa
  When it does not dissolve even the minimum static pressure condition, work the following operation
  a) Fan motor error displayed
  b) Fan stop 40 secounds
  c) Fan stop 50 secounds

9. Fan motor speed restriction by Room temperature (Suction temperature) (72 type only).

- When the room temperature is 40 ℃ or more and the fan rotation speed is 1230 rpm or more for 60 seconds, the fan rotation speed is limited to 1220 rpm.
- The fan rotation speed is limited, and it will be released after 60 minutes have elapsed.

1-21. COMPOMRESSOR SPEED CONTROL

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

(Table 19 : Operation temperature of compressor speed control)

	Temperature I	
	Cooling	Heating
Operation temperature	- 20°C	
Operation overview	120 rpm (Max)	
Operation release	more than - 15°C	

1-22. AUTOMATIC AIRFLOW ADJUSTMENT

The unit automatically sets the static pressure.

- This setting can be used by the function setting 26.

The static pressure is calculated by the input current and voltage of the motor and the return air temperature.
*For the setting method, refer to the technical manual.

NOTE

Be sure to conduct this setting before any other operation. If the motor is warm or the heat exchanger is wet, false and detection may lead to incorrect adjustments.
Check if the electrical wirings and duct installations are complete.
If there is a damper installed in the system, make sure the damper is open.
Check if the air filter(optional) is attached.
If there are several inlet, outlet ports, make sure the airflow rates of each port match the designed airflow rate by adjusting the throttles.

Automatic airflow adjustment is possible by the following procedures.

1) Change Function 26 to "Automatic airflow adjustment (32)".

2) Run the air conditioner on Fan mode (High).

* For instructions on how to operate the air conditioner, refer to the operation manual of the remote controller.
Automatic During airflow ajustment, the mode will be fixed at Fan mode(High).
When this function is active, do not operate the Outdoor unit.
When the setting is performing, Test mode display: 3-Wire RC/ Maintenance dispaly: 2-Wire RC will be shown on the remote controller panelle.

3) The air conditioner will run for about 1 to 8 min. then stop automatically.
* Do not change the throttles of the inlet and outlet ports during operation.
When used in a Group control system, the setting will take about 10 min.
When the Error code 15.4 (Automatic Air flow Adjustment Error) appears, the setting is not completed.
Refer to the Trouble shooting Error code15

4) Turn the air conditioner off and on again.

5) Check the setting value of Function 26 and take note of the setting value.
* If the setting value has not changed, repeat the procedure from step 2.

1-23. LOW NOISE OPERATION

The compressor speed and the outdoor unit fan speed are limited to reduce the operation noise by External Input.
During the LOW NOISE OPERATION,
"CURRENT OVERLOAD OPERATION", "ECONOMY OPERATION" and "PEAK CUT OPERATION" are effective, and the outdoor unit operates by lowest current of them.
However, during the DEFROST OPERATION, the compressor operates by the speed for DEFROST OPERATION.

(Table 20 : Detail of Low Noise Operation)

Low Noise mode		Outdoor fan speed (Upper / Lower) [rpm]		Compressor speed [rps]	
		AOYG72LRLA	AOYG90LRLA	AOYG72	AOYG90
LEVEL 1	Cooling	590/510	590/510	48	56
	Heating	590/510	590/510	50	57
LEVEL 2	Cooling	520/400	520/400	35	40
	Heating	520/400	520/400	37	46

*The performance drops when operating in the LOW NOISE OPERATION.

Capacity priority mode

(1) Operation condition

- The function setting is set the “1” for the capacity priority mode.

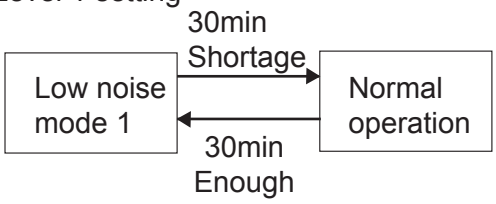
(2) Check the capacity condition

Shortage	Required compressor speed > Limited compressor speed of low noise mode
Enough	Required compressor speed ≦ Limited compressor speed of low noise mode

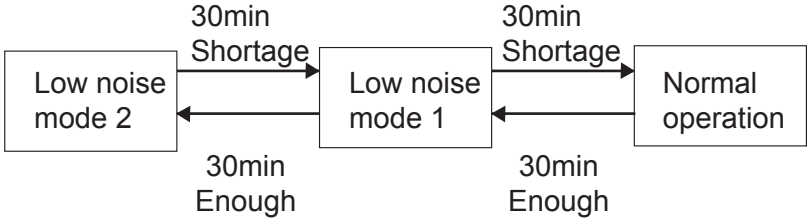
(3) Operation

- When detect the shortage capacity or enough capacity condition continuous 30 minute, the mode is upped or downed for 1 step.

Automatic switching 1
Level 1 setting



Automatic switching 2
Level 2 setting

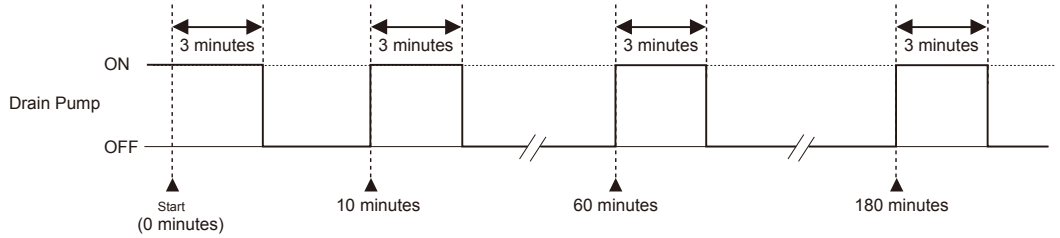


1-24. DRAIN PUMP OPERATION (OPTION)

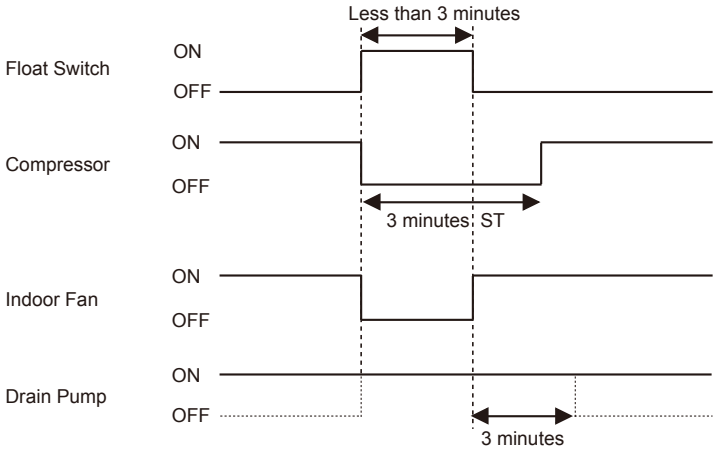
· During Cooling / Dry mode

1. When the compressor starts, the drain pump starts simultaneously.
2. The drain pump operates continuously for 3 minutes after the compressor is turned off as show in Fig15.
3. When the compressor stops by the "Anti- freezing protection", the drain pump is turned off in 1 hour after the compressor stops.
4. When the water level in the drain pan rises up and then the float switch functions:
   ① The compressor, indoor and outdoor fan motor operation are stopped.
   ② Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)
   ③ The indoor unit fan motor operates after the float switch is turned off.
5. When the float switch turns ON continuously for 3 minutes, "FAILURE INDICATION" operates. (It is necessary to turn off power for release it.)
6. When the float switch turns OFF less than 3 minutes, the unit starts Cooling operation.

(Fig 15 : Detail of Drain Pump Operation)



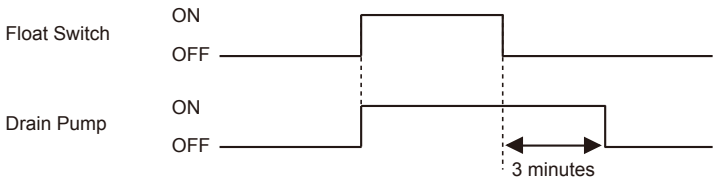
<Float Switch turns OFF less than 3 minutes>



· During Heating / Fan mode / Stop operation

1.When the water level in the drain pan rises up and then the float switch functions:
① Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)

2. When the float switch turns ON continuously for 3 minutes, "FAILURE INDICATION" operates. Thereafter, even if the float switch turns OFF, the "FAILURE INDICATION" is not released. (It is necessary to turn off power for release it.)



1-25. PEAK CUT OPERATION

The Current Value is limited to reduce the power consumption by External Input.
During the PEAK CUT OPERATION,
"CURRENT OVERLOAD OPERATION", "ECONOMY OPERATION" and "LOW NOISE OPERATION" are effective, and the outdoor unit operates by lowest current of them.
However, this function becomes invalid during DEFROST OPERATION.

(Table 22 : Outline of Peak Cut Operation)

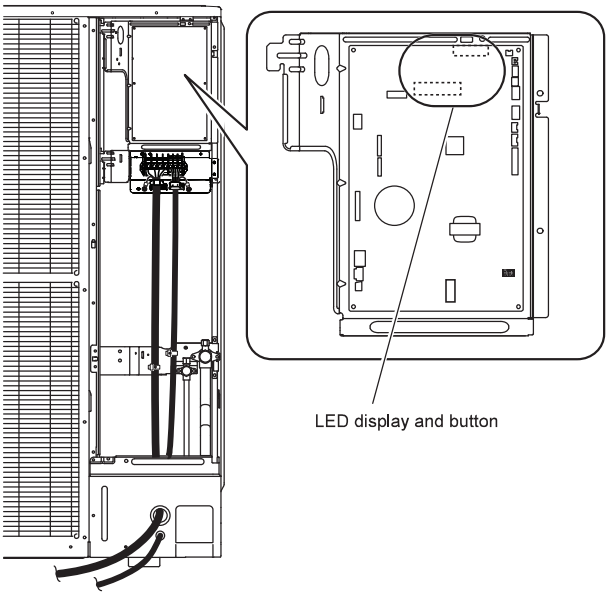
PEAK CUT LEVEL	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Peak Cut For Rated Capacity	Forced thermostat-OFF	50%	75%	100%

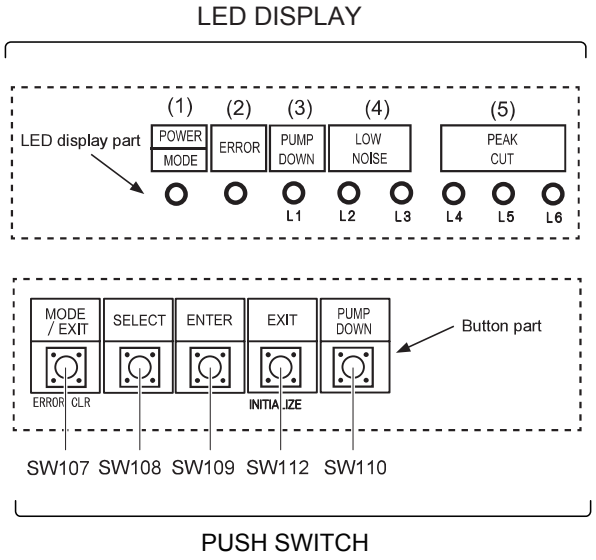
*Percentage is rated electrical power ratio.

1-26. DESCRIPTION OF DISPLAY UNIT

1-26-1 Layout of Display Unit

・ Various settings can be adjusted by changing Push switches on the board of the outdoor unit.
(Excerpt from the “INSTALATION MANUAL”)





Display lamp		Function or operation method
(1) POWER / MODE	Green	Lights on while power on. Local setting in outdoor unit or error code is displayed with blink.
(2) ERROR	Red	Blinks during abnormal air-conditioner operation.
(3) PUMP DOWN (L1)	Orange	Lights on during pump down operation.
(4) LOW NOISE MODE (L2, L3)	Orange	Lights on during “Low noise” mode when local setting is activated. (Lighting pattern of L2 and L3 indicates low noise level)
(5) PEAK CUT (L4, L5, L6)	Orange	Lights on during “Peak cut” mode when local setting is activated. (Lighting pattern of L4, L5 and L6 indicates peak cut level)

Switch		Function or operation method
MODE / EXIT	SW107	To switch between “Local setting” and “Error code display”.
SELECT	SW108	To switch between the individual “Local settings” and the “Error code displays”.
ENTER	SW109	To fix the individual “Local settings ” and the “Error code displays”.
EXIT / INITIALIZE	SW112	To return to “Operation status display”.
PUMP DOWN	SW110	To start the pump down operation.

1-26-2 Display mode

・ In this mode, the "Operation Condition" and "Error Code" can be displayed by Push Switch on outdoor unit PCB

(Table :23 Procedure for Present Value) ○ : Light OFF ● : Light ON ◑ : Blinking ◆1 : 1 Time Blinking

Procedure	Operation	Power / Mode	Error	L1	L2	L3	L4	L5	L6
1	During status display, press the MODE SWITCH 1 time. (Status display : Outdoor unit is stopping and no error)	◆1	○	○	○	○	○	○	○
2	When the POWER / MODE LED blinking 1 time, press the ENTER SWITCH.	◆1	○	○	○	◑	○	○	○
3	Press the SELECT SWITCH and adjust to DISPLAY ITEM (from L1 to L3) that you want to confirm. (Refer to Table : 24)	◆1	○	○	◑	○	○	○	○
4	Press the ENTER SWITCH. (Data is displayed by lighting LED. Refer to Table : 25)	◆1	○	○	●	○	DATA		
5	Selecting display items can be done by pressing the SELECT SWITCH. (Return to Procedure 3)	◆1	○	○	◑	○	○	○	○
	When the EXIT SWITCH is pressed, this mode ends and returns to the status display.	●	○	○	○	○	○	○	○

(Table :24 Display pattern) ○ : Light OFF ● : Light ON ◑ : Blinking ◆n : n Time Blinking

Display Item	**Power / Mode LED**	**LED**			
		ERROR	L1	L2	L3
Compressor frequency	Present Value Of Each Item ◆1	○	○	○	●
Upper fan speed (Outdoor unit)		○	○	●	○
Lower fan speed (Outdoor unit)		○	○	●	●
EEV pulse		○	●	○	○
Pressure sensor value (Low pressure range)		○	●	○	●
Pressure sensor value (High pressure range)		○	●	●	○
Outdoor air temperature sensor value		○	●	●	●
Discharge temperature sensor value		●	○	○	○
Heat-exchanger temperature sensor value (Middle)		●	○	○	●
Current value		●	○	●	○
Compressor accumulated time		●	○	●	●

(Table 25 : Detail of LED Display Data)

○ : Light OFF ● : Light ON ◆1 : 1 Time Blinking

Item No,	Display Item		Power Mode	Error	L1	L2	L3	L4	L5	L6
1	Compressor Frequency (0 ~ 95rps)	0	◆1	○	○	○	●	○	○	○
		1 ~ 15	◆1	○	○	○	●	○	○	●
		16 ~ 30	◆1	○	○	○	●	○	●	○
		31 ~ 45	◆1	○	○	○	●	○	●	●
		46 ~ 60	◆1	○	○	○	●	●	○	○
		61 ~ 75	◆1	○	○	○	●	●	○	●
		76 ~ 90	◆1	○	○	○	●	●	●	○
		90 ~ 95	◆1	○	○	○	●	●	●	●
2	Outdoor Unit Upper Fan Speed (0 ~ 900rpm)	0	◆1	○	○	●	○	○	○	○
		1 ~ 150	◆1	○	○	●	○	○	○	●
		151 ~ 300	◆1	○	○	●	○	○	●	○
		301 ~ 450	◆1	○	○	●	○	○	●	●
		451 ~ 600	◆1	○	○	●	○	●	○	○
		601 ~ 750	◆1	○	○	●	○	●	○	●
		751 ~ 900	◆1	○	○	●	○	●	●	○
		901 ~	◆1	○	○	●	○	●	●	●
3	Outdoor Unit Lower Fan Speed (0 ~ 900rpm)	0	◆1	○	○	●	●	○	○	○
		1 ~ 150	◆1	○	○	●	●	○	○	●
		151 ~ 300	◆1	○	○	●	●	○	●	○
		301 ~ 450	◆1	○	○	●	●	○	●	●
		451 ~ 600	◆1	○	○	●	●	●	○	○
		601 ~ 750	◆1	○	○	●	●	●	○	●
		751 ~ 900	◆1	○	○	●	●	●	●	○
		901 ~	◆1	○	○	●	●	●	●	●
4	EEV Pulse (0 ~ 480pulse)	0	◆1	○	●	○	○	○	○	○
		1 ~ 80	◆1	○	●	○	○	○	○	●
		81 ~ 160	◆1	○	●	○	○	○	●	○
		161 ~ 240	◆1	○	●	○	○	○	●	●
		241 ~ 320	◆1	○	●	○	○	●	○	○
		321 ~ 400	◆1	○	●	○	○	●	○	●
		401 ~ 480	◆1	○	●	○	○	●	●	○
		481 ~	◆1	○	●	○	○	●	●	●
5	Pressure sensor value <Low pressure range> (0 ~ 2.1MPa)	~ 0.0	◆1	○	●	○	●	○	○	○
		0.01 ~ 0.3	◆1	○	●	○	●	○	○	●
		0.31 ~ 0.6	◆1	○	●	○	●	○	●	○
		0.61 ~ 0.9	◆1	○	●	○	●	○	●	●
		0.91 ~ 1.2	◆1	○	●	○	●	○	○	○
	Check the High Pressure Range if it is displayed [1.81 ~ 2.1]	1.21 ~ 1.5	◆1	○	●	○	●	●	○	●
		1.51 ~ 1.8	◆1	○	●	○	●	●	●	○
		1.81 ~ 2.1	◆1	○	●	○	●	●	●	●
6	Pressure sensor value <High pressure range> (2.1 ~ 4.2MPa)	~ 2.1	◆1	○	●	●	○	○	○	○
		2.11 ~ 2.4	◆1	○	●	●	○	○	○	●
		2.41 ~ 2.7	◆1	○	●	●	○	○	●	○
		2.71 ~ 3.0	◆1	○	●	●	○	○	●	●
		3.01 ~ 3.3	◆1	○	●	●	○	●	○	○
	Check the Low Pressure Range if it is displayed [~ 2.1]	3.31 ~ 3.6	◆1	○	●	●	○	●	○	●
		3.61 ~ 3.9	◆1	○	●	●	○	●	●	○
		3.91 ~ 4.2	◆1	○	●	●	○	●	●	●

