

**SPLIT TYPE
ROOM AIR CONDITIONER**
**Universal Floor / Ceiling
Duct / Cassette
Wall Mounted / Floor type
INVERTER MULTI**

SERVICE INSTRUCTION

Models Indoor unit Outdoor unit

AB*14LBAJ	AU*12LBAB	AO*A18LAT3
AB*18LBAJ	AU*14LBAB	AO*A24LAT3
AB*F14LAT	AU*18LBAB	
AB*F18LAT	AU*F09LAL	
	AU*F12LAL	
AR* 9LUAB	AU*F14LAL	
AR*12LUAD	AU*F18LAL	
AR*14LUAD		
AR*18LUAD	AS* 7LMACW	
AR*F09LALU	AS* 9LMACW	
AR*F12LALU	AS*12LMACW	
AR*F14LALU	AS*A07LACM	
AR*F18LALU	AS*A09LACM	
	AS*A12LACM	
	AS*A14LACM	
	AS*A18LACM	
	AG*F09LAC	
	AG*F12LAC	
	AG*F14LAC	

Refrigerant
R410A

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*Universal Floor / Ceiling
Duct / Cassette
Wall Mounted / Floor type
INVERTER (MULTI)*

**1 . DESCRIPTION OF EACH
CONTROL OPERATION**

1. CAPACITY CONTROL

1-1 COOLING, HEATING, DRY CAPACITY CONTROL

Compressor frequency decides by capacity of an indoor unit, operation number of an indoor unit, set temperature, room temperature and outside temperature.

2. 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 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 degC steps.

- ① When operation starts, only the indoor fan is operated for 1 minute. (Air flow mode: S- Lo)
After 1 minute, depends on the room temperature and outdoor unit's operation mode, the operation mode is selected in accordance with the table below.

(Table 1 : Operation mode selection table)

Room temperature :TR	Operation mode
$TR \geq Ts + 2 \text{ degC}$	Cooling
$Ts + 2 \text{ degC} > TR > Ts - 2 \text{ degC}$	Monitoring
$Ts + 2 \text{ degC} \geq TR$	Heating

Ts : Setting temperature
TR: Room temperature

- ② When COOLING was selected at ①, the same operation as COOLING OPERATION is performed.
- ③ When HEATING was selected at ①, the same operation as HEATING OPERATION is performed.
- ④ When the compressor was stopped for 6 consecutive minutes by the temperature control function after the COOLING or HEATING operation mode was selected at ① above, operation is switched to MONITORING and the operation mode is selected again.

3. INDOOR FAN CONTROL

1. Fan speed

(Table 2 : Indoor Fan Speed)

• AB*14LBAJ

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	850
	Me	760
	Lo	670
	S-Lo	250

• AB*18LBAJ

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	1030
	Me	890
	Lo	770
	S-Lo	250

• AB*F14LAT

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	850
	Me	800
	Lo	740
	Quiet	670
	S-Lo	300

• AB*F18LAT

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	1040
	Me	950
	Lo	800
	Quiet	740
	S-Lo	300

• AR*9LUAB

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	955
	Me	870
	Lo	800
	S-Lo	650

• AR*12LUAD

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	750
	Me	680
	Lo	610
	S-Lo	550

• AR*14LUAD

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	1000
	Me	860
	Lo	720
	S-Lo	570

• AR*18LUAD

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	1040
	Me	890
	Lo	750
	S-Lo	595

• AR*F09LALU

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	1010
	Me	950
	Lo	880
	Quiet	830
	S-Lo	450

• AR*F12LALU

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	790
	Me	720
	Lo	620
	Quiet	570
	S-Lo	330

• AR*F14LALU

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	990
	Me	880
	Lo	770
	Quiet	620
	S-Lo	330

• AR*F18LALU

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	1040
	Me	950
	Lo	840
	Quiet	700
	S-Lo	450

• AU*12/ 14LBAB

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	730
	Me	670
	Lo	590
	S-Lo	---

• AU*18LBAB

Operation mode	Air flow mode	Speed (rpm)
Cooling Heating	Hi	800
	Me	700
	Lo	600
	S-Lo	---

• AU*F09LAL

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	590
	Me	540
	Lo	490
	Quiet	440
Heating	Hi	590
	Me+	570
	Me	540
	Lo	490
	Quiet	440
Dry	Auto	460
Monitoring	S- Lo	300

• AU*F12LAL

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	660
	Me	580
	Lo	520
	Quiet	460
Heating	Hi	650
	Me+	620
	Me	580
	Lo	520
	Quiet	460
Dry	Auto	460
Monitoring	S- Lo	300

• AU*F14LAL

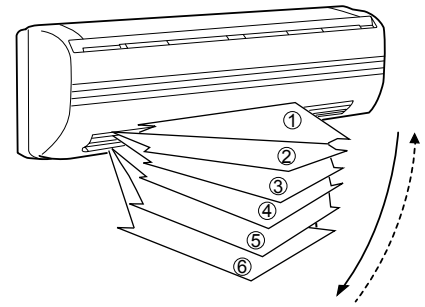
Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	730
	Me	630
	Lo	540
	Quiet	460
Heating	Hi	740
	Me+	700
	Me	670
	Lo	600
	Quiet	480
Dry	Auto	460
Monitoring	S- Lo	300

• AU*F18LAL

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	790
	Me	660
	Lo	570
	Quiet	460
Heating	Hi	840
	Me+	800
	Me	750
	Lo	650
	Quiet	500
Dry	Auto	460
Monitoring	S- Lo	300

• AS*7LMACW

Operation mode	Air flow mode	Speed (rpm)	
		Louver position ②	Louver position ①③④⑤⑥
Cooling Fan	Hi	1100	
	Me	1050	
	Lo	1000	
	Quiet	950	
Heating	Hi	1120	1100
	Me	1070	1030
	Lo	1000	970
	Quiet	950	930
	S- Lo	500	500



• AS*9LMACW

Operation mode	Air flow mode	Speed (rpm)	
		Louver position ②	Louver position ①③④⑤⑥
Cooling Fan	Hi	1200	
	Me	1100	
	Lo	1000	
	Quiet	940	
Heating	Hi	1200	1150
	Me	1100	1050
	Lo	1000	960
	Quiet	940	900
	S- Lo	500	500

• AS*12LMACW

Operation mode	Air flow mode	Speed (rpm)	
		Louver position ②	Louver position ①③④⑤⑥
Cooling Fan	Hi	1310	
	Me	1260	
	Lo	1190	
	Quiet	1100	
Heating	Hi	1310	1200
	Me	1180	1100
	Lo	1030	1000
	Quiet	970	970
	S- Lo	500	500

•AS*A07LACM

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	1140
	Me	1000
	Lo	880
	Quiet	700
Heating	Hi/ Me+	1140
	Me	1050
	Lo	980
	Quiet	800
Dry	Auto	700
Monitoring	S- Lo	480

•AS*A09LACM

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	1220
	Me	1060
	Lo	900
	Quiet	720
Heating	Hi/ Me+	1220
	Me	1110
	Lo	1040
	Quiet	830
Dry	Auto	720
Monitoring	S- Lo	480

•AS*A12LACM

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	1280
	Me	1100
	Lo	900
	Quiet	750
Heating	Hi/ Me+	1320
	Me	1180
	Lo	1080
	Quiet	860
Dry	Auto	750
Monitoring	S- Lo	480

•AS*A14LACM

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	1480
	Me	1250
	Lo	1050
	Quiet	850
Heating	Hi/ Me+	1480
	Me	1250
	Lo	1100
	Quiet	950
Dry	Auto	850
Monitoring	S- Lo	480

•AS*A18LACM

Operation mode	Air flow mode	Speed (rpm)
Cooling Fan	Hi	1480
	Me	1250
	Lo	1100
	Quiet	950
Heating	Hi/ Me+	1480
	Me	1250
	Lo	1100
	Quiet	950
Dry	Auto	950
Monitoring	S- Lo	480

• AG*F09LAC

Operation mode	Air flow mode		Speed (rpm)	
			Upper& Lower air flow mode	Upper air flow mode
Cooling Fan	Hi	(Upper/ Lower)	1120/ 950	1230/ ---
	Me	(Upper/ Lower)	960/ 820	1070/ ---
	Lo	(Upper/ Lower)	820/ 700	910/ ---
	Quiet	(Upper/ Lower)	660/ 560	750/ ---
	S-Lo	(Upper/ Lower)	570/ 480	--- / ---
Heating	Hi	(Upper/ Lower)	1120/ 950	1230/ ---
	Me	(Upper/ Lower)	1000/ 850	1090/ ---
	Lo	(Upper/ Lower)	860/ 730	940/ ---
	Quiet	(Upper/ Lower)	660/ 560	750/ ---
	Cool air prevention	(Upper/ Lower)	660/ 560	680/ ---
	S-Lo	(Upper/ Lower)	660/ 560	680/ ---

• AG*F12LAC

Operation mode	Air flow mode		Speed (rpm)	
			Upper& Lower air flow mode	Upper air flow mode
Cooling Fan	Hi	(Upper/ Lower)	1240/ 1050	1300/ ---
	Me	(Upper/ Lower)	1050/ 890	1120/ ---
	Lo	(Upper/ Lower)	860/ 730	930/ ---
	Quiet	(Upper/ Lower)	660/ 560	750/ ---
	S-Lo	(Upper/ Lower)	570/ 480	--- / ---
Heating	Hi	(Upper/ Lower)	1240/ 1050	1300/ ---
	Me	(Upper/ Lower)	1080/ 920	1140/ ---
	Lo	(Upper/ Lower)	910/ 770	980/ ---
	Quiet	(Upper/ Lower)	660/ 560	750/ ---
	Cool air prevention	(Upper/ Lower)	660/ 560	680/ ---
	S-Lo	(Upper/ Lower)	660/ 560	680/ ---

• AG*F14LAC

Operation mode	Air flow mode		Speed (rpm)	
			Upper& Lower air flow mode	Upper air flow mode
Cooling Fan	Hi	(Upper/ Lower)	1330/ 1120	1370/ ---
	Me	(Upper/ Lower)	1100/ 930	1160/ ---
	Lo	(Upper/ Lower)	890/ 750	960/ ---
	Quiet	(Upper/ Lower)	660/ 560	750/ ---
	S-Lo	(Upper/ Lower)	570/ 480	--- / ---
Heating	Hi	(Upper/ Lower)	1330/ 1120	1370/ ---
	Me	(Upper/ Lower)	1140/ 970	1180/ ---
	Lo	(Upper/ Lower)	940/ 800	1020/ ---
	Quiet	(Upper/ Lower)	660/ 560	750/ ---
	Cool air prevention	(Upper/ Lower)	660/ 560	680/ ---
	S-Lo	(Upper/ Lower)	660/ 560	680/ ---

2. FAN OPERATION

2-1. For AB*14L/ 18L

AR* 9L/ 12L/ 14L/ 18L

AU*12L/ 14L/ 18L

The airflow can be switched in 4 steps such as AUTO, LOW, MED, HIGH, while the indoor fan only runs.

2-2. For AB*F14L/ 18L

AR*F09L/ 12L/ 14L/ 18L

AU*F09L/ 12L/ 14L/ 18L

AS*7L/ 9L/ 12L

AS*A07L/ 09L/ 12L/ 14L/ 18L

AG*F09L/ 12L/ 14L

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

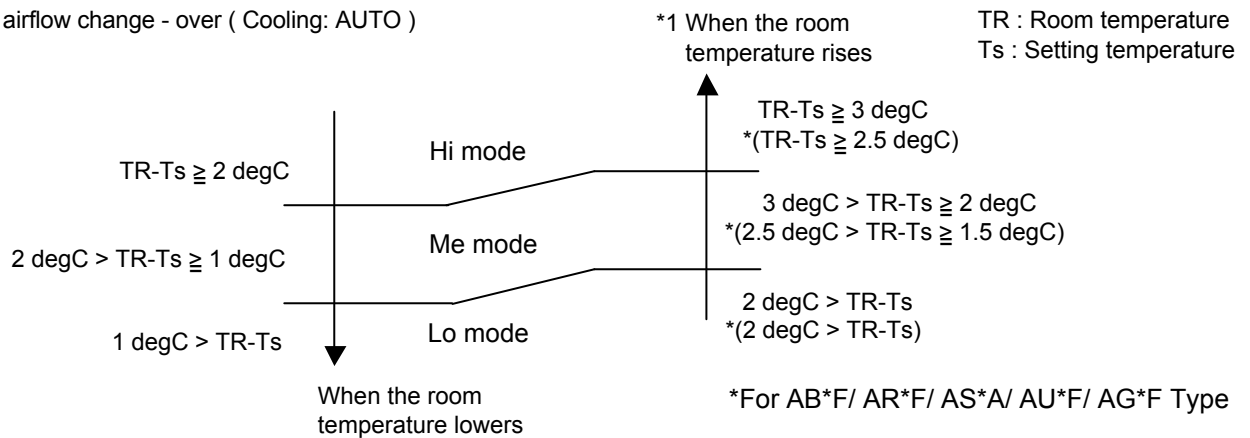
3. COOLING OPERATION

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure 1.

On the other hand, if switched in [HIGH]~ [QUIET], the indoor motor will run at a constant airflow of [COOL] operation modes QUIET, LOW, MED, HIGH, as shown in Table 2.

(Fig.1)

airflow change - over (Cooling: AUTO)



*1 : Contains a condition to the following

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

4. HEATING OPERATION

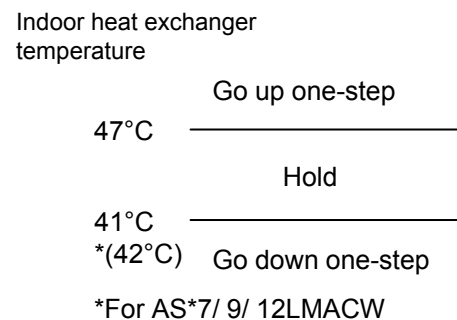
4-1. For AB/ AR/ AU/ AS Type

When the airflow is set to [AUTO], the indoor fan motor operates [MED] mode.

Then the indoor fan motor will run according to a room temperature, as shown in Figure 2.

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 Table 2.

(Fig.2 : Airflow change - over (Heating : AUTO))

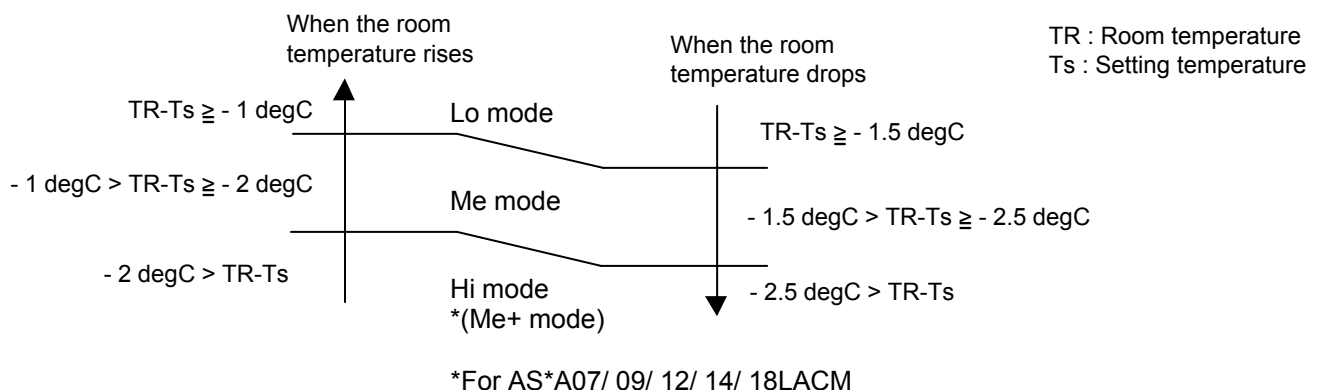


4-2. For AB*F/ AR*F/ AU*F/ AS*A/ AG*F Type

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure 3.

