SPLIT TYPE
ROOM AIR CONDITIONER

WALL MOUNTED type
INVERTER

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	AS*G30LMTA	AO*G30LMTA
	AS*G36LMTA	AO*G36LMTA
	#RSG30LMTA	#ROG30LMTA
	#RSG36LMTA	#ROG36LMTA

FUJITSU GENERAL LIMITED

CONTENTS

1. DESCRIPTION OF EACH CONTROL OPERATION

2. TROUBLE SHOOTING

3. APPENDING DATA

WALL MOUNTED type INVERTER

1 . DESCRIPTION OF EACH CONTROL OPERATION

1. COOLING OPERATION

1-1 COOLING CAPACITY CONTROL

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

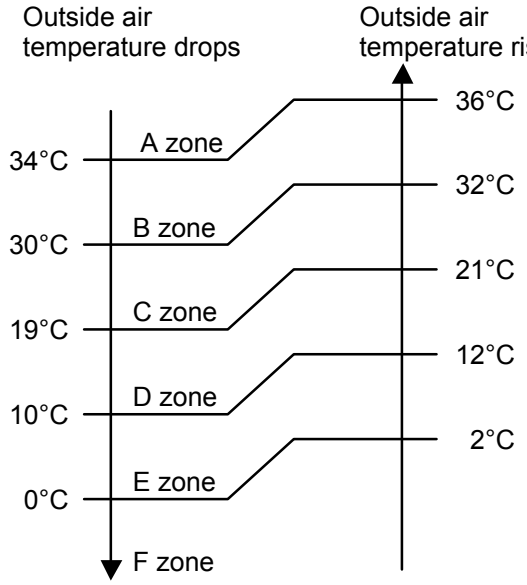
* If the room temperature is 1.0°C lower than a set temperature, the compressor will be stopped.

* When the room temperature is between +6.0°C to -1.0°C of the setting temperature, the compressor frequency is controlled within the range shown in Table1. However, the maximum frequency is limited in the range shown in Figure1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor Frequency Range)

minimum frequency	maximum frequency I
14rps	72rps

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



	Hi	Me	Lo	Quiet
A zone	72rps	50rps	37rps	20rps
B zone	72rps	50rps	37rps	20rps
C zone	56rps	42rps	32rps	20rps
D zone	42rps	37rps	27rps	17rps
E zone	42rps	37rps	27rps	17rps
F zone	42rps	37rps	27rps	17rps

2. HEATING OPERATION

2-1 HEATING CAPACITY CONTROL

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

* If the room temperature is lower by 6.0°C than a set temperature, the compressor operation frequency will attain to maximum performance.
* If the room temperature is 1.0°C higher 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
16rps	90rps

3. DRY OPERATION

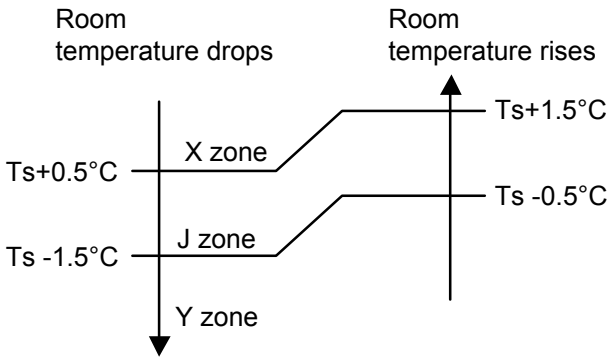
3-1 INDOOR UNIT CONTROL

The compressor rotation frequency shall change according to the temperature, set temperature, and room temperature variation which the room temperature sensor of the indoor unit body has detected as shown in the Table3.

(Table3 : Compressor frequency)

	Operating frequency
X zone	20rps
J zone	17rps
Y zone	0rps

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



4. 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 1.0°C 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.

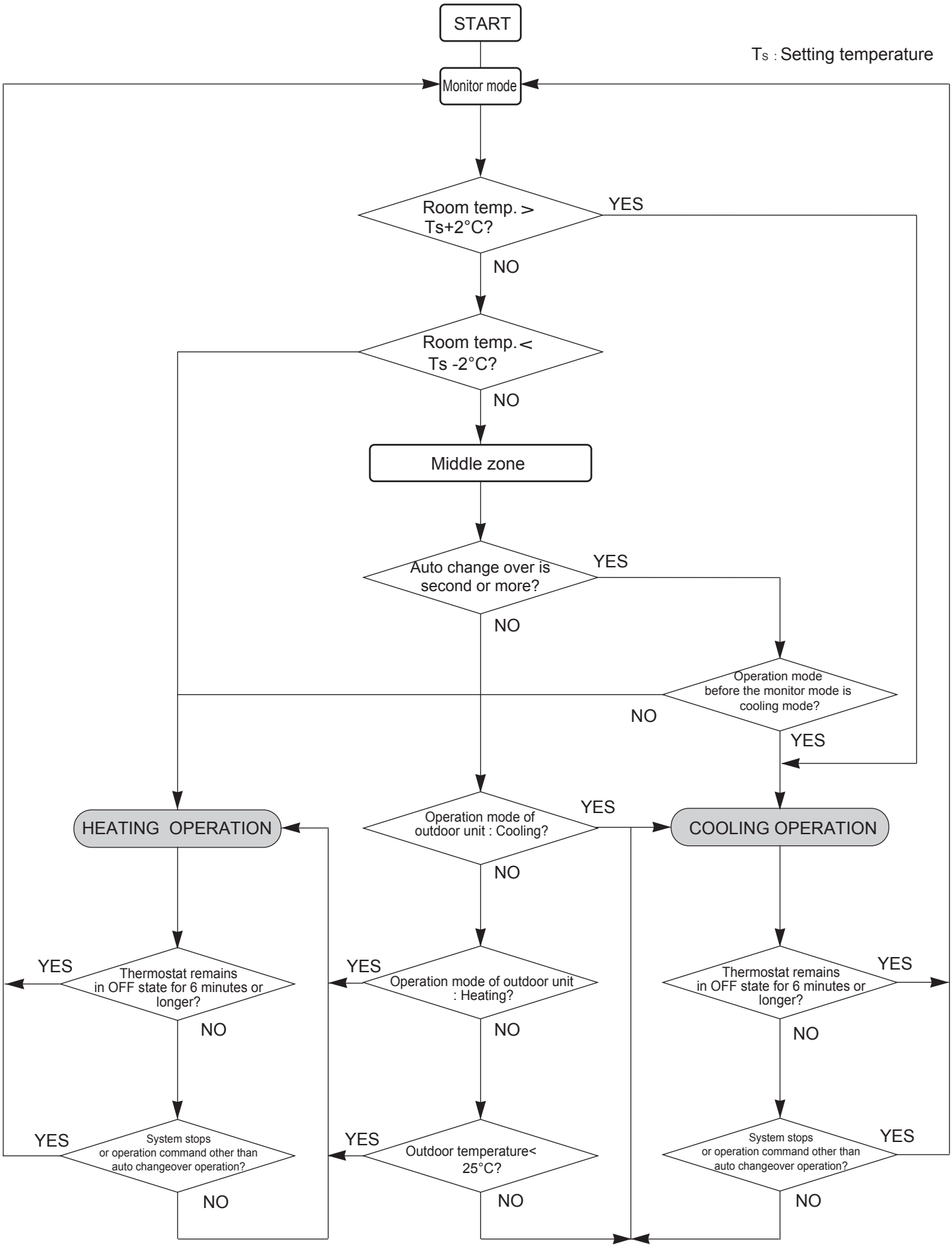
(Fig.3 : Outdoor temperature zone selection)

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



5. INDOOR FAN CONTROL

1. Fan speed

(Table4 : Indoor Fan Speed)

Operation mode	Air flow mode	Speed (rpm)
Heating	Powerful	1520
	Hi	1370
	Me+	1260
	Me	1150
	Lo	950
	Quiet	780
	Cool air prevention	600
	S-Lo	540
Cooling/ Fan	Powerful	1520
	Hi	1370
	Me	1150
	Lo	950
	Quiet	780
	S-Lo	540
Dry		X zone: 780 J zone: 680

2. FAN OPERATION

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

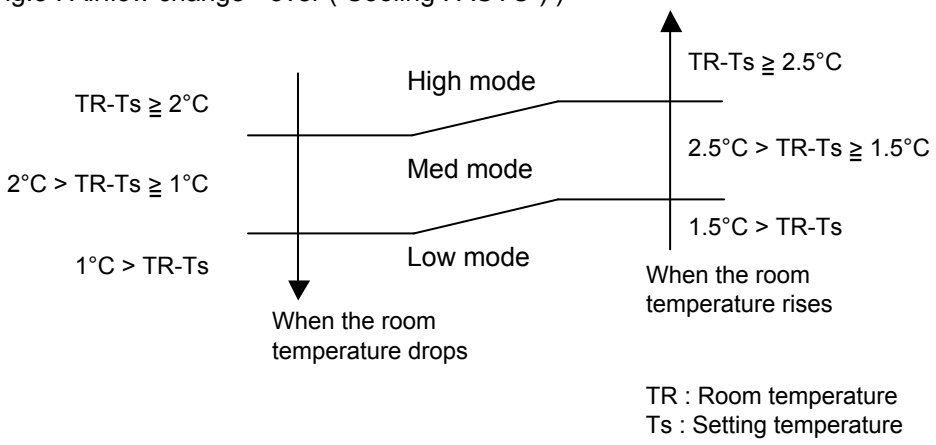
When Fan mode is set at [AUTO], it operates on [MED] Fan Speed.

3. COOLING OPERATION

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure3.

On the other hand, if switched in [HIGH]～[QUIET], the indoor motor will run at a constant airflow of [COOL] operation modes QUIET, LOW, MED, HIGH, as shown in Table4.

(Fig.3 : Airflow change - over (Cooling : AUTO))



4. DRY OPERATION

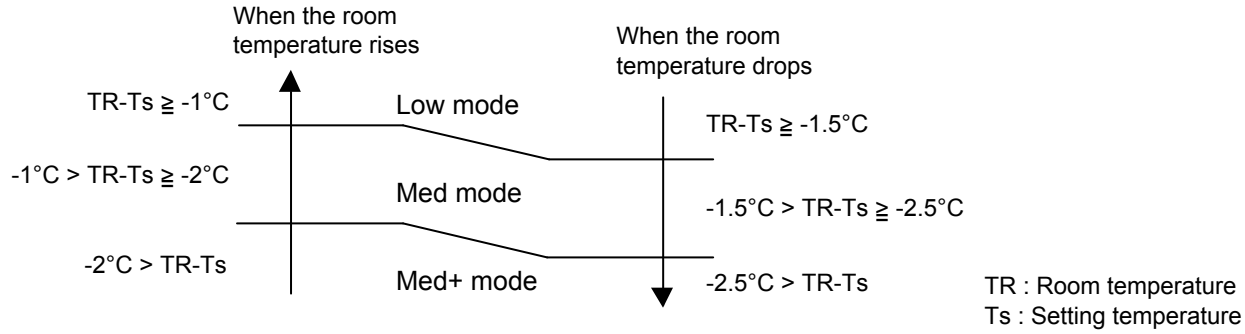
Refer to the Table4.

During the dry mode operation, the fan speed setting can not be changed.

5. HEATING OPERATION

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure4.
On the other hand, if switched in [HIGH] ~ [QUIET], the indoor motor will run at a constant airflow of [HEAT] operation modes QUIET, LOW, MED, HIGH, as shown in Table4.

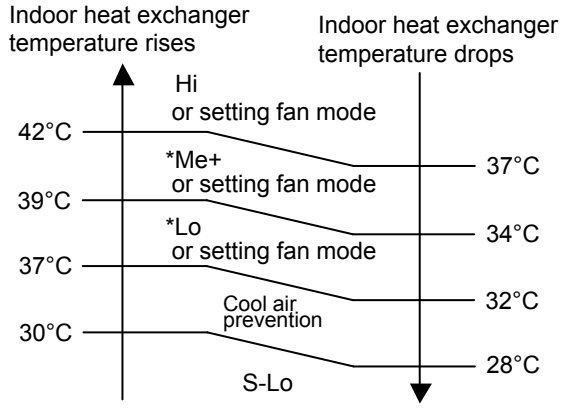
(Fig.4 : Airflow change - over (Heating : AUTO))



6. COOL AIR PREVENTION CONTROL (Heating mode)

The maximum value of the indoor fan speed is set as shown in Figure5, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

(Fig.5 : Cool Air Prevention Control)

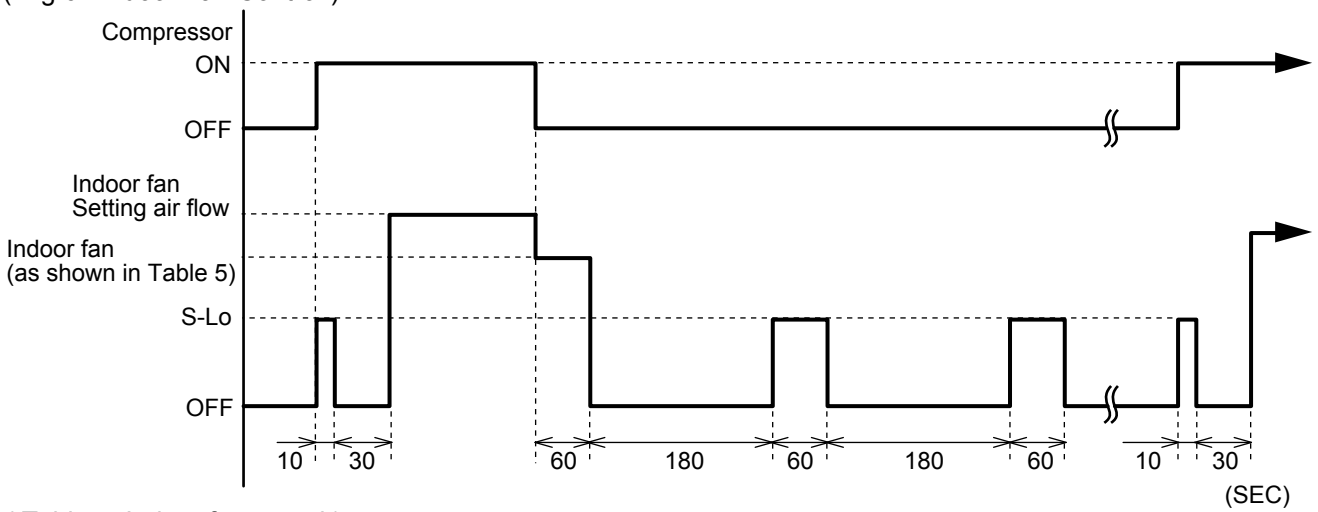


*Lower speed is selected.

