SPLIT TYPE
ROOM AIR CONDITIONER

WALL MOUNTED type

INVERTER

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	AS*G24LFCA	AO*G24LFL
	AS*G24LFCC	AO*G24LFCC
	AS*G30LFCA	AO*G30LFT

Refrigerant
R410A

FUJITSU GENERAL LIMITED

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Refrigerant
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WALL MOUNTED type
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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 2°C higher than a set temperature, the compressor operation frequency will attain to maximum performance.

* If the room temperature is some degrees lower than a set temperature, the compressor will be stopped.

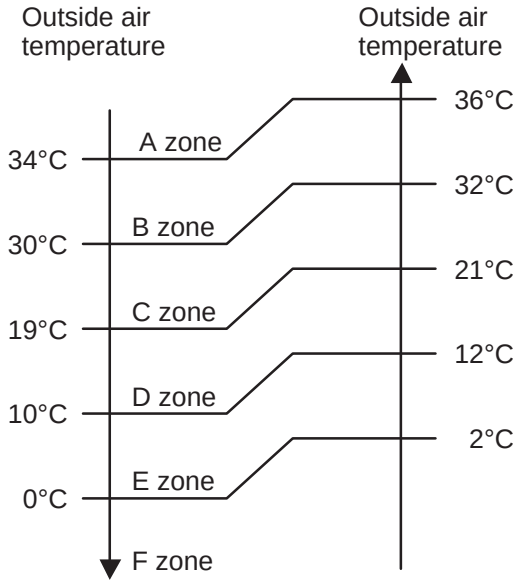
* When the room temperature is between +2°C to -2.5°C of the setting temperature, the compressor frequency is controlled within the range shown in Table1. However, the maximum frequency is limited in the range shown in Fig.1 based on the fan speed mode and the outdoor temperature.

(Table 1 : Compressor Frequency Range)

	minimum frequency	maximum frequency Ⅱ	maximum frequency Ⅰ
AO*G24LFL	15rps	88rps	95rps
AO*G24LFCC	13rps	80rps	111rps
AO*G30LFT	16rps	51rps	72rps

When the compressor operates for 30 minutes continuously at over the maximum frequency Ⅱ, the maximum frequency is changed from Maximum Frequency Ⅰ to Maximum Frequency Ⅱ.

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



		Hi	Me	Lo	Quiet
24LFL	A zone	95rps	74rps	62rps	38rps
	B zone	95rps	74rps	62rps	38rps
	C zone	95rps	74rps	62rps	38rps
	D zone	68rps	51rps	42rps	26rps
	E zone	68rps	51rps	42rps	26rps
	F zone	68rps	51rps	42rps	26rps
24LFCC	A zone	111rps	67rps	56rps	34rps
	B zone	111rps	67rps	56rps	34rps
	C zone	111rps	67rps	56rps	34rps
	D zone	62rps	47rps	40rps	25rps
	E zone	62rps	47rps	40rps	25rps
	F zone	62rps	47rps	40rps	25rps
30LFT	A zone	72rps	49rps	41rps	29rps
	B zone	72rps	49rps	41rps	29rps
	C zone	55rps	41rps	36rps	29rps
	D zone	41rps	36rps	31rps	20rps
	E zone	41rps	36rps	31rps	20rps
	F zone	41rps	36rps	31rps	20rps

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 3°C than a set temperature, the compressor operation frequency will attain to maximum performance.
* If the room temperature is some degrees higher than a set temperature, the compressor will be stopped.
* When the room temperature is between +2.5°C to -3°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
AO*G24LFL	16rps	133rps
AO*G24LFCC	14rps	120rps
AO*G30LFT	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.
However, after the compressor is driven, the indoor unit shall run at operation frequency of 68rps (24L), 43rps (30L), for a minute.

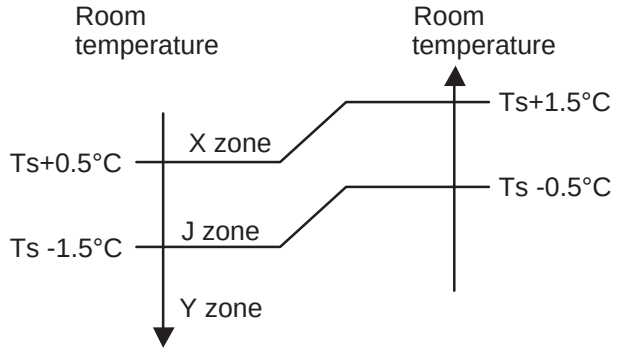
(Table3 : Compressor frequency)

		Operating frequency
24LFL	X zone	38rps
	J zone	18rps
	Y zone	0rps

		Operating frequency
24LFCC	X zone	34rps
	J zone	16rps
	Y zone	0rps

		Operating frequency
30LFT	X zone	29rps
	J zone	16rps
	Y zone	0rps

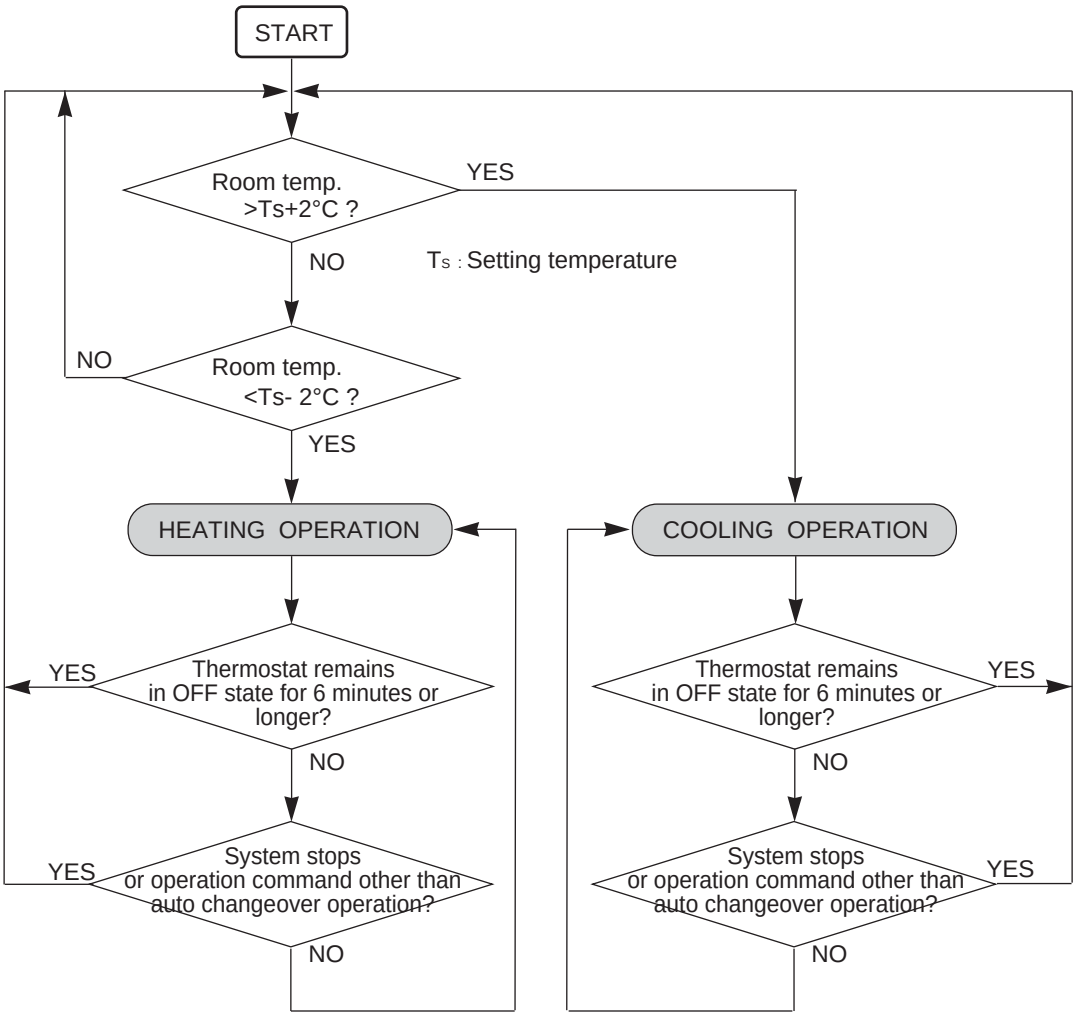
(Fig.2 : Compressor Control based on Room Temperature)



4. AUTO CHANGEOVER OPERATION

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

Operation flow chart



5. INDOOR FAN CONTROL

1. Fan speed

(Table4 : Indoor Fan Speed)

Operation mode	Air flow mode	Speed (rpm)	
		AS*G24LFCA(LFCC)	AS*G30LFCA
Heating	Hi	1480	1530
	Me+	1320	1320
	Me	1220	1220
	Lo	1020	1020
	Quiet	860	900
	Cool air prevention	680	720
	S-Lo	270 (480)	270
Cooling/ Fan	Hi	1430 (1480)	1430
	Me	1220	1220
	Lo	1020	1020
	Quiet	860	900
Dry		X zone: 860 J zone: 780	X zone: 900 J zone: 780

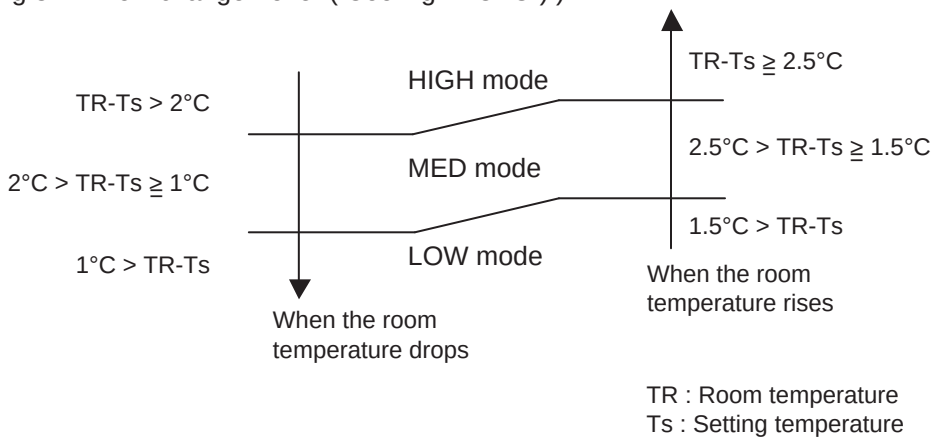
2. FAN OPERATION

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 Fig. 3.
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 Table5.

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



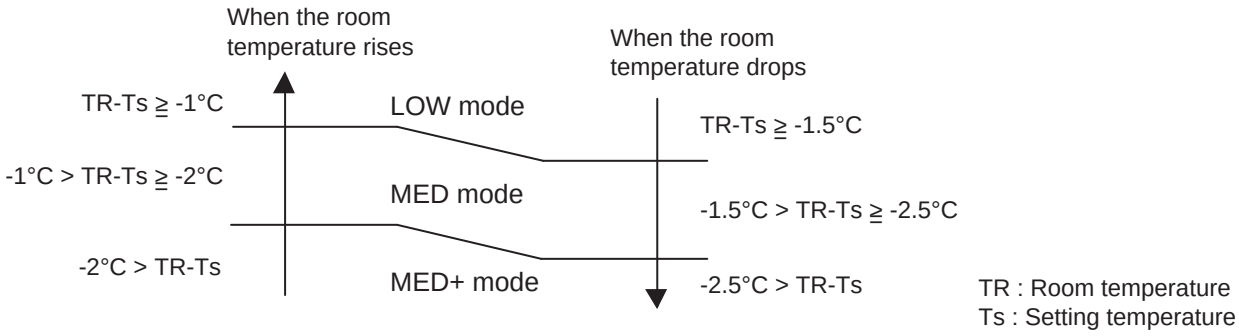
4. DRY OPERATION

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 Fig.4.
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 Table5.