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 Table 2.

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

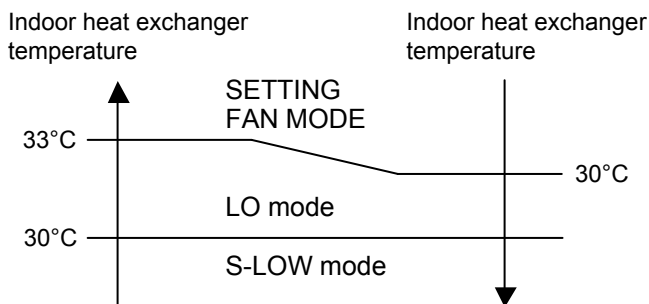


5. COOL AIR PREVENTION CONTROL (Heating mode)

5-1. For AB/ AR/ AU Type

The maximum value of the indoor fan speed is set as shown in Figure 4, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

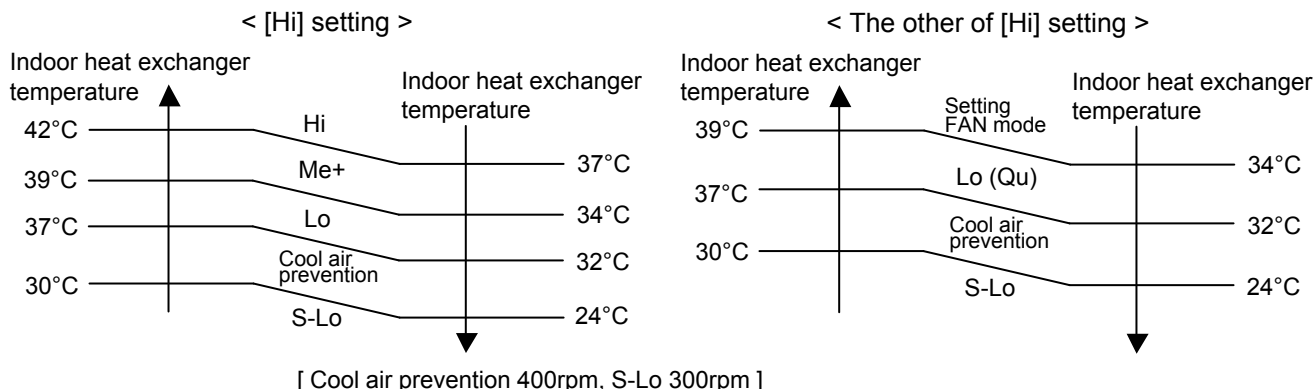
(Fig.4 : Cool Air Prevention Control)



5-2. For AB*F/ AU*F Type

When the compressor operates, the maximum value of the indoor fan speed is set as shown in Figure 5, based on the detected temperature by the indoor heat exchanger sensor on heating mode. When the compressor does not operate, the indoor fan motor operates [S-Lo] mode.

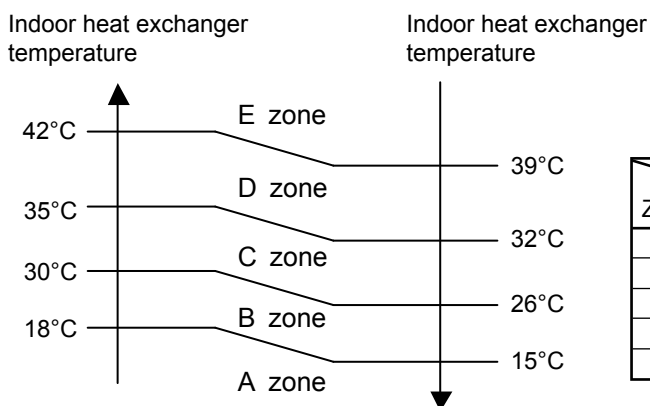
(Fig.5 : Cool Air Prevention Control)



5-3. For AS Type

The maximum value of the indoor fan speed is set as shown in Figure 6, based on the fan speed mode and the detected temperature by the indoor heat exchanger sensor on heating mode.

(Fig.6 : Cool Air Prevention Control for AS*7/ 9/ 12LMACW)

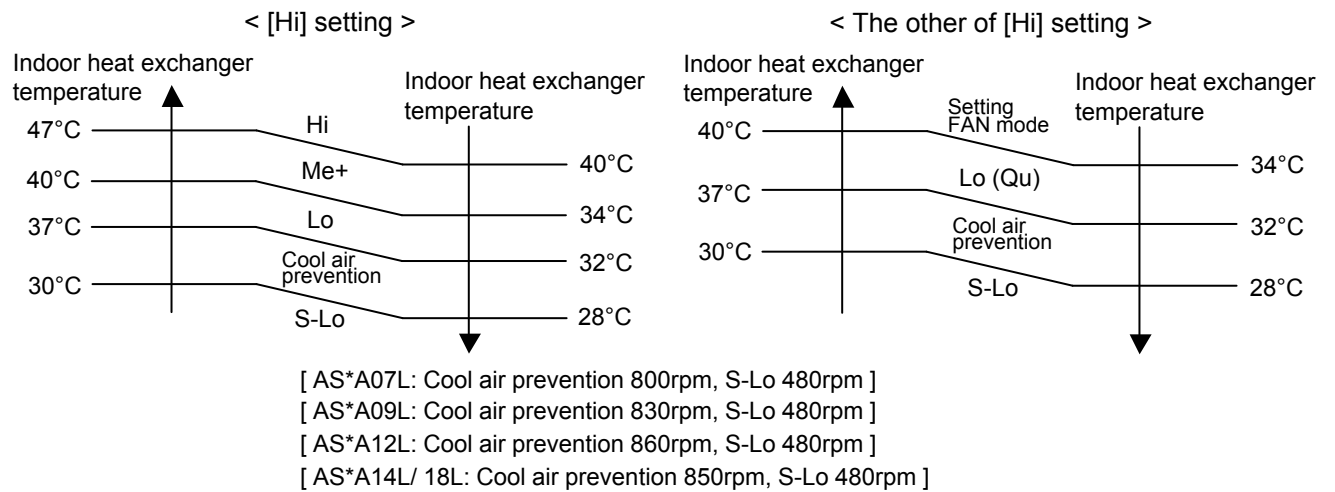


Fan speed mode \ ZONE	AUTO	HIGH	MED	LOW	QUIET
E zone	AUTO	Setting Fan Speed			
D zone	AUTO	Me	Setting Fan Speed		
C zone	Lo	Lo	Lo	Setting Fan Speed	
B zone	S-Lo	S-Lo	S-Lo	S-Lo	S-Lo
A zone	OFF	OFF	OFF	OFF	OFF

5-4. For AS*A Type

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

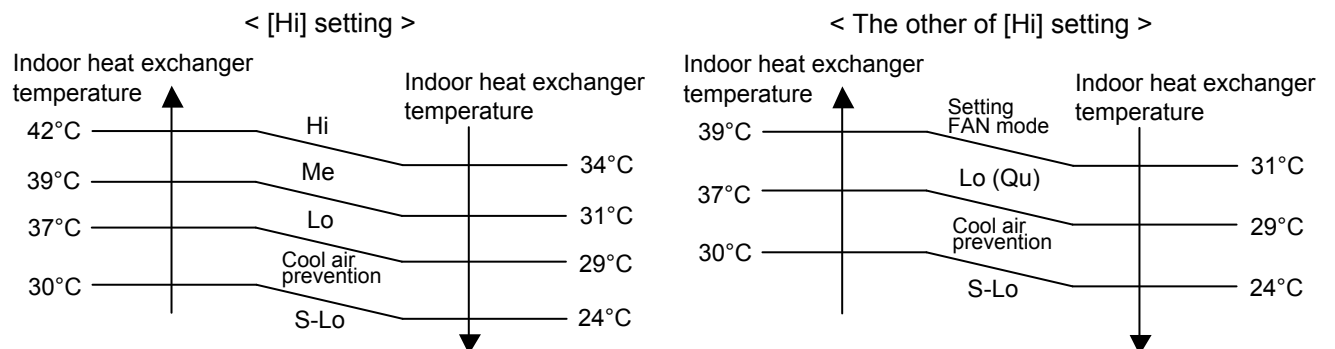
(Fig.7 : Cool Air Prevention Control)



5-5. For AG*F Type

When the compressor operates, the maximum value of the indoor fan speed is set as shown in Figure 8, based on the detected temperature by the indoor heat exchanger sensor on heating mode. When the compressor does not operate, the indoor fan motor operates [S-Lo] mode.

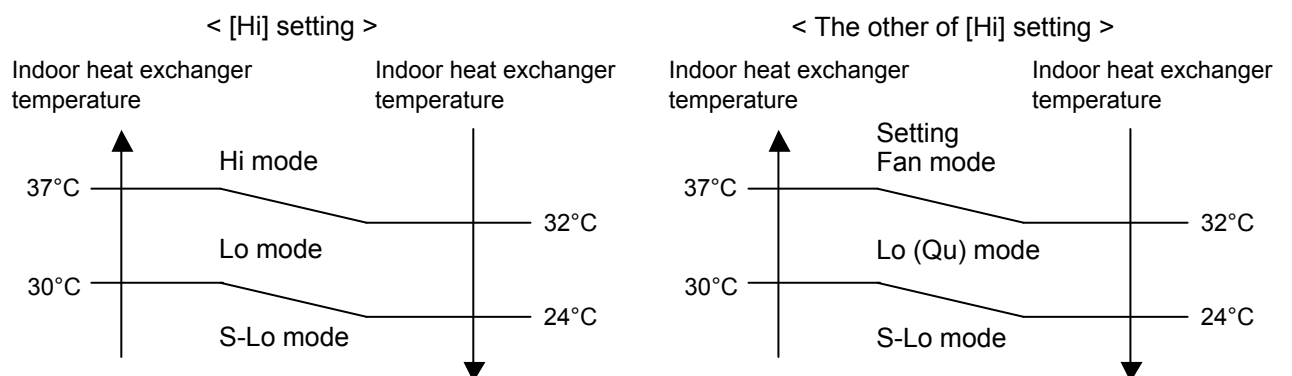
(Fig.8 : Cool Air Prevention Control)



5-6. For AR*F Type

When the compressor operates, the maximum value of the indoor fan speed is set as shown in Figure 9, based on the detected temperature by the indoor heat exchanger sensor on heating mode. When the compressor does not operate, the indoor fan motor operates [S-Lo] mode.

(Fig.9 : Cool Air Prevention Control)



6. DRY OPERATION

During the dry mode operation, the fan speed setting can not be changed. (S-Lo)

4. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

Following table shows the fan speed of the outdoor unit.

(Table 3 : Fan speed of the outdoor unit)

	Cooling	Heating
AO*A18LAT3	780/ 730/ 400/ 300/ 250/ 200 rpm	780/ 730/ 660/ 400/ 300/ 250 rpm
AO*A24LAT3		

* It runs at 500rpm for 20 seconds after starting up the outdoor fan.
When the outdoor heat exchanger temperature is lower than 1°C,
the fan speed switches to 780rpm on heating mode.

5. LOUVER CONTROL

5-1 Compact Cassette (AU) type

1. VERTICAL LOUVER CONTROL

(Function Range)

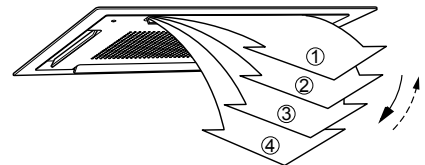
Each time the button is pressed, the air direction range will change as follows:

①↔②↔③↔④

(Operation Range)

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

(Air Direction Range)



Use the air direction adjustments within the ranges shown above.

- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.

Cooling / Dry / Fan mode	:	Horizontal flow	①
Heating mode	:	Downward flow	④
- At the start of operation if the setting louver position is ①, the setting position is set to ① after the louver moves from totally-enclosed position to ②. (Positioning Control)
- The indoor fan motor starts after the louver reaches to the setting position.

1-2. SWING OPERATION

When the swing signal is received from the remote controller, the vertical louver starts to swing. The range of swing depends on the set airflow direction.

(Swinging Range)

Airflow direction set	Range of swing
①	① to ③
②	② to ④
③	② to ④
④	① to ④

- When the indoor fan is either at S-Lo or Stop mode, the swinging operation is interrupted and the louver stops at the memorized position.
(Stop mode means Operation stop.)

5-2 Universal (AB) type

1. VERTICAL LOUVER CONTROL

(Function Range)

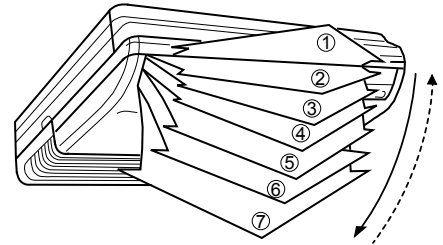
Each time the button is pressed, the air direction range will change as follows:

① → ② → ③ → ④ → ⑤ → ⑥ → ⑦

(Operation Range)

Cooling / Dry mode	:	① - ② - ③ - ④ - ⑤ - ⑥ - ⑦
Heating mode	:	
Fan mode	:	

(Air Direction Range)



Use the air direction adjustments within the ranges shown above.

- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.

Cooling / Dry / Fan mode	:	Horizontal flow	①
Heating mode	:	Downward flow	⑦

- At the start of operation if the setting louver position is ① or ②, the setting position is set to ① or ② after the louver moves from totally-enclosed position to ③. (Positioning Control)
- The indoor fan motor starts after the louver reaches to the setting position.

1-2. SWING OPERATION

When the swing signal is received from the remote controller, the vertical louver starts to swing. The range of swing depends on the set airflow direction.

(Swinging Range)

Airflow direction set	Range of swing
①	① to ③
②	① to ④
③	② to ⑤
④	③ to ⑥
⑤	④ to ⑦
⑥	⑤ to ⑦
⑦	① to ⑦

- When the indoor fan is either at S-Lo or Stop mode, the swinging operation is interrupted and the louver stops at the memorized position.
(Stop mode means Operation stop.)

2. HORIZONTAL LOUVER CONTROL

(Function Range)

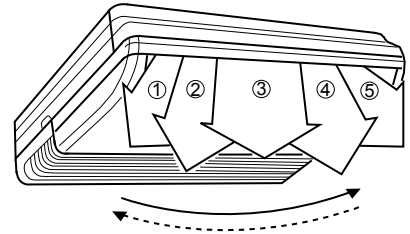
Each time the button is pressed, the air direction range will change as follows:

① → ② → ③ → ④ → ⑤

(Operation Range)

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

(Air Direction Range)



Use the air direction adjustments within the ranges shown above.