○ : Light OFF ● : Light ON ◆1 : 1 Time Blinking

Item No,	Display Item		Power Mode	Error	L1	L2	L3	L4	L5	L6
7	Outdoor Air Temperature (-30 ~ 70°C)	~ -15	◆1	○	●	●	●	○	○	○
		-15 ~ -5	◆1	○	●	●	●	○	○	●
		-5 ~ 5	◆1	○	●	●	●	○	●	○
		5 ~ 15	◆1	○	●	●	●	○	●	●
		15 ~ 25	◆1	○	●	●	●	●	○	○
		25 ~ 35	◆1	○	●	●	●	●	○	●
		35 ~ 45	◆1	○	●	●	●	●	●	○
		45 ~	◆1	○	●	●	●	●	●	●
8	Discharge Temperature (-30 ~ 120°C)	~ 55	◆1	●	○	○	○	○	○	○
		55 ~ 65	◆1	●	○	○	○	○	○	●
		65 ~ 75	◆1	●	○	○	○	○	●	○
		75 ~ 85	◆1	●	○	○	○	○	●	●
		85 ~ 95	◆1	●	○	○	○	●	○	○
		95 ~ 105	◆1	●	○	○	○	●	○	●
		105 ~ 115	◆1	●	○	○	○	●	●	○
		115 ~	◆1	●	○	○	○	●	●	●
9	Heat-exchanger Temperature <Middle> (-30 ~ 80°C)	~ 53	◆1	●	○	○	●	○	○	○
		53 ~ 55	◆1	●	○	○	●	○	○	●
		55 ~ 57	◆1	●	○	○	●	○	●	○
		57 ~ 59	◆1	●	○	○	●	○	●	●
		59 ~ 61	◆1	●	○	○	●	●	○	○
		61 ~ 63	◆1	●	○	○	●	●	○	●
		63 ~ 65	◆1	●	○	○	●	●	●	○
		65 ~	◆1	●	○	○	●	●	●	●
10	Current (0 ~ 10A)	~ 0.0	◆1	●	○	●	○	○	○	○
		0.0 ~ 1.5	◆1	●	○	●	○	○	○	●
		1.5 ~ 3.0	◆1	●	○	●	○	○	●	○
		3.0 ~ 4.5	◆1	●	○	●	○	○	●	●
		4.5 ~ 6.0	◆1	●	○	●	○	●	○	○
		6.0 ~ 7.5	◆1	●	○	●	○	●	○	●
		7.5 ~ 9.0	◆1	●	○	●	○	●	●	○
		9.0 ~	◆1	●	○	●	○	●	●	●
11	Compressor Accumulated Time (H) <Round up by 1 hour>	0	◆1	●	○	●	●	○	○	○
		0 ~ 10000	◆1	●	○	●	●	○	○	●
		10000 ~ 20000	◆1	●	○	●	●	○	●	○
		20000 ~ 30000	◆1	●	○	●	●	○	●	●
		30000 ~ 40000	◆1	●	○	●	●	●	○	○
		40000 ~ 50000	◆1	●	○	●	●	●	○	●
		50000 ~ 60000	◆1	●	○	●	●	●	●	○
		60000 ~	◆1	●	○	●	●	●	●	●

1-26-3 Error history mode

・ In this mode, the history of abnormality that occurred in the past can be confirmed.

(Table : 26 Procedure for History Mode) ○ : Light OFF ● : Light ON ◑ : Blinking ◆2 : 2 Times Blinking ◆**n** : **n** Times Blinking

Procedure	Operation	Power Mode	Error	L1	L2	L3	L4	L5	L6
1	During status display, press the MODE SWITCH 2 times. (Status display : Outdoor unit is stopping and no error)	◆2	○	○	○	○	○	○	○
2	When the POWER / MODE LED blinking 2 times, press the ENTER SWITCH.	◆2	○	○	○	◑	○	○	○
3	Press the SELECT SWITCH and adjust to DISPLAY ITEM (from L1 to L3) that you want to confirm. (Refer to Table : 27)	◆2	○	○	◑	○	○	○	○
4	Press the ENTER SWITCH, Error code is displayed by lighting LED. (Refer to Table : 28)	◆2	●	◆n	◆n	DATA			
5	Selecting display items can be done by pressingthe SELECT SWITCH. (Return to Procedure 3)	◆2	○	○	◑	○	○	○	○
	When the EXIT SWITCH is pressed, this mode ends and returns to the status display.	●	○	○	○	○	○	○	○

(Table :27 Display pattern) ○ : Light OFF ● : Light ON ◑ : Blinking ◆n : n Time Blinking

Power / Mode LED	**Display Item**	**LED**			
		ERROR	L1	L2	L3
Error Code ◆2	Newest error code	○	○	○	◑
	Error code before 1 time	○	○	◑	○
	Error code before 2 times	○	○	◑	◑

(Table : 28 Error Code) ○ : Light OFF ● : Light ON ◆2 : 2 Times Blinking ◆1 ~ ◆15 : 1~ 15 Times Blinking

LED display								DESCRIPTION	REMARK
POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT				
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)		
◆(2)	●	◆(1)	◆(1)	○	○	●	●	Serial communication error	Serial forward transmission error immediately after operation
◆(2)	●	◆(1)	◆(1)	○	●	○	○		Serial forward transmission error during operation
◆(2)	●	◆(2)	◆(3)	○	○	○	●	Combination error	Indoor unit combination error
◆(2)	●	◆(5)	◆(15)	○	○	○	●	Indoor unit error	Indoor unit error
◆(2)	●	◆(6)	◆(2)	○	○	○	●	Outdoor unit main PCB error	Outdoor unit PCB model information error
◆(2)	●	◆(6)	◆(3)	○	○	○	●	Inverter PCB error	Inverter error
◆(2)	●	◆(6)	◆(5)	○	○	●	●	IPM error	Trip terminal L error
◆(2)	●	◆(7)	◆(1)	○	○	○	●	Discharge temp. sensor error	Discharge temp. sensor 1 error
◆(2)	●	◆(7)	◆(2)	○	○	○	●	Compressor temp. sensor error	Compressor temp. sensor 1 error
◆(2)	●	◆(7)	◆(3)	○	○	●	○	Outdoor unit Heat Ex. sensor error	Heat Ex. middle temp. sensor error
◆(2)	●	◆(7)	◆(3)	○	○	●	●		Outdoor unit Heat Ex. liquid temp. sensor error
◆(2)	●	◆(7)	◆(4)	○	○	○	●	Outdoor temp. sensor error	Outdoor temp. sensor error
◆(2)	●	◆(7)	◆(7)	○	○	○	●	Heat sink temp. sensor error	Heat sink temp. sensor error
◆(2)	●	◆(8)	◆(4)	○	○	○	●	Current sensor error	Current sensor 1 error (stoppage permanently)
◆(2)	●	◆(8)	◆(6)	○	●	○	○	Pressure sensor error	High pressure switch 1 error
◆(2)	●	◆(8)	◆(6)	○	○	○	●		Outdoor unit discharge pressure sensor error
◆(2)	●	◆(8)	◆(6)	○	○	●	●		Outdoor unit suction pressure sensor error
◆(2)	●	◆(9)	◆(4)	○	○	○	●	Trip detection	Trip detection
◆(2)	●	◆(9)	◆(5)	○	○	○	●	Compressor motor control error	Rotor position detection error (stoppage permanently)
◆(2)	●	◆(9)	◆(7)	○	○	●	●	Outdoor unit fan motor 1 error	Duty error
◆(2)	●	◆(9)	◆(8)	○	○	●	●	Outdoor unit fan motor 2 error	Duty error
◆(2)	●	◆(9)	◆(9)	○	○	○	●	4-way valve error	4-way valve error
◆(2)	●	◆(10)	◆(1)	○	○	○	●	Discharge temp. 1 error	Discharge temp. 1 error
◆(2)	●	◆(10)	◆(3)	○	○	○	●	Compressor temp. error	Compressor 1 temp. error
◆(2)	●	◆(10)	◆(5)	○	○	○	●	Pressure error 2	Low pressure error

1-26-4 ERROR CHECK MODE

・ In this mode, abnormality that is occurring now can be confirmed.

(Table : 26 Procedure for Error Check Mode) ○ : Light OFF ● : Light ON ◆2 : 2 Times Blinking ◆**n** : **n** Times Blinking

Procedure	Operation	Power / Mode	Error	L1	L2	L3	L4	L5	L6
1	Check that the "ERROR" LED blinking (Hi-speed), and then short press the ENTER SWITCH 1 time.	●	Blinking Hi-speed	○	○	○	○	○	○
2	Error code is displayed by lighting LED. (Refer to Table : 27)	◆2	●	◆n	◆n	DATA			
3	When reset of the ERROR history, and then long press the MODE SWITCH.	◆2	◆2	◆2	◆2	◆2	◆2	◆2	◆2

※ After the error reset ,all LED is blinking and erased the all error history .
After this, ERROR LED is off and will normal display.

※ Confirm Chapter 2 " TROUBLE SHOOTING" in detail.

Refrigerant
R410A

DUCT type
INVERTER

2 . TROUBLE SHOOTING

2 ERROR DISPLAY

2-1 INDOOR UNIT AND WIRED REMOTE CONTROLLER DISPLAY

1 ERROR DETECTION

If you use a wireless remote control,
the lamp onthe photo detector unit will output error codes by way of blinking patterns.

If you use a wired type remote control, error codes will appear on the remote control display.

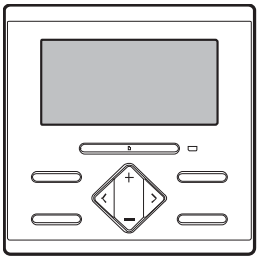
See the lamp blinking patterns and error codes in the table. An error display is displayed only during running.

Remote control

This is possible only on a wired remote control.

If an error occurs, the following display will be shown.

("Er" will appear in the set room temperature display.)

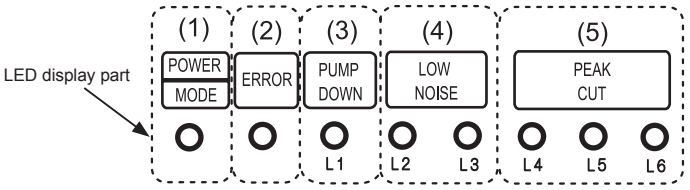


Error Contents	Error Code	Trouble shooting
Serial Communication Error	11	1,2
Wired Remote Controller Communication Error	12	3
Automatic Air Flow Adjustment Error	15	4
External Communication Error	18	5
Combination Error	23	6
Indoor Unit Address Setting Error	26	7
Connection Unit Number Error (Indoor Unit Wired Remote Controller Error)	29	8
Indoor Unit PCB Model Information Error	32	9
Indoor Unit Motor Electricity Consumption Detection Error	33	10
Indoor Unit Power Supply Error for Fan Motor	39	11
Indoor Unit Communication Circuit (Wired Remote Controller) Error	3A	12
Indoor Room Thermistor Error	41	13
Indoor Heat Ex. Thermistor Error	42	14
Indoor Unit Fan Motor Error	51	15
Drain Pump Error	53	16
Indoor Unit Error	5U	1- 16
Outdoor Unit Main PCB Model Information Error	62	17
Inverter Error	63	18

Error Contents	Error Code	Trouble shooting
IPM Error	65	20
Discharge Thermistor Error	71	21
Compressor Thermistor Error	72	22
Heat Ex. Liquid Outlet Thermistor Error	73	23
Outdoor Thermistor Error	74	24
Heat Sink Thermistor Error	77	25
Current Sensor Error	84	26
Pressure Switch Error	86	27
Over Current Error	94	28
Compressor Control Error	95	29
Outdoor Unit Fan Motor 1 Error	97	30
Outdoor Unit Fan Motor 2 Error	98	31
4-way Valve Error	99	32
Discharge Temp. Error	A1	33
Compressor Temp. Error	A3	34
Low Pressure Error	A5	35
Discharge Pressure Sensor Error	86	36
Suction Pressure Sensor Error	86	37

2-1-2 OUTDOOR UNIT DISPLAY

You can determine the operating status by the lighting up and blinking of the LED lamp.



Display when an error occurs.

POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
●	Blink (Hi speed)	○	○	○	○	○	○

Sign "○": Lights off, "●": Lights on

(1) Check that the "ERROR" LED blinks, then press the "ENTER" button once.

(2) For details, refer to the following table.

Check that the "ERROR" LED blinks, then press the [Enter] button once.

For details, refer to the following table. : Light OFF ● : Light ON ◆2 : 2Times Blinking ◆1 ~ ◆15 : 1~ 15 Times Blinking

LED display								DESCRIPTION	REMARK	TRABLU SHOOTING
POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT					
		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)			
◆(2)	●	◆(1)	◆(1)	○	○	●	●	Serial communication error	Serial forward transmission error immediately after operation	2
◆(2)	●	◆(1)	◆(1)	○	●	○	○		Serial forward transmission error during operation	
◆(2)	●	◆(2)	◆(3)	○	○	○	●	Combination error	Indoor unit combination error	6
◆(2)	●	◆(5)	◆(15)	○	○	○	●	Indoor unit error	Indoor unit error	2,3,4,5, 7～16
◆(2)	●	◆(6)	◆(2)	○	○	○	●	Outdoor unit main PCB error	Outdoor unit PCB model information error	17
◆(2)	●	◆(6)	◆(3)	○	○	○	●	Inverter PCB error	Inverter error	18
◆(2)	●	◆(6)	◆(5)	○	○	●	●	IPM error	Trip terminal L error	20
◆(2)	●	◆(7)	◆(1)	○	○	○	●	Discharge temp. sensor error	Discharge temp. sensor 1 error	21
◆(2)	●	◆(7)	◆(2)	○	○	○	●	Compressor temp. sensor error	Compressor temp. sensor 1 error	22
◆(2)	●	◆(7)	◆(3)	○	○	●	○	Outdoor unit Heat Ex. sensor error	Heat Ex. middle temp. sensor error	23
◆(2)	●	◆(7)	◆(3)	○	○	●	●		Outdoor unit Heat Ex. liquid temp. sensor error	
◆(2)	●	◆(7)	◆(4)	○	○	○	●	Outdoor temp. sensor error	Outdoor temp. sensor error	24
◆(2)	●	◆(7)	◆(7)	○	○	○	●	Heat sink temp. sensor error	Heat sink temp. sensor error	25
◆(2)	●	◆(8)	◆(4)	○	○	○	●	Current sensor error	Current sensor 1 error (stoppage permanently)	26
◆(2)	●	◆(8)	◆(6)	○	●	○	○	Pressure sensor error	High pressure switch 1 error	27
◆(2)	●	◆(8)	◆(6)	○	○	○	●		Outdoor unit discharge pressure sensor error	36
◆(2)	●	◆(8)	◆(6)	○	○	●	●		Outdoor unit suction pressure sensor error	37
◆(2)	●	◆(9)	◆(4)	○	○	○	●	Trip detection	Trip detection	28
◆(2)	●	◆(9)	◆(5)	○	○	○	●	Compressor motor control error	Rotor position detection error (stoppage permanently)	29
◆(2)	●	◆(9)	◆(7)	○	○	●	●	Outdoor unit fan motor 1 error	Duty error	30
◆(2)	●	◆(9)	◆(8)	○	○	●	●	Outdoor unit fan motor 2 error	Duty error	31
◆(2)	●	◆(9)	◆(9)	○	○	○	●	4-way valve error	4-way valve error	32
◆(2)	●	◆(10)	◆(1)	○	○	○	●	Discharge temp. 1 error	Discharge temp. 1 error	33
◆(2)	●	◆(10)	◆(3)	○	○	○	●	Compressor temp. error	Compressor 1 temp. error	34
◆(2)	●	◆(10)	◆(5)	○	○	○	●	Pressure error 2	Low pressure error	35

2-2 TROUBLE SHOOTING WITH ERROR CODE

Trouble shooting 1 **OUTDOOR UNIT Error Method:** **Serial Communication Error** **(Serial Reverse Transfer Error)**	**Indicate or Display:** **Outdoor unit : No indication** Error code : 11
Detective Actuators: Outdoor unit Main PCB Outdoor unit Fan motor	**Detective details:** When the indoor unit cannot receive the serial signal from Outdoor unit more than 2minutes after power ON, or the indoor unit cannot receive the serial signal more than 15seconds during normal operation.

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).

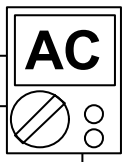
YES

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

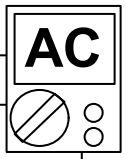
Check Point 3 : Check the voltage of power supply



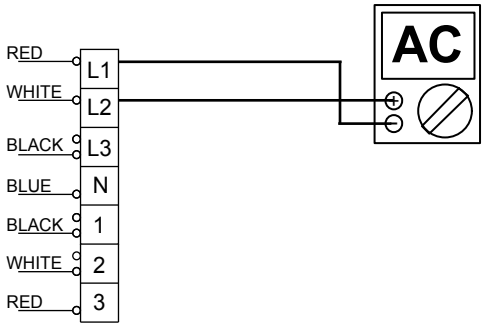
- Check the voltage of power supply
  >> Check if AC198V(AC220V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L3 - N.

OK

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



- Check serial signal (Reverse transfer signal)
  >> Check if indicated value swings between AC90V and AC270V at outdoor unit terminal 1 - 2.
  >> If it is abnormal, Check the parts as follows.
  - Outdoor unit fan motor (PARTS INFORMATION 5)
  >> If Outdoor fan motor is abnormal, replace Outdoor unit fan motor and Main PCB.
  >> If the parts are normal, replace Main PCB.



Trouble shooting 2
INDOOR UNIT Error Method:
Serial Communication Error
(Serial Forward Transfer Error)

Indicate or Display:

Error code : 11

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆1	◆1	○	○	●	●
◆2	●	◆1	◆1	○	●	○	○

Detective Actuators:

Indoor unit Controller PCB

Detective details:

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

Forecast of Cause:

1. Connection failure 2. External cause 3. Controller PCB 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).

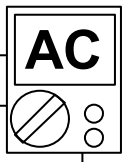
YES

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

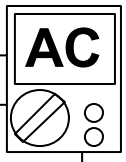
Check Point 3 : Check the voltage of power supply



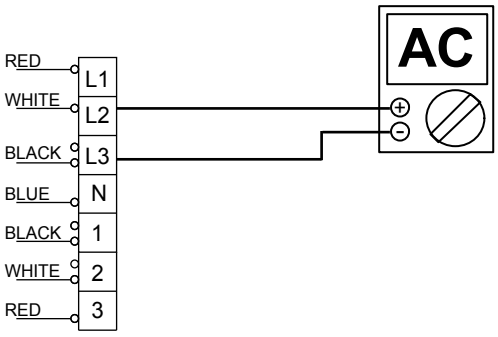
- Check the voltage of power supply
  >> Check if AC198V(AC220V-10%) - 268V(AC240V+10%) appears at outdoor unit terminal L3 - N.