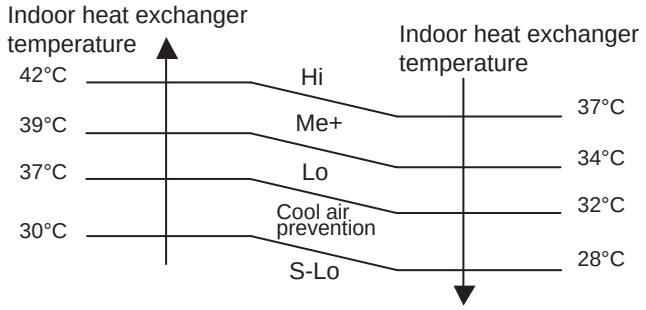
(Fig.4 : Airflow change - over (Heating : AUTO))



6. COOL AIR PREVENTION CONTROL (Heating mode)

The maximum value of the indoor fan speed is set as shown in Fig.5, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

(Fig.5 : Cool Air Prevention Control)



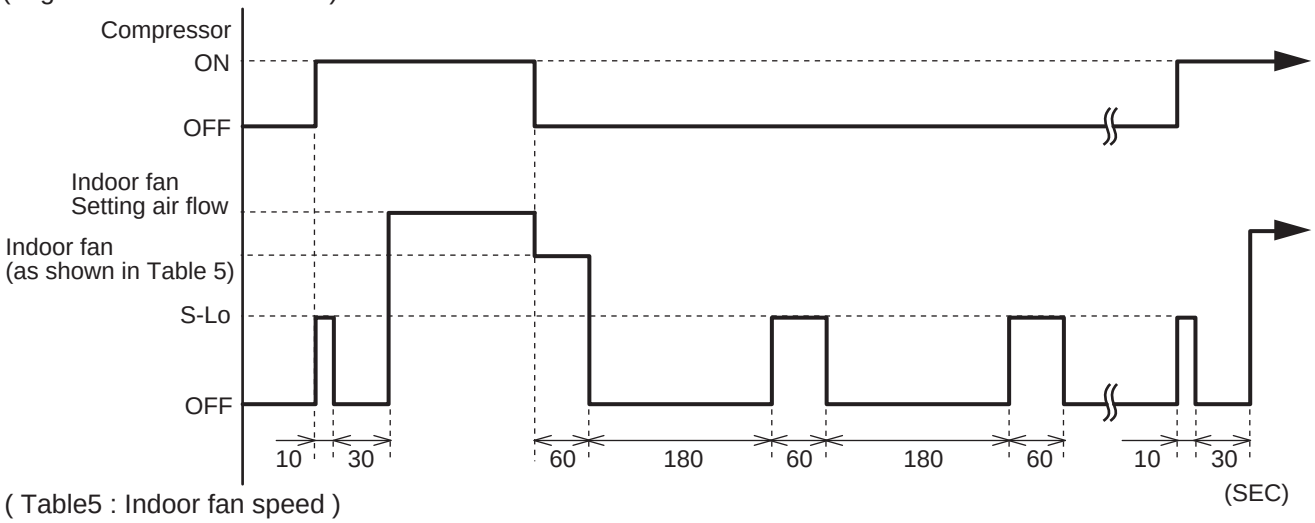
7. MOISTURE RETURN PREVENTION CONTROL (Cooling mode& Dry mode)

Switch the airflow [AUTO] at cooling mode, and the indoor fan motor will run as shown in Fig.6.

8. INDOOR UNIT FAN CONTROL FOR ENEGY SAVING (Cooling mode)

Switch the airflow at cooling mode, and the indoor fan motor will run as shown in Fig.6.
It depends on the function setting "Indoor unit fancontrol for energy saving"

(Fig.6 : Indoor Fan Control)



(Table5 : Indoor fan speed)

	Dry			Cooling
	X zone	J zone	Y zone	
AS*G24LFCA / LFCC	860rpm	780rpm	0⇔270rpm (24LFCC: 480rpm)	860rpm
AS*G30LFCA	900rpm	780rpm	0⇔270rpm	900rpm

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.

(Table6 : Type of Motor)

	AC Motor	DC Motor
AO*G24LFL / LFCC / 30LFT		○

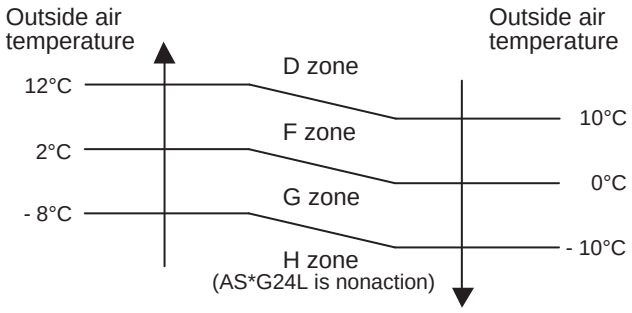
2. Fan Speed

(Table7 : Outdoor fan speed) (rpm)

	Zone ※	Cooling	Heating	Dry
AO*G24LFL	D	1050/ 820/ 720/ 500	1100/ 820/ 720/ 550/ 450	500
	F	430/ 350/ 300		
	G	350/ 290/ 260		
	H	280/ 250/ 230		
AO*G24LFCC	D	1100/ 870/ 720/ 500	1100/ 1050/ 780/ 720/ 590/ 480	530
	F	430/ 370/ 300		
	G	350/ 300 /260		
	H	250/ 200		
AO*G30LFT	D	850/ 800/ 620/ 500/ 400	900/ 850/ 800/ 620/ 550/ 450	550/ 450
	F	500/ 320/ 250		
	G	300/ 230 /200		
	H	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 table8 without relating to the compressor frequency.

(Table8 : Outdoor fan speed after the defrost)

AO*G24LFL / LFCC	1100rpm
AO*G30LFT	900rpm

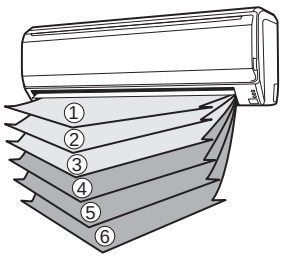
7. LOUVER CONTROL

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
- 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.
- Direction ① ⇄ ②
  Only the direction of the Airflow Direction Louver changes; the direction of the Power Diffuser does not change.
  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

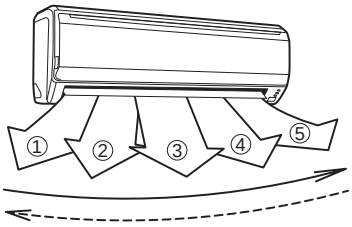
(Function Range)

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 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. OPEARTION FREQUENCY RANGE

The operation frequency of the compressor is different based on the operation mode as shown in the table9.

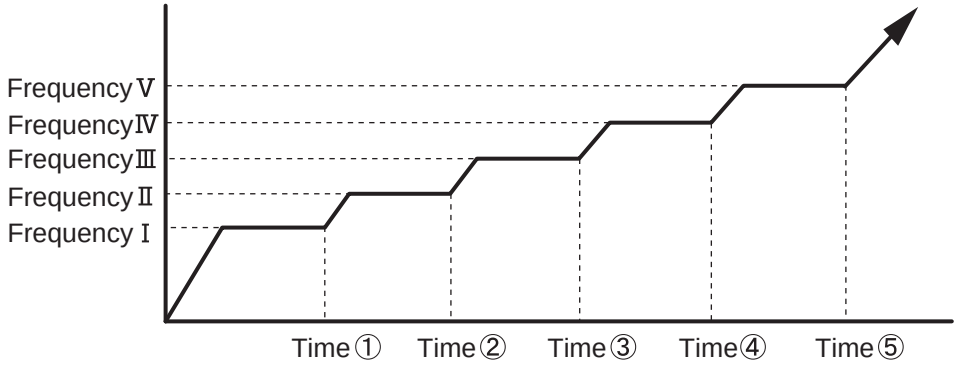
(Table 9 : Compressor Operation Frequency Range)

	Cooling		Heating		Dry	
	Min	Max	Min	Max	Min	Max
AO*G24LFL	15rps	95rps	16rps	133rps	18rps	38rps
AO*G24 LFCC	13rps	111rps	14rps	120rps	16rps	34rps
AO*G30LFT	16ps	72rps	16rps	90rps	16rps	29rps

2. OPEARTION FREQUENCY CONTROL AT NORMAL START UP

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

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



(Frequency)

	Frequency Ⅰ	Frequency Ⅱ	Frequency Ⅲ	Frequency Ⅳ	Frequency Ⅴ
AO*G24LFL	40rps	60rps	75rps	93rps	120rps
AO*G24LFCC	35rps	53rps	66rps	82rps	106rps
AO*G30LFT	30rps	47rps	60rps	———	———

(Time)

	Time ①	Time ②	Time ③	Time ④	Time ⑤
AO*G24LFL	70sec	180sec	320sec	500sec	550sec
AO*G24 LFCC	80sec	160sec	300sec	400sec	500sec
AO*G30LFT	60sec	120sec	180sec	———	———

9. TIMER OPEARTION CONTROL

9-1 WIRELESS REMOTE CONTROLLER

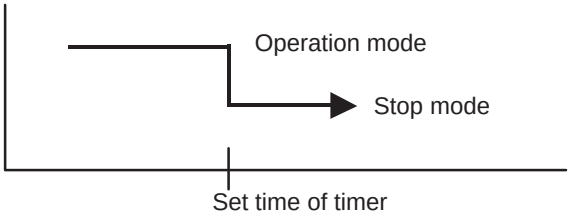
The table10 shows the available timer setting based on the product model.

(Table 10 : Timer Setting)

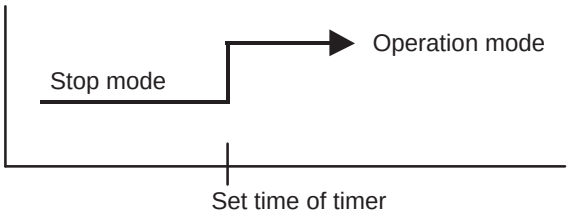
	ON TIMER / OFF TIMER	PROGRAM TIMER	SLEEP TIMER
AS*G24 / LFCC / 30LFCA	○	○	○

1. OPEARTION FREQUENCY RANGE

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

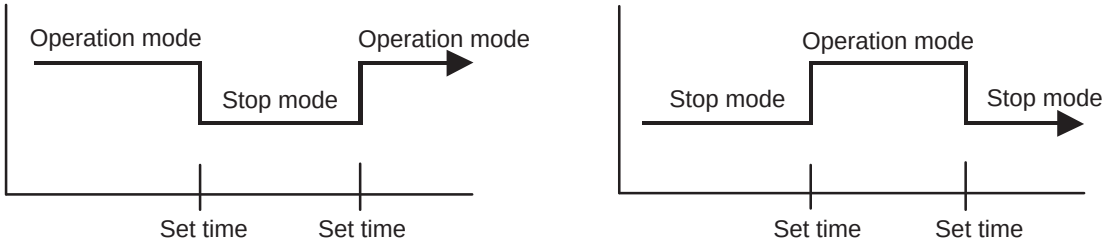


- ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. PROGRAM TIMER

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



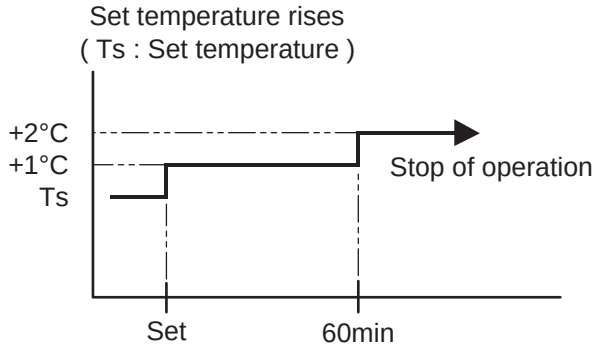
- Operation will start from the timer setting (either OFF timer or ON timer) whichever is closest to the clock's current timer setting.
  The order of operations is indicated by the arrow in the remote control unit's display.
- SLEEP timer operation cannot be combined with ON timer operation.

3. SLEEP TIMER

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

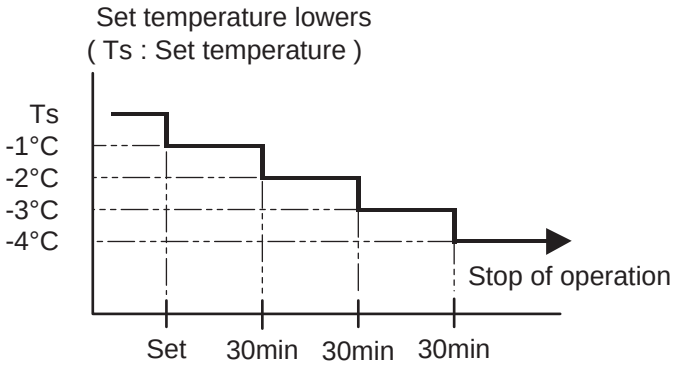
In the cooling operation mode

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



In the heating operation mode

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



9-2 WIRED REMOTE CONTROLLER (OPTION)

The table11 shows the available timer setting based on the product model.

(Table11 : Timer Setting)

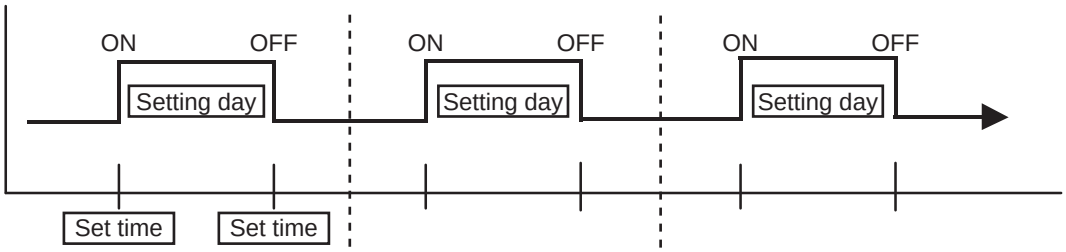
	ON TIMER / OFF TIMER	WEEKLY TIMER	TEMPERATURE SET BACK TIMER
AS*G24 / LFCC / 30LFCA	○	○	○

1. ON TIMER / OFF TIMER

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

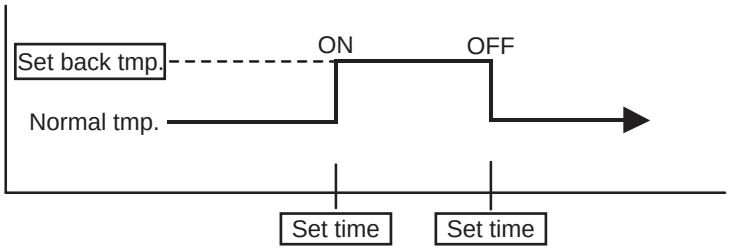
2. WEEKLY TIMER

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



3. TEMPERATURE SET BACK TIMER

This timer function can change setting temperature of setting operation times of the each day of the week.
This can be together with other timer setting.