- The horizontal airflow direction is set automatically on ③ after initialization.

2-1. SWING OPERATION

When the swing signal is received from the remote controller, the horizontal louver starts to swing. The range of swing depends on the set airflow direction.

(Swinging Range)

Airflow direction set	Range of swing
①	① to ⑤
②	① to ③
③	② to ④
④	③ to ⑤
⑤	① to ⑤

- When the indoor fan is either at S-Lo or Stop mode, the swinging operation is interrupted and the louver stops at the memorized position.
 (Stop mode means Operation stop.)

5-3 Wall Mounted (AS) type

1. VERTICAL LOUVER CONTROL

(Function Range)

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

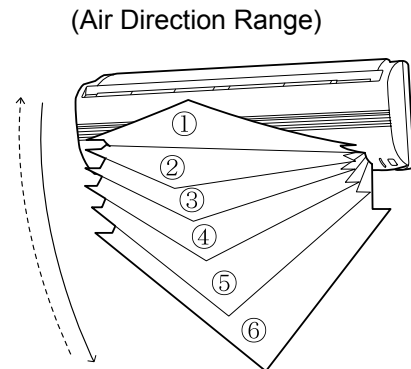
③ ↔ ② ↔ ① ↔ ⑥ ↔ ⑤ ↔ ④

(Operation Range)

Cooling / Dry mode : ①—②—③

Heating mode : ④—⑤—⑥

The remote control unit'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.
 - Cooling / Dry mode : Horizontal flow ①
 - Heating mode : Downward flow ⑤
- During AUTO mode operation, for the first minute after beginning operation, airflow will be horizontal ① ; the air direction cannot be adjusted during this period.

1-2. SWING OPERATION

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

(Swinging Range)

Cooling mode / Dry mode / Fan mode (①~③) : ① ↔ ③

Heating mode / Fan mode (④~⑥) : ④ ↔ ⑥

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

5-4 Wall Mounted (AS*A) type

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 → ⑦

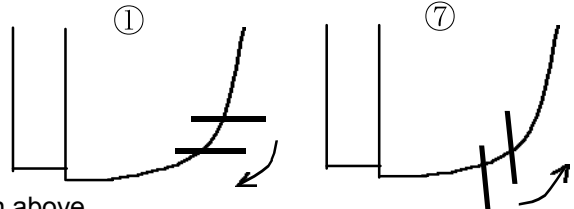
(Operation Range)

Cooling / Dry mode : ①—②—③

Heating mode : ④—⑤—⑥—⑦

Fan mode : ①—②—③—④—⑤—⑥—⑦

(Air Direction Range)



- Use the air direction adjustments within the ranges shown above.
- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
 - Cooling / Dry mode : Horizontal flow ①
 - Heating mode : Downward flow ⑦
- When the temperature of the air being blown out is low at the start of heating operation or during defrosting, the airflow direction temporarily becomes ⑦ to prevent cold air being blown onto the body.
- During use of the Cooling and Dry modes, do not set the Air Flow Direction Louver in the Heating range (④~⑦) for long period of time, since water vapor may condense near the outlet louvers and drop of water may drip from the air conditioner. During the Cooling and Dry modes, if the Air Flow Direction Louvers are left in the heating range for more than 30 minutes, they will automatically return to position ③.
- During Monitor operation in AUTO CHANGEOVER mode, the airflow direction automatically becomes ①, and it cannot be adjusted.

1-2. SWING OPERATION

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

(Swinging Range)

Cooling mode / Dry mode / Fan mode (①~③) : ① ↔ ③

Heating mode / Fan mode (④~⑦) : ④ ↔ ⑦

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

5-5 Compact Cassette (AU*F) type

1. VERTICAL LOUVER CONTROL

(Function Range)

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

① ⇄ ② ⇄ ③ ⇄ ④

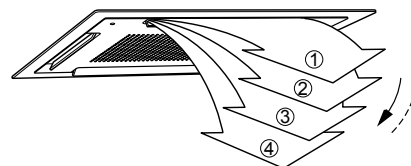
(Operation Range)

During Cooling/Dry mode/Fan mode : ①—②—③—④

During Heating mode : ②—③—④

Use the air direction adjustments within the ranges shown above.

(Air Direction Range)



- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
 - Cooling / Dry / Fan mode : Horizontal flow ①
 - Heating mode : Downward flow ④
- During AUTO mode operation, for the first minute after beginning operation, air-flow will be horizontal ①; the air direction cannot be adjusted during this period.

1-2. SWING OPERATION

When the swing signal is received from the remote controller, the vertical louver starts to swing. The range of swing depends on the set airflow direction.

(Swinging Range)

The type of operation	Range of swing
Cooling/Dry/Fan	① to ④
Heating	② to ④

- When the indoor fan is either at S-Lo or Stop mode, the swinging operation is interrupted and the louver stops at the memorized position.
(Stop mode means Operation stop.)

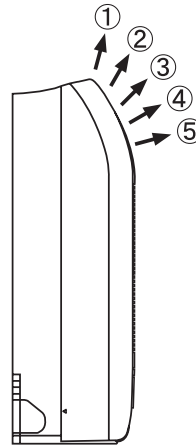
5-6 Floor (AG*F) type

1. VERTICAL LOUVER CONTROL

(Function and Operation Range)

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

① → ② → ③ → ④ → ⑤



(Air Direction Range)

Use the air direction adjustments within the ranges shown above.

- The vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.
 - Cooling / Dry mode : Horizontal flow ①
 - Heating mode : Downward flow ④
- When the temperature of the air being blown out is low at the start of heating operation or during defrosting, the airflow direction temporarily becomes ① to prevent cold air being blown onto the body.
- During Monitor operation in AUTO CHANGEOVER mode, the airflow direction automatically becomes ①, and it cannot be adjusted.

1-2. SWING OPERATION

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

(Swinging Range)

① ⇔ ⑤

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

6. COMPRESSOR CONTROL

1. OPERATION FREQUENCY RANGE

The operation frequency of the compressor is different based on the operation mode as shown in the table 4.

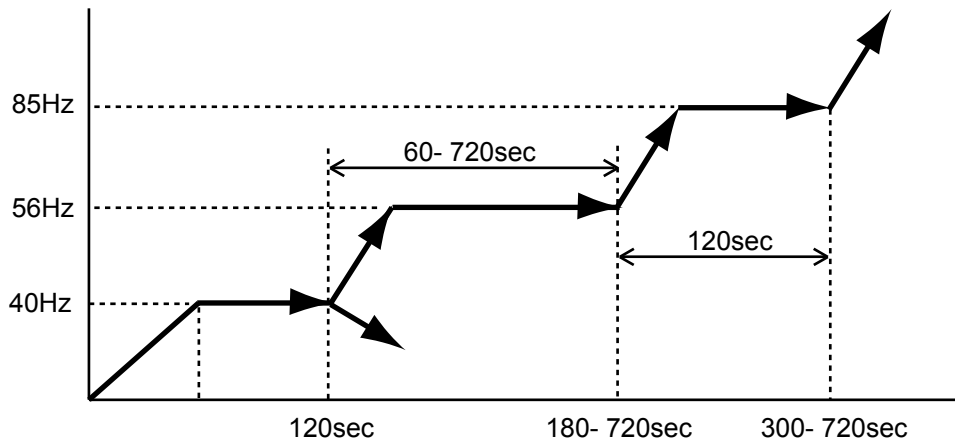
(Table 4 : Compressor Operation Frequency Range)

	Cooling		Heating	
	Min	Max	Min	Max
AO*A18LAT3	20Hz	100Hz	24Hz	110Hz
AO*A24LAT3				

2. OPERATION FREQUENCY CONTROL AT START UP

The compressor frequency soon after the start-up is controlled as shown in Figure 10.

(Fig.10 : Compressor Control at Start-up)



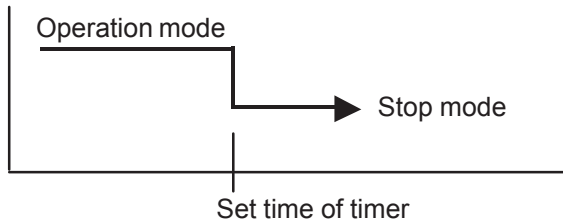
7. TIMER OPERATION CONTROL

7-1 Wireless Remote Controller (For AB/ AU/ AU*F/ AS/ AS*A/ AB*F/ AG*F type)

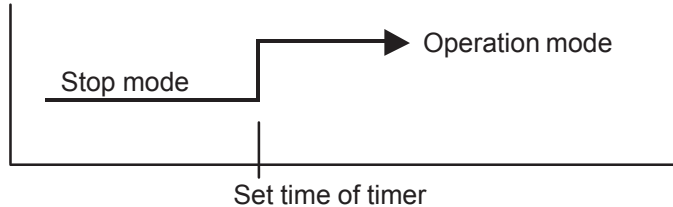
- ON / TIMER
- OFF / TIMER
- PROGRAM TIMER
- SLEEP TIMER

1. ON / OFF TIMER

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

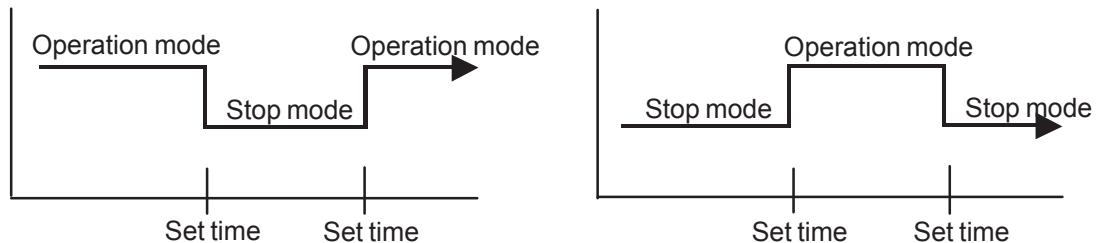


- ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. PROGRAM TIMER

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



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

3. SLEEP TIMER

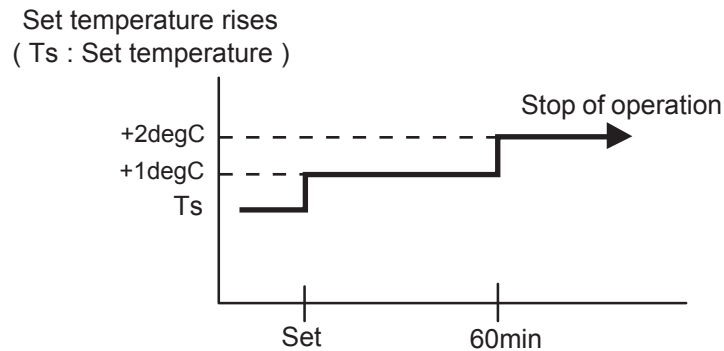
- If the sleep timer is set, the room temperature is monitored and the operation is stopped automatically. If the operation mode or the set temperature is change after the sleep timer is set, the operation is continued according to the changed setting of the sleep timer from that time ON.

In the cooling operation mode

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

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

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

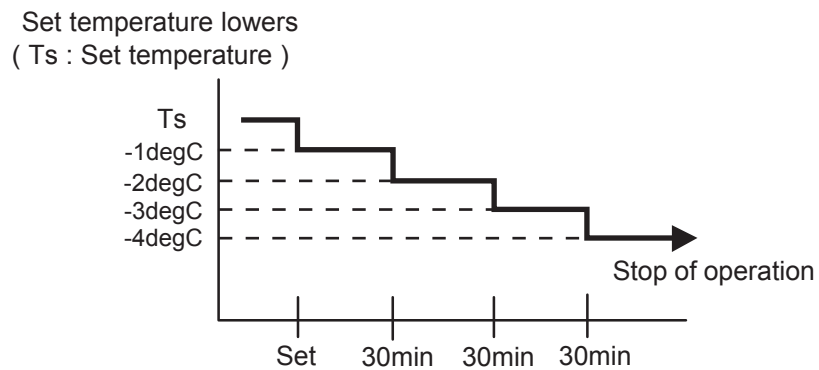


In the heating operation mode

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

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

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

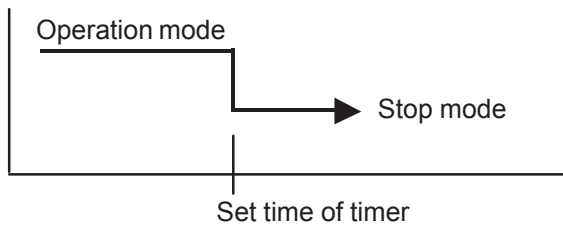


7-2 Wired Remote Controller (For AR/ AR*F type)

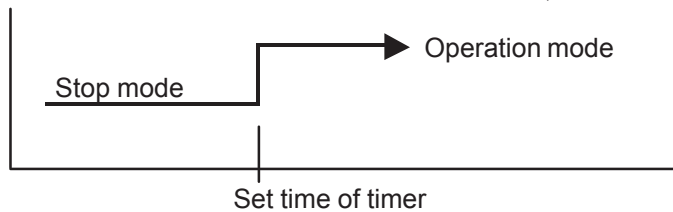
- ON / TIMER
- OFF / TIMER
- WEEKLY TIMER
- TEMPERATURE SET BACK TIMER

1. ON / OFF TIMER

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



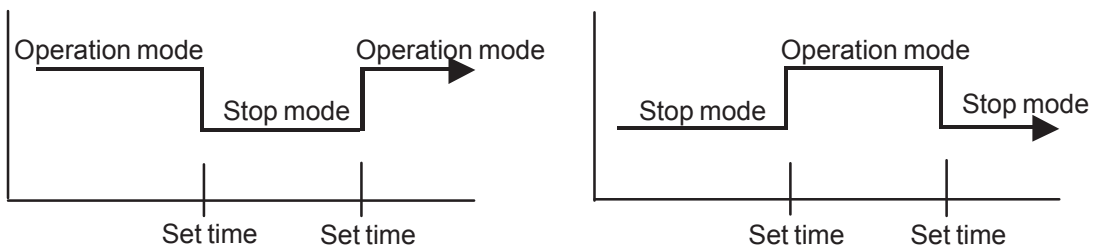
- ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. WEEKLY TIMER

2-1. WEEKLY TIMER

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

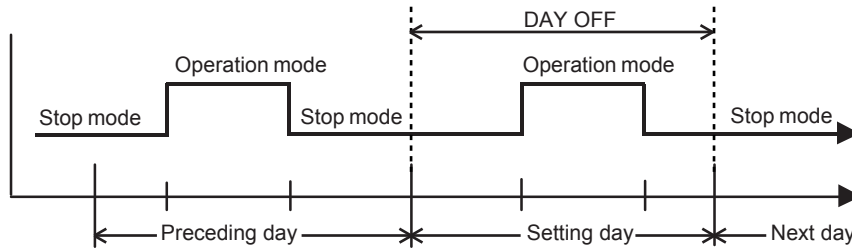


- The operating time can be set in 30 min increments only.
- The OFF time can be carried over to next day.
- The ON timer and the OFF timer functions cannot be set with using the weekly timer. Both ON and OFF time must be set.