7. MOISTURE RETURN PREVENTION CONTROL (Cooling mode& Dry mode)

Switch the airflow [AUTO] at cooling mode, and the indoor fan motor will run as shown in Figure6.

(Fig.6 : Indoor Fan Control)



(Table5 : Indoor fan speed)

	Dry			Cooling
	X zone	J zone	Y zone	
30,36LMTA	780rpm	680rpm	680rpm	780rpm

6. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

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

2. Fan Speed

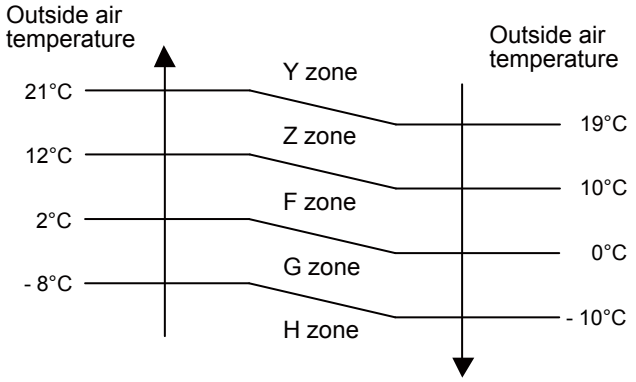
(Table 7 : Outdoor fan speed) (rpm)

	Zone ※	Cooling	Dry	Heating
30LMTA	Y	850/ 800/ 620/ 500/ 400	550/ 450	900/ 850/ 800/ 620/ 550/ 450
	Z	850/ 800/ 620/ 500/ 400	550/ 450	
	F	500/ 320/ 230	500/ 320/ 230	
	G	270/ 230/ 200	270/ 230/ 200	
	H	240/ 220/ 200	240/ 220/ 200	

	Zone ※	Cooling	Dry	Heating
36LMTA	Y	900/ 800/ 620/ 500/ 400	550/ 450	900/ 800/ 620/ 550/ 450
	Z	900/ 800/ 620/ 500/ 400	550/ 450	
	F	500/ 320/ 230	500/ 320/ 230	
	G	270/ 230/ 200	270/ 230/ 200	
	H	240/ 220/ 200	240/ 220/ 200	

※ Refer to Fig. 7

(Fig.7 : Outside air temperature zone selection)



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

* After the defrost control is operated on the heating mode, the fan speed keeps at the higher speed as table 9 without relating to the compressor frequency.

(Table 9 : Outdoor fan speed after the defrost)

30,36LMTA	900rpm

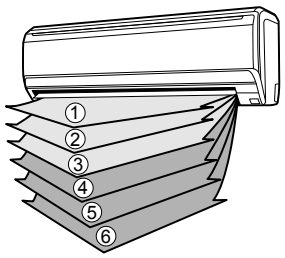
7. LOUVER CONTROL

1. VERTICAL LOUVER CONTROL

(Function Range)

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

① ⇄ ② ⇄ ③ ⇄ ④ ⇄ ⑤ ⇄ ⑥



Types of Airflow Direction Setting:

①,②,③,④,⑤,⑥ : During Heating/ Cooling/ Dry modes

The Remote Controller's display does not change.

- Use the air direction adjustments within the ranges shown above.
- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.

During Cooling / Dry mode : Horizontal flow ①
During Heating mode : Downward flow ⑤

when the Server room setting is activate,
the direction is set to ③,
2wire Remote controller : ①~ ④

- During AUTO mode operation, for the first a few minutes after beginning operation, airflow will be horizontal ① ; the air direction cannot be adjusted during this period.

  The airflow direction setting will temporarily become ① when the temperature of the airflow is low at the start of the Heating mode.

- After beginning of AUTO/HEAT mode operated and automatic defrosting operation time, the air flow will be horizontal ① .
  However, the Airflow Direction cannot be adjusted at beginning AUTO operation mode.

2. HORIZONTAL LOUVER CONTROL

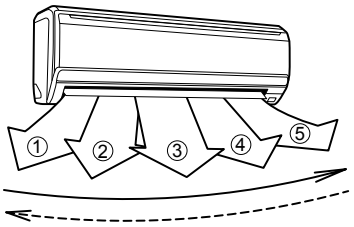
(Function Range)

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

Cooling / Heating / Dry mode / Fan mode

① ⇄ ② ⇄ ③ ⇄ ④ ⇄ ⑤

The Remote Controller's display does not change.



3. SWING OPERATION

To select Vertical Airflow Swing Operation

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

(Swinging Range)

Cooling mode / Dry mode / Fan mode(①～③) : ① ⇔ ④
Heating mode / Fan mode(④～⑥) : ③ ⇔ ⑥

when the Server room setting is activate,
the direction is set to ① ⇔ ⑥

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

To select Horizontal Airflow Swing Operation

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

(Swinging Range)

All mode : ① ⇔ ⑤

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

To select Vertical and Horizontal Airflow Swing Operation

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

8. COMPRESSOR CONTROL

1. OPERATION FREQUENCY RANGE

The operation frequency of the compressor is different based on the operation mode as shown in Table 10.

(Table 10 : Compressor Operation Frequency Range)

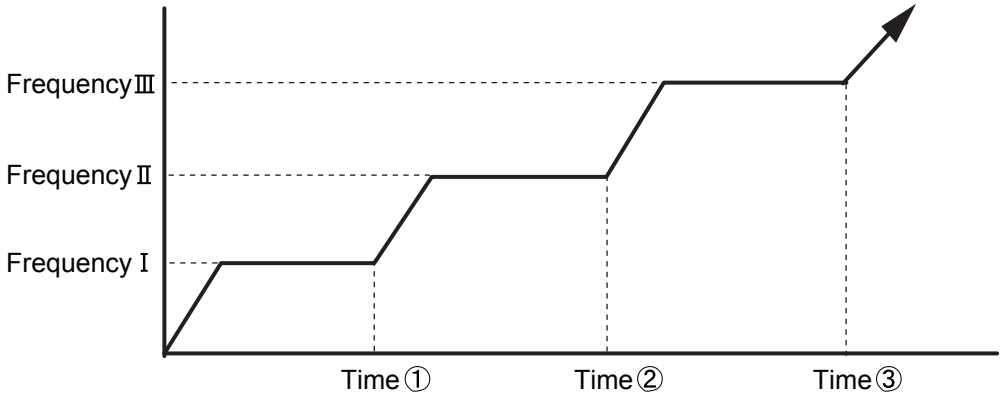
Cooling/ Dry /Heating	
Min	Max
16rps	90rps

2. OPERATION FREQUENCY CONTROL AT START UP

The compressor frequency soon after the start-up is controlled as shown in Fig.8.

(Fig.8 : Compressor Control at Start-up)

< Normal start-up >



1. Normal

(Frequency)

Frequency Ⅰ	Frequency Ⅱ	Frequency Ⅲ
30rps	47rps	60rps

(Time)

Time ①	Time ②	Time ③
60sec	120sec	180sec

Normal operation

* Cooling and dry mode.
* Below 3 hours from the compressor stop and the compressor thermistor ≥ 32˚C in heating mode.
* After defrost operation.

2. Special

(Frequency)

Frequency Ⅰ	Frequency Ⅱ	Frequency Ⅲ
30rps	47rps	60rps

(Time)

Time ①	Time ②	Time ③
60sec	180sec	240sec

Special operation

* Other than normal operation condition.
* First turn on.

9. TIMER OPEARTION CONTROL

9-1 WIRELESS REMOTE CONTROLLER

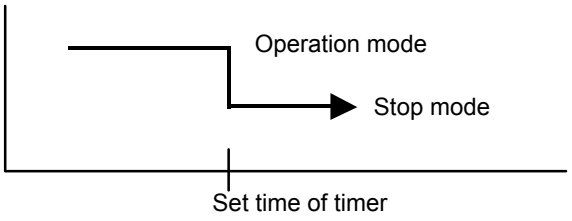
The table12 shows the available timer setting based on the product model.

(Table 12 : Timer Setting)

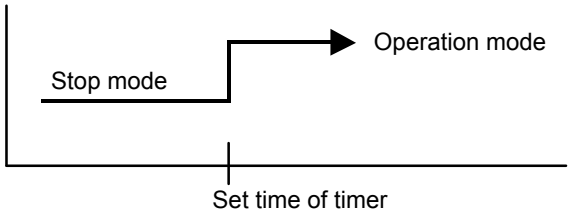
ON/OFF TIMER	PROGRAM TIMER	SLEEP TIMER	WEEKLY TIMER
○	○	○	○

1. ON TIMER/ OFF TIMER

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

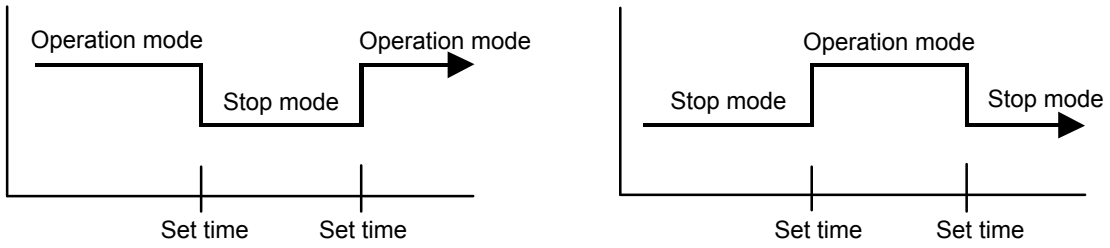


・ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. PROGRAM TIMER

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



・Operation will start from the timer setting (either OFF timer or ON timer) whichever is closest to the clock's current timer setting.
The order of operations is indicated by the arrow in the remote control unit's display.

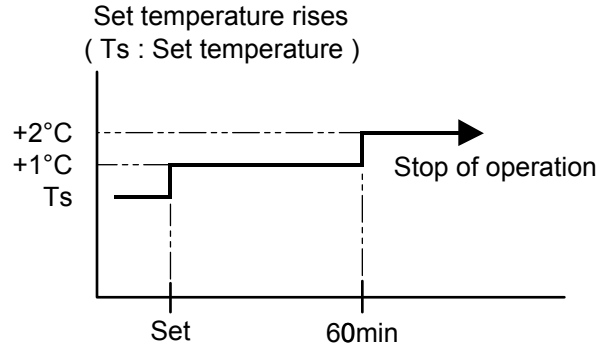
・SLEEP timer operation cannot be combined with ON timer operation.

3. SLEEP TIMER

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

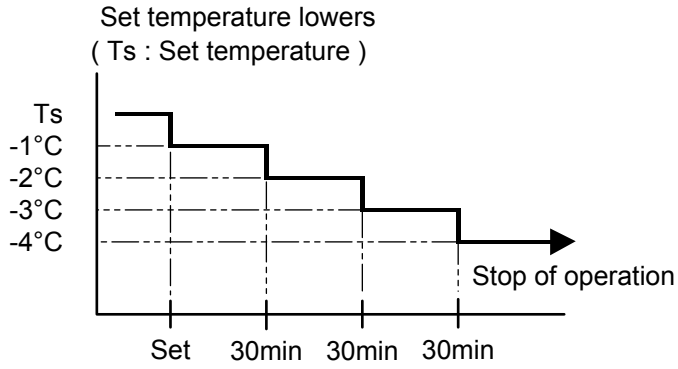
In the cooling operation mode

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



In the heating operation mode

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



4. WEEKLY TIMER

ON and OFF timer can be combined, and up to 4 reservations per day and 28 reservations per week.
Before setting the program, please set the week and time of the air conditioner first.
If the week and time are not set, the weekly timer will not operate correctly at the set time.

9-2 WIRED REMOTE CONTROLLER (OPTION)

The table13 shows the available timer setting based on the product model.

(Table13 : Timer Setting)

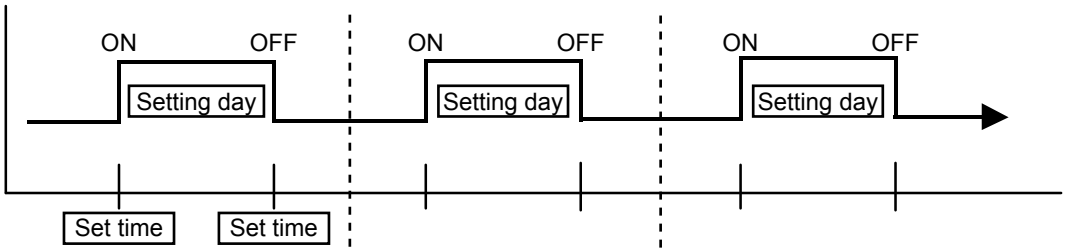
ON TIMER / OFF TIMER	WEEKLY TIMER	DAY OFF
○	○	○

1. ON TIMER / OFF TIMER

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

2. WEEKLY TIMER

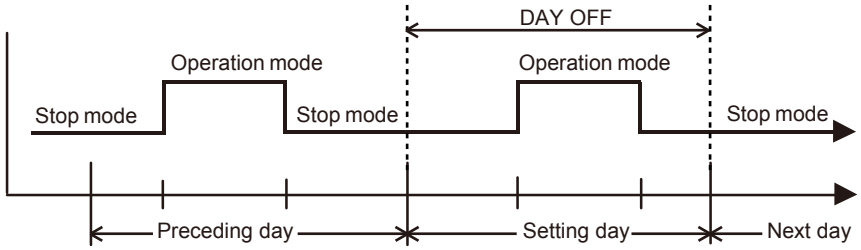
This timer function can set operation times of the each day of the week.
All days can be set together,the weekly timer can be used to repeat the timer setting for all of the days.



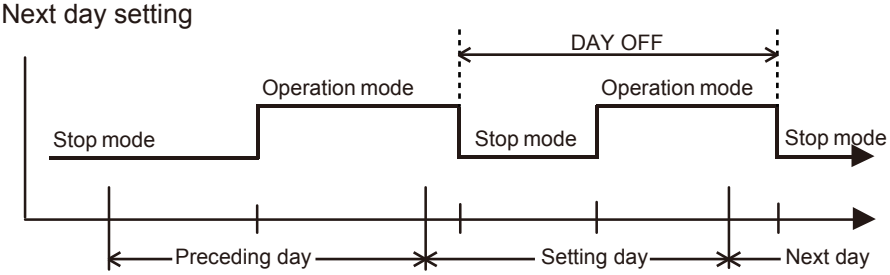
3. DAY OFF setting

- The DAY OFF setting is only available for days for which weekly settings already exist.
- If the operating time carries over to the next day (during a next day setting), the effective DAY OFF range will be set as shown below.