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 Table12.
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.

(Table12 : The pulse range of the electronic expansion valve control)

	Operation mode	Pulse range
AO*G24LFL / LFCC	Cooling / Dry mode	between 60 to 480 pulses.
	Heating mode	between 60 to 480 pulses.
AO*G30LFT	Cooling / Dry mode	between 53 to 480 pulses.
	Heating mode	between 40 to 480 pulses.

* The expansion valve is set at 480 pulses after 110seconds(24L), 120seconds(30L), of stopping compressor.
* At the time of supplying the power to the outdoor unit, the initialization of the electronic expansion valve is operated (528 pulses are input to the closing direction).

11. TEST OPERATION CONTROL

[Wireless remote controller]

Under the condition where the air conditioner runs, press the test run button of the remote control, and the test operation control mode will appear.
During test running, the operation lamp and timer lamp of the air conditioner body twinkle simultaneously.

[Wired remote controller (Option)]

If the operation lamp is on, press the Start/Stop button to turn it off.
Press the Master Control and Fan Control buttons at the same time for more than two seconds to start the test operation.
The operation lamp will light up and "o1" will be displayed on the set temperature display.

[Release]

Perform the test operation for 60 minutes.
Pressing the Start/Stop button will stop the test operation.

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

The compressor won't enter operation status for 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

15. MANUAL AUTO OPERATION (Indoor unit body operation)

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

(Table13)

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

16. FORCED COOLING OPERATION

If cooling operation is set, the operation is controlled as shown in Table14.

(Table14)

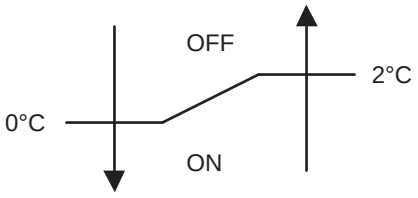
	Forced cooling operation
OPERATION MODE	Cooling
FAN CONT. MODE	Hi
TIMER MODE	-
SETTING TEMP.	Room Temp is not controlled
SETTING LOUVER	Initial : Horizontal (It is changed follow as setting of remote controller)
SWING	OFF

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 Table14.

17. COMPRESSOR PREHEATING

When the outdoor heat exchanger temperature is lower than 0°C and the heating operation has been stopped for 30 minutes, power is applied to the compressor and the compressor is heated.
(By heating the compressor, warm air is quickly discharged when operation is started.)
When operation was started and when the outdoor heat exchanger temperature rises to 2°C or greater, preheating is ended.

(Fig.9 : Compressor Preheating)



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.

(Table15)

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.

(Table16)

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 Table17.

(Table 17 : Condition of starting Defrost Operation)

1ST time defrosting after starting operation	Compressor integrating operation time		
	Less than 17 min.	17 to 57 min.	More than 57 min.
	Does not operate	- 9°C (Ta*1 - Tn ≧ 5°C)	- 5°C

*1 : Ta (Outdoor air temperature)

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 ≦ - 25°C 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 210 min. (For long continuous operation)	More than 210 min. (For long continuous operation)	Less than 10min.*1 (For intermittent operation)
	- 3°C (and after 30 minutes, if the - 3°C)	- 5°C (and after 5 minutes, if the - 5°C)	OFF count of the compressor 40 times.

*1 : If the compressor continuous operation time is less than 10 minutes and outdoor air temperature is less than 2°C once while operating the compressor, 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

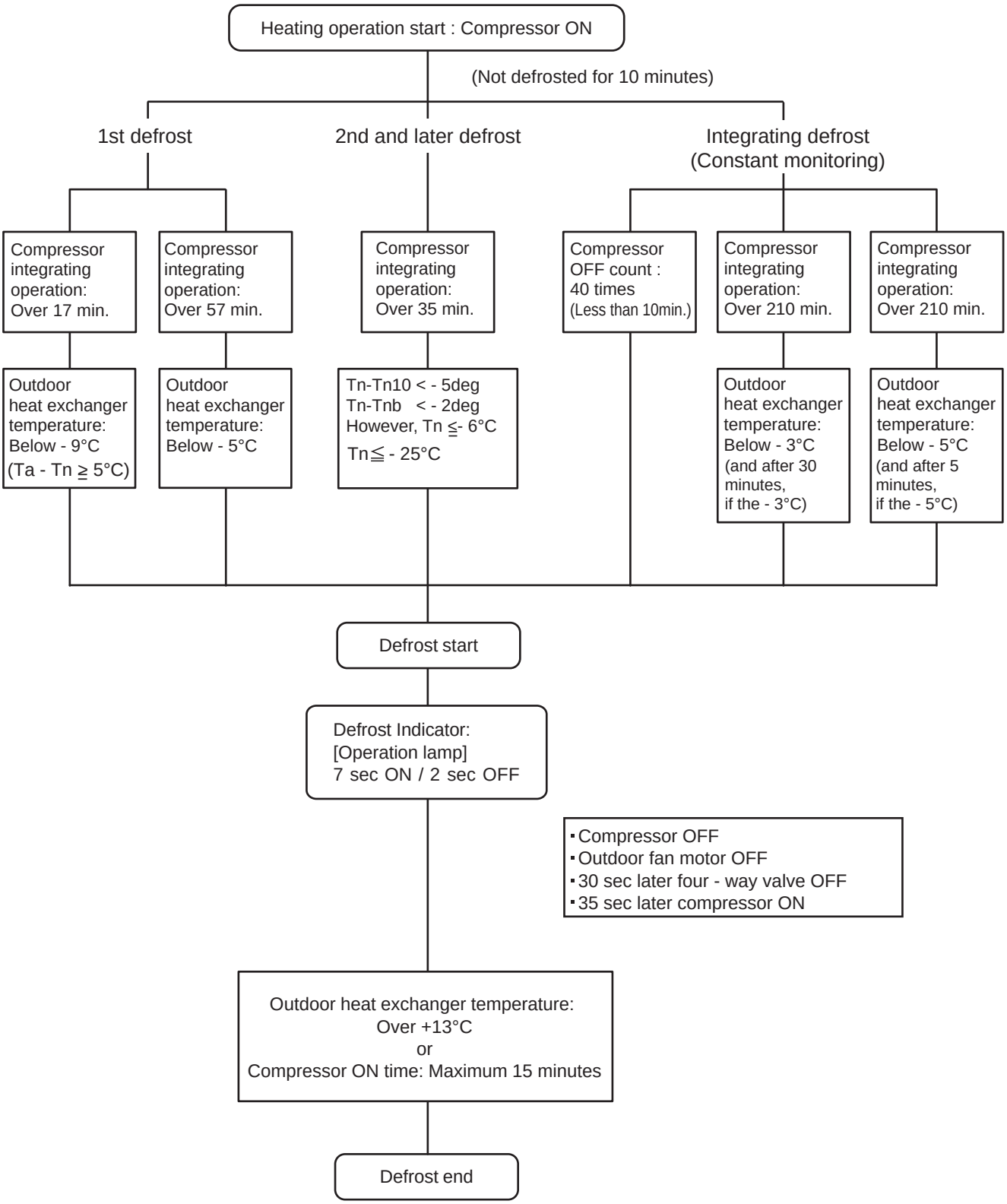
Defrost operation is released when the conditions become as shown in Table18.

(Table18 : 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.

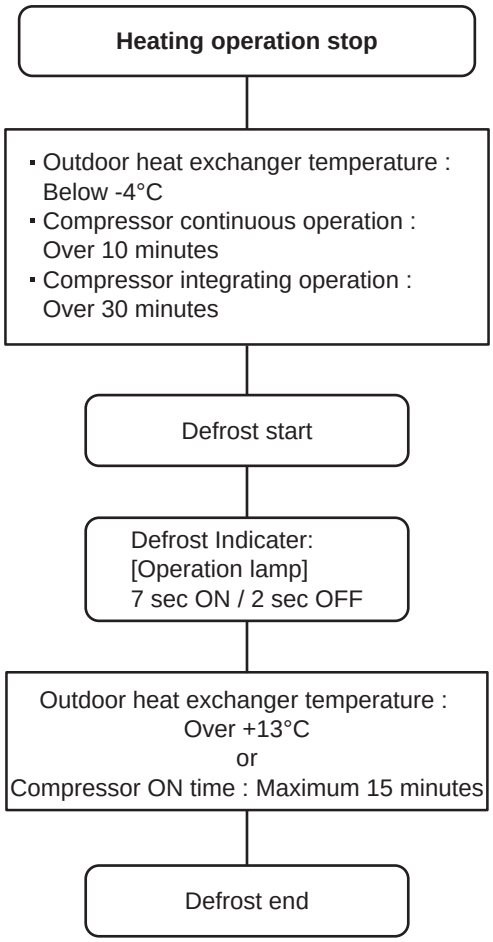
1. OFF DEFROST OPERATION CONDITION

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 (24L) or 10rps (30L), and it continues to decrease the frequency for 20rps (24L) or 10rps (30L) every 120 seconds until the temperature becomes lower than Temperature Ⅰ .
When the discharge temperature becomes lower than Temperature Ⅱ, the control of 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.

(Table 19 : Discharge Temperature Over Rise Prevension Control / Release Temperature)

	Temperature Ⅰ	Temperature Ⅱ	Temperature Ⅲ
AO*G24LFL / LFCC / 30LFT	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 20-1 : Current Release Operation Value / Release Value for AO*G24LFL / LFCC / 30LFT)

[Heating]

AO*G24LFL	
OT (Control / Release)	
17°C	10.5A / 10.0A
12°C	13.0A / 12.5A
5°C	15.0A / 14.5A
	17.0A / 16.5A

OT : Outdoor Temperature

[Heating]

AO*G24LFCC	
OT (Control / Release)	
17°C	10.5A / 10.0A
12°C	13.0A / 12.5A
5°C	15.0A / 14.5A
	17.0A / 16.5A

OT : Outdoor Temperature

[Heating]

AO*G30LFT	
OT (Control / Release)	
17°C	11.0A / 10.5A
12°C	13.0A / 12.5A
5°C	15.0A / 14.5A
	18.0A / 17.5A

OT : Outdoor Temperature

[Cooling]

AO*G24LFL	
OT (Control / Release)	
50°C	7.0A / 6.5A
46°C	7.0A / 6.5A
40°C	9.5A / 9.0A
	12.0A / 11.5A

OT : Outdoor Temperature

[Cooling]

AO*G24LFCC	
OT (Control / Release)	
50°C	7.0A / 6.5A
46°C	7.0A / 6.5A
40°C	9.5A / 9.0A
	12.0A / 11.5A

OT : Outdoor Temperature

[Cooling]

AO*G30LFT	
OT (Control / Release)	
50°C	9.0A / 8.5A
46°C	10.0A / 9.5A
40°C	13.0A / 12.5A
	16.0A / 15.5A

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 21 : Anti-freezing Protection Operation / Release Temperature)

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

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

4. COOLING PRESSURE OVERRISE PROTECTION

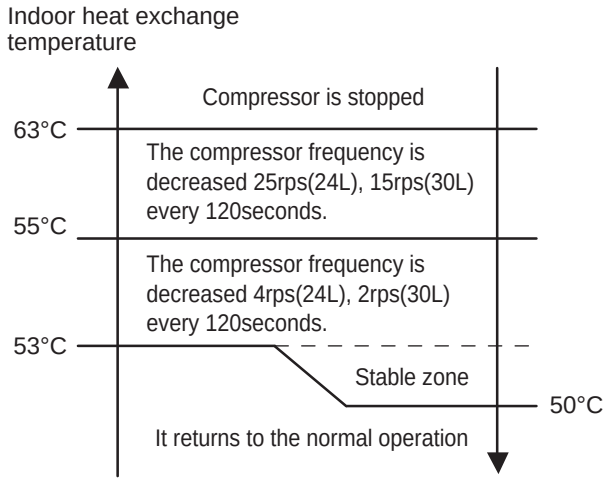
When the outdoor unit heat exchange sensor temperature rises to 67°C or greater, the compressor is stopped and trouble display is performed.

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]

For AO*G24LFL / LFCC / 30LFT



6. COMPRESSOR TEMPERATURE PROTECTION

When the compressor temperature sensor detects higher than 110°C(24L),108°C(30L), 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. COMPRESSOR STOP CONTROL

When the detection value of outdoor temperature sensor is lower than TempⅠin the table below, the compressor is stopped.

(Table 22 : Operation temperature of compressor stop control)

	Temperature Ⅰ	
	Cooling	Heating
AO*G24LFL / LFCC / 30LFT	-15°C	——

Refrigerant
R410A

WALL MOUNTED type
INVERTER

2 . TROUBLE SHOOTING

2-1 ERROR DISPLAY

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

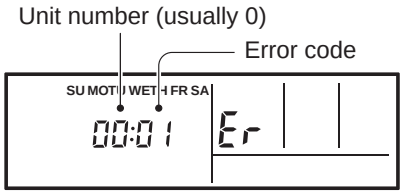
Please refer the flashing pattern as follows.
Indoor Unit : AS*G24/ 30LFCA, 24LFCC
The OPERATION, TIMER, ECONOMY lamps operate as follows according to the error contents.

