

**SPLIT TYPE
ROOM AIR CONDITIONER**

**Cassette type
INVERTER**

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	AUXG18LRLB	AO*G18LBCA
	AUXG24LRLB	AO*G24LBCA
	RCG18LRLB	RCG18LRLB
	RCG24LRLB	RCG24LRLB

Refrigerant

R410A

CONTENTS

1. DESCRIPTION OF EACH CONTROL OPERATION

1-1 COOLING OPERATION.....	01-01
1-2 HEATING OPERATION.....	01-02
1-3 DRY OPERATION.....	01-03
1-4 AUTO CHANGEOVER OPERATION.....	01-04
1-5 INDOOR FAN CONTROL.....	01-06
1-6 AIR FLOW DIRECTION CONTROL.....	01-09
1-7 OUTDOOR FAN CONTROL.....	01-10
1-8 COMPRESSOR CONTROL.....	01-11
1-9 TIMER OPERATION CONTROL.....	01-12
1-10 ELECTRONIC EXPANSION VALVE CONTROL.....	01-16
1-11 TEST OPERATION CONTROL.....	01-16
1-12 PREVENT TO START FOR 3 MINUTES (3 MINUTES ST).....	01-16
1-13 4-WAY VALVE EXTENSION SELECT.....	01-16
1-14 AUTO RESTART.....	01-17
1-15 PUMP DOWN.....	01-17
1-16 COMPRESSOR PREHEATING.....	01-18
1-17 10°C HEAT OPERATION.....	01-18
1-18 ECONOMY OPERATION.....	01-18
1-19 DEFROST OPERATION CONTROL.....	01-19
1-20 OFF DEFROST OPERATION CONTROL.....	01-21
1-21 VARIOUS PROTECTIONS.....	01-22
1-22 DRAIN PUMP OPERATION.....	01-24
1-23 HUMAN SENSOR(OPTION).....	01-25

2. TROUBLE SHOOTING

2-1 ERROR DISPLAY.....	02-01
2-2 TROUBLE SHOOTING WITH ERROR CODE.....	02-02
2-3 TROUBLE SHOOTING WITH NO ERROR CODE.....	02-43
2-4 SERVICE PARTS INFORMATION.....	02-49

Cassette type **INVERTER**

1 . DESCRIPTION OF EACH CONTROL OPERATION

1-1. COOLING OPERATION

1-1-1 COOLING CAPACITY CONTROL

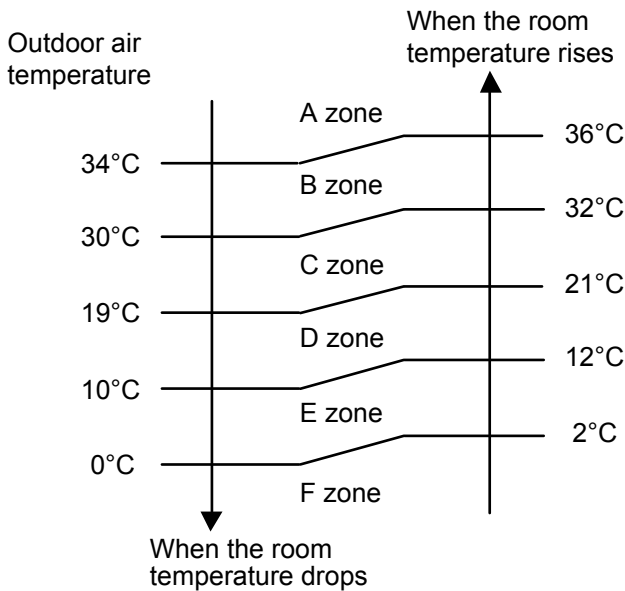
A sensor (room temperature thermistor) built in the indoor unit will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.

- * If the room temperature is 6.0°C higher than a set temperature, the compressor operation frequency will attain to maximum performance.
- * If the room temperature is 1.0°C lower than a set temperature, the compressor will be stopped.
- * When the room temperature is between +6.0°C to -1.0°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 Fig.1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor Frequency Range)

minimum frequency	maximum frequency
10rps	120rps

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



		Fan speed mode			
		Hi	Me	Lo	Qu
Model 18	A zone	97rps	53rps	46rps	34rps
	B zone	97rps	53rps	46rps	34rps
	C zone	72rps	49rps	40rps	34rps
	D-F zone	53rps	37rps	34rps	22rps
Model 24	A zone	107rps	62rps	51rps	40rps
	B zone	107rps	62rps	51rps	40rps
	C zone	80rps	56rps	47rps	40rps
	D-F zone	62rps	47rps	40rps	25rps

1-2. HEATING OPERATION

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

- * If the room temperature is lower 6.0°C than a set temperature, the compressor operation frequency will attain to maximum performance.
- * If the room temperature is higher 1.0°C than a set temperature, the compressor will be stopped.
- * When the room temperature is between +1.0°C to -6.0°C of the setting temperature, the compressor frequency is controlled within the range shown in Table2.

(Table 2 : Compressor Frequency Range)

minimum frequency	maximum frequency
12rps	120rps

1-3. DRY OPERATION

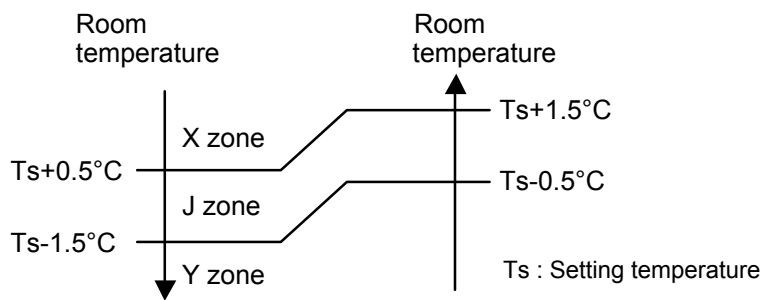
1-3-1 INDOOR UNIT CONTROL

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

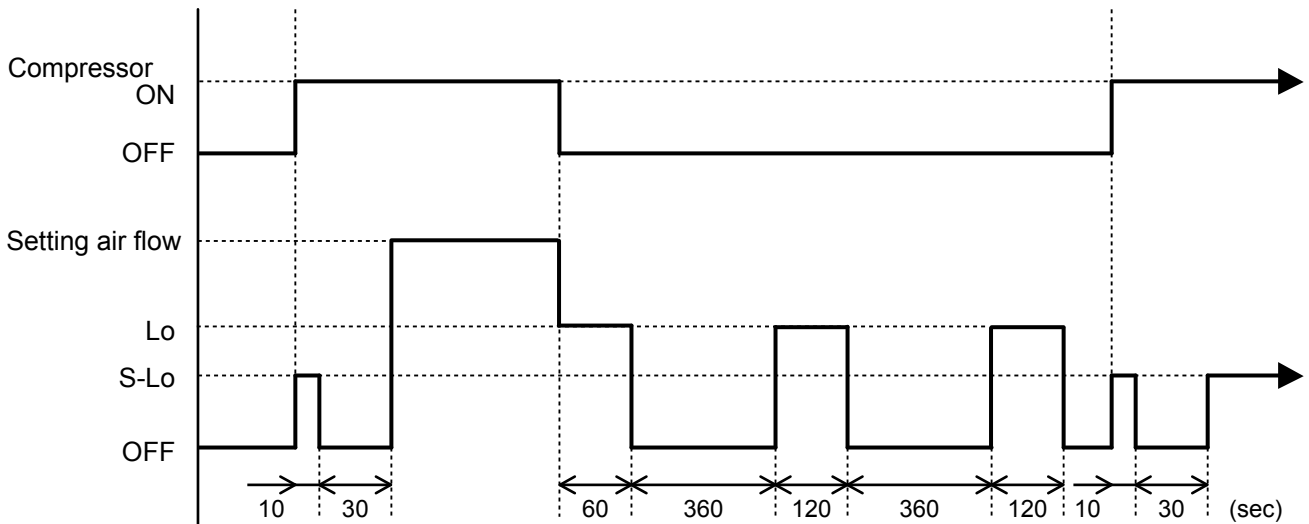
(Table 3 : Compressor frequency)

	Operating frequency
X zone	34rps
J zone	
Y zone	0rps

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



(Fig.3 : Indoor Fan Control)



1-4. 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 0.5°C (wireless and 2WIRE remote controller) Or 1.0°C (3WIRE remote controller) steps.

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

(Table 4 : Operation mode selection table)

Room temperature (TR)	Operation mode
$TR > Ts + 2^{\circ}\text{C}$	Cooling
$Ts + 2^{\circ}\text{C} \geq TR \geq Ts - 2^{\circ}\text{C}$	*Middle zone
$TR < Ts - 2^{\circ}\text{C}$	Heating

TR : Room temperature
Ts : Setting temperature

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

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

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

- (2). Selected by the outdoor temperature.

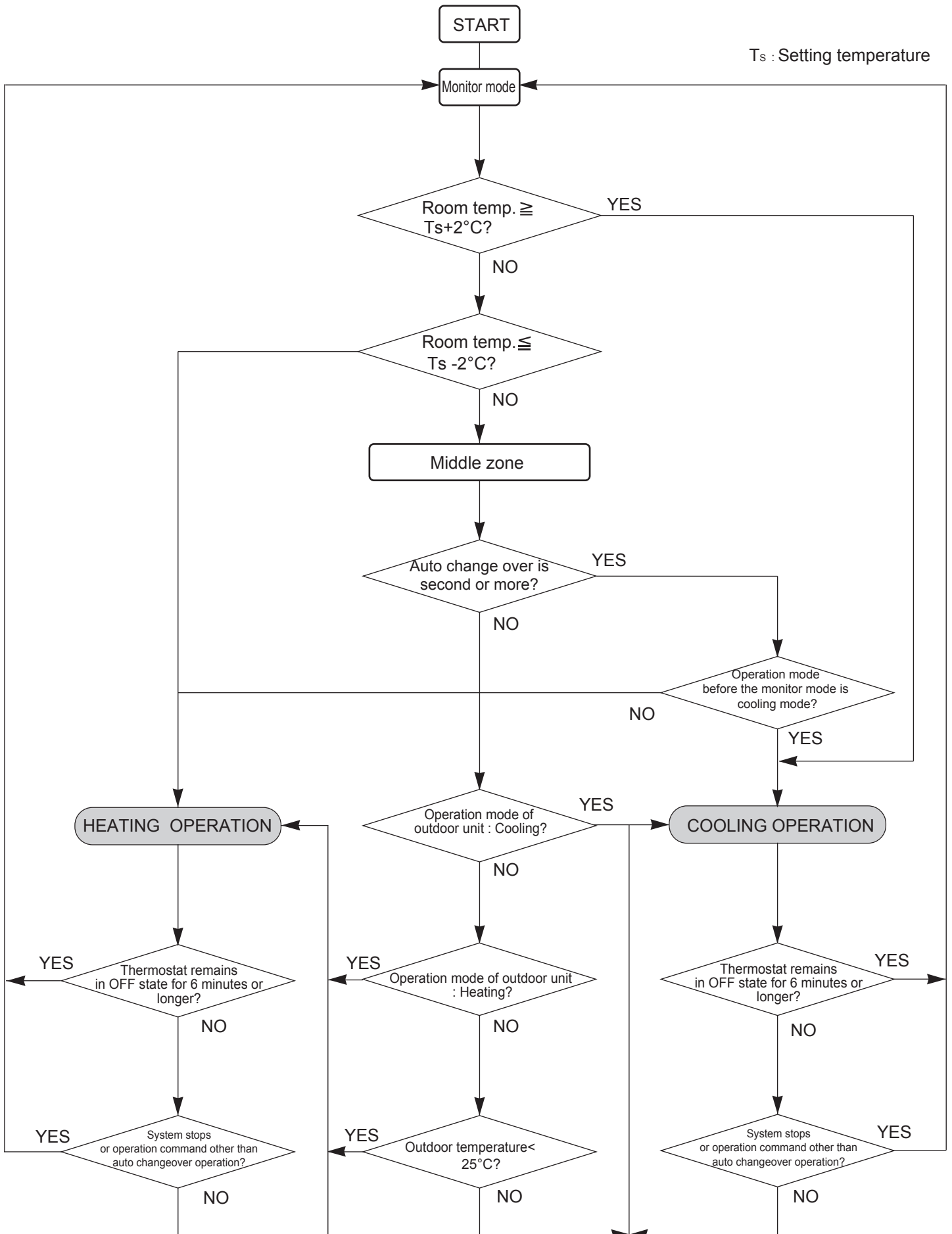
If outdoor unit is operating in other than Cooling and Heating mode, indoor unit will be operated according to the outdoor temperature as below.