- Normal



- Next day setting



- The DAY OFF setting can only be set one time. The DAY OFF setting is cancelled automatically after the set day has passed.

10. ELECTRONIC EXPANSION VALVE CONTROL

The most proper opening of the electronic expansion valve is calculated and controlled under the present operating condition based on the Table14.
The compressor frequency, the temperatures detected by the discharge temperature sensor, the indoor heat exchanger sensor, the outdoor heat exchanger sensor,
and the outdoor temperature sensor.

(Table14 : The pulse range of the electronic expansion valve control)

Operation mode	Pulse range
Cooling / Dry mode	between 53 to 480 pulses.
Heating mode	between 40 to 480 pulses.

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

11. TEST OPERATION CONTROL

Wirless remoe controller
The outdoor unit, may not operate, depending on the room temperature.
In this case, keep on pressing the MANUAL AUTO button of the indoor unit for more than 10 seconds.
The operation indicator lamp and timer indicator lamp will begin to flash simultaneously
during cooling test run. Then, heating test run will begin in about 3 minutes when HEAT is selected
by the remote control operation. To end test operation, press the remote controller START/STOP button.

The test operation procedure by using optional remote controllers, refer to the operatin manual of each remote controllers.

* This function is not available when the server room control is active

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

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

13. FOUR-WAY VALVE EXTENSION SELECT

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

14. AUTO RESTART

When the power was interrupted by a power failure, etc. during operation, the operation contents at that time are memorized and when power is recovered, operation is automatically started with the memorized operation contents.
When the power is interrupted and recovered during timer operation, since the timer operation time is shifted by the time the power was interrupted, an alarm is given by blinking (7 sec ON/2 sec OFF) the indoor unit body timer lamp.

[Operation contents memorized when the power is interrupted]

- Operation mode
- Set temperature
- Set air flow
- Timer mode and timer time
- Set air flow Direction
- Swing
- ECONOMY operation
- 10°C HEAT operation
- Human sensor setting
- Low noise operation

15. MANUAL AUTO OPERATION (Indoor unit body operation)

If MANUAL AUTO Button is set, the operation is controlled as shown in Table15.
If the remote control is lost or battery power dissipated, this function will work without the remote control.

(Table15)

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

* This function is not available when the server room control is active

16. FORCED COOLING OPERATION

If cooling operation is set, the operation is controlled as shown in Table16.

(Table16)

	Forced cooling operation
OPERATION MODE	Cooling
FAN CONT. MODE	Hi
TIMER MODE	-
SETTING TEMP.	Room Temp is not controlled
SETTING LOUVER	Initial : Horizontal (It is changed follow as setting of remote controller)
SWING	OFF

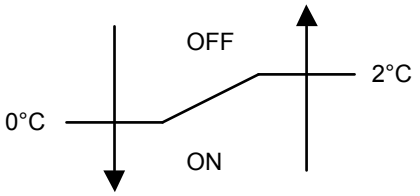
Forced cooling operation is started when pressing MANUAL AUTO button for 10 seconds or more.
During the forced cooling operation, it operates regardless of room temperature sensor.
Operation LED and timer LED blink during the forced cooling operation. They blink for 1 second ON and 1 second OFF on both operation LED and timer LED (same as test operation).
Forced cooling operation is released after 60 minutes of starting operation.
The FORCED COOLING OPERATION will start as shown in Table16.

* This function is not available when the server room control is active

17. COMPRESSOR PREHEATING

- When the outdoor heat exchanger temperature is lower than 0°C and the heating operation has been stopped for 0 minutes, power is applied to the compressor and the compressor is heated.
  (By heating the compressor, warm air is quickly discharged when operation is started.)
  When operation was started and when the outdoor heat exchanger temperature rises to 2°C or greater, preheating is ended.

(Fig.10:Compressor Preheating)



- When the outdoor temperature is lower than 20°C and the all operation mode has been stopped for 30 minutes, power is applied to the compressor and the compressor is heated.
  (By heating the compressor, warm air is quickly discharged when operation is started.)
  When operation was started and when the outdoor temperature rises to 26°C or greater, preheating is ended.

18. 10°C HEAT OPERATION

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

(Table17)

Mode	Heating
Setting temperature	10°C
Fan mode	AUTO

19. 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.

(Table18)

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

20. DEFROST OPERATION CONTROL

1. CONDITION OF STARTING THE DEFROST OPERATION

The defrost operation starts when the outdoor heat exchanger temperature sensor (Tn) detects the temperature lower than the values shown in Table19.

(Table 19 : Condition of starting Defrost Operation)

1ST time defrosting after starting operation	Compressor integrating operation time		
	Less than 22 min.	22 to 62 min.	More than 62 min.
	Does not operate	- 9°C	- 5°C

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

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

Integrating defrost (Constant monitoring)	Compressor integrating operation time		
	More than 240 min. (For long continuous operation)	More than 215 min. (For long continuous operation)	Less than 10min.*1 (For intermittent operation)
	- 3°C	- 5°C	OFF count of the compressor 40 times.

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

2. CONDITION OF THE DEFROST OPERATION COMPLETION

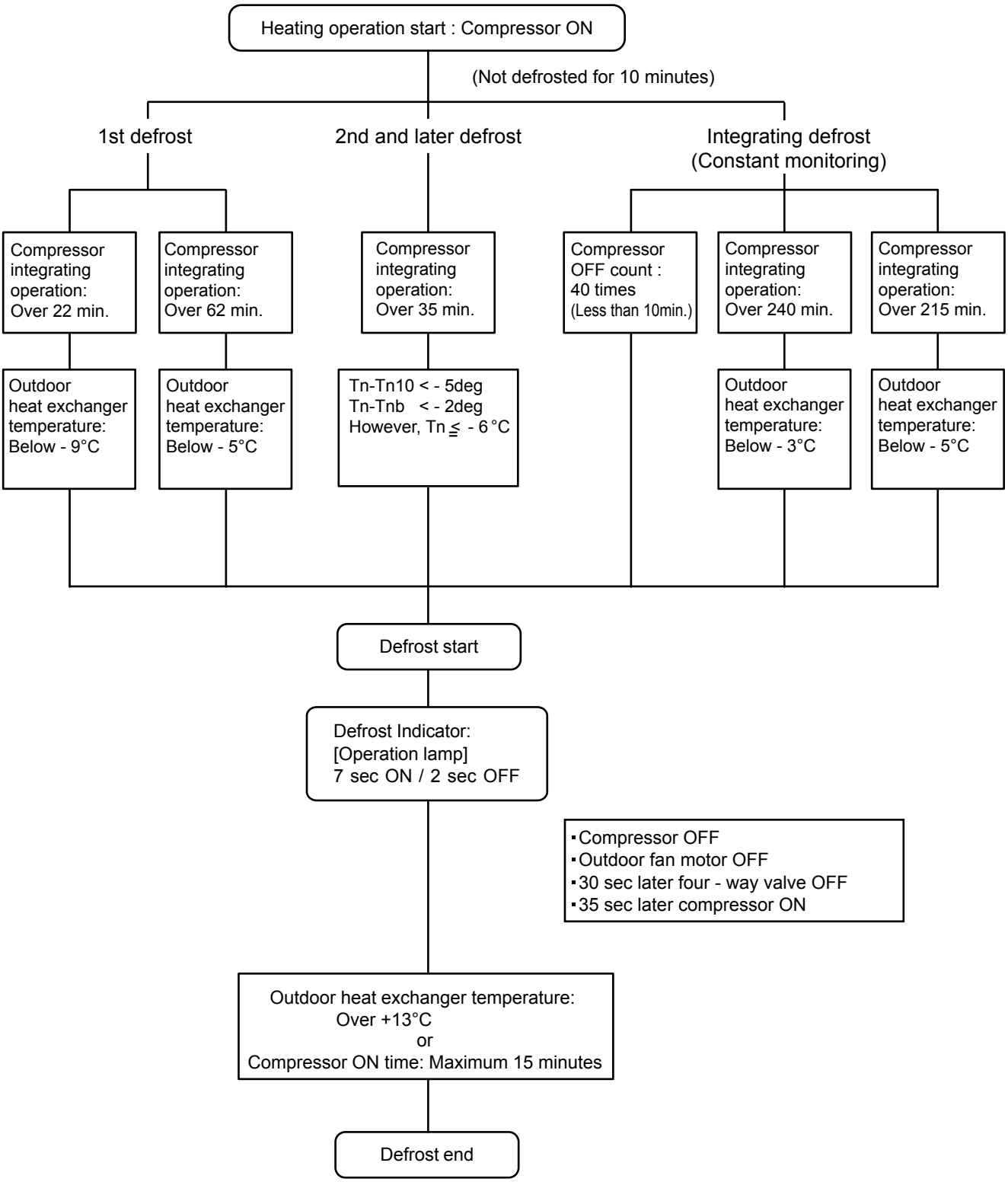
Defrost operation is released when the conditions become as shown in Table20.

(Table20 : Defrost Release Condition)

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

3. Defrost Flow Chart

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



21. 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.

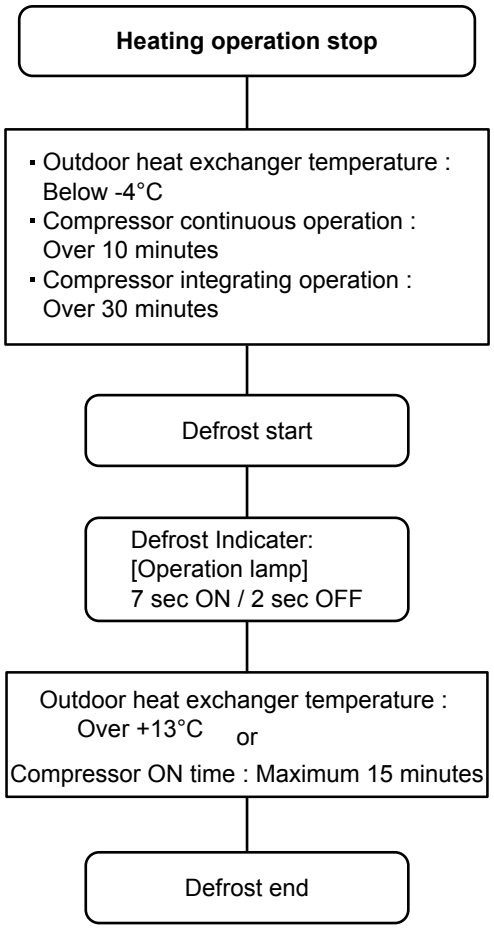
1. OFF DEFROST OPERATION CONDITION

In heating operation, the outdoor heat exchanger temperature is less than -4°C,
compressor continuous operation more than 10 minutes, and
compressor operation integrating time lasts for more than 30 minutes.

2. OFF DEFROST END CONDITION

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

OFF Defrost Flow Chart



22. VARIOUS PROTECTIONS

1. DISCHARGE GAS TEMPERATURE OVERRISE PREVENSION 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 20rps, and it continues to decrease the frequency for 20rps every 120 seconds until the temperature becoms lower than Temperature Ⅰ.
When the discharge temperature becomes lower than TemperatureⅡ, the control of the control of the compressor frequency is released.
When the discharge temperature becomes higher than TemperatureⅢ, the compressor is stopped and the indoor unit LED starts blinking.

(Table 21 : Discharge Temperature Over Rise Prevension Control / Release Temperature)

Temperature Ⅰ	TemperatureⅡ	TemperatureⅢ
104°C	101°C	110°C

2. CURRENT RELEASE CONTROL

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

(Table 22-1 : Current Release Operation Value / Release Value)

Model 30

[Heating]

TO (Control / Release)	
17°C	10.0A / 9.5A
12°C	11.5A / 11.0A
5°C	14.5A / 14.0A
	14.5A / 14.0A

[Cooling]

TO (Control / Release)	
50°C	9.0A / 8.5A
46°C	10.0A / 9.5A
40°C	12.5A / 12.0A
	14.5A / 14.0A

TO : Outdoor Temperature

Model 36

[Heating]

TO (Control / Release)	
17°C	10.0A / 9.5A
12°C	11.5A / 11.0A
5°C	16.0A / 15.5A
	18.0A / 17.5A

TO : Outdoor Temperature

[Cooling]

TO (Control / Release)	
50°C	9.0A / 8.5A
46°C	10.0A / 9.5A
40°C	13.0A / 12.5A
	16.5A / 16.0A

TO : 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 23 : Anti-freezing Protection Operation / Release Temperature)

Outdoor temperature	Temperature Ⅰ	TemperatureⅡ
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.

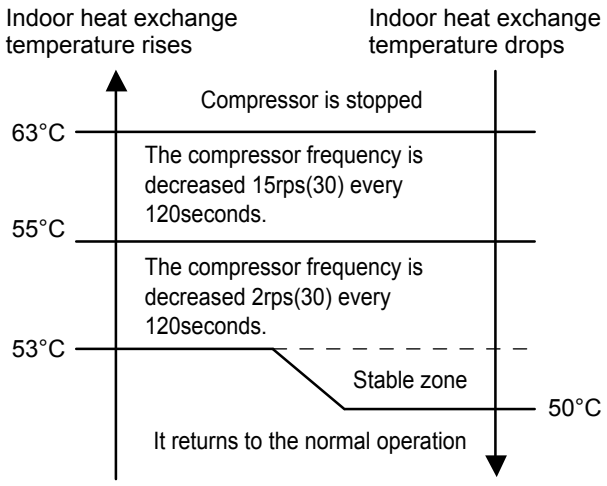
4. COOLING PRESSURE OVERRISE PROTECTION

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

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

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

[Control System]



6. COMPRESSOR TEMPERATURE PROTECTION

When the compressor temperature sensor detects higher than 108°C, the compressor is stopped.
The protection is released when the compressor temperature sensor detects 80°C after 3 minutes of compressor stop.

7. 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.

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 27 : Detail of Low Noise Operation)

Low Noise mode		Outdoor fan speed [rpm]	Compressor speed [rps]
Model 30	Cooling	620	32
	Heating	620	32
Model 36	Cooling	620	34
	Heating	620	34

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

24. HUMAN SENSOR (Energy Saving)

- **About the ENERGY SAVING Operation**

  If no one enters the room for approximately 20 minutes, the set temperature will be automatically controlled.
  (When someone comes back into the room, the human sensor will detect this, and automatically revert to the original settings.)