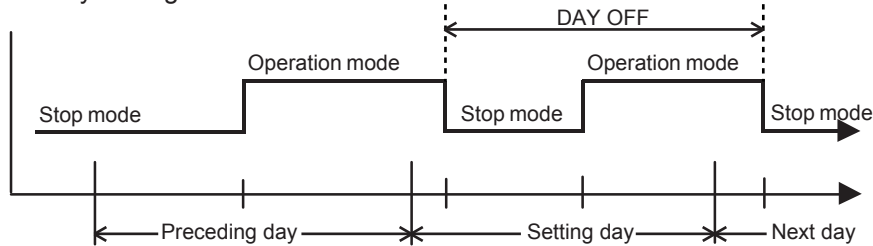
2-2. DAY OFF setting

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

- Normal



- Next day setting



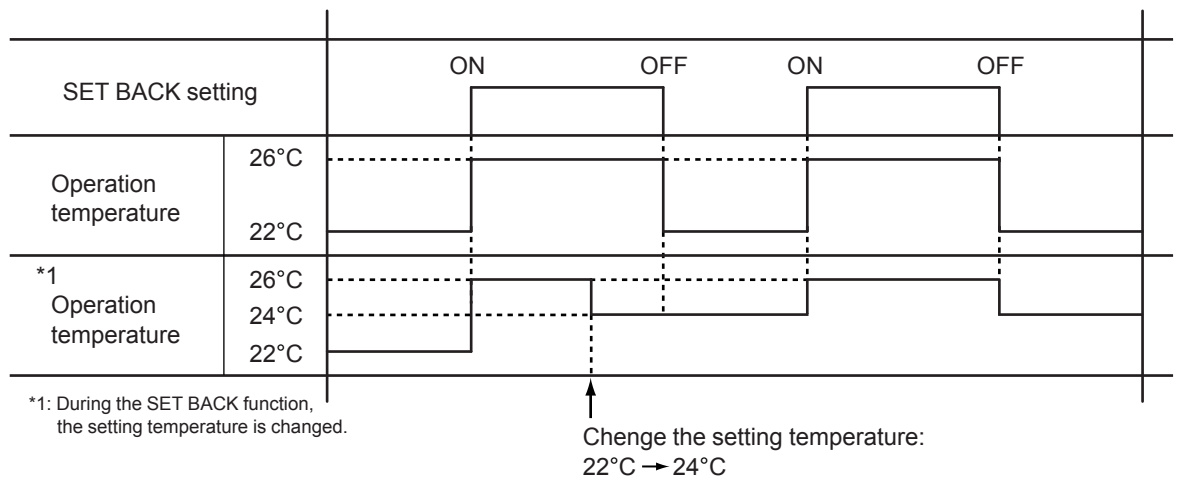
- The DAY OFF setting can only be set one time. The DAY OFF setting is cancelled automatically after the set day has passed.

3. TEMPERATURE SET BACK TIMER

- The SET BACK timer only changes the set temperature for 7 days, it cannot be used to start or stop air conditioner operation.
- The SET BACK timer can be set to operate up to two times per day but only one temperature setting can be used.
- During the COOL/DRY mode, the air conditioner will operate at a minimum of 18°C even if the SET BACK temperature is set to 17°C or lower.

Case of SET BACK timer on the Cooling operation.

(Setting temperature :22°C, SET BACK temperature :26°C)



8. ELECTRONIC EXPANSION VALVE CONTROL

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

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

- * The pulse range of the electronic expansion valve control is between 30 to 480 pulses.
- * At the time of supplying the power to the outdoor unit, the initialization of the electronic expansion valve is operated (1000 pulses are input to the closing direction).

9. TEST OPERATION CONTROL

▪ With Wireless Remote Controller

Under the condition where the air conditioner runs, short two metal contacts under the battery compartment lid, and the test operation control mode will appear.

During test running, the operation lamp and timer lamp of the air conditioner body twinkle simultaneously. Set the test operation mode, and the compressor will continue to run regardless of whether the room temperature sensor detects.

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

▪ With Wireless Remote Controller (with TEST RUN button)

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

During test running, the operation lamp and timer lamp of the air conditioner body twinkle simultaneously. Set the test operation mode, and the compressor will continue to run regardless of whether the room temperature sensor detects.

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

▪ With Wired Remote Controller (without TEST RUN button)

Under the condition where the air conditioner stops, press the MASTER CONTROL button and the FAN CONTROL button simultaneously for 5 seconds or more, and the test operation control mode will appear.

During test running, " a ! " will display on the remote controller display.

Set the test operation mode, and the compressor will continue to run regardless of whatever the room temperature sensor detects.

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

10. 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.

11. 4-WAY VALVE EXTENSION SELECT

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

12. AUTO RESTART

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

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

[Operation contents memorized when the power is interrupted]

- Operation mode
- Set temperature
- Set air flow
- Timer mode and timer time
- Air flow Direction
- Swing
- Thermistor detected position (For AU*F model with wired remote controller)
- 10°C HEAT (For AG*F model)

13. MANUAL AUTO OPERATION (Indoor unit body operation)

If MANUAL AUTO Button is set, the operation is controlled as shown in Table 5.

If the remote control is lost or battery power dissipated, this function will work without the remote control.

(Table 5 : Manual auto operation)

OPERATION MODE	Auto changeover
FAN CONT. MODE	Auto
TIMER MODE	Continuous (No timer setting available)
SETTING TEMP.	23°C or 24°C
SETTING LOUVER	Standard
SWING	OFF

14. COMPRESSOR PREHEATING

When the outdoor heat exchanger temperature is lower than Operation temperature (Refer to Table 6) and the heating operation has been stopped for 3 hours, power is applied to the compressor and the compressor is heated.

(By heating the compressor, warm air is quickly discharged when operation is started.)

When operation was started, and when the outdoor temperature rises to Release temperature or greater, preheating is over.

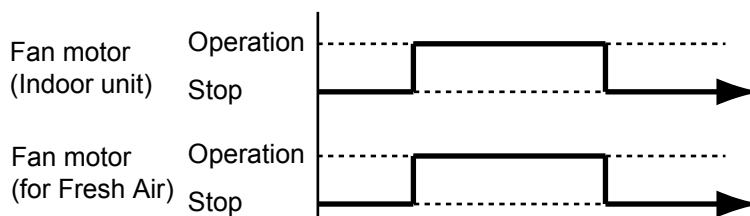
(Table 6 : Preheating Operation / Release Temperature)

Before 24 hour		After 24 hour	
Operation temperature	Release temperature	Operation temperature	Release temperature
3°C	7°C	0°C	4°C

15. FRESH AIR CONTROL (For AR type)

The fan motor for Fresh Air is operated in synchronization with the indoor fan operation as shown in Figure 11.

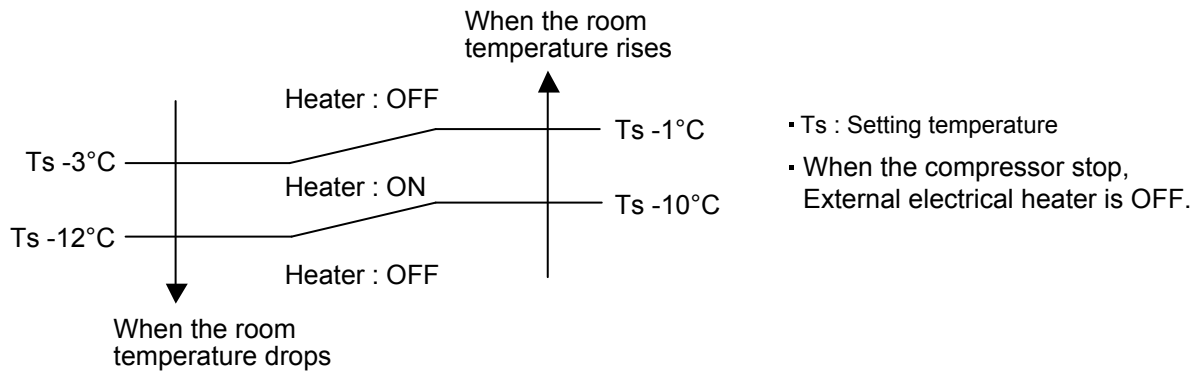
(Fig.11 : Fresh air control)



16. EXTERNAL ELECTRICAL HEATER CONTROL (For AR type)

The external electrical heater is operated as shown in Figure 12.

(Fig.12 : External electrical heater control)



17. COIL DRY OPERATION CONTROL (For AS*A/ AG*F type)

The coil-dry operation functions by pressing COIL DRY button on the remote controller. The coil-dry operation is consisted of 3 cycles of [Fan operation 3 minutes / Heating operation 2 minutes], and Fan operates for 3 minutes at last before ending the air conditioner operation. (It takes 18 minutes to complete the coil-dry operation.)

18. DEFROST OPERATION CONTROL

1. CONDITION OF STARTING THE DEFROST OPERATION

The defrost operation starts when the outdoor heat exchanger temperature sensor detects the temperature lower than the values shown in Table 7.

(Table 7 : Condition of starting Defrost Operation)

Compressor integrating operation :Less than 45min.	Compressor integrating operation :45min and over	
	Less than 6 min. *1 or 10min. *2	After 6 min. *1 or 10min. *2
Does not operate	-8°C *3 -12°C *4 -14°C *5 -16°C *6	

- *1. It means contiguous operation time.
- *2. Compressor stop time:
Below 20min. → Select 6min.
Above 20min. → Select 10min.
- *3. Outdoor temp. > 3°C
- *4. $3 \geq$ Outdoor temp. > -1°C
- *5. $-1 \geq$ Outdoor temp. > -5°C
- *6. Outdoor temp. < -5°C

2. CONDITION OF THE DEFROST OPERATION COMPLETION

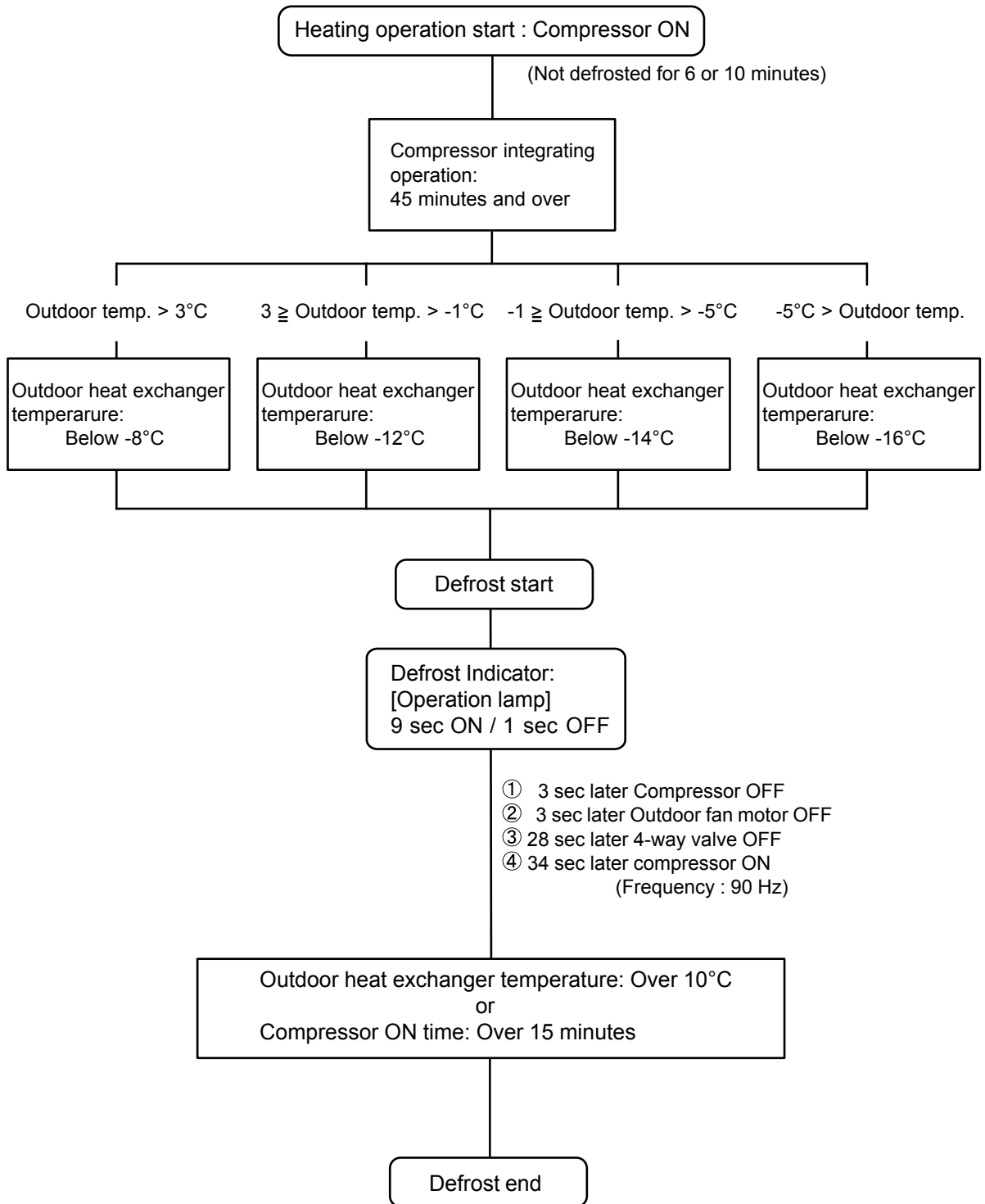
Defrost operation is released when the conditions become as shown in Table 8.

(Table 8 : Defrost Release Condition)

Release Condition
Outdoor heat exchanger temperature sensor value is higher than 10°C or Compressor operation time has passed 15 minutes.

3. Defrost Flow Chart

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



19. DRAIN PUMP OPERATION (For AU type)

- During Cooling / Dry operation

1. When the compressor starts, the drain pump starts simultaneously.
2. The drain pump operates continuously for 3 minutes after the compressor is turned off.
3. When the compressor stops by the "Indoor heat exchanger de-icing function", the drain pump is turned off in 1 hour after the compressor stops.
4. When the water level in the drain pan rises up and then the float switch functions:
 - ① The compressor, indoor and outdoor fan motor operation are stopped.
 - ② Drain pump operates continuously for 3 minutes after the float switch is turned off.
(Almost condensing water may be drained)
5. When the float switch turns ON continuously for 3 min., "FAILURE INDICATION" operates.
6. When the float switch turns OFF within 3 min., the unit starts cooling operation.

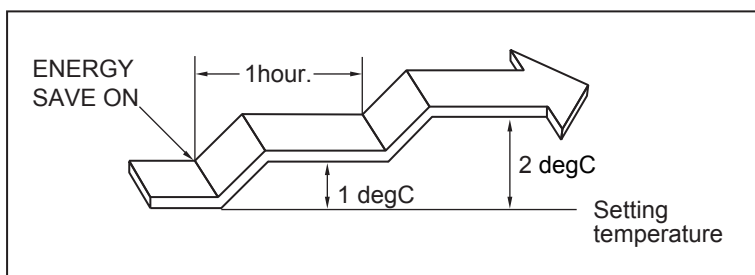
- During Heating / Fan / Stop operation

1. When the water level in the drain pan rises up and then the float switch functions:
 - ① Drain pump operates continuously for 3 minutes after the float switch is turned off.
(Almost condensing water may be drained)
2. When the float switch turns ON continuously for 3 min., "FAILURE INDICATION" operates.