(Fig.4 : Outdoor temperature zone selection)

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

- ② When the compressor was stopped for 6 consecutive minutes by the temperature control function after the Cooling or Heating mode was selected at ① above, operation is switched to Monitoring and the operation mode is selected again.
- ③ When the middle zone is selected on the predetermining of the operation mode, the operation mode before the changing to the monitor mode is selected.

■ AUTO CHANGEOVER operation flow chart



1-5. INDOOR FAN CONTROL

1. Fan speed

(Table 5 : Standard of Indoor Fan Speed)

*The following fan speed is a standard value.

Operation mode	Air flow mode	Speed (rpm)	
		Model 18	Model 24
Heating	HIGH	400	430
	MED+	380	410
	MED	360	400
	LOW	340	360
	Quiet	300	330
	Cool air prevention	300	300
Cooling / FAN	HIGH	400	430
	MED	360	400
	LOW	340	360
	Quiet	300	330
FAN	Soft Quiet	300	300
S-Lo		270	270
Dry		300	330

2. FAN OPERATION

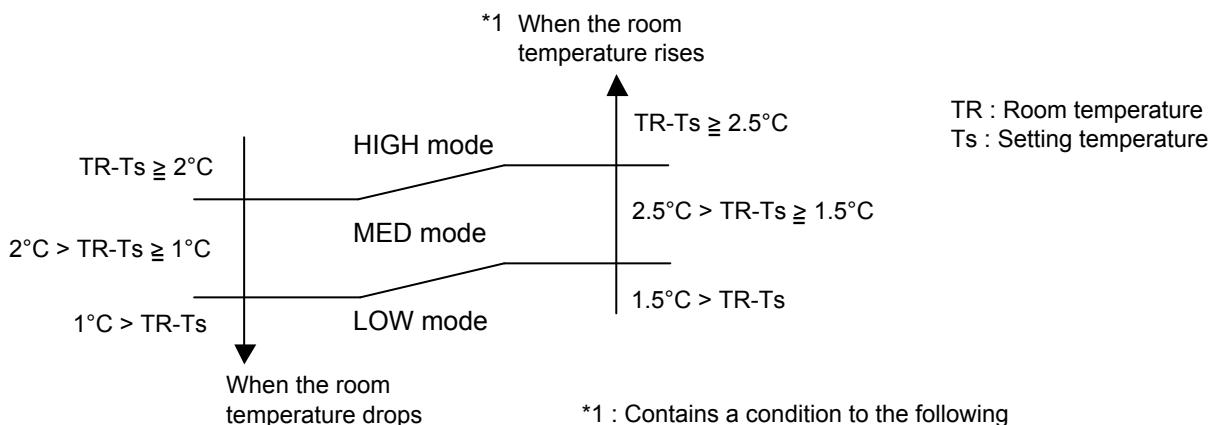
The airflow can be switched in 5 steps such as AUTO, QUIET, LOW, MED, HIGH, while the indoor fan only runs.

3. COOLING OPERATION

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

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

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



*1 : Contains a condition to the following

- 1 When the operation mode is set to AUTO mode at the start of operation.
- 2 When the setting temperature was changed.
- 3 When the operation mode was changed to COOLING mode.
- 4 When the airflow mode was changed to AUTO mode.

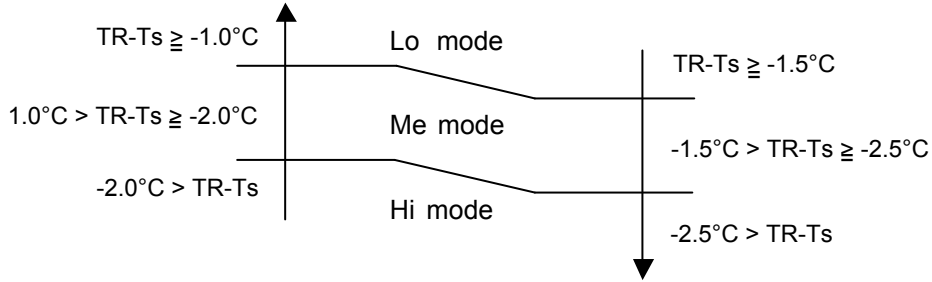
4. HEATING OPERATION

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

On the other hand, if switched in [Hi] ~ [Lo], the indoor motor will run at a constant airflow of [HEAT] operation modes Lo, Me, Hi, as shown in Table5.

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

Indoor heat exchanger temperature

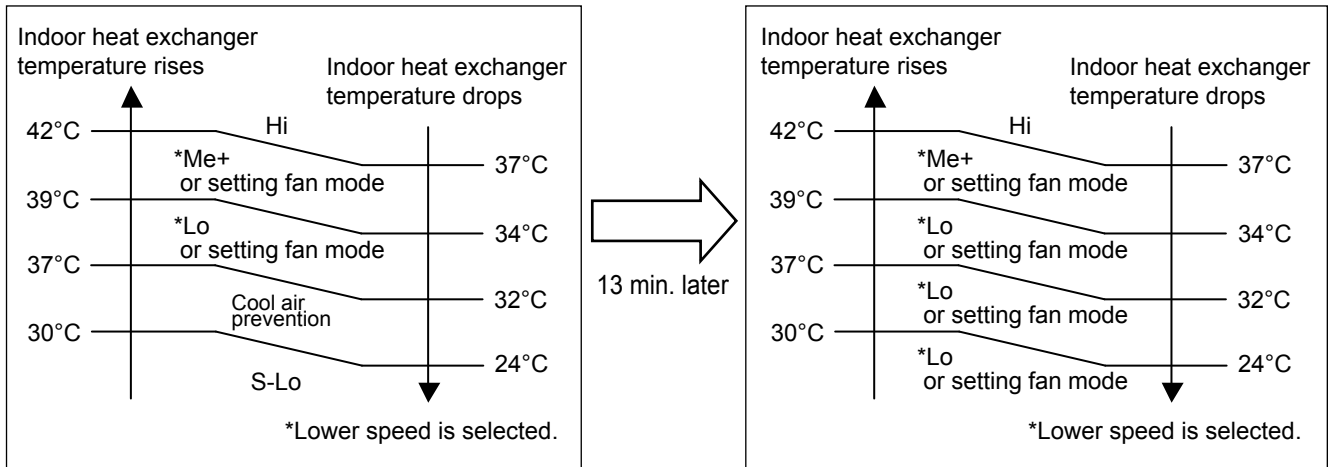


5. COOL AIR PREVENTION CONTROL (Heating mode)

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

When the compressor does not operate, the indoor fan motor operates [S-Lo] or [Stop] mode.

(Fig.7 : Cool Air Prevention Control)



6. DRY OPERATION

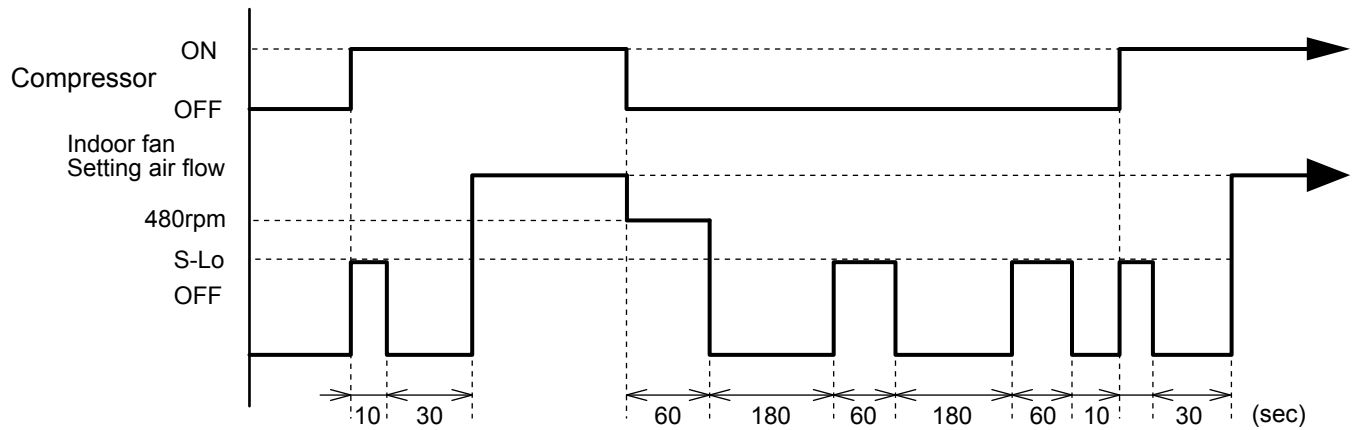
Refer to the table 5.

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

7. FAN CONTROL FOR ENERGY SAVING

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

(Fig 8 : Indoor Fan Control)



(◆ . . .Factory setting)

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

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

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

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

Set to "00" or "01" when connecting a remote controller that cannot set the Fan control for energy saving function or connecting a network converter.

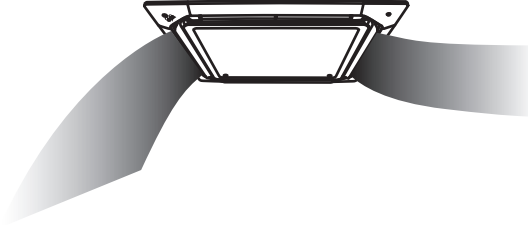
To confirm if the remote controller has this setting, refer to the operating manual of each remote controller.

1-6. AIR FLOW DIRECTION CONTROL

Individual control

To independently can be set the airflow pattern of each louver as this image.

(Fig.10 : Independent louver control image)

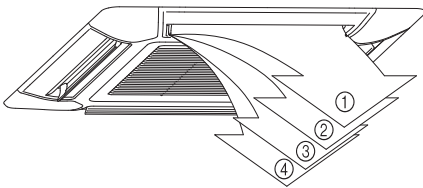


This function is given priority to overall louver control.
But this function is release during the following operation.

- Cold air prevention control
- Monitor mode on the auto change over operation
- Defrost operation

The air direction range will change as follows:

(Fig.11 : Air Direction Range)



Use the wired remote controller to set this function.

This function is only available by 2 wire remote controller.

*When the 2 wire remote controller is disconnected, clear the individual setting.
Otherwise, this setting can't change.

All louver control

- All louver operation

Cooling mode standard position: 2

Dry mode standard position: 2

Heating standard position : 4

Monitor mode position: 2

} When the mode is selected, the standard louver position of the each mode is set.

*Setting of the wireless remote controller is not displayed on the wired remote controller.

*The setting louver of the individual control function cannot be controlled.

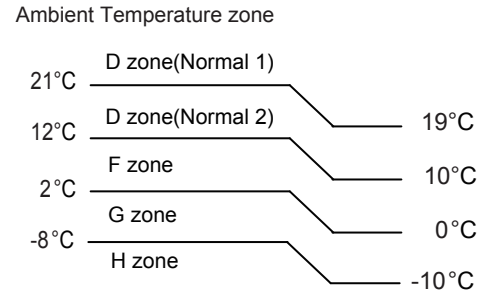
1-7. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

Following table shows the fan speed of the outdoor unit.