(Table 28)

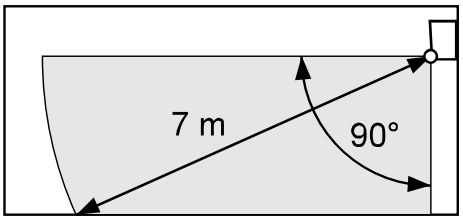
Operation mode	Operation details (if there is no one in the room for a while)
Cool / Dry	The set temperature will be increased by a maximum of approximately 2°C.
Heat	The set temperature will be decreased by a maximum of approximately 4°C.
Auto	This runs the ENERGY SAVING function automatically for the selected mode (Cooling/ Heating/ Drying)

* High limit : 30°C

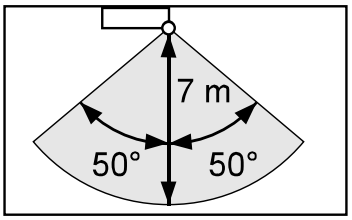
* Low limit : 16°C

Application range is follows.

Vertical angle 90°(Side view)



Horizontal angle 100°(Top view)



ENERGY SAVING function may not work when the room temperature is very different from the temperature defined in temperature setting, such as when immediately after starting the operation

About the HUMAN SENSOR

- Details about detection with the human sensor
  - The human sensor detects whether there are people in the room by looking for movement by people in the room.

25. POWERFUL OPERATION

The Powerful operation functions by pressing POWERFUL button on the remote controller.
The indoor unit & outdoor unit will operate at maximum power as shown in Table 18.

(Table 29)

	Powerful operation
COMPRESSOR FREQUENCY	Maximum
FAN CONT. MODE	Powerful
SETTING LOUVER	Cooling/ Dry : 3, Heating : 5

Release Condition is as follows.

[Cooling / Dry]

- Room tenperature ≦ Setting temperature - 0.5°C or Operation time has passed 20 minutes.

[Heating]

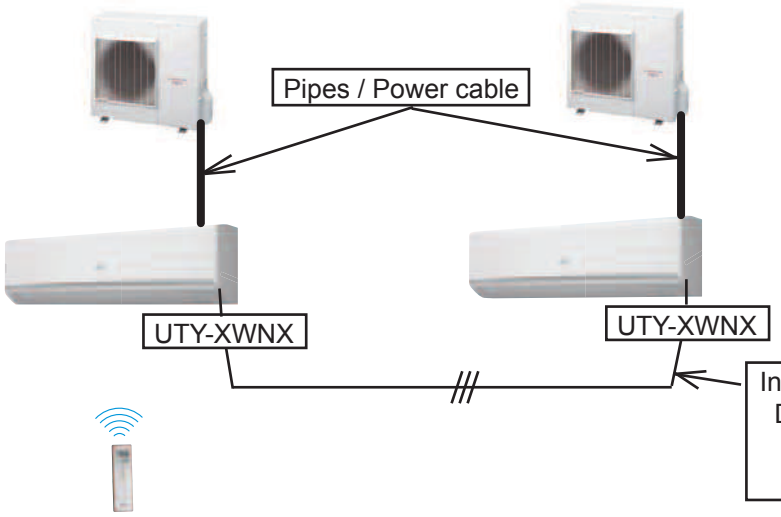
- Room tenperature ≧ Setting temperature +0.5°C or Operation time has passed 20 minutes.

26. SERVER ROOM CONTROL

Operation:

Cooling operation can be performed even in the low outdoor temperature and low humidity environment. In addition, the following interlock operation is possible by connecting two indoor units with a cable.

1. System configuration



Necessary items
- 30, 36LMTA: 2 systems
- UTY-XWNX: 2pcs
- Indoor unit communicatoin cable
- Wireless remote controller
  (Wired remote controller is not available)

2. Available Functions

- Alternative operation: 2 units operate alternately.
- Backup operation: In case one unit breaks down, the other unit starts operation automatically.
- Supporting operation: Both units operate simultaneously when the loaded capacity is not enough with one unit.

3. Controlling

The control specification (Compressor operation control, Outdoor unit FAN control, EEV control, Protection Function and abnormal deisplay) belongs to the original controlling specification of one system.

4. Operation specification

When Server room control is activated by changing the setting on function setting 96, this product maintains the room temperature constant by performing 3 types of operations automatically according to the room temperature conditions.

While this function is activated, contents of operation is fixed as follows:

Operation mode	Set temperature	Airflow mode
COOL	24 °C*	HIGH

*: Set temperature correction (±4 °C) is possible by switching the setting value on function setting 30.
The temperature correction has to be set with the same value on both indoor units.
(when the correction setting are not the same, the temperature controlling or the supporting operation might not work properly.)
For the setting details, refer to the technical manual.

5. Precautions & Restrictions

1) While performing Server room control, the following function cannnot be used.
   - Operation modes other than cooling
   - Airflow modes other than HIGH
   - POWERFUL mode
   - 10℃ HEAT operation
   - ECONOMY operation
   - On/Off timer, Program time, and Sleep timer
   - Weekly timer on the secondary unit
   - Human sensor function
   - Starting operation on the secondary unit
   - Temperature setting other than 24℃ *

     * Temperature correction is possible

2) For stopping the system operation, shutdown the power supply.
   *Stop operation by the Remote controller is impossible.

3) For canceling the server room control, refer to 9. Canceling procedure of Server room control.

4) The Pump down operation has to be performed by Pump down SW on the outdoor unit's PCB.
   *The forced operation by pushing MANUAL AUTO button is not available.

5) Error memory indication function is not available.

6) When the following setting needs to be changed, set the remote controller "Mode Cooling", and "High FAN mode"
   - Air flow direction (UP/Down,Right/Left, Swing)
   - Low noise mode
   - Clock adjust
   - Weekly timer

7) Procedure of when one of system needs a maintenace (repair / trouble shooting)
   1. Shutdown the system
   2. Disconnect the Indoor unit communication cable
   3. Turn ON the operable system
      *When the operable system is in operating, IU will show the Error 12 after system starting.
   4. Start the Maintenance.

Note: How to define the Primaly system and the Secondary system
Send the weekly timer setting signal from the wireless remote controller.
- The Primaly system can receive the signal.
  (IU reacts with beep sound " Pi " and the Operation LED blink.)
- The Secondary system cannot receive the signal
  (IU reacts with beep sound " Pi Pi----" and the 3 LEDs blink.)

6. External Input & Output function

The External Input & the External Output functios are available.
For the setting detail, refer to the technical manual

Input
- Operation / Stop*
- Forced Thermostat OFF*

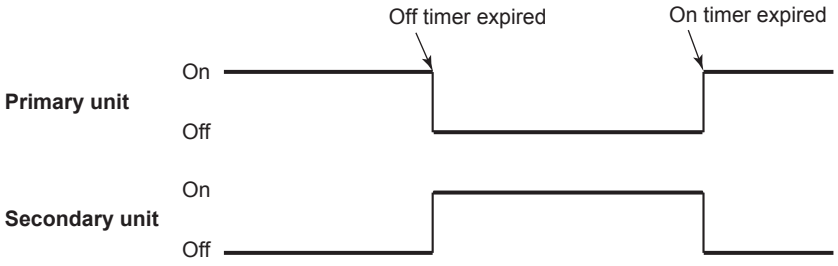
*Not available on the Secondary units

Output
- Operation / Stop
- Error status
- Indoor unit fan operation status
- Set point attainment status

7. Operation detail

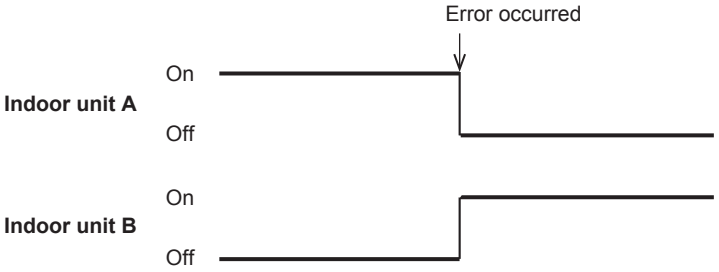
7-1 Alternative operation

Controls the units operations by using the weekly timer of the primary unit.
When the weekly timer is activated and the primary unit operation is turned off, the secondary unit starts operation simultaneously.
Also, when the weekly timer is activated and the primary unit operation is turned on, the secondary unit stops operation simultaneously.



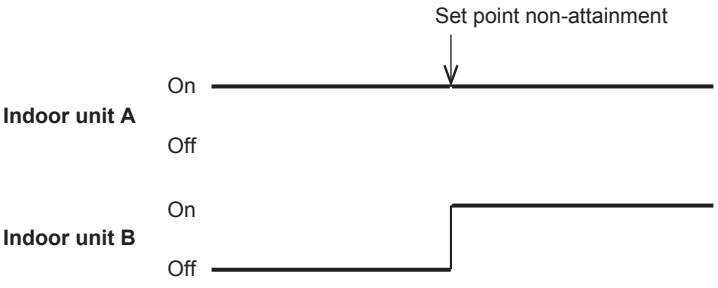
7-2 Backup operation

Regardless of the primary-secondary relation of the unit, if an error occurred on one unit, operation start indication is issued to another unit and the unit starts backup operation.

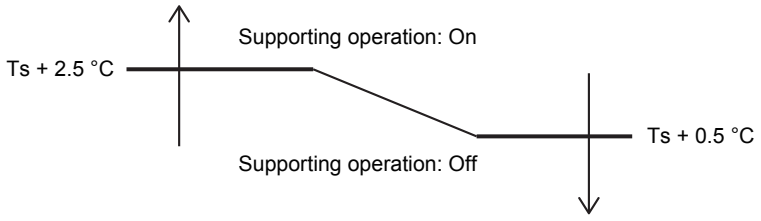


7-3 Supporting operation

When the room temperature does not reach to the set point after a certain period of time, regardless of the primary-secondary relation of the unit, operation start indication is issued to another unit and both indoor units perform air conditioning simultaneously.



*: Operaion is started even when the unit is stopped by the weekly timer.



8. Installation and Setting

Step 1. Install the system one by one (Refer to the Installation manual)

*Make sure that each system can operate in cooling by test operation.

Step 2. Install Option UTY-XWNX to each indoor unit (Refer to 8-1)

- Install UTY-XWNX (Terminal with connector)
- Change DIP switch setting of Indoor units Main PCB (2WIRE → 3WIRE)
- Install the Indoor unit communication cable

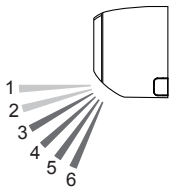
Step 5. Perform Initial setting (Refer to 8-2)

Step 6. Starting units operation (Refer to 8-3)

Step 7. Startting server room control function (Refer to 8-4)

Precautions

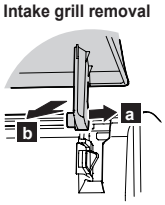
- Do not place any other electrical products or household belongings under the product. Condensation dripping from the product might get them wet, and may cause damage or malfunction to the property.
- In units installation facing each other, the vertical airflow direction louver on each indoor unit should be set at a position from 3 to 6.
  *If the louver position is other than 3 to 6, the temperature control might not work properly
- Do not connect any wired remote controller.



8-1 Install Option UTY-XWNX

8-1-1. Front panel, control box cover removal

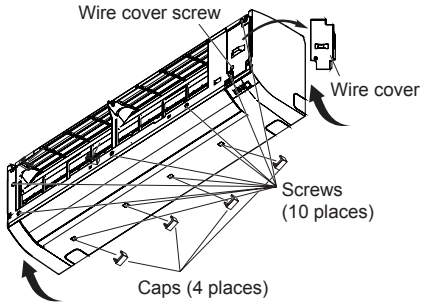
(1) Open the intake grille. While gently pressing the left and right mounting shafts of the intake grille outward “a”, remove the intake grille in the direction of the arrow “b”.



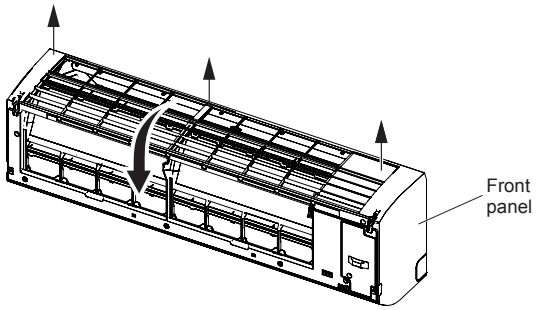
(2) Remove 4 caps.

(3) Remove wire cover screw, then remove the wire cover.

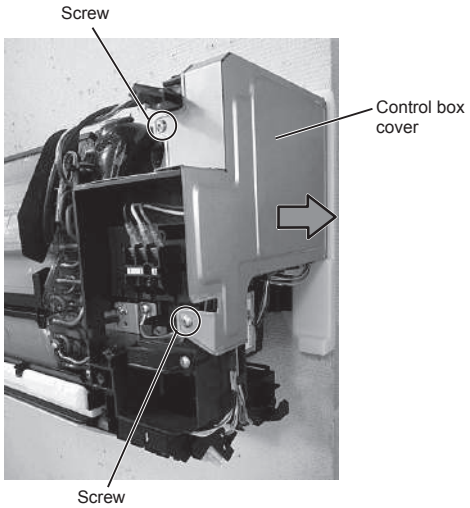
(4) Remove 10 screws.



(5) Pull the front panel forward raising the upper surface, to remove the front panel.