OK

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



- Check serial signal (Forward transfer signal)
  >> Check if indicated value swings berween AC30v and AC130V at outdoor unit terminal 2 - 3.
  >> If it is abnormal, replace Controller PCB.



Trouble shooting 3
INDOOR UNIT Error Method:

Wired Remote Controller
Communication Error

Indicate or Display:

Error code : 12

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:

Indoor unit Controller PCB
Wired Remote Controller

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 berween 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

- Ceck Voltage at CN14 of Controller PCB. (terminal 1-3) (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:** **Automatic Air flow Adjustment Error**	**Indicate or Display:** Error code : 15

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:	**Detective details:**
Indoor unit controller PCB	●On automatic airflow adjustment operation, when the fan speed other than 0rpm is detected at the 0rpm operation. ●On automatic airflow adjustment operation, when the fan speed is not reach the target speed, after 2 minutes from the fan started. ●On automatic airflow adjustment operation operation, when the 72:750W, 90:1000W of input power is detected.

Forecast of Cause:

1. Fan rotation failure 2. Fan motor winding open 3. Indoor unit controller PCB

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

・Checl 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 5 **INDOOR UNIT Error Method:** **External communication error**	**Indicate or Display:** Error code : 18 Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:	**Detective details:**
External communication error	After receiving a signal from the external I/O PCB, the same a signal has not been received for 15sec

Forecast of Cause :

1. Connection failure 2.External I/O PCB, Wi-fi adapter failure 3.Controller PCB failure

Check Point 1 : Check the connection

- Check any loose or removed connection of between the controller PCB to the external I/OPCB and Wi-fi adapter
  >>If there is an abnormal condition, correct it by refer to installation manual or the technical manual.
- Check the condition condtion on the external I/O PCB, Wi-fi adapter and the controller PCB
  (If there is loose connector, open cable or mis-wiring)

OK

Check Point 2: Replace external I/O PCB, Wi-fi adapter

▶ **If Check Point 1 do not improve the symptom, change External I/O PCB and Wi-fi adapter.**

OK

Check Point 3: Replace Controller PCB

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

Trouble shooting 6
INDOOR UNIT Error Method:

Combination error

Indicate or Display:

Error code : 23

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆2	◆3	○	○	○	●

Detective Actuators:

Indoor unit

Detective details:

1. When the outdoor unit type is multi.

Forecast of Cause:

1. The selection of indoor units is incorrect

Check Point 1 : Check the type of indoor unit

- Check the type of the connected indoor unit.
  >> If abnormal condition is found, correct it.

OK

Check Point 2 : Replace Main PCB

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

Trouble shooting 7
INDOOR UNIT Error Method:

Indoor unit address setting error

Indicate or Display:

Error code : 26

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:

Wired remote controller (2-Wire)
Indoor unit Controller PCB circuit

Detective details:

When the address number set by auto setting and manual setting are mixed in one RC group.
When the duplicated address number exists in one RC group.

Forecast of Cause : 1. Wrong wiring of RCgroup 2. Wrong remote address setting 3. Indoor unit controller PCB failure
4. Remote controller failure

Check Point 1 : Wire installation

- ☐ Wrong wire connection in RCgroup (Please refer to the installation manual)

↓

Check Point 2 : Wrong RCgroup setting

- ☐ The given address number by auto setting (00) and the manual set number (Except 00) were not existing in one RCG.
- ☐ The remote controller address setting by U.I. were not existing same address.
- ☐ The duplicated address number is not existing in one RCgroup

↓

Check Point 3 : Check Indoor unit controller PCB

- ☐ Check if controller PCB damage
- ☐ Change controller PCB and check the Error after setting remote controller address

Trouble shooting 8 **INDOOR UNIT Error Method:** **Connection unit number error (Indoor unit in Wired remote controller system)**	**Indicate or Display:** Error code : 29 Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	**Detective details:** When the number of connecting indoor units are out of specified rule.

Forecast of Cause : 1. Wrong wiring / Number of I.U, RC in RCgroup 2. Indoor unit controller PCB defective

Check Point 1 : Wire installation

- ☐ Wrong number of connecting indoor unit

↓

Check Point 2 : Check Indoor unit controller PCB

- ☐ Check if controller PCB damage
- ☐ Check if controller PCB and check the Error after setting remote controller address

Trouble shooting 9
INDOOR UNIT Error Method:

Indoor unit PCB model information error

Indicate or Display:

Error code : 32

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:

Indoor unit Controller PCB

Detective details:

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 connection of electric components 3. Controller PCB failure

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO

YES

Check Point 2 :
Check Indoor unit electric components

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

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).

Check Point 3 : Replace Controller PCB

▶ **Change Controller PCB.**

Note : EEPROM

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

Trouble shooting 10
INDOOR UNIT Error Method:

Indoor unit motor electricity consumption detection error

Indicate or Display:

Error code : 33

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:

Indoor unit motor electricity consumption detection error

Detective details:

When the voltage value or the current value of the motor go beyond the limits.

Forecast of Cause:

1. Fan motor failure 2. Main PCB failure

Check Point 1 : Check rotation of Fan

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

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 Power Supply PCB

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

Trouble shooting 11 **INDOOR UNIT Error Method:** Indoor unit power supply error for fan motor	**Indicate or Display:** Error code : 39 Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	●	●	●	●

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB	When a momentary power cut off. When do not start fan motor.

Forecast of Cause :

1. External cause 2. Connection of connector failure 3. Controller 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 Controller PCB

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

Trouble shooting 12 **INDOOR UNIT Error Method:** Indoor unit Communication circuit (wired remote controller) error	**Indicate or Display:** Error code : 3A Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators: Indoor unit Controller PCB circuit	**Detective details:** Detect the communication error of microcomputer and communication PCB.

Forecast of Cause : 1.Communication PCB defective
2. Indoor unit controller PCB defective

Check Point 1 : Check the connection of terminal
After turning off the power supply, check & correct the followings □ Indoor unit - Check the connection the communication PCB and the controller PCB

OK

Check Point 2 : Replace the communication PCB
If the Check point 1 is ok, replace the communication PCB

OK

Check Point 3 : Replace the controller PCB
If condition is doesn't change, replace the controller PCB

Trouble shooting 13
INDOOR UNIT Error Method:

Indoor Room Thermistor Error

Indicate or Display:

Error code : 41

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:

Indoor Unit Controller PCB Circuit
Indoor Temperature Thermistor

Detective details:

Indoor unit thermistor is open or short is detected always.

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

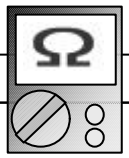
Check Point 1 : Check connection of Connector

- ☐ Check if connector is loose or removed
- ☐ Check erroneous connection
- ☐ Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics(Rough value)

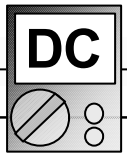
Temperature (°C)	0	5	10	15	20	25	30	35
Resistance value (kΩ)	33.6	25.9	20.2	15.8	12.5	10.0	8.0	6.5

Temperature (°C)	40	45	50
Resistance value (kΩ)	5.3	4.35	3.59

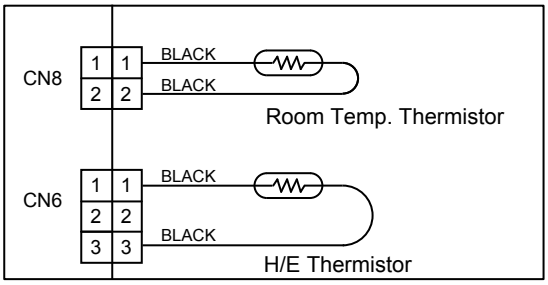
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check Voltage of Controller PCB (DC 5.0V)



Make sure circuit diagram of each 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 14
INDOOR UNIT Error Method:

Indoor Heat Ex. Thermistor Error

Indicate or Display:

Error code : 42

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:

Indoor Unit Controller PCB
Heat Exchanger (MID) Thermistor

Detective details:

Indoor unit thermistor is open or short is detected always.

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

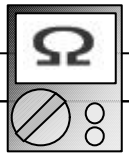
Check Point 1 : Check connection of Connector

- ☐ Check if connector is loose or removed
- ☐ Check erroneous connection
- ☐ Check if thermistor cable is open

>>Reset Power when reinstalling due to removed connector or incorrect wiring.

OK

Check Point 2 : Remove connector and check Thermistor resistance value



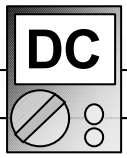
Thermistor Characteristics(Rough value)

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

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

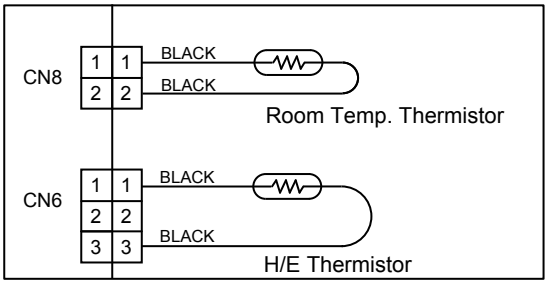
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK



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

Make sure circuit diagram of each 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 15
INDOOR UNIT Error Method:

Indoor Unit Fan Motor1 Error

Indicate or Display:

Error code : 51

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:

Indoor unit Controller PCB
Indoor unit fan motor

Detective details:

When the fan motor speed is less than 1/3 of the target fan speed for 56 seconds.

When detect the 0 rpm for 56 seconds after fan motor started.

Forecast of Cause:

1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by surrounding temperature rise
4. Controller 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 16
INDOOR UNIT Error Method:
Drain pump Error

Indicate or Display:

Error code : 53

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆5	◆15	○	○	○	●

Detective Actuators:

Indoor Unit Controller PCB Circuit
Float Switch

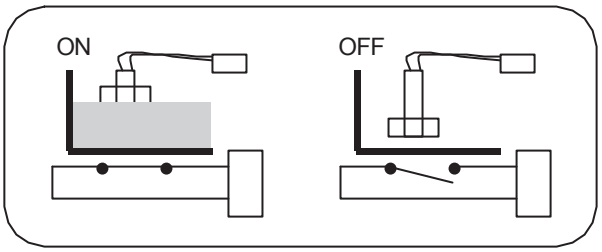
Detective details:

When Float switch is ON for more than 3 minutes.

Forecast of Cause : 1. Float switch failure 2. Shorted connector/wire 3. Controller PCB failure
4. Drain pump failure 5. Hose clogging

Check Point 1 : Check Float Switch

- ☐ Check operation of float switch. (any blocking by dust, etc.)
- ☐ Remove Float switch and check ON/OFF switching operation by using a meter.
  >>If Float switch is abnormal, replace it.



OK

Check Point 2 : Check Connector and Wire

- ☐ Check loose contact of CN9 and shorted wire (pinched wire).
  >>Replace Float switch if the wire is abnormal

OK

Check Point 3 : Check Drain Hose

- ☐ Check Drain Hose .
  >>If there is Hose clogging. Please clear the clog.

OK

Check Point 4 : Check Controller PCB

If Check Point 1 ~ 3 do not improve the symptom, change Controller PCB and execute the check operation again.

Trouble shooting 17 **OUTDOOR UNIT Error Method:** **Outdoor unit main PCB model information error**	**Indicate or Display:** Error code : 62 Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆6	◆2	○	○	○	●

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	Access to EEPROM failed due to some cause after outdoor unit started.

Forecast of Cause:

1. External cause (Noise, temporary open, voltage drop) 2. Main PCB failure

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO

YES

Check Point 2 : Replace Main PCB

▶ **Change Main PCB.**

Check Point 1-2 : Check external cause

- Check if temporary voltage drop was not generated.
- Check if momentary open was not generated.
- Check if ground is connection correctly or there are no related cables near the power line.

Trouble shooting 18 **OUTDOOR UNIT Error Method:** **Inverter Error**	**Indicate or Display:** Error code : 63 Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆6	◆3	○	○	○	●

Detective Actuators:	**Detective details:**
Transistor PCB Main PCB	▪Error information received from Transistor PCB

Forecast of Cause : 1. External cause. 2. Power supply to Filter PCB to Transistor PCB wiring disconnection, open.
3. Transistor PCB failure. 4. Transistor PCB to Main PCB wiring disconnection, open.
5. Main PCB failure.

Check Point 1-1 :
Turn the power on again.

Error displayed again?

NO →

Check Point 1-2 : External cause

- ☐ Check if temporary voltage drop was not generated.
- ☐ Check if temporary open was not generated.
- ☐ Check if ground is connected correctly or there are no related cables near the power line.

YES ↓

Check Point 2 : Check the wiring (Power supply to Filter PCB to Transistor PCB)

- ☐ Connector and wiring connection state check
- ☐ Cable open check

OK ↓

Check Point 3 : Transistor PCB

- ☐ Replace Transistor PCB.

NO ↓

Check Point 4 : Check the wiring (Transistor PCB to Main PCB)

- ☐ Connector and wiring connection state check
- ☐ Cable open check

OK ↓

Check Point 5 : Main PCB

- ☐ Replace Main PCB.

Trouble shooting 20
OUTDOOR UNIT Error Method:

IPM Error

Indicate or Display:

Error code : 65

Outdoor unit :

POWER MODE	ERROR	PUMP DOWN (L1)	LOW NOISE (L2)	LOW NOISE (L3)	PEAK CUT (L4)	PEAK CUT (L5)	PEAK CUT (L6)
◆2	●	◆6	◆5	○	○	●	●

Detective Actuators:

Transistor PCB

Detective details:

When more than normal operating current to IPM in Transistor PCB flows, the compressor stops.

Forecast of Cause :

1. Compressor failure (Earth fault)
2. Main PCB failure
3. Transistor PCB failure

Check Point 4 : Check Compressor

・Check Compressor. **(PARTS INFORMATION 2)**

OK

Check Point 5 : Check Transistor PCB

・Check Transistor PCB
>>If Transistor PCB is abnormal, replace it.

OK

Check Point 6 : Replace Main PCB

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

Trouble shooting 21 **OUTDOOR UNIT Error Method:** **Discharge Thermistor Error**	**Indicate or Display:** Error code : 71 Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆7	◆1	○	○	○	●

Detective Actuators:	**Detective details:**
Discharge temperature thermistor	・ Discharge temperature thermistor short detected ・ Discharge thermistor open detected

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

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

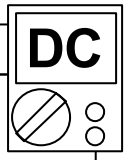
OK

Check Point 2 : Check the thermistor

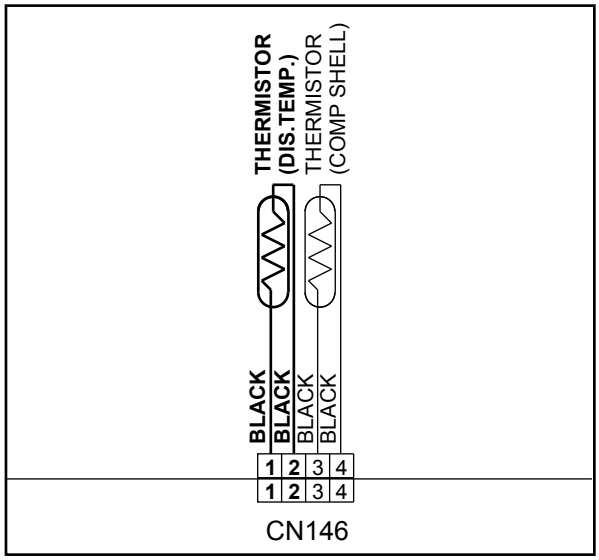
- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 8".

OK

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



- ☐ Main PCB (CN146:1-2) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Discharge temperature thermistor (CN146:1-2)

►**If the voltage do not appear, replace Main PCB, and execute the check operation again.**

Trouble shooting 22 **OUTDOOR UNIT Error Method:** **Compressor Thermistor Error**	**Indicate or Display:** Error code : 72 Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆7	◆2	○	○	○	●

Detective Actuators:	**Detective details:**
Compressor temperature thermistor	▪ Compressor temperature thermistor short detected ▪ Compressor thermistor open detected

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

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

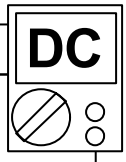
OK

Check Point 2 : Check the thermistor

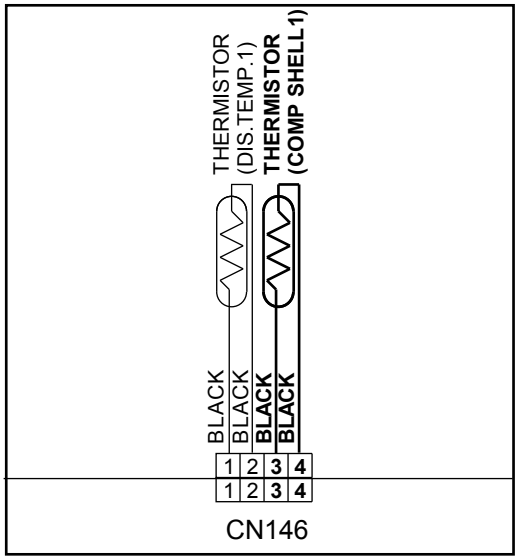
- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 8".

OK

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



- ☐ Main PCB (CN146:3-4) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Compressor temperature thermistor (CN146:3-4)

►**If the voltage do not appear, replace Main PCB, and execute the check operation again.**

Trouble shooting 23 **OUTDOOR UNIT Error Method:** **Heat Ex. Outlet Temp. Thermistor Error**	**Indicate or Display:** Error code : 73

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆7	◆3	○	○	●	○
◆2	●	◆7	◆3	○	○	●	●

Detective Actuators:	**Detective details:**
Heat exchanger liquid temperature thermistor	▪ Heat exchanger outlet temperature thermistor short or open detected

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

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

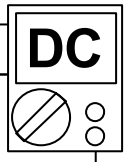
OK

Check Point 2 : Check the thermistor

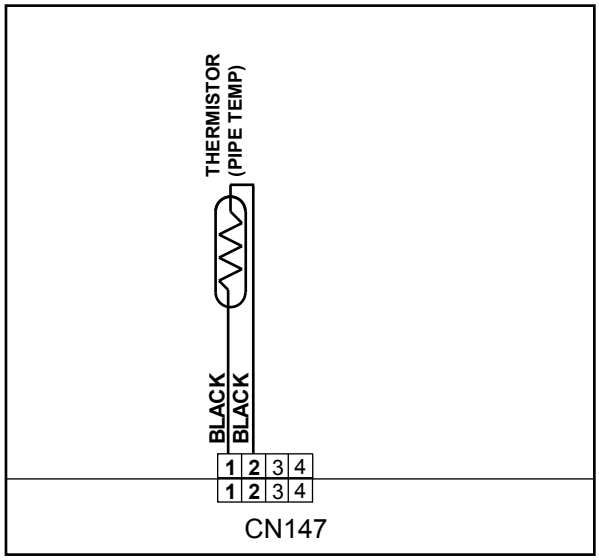
- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 8".