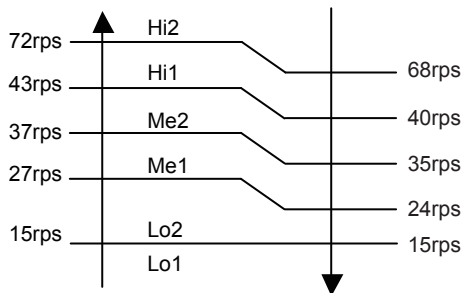
(Table 6 : Fan speed of the outdoor unit)

	Cooling	Heating	Dry	Low ambient cooling / Dry		
	Normal	Normal	Normal	F zone	G zone	H zone
S-Hi2	-	1100	-	-	-	-
S-Hi1	1100	1100	-	-	-	-
Hi3	1100	1050	-	-	-	-
Hi2	1100	1050	-	-	-	-
Hi1	870	780	530	430	350	250
Me2	870	720	-	-	-	-
Me1	720	590	530	370	300	250
Lo2	500	590	-	-	-	-
Lo1	500	480	530	300	260	200



Zone control (rps:Compressor frequency)

1) Cool / Heat (Normal)



2) Dry (Normal)

19rps and over	[Hi 1]
16rps and over	[Me 1]
16rps under	[Lo 1]

3) Cool / Dry / F zone

51rps and over	[Hi 1]
43rps and over	[Me 1]
43rps under	[Lo 1]

4) Cool / Dry / G zone

51rps and over	[Hi 1]
43rps and over	[Me 1]
43rps under	[Lo 1]

5) Cool / Dry / H zone

43rps and over	[Hi 1]
34rps and over	[Me 1]
34rps under	[Lo 1]

1-8. COMPRESSOR CONTROL

1. OPERATION FREQUENCY RANGE

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

(Table 7 : Compressor Operation Frequency Range)

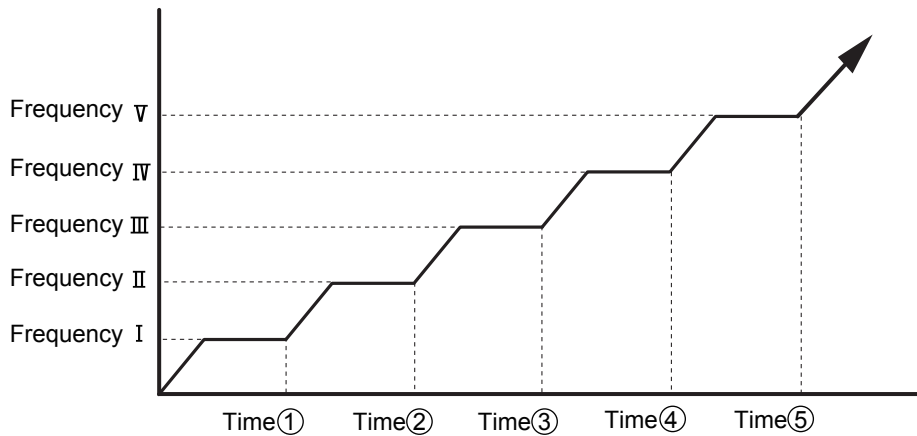
Cooling / Dry		Heating	
Min	Max	Min	Max
10rps	120rps	12rps	120rps

2. OPERATION FREQUENCY CONTROL AT START UP

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

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

Normal start-up



(Frequency)

Frequency I	Frequency II	Frequency III	Frequency IV	Frequency V
35rps	53rps	66rps	82rps	106rps

(Time)

Time 1	Time 2	Time 3	Time 4	Time 5
80sec	160sec	300sec	440sec	500sec

1-9. TIMER OPERATION CONTROL

1-9-1 Wired Remote Controller

UTY-RNR*Z1(2 wire remote controller)

- ON / TIMER
- OFF / TIMER
- WEEKLY TIMER

*3 wire remote controller can be connected

If 3 wire remote controller is connected, set the DIP-SW on the controller PCB

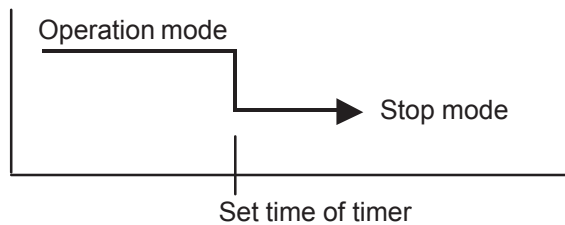
Refer to the installation manual for detailed.

If used in combination with wireless and wired remote controller, the following function is limited.

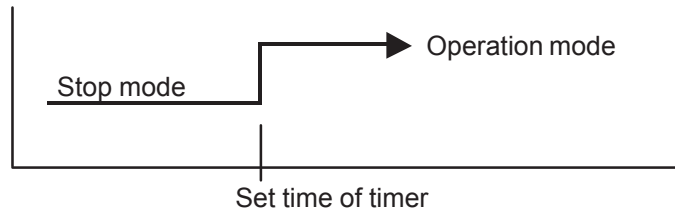
- Sleep timer
- Timer
- 10°C heat operation

1. ON / OFF TIMER

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



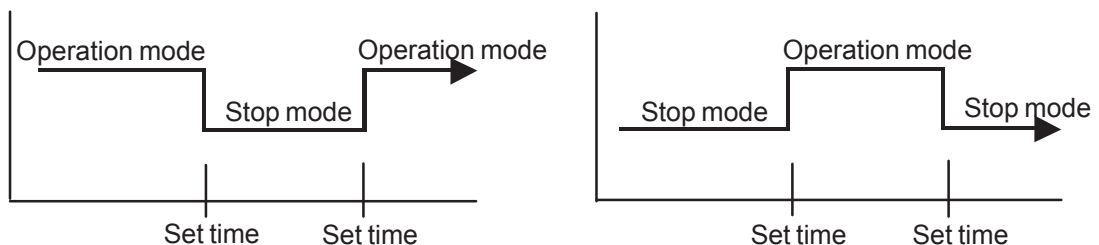
- ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. WEEKLY TIMER

2-1. WEEKLY TIMER

- Use this timer function to set operating time for each day of the week.
- The weekly timer allows up to two ON and OFF time to set up per day.

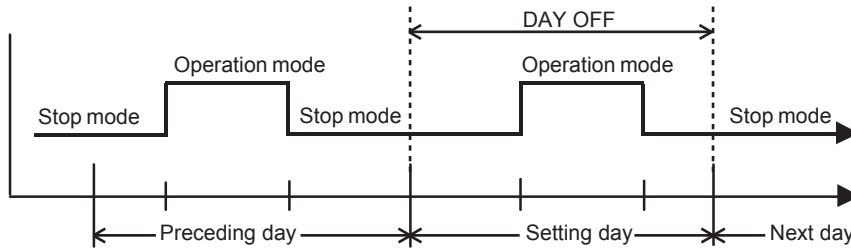


- The operating time can be set in 30 min increments only.
- The OFF time can be carried over to next day.
- The ON timer and the OFF timer functions cannot be set with using the weekly timer. Both ON and OFF time must be set.

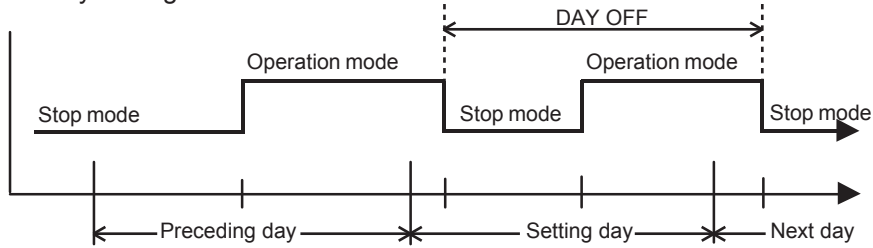
2-2. DAY OFF setting

- 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.

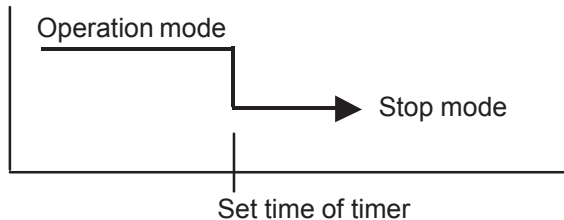
1-9-2 Wireless Remote Controller (OPTION)

AR-REJ1E

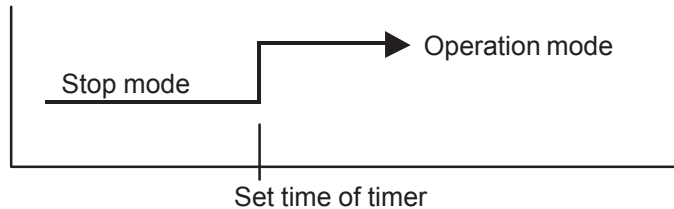
- ON / TIMER
- OFF / TIMER
- PROGRAM TIMER
- SLEEP TIMER

1. ON / OFF TIMER

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

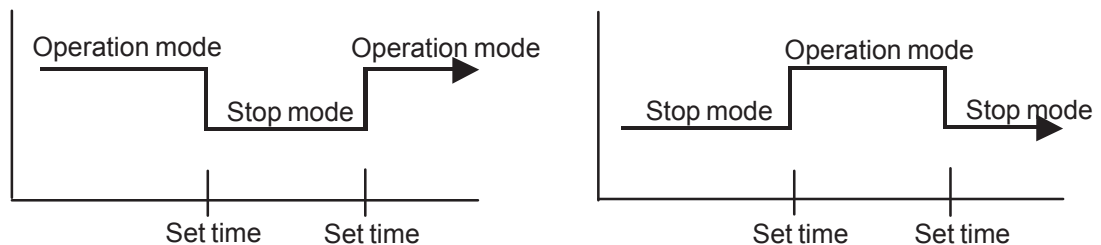


- ON timer : When the clock reaches the set time, the air conditioner will be turned on.



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

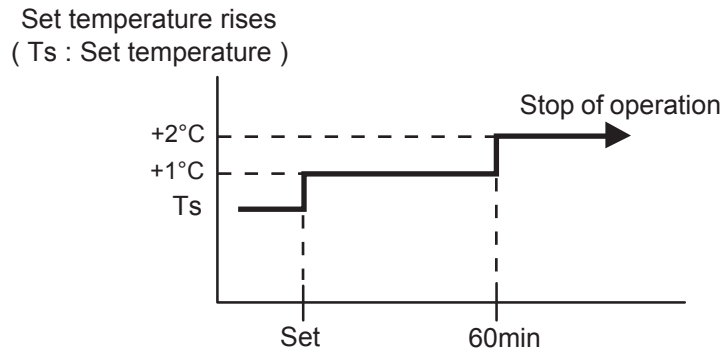
- If the sleep timer is set, the room temperature is monitored and the operation is stopped automatically. If the operation mode or the set temperature is change after the sleep timer is set, the operation is continued according to the changed setting of the sleep timer from that time ON.

In the COOLING operation mode

When the sleep timer is set, the setting temperature is increased 1 degC.

It increases the setting temperature another 1 degC after 1 hour.

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

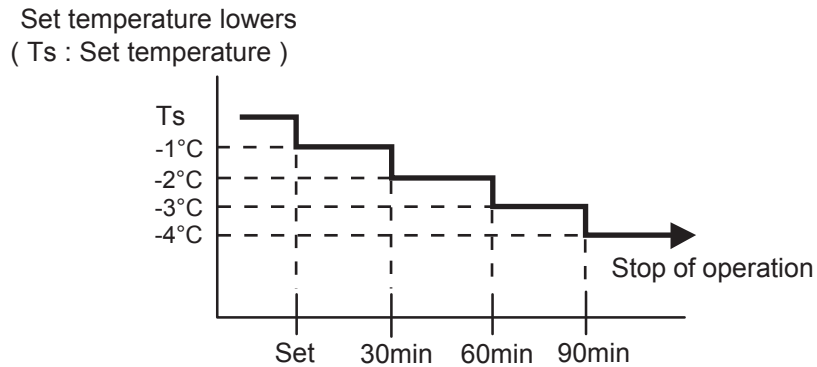


In the HEATING operation mode

When the sleep timer is set, the setting temperature is decreased 1 degC.

It decreases the setting temperature another 1 degC every 30 minutes.

Upon lowering 4 degC, the setting temperature is not changed and the operation stops at the time of timer setting.



1-10. ELECTRONIC EXPANSION VALVE CONTROL

The most proper opening of the electronic expansion valve is calculated and controlled under the present operating condition based on the following values.

The compressor frequency, the temperatures detected by the discharge temperature sensor and the outdoor temperature sensor.

The pulse range of the electronic expansion valve control is 52 ~ 480 pulses (Cooling) and 52 ~ 480 pulses (Heating).

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

1-11. TEST OPERATION CONTROL

▪ With Wired Remote Controller

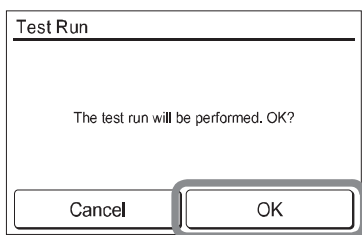
Touch the [Test run] in the “Maintenance” screen.
(Installer password* is required.)

The “Test Run” screen is displayed.

Touch [OK] to return to the Maintenance screen, and start the test run.

The test run will automatically end is approximately 60 min.

If you wish to cancel the test run before it is complete, return to the “Monitor Mode screen”, and touch the On/Off button.



*If the password has been changed from the default setting “0000”, please contact the installer.

▪ With Wireless Remote Controller

Under the condition where the air conditioner runs, press the TEST RUN button, and the test operation control mode will appear.

During test running, the Operation LED and Timer LED of the air conditioner body blinks simultaneously. Set the test operation mode, and the compressor will continue to run regardless of whether the room temperature sensor detects.

The test operation mode is released if 60 minutes have passed after setting up the test operation.

1-12. 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.

1-13. 4-WAY VALVE EXTENSION SELECT

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

1-14. 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 resumed with the memorized operation contents.

When the power is interrupted and recovered during timer operation, timer operation is canceled, but only setting time is memorized.