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
Indoor Unit Model Information Error EEPROM Access Abnormal	3 times	2 times	Continuous	32	4
Manual Auto Switch Error	3 times	5 times	Continuous	35	5
Indoor Room Thermistor Error	4 times	1 times	Continuous	41	6
Indoor Heat Ex. Thermistor Error	4 times	2 times	Continuous	42	7
Indoor Unit Fan Motor Error	5 times	1 times	Continuous	51	8
A. F. Voltage Error	6 times	4 times	Continuous	64	9
IPM Error	6 times	5 times	Continuous	65	10
Discharge Thermistor Error	7 times	1 times	Continuous	71	11
Compressor Thermistor Error	7 times	2 times	Continuous	72	12
Heat Ex. Liquid Outlet Thermistor Error	7 times	3 times	Continuous	73	13
Outdoor Thermistor Error	7 times	4 times	Continuous	74	14
Current Sensor Error	8 times	4 times	Continuous	84	15
High Pressure Switch Error	8 times	6 times	Continuous	86	16
Over Current Error	9 times	4 times	Continuous	94	17
Compressor Control Error	9 times	5 times	Continuous	95	18
Outdoor Unit Fan Motor Error	9 times	7 times	Continuous	97	19
4 Way Valve Error	9 times	9 times	Continuous	99	20
Discharge Temp. Error	10 times	1 times	Continuous	A1	21
Compressure Temp. Error	10 times	3 times	Continuous	A3	22
Low Pressure Error	10 times	5 times	Continuous	A5	23

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

1. SELF - DIAGNOSIS

When " Er " in Temperature Display is displayed, inspection of the air conditioning system is necessary. Please consult authoilzed servise personnel.



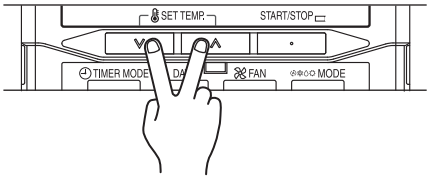
ex. Self-diagnosis check

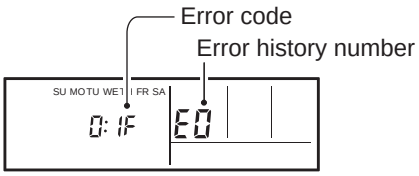
2. ERROR CODE HISTORY DISPLAY

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

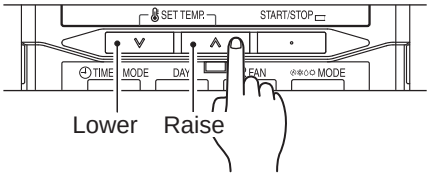
1. Stop the air conditioner operation.

2. Press the SET TEMPERATURE buttons ∨, ∧ simultaneously for 3 seconds or more to start the self-diagnosis.





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



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

4. Press the SET TEMPERATURE buttons ∨, ∧ simultaneously for 3 seconds or more or there is no key input for 60 seconds to stop the display.

2-2 TROUBLE SHOOTING WITH ERROR CODE

Trouble shooting 1 **OUTDOOR UNIT Error Method:** **Serial Communication Error** **(Serial Reverse Transfer Error)**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Outdoor unit Main PCB Outdoor unit Fan motor	**Detective details:** When the indoor unit cannot 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).

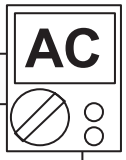
YES ↓

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 ↓

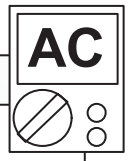
Check Point 3 : Check the voltage of power supply



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

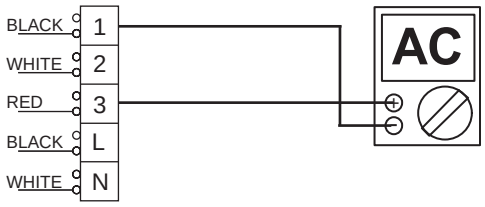
OK ↓

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 4)**
  - **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:** **Refer to error code table.**
Detective Actuators: Indoor unit Controller PCB	**Detective details:** When the outdoor unit cannot properly receive the serial signal from indoor unit for 10 seconds or more.

Forecast of Cause:

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

Check Point 1-1 : Reset the power and operate

- Does error indication reappear?

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

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

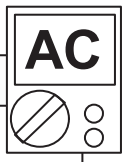
YES ↓

Check Point 2 : Check connection

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

OK ↓

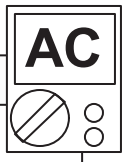
Check Point 3 : Check the voltage of power supply



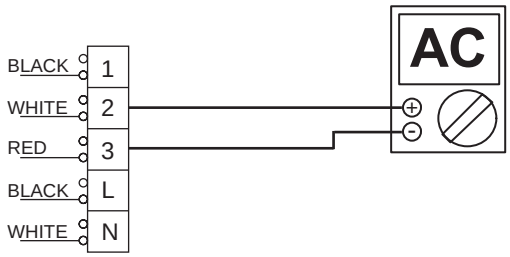
- Check the voltage of power supply
  >> Check if AC216V(AC240V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal L - N.

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.



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

Forecast of Cause:

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

Check Point 1 : Check the connection of terminal

Check & correct the followings.

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

OK

Check Point 2 : Check Wired Remote Controller and Controller PCB

- Check Voltage at 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

Trouble shooting 4 **INDOOR UNIT Error Method:** **Indoor Unit Model Information Error** **EEPROM Access Abnormal**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause:

1. External cause 2. Defective 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.**

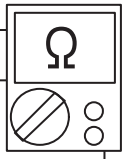
Note : EEPROM

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 5 **INDOOR UNIT Error Method:** **Manual Auto Switch Error**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Indoor Unit Controller PCB Indicator PCB Manual Auto Switch	**Detective details:** When the Manual Auto Switch becomes ON for consecutive 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 6 **INDOOR UNIT Error Method:** **Indoor Room Thermistor Error**	**Indicate or Display:** **Refer to error code table.**

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

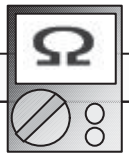
Check Point 1 : Check connection of Connector

- ☐ 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)	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

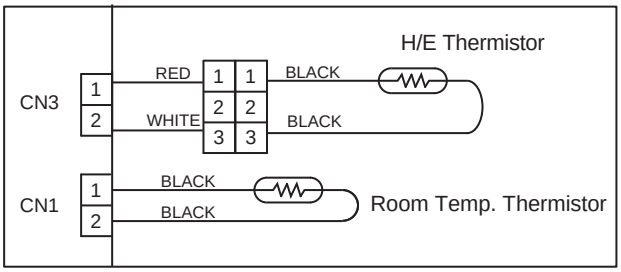
Temperature (°C)	40	45	50	60	70	80	90	100
Resistance value (kΩ)	5.3	4.35	3.59	2.47	1.76	1.27	0.93	0.70

▶ **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 7 **INDOOR UNIT Error Method:** **Indoor Heat Ex. Thermistor Error**	**Indicate or Display:** **Refer to error code table.**

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

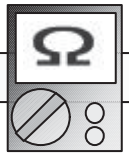
Check Point 1 : Check connection of Connector

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

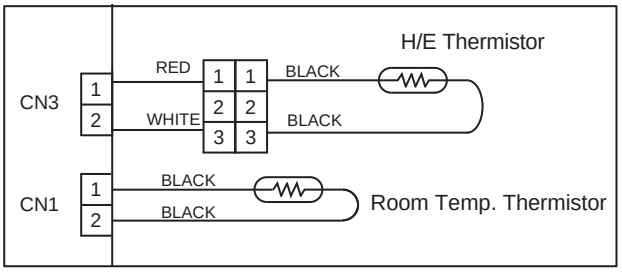
Temperature (°C)	40	45	50	60	70	80	90	100
Resistance value (kΩ)	25.6	20.9	17.1	11.6	8.12	5.78	4.19	3.09

▶ **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 8 **INDOOR UNIT Error Method:** **Indoor unit Fan Motor Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Indoor unit fan motor	When the condition that actual frequency of Indoor Fan is below 1/3 of target frequency 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 9 **OUTDOOR UNIT Error Method:** **A.F Voltage Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Active filter module	When inverter input DC voltage is higher than 425V or lower than 80V. 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. **(PARTS INFORMATION 6)**

>>If Active filter module is abnormal, replace it.

OK

Check Point 4 : Replace Main PCB

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

Trouble shooting 10 **OUTDOOR UNIT Error Method:** **IPM Error**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Outdoor unit Main PCB Compressor	**Detective details:** ①When more than normal operating current to IPM in Main PCB flows, the compressor stops. ②After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③If 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 19)

>> 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 11 **OUTDOOR UNIT Error Method:** **Discharge Thermistor Error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause :

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

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	0	5	10	15	20	30	40	50	60
Resistance value (kΩ)	169	130	101	79.1	62.6	40.0	26.3	17.8	12.3

Temperature (°C)	70	80	90	100	120
Resistance value (kΩ)	8.70	6.27	4.60	3.43	2.00

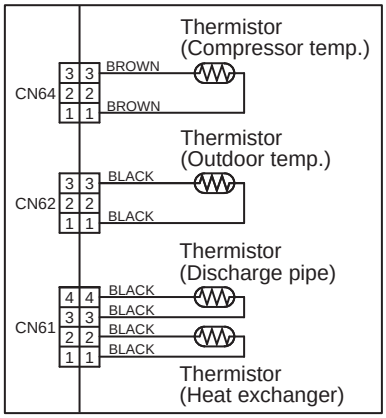
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

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)

AO*G24LFL



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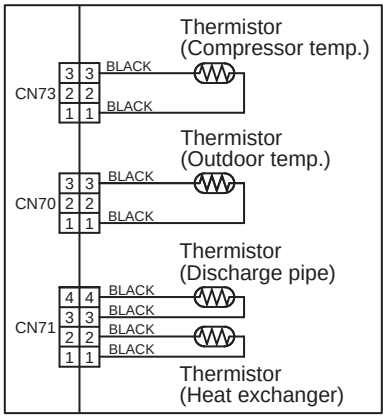
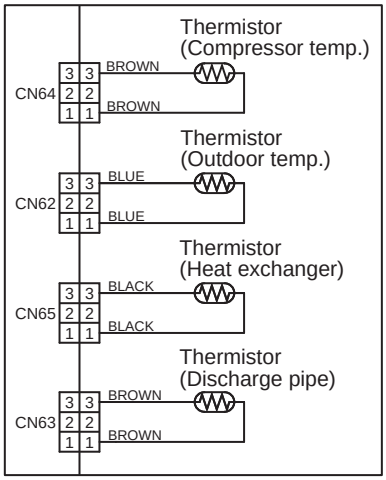


AO*G30LFT



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

Trouble shooting 12 **OUTDOOR UNIT Error Method:** **Compressor Thermistor Error**	**Indicate or Display:** **Refer to error code table.**

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)	0	5	10	15	20	30	40	50	60
Resistance value (kΩ)	169	130	101	79.1	62.6	40.0	26.3	17.8	12.3

Temperature (°C)	70	80	90	100	120
Resistance value (kΩ)	8.70	6.27	4.60	3.43	2.00

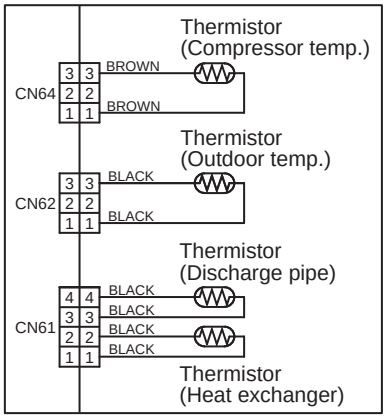
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

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)

AO*G24LFL



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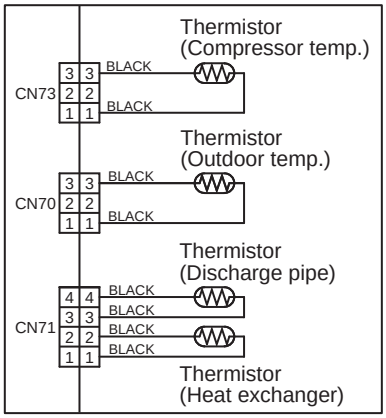

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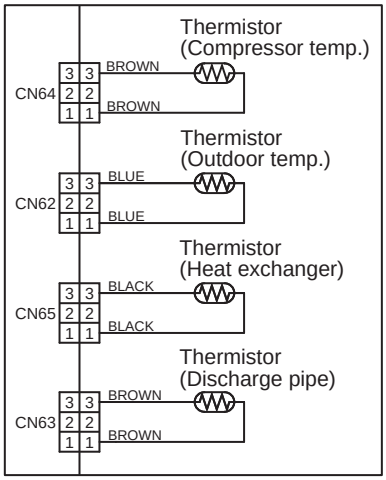


▶ **If the voltage does not appear, replace Main PCB.**

Trouble shooting 13 **OUTDOOR UNIT Error Method:** **Heat Ex. Liquid Outlet Thermistor Error**	**Indicate or Display:** **Refer to error code table.**