20. ENERGY SAVE FUNCTION (For AR type)

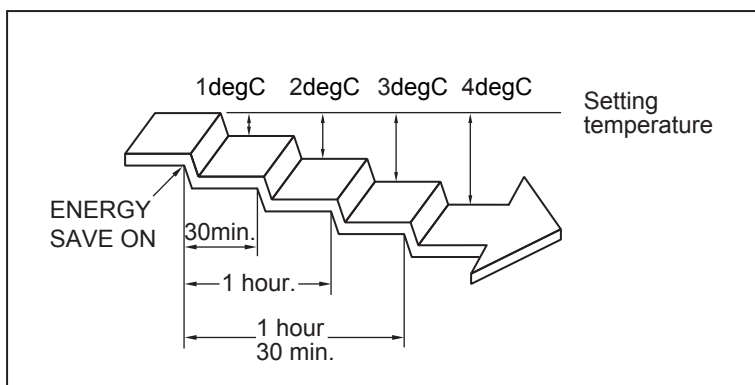
1. During Cooling / Dry operation:

The thermostat temperature setting increases by 1 degC as soon as the ENERGY SAVE button is pressed, and then increases by 1 degC after 1 hour later. Afterwards, energy consumption is saved by continuing to cool or dry at a thermostat temperature of 2 degC higher than setting temperature.



2. During Heating operation:

The thermostat temperature setting decreases by 1 degC as soon as the ENERGY SAVE button is pressed, and then decreases by another 1 degC every 30 minutes. Afterwards, energy consumption is saved by continuing to heat at a thermostat temperature of 4 degC lower than setting temperature.



21. VARIOUS PROTECTIONS

1. DISCHARGE GAS TEMPERATURE OVER RISE PREVENTION CONTROL

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

When the discharge temperature becomes higher than 105°C ,the compressor frequency is decreased 20 Hz, and it continues to decrease the frequency for 20 Hz every 120 seconds until the temperature becomes lower than 105°C .

When the discharge temperature becomes lower than 95°C ,the control of the compressor frequency is released.

When the discharge temperature becomes higher than 110°C ,the compressor stops.

When the discharge temperature becomes lower than 80°C ,the compressor operates.

2. CURRENT RELEASE CONTROL

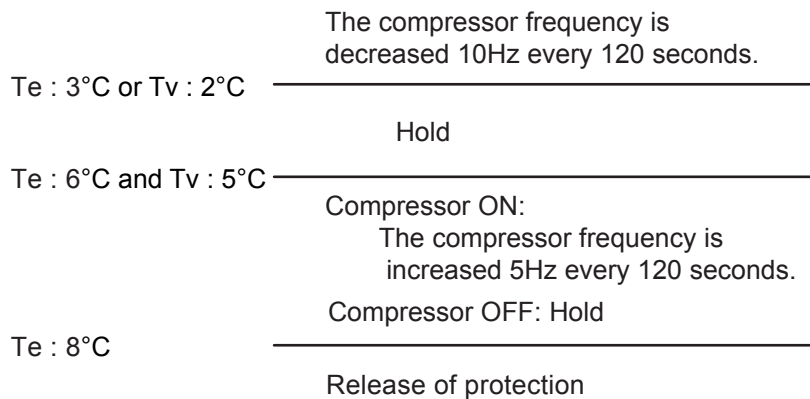
The compressor frequency is controlled so that the outdoor unit input current does not exceeds the current limit value that was set up with the outdoor temperature.

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

3. ANTI-FREEZING CONTROL (Cooling mode)

The compressor frequency decreases on cooling mode when the indoor heat exchanger temperature sensor detects the temperature lower than 3°C or 2-way valve temperature sensor detects the temperature lower than 2°C.

(Fig 13 : Anti-freezing Protection Operation / Release Temperature)



Te : Indoor heat exchange temperature
Tv : 2-way valve temperature

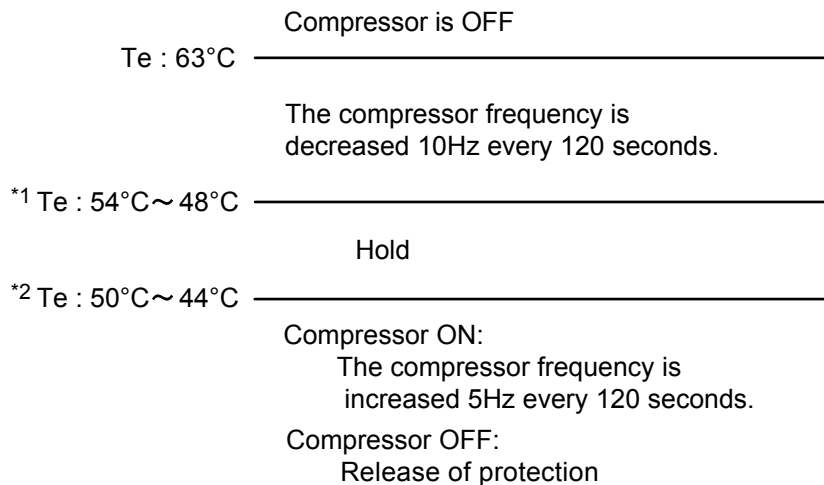
4. COOLING PRESSURE OVER RISE PROTECTION

When the outdoor unit heat exchange sensor temperature rises to 70.5°C or greater, the compressor is stopped and error display is indicated.

5. HIGH TEMPERATURE RELEASE CONTROL (HEATING MODE)

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

(Fig 14 : Heating Overload Protection Control)



*1	Th ≥ -9°C ---> Te : 54°C
	-9°C > Th ≥ -11°C ---> Te : 54°C
	-11°C > Th ≥ -13°C ---> Te : 52°C
	-13°C > Th ≥ -15°C ---> Te : 50°C
	-15°C > Th ---> Te : 48°C

Th : Outdoor heat exchange temperature
Te : Indoor heat exchange temperature

*2	Th ≥ -9°C ---> Te : 50°C
	-9°C > Th ≥ -11°C ---> Te : 50°C
	-11°C > Th ≥ -13°C ---> Te : 48°C
	-13°C > Th ≥ -15°C ---> Te : 46°C
	-15°C > Th ---> Te : 44°C

***Universal Floor / Ceiling
Duct / Cassette
Wall Mounted / Floor type
INVERTER (MULTI)***

2 . TROUBLE SHOOTING

2. TROUBLESHOOTING

2-1 ERROR DISPLAY

2-1-1 INDOOR UNIT DISPLAY

1. ERROR DISPLAY

Please refer the blinking pattern as follows.

For AS*7/ 9/ 12LMACW

Operation lamp : Red lamp ○ : Fast flashing
Timer lamp : Green lamp ● : Slow flashing

Large division indication			Small division indication				Trouble shooting
Error contents	LED indication		Error contents	LED indication			
Thermistor error (indoor unit)	Red lamp Green lamp	● (2 times) ○	Room temperature thermistor error	Red lamp	○	3	
				Green lamp	● (2 times)		
			Indoor heat exchanger temperature thermistor error	Red lamp	○	4	
				Green lamp	● (3 times)		
Control unit error (indoor unit)	Red lamp Green lamp	● (4 times) ○	Forced auto switch error	Red lamp	○	25	
				Green lamp	● (2 times)		
			Power supply frequency detection error	Red lamp	○	26	
				Green lamp	● (4 times)		
Serial error	Red lamp Green lamp	● (5 times) ○	Communication error (Serial reverse transfer error)	Red lamp	○	2	
				Green lamp	● (2 times)		
			Outdoor communication signal error (Forward transfer signal error)	Red lamp	○	11	
				Green lamp	● (3 times)		
Fan motor error (indoor unit)	Red lamp Green lamp	● (6 times) ○	Indoor fan motor lock error	Red lamp	○	10	
				Green lamp	● (2 times)		
			Indoor fan motor speed error	Red lamp	○		
				Green lamp	● (3 times)		
Thermistor error (outdoor unit)	Red lamp Green lamp	○ ● (2 times)	Outdoor discharge pipe temperature thermistor error	Red lamp	● (2 times)	8	
				Green lamp	○		
			Outdoor heat exchanger temperature thermistor error	Red lamp	● (4 times)	5	
				Green lamp	○		
			Outdoor temperature thermistor error	Red lamp	● (6 times)	7	
				Green lamp	○		
Compressor temperature thermistor error	Red lamp	● (8 times)	12				
	Green lamp	○					
2-way valve temperature thermistor error	Red lamp	● (9 times)	21				
	Green lamp	○					
3-way valve temperature thermistor error	Red lamp	● (10 times)	22				
	Green lamp	○					
Pressure switch error	Red lamp Green lamp	○ ● (3 times)	Pressure switch error	Red lamp	● (2 times)	13	
				Green lamp	○		
Control unit error (outdoor unit)	Red lamp Green lamp	○ ● (4 times)	Connected indoor unit error	Red lamp	● (2 times)	23	
				Green lamp	○		
			Outdoor unit fan motor error	Red lamp	● (3 times)	18	
				Green lamp	○		
Inverter error	Red lamp Green lamp	○ ● (5 times)	IPM error	Red lamp	● (2 times)	14	
				Green lamp	○		
			Compressor rotor location cannot detect (permanent stop)	Red lamp	● (5 times)	17	
				Green lamp	○		
Indoor EEPROM abnormal error	Red lamp Green lamp	○ ○	Indoor EEPROM abnormal (Model No.)	Red lamp	● (2 times)	9	
				Green lamp	○		

When an error occurs, "Large division indication" is indicated first.

Secondly, "Small division indication" is indicated by pushing "Test run" button of remote controller.

For AB*14/ 18L / AU*12L - 18L

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

Error contents	Error display			Trouble shooting
	OPERARION (RED)	TIMER (GREEN)	SWING (ORANGE)	
Indoor EEPROM abnormal (Model No.)	○	○	—	9
Room temperature thermistor error (Opened)	2 times ●	○	—	3
Room temperature thermistor error (Short circuited)	2 times ●	○	○	
Indoor heat exchanger temperature thermistor error (Opened)	3 times ●	○	—	4
Indoor heat exchanger temperature thermistor error (Short circuited)	3 times ●	○	○	
Water drain abnormal	4 times ●	○	—	6
Communication error (Serial reverse transfer error)	5 times ●	○	—	2
Outdoor communication signal error (Forward transfer signal error)	5 times ●	○	○	11
Indoor fan error	6 times ●	○	—	10
Outdoor heat exchanger temperature thermistor error	○	3 times ●	—	5
Outdoor temperature thermistor error	○	4 times ●	—	7
Outdoor discharge pipe temperature thermistor error	○	5 times ●	—	8
Compressor temperature thermistor error	○	8 times ●	—	12
Pressure switch error	○	9 times ●	—	13
2-way valve temperature thermistor error	○	—	2 times ●	21
3-way valve temperature thermistor error	○	—	3 times ●	22
Connected indoor unit error	○	—	4 times ●	23
IPM error	○	10 times ●	—	14
Compressor rotor location cannot detect (permanent stop)	○	13 times ●	—	17
Outdoor unit fan motor error	○	14 times ●	—	18
Main CPU-Sub CPU communication error	○	—	5 times ●	24

○ : Fast flashing ● : Slow flashing — : Off

For AS*A09 - 18LACM

The OPERATION, TIMER, AIR CLEAN and COIL DRY lamps operate as follows according to the error contents.

Error contents	Error display				Trouble shooting
	OPERATION (RED)	TIMER (GREEN)	AIR CLEAN or QUIET (GREEN)	COIL DRY (ORANGE)	
Communication error (Serial reverse transfer error)	—	2 times ○ 3 times ○	—	—	2
Outdoor communication signal error (Forward transfer signal error)	—	4 times ○ 5 times ○	—	—	11
Communication error (indoor unit ← remote control)	—	8 times ○	—	—	1
Room temperature thermistor error	2 times ○	2 times ○	—	—	3
Indoor heat exchanger temperature thermistor (middle) error	2 times ○	3 times ○	—	—	4
Outdoor discharge pipe temperature thermistor error	3 times ○	2 times ○	—	—	8
Outdoor heat exchanger temperature thermistor error	3 times ○	3 times ○	—	—	5
Outdoor temperature thermistor error	3 times ○	4 times ○	—	—	7
Heat sink temperature thermistor error	3 times ○	7 times ○	—	—	19
Compressor temperature thermistor error	3 times ○	8 times ○	—	—	12
2-way valve temperature thermistor error	3 times ○	—	2 times ○	—	21
3-way valve temperature thermistor error	3 times ○	—	3 times ○	—	22
Forced auto switch error	4 times ○	2 times ○	—	—	25
Power supply frequency detection error	4 times ○	4 times ○	—	—	26
VDD permanence stop protection (Electric air clean)	4 times ○	7 times ○	—	—	34
Reverse-VDD permanence stop protection (Electric air clean power supply circuit abnormal)	4 times ○	8 times ○	—	—	35
IPM error	5 times ○	2 times ○	—	—	14
CT error	5 times ○	3 times ○	—	—	15
Compressor rotor location cannot detect (permanent stop)	5 times ○	5 times ○	—	—	17
Outdoor unit fan motor error	5 times ○	6 times ○	—	—	18
Connected indoor unit error	5 times ○	7 times ○	—	—	23
Main CPU-Sub CPU communication error	5 times ○	8 times ○	—	—	24
Indoor fan motor abnormal	6 times ○	2 times ○ 3 times ○	—	—	10
Discharge temperature error	7 times ○	2 times ○	—	—	30
Excessive high pressure protection on cooling	7 times ○	3 times ○	—	—	31
Pressure switch error	7 times ○	5 times ○	—	—	13
Active filter module (AFM) error	8 times ○	2 times ○ 3 times ○	—	—	16
Indoor EEPROM abnormal (Model No.)	Continuous blink	Continuous blink	Continuous blink	Continuous blink	9

○ : 0.5s ON / 0.5s OFF (Flash) — : OFF

For AG*F09 - 14LAC

The OPERATION, TIMER and 10°C HEAT lamps operate as follows according to the error contents.