[Operation contents memorized when the power is interrupted]

- Operation mode
- Set temperature
- Set air flow
- Timer mode and timer time (Set by wireless remote controller)
- 10°C HEAT (Wireless remote controller is in use)
- ECONOMY
- Energy saving setting
- Each central setting

1-15. PUMP DOWN

PUMP DOWN OPERATION

To avoid discharging refrigerant into the atmosphere at the time of relocation or disposal recover refrigerant by doing the test run operation according to the following procedure.

- (1) Conduct preliminary operation for 5 to 10 minutes using the test run operation
For test run operation refer to the installation manual for the indoor unit.
- (2) Close the valve stem of 2-way valve completely.
- (3) Continue the test run operation for 2 to 3 minutes, then close all the valve stems or the 3-way valves.
- (4) Stop the operation.
 - Press the START/STOP button of the remote controller to stop the operation.

1-16. COMPRESSOR PREHEATING

When the outdoor temperature is lower than 0°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 25°C or greater, preheating is ended.

1-17. 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 can be set by the wireless remote controller. The 10°C HEAT operation is almost the same operation as below settings.

(Table9)

Mode	Heating
Setting temperature	10°C
Fan mode	AUTO

1-18. ECONOMY OPERATION

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

(Table10)

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

1-19. 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 Table11.

(Table 11 : 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 2 ND 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)	Less than 10min.*1 (For intermittent operation)
	- 3°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

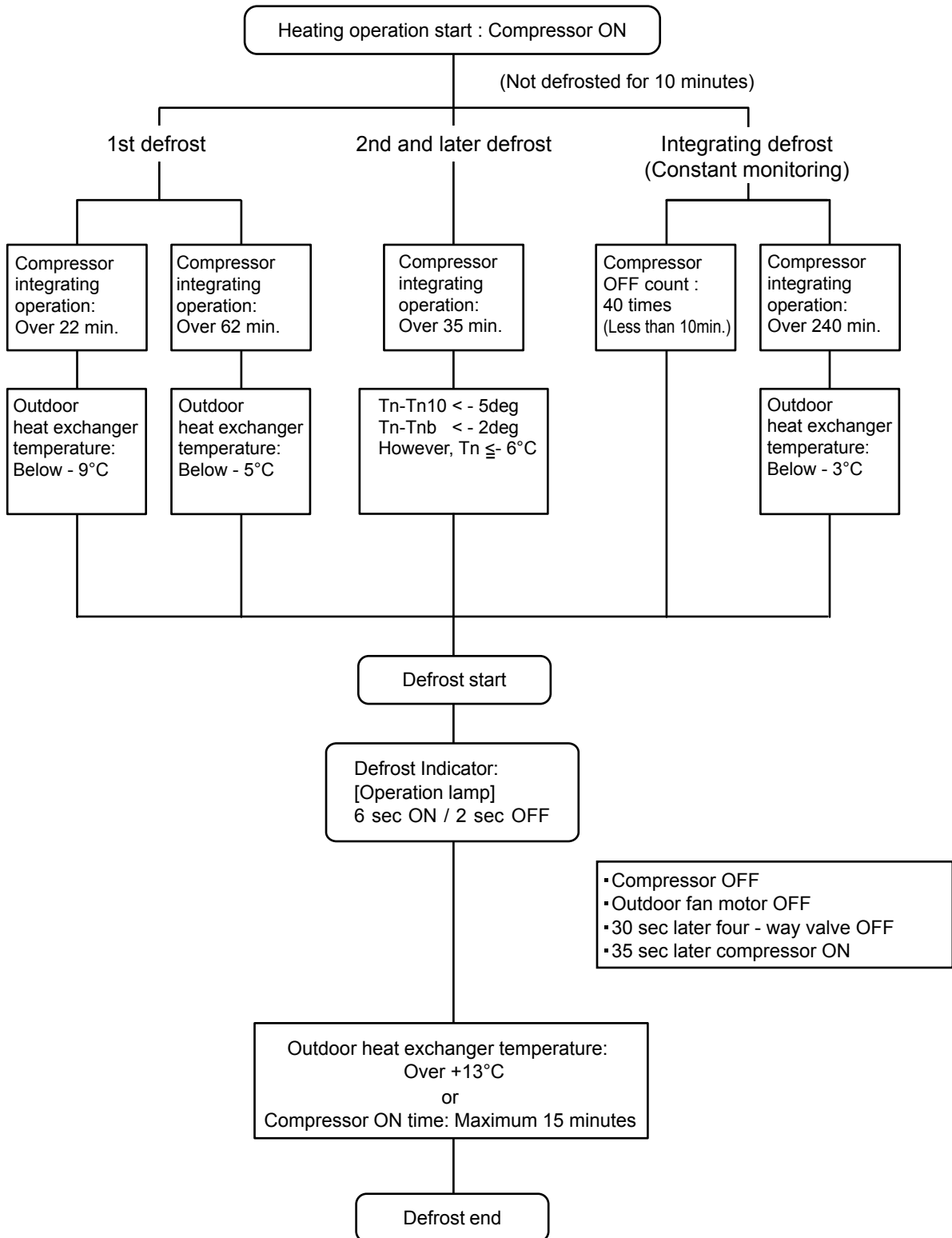
Defrost operation is released when the conditions become as shown in Table12.

(Table12 : 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.



1-20. OFF DEFROST OPERATION 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 (6 sec ON / 2 sec OFF), the outdoor unit will allow the heat exchanger to defrost, and then stop.

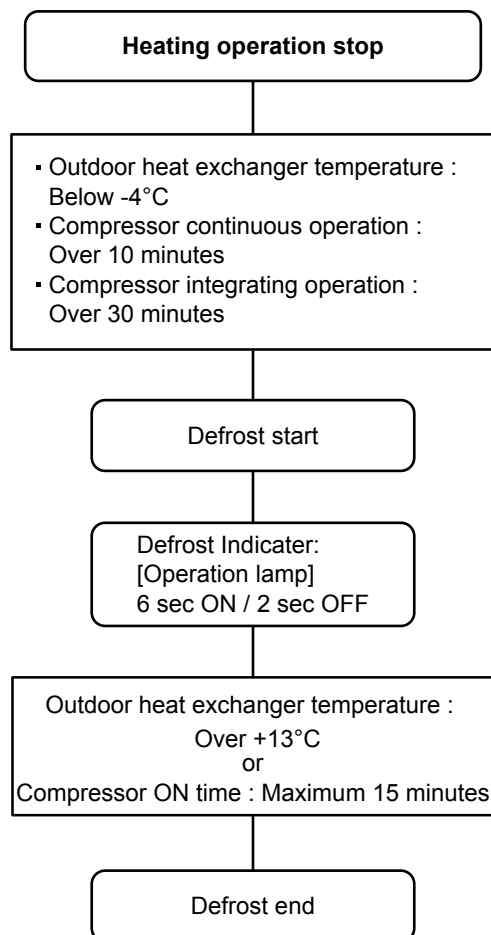
1. OFF DEFROST OPERATION CONDITION

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 $+13^{\circ}\text{C}$ or Compressor operation time has passed 15 minutes.

OFF Defrost Flow Chart



1-21. VARIOUS PROTECTIONS

1. DISCHARGE GAS TEMPERATURE OVERRISE PREVENTION CONTROL

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

When the discharge temperature becomes higher than Temperature I ,the compressor frequency is decreased 20rps, and it continues to decrease the frequency for 20rps every 120 seconds until the temperature becomes lower than Temperature I .

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

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

(Table14 : Discharge Temperature Over Rise Prevention Control / Release Temperature)

Temperature I	Temperature II	Temperature III
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 value that was set up with the outdoor temperature.

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

(Table 15 : Current release operation value / release value)

Model 18

[Heating]

OT (Control / Release)
17°C $\frac{7.0A}{6.5A}$
12°C $\frac{9.0A}{8.5A}$
5 °C $\frac{10.5A}{10.0A}$
$\frac{12.0A}{11.5A}$

OT : Outdoor Temperature

[Cooling]

OT (Control / Release)
50°C $\frac{4.5A}{4.0A}$
46°C $\frac{4.5A}{4.0A}$
40°C $\frac{6.0A}{5.5A}$
$\frac{8.5A}{8.0A}$

OT : Outdoor Temperature

Model 24

[Heating]

OT (Control / Release)
17°C $\frac{10.5A}{10.0A}$
12°C $\frac{13.0A}{12.5A}$
5 °C $\frac{15.0A}{14.5A}$
$\frac{17.0A}{16.5A}$

OT : Outdoor Temperature

[Cooling]

OT (Control / Release)
50°C $\frac{7.0A}{6.5A}$
46°C $\frac{7.0A}{6.5A}$
40°C $\frac{9.5A}{9.0A}$
$\frac{12.0A}{11.5A}$

OT : Outdoor Temperature

3. ANTIFREEZING CONTROL (Cooling and Dry mode)

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

(Table 16 : Anti-freezing Protection Operation / Release Temperature)

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

*1. When the temperature rises.

*2. When the temperature drops.

4. COOLING PRESSURE OVERRISE PROTECTION

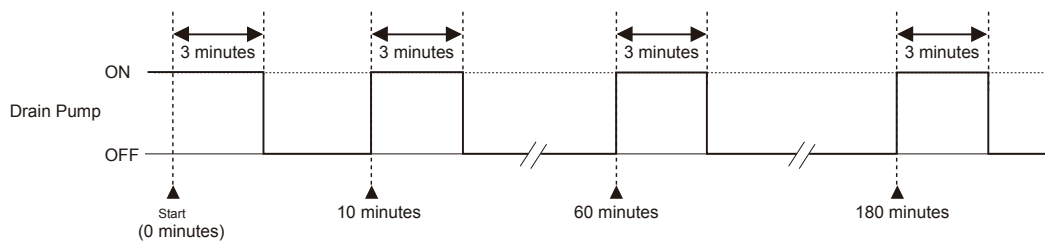
When the outdoor unit heat exchange sensor temperature rises to 67°C or greater, the compressor is stopped and trouble display is performed.

1-22. DRAIN PUMP OPERATION

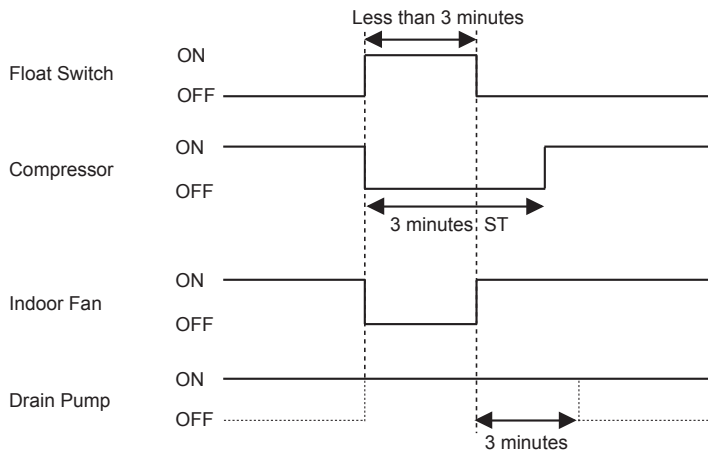
· During Cooling / Dry mode

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

(Fig 15 : Detail of Drain Pump Operation)

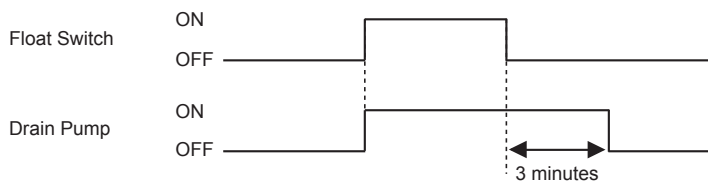


<Float Switch turns OFF less than 3 minutes>



· During Heating / Fan mode / Stop operation

1. When the water level in the drain pan rises up and then the float switch functions:
 - ① Drain pump operates continuously for 3 minutes after the float switch is turned off. (Almost condensing water may be drained)
2. When the float switch turns ON continuously for 3 minutes, "FAILURE INDICATION" operates. Thereafter, even if the float switch turns OFF, the "FAILURE INDICATION" is not released. (It is necessary to turn off power for release it.)



1-23. HUMAN SENSOR (OPTION)

Auto saving operation

If no one enters the room during the set time (15, 30, 60, 90, 120, 180 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).

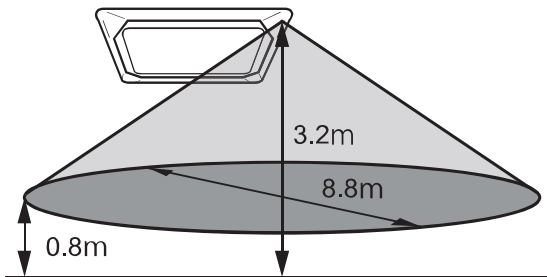
(Table 12)

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.	* High limit : 30°C
Heat	The set temperature will be decreased by a maximum of approximately 2°C.	* Low limit : 16°C

Auto off operation

If no one enters the room during the set time (1 to 24 hours in 1 hour increments), the air conditioner will automatically stop operation.