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)	-10	-5	0	5	10	15	20	25	30	35
Resistance value (kΩ)	27.8	21.0	16.1	12.4	9.63	7.56	5.98	4.77	3.84	3.11

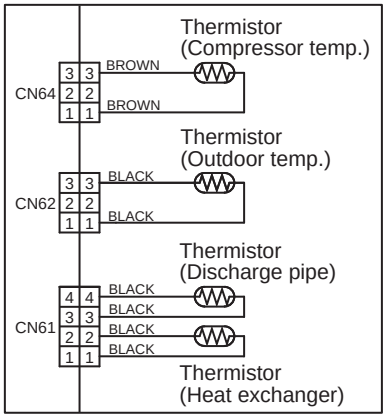
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

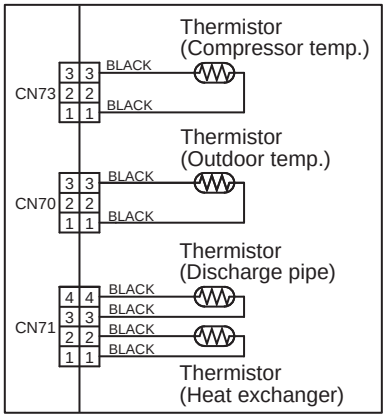
Check Point 3 : Check voltage of Main PCB (DC5.0V)

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

AO*G24LFL



AO*G24LFCC



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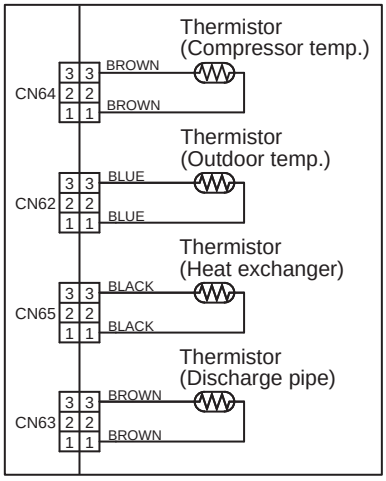


▶ **If the voltage does not appear, replace Main PCB.**

Trouble shooting 14 **OUTDOOR UNIT Error Method:** **Outdoor Thermistor Error**	**Indicate or Display:** **Refer to error code table.**

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)	-20	-10	-5	0	5	10	15	20
Resistance value (kΩ)	115	62.3	46.6	35.2	26.9	20.7	16.1	12.6

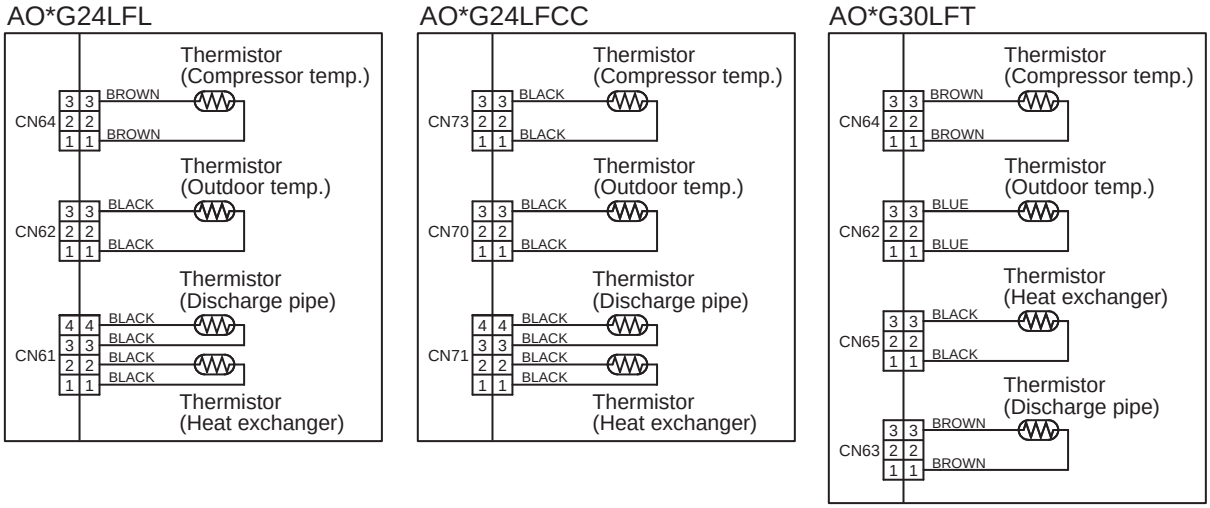
Temperature (°C)	30	40	50	60	70
Resistance value (kΩ)	7.97	5.18	3.45	2.36	1.65

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

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 15 **OUTDOOR UNIT Error Method:** **Current Sensor Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB	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 16 **OUTDOOR UNIT Error Method:** **High Pressure Switch Error**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Outdoor unit Main PCB High Pressure Switch	**Detective details:** 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

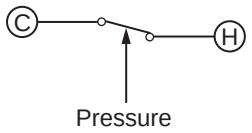
- Switch characteristics check
  * For the characteristics of high pressure switch, refer to below.

OK

Check Point 3 : Replace Main PCB

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

- Type of contact



- Characteristics of pressure switch (24LFL/LFCC/30LFT : CN90)

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

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

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 18 **OUTDOOR UNIT Error Method:** **Compressor Control Error**	**Indicate or Display:** **Refer to error code table.**

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 19 **OUTDOOR UNIT Error Method:** **Outdoor Unit Fan Motor Error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause:

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

Check Point 1 : Check rotation of Fan

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

OK

Check Point 2 : Check ambient temp. around motor

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

OK

Check Point 3 : Check Outdoor unit fan motor

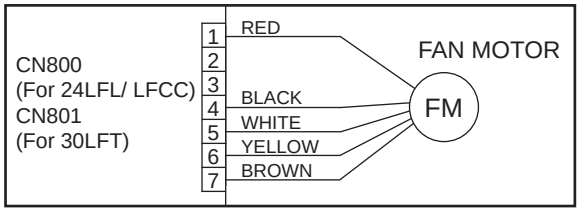
・Check Outdoor unit fan motor. **(PARTS INFORMATION 5)**
>>If Outdoor Fan Motor is abnormal, replace Outdoor fan motor and Main PCB.

OK

Check Point 4 : Check Output Voltage of Main PCB

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

AO*G24LFL / LFCC / 30LFT



Read wire	DC voltage
Red - Black	240 ~ 400V (24L)
	300 ~ 400V (30L)
White - Black	15 ±1.5V

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

Trouble shooting 20 **OUTDOOR UNIT Error Method:** **4-Way Valve Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Heat exchanger 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.] > 20degC ・Heating operation [indoor heat exchanger temp.] - [Room temp.] < -20degC If the same operation is repeated 5 times, the compressor stops permanently.

Forecast of Cause :

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

Check Point 1 : Check connection of Connector

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

OK

Check Point 2 : Check thermistor of Indoor unit

・Isn't it fallen off the holder?
・Is there a cable pinched?
>> Check characteristics of thermistor, (Refer to Trouble shooting 6,7),
If defective, replace the thermistor.

OK

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

[Solenoid coil]
・Remove CN500 from PCB and check the resistance value of coil.
Resistance value is about 1.4kΩ
>> If it is Open or abnormal resistance value, replace Solenoid Coil.

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

OK

Check Point 4 : Replace Main PCB

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

Trouble shooting 21 **OUTDOOR UNIT Error Method:** **Discharge Temp. Error**	**Indicate or Display:** **Refer to error code table.**

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

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

<Cooling operation>

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

↓ **OK**

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

↓ **OK**

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 11".

↓ **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 22 **OUTDOOR UNIT Error Method:** **Compressor Temp. Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Compressor temperature thermistor Outdoor unit Main PCB	▪ "Protection stop by "compressor temperature ≧ 110degC(24L), 108degC(30L) 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**

<Heating operation>

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

↓ **OK**

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

↓ **OK**

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

↓ **OK**

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

  * For the characteristics of the thermistor, refer to the "Trouble shooting 12".

↓ **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.**

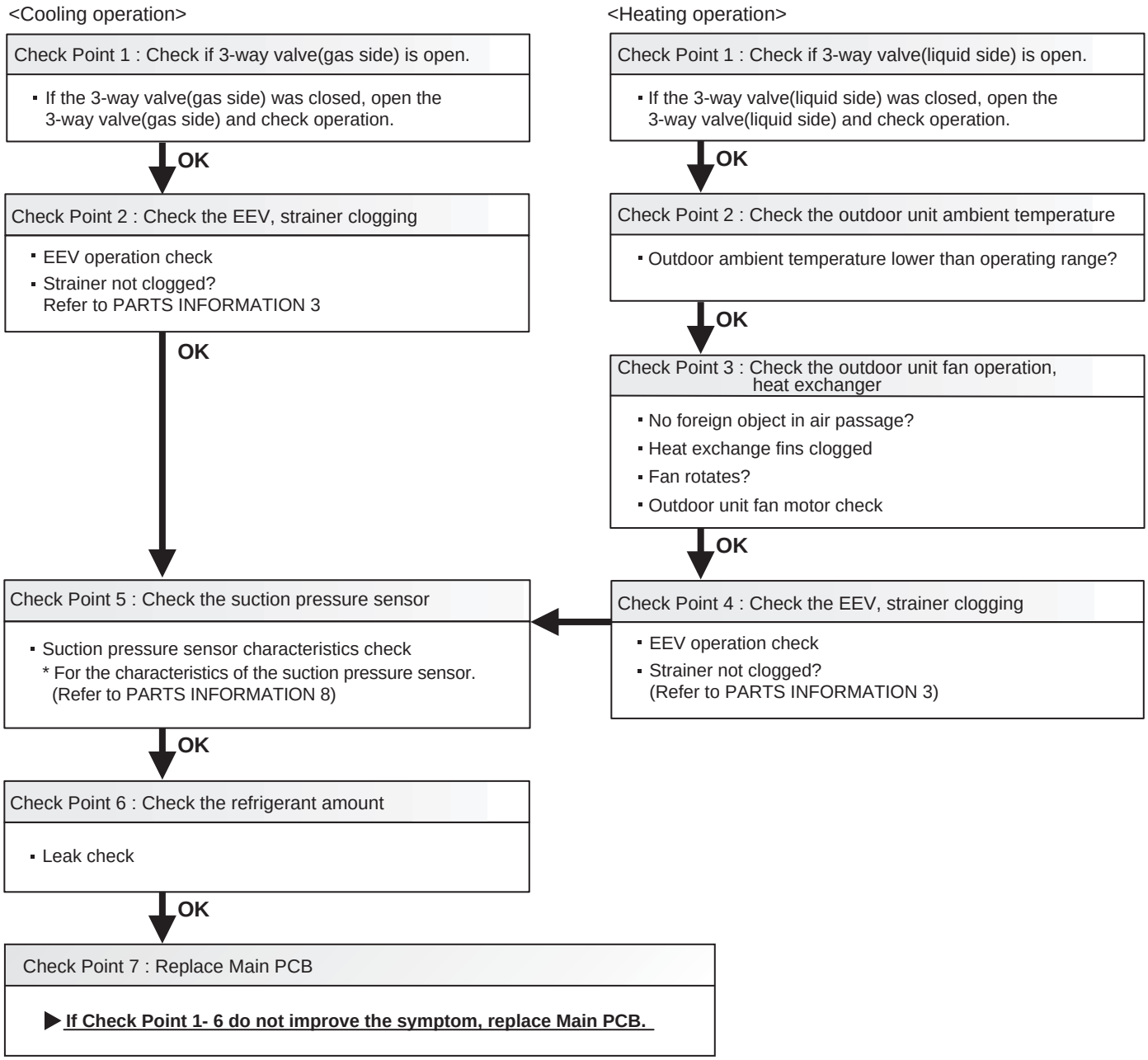
For AOTG34LFT

Trouble shooting 23 **OUTDOOR UNIT Error Method:** Low Pressure Error	**Indicate or Display:** Refer to error code table.

Detective Actuators:	**Detective details:**
Suction pressure sensor Outdoor unit Main PCB	▪ "Protection stop by suction pressure ≦ 0.02MPaG continued for 5 minutes repeats 5 times within 2 hours.

Forecast of Cause :

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



2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 24

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 25

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.

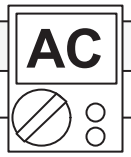
OK

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 26

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 27

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 ?

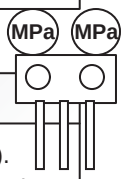
OK

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

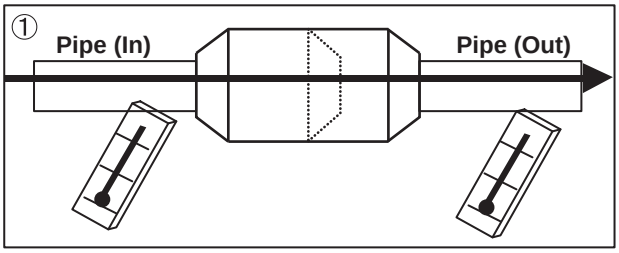
- Check if Strainer is clogged (Refer to the figure at right).
- Measure Gas Pressure and if there is a leakage, correct it.