OK

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



- ☐ Main PCB (CN147:1-2) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Heat exchanger outlet temperature thermistor (CN147:1-2)

►**If the voltage do not appear, replace Main PCB, and execute the check operation again.**

Trouble shooting 24 **OUTDOOR UNIT Error Method:** **Outdoor Thermistor Error**	**Indicate or Display:** Error code : 74

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆7	◆4	○	○	○	●

Detective Actuators:	**Detective details:**
Outdoor temperature thermistor	・ Outdoor temperature thermistor short or open detected

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

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

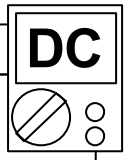
OK

Check Point 2: Check the thermistor

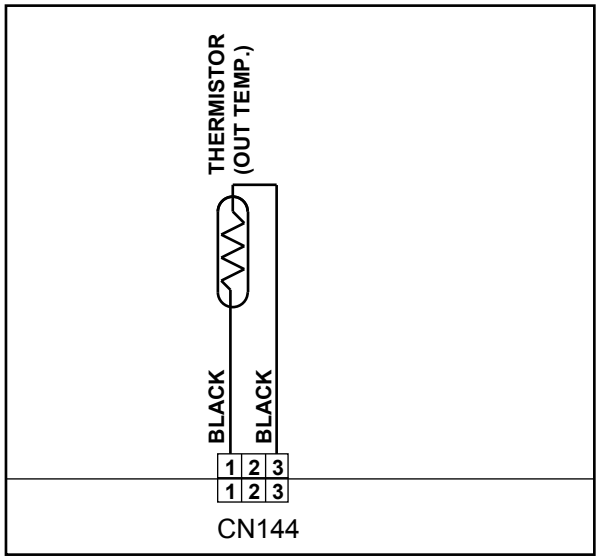
- ☐ Thermistor characteristics check (Disconnect the thermistor from the PCB and check.)
  * For the thermistor characteristics, refer to the "Service Parts Information 8".

OK

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



- ☐ Main PCB (CN144:1-3) voltage value = 5V
  Remove the thermistor from Main PCB, check the voltage.



Outdoor temperature thermistor (CN144:1-3)

►**If the voltage do not appear, replace Main PCB, and execute the check operation again.**

Trouble shooting 25
OUTDOOR UNIT Error Method:

Heat Sink Thermistor Error

Indicate or Display:

Error code : 77

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆7	◆7	○	○	○	●

Detective Actuators:

Heat sink temp. thermistor

Detective details:

・ Heat sink temp. thermistor open/short detected

Forecast of Cause :

1. Connector connection defective, open
2. Sensor defective
3. Transistor PCB defective

Check Point 1 : Check the connector connection and cable open

- ☐ Connector connection state check
- ☐ Cable open check

OK

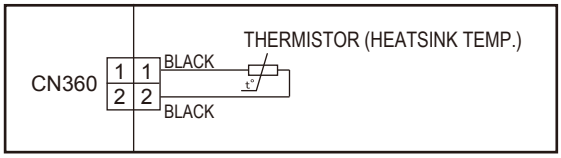
Check Point 2 : Check the thermistor

- ☐ Thermistor characteristics check (Disconnect the sensor from the PCB and check.)
  * For the sensor characteristics, refer to the "Service Parts Information 8".

OK

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

- ☐ Transistor PCB (CN360: 1-2) voltage value = 5V
  Remove the sensor from Inverter PCB, check the voltage.



Heat sink temp. thermistot (CN360: 1-2)

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

Trouble shooting 26
OUTDOOR UNIT Error Method:

Current Sensor Error

Indicate or Display:

Error code : 84

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆8	◆4	○	○	○	●

Detective Actuators:

Power supply PCB
Transistor PCB

Detective details:

When Input Current Sensor has detected 0A, while Inverter Compressor is operating at higher than 50rps, after 1minute upon starting the Compressor. (Except during the defrost operation)

Forecast of Cause :

1. Defective connection of electric components
2. External cause
3. Power supply PCB failure
4. Transistor PCB failure

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO → Check Point 1-2 :
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.

YES ↓

Check Point 2 :
Check connections of Outdoor Unit Electrical Components

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

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

OK ↓

Check Point 3 : Replace Filter PCB

▶ **If Check Point 1, 2 do not improve the symptom, change Power supply PCB .**

OK ↓

Check Point 4 : Replace Main PCB

▶ **If Check Point 3 do not improve the symptom, change Transistor PCB**

Trouble shooting 27 **OUTDOOR UNIT Error Method:** **Pressure Switch Error**	**Indicate or Display:** Error code : 86 (86.4)

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆8	◆6	○	●	○	○

Detective Actuators:	**Detective details:**
High pressure switch Main PCB	・ When the power was turned on, "high pressure switch : open" was failure.

Forecast of Cause :

1. High pressure switch connector disconnection, open
2. High pressure switch characteristics failure
3. Main PCB failure

Check Point 1 : Check the high pressure switch connection state

- ☐ Connector and wiring connection state check
- ☐ Cable open check

↓ **OK**

Check Point 2 : Check the high pressure switch characteristics

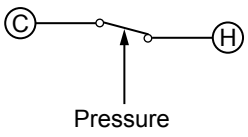
- ☐ Switch characteristics check
  * For the characteristics of high pressure switch, refer to below.

↓ **OK**

Check Point 3 : Replace Main PCB

- ☐ **Change Main PCB, and execute the check operation again.**

・Type of contact



・Characteristics of pressure switch (CN120)

	Pressure switch
Contact : Short ⇒ Open	4.2 −0.15MPa
Contact : Open ⇒ Short	3.2 ±0.15MPa

Trouble shooting 28 **OUTDOOR UNIT Error Method:** **Over Current Error**	**Indicate or Display:** Error code : 94 Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆9	◆4	○	○	○	●

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Compressor Transistor PCB	・"**Protection stop** by overcurrent generation after inverter compressor start processing completed" generated consecutively 10 times. * The number of generations is reset if the start-up of the compressor succeeds.

Forecast of Cause :
1. Outdoor unit fan operation defective, foreign matter on heat exchanger, excessive rise of ambient temperature
2. Main PCB
3. Inverter compressor failure (lock, winding short)
4. Transistor PCB (IPM) failure

Check Point 1 : Check the outdoor unit fan operation, heat exchanger, ambient temperature

・No obstructions in air passages?
・Heat exchange fins clogged
・Outdoor unit fan motor check
・Ambient temperature not raised by the effect of other heat sources?
・Discharged air not sucked in?

OK

Check Point 2: Check Transistor PCB (IPM)

・Check IPM. **(PARTS INFORMATION 7)**
>> If IPM is abnormal, replace Transistor PCB.

OK

Check Point 3: Replace Main PCB

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

OK

Check Point 4: Replace Compressor

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

Trouble shooting 29
OUTDOOR UNIT Error Method:

Compressor Control Error

Indicate or Display:

Error code : 95

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆9	◆5	○	○	○	●

Detective Actuators:

Compressor
Transistor PCB
CT PCB

Detective details:

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 ②repeats 5 times, the compressor stops permanently.

Forecast of Cause :

1. Defective connection of electric components 2. Compressor failure 3. Transistor PCB failure
4. CT PCB

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: Check Transistor PCB

・Check IPM. **(PARTS INFORMATION 7)**

>> If IPM is abnormal, replace Transistor PCB.

OK

Check Point 4: Replace Compressor

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

Trouble shooting 30
OUTDOOR UNIT Error Method:

Outdoor Unit Fan Motor 1 Error

Indicate or Display:

Error code : 97

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆9	◆7	○	○	●	●

Detective Actuators:

Outdoor unit Main PCB
Outdoor unit fan motor

Detective details:

① When outdoor fan rotation speed is less than 100rpm in 20 seconds after fan motor starts, fan motor stops.
② After fan motor restarts, if the same operation within 60sec is repeated 3 times in a row, compressor and fan motor stops.
③ If ① and 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

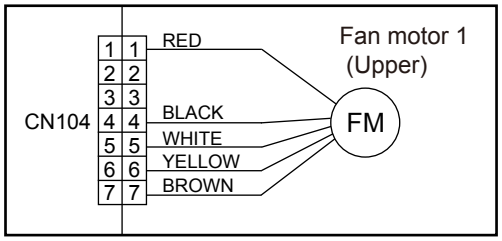
Check Point 3 : Check Outdoor unit fan motor

・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 (AC220V-10%) ~ 373V (AC240+10%)
White - Black	15±1.5V

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

Trouble shooting 31
OUTDOOR UNIT Error Method:

Outdoor Unit Fan Motor 2 Error

Indicate or Display:

Error code : 98

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆9	◆8	○	○	●	●

Detective Actuators:

Outdoor unit Main PCB
Outdoor unit fan motor

Detective details:

① When outdoor fan rotation speed is less than 100rpm in 20 seconds after fan motor starts, fan motor stops.
② After fan motor restarts, if the same operation within 60sec is repeated 3 times in a row, compressor and fan motor stops.
③ If ① and 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

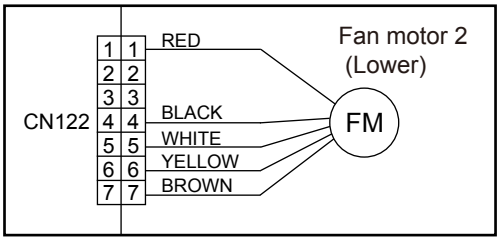
Check Point 3 : Check Outdoor unit fan motor

・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 (AC220V-10%) ~ 373V (AC240+10%)
White - Black	15±1.5V

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

Trouble shooting 32
OUTDOOR UNIT Error Method:
4-Way Valve Error

Indicate or Display:

Error code : 99

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆9	◆9	○	○	○	●

Detective Actuators:

Indoor Unit Controller PCB Circuit
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.] > 20°C
- Heating operation
  [indoor heat exchanger temp.] - [Room temp.] < -14°C

If the same operation is repeated 2 times,
the compressor stops permanently.

Forecast of Cause :

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

Check Point 1 : Check connection of Connector

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

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

OK

Check Point 2 : Check thermistor of Indoor unit

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

>> Check characteristics of thermistor, (Refer to Trouble shooting 13,14), If defective, replace the thermistor.

OK

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

[Solenoid coil]

- Remove CN106 from PCB and check the resistance value of coil.
  Resistance value is about 1.7kΩ

>> 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 Controller PCB

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

Trouble shooting 33
OUTDOOR UNIT Error Method:
Discharge Temp. Error

Indicate or Display:

Error code : A1

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆10	◆1	○	○	○	●

Detective Actuators:

Discharge temperature thermistor
Main PCB

Detective details:

- "Protection stop by "discharge temperature ≧115°C 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

<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 (before and after EEV, ACM oil return)
  Refer to "Service 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 "Service Parts Information 8" and “Trouble shooting 21”.

OK

Check Point 5 : Check the refrigerant amount

- ☐ Leak check

<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 (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 3 "

OK

Trouble shooting 34 **OUTDOOR UNIT Error Method:** **Compressor Temp. Error**	**Indicate or Display:** Error code : A3

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆10	◆3	○	○	○	●

Detective Actuators:	**Detective details:**
Compressor temperature thermistor Main PCB	▪ "Protection stop by "compressor temperature" ≧ 130°C 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. Compressor temperature thermistor failure
5. Insufficient refrigerant

<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 (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 3 ".

OK

Check Point 3 : Outdoor unit fan, heat exchanger check

- ☐ 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 compressor temperature thermistor

- ☐ Compressor temperature thermistor characteristics check
  (Check by disconnecting thermistor from PCB)
  * For the characteristics of the thermistor, refer to the "Service Parts Information 8 and Trouble shooting 22.

OK

Check Point 5 : Check the refrigerant amount

- ☐ Leak check

<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 (before and after EEV, ACM oil return)
  Refer to "Service Parts Information 3 ".

OK

Trouble shooting 35
OUTDOOR UNIT Error Method:

Low Pressure Error

Indicate or Display:

Error code : A5

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆10	◆5	○	○	○	●

Detective Actuators:

Suction pressure sensor (Low)
Outdoor unit Main PCB

Detective details:

- "Protection stop by suction pressure ≦ 0.02MPaG continued for 5 minutes repeats 5 times within 2 hours.

Forecast of Cause :

1. 3-way valve not opened
2. Outdoor unit ambient temperature too low
3. Outdoor unit fan operation defective, foreign matter at heat exchanger
4. EEV defective, strainer clogged
5. Solenoid valve defective
6. Low pressure sensor characteristics defective
7. Insufficient refrigerant
8. 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 clogging

- EEV operation check
- Strainer not clogged?
  Refer to PARTS INFORMATION 3

OK

Check Point 5 : Check the suction pressure sensor

- Suction pressure sensor characteristics check
  * For the characteristics of the suction pressure sensor. (Refer to PARTS INFORMATION 9)

OK

Check Point 6 : Check the refrigerant amount

- Leak check

OK

Check Point 7 : Replace Main PCB

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

<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 outdoor unit ambient temperature

- Outdoor ambient temperature lower than operating range?

OK

Check Point 3 : Check the outdoor unit fan operation, heat exchanger

- No foreign object in air passage?
- Heat exchange fins clogged
- Fan rotates?
- Outdoor unit fan motor check

OK

Check Point 4 : Check the EEV, strainer clogging

- EEV operation check
- Strainer not clogged?
  (Refer to PARTS INFORMATION 3)

Trouble shooting 36 E86. 1 **OUTDOOR UNIT Error Method:** **Discharge Pressure Sensor Error**	**Indicate or Display:** Error code : 86 (86.1)

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆8	◆6	○	○	○	●

Detective Actuators:	**Detective details:**
Discharge pressure sensor	・When any of the following conditions is satisfied, a discharge pressure sensor error is generated. 1. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value ＜0.3V continued for 30 seconds or more 2. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value ≧ 5.0V was detected.

Forecast of Cause :

1. Discharge pressure sensor connector disconnection, open
2. Discharge pressure sensor defective
3. Main PCB defective

Check Point 1 : Check the discharge pressure sensor connection state

- ☐ Connector connection state check
- ☐ Cable open check

OK

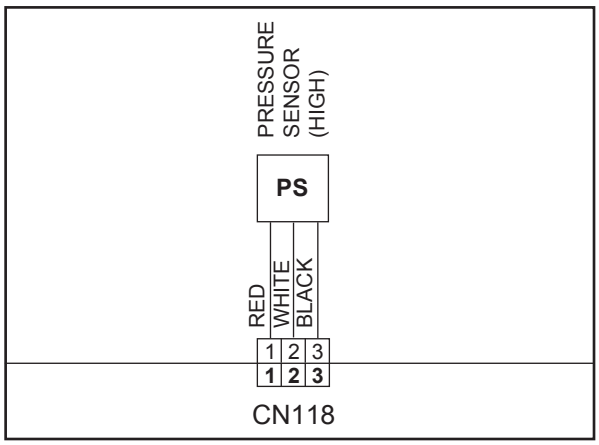
Check Point 2 : Check the discharge pressure sensor

- ☐ Sensor characteristics check
  * For the characteristics of the discharge pressure sensor, refer to the "Service Parts Information 9".

OK

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

- ☐ Main PCB (CN118:1-3) voltage value = 5V
  Remove the sensor from Main PCB, check the voltage.



Discharge pressure sensor (CN118:1-3)

►**If the voltage does not appear, replace Main PCB and set up original address.**

Trouble shooting 37 E86. 3 **OUTDOOR UNIT Error Method:** **Suction Pressure Sensor Error**	**Indicate or Display:** Error code : 86 (86.3)

Outdoor unit :

POWER	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
MODE		(L1)	(L2)	(L3)	(L4)	(L5)	(L6)
◆2	●	◆8	◆6	○	○	●	●

Detective Actuators:	**Detective details:**
Suction pressure sensor	・When any of the following conditions is satisfied, a suction pressure sensor error is generated. 1. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value ＜ 0.06V continued for 30 seconds or more. 2. 30 seconds or more have elapsed since the outdoor unit power was turned on and pressure sensor detected value ≧ 5.0V was detected.

Forecast of Cause :
1. Suction pressure sensor connector disconnection, open
2. Suction pressure sensor defective
3. Main PCB defective

Check Point 1 : Check the suction pressure sensor connection state

- ☐ Connector connection state check
- ☐ Cable open check

OK

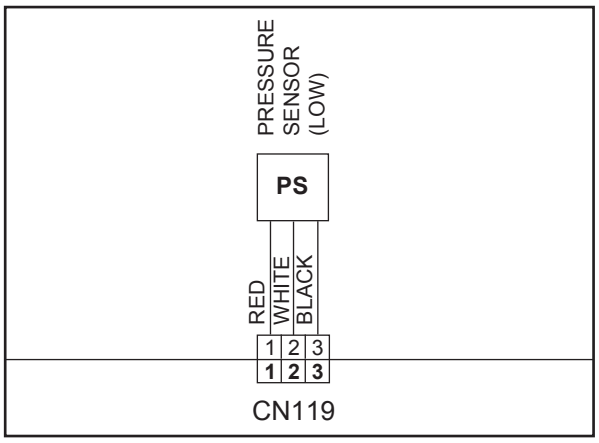
Check Point 2 : Check the suction pressure sensor

- ☐ Sensor characteristics check
  * For the characteristics of the suction pressure sensor, refer to the "Service Parts Information 9".

OK

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

- ☐ Main PCB (CN119:1-3) voltage value = 5V
  Remove the sensor from Main PCB, check the voltage.



Suction pressure sensor (CN119:1-3)

►**If the voltage does not appear, replace Main PCB and set up original address.**

2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 38

Indoor Unit - No Power

Forecast of Cause:

1. Power Supply failure 2. External cause
3. Electrical Component defect

Attention point

An indoor unit and an outdoor unit are connected, and a power supply has be connected to an indoor unit.

Check Point 1 : Check Installation Condition

- Isn't the breaker down?
- Check loose or removed connection cable.

>>If abnormal condition was found, correct it by referring to Installation Manual or Data & Technical Manual.

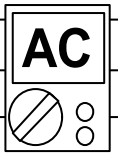
OK

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

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

OK

Check Point 3 : Check Electrical Components



- Check the voltage of power supply.

>> Check if AC198 - 264V appears at Outdoor Unit Terminal 1 - 2 .

NO

YES

- Check Fuse in Controller PCB

>> If Fuse is open, check if the wiring between Terminal and Controller PCB is loose, and replace Fuse.