Example of sensitivity range



Equal sensitivity range of temperature	Ceiling height : 3.2m
	Detecting position : 0.8m from floor surface

Cassette type **INVERTER**

2 . TROUBLE SHOOTING

2 ERROR DISPLAY

2-1 INDOOR UNIT AND WIRED REMOTE CONTROLLER DISPLAY

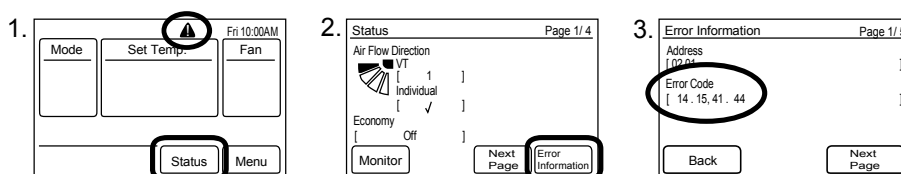
Check the Error LED display on the Indoor unit (IR Receiver *Option)

1. Check ECONOMY (Green) LED Blinking, it means the Error on the system. (Not blinking: No Error)
2. Count OPERATION (Green) LED blinks: The number of blinking means the first digit of Error code.
3. Count TIMER (Orange) LED blinks: The number of blinking means the second digit of Error code.

Example) ECONOMY: Blinking continuous / OPERATION: **4** times / TIMER: **1** time ⇒ Indoor Room Thermistor Error

Check the Error code on the wired remote controller (Remote controller *Option)

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. Example) 2WIRE remote controller



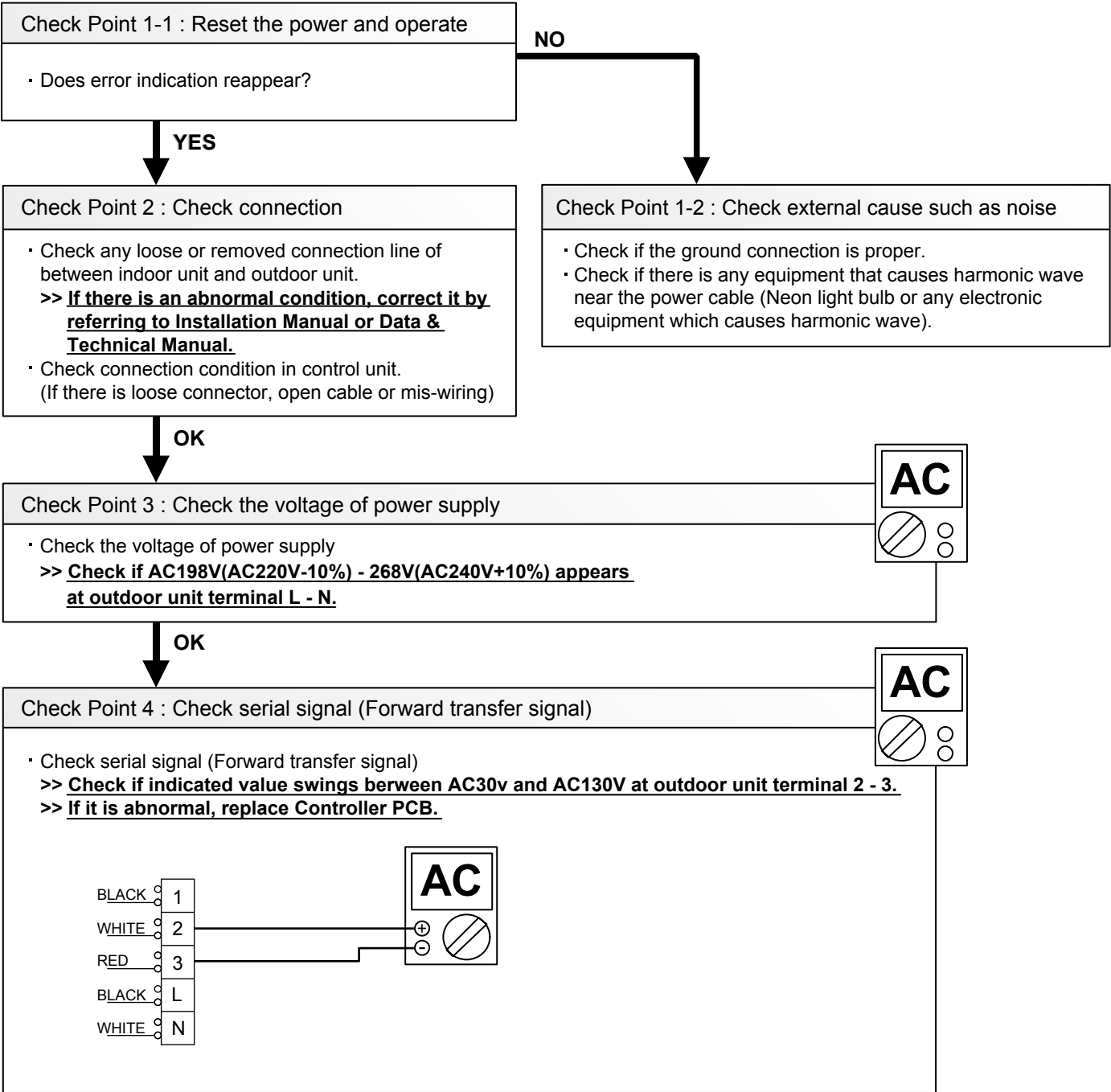
Error Contents	Error Code	Trouble shooting
Serial Communication Error	11	1,2
Wired Remote Controller Communication Error	12	3
External communication Error	18	4
Combination error	23	5
Indoor unit address setting Error	26	6
Connection unit number error (Indoor unit Wired remote controller Error)	29	7
Indoor unit PCB model information Error	32	8
Manual Auto SW error	35	9
Indoor unit Communication circuit (wired remote controller) Error	3A	10
Indoor Room Thermistor Error	41	11
Indoor Heat Ex. Thermistor Error	42	12
Human Sensor Error	44	13
Indoor Unit Fan Motor Error	51	14
Drain pump Error	53	15
Outdoor unit main PCB model information Error	62	16
Inverter Error	63	17

Error Contents	Error Code	Trouble shooting
PFC circuit Error	64	18
Trip terminal L Error	65	19
Discharge Thermistor Error	71	20
Compressor Thermistor Error	72	21
Heat Ex. Liquid Outlet Thermistor Error	73	22
Outdoor Thermistor Error	74	23
Heat Sink Thermistor Error	77	24
Current sensor Error	84	25
Pressure sensor Error	86	26
Trip detection	94	27
Compressor rotor position detection Error	95	28
Outdoor Unit Fan Motor Error	97	29
4-way Valve Error	99	30
Discharge Temp. Error	A1	31
Compressor Temp. Error	A3	32

Trouble shooting 2 INDOOR UNIT Error Method: Serial Communication Error (Serial Forward Transfer Error)	Indicate or Display: Error code : 11 Outdoor unit : No indication
--	--

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

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



Trouble shooting 3 <u>INDOOR UNIT Error Method:</u> Wired Remote Controller Communication Error	Indicate or Display: Error code : 12 Outdoor unit : No indication
---	--

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

Forecast of Cause:
1. Connection failure 2. Wired Remote Controller failure 3. Controller PCB failure

Check Point 1 : Check the connection of terminal

After turning off the power,
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.



Check Point 1-2 : Check Wired Remote Controller and Controller PCB

- Ceck Voltage at CN14 of Controller PCB. (Terminal 1-3, Terminal 1-2)
(Power supply for the Remote Control)

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



Check Point 2 : Wire installation Wrong RCgroup setting

- Wrong wire connection in RCgroup (Please refer to the installation manual)
- The number of connecting indoor unit and Remote controller in one RCgroup were less than 32 units.



Check Point 2-1 : Check Indoor unit controller PCB

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

Trouble shooting 6 INDOOR UNIT Error Method: Indoor unit address setting error	Indicate or Display: Error code : 26 Outdoor unit : No indication
--	---

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 <u>INDOOR UNIT Error Method:</u> Connection unit number error (Indoor unit in Wired remote controller system)	<u>Indicate or Display:</u> Error code : 29 Outdoor unit : No indication
---	--

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



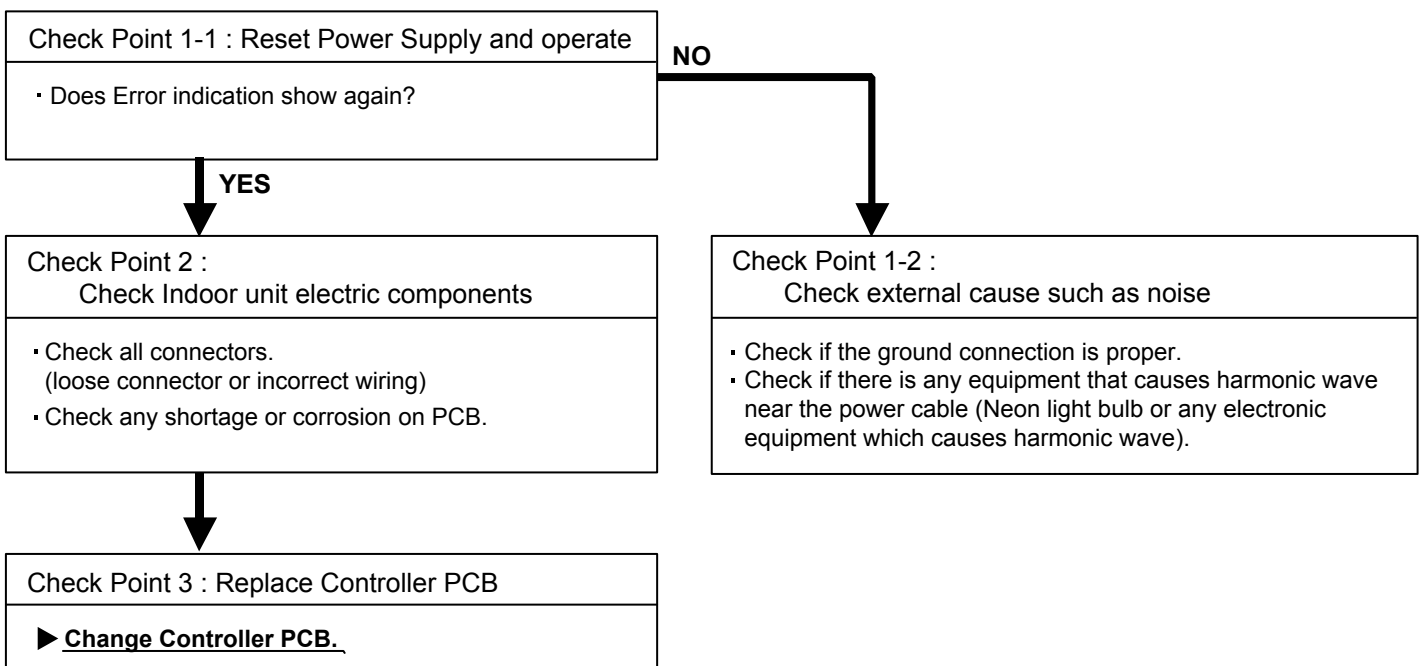
Check Point 2 : Check Indoor unit controller PCB

- 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 PCB model information error	Indicate or Display: Error code : 32 Outdoor unit : No indication
---	---

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

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



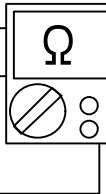
Note : EEPROM

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: ERROR CODE : 35 Outdoor unit : No indication
--	--

Detective Actuators: Indoor Unit Controller PCB Indicator PCB Manual Auto Switch	Detective details: 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	
<ul style="list-style-type: none"> • Check if Manual Auto Switch is kept pressed. • Check ON/OFF switching operation by using a meter. >> <u>If Manual Auto Switch is disabled (on/off switching), replace it.</u> 	



Check Point 2 : Replace Controller PCB and Indicator PCB
▶ <u>If Check Point 1 do not improve the symptom, replace Controller PCB and Indicator PCB and execute the check operation again.</u>

Trouble shooting 10 <u>INDOOR UNIT Error Method:</u> Indoor unit Communication circuit (wired remote controller) error	<u>Indicate or Display:</u> Error code : 3A Outdoor unit : No indication
---	--

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

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

Check Point 1 : Check the connection of terminal

After turning off the power supply, check & correct the followings
 Indoor unit - Check the connection the communication PCB and the controller PCB



Check Point 2 : Replace the communication PCB

If the Check point 1 is ok, replace the communication PCB



Check Point 3 : Replace the controller PCB

If condition is doesn't change, replace the controller PCB

Trouble shooting 11 INDOOR UNIT Error Method: Indoor Room Thermistor Error	Indicate or Display: Error code : 41 Outdoor unit : No indication
---	---

Detective Actuators: Indoor Unit Controller PCB Circuit Indoor Temperature Thermistor	Detective details: Indoor unit thermistor is open or short is detected always.
--	--


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

Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value 


Thermistor Characteristics(Rough value)

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

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

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



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

Make sure circuit diagram of each indoor unit and check terminal voltage at Thermistor (DC5.0V)

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

Trouble shooting 12 <u>INDOOR UNIT Error Method:</u> Indoor Heat Ex. Thermistor Error	<u>Indicate or Display:</u> Error code : 42 Outdoor unit : No indication
--	--

<u>Detective Actuators:</u> Indoor Unit Controller PCB Heat Exchanger (MID) Thermistor	<u>Detective details:</u> Indoor unit thermistor is open or short is detected always.
---	---

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

Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics(Rough value)

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

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

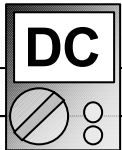
► If Thermistor is either open or shorted, replace it and reset the power.