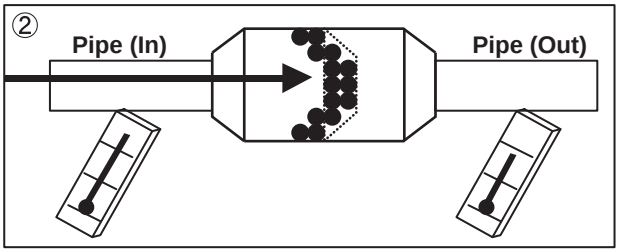
>> When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.

- 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 28

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 29

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

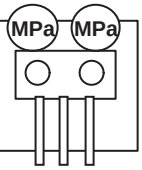
- Is Fan rotating?

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)

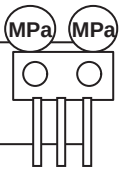
Replace Compressor

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)

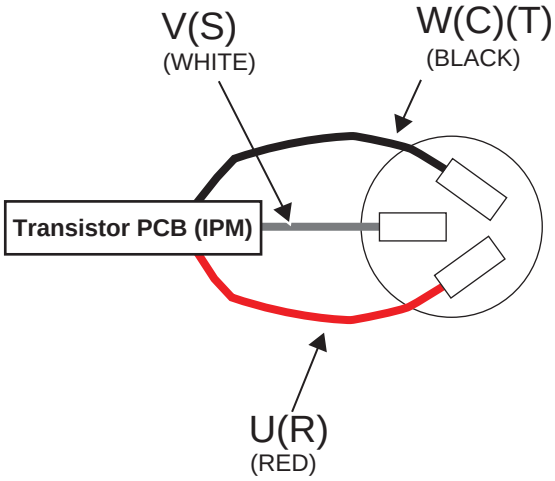
Replace Compressor

SERVICE PARTS INFORMATION 2

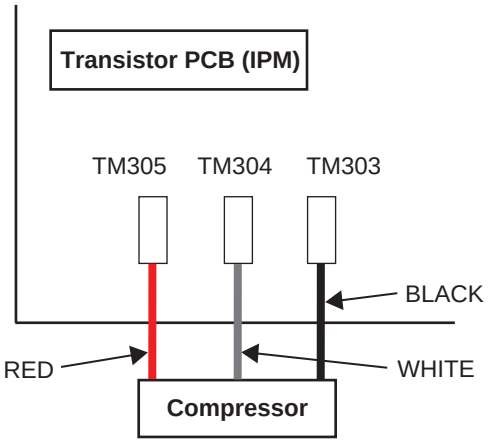
Inverter Compressor

Check Point 1 : Check connection

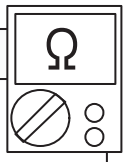
- Check terminal connection of Compressor (Loose or incorrect wiring)



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

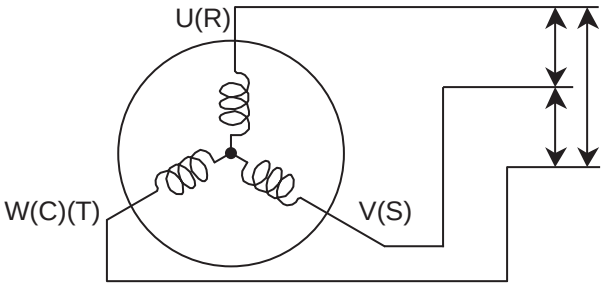


Check Point 2 : Check winding resistance



- Check winding resistance of each terminal

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



- **AO*G24LFL / LFCC**
  Resistance Value :
  0.921Ω at 25°C
- **AO*G30LFT**
  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.**

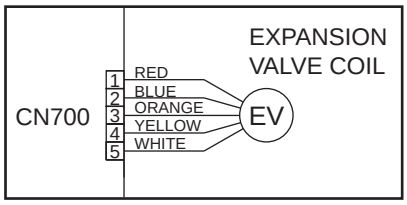
SERVICE PARTS INFORMATION 3

Outdoor unit Electronic Expansion Valve
(EEV)

Check Point 1 : Check Connections

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

AO*G24LFL / LFCC / 30LFT



Check Point 2 : Check Coil of EEV

・Remove connector, check each winding resistance of Coil.

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

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

Check Point 3 : Check Voltage from Main PCB.

・Remove Connector and check Voltage (DC12V)

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

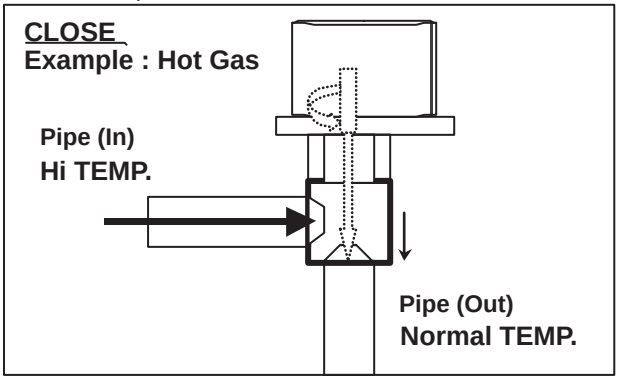
Check Point 4 : Check Noise at start up

・Turn on Power and check operation noise.

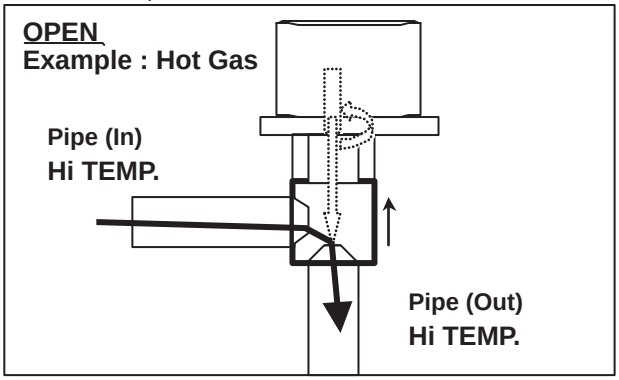
▶ **If an abnormal noise does not show, replace Main PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

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

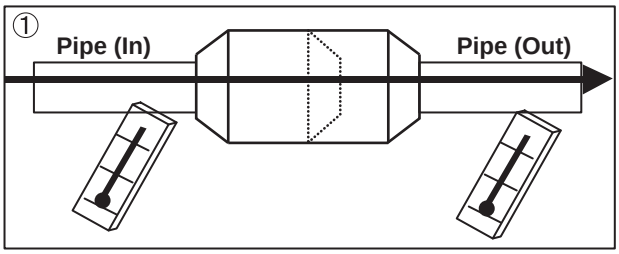


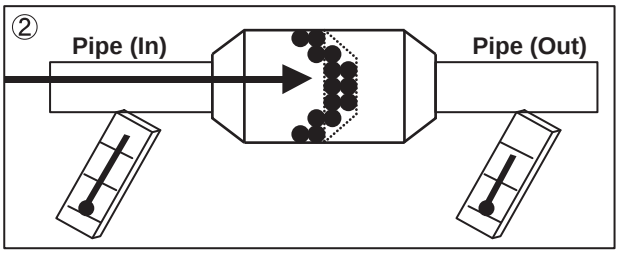
If it is open,
it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check Strainer

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





SERVICE PARTS INFORMATION 4

Indoor unit fan motor

Check Point 1 : Check rotation of Fan

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

Check Point 2 : Check resistance of Indoor Fan Motor

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

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

SERVICE PARTS INFORMATION 5

Outdoor unit fan motor

Check Point 1 : Check rotation of Fan

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

Check Point 2 : Check resistance of Outdoor Fan Motor

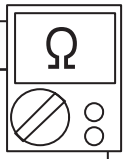
・Refer to below. Circuit-test "Vm" and "GND" terminal.
(Vm: DC voltage, GND: Earth terminal)
>>If they are short-circuited (below 300 kΩ), replace Outdoor fan motor and Main PCB.

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

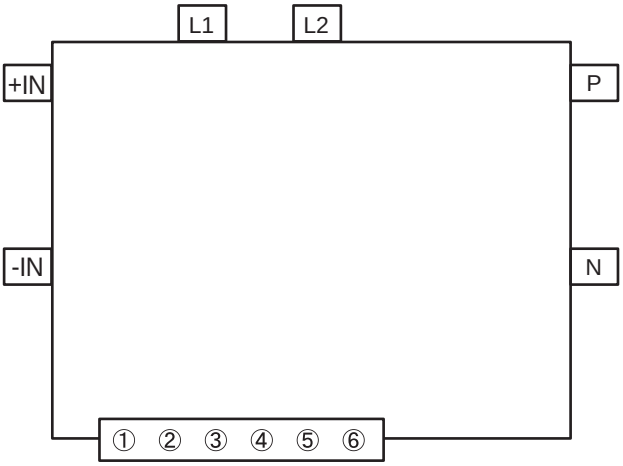
SERVICE PARTS INFORMATION 6

Active filter module

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



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



Check the open or short-circuit

Terminal		Resistance value
Tester(+)	Tester(-)	
(+IN)	(–IN)	**360kΩ ±20%**
(–IN)	N	**0 Ω**
P	(+IN)	**720kΩ ±20%**
L1	L2	**1.40MΩ / 2.28MΩ** (Ref. value 1) (Ref. value 2)
P	N	**360kΩ ±20%**
L1,L2	Control Box	**∞ Ω**
L2	N	**1.69MΩ / 1.88MΩ** (Ref. value 1) (Ref. value 2)

Check the diode

Terminal		Resistance value
Tester(+)	Tester(-)	
L2	P	**1.32MΩ / 1.50MΩ** (Ref. value 1) (Ref. value 2)
P	L2	**1.40MΩ / 1.51MΩ** (Ref. value 1) (Ref. value 2)

Ref. value 1
Specifications for Multimeter
Manufacturer : HIOKI
Model name : 3804
Power source : DC9V.

Ref. value 2
Specifications for Multimeter
Manufacturer : YOKOGAWA
Model name : 7534
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**

SERVICE PARTS INFORMATION 7

IPM
(Mounted on Transistor PCB)

Check Point 1

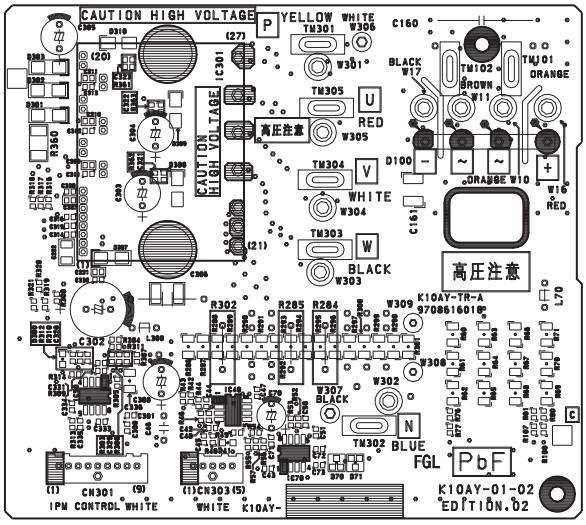
① Disconnect the connection wires between the Transistor PCB - Capacitor PCB and Transistor PCB - Inverter Compressor.

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:

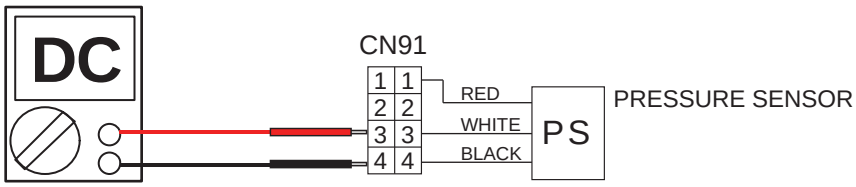
Terminal		Tester display
Tester(+)	Tester(-)	
P	U	∞
P	V	
P	W	
U	P	0.3V～0.7V
V	P	
W	P	
N	U	
N	V	
N	W	
U	N	∞
V	N	
W	N	

SERVICE PARTS INFORMATION 8

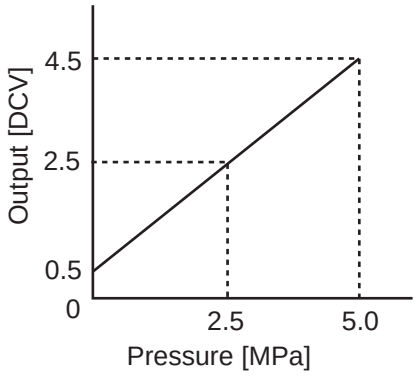
Suction Pressure Sensor

Check Point 1 : Check Voltage from Main PCB

・With the connector connected to the PCB, measure the voltage between CN91(terminal 3-4) of the Main PCB.



・Characteristics of pressure sensor



Refrigerant
R410A

WALL MOUNTED type
INVERTER

3 . APPENDING DATA

3-1. FUNCTION SETTING

3-1-1 INDOOR UNIT

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

1-1. Setting the Filter Sign

The indoor unit has a sign to inform the user that it is time to clean the filter.
Select the time setting for the filter sign display interval in the table below according to the amount of dust or debris in the room.
If you do not wish the filter sign to be displayed, select the setting value for "No indication".

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
	Standard (400 hours)	11	00
	Long interval (1000 hours)		01
	Short interval (200 hours)		02
◆	No indication		03

1-2. Setting the Cooling Room Temperature Correction

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

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	Standard	30	00
	Slightly lower control		01
	Lower control		02
	Warmer control		03

1-3. Setting the Heating Room Temperature Correction

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

(◆. . . Factory setting)

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

1-4. Setting the Auto Restart

Enable or disable automatic system restart after a power outage.