OK

▶ **If the symptom does not change by above Check 3, replace Controller PCB**

Trouble shooting 39

Outdoor Unit - No Power

Forecast of Cause:

1. Power Supply failure 2. External cause
3. Electrical Component defect

Check Point 1 : Check Installation Condition

- Isn't the breaker down?
- Check loose or removed connection cable.

>>If abnormal condition was found, correct it by referring to Installation Manual or Data & Technical Manual.

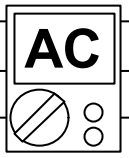
OK

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

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

OK

Check Point 3 : Check Electrical Components



- Check the voltage of power supply.

>> Check if AC198 - 264V appears at Outdoor Unit Terminal L1-N,L2-N,L3-N.

NO

YES

- Check Fuse in Main PCB.

>> If Fuse is open, check if the wiring between Terminal and Main PCB is loose, and replace Fuse.

YES

- Check Transistor PCB **(PARTS INFORMATION 7)**

>> If IPM is abnormal, replace it.

OK

▶ **If the symptom does not change by above Check 3, replace Main PCB.**

Trouble shooting 40

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 CN300 of Controller PCB. (3-wire type:terminal1-3, 2-wire type:terminal1-2)
  (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 41

No Cooling / No Heating

Forecast of Cause:

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

Check Point 1 : Check Indoor Unit

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

OK

Check Point 2 : Check Outdoor Unit Operation

- Check if Outdoor Unit is operating
- Check any objects that obstruct the air flow route.
- Check clogged Heat 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 ?

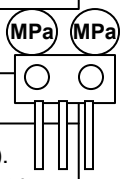
OK

Check Point 4 :
Check Indoor/ Outdoor Installation Condition

- Check connection pipe
  (specified pipe length & Pipe diameter?)
- Check any loose or removed communication line.

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

OK



Check Point 5 : Check Refrigeration Cycle

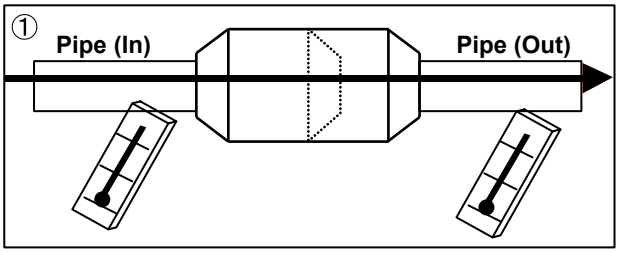
- Check if Strainer is clogged (Refer to the figure at right).
- Measure Gas Pressure and if there is a leakage, correct it.

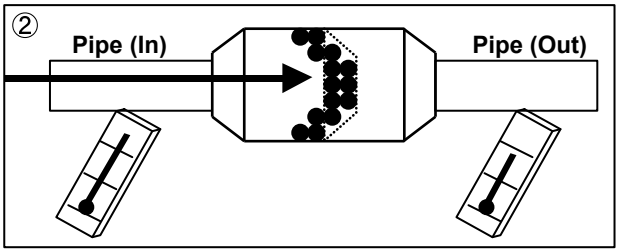
>> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.

- Check EEV (PARTS INFORMATION 3)
- Check Compressor (PARTS INFORMATION 1,2)

Attention

Strainer normally does not have temperature difference between inlet and outlet as shown in① , but if there is a difference like shown in② , there is a possibility of inside clogged. In this case, replace Strainer.





Trouble shooting 42

Abnormal Noise

Forecast of Cause :

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

Diagnosis method when Abnormal Noise is occurred

- 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 (PARTS INFORMATION 1,2)

Trouble shooting 43

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

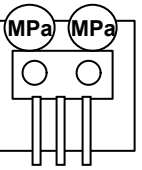
- Is Fan rotating?

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 Main PCB, connection of Compressor, and winding resistance. (Refer to the next page).

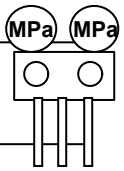
>> If there is no failure, the defect of Compressor is considered (Locked compressor due to clogged dirt or less oil)

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 Transistor 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)

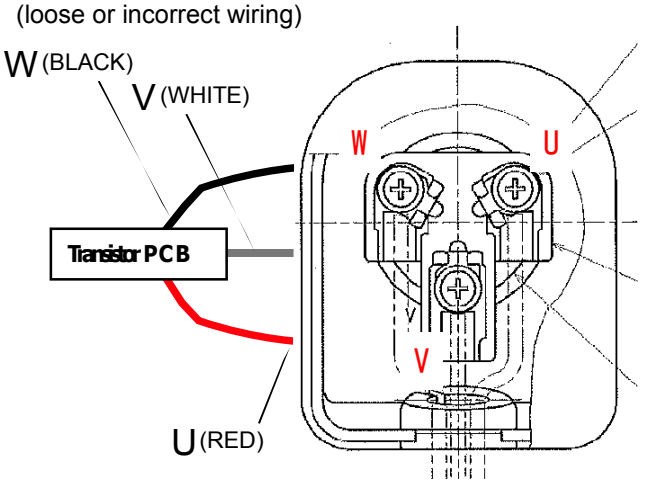
Replace Compressor

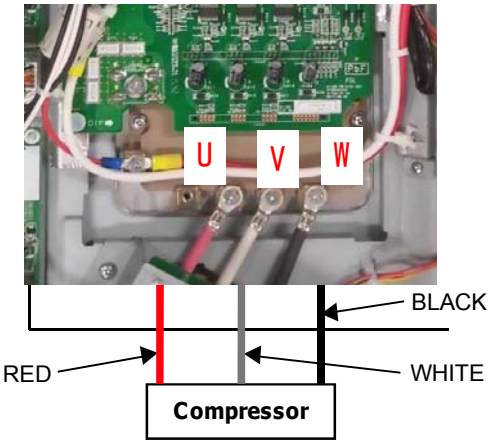
SERVICE PARTS INFORMATION 2

Inverter Compressor

Check Point 1 : Check Connection

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

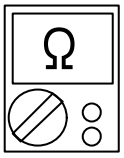


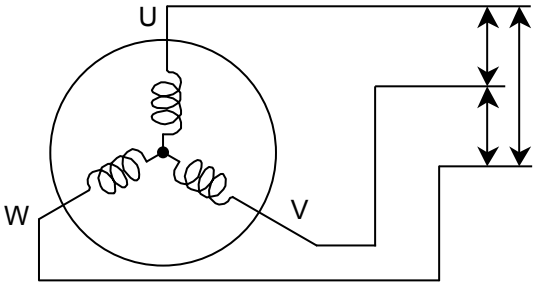


Check Point 2 : Check Winding Resistance

・Check winding resistance of each terminal

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





Resistance Value :
0.33Ω at 20°C (72/90)

Check Point 3 : Replace Main PCB

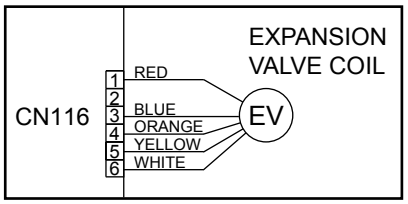
▶**If the symptom does not change with above Check 1, 2, replace Transistor PCB.**

SERVICE PARTS INFORMATION 3

Outdoor unit Electronic Expansion Valve
(EEV)

Check Point 1 : Check Connections

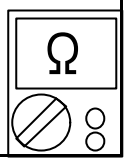
・Check connection of connector
(Loose connector or open cable)



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 68°F(20°C)
Yellow - Red	
Orange - Red	
Blue - Red	



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

Check Point 3 : Check Noise at start up

・Turn on Power and check operation noise.

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

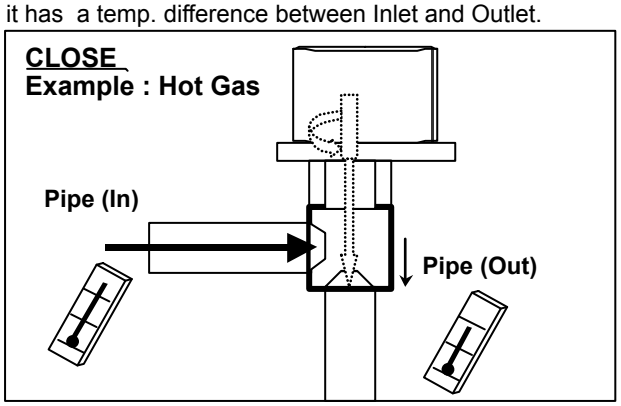
Check Point 4 : Check Voltage from Main PCB.

・Remove Connector and check Voltage (DC12V)

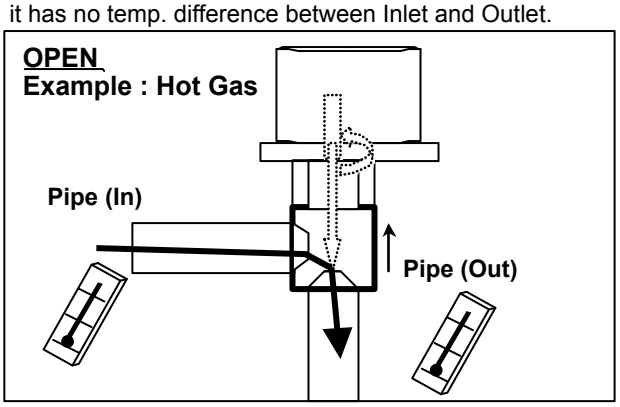
▶ **If it does not appear, replace Main PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

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

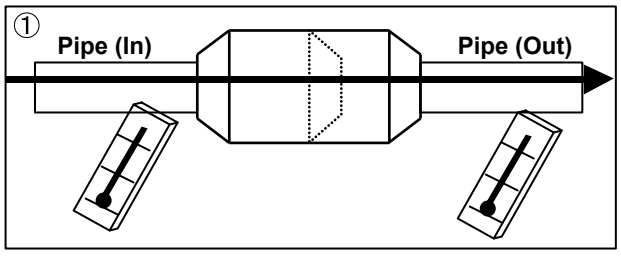


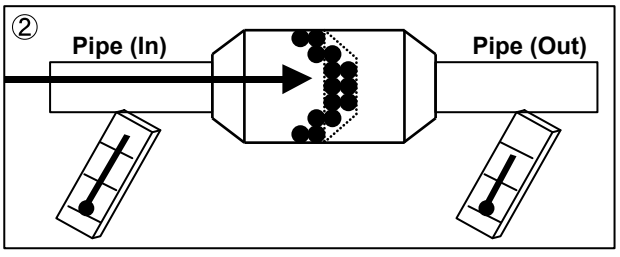
If it is open,
it has no temp. difference between Inlet and Outlet.



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

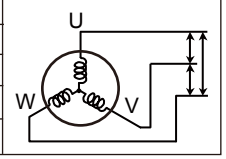
Check Point 1 : Check rotation of Fan

・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.

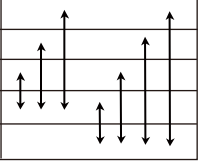
Check Point 2 : Check resistance of Indoor Fan Motor

Check resistance when the main power supply is OFF.

1. Winding coil resistance check (U,V,W)

Pin number (wire color)	Terminal function (symbol)	Resistance: 2.10Ω
1 (Red)	Motor Winding U	
2		
3 (White)	Motor Winding V	
4		
5 (Black)	Motor Winding W	

2. Location circuit resistance check

Pin number (wire color)	Terminal function (symbol)	Resistance: More than 2 M Ω
1 (Yellow)	Hu	
2 (Blue)	Hw	
3 (Orange)	Hv	
4 (Pink)	Vcc	
5 (Gray)	GND	

>> If they are other resistance valule, replace the fan motor

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 1 or 2

・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 7

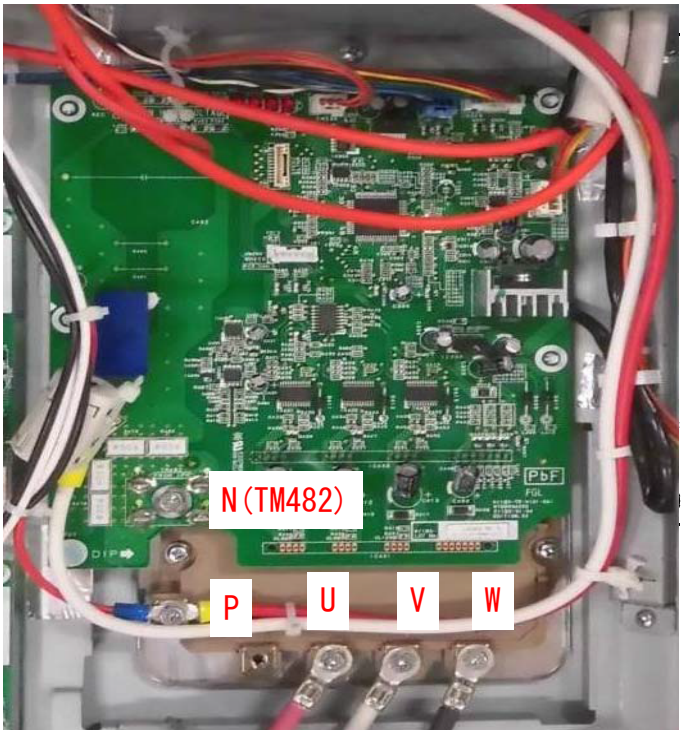
IPM

(Mounted on Transistor PCB)

Check Point 1

① Disconnect the connection wires between the Transistor PCB - Capacitor PCB and Transistor PCB - Inverter Compressor.

② Set the tester to the "Resistance" mode, and measure the resistance between the following terminals.



③ Judge the result of ② as follows:

Terminal		Resistance value
Tester(+)	Tester(-)	
P	U	Over 2kΩ (Including ∞Ω)
P	V	
P	W	
U	P	Over 20kΩ (Including ∞Ω)
V	P	
W	P	
N	U	
N	V	
N	W	
U	N	Over 2kΩ (Including ∞Ω)
V	N	
W	N	

Check Point 2

④ Set the tester to the "Diode" mode, and measure the voltage value between the following terminals.

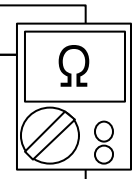
⑤ Judge the result of ④ as follows:

Terminal		Tester display
Tester(+)	Tester(-)	
P	U	∞
P	V	
P	W	
U	P	0.3V～0.7V
V	P	
W	P	
N	U	
N	V	
N	W	
U	N	∞
V	N	
W	N	

SERVICE PARTS INFORMATION 8

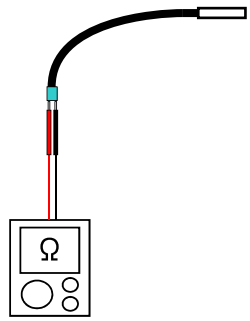
Thermistor

Check Point : Check Thermistor resistance value



☐ Remove connector and check Thermistor resistance value.

Temperature [°C]	Resistance Value [kΩ]			
	Thermistor A	Thermistor B	Thermistor C	Thermistor D
- 20	---	---	105.4	---
- 10	---	27.8	58.2	27.4
- 5	---	21.0	44.0	20.7
0	168.6	16.1	33.6	15.8
5	129.8	12.4	25.9	12.2
10	100.9	9.6	20.2	9.5
15	79.1	7.6	15.8	7.5
20	62.6	6.0	12.5	5.9
25	49.8	4.8	10.0	4.7
30	40.0	3.8	8.0	3.8
40	26.3	2.5	5.3	2.5
50	17.8	1.7	3.6	1.7
60	12.3	1.2	---	1.2
70	8.7	---	---	0.8
80	6.3	---	---	0.6
90	4.6	---	---	0.4
100	3.4	---	---	0.3
110	2.6	---	---	---
120	2.0	---	---	---
Applicable Thermistors	Discharge temp. TH Compressor temp. TH	Heat exchanger. TH	Outdoor temp. TH	Heat sink temp. TH



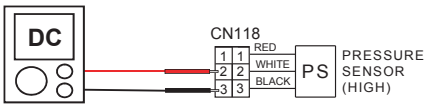
SERVICE PARTS INFORMATION 9

Pressure Sensor

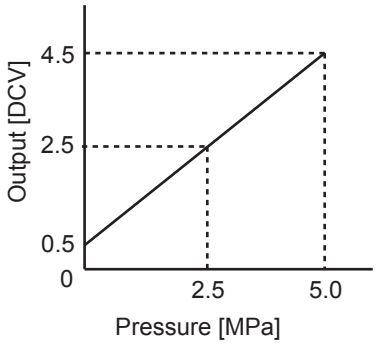
1. High Pressure Sensor

Check Point : Check Voltage from Main PCB

☐ With the connector connected to the PCB, measure the voltage between CN118:2-3 of the Main PCB.



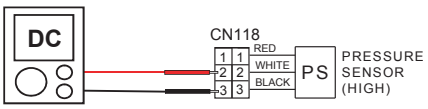
▪ Characteristics of pressure sensor



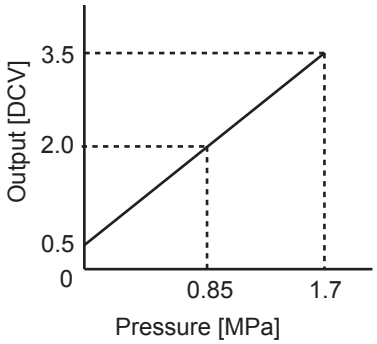
2. Low Pressure Sensor

Check Point : Check Voltage from Main PCB

☐ With the connector connected to the PCB, measure the voltage between CN118:2-3 of the Main PCB.



▪ Characteristics of pressure sensor



Refrigerant
R410A

DUCT 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.

Filter sign

- Select appropriate intervals for displaying the filter sign on the indoor unit according to the estimated amount of dust in the air of the room.
  If the indication is not required, select “No indication” (03).

(◆ ··· Factory setting)

	Setting Description	Function Number	Setting Value
◆	Standard (2500 hours)	11	00
	Long interval (4400 hours)		01
	Short interval (1250 hours)		02
	No indication		03

a. Manual setting(Function setting)

Select the appropriate static pressure according to the installation conditions.

(◆ ··· Factory setting)

	Setting Description	Function Number	Setting Value
	30Pa	26	03
	40Pa		04
	50Pa		05
	60Pa		06
	70Pa		07
	80Pa		08
	90Pa		09
	100Pa		10
	110Pa		11
	120Pa		12
	130Pa		13
	140Pa		14
	150Pa		15
	160Pa		16
	170Pa		17
	180Pa		18
	190Pa		19
	200Pa		20
◆	72Pa (Standard)		31
	Automatic airflow adjustment		32

Automatic airfloe adjustment

NOTE

Be sure to conduct this setting before any other operation. If the motor is warm or the heat exchanger is wet, false and detection may lead to incorrect adjustments.
Check if the electrical wirings and duct installations are complete.
If there is a damper installed in the system, make sure the damper is open.
Check if the air filter(optional) is attached.
If there are several inlet, outlet ports, make sure the airflow rates of each port match the designed airflow rate by adjusting the throttles.