Error contents	Error display			Trouble shooting
	OPERATION (GREEN)	TIMER (ORANGE)	10°C HEAT (GREEN)	
Communication error (Serial reverse transfer error)	—	2 times ○ 3 times ○	—	2
Outdoor communication signal error (Forward transfer signal error)	—	4 times ○ 5 times ○	—	11
Communication error (indoor unit ← remote control)	—	8 times ○	—	1
Room temperature thermistor error	2 times ○	2 times ○	—	3
Indoor heat exchanger temperature thermistor (middle) error	2 times ○	3 times ○	—	4
Outdoor discharge pipe temperature thermistor error	3 times ○	2 times ○	—	8
Outdoor heat exchanger temperature thermistor error	3 times ○	3 times ○	—	5
Outdoor temperature thermistor error	3 times ○	4 times ○	—	7
Forced auto switch error	4 times ○	2 times ○	—	25
Main relay welded	4 times ○	3 times ○	—	38
IPM error	5 times ○	2 times ○	—	14
CT error	5 times ○	3 times ○	—	15
Compressor rotor location cannot detect (permanent stop)	5 times ○	5 times ○	—	17
Outdoor unit fan motor error	5 times ○	6 times ○	—	18
Indoor fan lock error	6 times ○	2 times ○	—	10
Indoor UPPER fan speed error	6 times ○	3 times ○	—	
Indoor LOWER fan lock error	6 times ○	—	2 times ○	
Indoor LOWER fan speed error	6 times ○	—	3 times ○	39
Damper error (UPPER & LOWER air flow)	6 times ○	—	4 times ○	
Damper error (UPPER air flow)	6 times ○	5 times ○	—	
Damper error	6 times ○	—	5 times ○	40
Discharge temperature error	7 times ○	2 times ○	—	30
Excessive high pressure protection on cooling	7 times ○	3 times ○	—	31
Indoor EEPROM abnormal (Model No.)	Continuous blink	Continuous blink	Continuous blink	9

○ : 0.5s ON / 0.5s OFF (Flash) — : OFF

For AU*F09 - 18LAL
AB*F14/ 18LAT

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

Error contents	Error display			Trouble shooting
	OPERATION (GREEN)	TIMER (ORANGE)	FILTER (RED)	
Communication error (Serial reverse transfer error)	—	2 times 3 times ○	—	2
Outdoor communication signal error (Forward transfer signal error)	—	4 times 5 times ○	—	11
Communication error (Main PCB → Display PCB)	—	6 times ○	—	27
Communication error (Main PCB ← Display PCB)	—	7 times ○	—	28
Communication error (indoor unit ← remote control)	—	8 times ○	—	1
Room temperature thermistor error	2 times ○	2 times ○	—	3
Indoor heat exchanger temperature thermistor (middle) error	2 times ○	3 times ○	—	4
Indoor heat exchanger temperature thermistor (inlet) error	2 times ○	4 times ○	—	
Outdoor discharge pipe temperature thermistor error	3 times ○	2 times ○	—	8
Outdoor heat exchanger temperature thermistor error	3 times ○	3 times ○	—	5
Outdoor temperature thermistor error	3 times ○	4 times ○	—	7
Heat sink temperature thermistor error	3 times ○	7 times ○	—	19
Compressor temperature thermistor error	3 times ○	8 times ○	—	12
2-way valve temperature thermistor error	3 times ○	—	2 times ○	21
3-way valve temperature thermistor error	3 times ○	—	3 times ○	22
Forced auto switch error	4 times ○	2 times ○	—	25
IPM error	5 times ○	2 times ○	—	14
CT error	5 times ○	3 times ○	—	15
Compressor rotor location cannot detect (permanent stop)	5 times ○	5 times ○	—	17
Outdoor unit fan motor error	5 times ○	6 times ○	—	18
Connected indoor unit error	5 times ○	7 times ○	—	23
Main CPU-Sub CPU communication error	5 times ○	8 times ○	—	24
Indoor fan motor abnormal	6 times ○	2 times 3 times ○	—	10
Discharge temperature error	7 times ○	2 times ○	—	30
Excessive high pressure protection on cooling	7 times ○	3 times ○	—	31
4-way valve error	7 times ○	4 times ○	—	32
Pressure switch error	7 times ○	5 times ○	—	13
Compressor temperature error	7 times ○	6 times ○	—	33

○ : 0.5s ON / 0.5s OFF (Flash) — : OFF

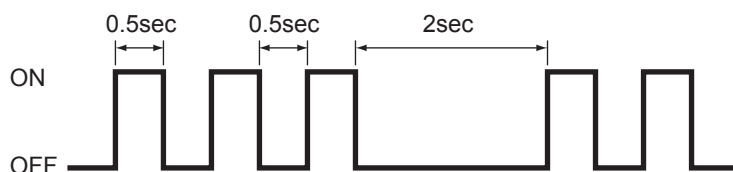
2-1-2 OUTDOOR UNIT DISPLAY

1. ERROR DISPLAY

Error Contents	LED			Trouble shooting
	A	B	C	
Outdoor communication signal error (Forward transfer signal error)	1 times blink	OFF	OFF	11
	OFF	1 times blink	OFF	
	OFF	OFF	1 times blink	
Outdoor discharge pipe temperature thermistor error	2 times blink	OFF	OFF	8
Outdoor heat exchanger temperature thermistor error	3 times blink	OFF	OFF	5
Outdoor temperature thermistor error	4 times blink	OFF	OFF	7
2-way valve temperature thermistor A error	5 times blink	OFF	OFF	21
2-way valve temperature thermistor B error	OFF	5 times blink	OFF	
2-way valve temperature thermistor C error	OFF	OFF	5 times blink	
3-way valve temperature thermistor A error	6 times blink	OFF	OFF	22
3-way valve temperature thermistor B error	OFF	6 times blink	OFF	
3-way valve temperature thermistor C error	OFF	OFF	6 times blink	
Compressor temperature thermistor error	7 times blink	OFF	OFF	12
Heat sink temperature thermistor error	8 times blink	OFF	OFF	19
Pressure switch 1 error	9 times blink	OFF	OFF	13
Pressure switch 2 error	10 times blink	OFF	OFF	
Connected indoor unit error	11 times blink	OFF	OFF	23
IPM error	12 times blink	OFF	OFF	14
Compressor rotor location cannot detect (permanent stop)	13 times blink	OFF	OFF	17
Compressor Start-up error (permanent stop)	14 times blink	OFF	OFF	20
Outdoor unit fan motor error	15 times blink	OFF	OFF	18
Main CPU - sub CPU communication error	17 times blink	OFF	OFF	24
4-way valve error	19 times blink	OFF	OFF	32

2. ERROR DISPLAY METHOD

Outdoor LED Blink (1 to 18 times) 0.5sec ON / 0.5sec OFF blinking



3. NORMAL OPERATION DISPLAY

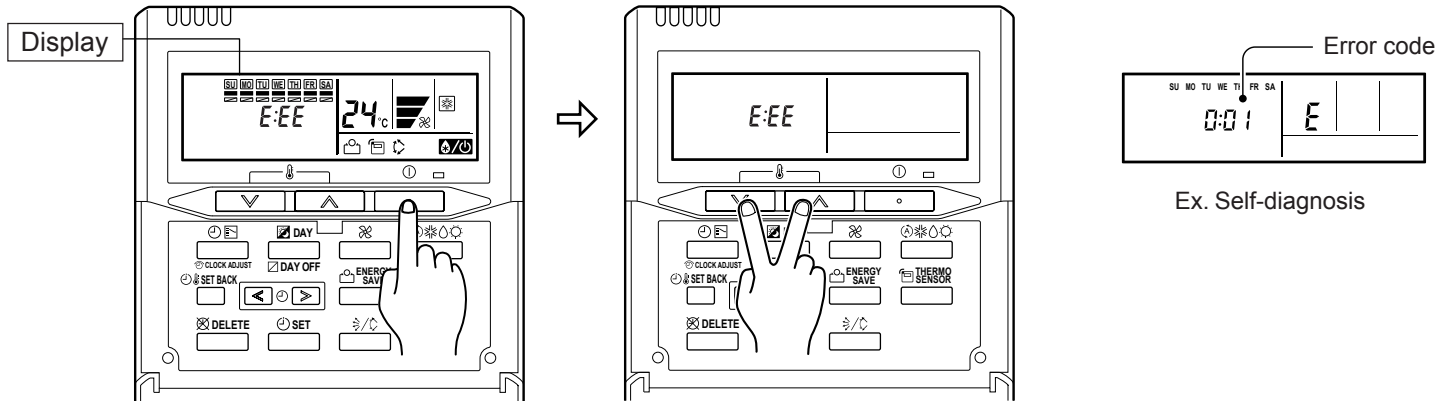
Operation	LED A	LED B	LED C	LED D
Normal operation	Continuously lighting	OFF	OFF	OFF
Protected operation	5sec ON / 1sec OFF	OFF	OFF	OFF

2-1-3 WIRED REMOTE CONTROLLER DISPLAY (For AR*9L - 18L)

1. SELF - DIAGNOSIS

When the error indication "E:EE" is displayed, inspection of the air conditioning system is necessary. Please consult authorized service personnel.

Run [Self-Diagnosis] if [E:EE] flashes on the clock display of the remote controller.

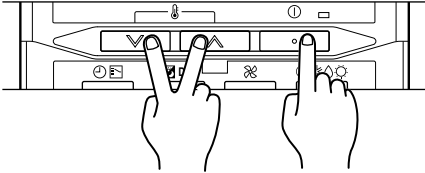
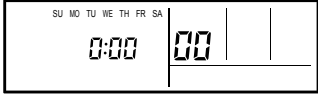
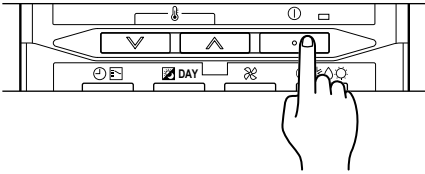
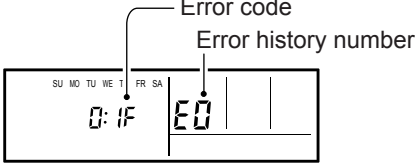
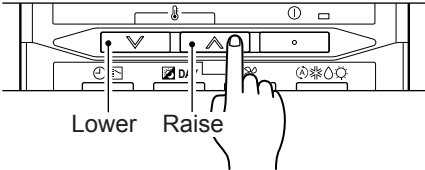
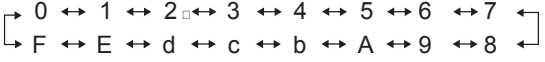


1. Stop the air conditioner operation.
2. Press the SET TEMPERATURE buttons ∇ and \blacktriangle simultaneously for 5 seconds or more to start the self-diagnosis.
3. Press the SET TEMPERATURE buttons ∇ and \blacktriangle simultaneously for 5 seconds or more or there is no key input for 20 seconds to stop the self-diagnosis.

Error code	Error contents	Trouble shooting
00	Communication error (indoor unit ← remote control)	1
01	Communication error (Serial reverse transfer error)	2
02	Room temperature thermistor open	3
03	Room temperature thermistor short-circuited	
04	Indoor heat exchanger temperature thermistor open	4
05	Indoor heat exchanger temperature thermistor short-circuited	
06	Outdoor heat exchanger temperature thermistor error	5
07	Outdoor heat exchanger temperature thermistor short-circuited	
08	Power supply frequency detection error	26
0A	Outdoor temperature thermistor open	7
0b	Outdoor temperature thermistor short-circuited	
0C	Outdoor discharge pipe temperature thermistor open	8
0d	Outdoor discharge pipe temperature thermistor short-circuited	
0E	Heat sink temperature thermistor error	19
11	Indoor EEPROM abnormal (Model No.)	9
12	Indoor fan motor abnormal	10
13	Outdoor communication signal error (Forward transfer signal error)	11
15	Compressor temperature thermistor error	12
16	Pressure switch error	13
17	IPM error	14
18	CT error	15
19	Active Filter Module (AFM) error	16
1A	Compressor rotor location cannot detect	17
1b	Outdoor unit fan motor error	18
1C	Main CPU - sub CPU communication error	24
1d	2-way valve temperature thermistor error	21
1E	3-way valve temperature thermistor error	22
1F	Connected indoor unit error	23

2. ERROR CODE HISTORY DISPLAY

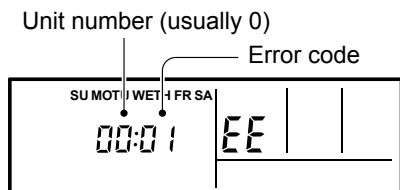
Up to 16 memorized error codes may be displayed for the indoor unit connected to the remote controller.

<p>1. Stop the air conditioner operation.</p>	
<p>2. Press the SET TEMPERATURE buttons ∇, \blacktriangle and the START/STOP button $\textcircled{1}$ simultaneously for 5 seconds or more to start the self-diagnosis.</p>	
	
<p>3. Press the START/STOP button.</p>	
	
<p>4. Press the SET TEMPERATURE button to select the error history number.</p>	
 <p>Lower Raise</p>	
<p>5. Press the SET TEMPERATURE buttons ∇, \blacktriangle and START/STOP button $\textcircled{1}$ simultaneously for 5 seconds or more or there is no key input for 20 seconds to stop the display.</p>	

2-1-4 WIRED REMOTE CONTROLLER DISPLAY (For AR*F09 - 18L)

1. SELF - DIAGNOSIS

When "EE" in Temperature Display is displayed, inspection of the air conditioning system is necessary. Please consult authorized service personnel.



ex. Self-diagnosis check

Error code	Error contents	Trouble shooting
00	Communication error (indoor unit ← remote control)	1
01	Communication error (Serial reverse transfer error)	2
02	Room temperature sensor error	3
04	Indoor heat exchanger temperature sensor error	4
06	Outdoor heat exchanger temperature sensor(outlet) error	5
09	Water drain abnormal	6
0A	Outdoor temperature sensor error	7
0C	Outdoor discharge pipe temperature sensor error	8
0F	Discharge temperature error	30
12	Indoor fan motor abnormal	10
13	Outdoor communication signal error (Forward transfer signal error)	11
15	Compressor temperature sensor error	12
16	Pressure switch error	13
17	IPM error	14
18	CT error	15
1A	Compressor rotor location cannot detect (permanent stop)	17
1B	Outdoor unit fan motor error	18
1D	2-way valve temperature thermistor error	21
1E	3-way valve temperature thermistor error	22
1F	Main CPU - sub CPU communication error	24
1F	Connected indoor unit error	23
20	Indoor manual auto switch error	25
24	Excessive high pressure protection on cooling	31
26	Communication error (Main PCB → Display PCB)	27
27	Communication error (Main PCB ← Display PCB)	28
2C	4-way valve error	32

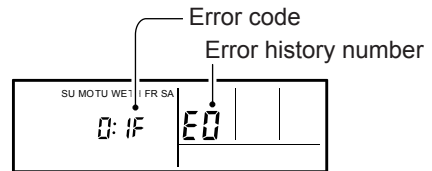
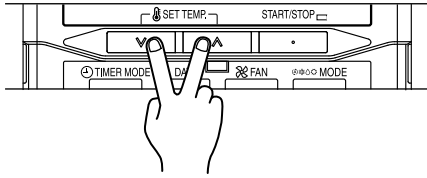
- If "CO" appears in the unit number display, there is a remote controller error. Refer to the installation instruction sheet included with the remote controller.

2. ERROR CODE HISTORY DISPLAY

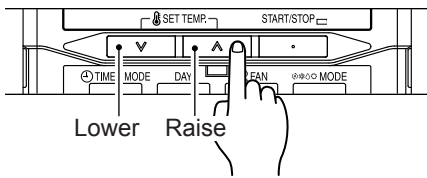
Up to 16 memorized error codes may be displayed for the indoor unit connected to the remote controller.