(◆. . . Factory setting)

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

1-5. Setting the Indoor room temperature sensor switching function (Only for Wired remote controller)

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

(◆. . . Factory setting)

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

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

1-6. Setting the Remote controller signal code

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

(◆. . . Factory setting)

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

1-7. Setting the External input control

"Operation/Stop" mode or "Forced stop" mode can be elected.

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
◆	Operation/Stop mode	46	00
	(Setting forbidden)		01
	Forced stop mode		02

1-8. Indoor unit fan control for energy saving

Enable or disable indoor unit fan control when the outdoor unit is stopped.

(◆. . . Factory setting)

	Setting Description	Function Number	Setting Value
	No	49	00
◆	Yes		01

*AS*A24LFCA does not have this function.
Factry setting: No

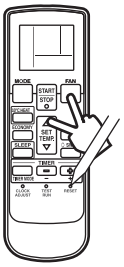
* If setting value is "00":
  When the outdoor unit is stopped, the indoor unit fan operates following the setting on the remote controller continuously.
* If setting value is "01":
  When the outdoor unit stopped, the indoor unit fan operates at very low speed intermittently.

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

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

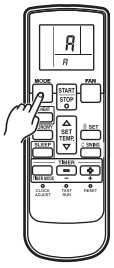
Entering the Function Setting Mode

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



Selecting the Function Number and Setting Value

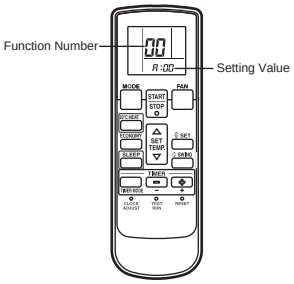
(1) Press the MODE button, and proceed to Fanction Number and Setting Value.
(There is no necessity for setting remote control signal code. Because signal code is setting by Fanction Number and Setting Value.)



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

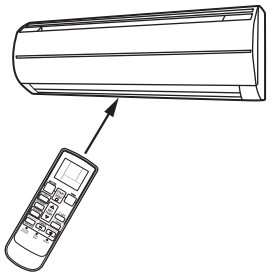
(3) Press the FAN button to proceed to Setting Value.
(Press the FAN button again to return to the Function Number selection.)

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



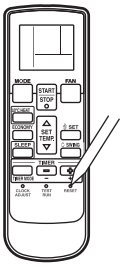
(5) Press the TIMER MODE button. It makes a signal to indoor unit.
(Indoor unit recognize the setting.)

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



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

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



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

Custom code setting for remote controller

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

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

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

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

3-2. Outdoor unit Pressure Value and Total Electric Current Curve

Outdoor Unit Low Pressure Value and Outdoor Total Electric Current Curve (Cooling)

Model Name : AS*G24LFCA / LFCC

[Condition]

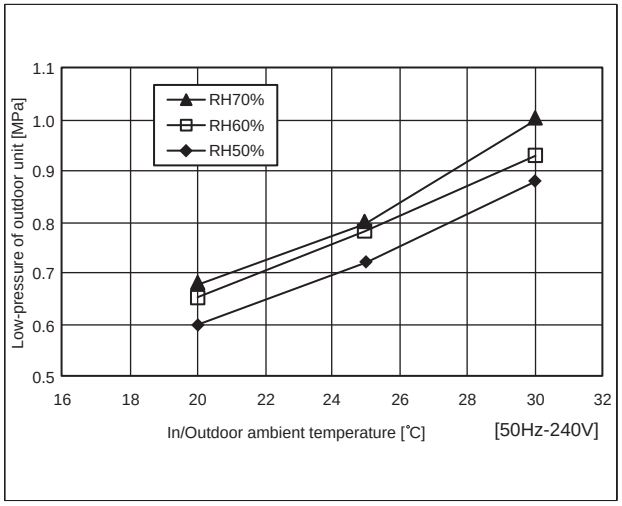
Ambient temperature	Indoor / Outdoor - Same temperature
Refrigerant amount	Standard amount
Piping length	7.5m * (Height difference 1m) *AS*G24LFCC: 5m
Power voltage	50Hz - 240V
Operation condition	TEST mode (Cooling), Hi Fan, Horizontal direction, Front air flow
Measuring method	Measure the low pressure with the pressure meter at the service valve. Measure the outdoor unit overall current with the current clamp meter at Power Cable.
Caution	**Start operation with the condition of the Indoor Unit air filter clean.**

[Constant Frequency Operation Method (Test mode)]

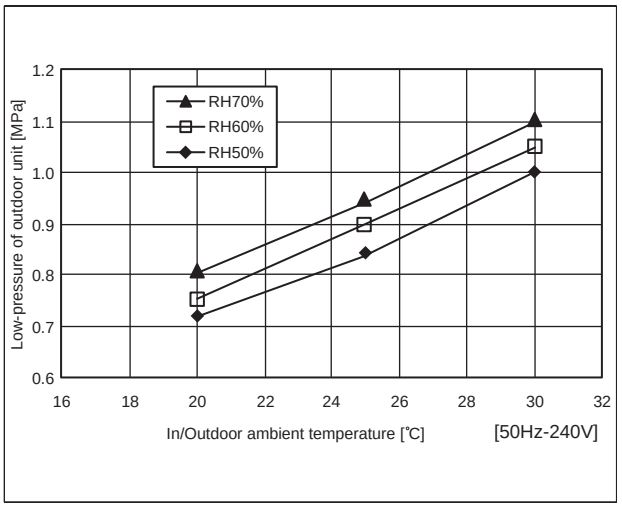
1. Operate on Cooling mode, and press TEST button of remote control.
2. Operate continuously for 30 minutes. (After 60 minutes of operation, Test mode is released automatically.)

(1) Indoor/Outdoor Temperature - Outdoor Low Pressure Curve

AS*G24LFCA

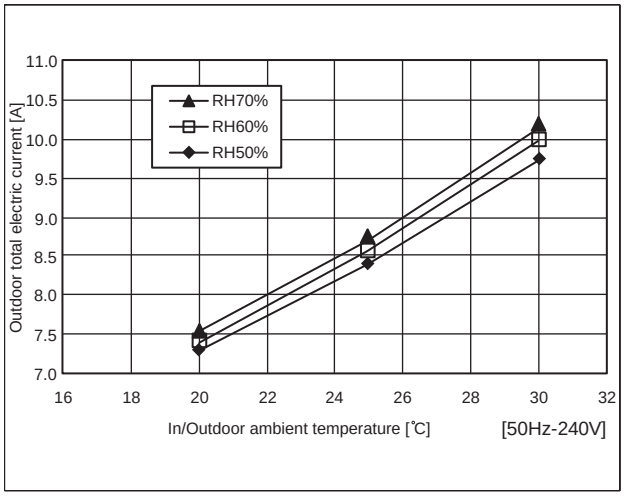


AS*G24LFCC

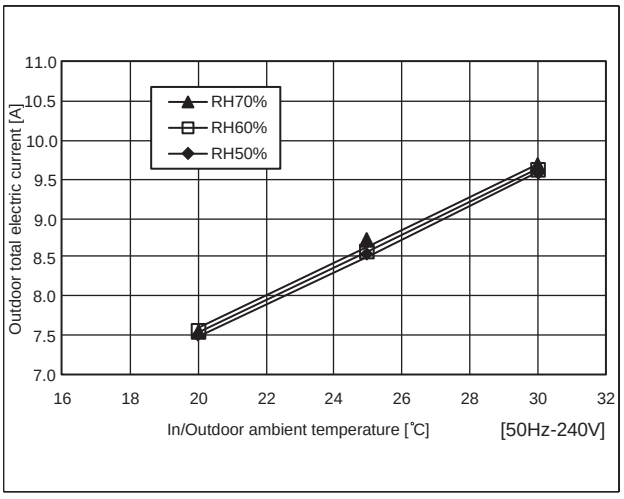


(2) Indoor/Outdoor Temperature - Outdoor Total Electric Current Curve

AS*G24LFCA



AS*G24LFCC



Outdoor Unit High Pressure Value and Outdoor Total Electric Current Curve (Heating)

Model Name : AS*G24LFCA / LFCC

[Condition]

Ambient temperatur	Indoor 15, 20, 23˚C, Outdoor 2, 7, 12˚C
Refrigerant amount	Standard amount
Piping length	7.5m * (Height difference 1m) ∗AS*G24LFCC: 5m
Power voltage	50Hz - 240V
Operation condition	TEST mode (Heating), Hi Fan, One step up from lower direction, Front air flow
Measuring method	outdoor unit overall current with the current clamp meter at Power Cable.

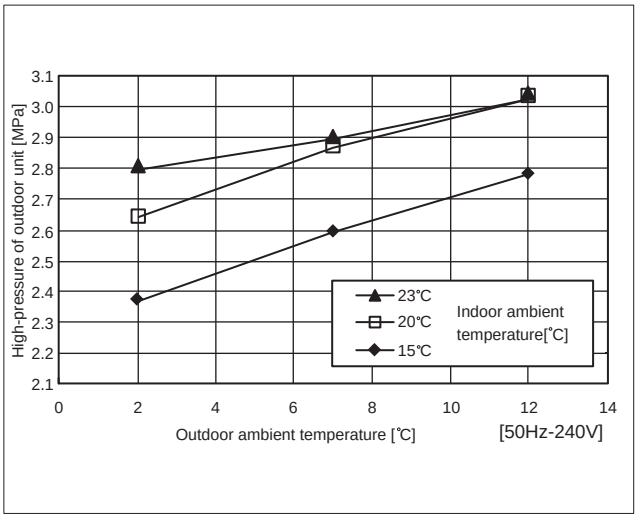
Caution **Start operation with the condition of the Indoor Unit air filter clean.**

[Constant Frequency Operation Method (Test mode)]

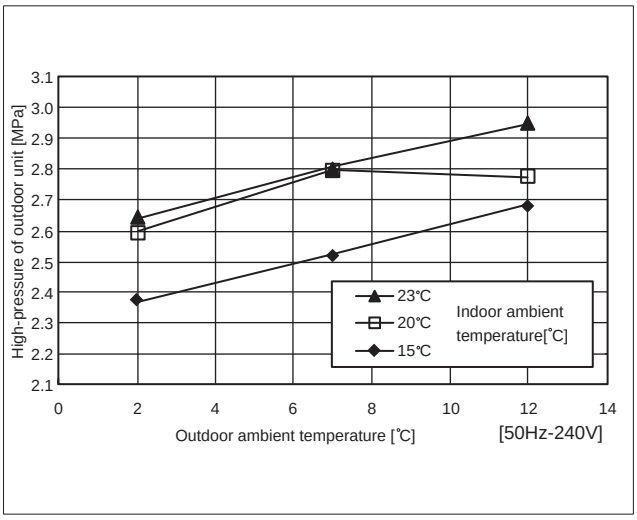
1. Operate on Heating mode, and press TEST button of remote control.
2. Operate continuously for 30 minutes. (After 60 minutes of operation, Test mode is released automatically.)

(1) Indoor/Outdoor Temperature - Outdoor High Pressure Curve

AS*G24LFCA

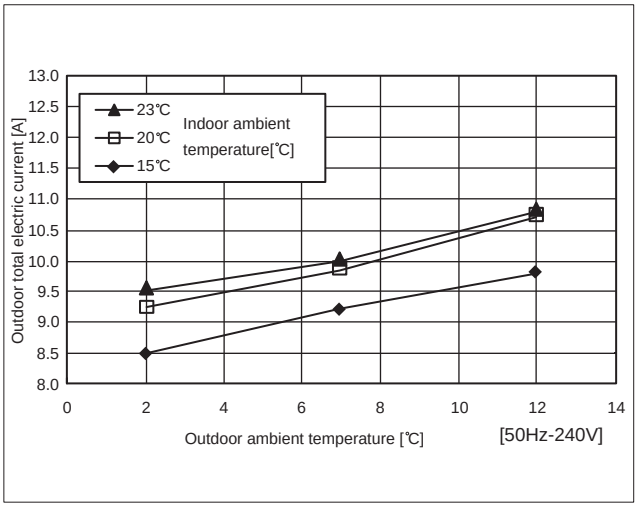


AS*G24LFCC

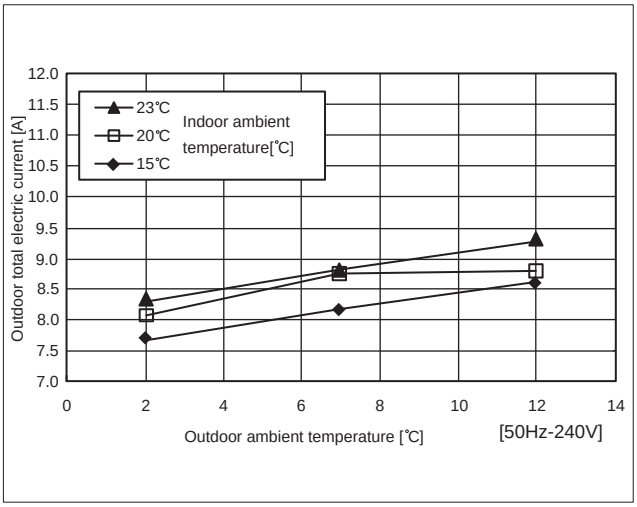


(2) Indoor/Outdoor Temperature - Outdoor Total Electric Current Curve

AS*G24LFCA



AS*G24LFCC



Outdoor Unit Low Pressure Value and Outdoor Total Electric Current Curve (Cooling)