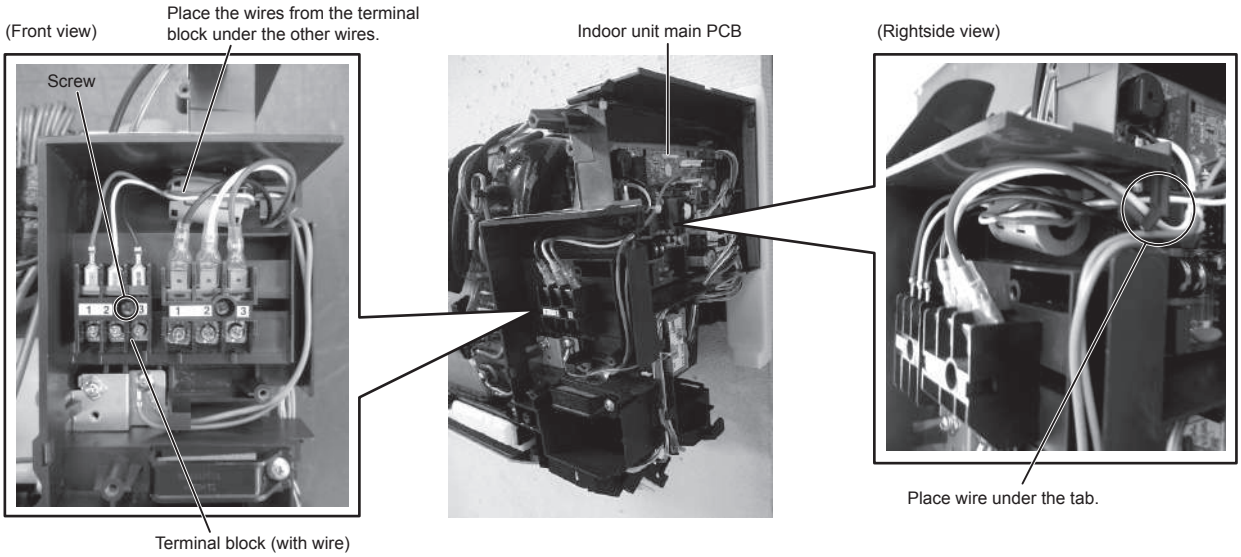
(6) Remove 2 screws, then remove the control box cover.



8-1-2. Install the terminal block

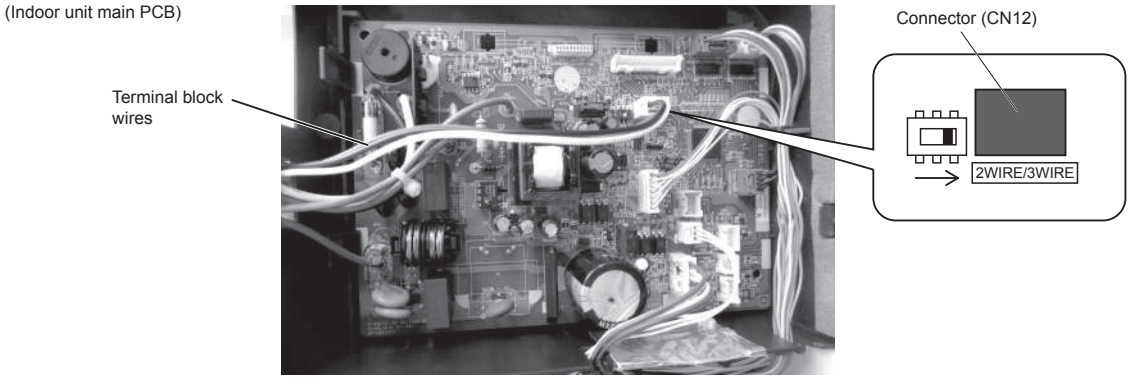
(1) Attach the terminal block to the indoor unit firmly with 1 screw.

(2) Place the wiring as per the figure.



(3) Connect the wires from the terminal block to the indoor unit main PCB by inserting to connector (CN12).

(4) Change the DIP switch setting as shown in the following photograph.



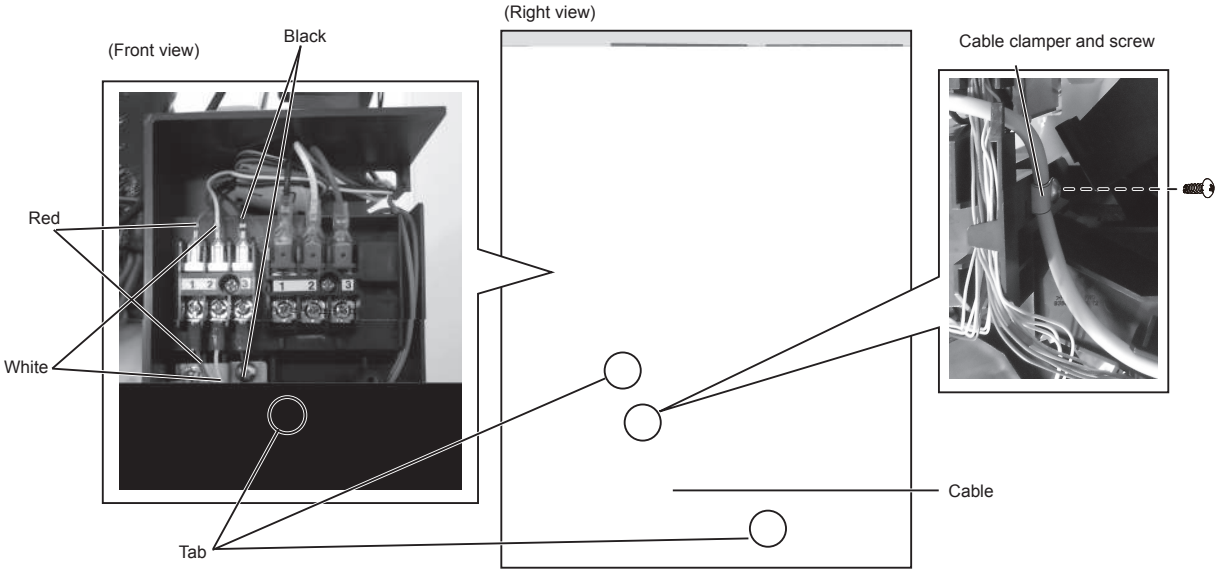
⚠ CAUTION
• Be careful not to damage the parts on the board. Otherwise, it will cause malfunction.
• Ensure that the connector is properly inserted. Otherwise, it may result in erroneous operation.

8-1-3. Connecting the cable

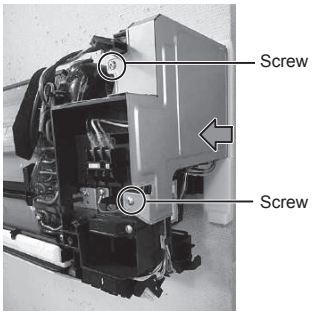
(1) Use the following cables (locally purchased) for this connection.

Cable size	Remarks
22AWG Sheathed PVC cable Polar 3 core	Use shielded cable in accordance with local rules for cable.

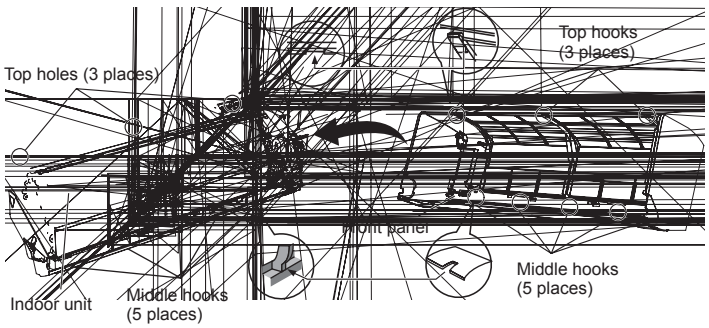
(2) Attach the cable to the terminal block.
Position the wires so that the number on the terminal match.
(3) Install the cable as shown in the photograph below.
Be sure to place the wiring under the tabs.
(4) Fix the cable with the cable clamper and screw as shown in the photograph mentioned above.



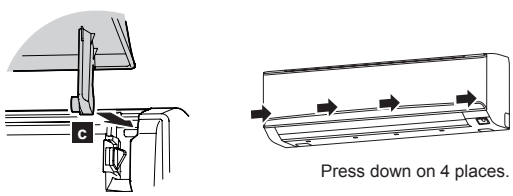
Reinstall by reversing the procedure in “8-1-1 Front panel, control box cover removal”
(1) Replace the control box cover (2 screws).



(2) Open a hole in the front panel for the remote controller cable to pass through.
* Choose from 4 knockout holes marked on the inside of the front panel.
(3) Replace the front cover.
First, insert the hook on the lower part of the front panel (5 places), then fit the hooks on the top (3 places).
(4) Replace the 10 screws.
(5) Replace the wire cover (1 screw).
(6) Replace the 4 caps.
(7) Replace the intake grille.



Intake grill installation



8-2 Function setting procedure

Before activating server room control, assignment of primary unit and secondary unit is required
Change the setting of function setting 96 as follows:

1. Turn on the power source of 2 indoor units.
2. Set one of the indoor unit as “Primary unit” (Setting value: 01) by function setting 96. (For contents of function setting 96, refer to the Technical manual)
   When performing the setting, operate the remote controller close to the signal receiver on the primary unit as possible so that the signal transmission is firmly received by the primary unit only.
3. Set the other unit as “Secondary unit” (Setting value: 02) by function setting 96.
   When performing the setting, operate the remote controller close to the signal receiver on the secondary unit as possible so that the signal transmission is firmly received by the secondary unit only.
4. Turn off the power supply of the 2 indoor units.

8-3 Starting units operation

After the setting change on function setting 96 is completed, do as follows:

1. After 30 seconds or more since the power source is turned off, turn on the power source of the secondary unit.
2. Turn on the power source of the primary unit.
3. Press the MANUAL AUTO button on the primary unit for more than 3 seconds.
   You will hear a short beep, and the primary unit starts operation.

NOTE: While performing these steps, error indications will be lit on the unit. Nevertheless, continue the procedure.

8-4 Starting Server room control

Set the weekly timer on the primary unit.
Example of setting: Monday_0:00_ON - Thursday_12:00_OFF
Primaly unit: Operation start on Monday_0:00 --> Operation stop on Thursday_12:00
Secondary unit: Operation start on Thursday_12:00 --> Operation stop on Monday_0:00
(For the weekly timer setting procedure, refer to the OPERATION MANUAL)

Server room control is activated, and the unit will start the alternative operation.

NOTE: If the alternative operation does not start or error indications on the unit are still lit, reconfirm whether the settings on function setting 96 are set correctly, and perform the setup procedures from the beginning.
As for the display pattern of the error indications of the indoor unit, refer to 2-1 ERROR DISPLAY.

9 Canceling procedure of Server room control

Step 1. Turn OFF both system
Step 2. Disconeect the indoor unit communication cable
Step 3. Turn ON both system
Step 4. Change the Fuction setting 96 to 00 both system
*When the Indoor units start the operation, push MANUAL AUTO button more than 3 sec.
After the Indoor units stopped, apply the function setting.
The Indoor units shows Error 12, until the new setting is completed.
Step 5. Turn OFF both system.
*When the Indoor unit shows Error, repeat from the step 3.

WALL MOUNTED type
INVERTER

2 . TROUBLE SHOOTING

2-1 ERROR DISPLAY

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

Please refer the flashing pattern as follows.
Indoor Unit : 30,36LMTA
The OPERATION, TIMER, ECONOMY lamps operate as follows according to the error contents.

Error Contents	Indoor Unit Display			Wired Remote Controller Display	Trouble shooting
	Operation (Green)	Timer (Orange)	Economy (Green)		
Serial Communication Error	1 times	1 times	Continuous	11	1,2
Wired Remote Controller communication Error	1 times	2 times	Continuous	12	3
Server room control communication error	1 times	2 times	Continuous	12	3
External communication Error	1 times	8 times	Continuous	18	4
Combination Error	2 times	3 times	Continuous	23	5
Address setting Error in Wired remote controller system	2 times	6 times	Continuous	26	6
Connection unit number Error (Indoor unit Wired remote controller error)	2 times	9 times	Continuous	29	7
Indoor Unit Model Information Error EEPROM Access Abnormal	3 times	2 times	Continuous	32	8
Manual Auto Switch Error	3 times	5 times	Continuous	35	9
Indoor unit (Communication circuit) Wired remote controller Error	3 times	10 times	Continuous	3A	10
Indoor Room Thermistor Error	4 times	1 times	Continuous	41	11
Indoor Heat Ex. Thermistor Error	4 times	2 times	Continuous	42	12
Human sensor Error	4 times	4 times	Continuous	44	13
Indoor Unit Fan Motor Error	5 times	1 times	Continuous	51	14
Drain pump Error	5 times	3 times	Continuous	53	15
Outdoor unit main PCB model information Error	6 times	2 times	Continuous	62	16
Inverter Error	6 times	3 times	Continuous	63	17
A. F. Voltage Error	6 times	4 times	Continuous	64	18
IPM Error	6 times	5 times	Continuous	65	19
Discharge Thermistor Error	7 times	1 times	Continuous	71	20
Compressor Thermistor Error	7 times	2 times	Continuous	72	21
Heat Ex. Liquid Outlet Thermistor Error	7 times	3 times	Continuous	73	22

Error Contents	Indoor Unit Display			Wired Remote Controller Display	Trouble shooting
	Operation (Green)	Timer (Orange)	Economy (Green)		
Outdoor Thermistor Error	7 times	4 times	Continuous	74	23
Heat sink temp. sensor Error	7 times	7 times	Continuous	77	24
Current Sensor Error	8 times	4 times	Continuous	84	25
High Pressure Switch Error	8 times	6 times	Continuous	86	26
Over Current Error	9 times	4 times	Continuous	94	27
Compressor Control Error	9 times	5 times	Continuous	95	28
Outdoor Unit Fan Motor Error	9 times	7 times	Continuous	97	29
4 Way Valve Error	9 times	9 times	Continuous	99	30
Discharge Temp. Error	10 times	1 times	Continuous	A1	31
Compressor Temp. Error	10 times	3 times	Continuous	A3	32

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

- **3-Wire**

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.

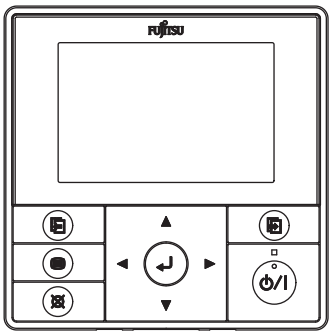
See the lamp blinking patterns and error codes in the table. An error display is displayed only during running.

Remote control

This is possible only on a wired remote control.

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

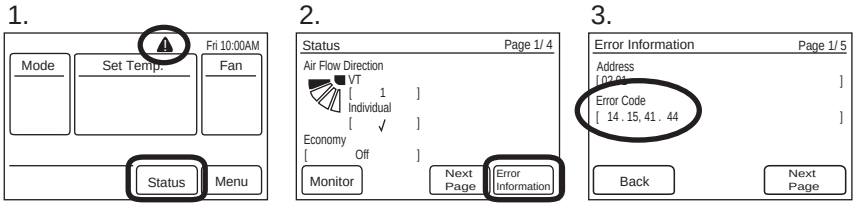
("Er" will appear in the set room temperature display.)