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 <u>INDOOR UNIT Error Method:</u> Human sensor error	<u>Indicate or Display:</u> Error code : 44 Outdoor unit: No indication
--	--

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

<u>Forecast of Cause:</u> 1. Connection failure 2. Sensor failure 3. Indoor unit Main PCB failure

Check Point 1 : Check the connector connection and cable open <input type="checkbox"/> Check if connector is loose or removed <input type="checkbox"/> Check erroneous connection <input type="checkbox"/> Check if sensor cable is open >>Reset Power when reinstalling due to removed connector or incorrect wiring.

↓ **OK (Sensor connections error)**

↓ **OK(Sensor signal 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

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 <u>INDOOR UNIT Error Method:</u> Indoor Unit Fan Motor Error	<u>Indicate or Display:</u> Error code : 51 Outdoor unit : No indication
---	--

<u>Detective Actuators:</u> Indoor unit Power Supply PCB Indoor unit fan motor	<u>Detective details:</u> When the fan motor speed is less than 1/3 of the target fan speed for 56 seconds. When detect the 0 rpm for 56 seconds after fan motor started.
---	--

<u>Forecast of Cause:</u> 1. Fan rotation failure 2. Fan motor winding open 3. Motor protection by surrounding temperature rise 4. Power Supply PCB failure 5. Indoor unit fan motor failure

Check Point 1 : Check rotation of Fan
<ul style="list-style-type: none"> · Rotate the fan by hand when operation is off. (Check if fan is caught, dropped off or locked motor) >><u>If Fan or Bearing is abnormal, replace It.</u>



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



Check Point 3 : Check Indoor unit fan motor
<ul style="list-style-type: none"> · Check Indoor unit fan motor. (PARTS INFORMATION 4) >><u>if Indoor unit fan motor is abnormal, replace Indoor unit fan motor.</u>



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

<p>Trouble shooting 19 <u>OUTDOOR UNIT Error Method:</u> Trip terminal L error</p>	<p><u>Indicate or Display:</u> Error code : 65 Outdoor unit : No indication</p>
---	---

<p><u>Detective Actuators:</u> Outdoor unit Main PCB</p>	<p><u>Detective details:</u> When the signal from FO terminal of IPM is "L"(=0V) while the compressor stops.</p>
--	--

<p><u>Forecast of Cause:</u> 1. Outdoor unit Main PCB failure</p>
--

<p>Check Point 1 : Replace Main PCB</p>
<p>▶ <u>Replace Outdoor unit Main PCB.</u></p>

Trouble shooting 20 OUTDOOR UNIT Error Method: Discharge Thermistor Error	Indicate or Display: Error code : 71 Outdoor unit : No indication
--	---

Detective Actuators: Discharge temperature thermistor	Detective details: <ul style="list-style-type: none"> • Discharge temperature thermistor short detected • Discharge thermistor open detected
---	---


Forecast of Cause : <ol style="list-style-type: none"> 1. Connector connection failure, open 2. Thermistor failure 3. Main PCB failure
--

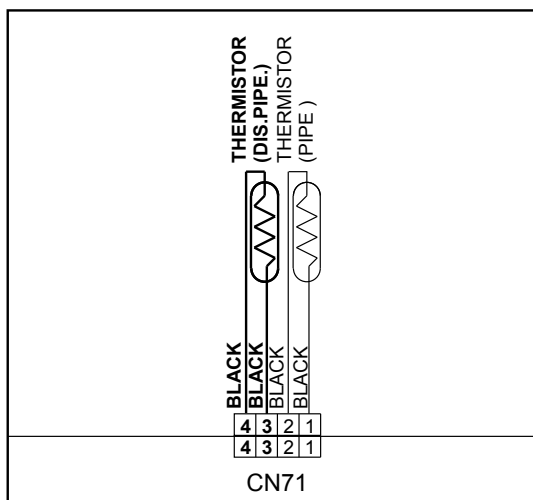
Check Point 1 : Check the connector connection and cable open
<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check



Check Point 2 : Check the thermistor
<input type="checkbox"/> Thermistor characteristics check (Disconnect the thermistor from the PCB and check.) * For the thermistor characteristics, refer to the "Service Parts Information 8".



Check Point 3 : Check voltage of Main PCB (DC5.0V)	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> DC  </div>
<input type="checkbox"/> Main PCB CN71:3-4 voltage value =5V <u>Remove the thermistor from Main PCB, check the voltage.</u>	



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

Trouble shooting 22 OUTDOOR UNIT Error Method: Heat Ex. Outlet Temp. Thermistor Error	Indicate or Display: Error code : 73 Outdoor unit : No indication
--	--

Detective Actuators: Heat exchanger liquid temperature thermistor	Detective details: • Heat exchanger outlet temperature thermistor short or open detected
---	--


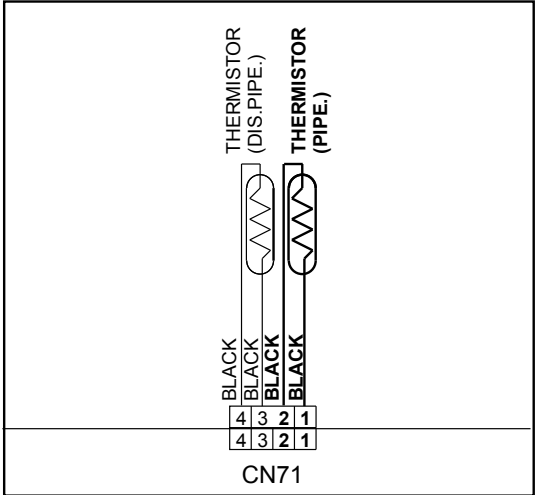
Forecast of Cause : <ol style="list-style-type: none"> 1. Connector connection defective, open 2. Thermistor failure 3. Main PCB failure
--

Check Point 1 : Check the connector connection and cable open
<input type="checkbox"/> Connector connection state check <input type="checkbox"/> Cable open check



Check Point 2 : Check the thermistor
<input type="checkbox"/> Thermistor characteristics check (Disconnect the thermistor from the PCB and check.) * For the thermistor characteristics, refer to the "Service Parts Information 8".



Check Point 3 : Check voltage of Main PCB (DC5.0V)	<div style="border: 1px solid black; padding: 2px; width: 30px; margin: 0 auto;">DC</div> 
<input type="checkbox"/> Main PCB CN71:1-2 voltage value =5V <u>Remove the thermistor from Main PCB, check the voltage.</u>	
	
<p>▶ <u>If the voltage does not appear, replace Main PCB, and execute the check operation again.</u></p>	

<p>Trouble shooting 24 <u>OUTDOOR UNIT Error Method:</u> Heat Sink Thermistor Error</p>	<p><u>Indicate or Display:</u></p> <p>Error code : 77 Outdoor unit : No indication</p>
--	---

<p><u>Detective Actuators:</u></p> <p>Outdoor unit Main PCB</p>	<p><u>Detective details:</u></p> <ul style="list-style-type: none"> ▪ Heat sink temperature thermistor (Built-in IPM) open/short detected
--	---

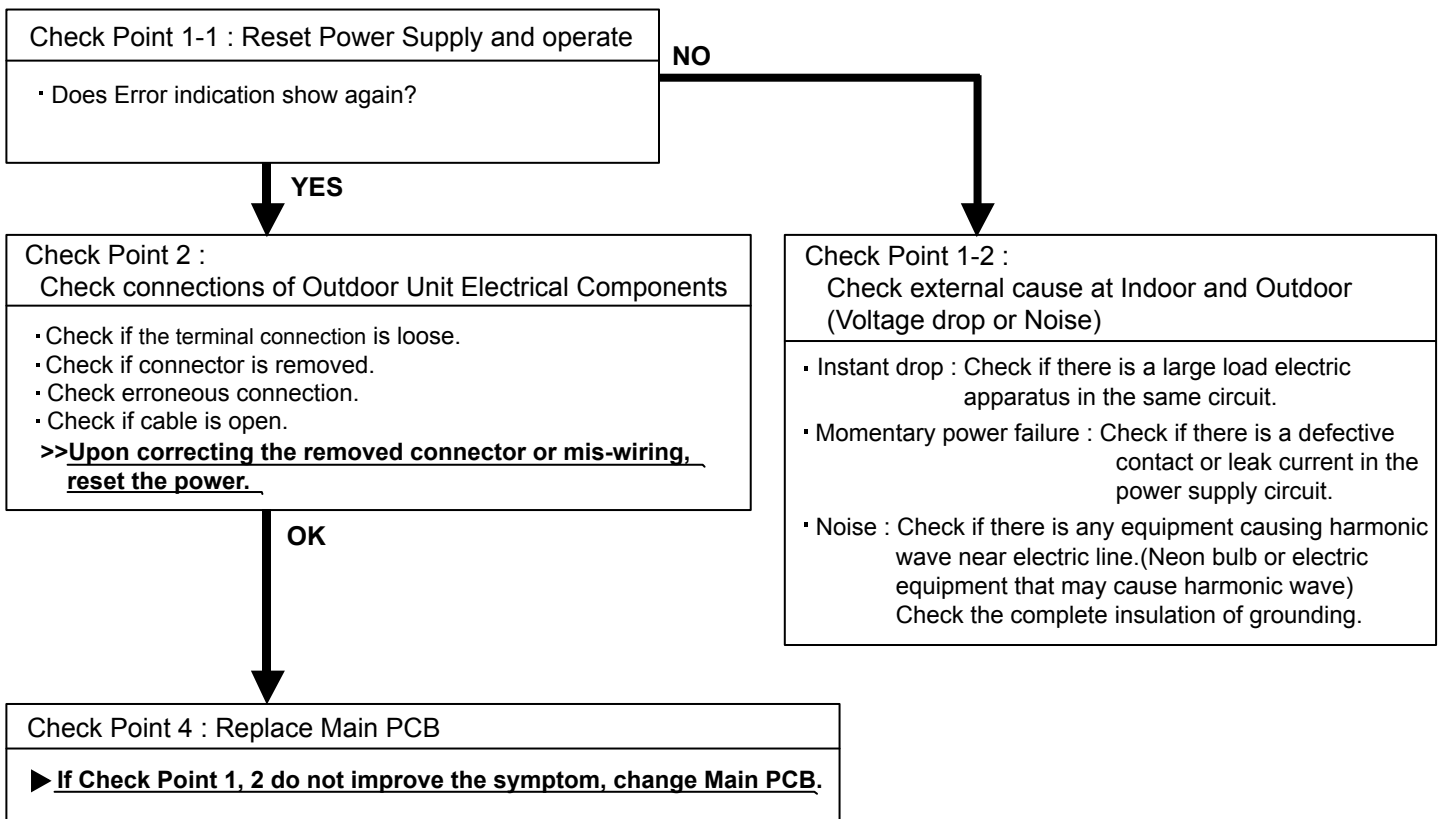
<p><u>Forecast of Cause :</u> 1. Main PCB failure ▶ <u>If this error is displayed, replace Main PCB</u></p>
--

Attention!!
This unit does not have a heat sink themistor
In this case, replace Main PCB

Trouble shooting 25 OUTDOOR UNIT Error Method: Current sensor error	Indicate or Display: Error code : 84 Outdoor unit : No indication
--	---

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
--



Trouble shooting 26 OUTDOOR UNIT Error Method: Pressure Sensor Error	Indicate or Display: Error code : 86 Outdoor unit : No indication
---	---

Detective Actuators: High pressure switch	Detective details: <ul style="list-style-type: none"> When the power was turned on, "high pressure switch : open" was detected.
---	--

Forecast of Cause : <ol style="list-style-type: none"> High pressure switch connector disconnection, open High pressure switch characteristics failure Main PCB failure

Check Point 1 : Check the high pressure switch connection state
<input type="checkbox"/> Connector and wiring connection state check <input type="checkbox"/> Cable open check

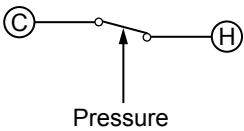
↓ **OK**

Check Point 2 : Check the high pressure switch characteristics
<input type="checkbox"/> Switch characteristics check * For the characteristics of high pressure switch, refer to below.