Automatic airflow adjustment is possible by the following procedures.

1) Change Function 26 to "Automatic airflow adjustment (32)".
2) Run the air conditioner on Fan mode (High).

* For instructions on how to operate the air conditioner, refer to the operation manual of the remote controller.
Automatic During airflow ajustment, the mode will be fixed at Fan mode(High).
When this function is active, do not operate the Outdoor unit.

3) The air conditioner will run for about 1 to 8 min. then stop automatically.
* Do not change the throttles of the inlet and outlet ports during operation.
When used in a Group control system, the setting will take about 10 min.

4) Turn the air conditioner off and on again.
5) Check the setting value of Function 26 and take note of the setting value in the following chart.
* If the setting value has not changed, repeat the procedure from step 1.

Setting the Room temperature control for indoor unit sensor

Depending on the installed environment, correction of the room temperature sensor may be required.
Select the appropriate control setting according to the installed environment.
The temperature correction values show the difference from the Standard setting “00” (manufacturer’s recommended value).

(◆ ··· Factory setting)

	Setting Description	Function Number		Setting Value
◆	Standard setting	30 (For cooling)	31 (For heating)	00
	No correcion 00°C			01
More Cooling Less Heating	-0.5°C			02
	-1.0°C			03
	-1.5°C			04
	-2.0°C			05
	-2.5°C			06
	-3.0°C			07
	-3.5°C			08
	-4.0°C			09
Less Cooling More Heating	+0.5°C			10
	+1.0°C			11
	+1.5°C			12
	+2.0°C			13
	+2.5°C			14
	+3.0°C			15
	+3.5°C			16
	+4.0°C			17

Setting the Room temperature control for wired remote controller sensor

Depending on the installed environment, correction of the wire remote temperature sensor may be required.
Select the approriate control drtting according to the installed environment.
To change this setting, set Function 42 to Both “01”.
Ensure that the Thermo Sensor icon is displayed on the remote controller screen.

(◆ ··· Factory setting)

	Setting Description	Function Number		Setting Value
◆	No correcion	35 (For cooling)	36 (For heating)	00
	No correcion 00°C			01
More Cooling Less Heating	-0.5°C			02
	-1.0°C			03
	-1.5°C			04
	-2.0°C			05
	-2.5°C			06
	-3.0°C			07
	-3.5°C			08
Less Cooling More Heating	-4.0°C			09
	+0.5°C			10
	+1.0°C			11
	+1.5°C			12
	+2.0°C			13
	+2.5°C			14
	+3.0°C			15
	+3.5°C			16
	+4.0°C			17

Auto restart

• Enable or disable automatic restart after a power interruption.

(◆ ··· Factory setting)

	Setting Description	Function Number	Setting Value
◆	Enable	40	00
	Disable		01

* Auto restart is an emergency function such as for power outage etc. Do not attempt to use this function in normal operation. Be sure to operate the unit by remote controller or external device.When operating by a concentration remoto controll, “Enable:00” that and use it.

Room temperature sensor switching

(Only for wired remote controller)
When using the Wired remote controller temperature sensor, change the setting to “Both” (01).

(◆ ··· Factory setting)

	Setting Description	Function Number	Setting Value
◆	Indoor Unit	42	00
	Both		01

00: Sensor on the indoor unit is active.
01: Sensors on both indoor unit and wired remote controller are active.

Cold air prevention

• This setting is to disable the cold air prevention function during heating operation. When disabled, the fan setting will always follow the setting on the remote controller. (Excluding defrost mode)

(◆ ⋯ Factory setting)

	Setting Description	Function Number	Setting Value
◆	Enable	43	00
	Disable		01

External input control

• "Operation/Stop" mode or "Forced stop" mode can be selected.

(◆ ⋯ Factory setting)

	Setting Description	Function Number	Setting Value
◆	Operation/Stop mode 1	46	00
	(Setting prohibited)		01
	Forced stop mode		02
	Operation/Stop mode 2		03

Room temperature sensor switching (Aux.)

• To use the temperature sensor on the wired remote controller only, change the setting to "Wired remote controller" (01). This function will only work if the function setting 42 is set at "Both" (01)

(◆ ⋯ Factory setting)

	Setting Description	Function Number	Setting Value
◆	Both	48	00
	Wired remote controller		01

Indoor unit fan control for energy saving for cooling

Enables or disables the power-saving function by controlling the indoor unit fan rotation when the outdoor unit is stopped during cooling operation.

(◆ . . . Factory setting)

	Setting Description	Function Number	Setting Value
	Disable	49	00
	Enable		01
◆	Remote controller		02

00 : When the outdoor unit is stopped, the indoor unit fan operates continuously following the setting on the remote controller.

01 : When the outdoor unit is stopped, the indoor unit fan operates intermittently at a very low speed.

02 : Enable or disable this function by remote controller setting.

NOTES:

- As the factory setting, this setting is initially inactivated.
- Set to "00" or "01" when connecting a remote controller that cannot set the Fan control for energy saving function or connecting a network converter.
  To confirm if the remote controller has this setting, refer to the operating manual of each remote controller.

Switching functions for external output terminal

Functions of the external output terminal can be switched.

(◆ ⋯ Factory setting)

	Setting Description	Function Number	Setting Value
◆	Operation status	60	00
	Error status		09
	Fresh air control		10
	Auxiliary heater		11

3-1-2 Procedures to change the Function Setting

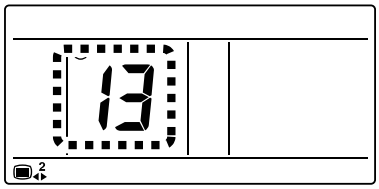
Note

This item cannot be set from slave remote controllers.

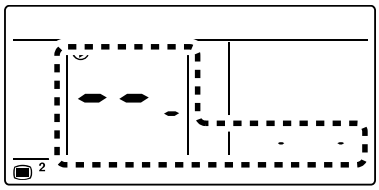
This procedure changes the function settings used to control the indoor unit according to the installation conditions. Incorrect settings can cause the system to malfunction. Perform the "Function Setting" according to the installation conditions using the remote controller.

- Prepare for setting of indoor unit referring to installation manual of indoor unit before start of function setting.
- Refer to the indoor unit installation manual for details on the function numbers and setting numbers.

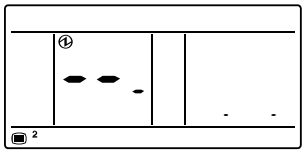
(1) Select the "13" in Menu 2 Settings. Then press the [↵ ENTER] button.



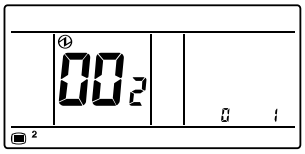
(2) Select the 2-wire remote controller address with the [+] or [—] buttons. Then press the [↵ ENTER] button.



Select all

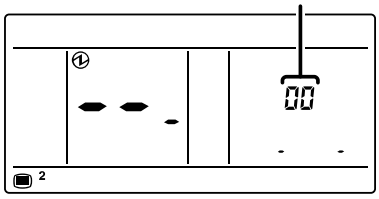


Select the 2-wire remote controller address (Ex. Select the 002-01)



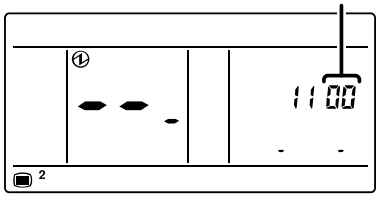
(3) Set the Function Number with the [+] or [—] buttons. Then press the [↵ ENTER] button.

Function Number

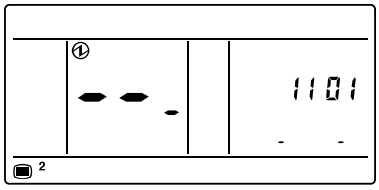


(4) Set the Setting Number with the [+] or [—] buttons. Then Press the [↵ ENTER] button.

Setting Number



(5) Setting results are displayed after data transmission.



(6) Press the [↵ ENTER] button to return to the 2-wire remote controller address selection screen of (2). If setting has been completed, press the [▣ MENU] button to return to the Menu 2 item selection screen.

Wierless remote controller (option)

Perform the “FUNCTION SETTING” according to the installation conditions using the remote controller.

⚠ CAUTION
• Confirm whether the wiring work for outdoor unit has been finished.
• Confirm that the cover for the electrical enclosure on the outdoor unit is in place.

- 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 to malfunction.
- After the power is turned on, perform the “FUNCTION SETTING” according to the installation conditions using the remote controller.
- 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.
- Refer to the installation manual enclosed with the remote controller when the wired remote controller (option) is used.

Selecting the Function Number and Setting Value

(1) While pressing the “ECONOMY” button and “TEMP.” (∧) button simultaneously, press the “RESET” button to enter the function setting mode.

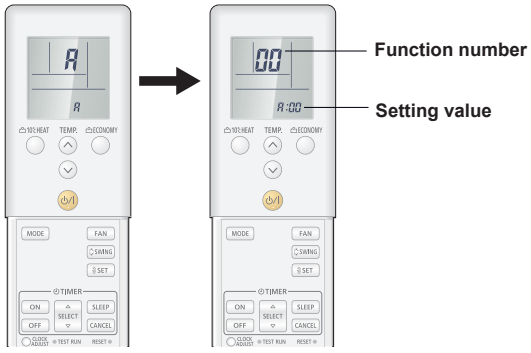
(2) Press th e “10°C HEAT” button

(3) Press the “TEMP.” (∧/ ∨) buttons to select the function number. (Press the “10°C HEAT” button to switch between the left and right digits.)

(4) Press the “ECONOMY” button to proceed to setting value. (Press the “ECONOMY” button again to return to the function number selection.)

(5) Press the “TEMP.” (∧ / ∨) buttons to select the setting value. (Press the “10°C HEAT” button to switch between the left and right digits.)

(6) Press the “MODE” button once to send the function setting information. Please confirm the beeping sound.



(7) Next, please press “Start/Stop(⏻/❙)” button once to fix the function setting. Please confirm the beeping sound.

(8) Press the “RESET” button to cancel the function setting mode.

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

⚠ CAUTION
• After turning off the power, wait 30 seconds or more before turning on it again. The function setting does not become active unless the power is turned off then on again.

2-Wire remote controller (option)

UTY-RSR*/ UTY-RHR*

Note

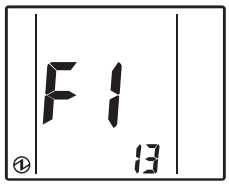
This item cannot be set from slave remote controllers.

This procedure changes the function settings used to control the indoor unit according to the installation conditions. Incorrect settings can cause the system to malfunction. Perform the “Function setting” according to the installation conditions using the remote controller.

- Prepare for setting of indoor unit referring to installation manual of indoor unit before start of function setting.
- Refer to the indoor unit installation manual for details on the function numbers and setting numbers.

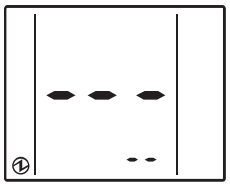
(1) Select the “13” in Menu 2-F1 Settings.
Then press the “ ⏻/❙ ” button.

(1)



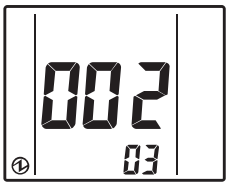
(2) Select the 2-wire remote controller address with the “ TEMP. ∧ ” or “ TEMP. ∨ ” button. Then press the “ ⏻/❙ ” button.

(2)-a



Select all

(2)-b



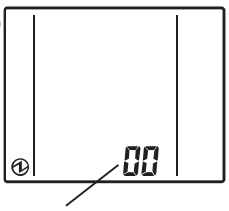
Select the 2-wire remote controller address (Ex. Select the 002-03)

(3) Set the function number with the “ TEMP. ∧ ” or “ TEMP. ∨ ” button. Then press the “ ⏻/❙ ” button.

(4) Set the setting number with the “ TEMP. ∧ ” or “ TEMP. ∨ ” button. Then press the “ ⏻/❙ ” button.

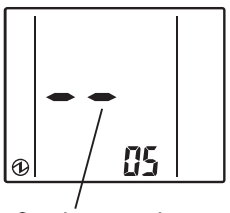
(5) Setting results are displayed after data transmission.

(3)



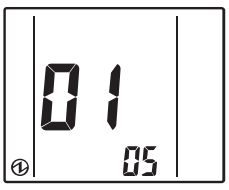
Function number

(4)



Setting number

(5)



(6) Press the “ ⏻/❙ ” button to return to the 2-wire remote controller address selection screen of (2). If setting has been completed, press the “ FAN ∨ ” button to return to the Menu 2-F1 item selection screen.

2-Wire remote controller (option)

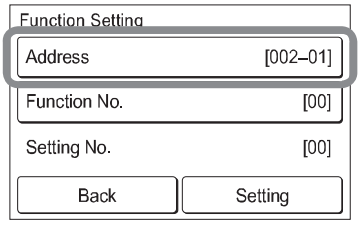
UTY-RNR*Z2

This procedure changes the function settings used to control the indoor unit according to the installation conditions. Incorrect settings can cause the indoor unit to malfunction. Perform the “Function Setting” according to the installation conditions using the remote controller.

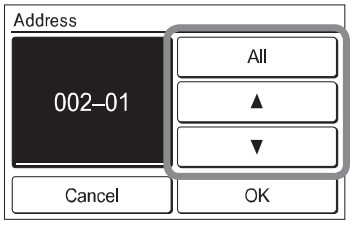
- Refer to the indoor unit installation manual for details on the function numbers and setting numbers, before the start of function setting.

1. Touch the [Function Setting] on the “Maintenance” screen. The “Function Setting” screen is displayed.
   Touch the [Address] on the “Function Setting” screen. The “Address” screen is displayed.
2. Touch [▲] or [▼] to select the address of the indoor units to be configured. (To set all indoor units at the same time, touch [All].)
   Touch [OK] to return to the Function Setting screen.
3. Touch the [Function No.] on the “Function Setting” screen. The “Function No.” screen is displayed.

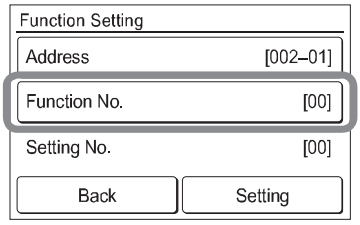
1.



2.

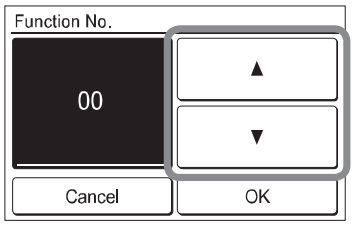


3.

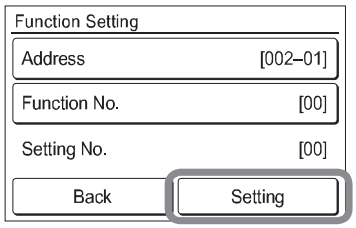


4. Touch [▲] or [▼] to set the function number. Touch [OK] to return to the “Function Setting” screen.
5. Touch the [Setting No.] on the “Function Setting” screen. The “Setting No.” screen is displayed.
6. Touch [▲] or [▼] to set the setting number. Touch [OK] to return to the “Function Setting” screen.

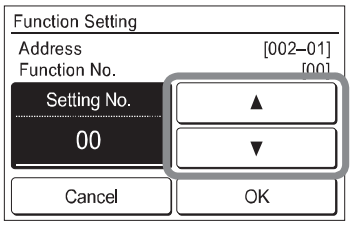
4.



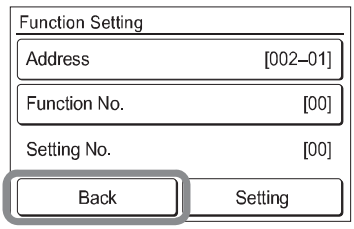
5.



6.



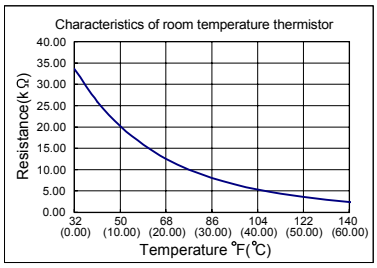
7. Touch [Back] to return to the “Maintenance” screen.