- **2-Wire**

1. Check the error

1. If an error occurs, an error icon appears on the "Monitor mode screen".
   Touch the [Status] on the "Monitor mode screen".The "Status" screen is displayed.
2. Touch the [Error Information] on the "Status"screen. The "Error Information"screen is displayed.
   (If there are no errors, the [Error Information] will not be displayed.)
3. 2-digit numbers correspond to the error code in the table below. Touch the [Next page]
   (or [Previous page]) to switch to other connected indoor units.



For the details of the indoor unit or outdoor unit error , refer to the error codes in each installation manual

2-2 TROUBLE SHOOTING WITH ERROR CODE

Trouble shooting 1 **OUTDOOR UNIT Error Method:** **Serial Communication Error** **(Serial Reverse Transfer Error)**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 1 time Flash,** **Timer lamp : 1 time Flash** **Wired Remote Controller :** **ERROR CODE : [E : 11]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Outdoor unit Fan motor	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. Active filter module failure
5. Transistor PCB (IPM) failure 6. Filter PCB failure 7. 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).

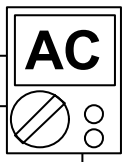
YES

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

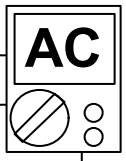
Check Point 3 : Check the voltage of power supply



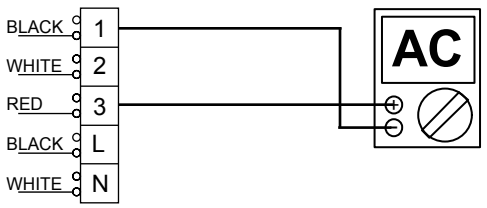
- Check the voltage of power supply
  >> Check if AC216V(AC240V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L - N.

OK

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



- Check serial signal (Reverse transfer signal)
  >> Check if indicated value swings between AC90V and AC270V at outdoor unit terminal 1 - 3.
  >> If it is abnormal, Check the parts as follows.
  - Outdoor unit fan motor (PARTS INFORMATION 5)
  - Active filter module (PARTS INFORMATION 6)
  - Transistor PCB (IPM) (PARTS INFORMATION 7)
  - Filter PCB (Check the wire of CN110)
  >> If Outdoor fan motor is abnormal, replace Outdoor unit fan motor and Main PCB.
  >> If Active filter module or IPM is abnormal, replace it.
  >> 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:** **Indoor Unit :** **Operation lamp: 1 time Flash,** **Timer lamp : 1 time Flash** **Wired Remote Controller :** **ERROR CODE : [E : 11]**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Indoor unit Fan motor Outdoor unit Main PCB	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 4. Indoor unit fan motor failure
5. Outdoor unit Main PCB

Check Point 1-1 : Reset the power and operate

- Does error indication reappear?

NO

YES

Check Point 2 : Check connection

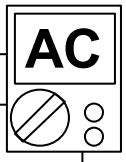
- Check any loose or removed connection line of between indoor unit and outdoor unit.
  >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
- Check connection condition in control unit.
  (If there is loose connector, open cable or mis-wiring)

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).

OK

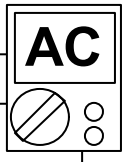
Check Point 3 : Check the voltage of power supply



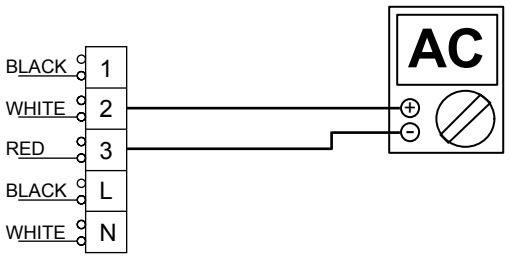
- Check the voltage of power supply
  >> Check if AC216V(AC240V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L - N.

OK

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



- Check serial signal (Forward transfer signal)
  >> Check if indicated value swings between AC30V and AC130V at outdoor unit terminal 2 - 3.
  >> If it is abnormal, replace Controller PCB.
  >> If it is abnormal, Check Indoor unit fan motor. (PARTS INFORMATION 4)
  >> If Indoor unit fan motor is abnormal, replace Indoor unit fan motor and Controller PCB.
  >> If it is abnormal, replace Outdoor unit Main PCB.



Trouble shooting 3 **INDOOR UNIT Error Method:** **Wired Remote Controller Communication Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 1 times Flash,** **Timer lamp : 2 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 12]**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Wired Remote Controller (Option)	When the indoor unit cannot properly receive the signal from Wired Remote Controller for 1 minute or more.

Forecast of Cause:

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

Check Point 1 : Check the connection of terminal

Check & correct the followings.

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

OK

Check Point 2 : Check Wired Remote Controller and Controller PCB

- Check Voltage at CN6 (terminal 1-3) of Controller PCB. (Power supply to Remote Control)

>> If it is DC12V, 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

***When the server room setting is activate:**

Forecast of Cause:

1. Connection failure 2. DIP switch wrong setting 3. Function setting wrong setting 4.Controller PCB failure

Check Point 1 : Check the wiring connection

- Check if 3 wires on the terminal are corresponding with the same color or number on the each terminals.

OK

Check Point 2 : Check DIP switch setting on the Indoor unit PCB

- Check if the DIP Switch set with [3wire]

OK

Check Point 3 : Check Function setting

- Perform the Function setting again

OK

Check Point 4 : Check Wired Remote Controller and Controller PCB

- Check Voltage at CN6 (terminal 1-3) of Controller PCB.

>> If it is DC 0V, Controller PCB is failure. >> Replace Controller PCB

Trouble shooting 4 **INDOOR UNIT Error Method:** **External communication error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 1 times Flash,** **Timer lamp : 8 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 18]**

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

OK

Check Point 2: Replace external I/O PCB

▶ **If Check Point 1 do not improve the symptom, change External I/O PCB.**

OK

Check Point 3: Replace Controller PCB

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

Trouble shooting 5 **OUTDOOR UNIT Error Method:** **Combination error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 2 times Flash,** **Timer lamp : 3 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 23]**

Detective Actuators:	**Detective details:**
Indoor unit	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 6 **INDOOR UNIT Error Method:** **Address setting Error in Wired remote controller system**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 2 times Flash,** **Timer lamp : 6 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 26]**

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 7 **INDOOR UNIT Error Method:** **Connection unit number error (Indoor unit in Wired remote controller system)**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 2 times Flash,** **Timer lamp : 9 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 29]**

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 8 **INDOOR UNIT Error Method:** **Indoor Unit Model Information Error** **EEPROM Access Abnormal**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 3 times Flash,** **Timer lamp : 2 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 32]**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB	When power is on and there is some below case. 1. When model information of EEPROM is incorrect. 2. When the access to EEPROM failed.

Forecast of Cause:

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

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO → Check Point 1-2 : Check external cause such as noise

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

YES ↓

Check Point 2 : Check Indoor unit electric components

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

↓

Check Point 3 : Replace Controller PCB

▶ **Change Controller PCB.**

Note : EEPROM

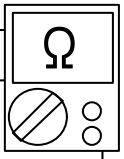
EEPROM(Electronically Erasable and Programmable Read Only Memory) is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically.
To change the contents, it uses higher voltage than normal, and it can not change a partial contents. (Rewriting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

Trouble shooting 9 **INDOOR UNIT Error Method:** **Manual Auto Switch Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 3 times Flash,** **Timer lamp : 5 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 35]**

Detective Actuators:	**Detective details:**
Indoor Unit Controller PCB Indicator PCB Manual Auto Switch	When the Manual Auto Switch becomes ON for consecutive 30 or more seconds.

Forecast of Cause :

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



Check Point 1 : Check the Manual Auto Switch

- Check if Manual Auto Switch is kept pressed.
- Check ON/OFF switching operation by using a meter.

>> If Manual Auto Switch is disabled (on/off switching), replace it.

OK

Check Point 2 : Replace Controller PCB and Indicator PCB

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

Trouble shooting 10 **INDOOR UNIT Error Method:** **Indoor unit communication circuit (WRC) error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 3 times Flash,** **Timer lamp : 10 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 3A]**

Detective Actuators: Wired remote controller (2-Wire) Indoor unit Controller PCB circuit	**Detective details:** When the indoor unit(s) detects the configuration of RCG abnormal or the indoor unit detects lack of primarily -remote controller.

Forecast of Cause : 1. Terminal connection abnormal 2. Wired remote controller failure
3. 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 of terminal between remote control and indoor unit, or between Indoor units and check if there is a disconnection or short of the cable

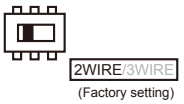
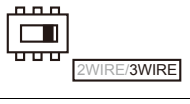
Check Point 2 , 3: Check Indoor unit controller PCB

- Check terminal voltage of controller PCB connector CNC01 (Power supply for remote)
  If DC12V, Remote control failure (Controller PCB is OK) >>> Replace Remote controller
  If DC0V, Controller PCB failure (Remote is OK) >>> Replace Controller PCB

In case of re-installation is done due to removed connector or incorrect wiring, turn on the power again.

TIP setting the remote controller

Depending on the connected remote controller type, following setting is required:

Connected remote controller	DIP switch	Jumper (JM9)
2-wire-type wired remote controller is connected	 (Factory setting)	 (Disconnected)
3-wire-type wired remote controller is connected		 (Connected) (Factory setting)

2 wire remote controller PCB

If the communication PCB is not conncected, and JM9 is disconnected, 3A error is displyed.

If the communication PCB is conncected, and JM9 is connected, the 2 wire remote controller doesn't work.

If the DIP switch is 3 wire side, the 2 wire remote controller doesn't work.

3 wire remote controller PCB

If the DIP switch is 2 wire side, the 3 wire remote controller doesn't work.

Trouble shooting 11 **INDOOR UNIT Error Method:** **Indoor Room Thermistor Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 4 times Flash,** **Timer lamp : 1 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 41]**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Room temperature thermistor	Room temperature thermistor is open or short is detected always.

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

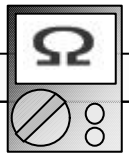
Check Point 1 : Check connection of Connector

- 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)	-10	-5	0	5	10	15	20	25
Resistance value (kΩ)	58.3	44.0	33.6	25.9	20.2	15.8	12.5	10.0

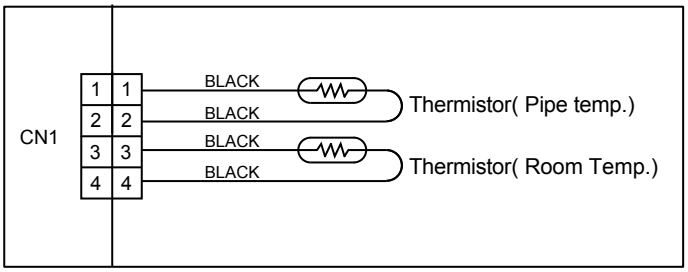
Temperature (°C)	30	35	40	45
Resistance value (kΩ)	8.0	6.5	5.3	4.4

▶ **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 12 **INDOOR UNIT Error Method:** **Indoor Heat Ex. Thermistor Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 4 times Flash,** **Timer lamp : 2 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 42]**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Heat exchanger (MID) Thermistor	Heat exchanger (MID) thermistor is open or short is detected always.

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

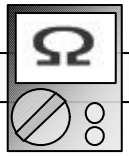
Check Point 1 : Check connection of Connector

- ☐ 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)	-30	-25	-20	-15	-10	-5	0	5	10	15
Resistance value (kΩ)	1131.9	804.5	579.6	422.9	312.3	233.2	176.0	134.2	103.3	80.3

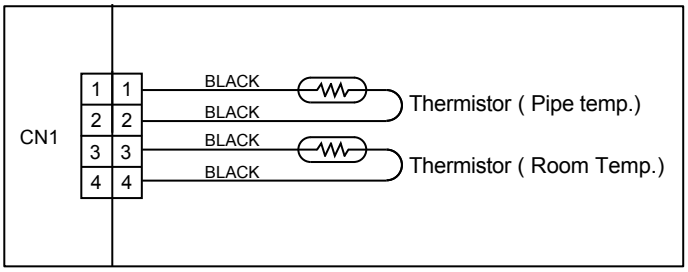
Temperature (°C)	20	25	30	35	40	45	50	55	60	63
Resistance value (kΩ)	62.9	49.7	39.6	31.7	25.6	20.9	17.1	14.1	11.6	10.4

▸ **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 13 **INDOOR UNIT Error Method:** **Human sensor error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 4 times Flash,** **Timer lamp : 4 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 44]**

Detective Actuators:	**Detective details:**
Indoor unit Main PCB	1 Detect the open condition of the sensor. 2 When the signal from the sensor is "L"(=0V) for more than 10 min.

Forecast of Cause:

1. Connection failure 2. Sensor failure 3. Indoor unit Main PCB failure

Check Point 1 : Check the connector connection and cable open

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

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

OK (Sensor connections error)

Check Point 2 : Conduction check

Disconnect the sensor and check the 2-3pin on sensor connector.

>>With conduction : Main PCB failure
>>Without conduction : Sensor failure

OK(Sensor signal error)

Check Point 2 : Voltage check

Disconnect the sensor and check the Voltage of 1pin of the CN10 on the Main PCB

>>5V: Sensor failure
>>Other than 5V: Main PCB failure

Trouble shooting 14 **INDOOR UNIT Error Method:** **Indoor unit Fan Motor Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 5 times Flash,** **Timer lamp : 1 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 51]**

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

Forecast of Cause:

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

Check Point 1 : Check rotation of Fan

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

OK

Check Point 2 : Check ambient temp. around motor

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

OK

Check Point 3 : Check Indoor unit fan motor

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

OK

Check Point 4 : Replace Controller PCB

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

Trouble shooting 15 **INDOOR UNIT Error Method:** **Drain pump error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 5 times Flash,** **Timer lamp : 3 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 53]**

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. Controller PCB failure

Check Point 1 : Replacethe indoor unit controller PCB
☐ No float switch on this unit If this error is displayed, Replease the indoor unit controller PCB.

Trouble shooting 16 **OUTDOOR UNIT Error Method:** **Outdoor unit main PCB model information error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 6 times Flash,** **Timer lamp : 2 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 62]**

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 → 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.

YES → Check Point 2 : Replace Main PCB

▶ **Change Main PCB.**

Trouble shooting 17 **OUTDOOR UNIT Error Method:** Inverter Error	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 6 times Flash,** **Timer lamp : 3 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 63]**

Detective Actuators:	**Detective details:**
Inverter PCB	▪Error information received from Inverter PCB

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

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

OK ↓

Check Point 3 : Replace Filter PCB (INV) and Inverter PCB

- ☐ Replace Filter PCB and Inverter PCB.