Model Name : AS*G30LFCA

[Condition]

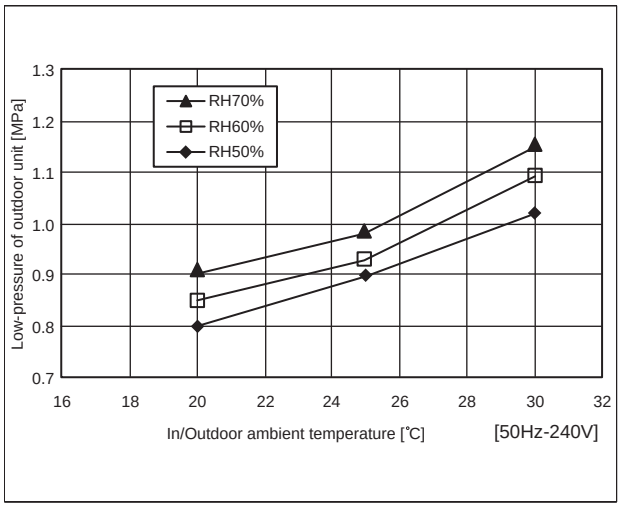
Ambient temperature	Indoor / Outdoor - Same temperature
Refrigerant amount	Standard amount
Piping length	7.5m (Height difference 1m)
Power voltage	50Hz - 240V
Operation condition	TEST mode (Cooling), Hi Fan, Horizontal direction, Front air flow
Measuring method	Measure the low pressure with the pressure meter at the service valve. Measure the outdoor unit overall current with the current clamp meter at Power Cable.
Caution	**Start operation with the condition of the Indoor Unit air filter clean.**

[Constant Frequency Operation Method (Test mode)]

1. Operate on Cooling mode, and press TEST button of remote control.
2. Operate continuously for 30 minutes. (After 60 minutes of operation, Test mode is released automatically.)

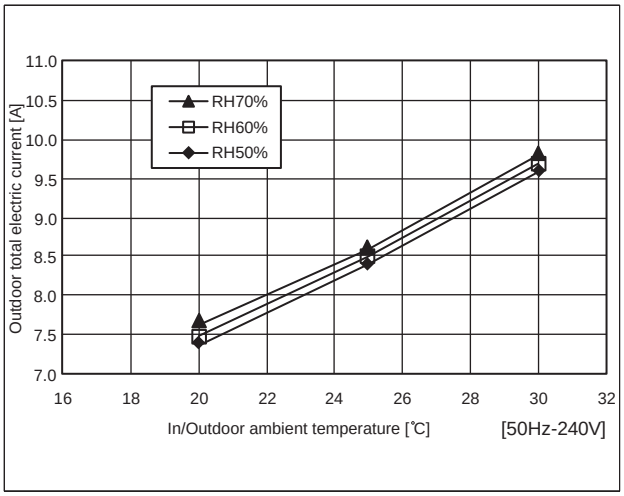
(1) Indoor/Outdoor Temperature - Outdoor Low Pressure Curve

AS*G30LFCA



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

AS*G30LFCA



Outdoor Unit High Pressure Value and Outdoor Total Electric Current Curve (Heating)

Model Name : AS*G30LFCA

[Condition]

Ambient temperatur	Indoor 15, 20, 23˚C, Outdoor 2, 7, 12˚C
Refrigerant amount	Standard amount
Piping length	7.5m (Height difference 1m)
Power voltage	50Hz - 240V
Operation condition	TEST mode (Heating), Hi Fan, One step up from lower direction, Front air flow
Measuring method	outdoor unit overall current with the current clamp meter at Power Cable.

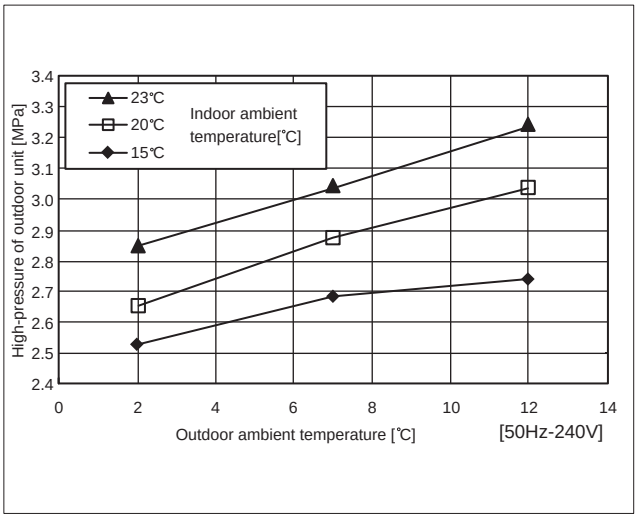
Caution **Start operation with the condition of the Indoor Unit air filter clean.**

[Constant Frequency Operation Method (Test mode)]

1. Operate on Heating mode, and press TEST button of remote control.
2. Operate continuously for 30 minutes. (After 60 minutes of operation, Test mode is released automatically.)

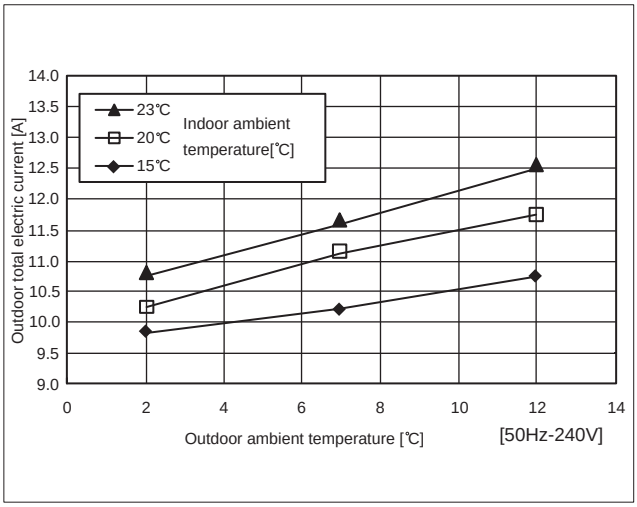
(1) Indoor/Outdoor Temperature - Outdoor High Pressure Curve

AS*G30LFCA



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

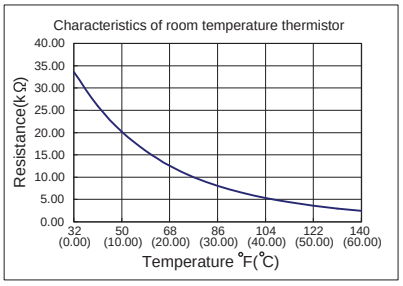
AS*G30LFCA

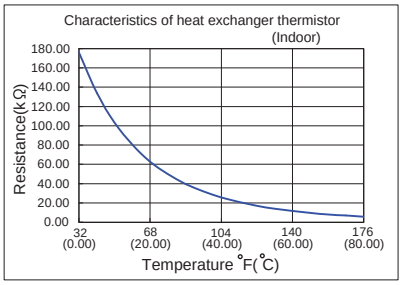


3-3. Thermistor Resistance Values

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

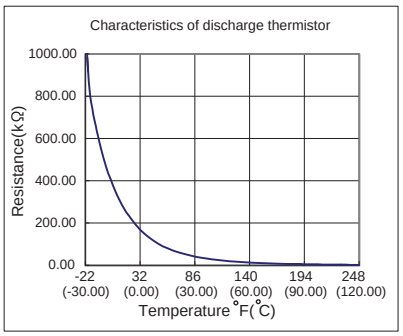
Indoor heat exchanger thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
32.0	0.0	176.03	1.10
41.0	5.0	134.23	1.36
50.0	10.0	103.34	1.63
59.0	15.0	80.28	1.92
68.0	20.0	62.91	2.21
77.0	25.0	49.70	2.51
86.0	30.0	39.57	2.79
95.0	35.0	31.74	3.06
104.0	40.0	25.64	3.30
113.0	45.0	20.85	3.53
122.0	50.0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

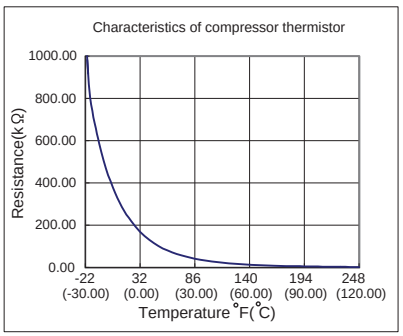




Discharge thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	1013.11	0.06
-13.0	-25.0	729.09	0.09
-4.0	-20.0	531.56	0.12
5.0	-15.0	392.31	0.16
14.0	-10.0	392.91	0.21
23.0	-5.0	221.09	0.28
32.0	0.0	168.60	0.36
41.0	5.0	129.84	0.46
50.0	10.0	100.91	0.57
59.0	15.0	79.12	0.71
68.0	20.0	62.55	0.86
77.0	25.0	49.84	1.03
86.0	30.0	40.01	1.23
95.0	35.0	32.35	1.43
104.0	40.0	26.34	1.65
113.0	45.0	21.58	1.88
122.0	50.0	17.79	2.11
131.0	55.0	14.75	2.34
140.0	60.0	12.30	2.57
149.0	65.0	10.32	2.79
158.0	70.0	8.70	3.00
167.0	75.0	7.36	3.19
176.0	80.0	6.27	3.37
185.0	85.0	5.36	3.54
194.0	90.0	4.60	3.69
203.0	95.0	3.96	3.83
212.0	100.0	3.43	3.96
221.0	105.0	2.98	4.07
230.0	110.0	2.60	4.17
239.0	115.0	2.27	4.26
248.0	120.0	2.00	4.33

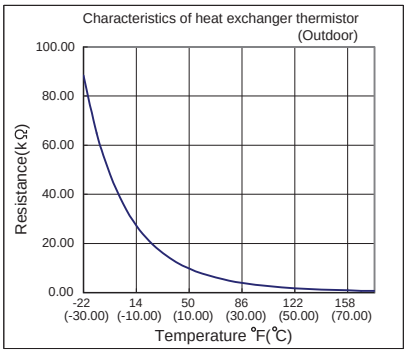
Compressor temperature thermistor			
Tempe°F	Tempe°C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	1013.11	0.06
-13.0	-25.0	729.09	0.09
-4.0	-20.0	531.56	0.12
5.0	-15.0	392.31	0.16
14.0	-10.0	392.91	0.21
23.0	-5.0	221.09	0.28
32.0	0.0	168.60	0.36
41.0	5.0	129.84	0.46
50.0	10.0	100.91	0.57
59.0	15.0	79.12	0.71
68.0	20.0	62.55	0.86
77.0	25.0	49.84	1.03
86.0	30.0	40.01	1.23
95.0	35.0	32.35	1.43
104.0	40.0	26.34	1.65
113.0	45.0	21.58	1.88
122.0	50.0	17.79	2.11
131.0	55.0	14.75	2.34
140.0	60.0	12.30	2.57
149.0	65.0	10.32	2.79
158.0	70.0	8.70	3.00
167.0	75.0	7.36	3.19
176.0	80.0	6.27	3.37
185.0	85.0	5.36	3.54
194.0	90.0	4.60	3.69
203.0	95.0	3.96	3.83
212.0	100.0	3.43	3.96
221.0	105.0	2.98	4.07
230.0	110.0	2.60	4.17
239.0	115.0	2.27	4.26
248.0	120.0	2.00	4.33

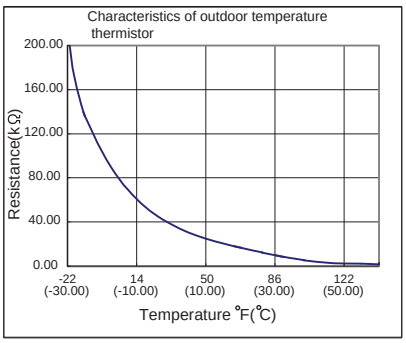




Outdoor heat exchanger thermistor			
Tempe˚F	Tempe˚C	Resistance(KΩ)	Voltage(V)
-22.0	-30.0	95.58	0.24
-13.0	-25.0	68.90	0.32
-4.0	-20.0	50.31	0.43
5.0	-15.0	37.19	0.57
14.0	-10.0	27.81	0.73
23.0	-5.0	21.02	0.92
32.0	0.0	16.05	1.14
41.0	5.0	12.38	1.39
50.0	10.0	9.63	1.65
59.0	15.0	7.56	1.93
68.0	20.0	5.98	2.21
77.0	25.0	4.77	2.49
86.0	30.0	3.84	2.77
95.0	35.0	3.11	3.02
104.0	40.0	2.53	3.26
113.0	45.0	2.08	3.48
122.0	50.0	1.71	3.68
131.0	55.0	1.42	3.85
140.0	60.0	1.19	4.00
149.0	65.0	1.00	4.13
158.0	70.0	0.84	4.25
167.0	75.0	0.71	4.35
176.0	80.0	0.61	4.43

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





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