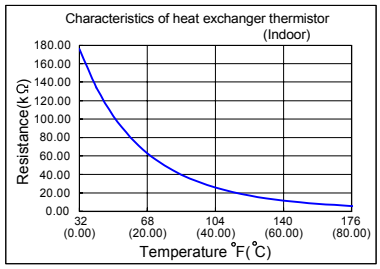


3-2. THERMISTOR RESISTANCE VALUES

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

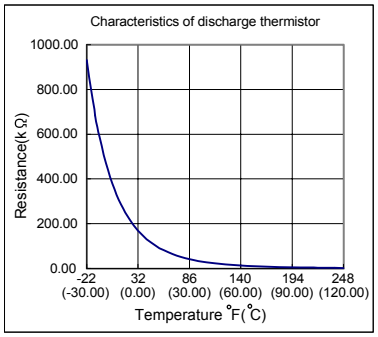
Indoor heat exchanger thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
32.0	0.0	176.03	1.10
41.0	5.0	134.23	1.36
50.0	10.0	103.34	1.63
59.0	15.0	80.28	1.92
68.0	20.0	62.91	2.21
77.0	25.0	49.70	2.51
86.0	30.0	39.57	2.79
95.0	35.0	31.74	3.06
104.0	40.0	25.64	3.30
113.0	45.0	20.85	3.53
122.0	50.0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

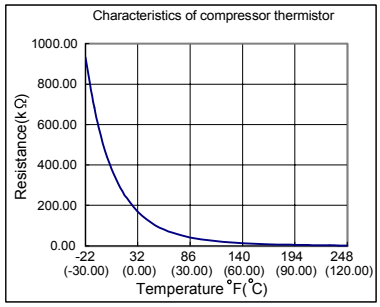




Discharge thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	931.50	0.07
-13.0	-25.0	683.30	0.09
-4.0	-20.0	506.60	0.13
5.0	-15.0	379.40	0.17
14.0	-10.0	286.90	0.22
23.0	-5.0	219.0	0.28
32.0	0.0	168.6	0.36
41.0	5.0	130.7	0.45
50.0	10.0	102.2	0.56
59.0	15.0	80.51	0.70
68.0	20.0	63.89	0.85
77.0	25.0	51.05	1.01
86.0	30.0	41.07	1.20
95.0	35.0	33.26	1.41
104.0	40.0	27.09	1.62
113.0	45.0	22.20	1.85
122.0	50.0	18.29	2.08
131.0	55.0	15.15	2.31
140.0	60.0	12.62	2.54
149.0	65.0	10.56	2.76
158.0	70.0	8.88	2.97
167.0	75.0	7.50	3.17
176.0	80.0	6.36	3.36
185.0	85.0	5.42	3.53
194.0	90.0	4.64	3.69
203.0	95.0	3.98	3.83
212.0	100.0	3.43	3.96
221.0	105.0	2.97	4.07
230.0	110.0	2.58	4.17
239.0	115.0	2.24	4.26
248.0	120.0	1.96	4.34

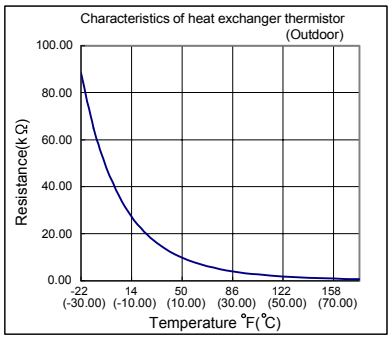
Compressor temperature thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	931.50	0.07
-13.0	-25.0	683.30	0.09
-4.0	-20.0	506.60	0.13
5.0	-15.0	379.40	0.17
14.0	-10.0	286.90	0.22
23.0	-5.0	219.0	0.28
32.0	0.0	168.6	0.36
41.0	5.0	130.7	0.45
50.0	10.0	102.2	0.56
59.0	15.0	80.51	0.70
68.0	20.0	63.89	0.85
77.0	25.0	51.05	1.01
86.0	30.0	41.07	1.20
95.0	35.0	33.26	1.41
104.0	40.0	27.09	1.62
113.0	45.0	22.20	1.85
122.0	50.0	18.29	2.08
131.0	55.0	15.15	2.31
140.0	60.0	12.62	2.54
149.0	65.0	10.56	2.76
158.0	70.0	8.88	2.97
167.0	75.0	7.50	3.17
176.0	80.0	6.36	3.36
185.0	85.0	5.42	3.53
194.0	90.0	4.64	3.69
203.0	95.0	3.98	3.83
212.0	100.0	3.43	3.96
221.0	105.0	2.97	4.07
230.0	110.0	2.58	4.17
239.0	115.0	2.24	4.26
248.0	120.0	1.96	4.34

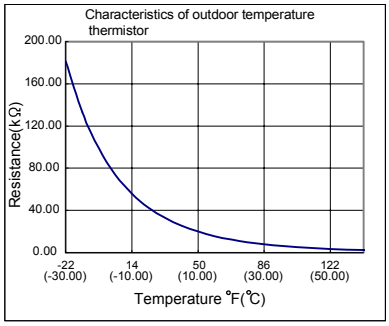




Outdoor heat exchanger thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	88.42	0.25
-13.0	-25.0	64.89	40.341
-4.0	-20.0	48.13	0.449
5.0	-15.0	36.07	0.581
14.0	-10.0	27.29	0.741
23.0	-5.0	20.84	0.928
32.0	0.0	16.05	1.14
41.0	5.0	12.45	1.38
50.0	10.0	9.74	1.64
59.0	15.0	7.67	1.91
68.0	20.0	6.09	2.19
77.0	25.0	4.87	2.47
86.0	30.0	3.92	2.74
95.0	35.0	3.17	3.00
104.0	40.0	2.59	3.24
113.0	45.0	2.12	3.46
122.0	50.0	1.75	3.66
131.0	55.0	1.45	3.83
140.0	60.0	1.21	3.99
149.0	65.0	1.01	4.12
158.0	70.0	0.85	4.24
167.0	75.0	0.72	4.34
176.0	80.0	0.61	4.43

Outdoor Temprature thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	181.60	0.87
-13.0	-25.0	133.30	1.12
-4.0	-20.0	98.86	1.40
5.0	-15.0	74.08	1.70
14.0	-10.0	56.05	2.03
23.0	-5.0	42.80	2.36
32.0	0.0	32.97	2.69
41.0	5.0	25.57	3.00
50.0	10.0	20.00	3.28
59.0	15.0	15.76	3.54
68.0	20.0	12.51	3.77
77.0	25.0	10.00	3.96
86.0	30.0	8.05	4.13
95.0	35.0	6.52	4.27
104.0	40.0	5.31	4.39
113.0	45.0	4.35	4.49
122.0	50.0	3.59	4.57
131.0	55.0	2.97	4.64
140.0	60.0	2.48	4.70
149.0	65.0	2.07	4.74
158.0	70.0	1.74	4.78
167.0	75.0	1.47	4.81
176.0	80.0	1.25	4.84





3-3. EXTERNAL INPUT AND OUTPUT

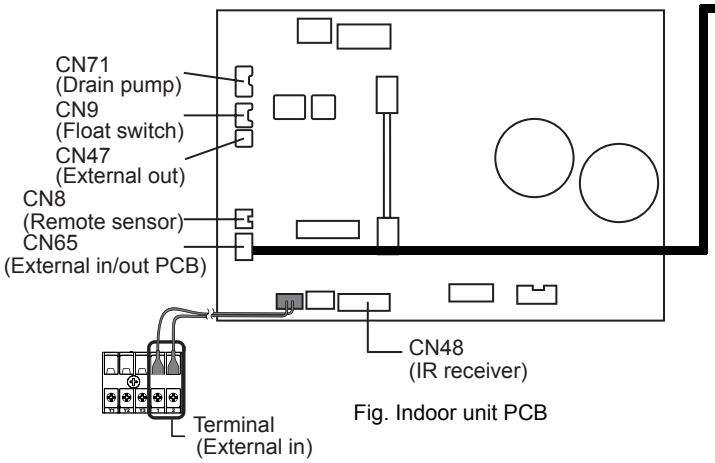


Fig. Indoor unit PCB

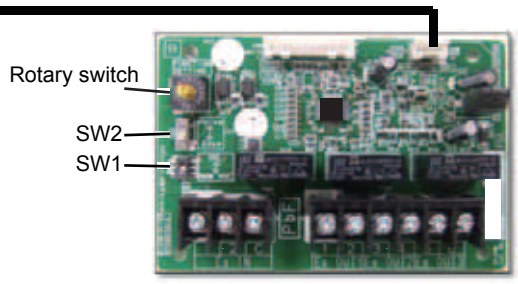


Fig. External input and output PCB

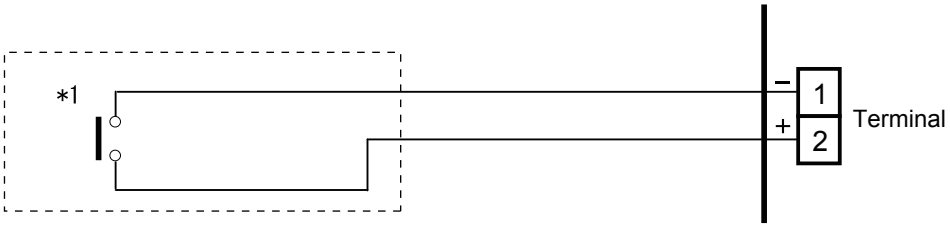
PCB	External input	External output	Connector	Input select	Input signal	External connect kit (Optional parts)
Indoor unit	Operation/Stop Forced stop	-	Terminal	Dry contact	Edge	-
	-	Operation status Error status Indoor unit fan operation status External heater output	CN47	-	-	UTY-XWZXZG
External input and output (UTY-XCSX)	Operation/Stop	-	Input 1/ Input 2	Dry contact/ Apply voltage	Edge/ Pulse	-
	Forced thermostat off		Input 1		Edge	
	-	Operation status Error status Indoor unit status External heater output	Output 1 Output 2 Output 3	-	-	-

3-3-1. External input

- “Operation/Stop” mode or "Forced stop" mode can be selected with function setting of indoor unit.
- A twisted pair cable (22AWG) should be used. Maximum length of cable is 150 m.
- Use an external input and output cable with appropriate external dimension, depending on the number of cables to be installed.
- The wire connection should be separate from the power cable line.

■ Indoor unit

Indoor unit functions such as Operation/Stop can be done by using indoor unit terminals.



*1: The switch can be used on the following condition: DC 12 V to 24 V, 1 mA to 15 mA.

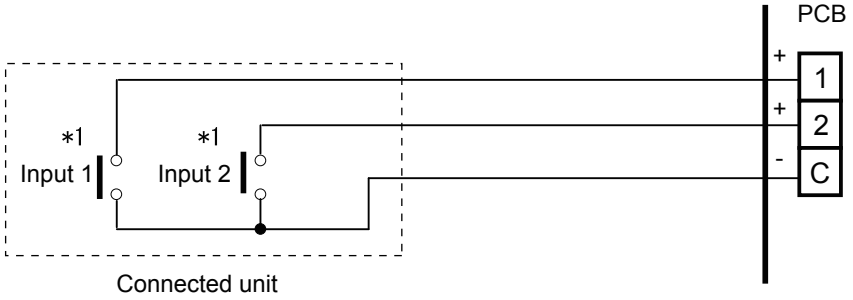
■ External input and output PCB

The indoor unit Operation/Stop can be set by using the input terminal on the PCB.

● Input select

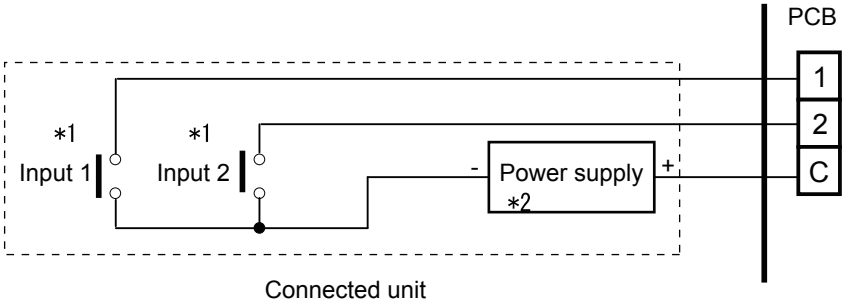
Use either one of these types of terminals according to the application. (Both types of terminals cannot be used simultaneously.)

- Dry contact
  In case of internal power supply, set the slide switch of SW1 to "NON VOL" side.



*1: The switches can be used on the following condition: DC 12 V to 24 V, 1 mA to 15 mA.

- Apply voltage
  In case of external power supply, set the slide switch of SW1 to "VOL" side.



*1: The switches can be used on the following condition: DC 12 V to 24 V, 1 mA to 15 mA.

*2: Make the power supply DC 12 to 24 10 mA or more.

3-3-2. External output

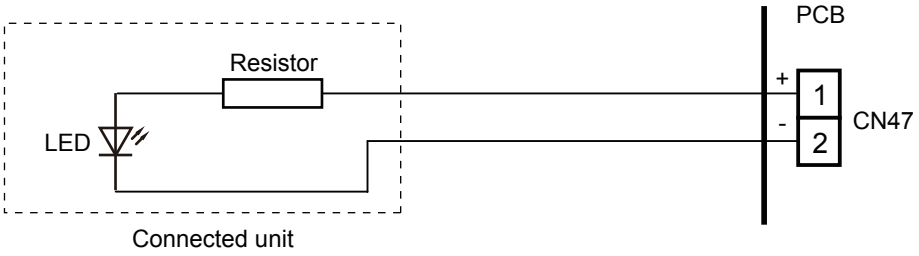
Use an external output cable with appropriate external dimension, depending on the number of cables to be installed.

■ Indoor unit

- A twisted pair cable (22AWG) should be used. Maximum length of cable is 25 m.
- Output voltage: High DC 12 V ± 2 V, Low 0 V.
- Permissible current: 50 mA
- For details, refer to Chapter 10-3. "Combination of external input and output" on page 14.

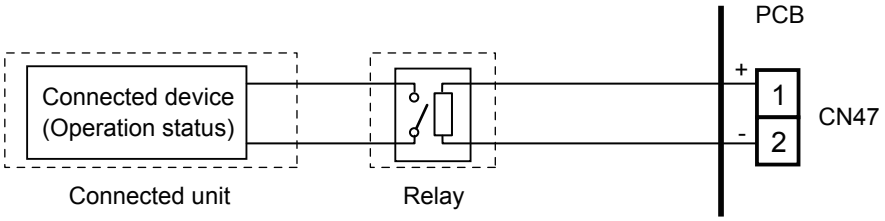
● When indicator, etc. are connected directly

Example: Function setting 60 is set to "00"



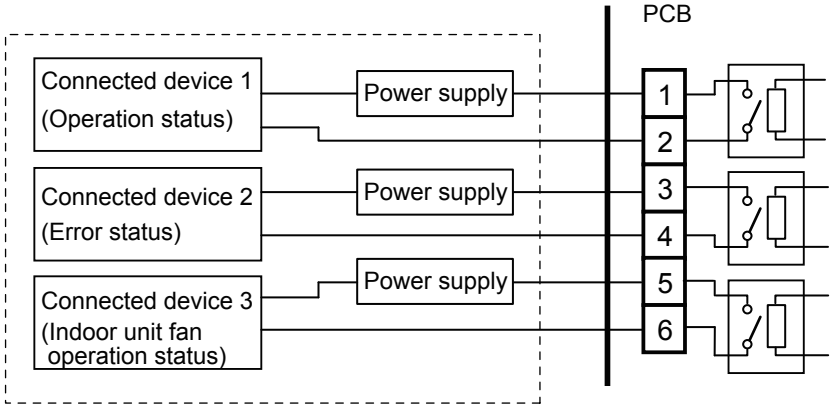
● When connecting with a device equipped with a power supply

Example: Function setting 60 is set to "00"



■ External input and output PCB

- A twisted pair cable (22AWG) should be used.
- Permissible voltage and current: DC 5 V to 30 V / 3 A, AC 30 V to 250 V / 3 A
- For details, refer to Chapter 10-3. "Combination of external input and output" on page 14.



3-3-3. Combination of external input and output

By combining the function setting of the indoor unit and rotary switch setting of the External input and output PCB, you can select various combinations of functions.

Combination examples of external input and output are as follows:

Mode	Function setting	External input and output PCB (Rotary SW)	External input			
			Indoor unit Input	External input and output PCB		
			Terminal	Input 1	Input 2	Signal type
0-1	60-00	1	Operation/Stop	Operation/Stop	Not available	Edge
				Operation	Stop	Pulse
0-2	60-00	2	Operation/Stop	Forced Thermostat OFF	Not available	Edge
1—8	60-01 to 60-08	3 - 9, A	(Setting prohibited)			
9	60-09	B	Operation/Stop	Forced Thermostat OFF	Not available	Edge
10	60-10	C	Operation/Stop	Forced Thermostat OFF	Not available	Edge
11	60-11	D	Operation/Stop	Forced Thermostat OFF	Not available	Edge

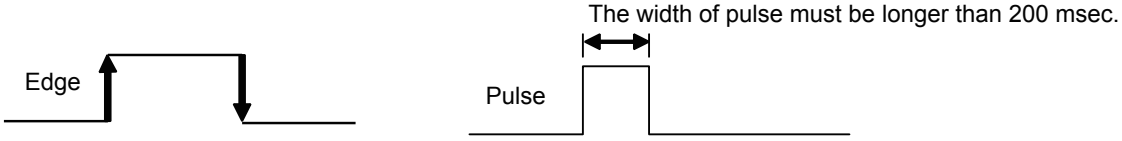
Mode	Function setting	External input and output PCB (Rotary SW)	External output			
			Indoor unit Output	External input and output PCB		
			CN47	Output 1	Output 2	Output 3
0-1	60-00	1	Operation/Stop	Operation/Stop	Error status	Indoor unit fan operation status
0-2	60-00	2	Operation/Stop	Error status	Indoor unit fan operation status	External heater output
1—8	60-01 to 60-08	3 - 9, A	(Setting prohibited)			
9	60-09	B	Error status	Operation/Stop	Indoor unit fan operation status	External heater output
10	60-10	C	Indoor unit fan operation status	Operation/Stop	Error status	External heater output
11	60-11	D	External heater output	Operation/Stop	Indoor unit fan operation status	Error status

NOTE: Input of Operation/Stop depends on the setting of function setting 46.
00: Operation/Stop mode 1 (R.C. enabled)
01: (Setting prohibited)
02: Forced stop
03: Operation/Stop mode 2 (R.C. disabled)

■ Input signal type

- Indoor unit
  Input signal type is only "Edge".

- External input and output PCB
  The input signal type can be selected.
  Signal type (edge or pulse) can be switched by the DIP switch 2 (SW2) on the External input and output PCB.



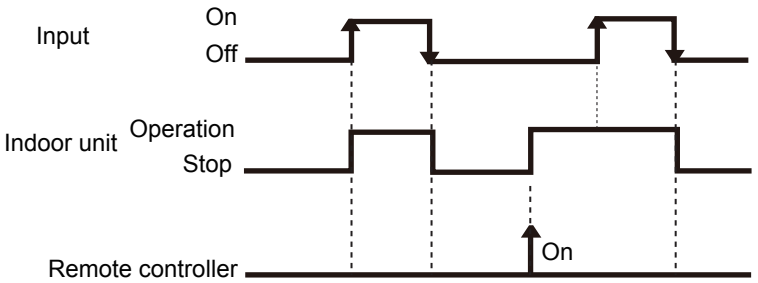
3-3-4. Details of function

■ Control input function

● When function setting is "Operation/Stop" mode 1

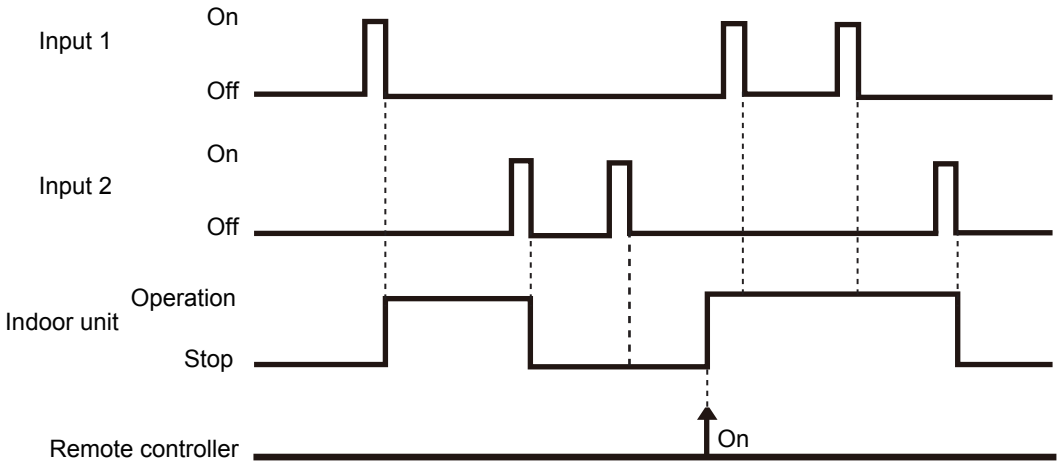
- In the case of "Edge" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-00	-	Input of indoor unit	Terminal	Off → On	Operation
				On → Off	Stop
	60-00 / 1	External input and output PCB	Input 1	Off → On	Operation
				On → Off	Stop



- In the case of "Pulse" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-00	60-00 / 1	External input and output PCB	Input 1	Pulse	Operation
			Input 2	Pulse	Stop



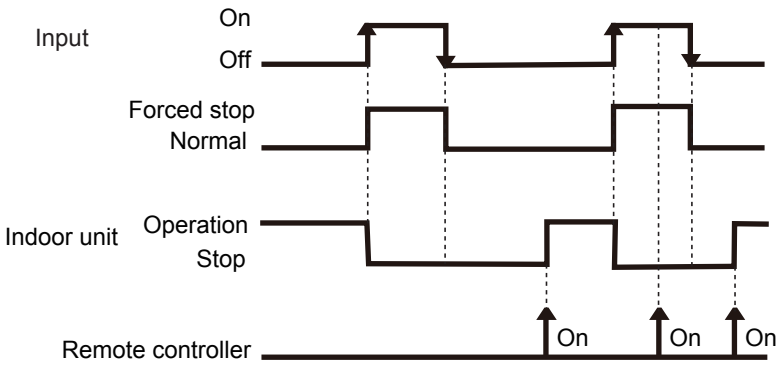
NOTES:

- The last command has priority.
- The indoor units within the same remote controller group operates in the same mode.