Trouble shooting 18 **OUTDOOR UNIT Error Method:** **Active filter voltage error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 6 times Flash,** **Timer lamp : 4 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 64]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Active filter module	① When inverter input DC voltage is higher than 430V or lower than 110V. ② When a momentary power cut off occurred on low voltage

Forecast of Cause :

1. External cause 2. Connector connection failure 3. Main PCB failure 4. Active filter module 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 : Check Active filter module

- Check Active filter module.

>>If Active filter module is abnormal, replace it. (PARTS INFORMATION 6)

OK

Check Point 4 : Replace Main PCB

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

Trouble shooting 19 **OUTDOOR UNIT Error Method:** **IPM Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 6 times Flash,** **Timer lamp : 5 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 65]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Compressor	① When more than normal operating current to IPM in Main PCB flows, 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. Outdoor Fan Operation failure
3. Outdoor Heat Exchanger clogged
4. Compressor failure
5. Transistor PCB failure
6. Main PCB failure

Check Point 1 : 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 2 : Check Outdoor Fan, Heat Exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of Outdoor Heat Exchanger?
- Is the Fan rotating by hand when operation is off ?

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

OK

Check Point 3 : Check Outdoor Fan

- Check Outdoor Fan Motor. (Refer to Trouble shooting 29)

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

OK

Check Point 4 : Check Compressor

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

OK

Check Point 5 : Check Transistor PCB

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

OK

Check Point 6 : Replace Main PCB

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

Trouble shooting 20 **OUTDOOR UNIT Error Method:** **Discharge Thermistor Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 7 times Flash,** **Timer lamp : 1 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 71]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Discharge pipe temperature thermistor	When Discharge pipe temperature thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-30	-20	-10	-5	0	5	10	15	20
Resistance value (kΩ)	1013.1	531.6	292.9	221.1	168.6	129.8	100.9	79.1	62.6

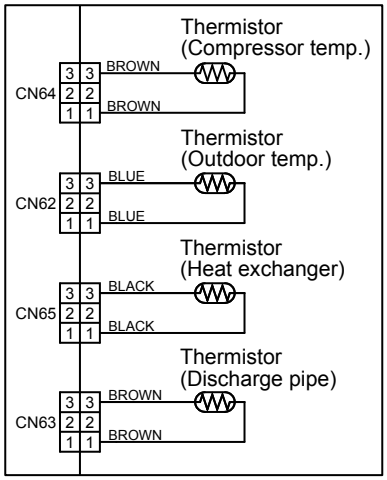
Temperature (°C)	30	40	50	60	70	80	90	100	120
Resistance value (kΩ)	40.0	26.3	17.8	12.3	8.7	6.3	4.6	3.4	2.0

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

OK

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

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



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

Trouble shooting 21 **OUTDOOR UNIT Error Method:** **Compressor Thermistor Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 7 times Flash,** **Timer lamp : 2 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 72]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Compressor temperature thermistor	When Compressor temperature thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-30	-20	-10	-5		5	10 0	15	20
Resistance value (kΩ)	1013.1	531.6	292.9	221.1	168.6	129.8	100.9	79.1	62.6

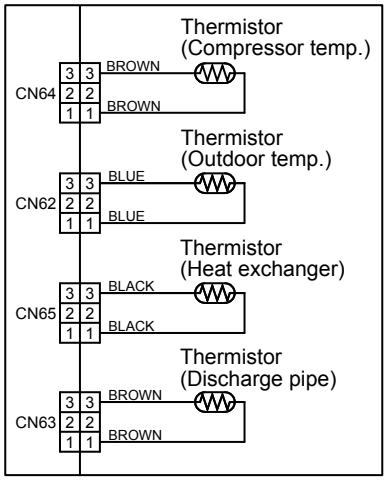
Temperature (°C)	30	40	50	60	70	80	90	100	120
Resistance value (kΩ)	40.0	26.3	17.8	12.3	8.7	6.3	4.6	3.4	2.0

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

OK

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

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



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

Trouble shooting 22 **OUTDOOR UNIT Error Method:** **Heat Ex. Liquid Outlet Thermistor Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 7 times Flash,** **Timer lamp : 3 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 73]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Heat exchanger temperature thermistor	When Heat exchanger temperature thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-30	-20	-10	-5	0	5	10	15
Resistance value (kΩ)	92.3	49.2	27.5	20.9	16.1	12.4	9.7	7.7

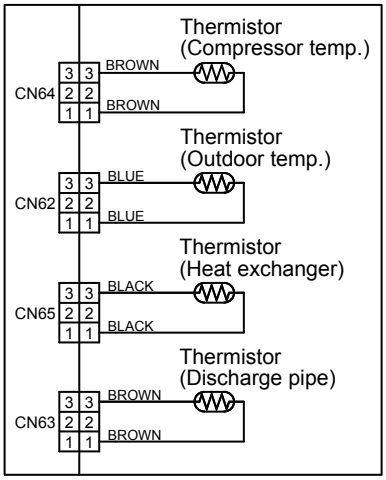
Temperature (°C)	20	30	40	50	60	70	80	90
Resistance value (kΩ)	6.1	4.0	2.6	1.8	1.3	0.9	0.7	0.5

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

OK

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

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



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

Trouble shooting 23 **OUTDOOR UNIT Error Method:** **Outdoor Thermistor Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 7 times Flash,** **Timer lamp : 4 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 74]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Outdoor temperature thermistor	When Outdoor temperature thermistor open or short-circuit is detected at power ON or while running the compressor.

Forecast of Cause :

1. Connector connection failure 2. Thermistor failure 3. Main PCB failure

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

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

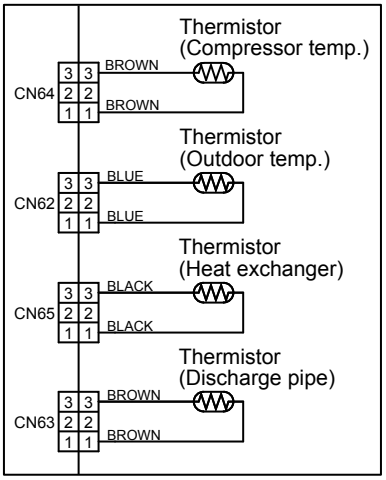
Temperature (°C)	20	30	40	50	60	70	80
Resistance value (kΩ)	12.6	8.0	5.2	3.5	2.4	1.7	1.2

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

OK

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

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



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

Trouble shooting 24 **OUTDOOR UNIT Error Method:** Heat Sink Thermistor Error	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 7 times Flash,** **Timer lamp : 7 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 77]**

Detective Actuators:	**Detective details:**
Inverter PCB	・ Heat sink temperature thermistor (Built-in IPM) open/short detected

Forecast of Cause : 1. Inverter PCB failure

►**If this error is displayed, replace Inverter PCB**

Trouble shooting 25
OUTDOOR UNIT Error Method:

Current Sensor Error

Indicate or Display:

Indoor Unit :
Operation lamp: 8 times Flash,
Timer lamp : 4 times Flash

Wired Remote Controller :
ERROR CODE : [E : 84]

Detective Actuators:

Outdoor unit Main PCB

Detective details:

When Input Current Sensor has detected 0A, while Inverter Compressor is operating at higher than 56rps,
after 1minute upon starting the Compressor. (Except during the defrost operation)

Forecast of Cause :

1. Defective connection of electric components 2. External cause 3. Main 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 4 : Replace Main PCB

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

Trouble shooting 26 **OUTDOOR UNIT Error Method:** **High Pressure Switch Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 8 times Flash,** **Timer lamp : 6 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 86]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB High Pressure Switch	When pressure switch open is detected in 10 seconds after the power is turned on.

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

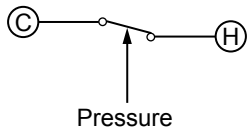
- Switch characteristics check
  * For the characteristics of high pressure switch, refer to below.

OK

Check Point 3 : Replace Main PCB

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

- Type of contact



- Characteristics of pressure switch (30 : CN90)
  (34 : CN101)

	Pressure switch 1
Contact : Short ⇒ Open	4.2±0.1MPa
Contact : Open ⇒ Short	3.2±0.15MPa

Trouble shooting 27 **OUTDOOR UNIT Error Method:** **Over Current Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 9 times Flash,** **Timer lamp : 4 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 94]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Compressor Transistor PCB (IPM)	・"**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 hear 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 28 **OUTDOOR UNIT Error Method:** **Compressor Control Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 9 times Flash,** **Timer lamp : 5 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 95]**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Compressor Transistor PCB (IPM)	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. Main PCB failure 3. Compressor failure
4. Transistor PCB (IPM) failure

Check Point 1 : Check Noise from Compressor

・Turn on Power and check operation noise.

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

OK

Check Point 2 : Check connection of around the Compressor components

For Compressor Terminal, Main PCB

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

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

OK

Check Point 3: Check Transistor PCB (IPM)

・Check IPM. **(PARTS INFORMATION 7)**

>> If IPM is abnormal, replace Transistor PCB.

OK

Check Point 4: Replace Main PCB

▶ **If Check Point 1,2 or 1~3 do not improve the symptom, change Main PCB.**

OK

Check Point 5: Replace Compressor

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

Trouble shooting 29 **OUTDOOR UNIT Error Method:** **Outdoor Unit Fan Motor Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 9 times Flash,** **Timer lamp : 7 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 97]**

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

Forecast of Cause:

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

Check Point 1 : Check rotation of Fan

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

OK

Check Point 2 : Check ambient temp. around motor

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

OK

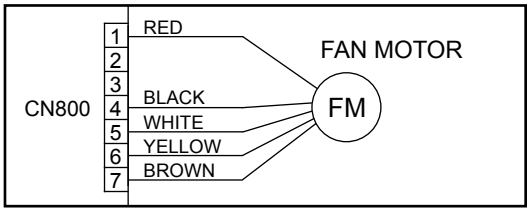
Check Point 3 : Check Outdoor unit fan motor

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

OK

Check Point 4 : Check Output Voltage of Main PCB

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



Read wire	DC voltage
Red - Black	240 ~ 400V
White - Black	15 ±1.5V

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

Trouble shooting 30 **OUTDOOR UNIT Error Method:** **4-Way Valve Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 9 times Flash,** **Timer lamp : 9 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : 99]**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Heat Ex. temperature thermistor Room temperature thermistor 4-way valve	When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops. ・Cooling or Dry operation [Indoor heat exchanger temp.] - [Room temp.] > 10degC ・Heating operation [Indoor heat exchanger temp.] - [room temp.] < -10degC If the same operation is repeated 5 times, the compressor stops permanently.

Forecast of Cause :

1. Air filter clogged 2. Connector connection failure 3. Thermistor failure 4. Coil failure
5. 4-way valve failure 6. Controller PCB failure

Check Point 1 : Check the Air filter condition

・Check is Air filter dirty.
>>If the Air filter dirty, clean up the Air filter.

OK

Check Point 2 : 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 3 : Check each thermistor

・Isn't it fallen off the holder?
・Is there a cable pinched?
>> Check characteristics of thermistor (Refer to Trouble shooting 11, 12), If defective, replace the thermistor

OK

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

[Solenoid coil]
・Remove CN30 from PCB and check the resistance value of coil.
Resistance value is 2.085Ω (at 20°C).
>> 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 5 : Replace Controller PCB

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

Trouble shooting 31
OUTDOOR UNIT Error Method:
Discharge Temp. Error

Indicate or Display:

Indoor Unit :
Operation lamp: 10 times Flash,
Timer lamp : 1 times Flash

Wired Remote Controller :
ERROR CODE : [E : A1]

Detective Actuators:

Discharge temperature thermistor
Outdoor unit Main PCB

Detective details:

- "Protection stop by "discharge temperature ≧ 110degC during compressor operation"" generated 2 times within 24 hours.

Forecast of Cause :

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

<Cooling operation>

Check Point 1 : Check if 3-way valve(gas side) is open.

- If the 3-way valve(gas side) was closed, open the 3-way valve(gas side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- EEV open?
- Strainer clogging check (Refer to PARTS INFORMATION 3)

OK

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

- Check for foreign object at heat exchanger
- Check if fan can be rotated by hand.
- Motor check (PARTS INFORMATION 5)

OK

Check Point 4 : Check the discharge thermistor

- Discharger thermistor characteristics check (Check by disconnecting thermistor from PCB.)

  * For the characteristics of the thermistor, refer to the "Trouble shooting 20".

OK

Check Point 5 : Check the refrigerant amount

- Leak check

OK

Check Point 6 : Replace Main PCB

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

<Heating operation>

Check Point 1 : Check if 3-way valve(liquid side) is open.

- If the 3-way valve(liquid side) was closed, open the 3-way valve(liquid side) and check operation.

OK

Check Point 2 : Check the EEV, strainer

- EEV open?
- Strainer clogging check (Refer to PARTS INFORMATION 3)

OK

Trouble shooting 32 **OUTDOOR UNIT Error Method:** **Compressor Temp. Error**	**Indicate or Display:** **Indoor Unit :** **Operation lamp: 10 times Flash,** **Timer lamp : 3 times Flash** **Wired Remote Controller :** **ERROR CODE : [E : A3]**

Detective Actuators:	**Detective details:**
Compressor temperature thermistor Outdoor unit Main PCB	▪ "Protection stop by "compressor temperature ≧ 108degC(30/ 34) 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
6. Main PCB failure

<Cooling operation>

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

OK

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

OK

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 Compressor thermistor
- Compressor thermistor characteristics check (Check by disconnecting thermistor from PCB.)

  * For the characteristics of the thermistor, refer to the "Trouble shooting 21".

OK

Check Point 5 : Check the refrigerant amount
- Leak check

OK

Check Point 6 : Replace Main PCB

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

<Heating operation>

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

OK

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

OK

2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 34

Indoor Unit - No Power

Forecast of Cause:

1. Power Supply failure 2. External cause
3. Electrical Components defective

Check Point 1 : Check Installation Condition

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

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

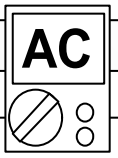
OK

Check Point 2 : Check external cause at Indoor 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 AC216 - 264V appears at Outdoor Unit Terminal L - N.

NO

YES

- Check Fuse in Filter PCB.

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

- Check Varistor in Filter PCB.

>> If Varistor is defective, there is a possibility of an abnormal power supply. Check the correct power supply and replace Varistor. Upon checking the normal power supply, replace Varistor.