↓ **OK**

Check Point 3 : Replace Main PCB
<input type="checkbox"/> Change Main PCB, and execute the check operation again.

▪ Type of contact



▪ Characteristics of pressure switch (CN 74)

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

Trouble shooting 29 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor Error	Indicate or Display: Error code : 97 Outdoor unit : No indication
--	---

Detective Actuators: Outdoor unit Main PCB Outdoor unit fan motor	Detective details: ① When outdoor fan rotation speed is less than 100rpm in 20 seconds after fan motor starts, fan motor stops. ② After fan motor restarts, if the same operation within 60sec is repeated 3 times in a row, compressor and fan motor stops. ③ If ① and ② repeats 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
<ul style="list-style-type: none"> Rotate the fan by hand when operation is off. (Check if fan is caught, dropped off or locked motor) <p>>>If Fan or Bearing is abnormal, replace it.</p>

↓
OK

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

↓
OK

Check Point 3 : Check Outdoor unit fan motor
<ul style="list-style-type: none"> Check Outdoor unit fan motor. (PARTS INFORMATION 5) <p>>>If Outdoor Fan Motor is abnormal, replace Outdoor fan motor and Main PCB.</p>

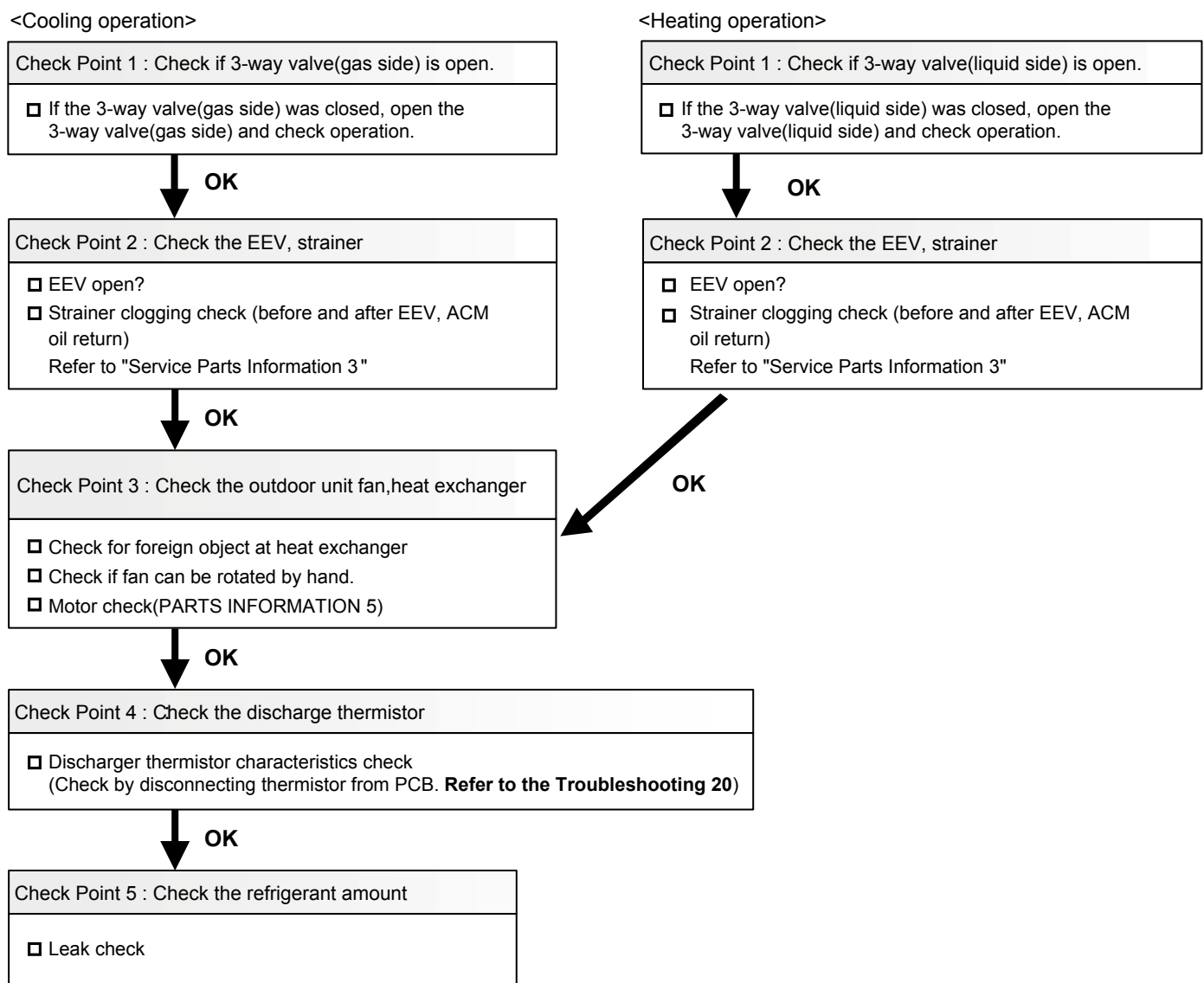
↓
OK

Check Point 4 : Check Output Voltage of Main PCB	DC 						
<ul style="list-style-type: none"> Check outdoor unit circuit diagram and the voltage. (Measure at Main PCB side connector) 							
	<table border="1"> <thead> <tr> <th>Read wire</th> <th>DC voltage</th> </tr> </thead> <tbody> <tr> <td>Red - Black</td> <td>280V (AC220V-10%) ~ 373V (AC240+10%)</td> </tr> <tr> <td>White - Black</td> <td>15 ± 1.5V</td> </tr> </tbody> </table>	Read wire	DC voltage	Red - Black	280V (AC220V-10%) ~ 373V (AC240+10%)	White - Black	15 ± 1.5V
Read wire	DC voltage						
Red - Black	280V (AC220V-10%) ~ 373V (AC240+10%)						
White - Black	15 ± 1.5V						
▶ If the voltage is not correct, replace Main PCB.							

Trouble shooting 31 OUTDOOR UNIT Error Method: Discharge Temp. Error	Indicate or Display: Error code : A1 Outdoor unit : No indication
---	---

Detective Actuators: Discharge temperature thermistor	Detective details: <ul style="list-style-type: none"> ▪ "Protection stop by "discharge temperature $\geq 115^{\circ}\text{C}$ during compressor operation"" generated 2 times within 24 hours.
---	--

Forecast of Cause : <ol style="list-style-type: none"> 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



Trouble shooting 32 OUTDOOR UNIT Error Method: Compressor Temp. Error	Indicate or Display: Error code : A3 Outdoor unit : No indication
--	---

Detective Actuators: Compressor temperature thermistor	Detective details: <ul style="list-style-type: none"> ▪ "Protection stop by "compressor temperature" $\geq 110^{\circ}\text{C}$ during compressor operation""generated 2 times within 24 hours
--	--

Forecast of Cause : <ol style="list-style-type: none"> 1. 3-way valve not opened 2. EEV defective, strainer clogged 3. Outdoor unit operation failure, foreign matter on heat exchanger 4. Compressor temperature thermistor failure 5. Insufficient refrigerant
--

<Cooling operation>

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

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

↓ **OK**

Check Point 2 : Check the EEV, strainer

EEV open?
 Strainer clogging check (before and after EEV, ACM oil return)
Refer to "Service Parts Information 3".

↓ **OK**

Check Point 3 : Outdoor unit fan, heat exchanger check

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

↓ **OK**

Check Point 4 : Check the compressor temperature thermistor

Compressor temperature thermistor characteristics check
(Check by disconnecting thermistor from PCB **Refer to the Troubleshooting 21)**)

↓ **OK**

Check Point 5 : Check the refrigerant amount

Leak check

<Heating operation>

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

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

↓ **OK**

Check Point 2 : Check the EEV, strainer

EEV open?
 Strainer clogging check (before and after EEV, ACM oil return)
Refer to "Service Parts Information 3 "

↙ **OK**

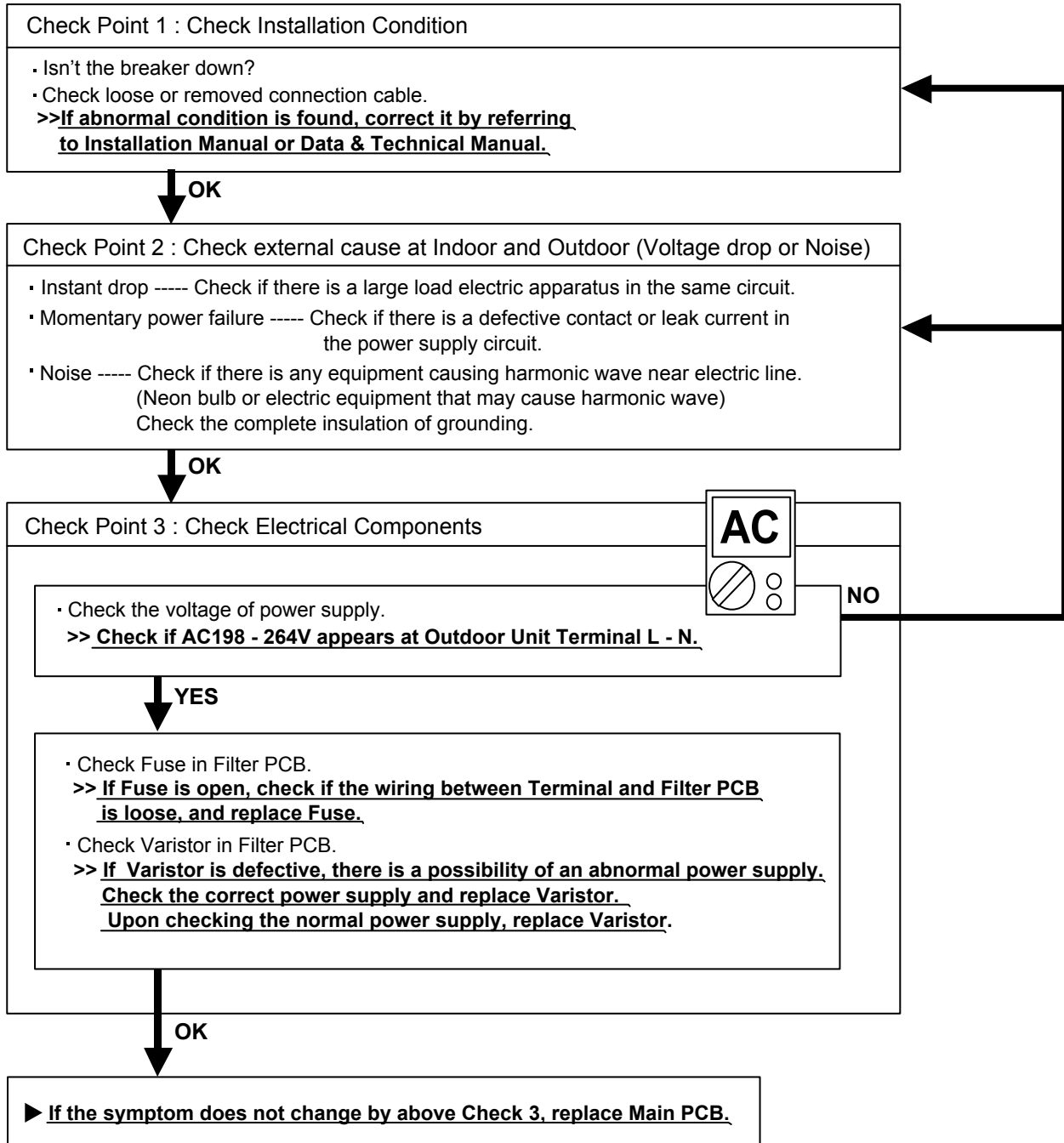
2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 33

Indoor Unit - No Power

Forecast of Cause:

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



Trouble shooting 34

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

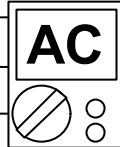
- Check the voltage of power supply.
- >> Check if AC198 - 264V appears at Outdoor unit Terminal L - N.**

YES

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

OK

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



NO

Trouble shooting 35

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 CN14 of Controller PCB. (terminal 1-3)
(Power supply to Remote Control)

- >> **If it is DC13V, Remote Control is failure. (Controller PCB is normal) >> Replace Remote Control**
- >> **If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB**
- >> **If the symptom does not change by above Check 1, 2, 3, replace Main PCB of Outdoor unit.**

Trouble shooting 36

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.