● When function setting is "Forced stop" mode

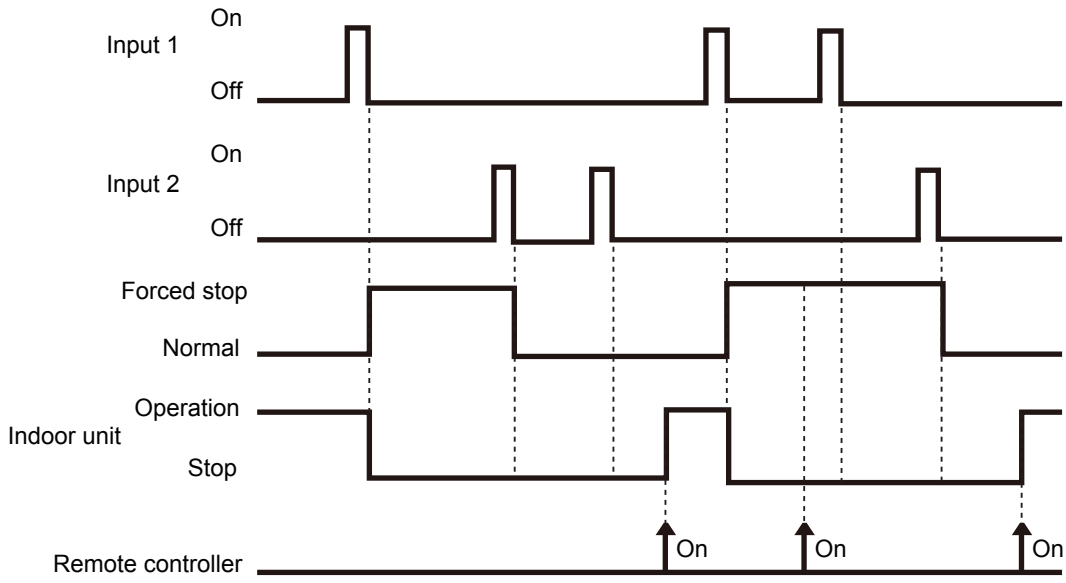
- In the case of "Edge" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-02	-	Input of indoor unit	Terminal	Off → On	Forced stop
				On → Off	Normal
	60-00 / 1	External input and output PCB	Input 1	Off → On	Forced stop
				On → Off	Normal



- In the case of "Pulse" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-02	60-00 / 1	External input and output PCB	Input 1	Pulse	Forced stop
			Input 2	Pulse	Normal



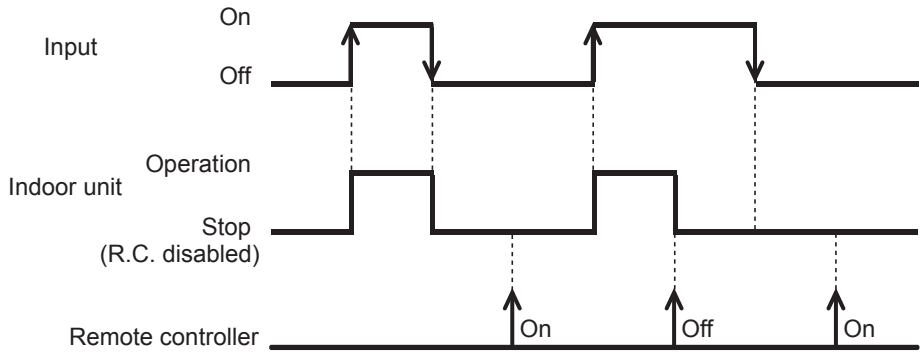
NOTES:

- When the forced stop is triggered, indoor unit stops and Operation/Stop operation by the remote controller is restricted.
- When forced stop function is used with forming a remote controller group, connect the same equipment to each indoor unit within the group.

● When function setting is "Operation/Stop" mode 2

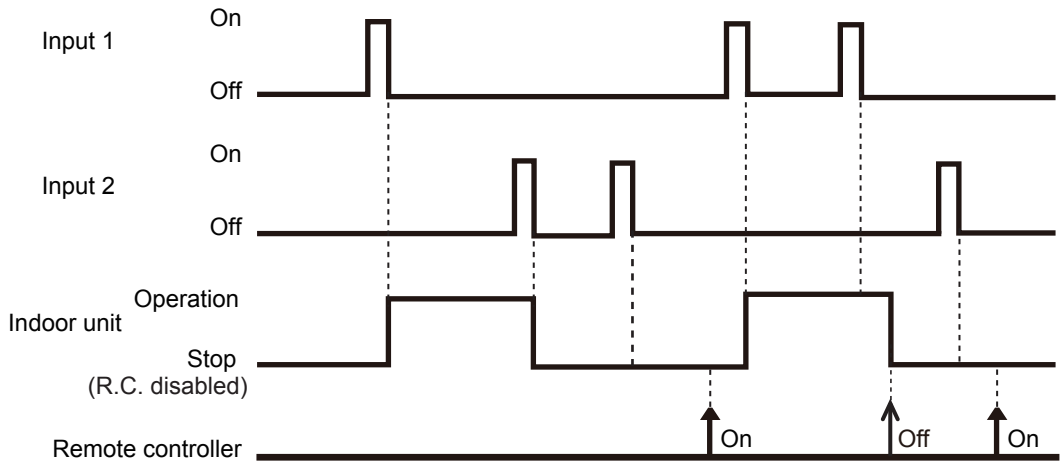
- In the case of "Edge" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-03	-	Input of indoor unit	Terminal	Off → On	Operation
				On → Off	Stop (R.C. disabled)
	60-00 / 1	External input and output PCB	Input 1	Off → On	Operation
				On → Off	Stop (R.C. disabled)



- In the case of "Pulse" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-03	60-00 / 1	External input and output PCB	Input 1	Pulse	Operation
			Input 2	Pulse	Stop (R.C. disabled)

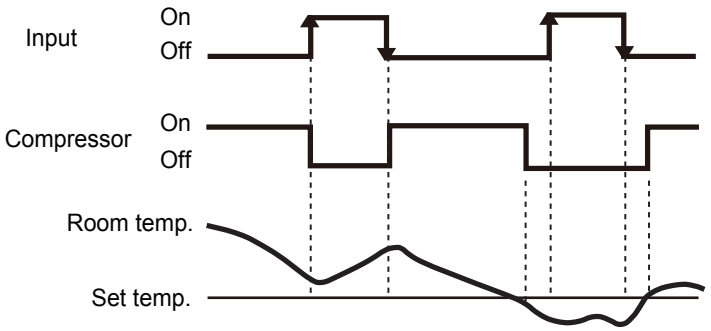


NOTES:

- When "Operation/Stop" mode 2 function is used with forming a remote controller group, connect the same equipment to each indoor unit within the group.

■ Forced thermostat off function

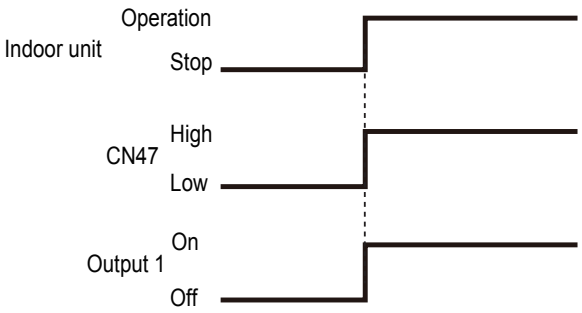
Function setting / Rotary SW of External input and output PCB	External input		Input signal	Command
60-00 / 2 60-09 / B 60-10 / C 60-11 / D	External input and output PCB	Input 1	Off →On	Thermostat off
			On → Off	Normal operation



■ Control output function

Function setting / Rotary SW of External input and output PCB	External output		Output signal	Command
60-00 / 1, 2	Output of indoor unit	CN47	Low → High	Operation
			High → Low	Stop
60-00 / 1 60-09 / B 60-10 / C 60-11 / D	External input and output PCB	Output 1	Off → On	Operation
			On → Off	Stop

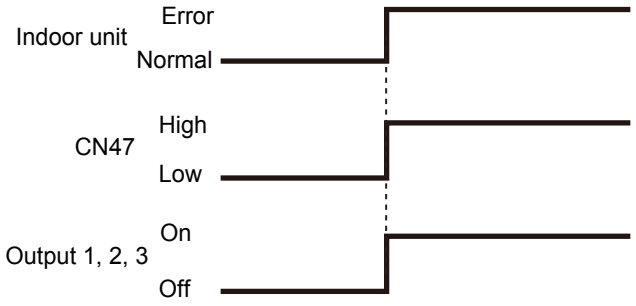
The output is low when the unit is stopped.



■ Error status

Function setting / Rotary SW of External input and output PCB	External output		Output signal	Command
60-09 / B	Output of indoor unit	CN47	Low → High	Error
			High → Low	Normal
60-00 / 2	External input and output PCB	Output 1	Off → On	Error
			On → Off	Normal
60-00 / 1 60-10 / C		Output 2	Off → On	Error
			On → Off	Normal
60-11 / D		Output 3	Off → On	Error
			On → Off	Normal

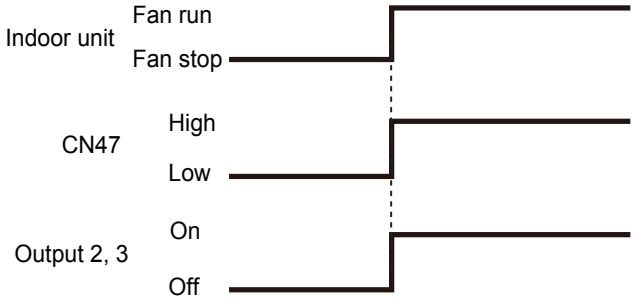
The output is ON when an error is generated for the indoor unit.



■ Indoor unit fan operation status

Function setting / Rotary SW of External input and output PCB	External output		Output signal	Command
60-10 / C	Output of indoor unit	CN47	Low → High	Fan run
			High → Low	Fan stop
60-00 / 2 60-09 / B 60-11 / D	External input and output PCB	Output 2	Off → On	Fan run
			On → Off	Fan stop
60-00 / 1		Output 3	Off → On	Fan run
			On → Off	Fan stop

Output signal	Condition
On Low → High	The indoor unit fan is operating.
Off High → Low	The fan is stopped or during cold air prevention. During thermostat off when in dry mode operation.



■ External heater output

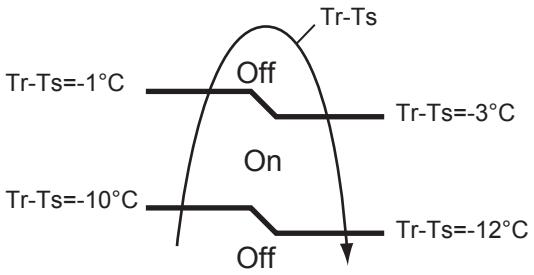
Function setting /	Rotary SW of External input and output PCB	External output		Output signal	Command
60-11 / D		Output of indoor unit	CN47	Low → High	Heater on
				High → Low	Heater off
60-00 / 2 60-09 / B 60-10 / C		External input and output PCB	Output 3	Off → On	Heater on
				On → Off	Heater off

Output signal	Condition
Low → High Off → On	Heater turns on as shown in diagram of heating temperature
High → Low On → Off	Heater turns off as shown in diagram of heating temperature • Other than Heating mode • Error occurred • Forced thermo off • Fan stop protection

Specifications of the signal output performance are as shown as follows:

Example: When set temperature (Ts) is set at 22 °C;

- And room temperature (Tr) increase above 12 °C, signal output is on.
- And Tr increase above 21 °C, signal output is off.
- And Tr decrease below 19 °C, signal output is on.
- And Tr decrease below 10 °C, signal output is off.



The output also turns off in defrost operation.

3-4. BUZZER SOUND

Hearing feeling improvement of the buzzer sound function

1. Change the buzzer sound

   The buzzer sound is changed based on "ISO24500, JIS-S-0013" in consideration for the accessibility of the consumers.

- Sound frequency

Current model (Before)	New model (After)
4kHz	2kHz

- Sound way

Operation	Sound condition	Sound pattern	
		Current model (Before)	New model (After)
ON	Turned on from wireless remote	0.08 ON / 0.08 OFF / 0.28 ON	0.1 ON
Receive	Setting change from wireless remote	0.06 ON / 0.06 OFF / 0.06 ON	0.1 ON
Base point	Louver reach the high or low limit	No	0.06 ON / 0.06 OFF / 0.06 ON
OFF	Turned off from wireless remote	0.28 ON / 0.08 OFF / 0.08 ON	0.5 ON
No effect	Prohibit function	0.06 ON / 0.06 OFF / 0.06 ON / 0.06 OFF / 0.06 ON / 0.06 OFF / 0.06 ON / 0.06 OFF / 0.06 ON	0.1 ON / 0.1 OFF / 0.5 ON

*The following sound is not changed

Function setting

Erase the error history

3-5. SEPARATION METHOD

It is possible to install the indoor unit through narrow openings by separating the heat exchanger unit and fan unit.
The separation method is as follows;

1. Remove parts (1) and (2).
   (1) Control box cover
   (2) Connection plates

2. Disconnect the wiers(3).
   - Pipe thermistor wire

<For products with built-in drain pump>

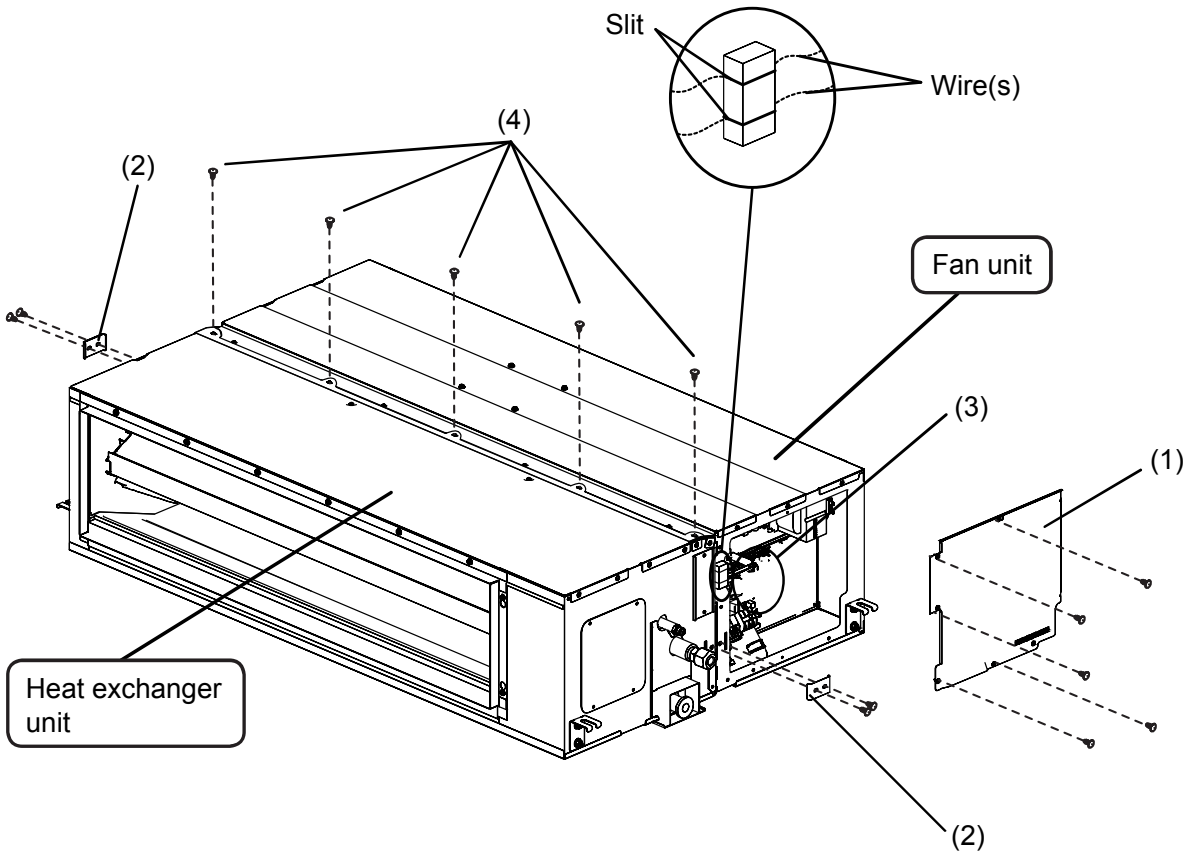
-Drain pump wire
-Float SW wire

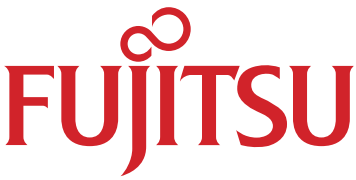
3. Remove the screws (4).
4. Separate the heat exchanger unit and fan unit.

To attach the units again, reverse the instructions above.

⚠ CAUTION

Do not damage the wires.





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