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


<p>Trouble shooting 1 <u>INDOOR UNIT Error Method:</u> Communication Error (Indoor unit ← Remote control)</p>	<p><u>Indicate or Display:</u></p> <p>Refer to error code table.</p>
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<p><u>Detective Actuators:</u></p> <p>Indoor unit controller PCB circuit Wired Remote Control</p>	<p><u>Detective details:</u></p> <p>When the indoor unit cannot receive the signal from Wired Remote more than 10seconds after power ON, or the indoor unit cannot receive the signal more than 1minute during normal operation.</p>
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<p><u>Forecast of Cause:</u></p> <p>1. Terminal connection abnormal 2. Wired Remote Control failure 3. Controller PCB failure</p>
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<p>Check Point 1 : Check the connection of terminal</p> <p><u>After turning off the power, check & correct the followings.</u></p> <ul style="list-style-type: none"> · Check the connection of terminal between remote control and Indoor unit, and check if there is a disconnection of the cable.
--

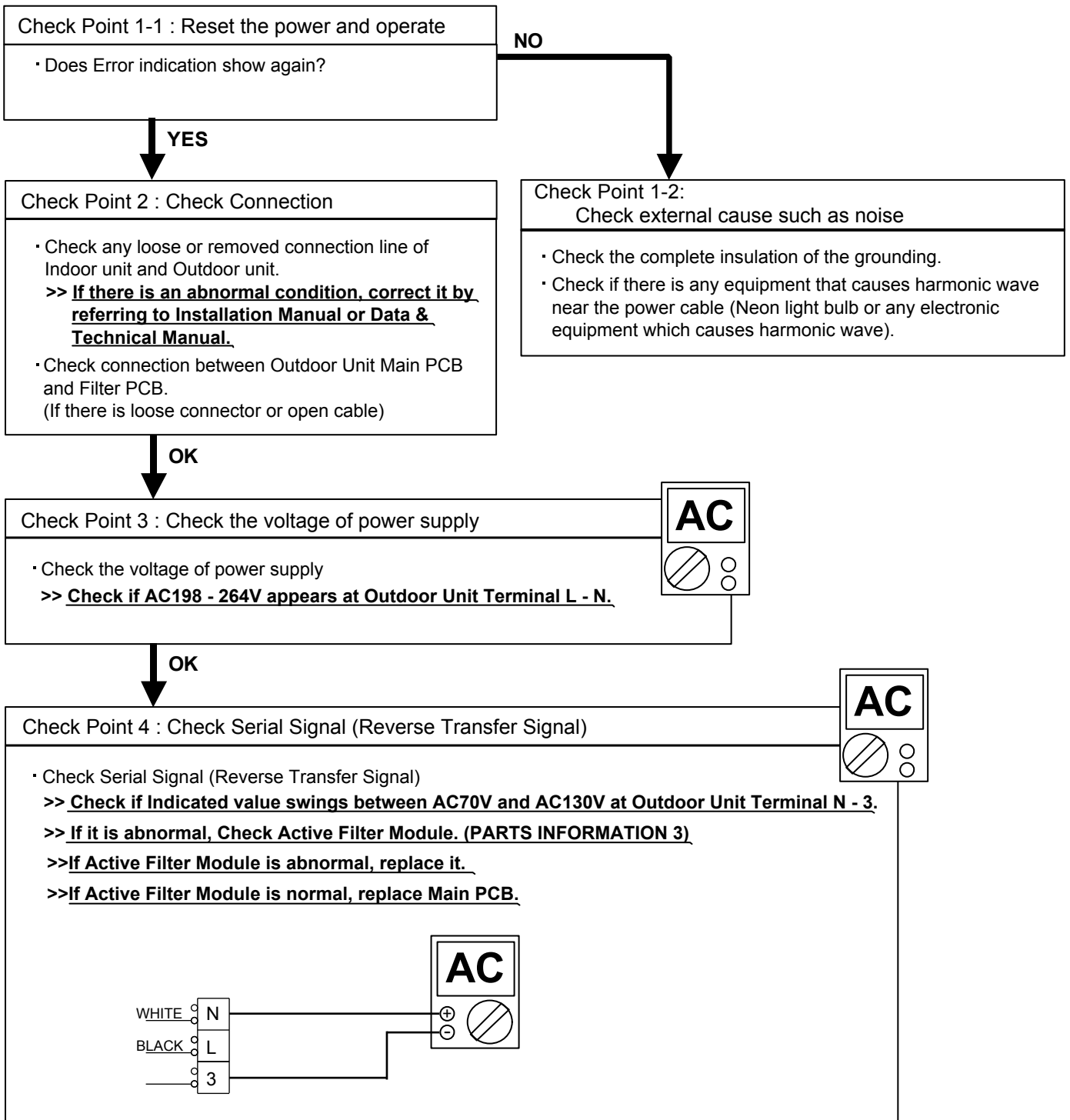


<p>Check Point 2 : Check Remote Control and Controller PCB</p> <ul style="list-style-type: none"> · Check Voltage at Connector of Remote Control of Controller PCB. (Power supply to Remote Control) >> If it is DC12V, Remote Control is failure. (Controller PCB is normal) >> Replace Remote Control >> If it is DC 0V, Controller PCB is failure. (Check Remote Control once again) >> Replace Controller PCB <p>▶ <u>Upon correcting the removed connector or mis-wiring, reset the power.</u></p>	
---	--

Trouble shooting 2 <u>OUTDOOR UNIT Error Method:</u> Communication Error (Serial Reverse Transfer Error)	<u>Indicate or Display:</u> Refer to error code table.
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<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit Active Filter Module	<u>Detective details:</u> When the indoor unit cannot receive the serial signal from Outdoor unit more than 10seconds.
---	--

<u>Forecast of Cause:</u> 1. Connection failure 2. External cause 3. Main PCB failure 4. Active Filter Module failure



Trouble shooting 3 INDOOR UNIT Error Method: Room Temperature Thermistor Error	Indicate or Display: Refer to error code table.
---	---

Detective Actuators: Indoor Unit Controller PCB Circuit Room Temperature Thermistor	Detective details: When Room Temperature Thermistor open or short-circuit is detected at power ON.
--	--

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

Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Approx. value)

Temperature	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
Resistance Value (kΩ)	33.6	25.9	20.2	15.8	12.5	10.0	8.04	6.51

Temperature	40°C	45°C	50°C
Resistance Value (kΩ)	5.30	4.35	3.59

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



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

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

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

Trouble shooting 4 INDOOR UNIT Error Method: Indoor Heat Exchanger Temperature Thermistor Error	<u>Indicate or Display:</u> Refer to error code table.
--	--

<u>Detective Actuators:</u> Indoor Unit Controller PCB Circuit Heat Exchanger Temperature Thermistor	<u>Detective details:</u> When Heat Exchanger Temperature Thermistor open or short-circuit is detected at power ON.
--	--

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

Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value										
Thermistor Characteristics (Approx. value)										
Temperature	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C		
Resistance Value (kΩ)	176	134	103	80.3	62.9	49.7	39.6	31.7		
Temperature	40°C	45°C	50°C							
Resistance Value (kΩ)	25.6	20.8	17.1							
▶ If Thermistor is either open or shorted, replace it and reset the power.										



Check Point 3 : Check voltage of Controller PCB (DC5.0V)	
Make sure circuit diagram of indoor unit and check terminal voltage at Thermistor (DC5.0V)	
▶ If the voltage does not appear, replace Controller PCB.	

Trouble shooting 5 OUTDOOR UNIT Error Method: Outdoor Heat Exchanger Temperature Thermistor Error	Indicate or Display: Refer to error code table.
--	---

Detective Actuators: Outdoor Unit Main PCB Circuit Heat Exchanger Temperature Thermistor	Detective details: When Heat Exchanger Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.
---	--

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

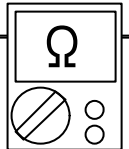


Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Approx. value)

Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	25°C	30°C
Resistance Value (kΩ)	27.8	21.0	16.1	12.4	9.63	7.56	5.98	4.77	3.84

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



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)

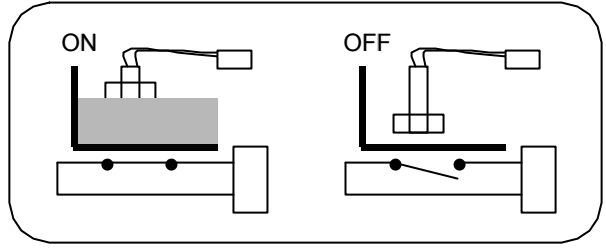
► **If the voltage does not appear, replace Main PCB.**



Trouble shooting 6 INDOOR UNIT Error Method: Water Drain Abnormal	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Indoor Unit Controller PCB Circuit Float Switch	Detective details: When Float Switch is ON for more than 3 minutes.
---	---

Forecast of Cause : 1. Float Switch failure 2. Shorted connector/ wire 3. Controller PCB failure
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Check Point 1 : Check Float Switch	
<ul style="list-style-type: none"> • Check operation of float switch. (any blocking by dust, etc.) • Remove Float switch and check ON/OFF switching operation by using a meter. <p>>>If Float switch is detective, replace it.</p>	



Check Point 2 : Check Connector (CN15) / Wire
<ul style="list-style-type: none"> • Check loose contact of CN15 /shorted wire (pinched wire). <p>>>Replace Float switch if the wire is abnormal</p>



Check Point 3 : Replace Controller PCB
<p>► If Check Point 1 & 2 do not improve the symptom, change Controller PCB.</p>

Trouble shooting 7 OUTDOOR UNIT Error Method: Outdoor Temperature Thermistor Error	Indicate or Display: Refer to error code table.
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Detective Actuators: Outdoor Unit Main PCB Circuit Outdoor Temperature Thermistor	Detective details: When Outdoor Temperature Thermistor open or short-circuit is detected at power ON or while running the compressor.
--	---

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



Check Point 2 : Remove connector and check Thermistor resistance value

Ω

Thermistor Characteristics (Approx. value)

Temperature	-20°C	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C
Resistance Value (kΩ)	115	62.3	46.6	35.2	26.9	20.7	16.1	12.6

Temperature	30°C	40°C	50°C	60°C	70°C
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.**



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

DC

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

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

Trouble shooting 8 OUTDOOR UNIT Error Method: Outdoor Discharge Pipe Temperature Thermistor Error	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Outdoor Unit Main PCB Circuit Discharge Pipe Temperature Thermistor	Detective details: 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

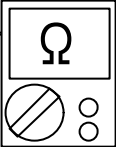
Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)


Temperature	0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C	60°C
Resistance Value (kΩ)	169	130	101	79.1	62.5	40.0	26.3	17.8	12.3

Temperature	70°C	80°C	90°C	100°C	120°C	140°C	160°C	180°C
Resistance Value (kΩ)	8.69	6.27	4.60	3.43	2.00	1.22	0.79	0.52

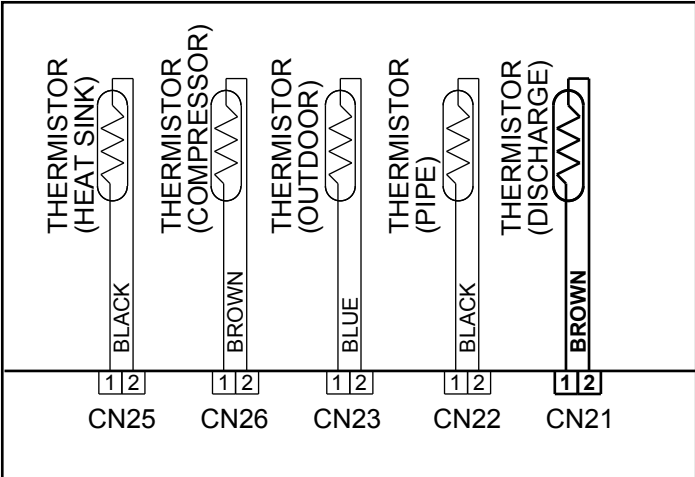
► If Thermistor is either open or shorted, replace it and reset the power.



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)

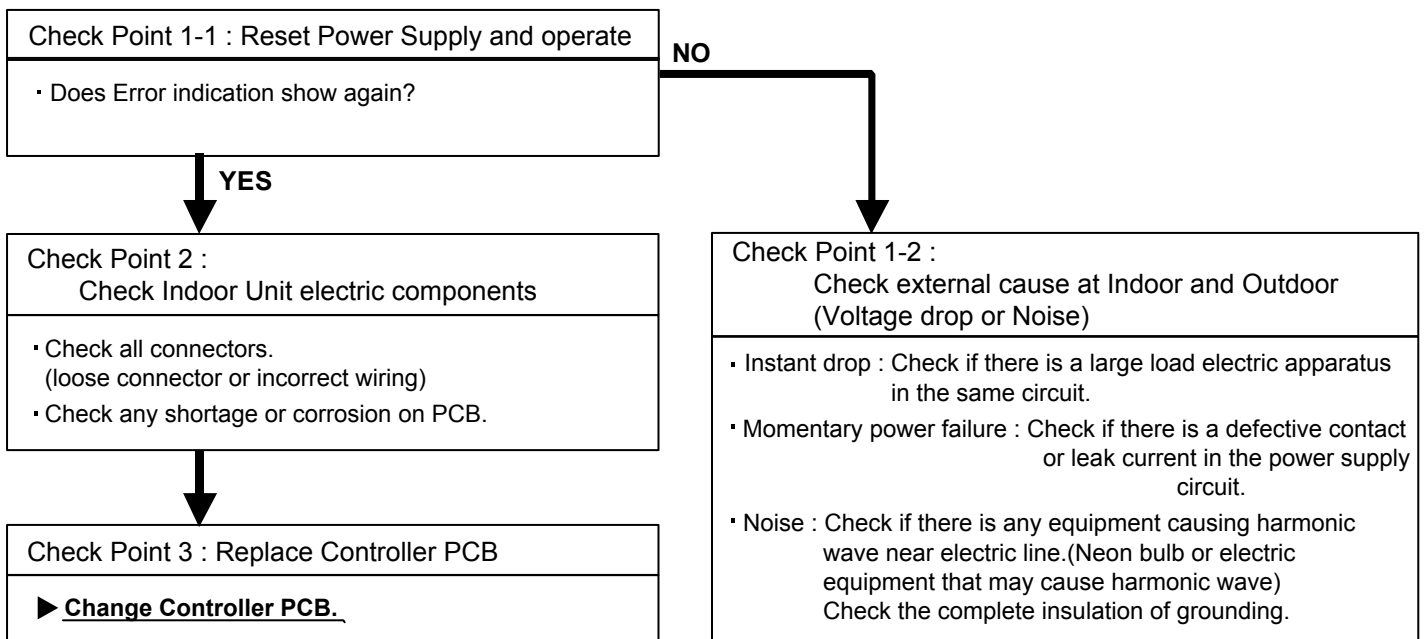


► If the voltage does not appear, replace Main PCB.

Trouble shooting 9 <u>INDOOR UNIT Error Method:</u> Indoor EEPROM abnormal (Model No.)	<u>Indicate or Display:</u> Refer to error code table.
---	---

<u>Detective Actuators:</u> Indoor Unit Controller PCB circuit	<u>Detective details:</u> When the model information being read from EEPROM has an apparent error.
--	--

<u>Forecast of Cause:</u> 1. External cause 2. Defective connection of electric components 3. Controller PCB failure
--



Note : EEPROM

EEPROM(Electronically Erasable and Programmable Read Only Memory) is a non-volatile memory which keeps memorized information even if power is turned off. It can change the contents electronically.

To change the contents, it uses higher voltage than normal, and it can not change a partial contents. (Rewriting shall be done upon erasing the all contents.)

There is a limit in a number of rewriting.