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?



Check Point 3 : Check Site Condition

- Is capacity of Indoor Unit fitted to Room size?
- Any windows open? Or direct sunlight ?



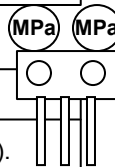
Check Point 4 : Check Indoor/ Outdoor Installation Condition

- 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.**



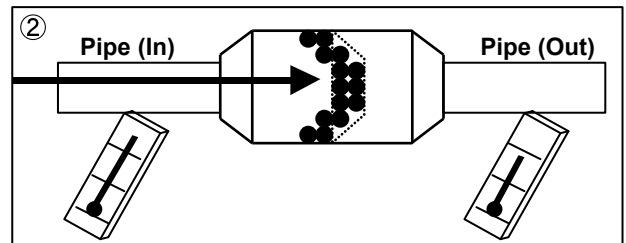
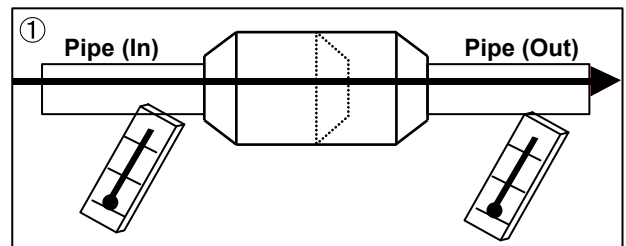
Check Point 5 : Check Refrigeration Cycle

- 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 in ①, but if there is a difference like shown in ②, there is a possibility of inside clogged. In this case, replace Strainer.



Trouble shooting 37

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

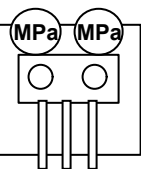
- Is Fan rotating?

Diagnosis method when water is spitting out.

- Is the filter clogged?

OK

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

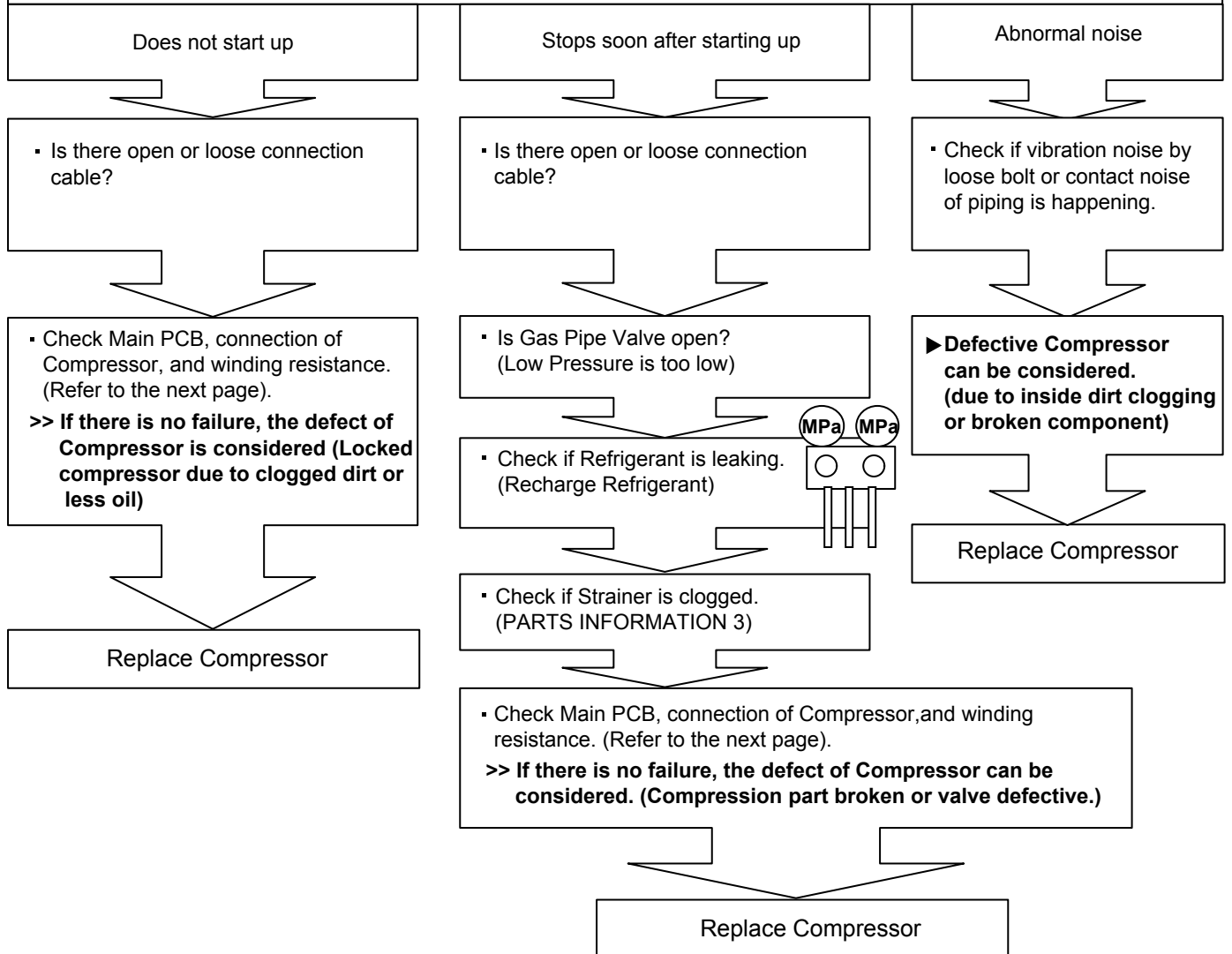


2-4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

Diagnosis method of Compressor (If Outdoor Unit LED displays Error, refer to Trouble shooting)

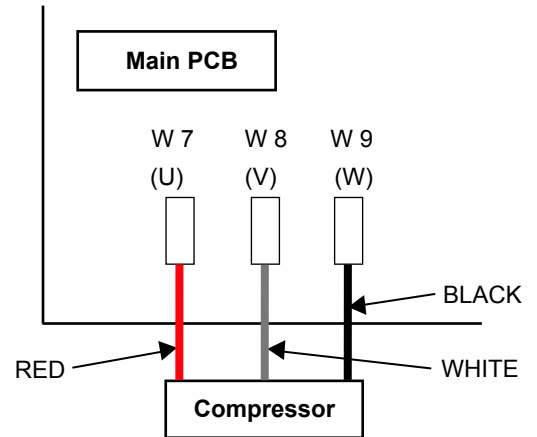
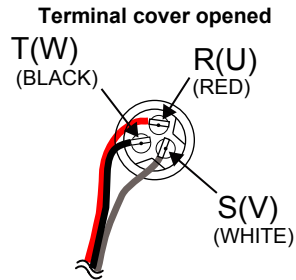
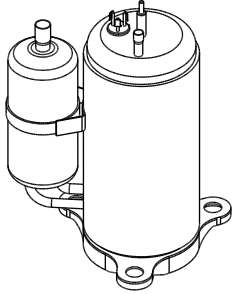


SERVICE PARTS INFORMATION 2

Inverter Compressor

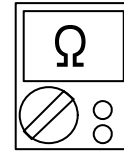
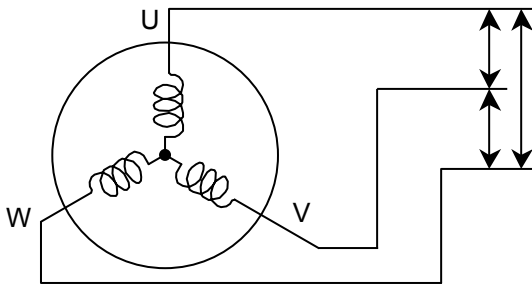
Check Point 1 : Check Connection

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



Check Point 2 : Check Winding Resistance

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



Check Point 3 : Replace Main PCB

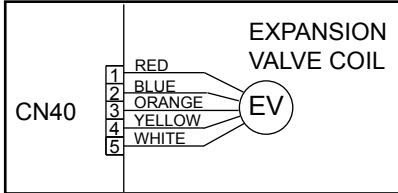
- ▶ **If the symptom does not change with above Check 1, 2, replace Main PCB.**

SERVICE PARTS INFORMATION 3

Outdoor unit Electronic Expansion Valve (EEV)

Check Point 1 : Check Connections

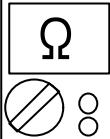
- Check connection of connector (Loose connector or open cable)



Check Point 2 : Check Coil of EEV

- Remove connector, check each winding resistance of Coil.

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



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

Check Point 3 : Check Noise at start up

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

Check Point 4 : Check Voltage from Main PCB.

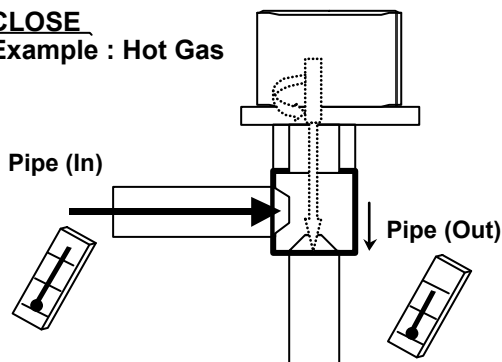
- Remove Connector and check Voltage (DC12V)
- **If it does not appear, replace Main PCB.**



Check Point 5 : Check Opening and Closing Operation of Valve

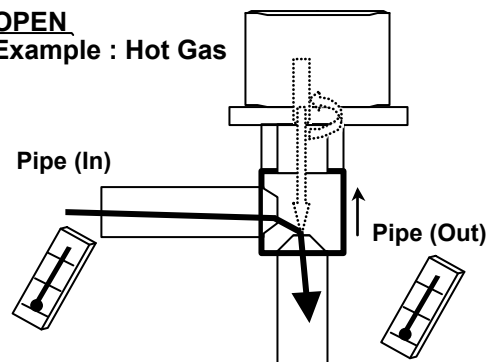
When Valve is closed, it has a temp. difference between Inlet and Outlet.

CLOSE
Example : Hot Gas



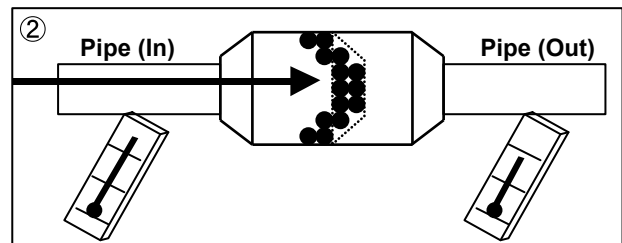
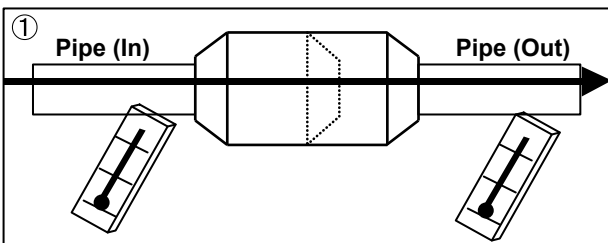
If it is open, it has no temp. difference between Inlet and Outlet.

OPEN
Example : Hot Gas



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

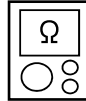
Check Point 1 : Check rotation of Fan

- 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 unit 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)	(GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown)	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)

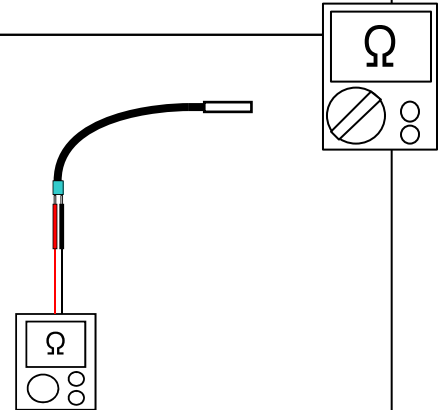
SERVICE PARTS INFORMATION 8

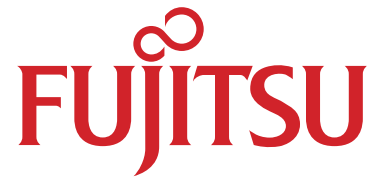
Thermistor

Check Point : Check Thermistor resistance value

- Remove connector and check Thermistor resistance value.

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





FUJITSU GENERAL LIMITED

3-3-17, Suenaga, Takatsu-ku, Kawasaki 213-8502, Japan