Trouble shooting 35

Outdoor Unit - No Power

Forecast of Cause:

1. Power Supply failure 2. External cause
3. Electrical Components defective

Check Point 1 : Check Installation Condition

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

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

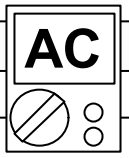
OK

Check Point 2 : Check external cause at Indoor 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 AC216 - 264V appears at Outdoor Unit Terminal L - 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 Active Filter Module and IPM. **(PARTS INFORMATION 6 and 7)**

>> If Active Filter Module or IPM is abnormal, replace it.

OK

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

Trouble shooting 36

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 CN6 (terminal 1-3) of Controller PCB.
  (Power supply to Remote Control)

>> If it is DC12V, 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 37

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 ?

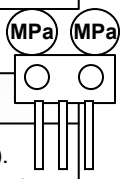
OK

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

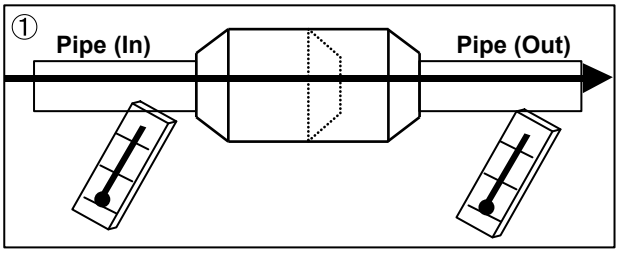
- Check if Strainer is clogged (Refer to the figure at right).
- Measure Gas Pressure and if there is a leakage, correct it.

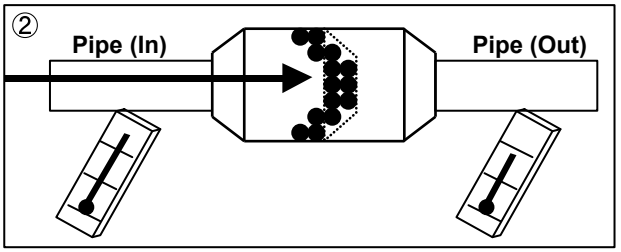
>> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.

- 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 38

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 39

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

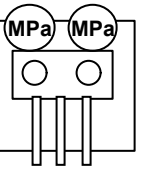
- Is Fan rotating?

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

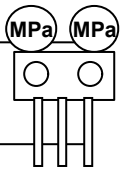
- Is there open or loose connection cable?
- Check Main PCB, connection of Compressor, and winding resistance. (Refer to the next page).

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

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

Replace Compressor

Abnormal noise

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

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

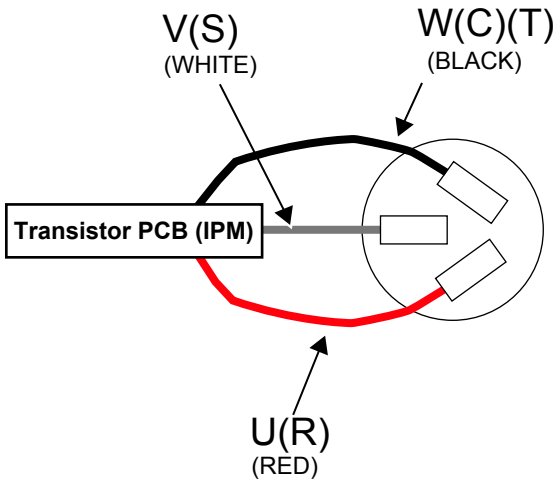
Replace Compressor

SERVICE PARTS INFORMATION 2

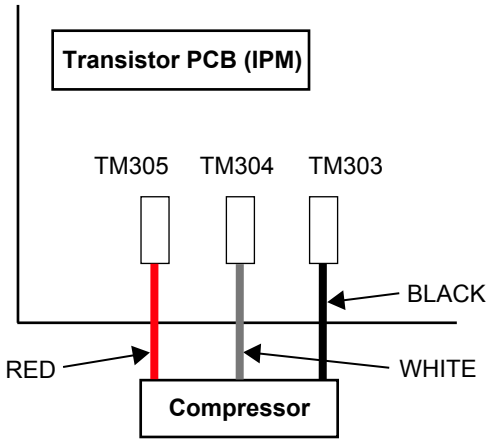
Inverter Compressor

Check Point 1 : Check connection

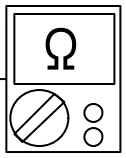
- Check terminal connection of Compressor
  (Loose or incorrect wiring)



Check connection of Transisitor PCB(IPM).
(Loose or incorrect wiring)

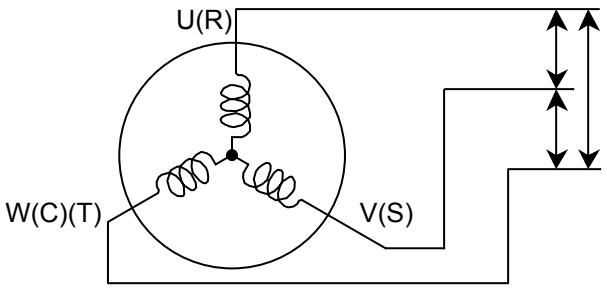


Check Point 2 : Check winding resistance



- Check winding resistance of each terminal

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



Resistance Value :
0.642Ω at 20°C

Check Point 3 : Replace Inverter PCB

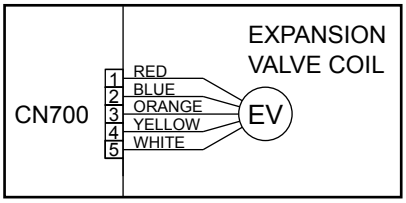
▶ **If Check Point 1, 2 do not improve the symptom, replace Main PCB.**

SERVICE PARTS INFORMATION 3

Outdoor unit Electronic Expansion Valve
(EEV)

Check Point 1 : Check Connections

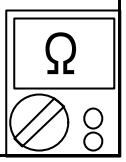
・Check connection of connector
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV

・Remove connector, check each winding resistance of Coil.

Read wire	Resistance value
White - Red	**46**Ω ± **4**Ω at 20°C
Yellow - Red	
Orange - Red	
Blue - Red	



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

Check Point 3 : Check Voltage from Main PCB.

・Remove Connector and check Voltage (DC12V)

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

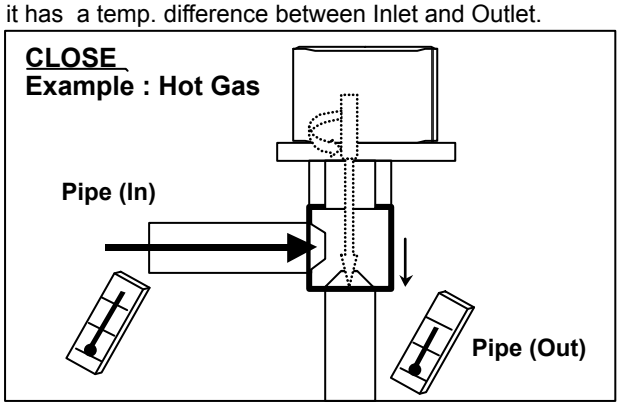
Check Point 4 : Check Noise at start up

・Turn on Power and check operation noise.

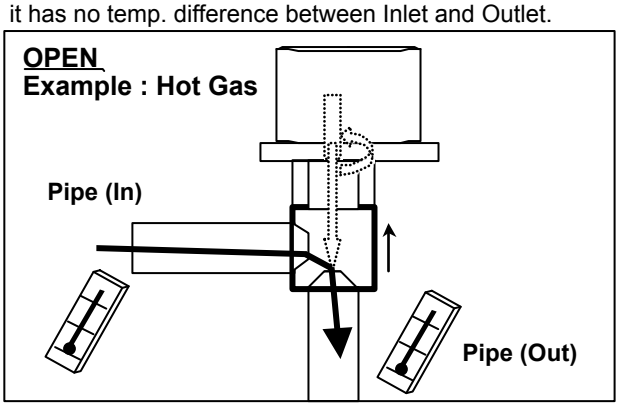
▶ **If an abnormal noise does not show, replace Main PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

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

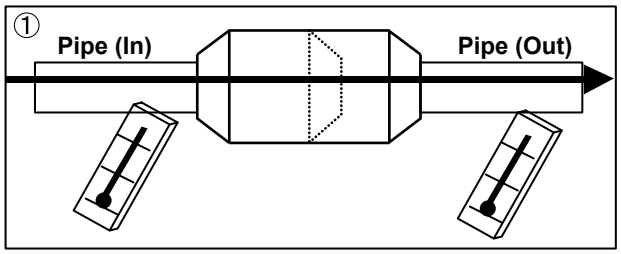


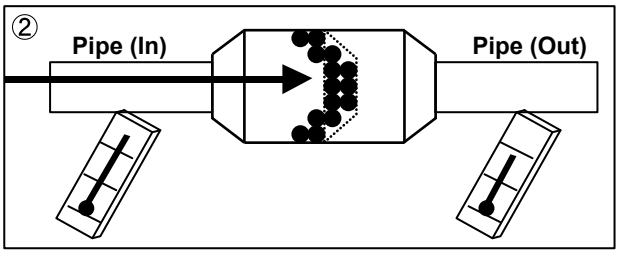
If it is open,
it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

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





SERVICE PARTS INFORMATION 4

Indoor unit fan motor

Check Point 1 : Check rotation of Fan

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

Check Point 2 : Check resistance of Indoor Fan Motor

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

Pin number (wire color)	Terminal function (symbol)
1 (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 (Blue)	Feed back (FG)

SERVICE PARTS INFORMATION 5

Outdoor unit fan motor

Check Point 1 : Check rotation of Fan

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

Check Point 2 : Check resistance of Outdoor Fan Motor

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

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

SERVICE PARTS INFORMATION 6

Active filter module

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

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

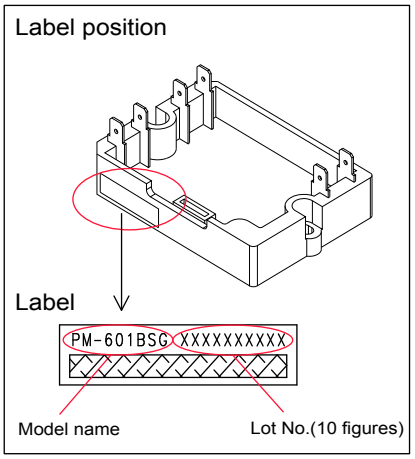
Check the open or short-circuit

Table.1 Each type standard value

	Terminal		Resistance value	
			Type A	Type B
	multimeter (+)	multimeter (-)	SACT32010 [HITACHI] LACT33020 [HITACHI] PM-601 [FGEL] **LOT No. - 1302931395**	PM-604 [FGEL] PM-703 [FGEL] PM-601 [FGEL] **LOT No. 1302931396 -**
	+ (+IN)*	- (-IN)*	**360kΩ ± 20%**	**360kΩ ± 20%**
	- (-IN)*	N1 (N)*	**0 Ω**	**0 Ω**
※	P	+ (+IN)*	**720kΩ ± 20%**	**900kΩ ± 20%**
	L1	L2	**1.01MΩ / 0.76MΩ** **(Ref. value 1) (Ref. value 2)**	**1.01MΩ / 0.76MΩ** **(Ref. value 1) (Ref. value 2)**
	P	N1 (N)*	**360kΩ ± 20%**	**540kΩ ± 20%**
	L1 , L2	Control Box	**∞Ω**	**∞Ω**
※	L2	N1 (N)*	**1.65MΩ / 1.14MΩ** **(Ref. value 1) (Ref. value 2)**	**1.65MΩ / 1.14MΩ** **(Ref. value 1) (Ref. value 2)**

* ( ) is FGEL terminal name.

LOT No. of PM-601 [FGEL] type



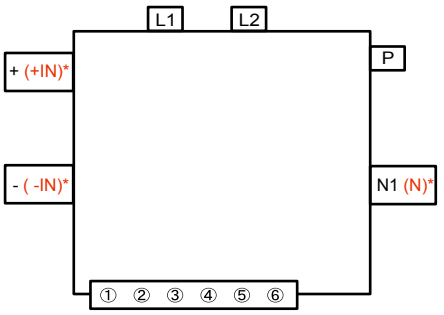


Table.2 Standard value is changed by the tool specification
(Type A and B are the same value)

	Terminal		Resistance value
	multimeter (+)	multimeter (-)	
※	L2	P	**1.32MΩ / 0.66MΩ** **(Ref. value 1) (Ref. value 2)**
※	P	L2	**1.01MΩ / 0.76MΩ** **(Ref. value 1) (Ref. value 2)**

※ By kind of multimeter , the value may change significantly.

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

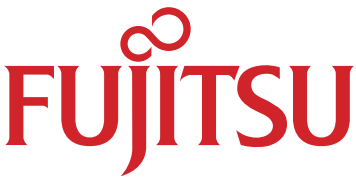
Ref. value 2
Specifications for Multimeter
Manufacturer : SANWA
Model name : PM3
Power source : DC3V.

▶ If it is abnormal,replace ACTIVE FILTER MODULE

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

・Check the Output DC voltage (between P and N) of compressor stopping and operating.

>> If the output voltage of compressor operating is less than the output voltage of compressor stopping, Active Filter Module is detective. >> **Replace Active Filter Module**



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Oct. 2015 Printed in Japan

SERVICE PARTS INFORMATION 7

IPM

(**Mounted on Transistor PCB)**

Check Point 1

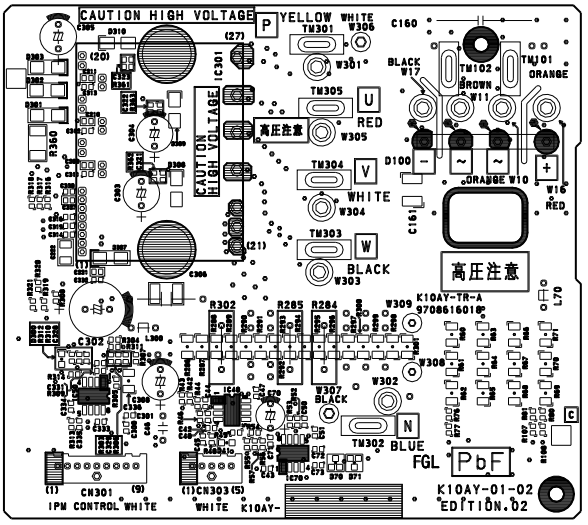
① Disconnect the connection wires between the Transistor PCB - Capacitor PCB and Transistor PCB - Inverter Compressor.

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

TM301 (P) - TM305(U) / TM304(V) / TM303(W)
TM302 (N) - TM305(U) / TM304(V) / TM303(W)

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	