<p>Trouble shooting 10 <u>INDOOR UNIT Error Method:</u> Indoor Fan Motor abnormal</p>	<p><u>Indicate or Display:</u> Refer to error code table.</p>
--	--

<p><u>Detective Actuators:</u> Indoor Unit Controller PCB Circuit Indoor Fan Motor</p>	<p><u>Detective details:</u> When the condition that actual frequency of Indoor Fan is below 1/3 of target frequency is continued more than 56 seconds. Or the condition of fan speed is 0rpm is continued more than 56 seconds.</p>
---	---

<p><u>Forecast of Cause:</u> 1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Control PCB failure</p>

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



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

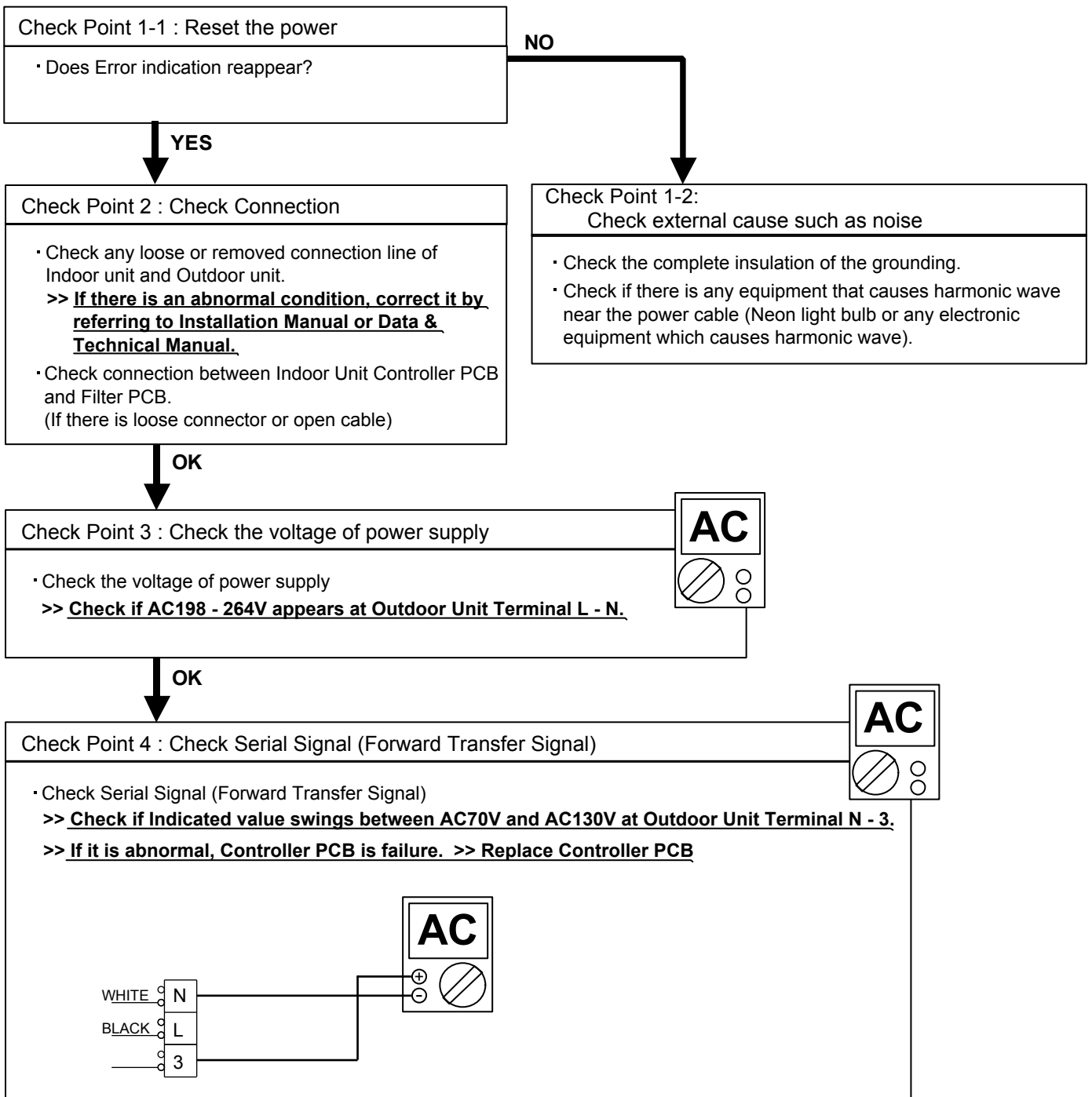


<p>Check Point 3 : Replace Controller PCB</p> <p>▶ <u>If Check Point 1,2 do not improve the symptom, change Controller PCB.</u></p>

Trouble shooting 11 INDOOR UNIT Error Method: Outdoor Communication Signal Error (Forward Transfer Signal Error)	<u>Indicate or Display:</u> Refer to error code table.
---	--

<u>Detective Actuators:</u> Indoor Unit Controller PCB Circuit	<u>Detective details:</u> When the outdoor unit cannot receive the serial signal from Indoor unit more than 10seconds.
---	---

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



Trouble shooting 12 OUTDOOR UNIT Error Method: Compressor Temperature Thermistor Error	<u>Indicate or Display:</u> Refer to error code table.
---	--

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit Compressor Temperature Thermistor	<u>Detective details:</u> 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 erroneous connection.
- Check if thermistor cable is open.

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



Check Point 2 : Remove connector and check Thermistor resistance value

Ω

Thermistor Characteristics (Rough value)

Temperature	0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C	60°C
Resistance Value (k Ω)	169	130	101	79.1	62.5	40.0	26.3	17.8	12.3

Temperature	70°C	80°C	90°C	100°C	120°C	140°C	160°C	180°C
Resistance Value (k Ω)	8.69	6.27	4.60	3.43	2.00	1.22	0.79	0.52

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



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

DC

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 13 OUTDOOR UNIT Error Method: Pressure Switch Error	Indicate or Display: Refer to error code table.
---	--

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

Forecast of Cause :
1. Connector connection failure 2. Pressure Switch failure 3. Main PCB failure

Check Point 1 : Reset Power Supply and operate
· Does abnormal LED indication show again?

NO

YES

Check Point 2 : Check voltage of Main PCB (DC5.0V)

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

► If the voltage does not appear, replace Main PCB.

OK

Check Point 3 : Check Pressure Switch

· Check if connector is loose or cable is open.
>> **If no abnormal connection is found, replace Pressure Switch.**

► After replacing Pressure Switch, check operating condition and pressure in operation.

OK

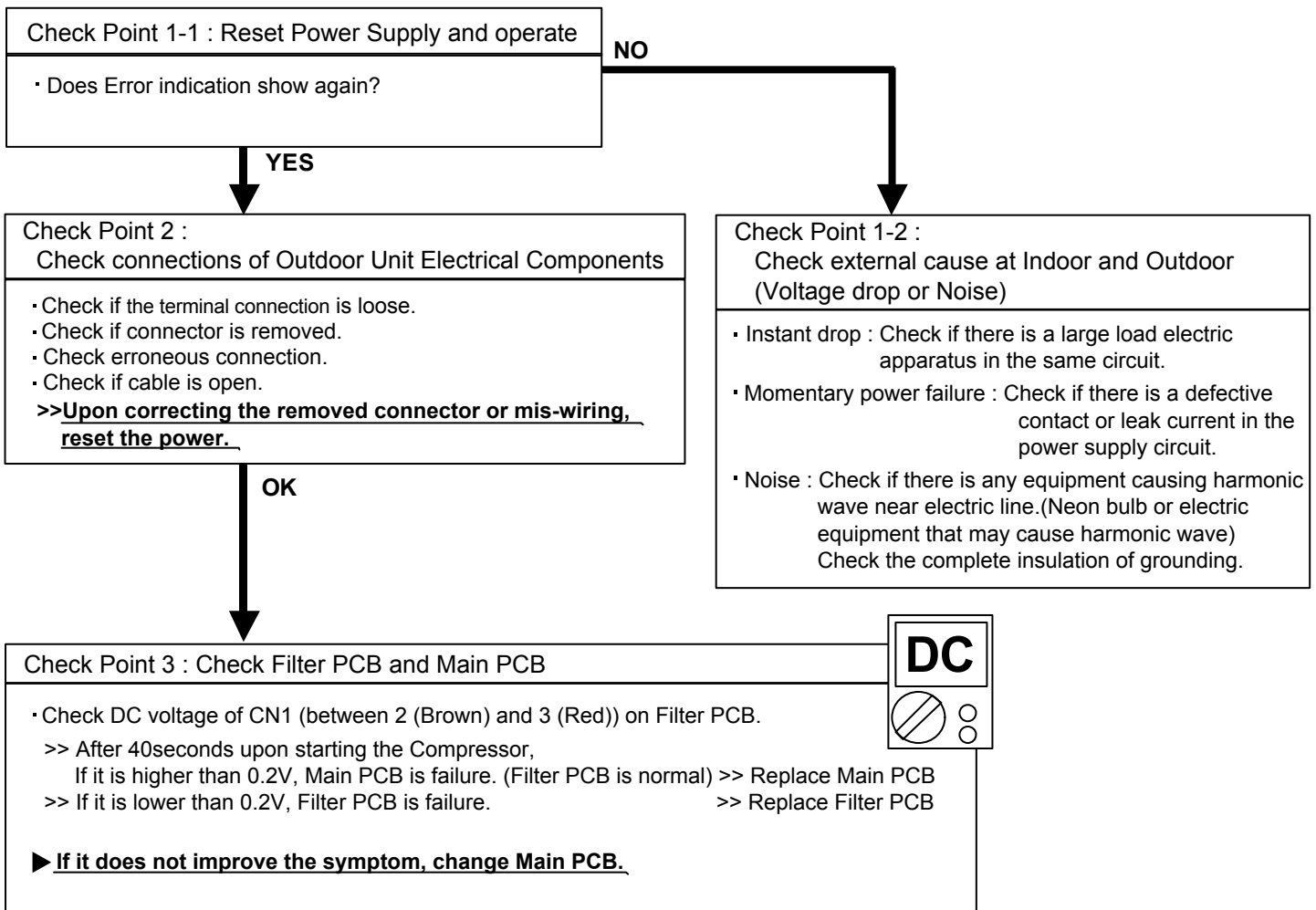
Check Point 4 : Check High Pressure Protection on cooling

· Check Excessive high pressure protection on cooling.
(Refer to Trouble shooting 31)

Trouble shooting 15 OUTDOOR UNIT Error Method: CT error	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Outdoor Unit Main PCB Circuit Outdoor Unit Filter PCB Circuit (Input current sensor unit)	Detective details: When Input Current Sensor has detected lower than 0.5A while Inverter Compressor is operating at higher than 56Hz, after 1minute upon starting the Compressor. (Except during the defrost operation)
--	--

Forecast of Cause :
1. Defective connection of electric components 2. External cause 3. Filter PCB failure 4. Main PCB failure



Trouble shooting 16 OUTDOOR UNIT Error Method: Active Filter Module (AFM) error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit Active Filter Module	<u>Detective details:</u> When inverter input DC voltage is higher than 467V or lower than 237V. When a momentary power cut off occurred on low voltage.
---	---

<u>Forecast of Cause :</u> 1. External cause 2. Connector connection failure 3. Active Filter Module failure 4. Main PCB failure

Check Point 1 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)
<ul style="list-style-type: none"> • 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.



Check Point 2 : Check connection of Connector
<ul style="list-style-type: none"> • Check if connector is removed. • Check erroneous connection. • Check if cable is open. <p>>>Upon correcting the removed connector or mis-wiring, reset the power.</p>



Check Point 3 : Check Active Filter Module
<ul style="list-style-type: none"> • Check Active Filter Module. (PARTS INFORMATION 3) <p>>>If Active Filter Module is abnormal, replace it.</p>



Check Point 4 : Replace Main PCB
<p>▶ If Check Point 1, 2 do not improve the symptom, change Main PCB.</p>

Trouble shooting 17 OUTDOOR UNIT Error Method: Compressor rotor location cannot detect (Permanent Stop)	Indicate or Display: Refer to error code table.
--	--

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

Forecast of Cause : 1. Defective connection of electric components 2. Main PCB failure

Check Point 1 : 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.



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

Trouble shooting 18 OUTDOOR UNIT Error Method: Outdoor Unit Fan Motor Error	Indicate or Display: Refer to error code table.
--	--

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

Forecast of Cause: 1. Fan rotation failure 2. Motor protection by surrounding temperature rise 3. Main PCB failure
--

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)

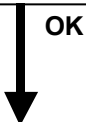
>>If Fan or Bearing is abnormal, replace it.



Check Point 2 : Check 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.



Check Point 3 : Check Output Voltage of Main PCB

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

DC

Read wire	DC voltage
Red - Black	300 ~ 400V
White - Black	15 ± 1.5V

► If the voltage is not correct, replace Main PCB.

Trouble shooting 19 OUTDOOR UNIT Error Method: Heat Sink Temperature Thermistor Error	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Outdoor Unit Main PCB Circuit Heat Sink Temperature Thermistor	Detective details: When Heat Sink 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 erroneous connection.
- Check if thermistor cable is open.

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



Check Point 2 : Remove connector and check Thermistor resistance value

Ω

Thermistor Characteristics (Approx. value)

Temperature		0°C	5°C	10°C	15°C	20°C	30°C	40°C	50°C
Resistance Value (kΩ)	AO*18L/ 24L	169	130	101	79.1	62.5	40.0	26.3	17.8
	AO*30L	16.1	12.4	9.73	7.67	6.10	3.95	2.62	1.79

Temperature		60°C	70°C	80°C	90°C	100°C	120°C
Resistance Value (kΩ)	AO*18L/ 24L	12.3	8.69	6.27	4.60	3.43	2.00
	AO*30L	1.25	0.89	0.65	0.48	0.36	0.21

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



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

DC

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 20 OUTDOOR UNIT Error Method: Compressor Start-up error (Permanent Stop)	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit	<u>Detective details:</u> ① On start-up the compressor, when detected rotor position is out of phase with actual rotor position more than 90 degrees, the compressor stops. ② After the compressor restarts, if the same operation is repeated within 40sec, the compressor stops again. ③ If ① and ② repeats 5 times, the compressor stops permanently.
---	--

<u>Forecast of Cause :</u> 1. Defective connection of electric components 2. Main PCB failure
--

Check Point 1 : Check connection of around the Compressor components
For Compressor Terminal, Main PCB <ul style="list-style-type: none"> • 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.



Check Point 2 : Replace Main PCB
▶ <u>If Check Point 1 do not improve the symptom, replace Main PCB.</u>

Trouble shooting 21 OUTDOOR UNIT Error Method: 2-way valve Temperature Thermistor Error	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Outdoor Unit Main PCB Circuit 2-way valve Temperature Thermistor	Detective details: When 2-way valve 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

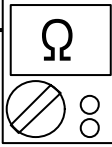
Check Point 1 : Check connection of Connector

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

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



Check Point 2 : Remove connector and check Thermistor resistance value



Thermistor Characteristics (Approx. value)


Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	30°C
Resistance Value (kΩ)	312	233	176	134	103	80.3	62.9	39.6

Temperature	40°C	50°C	60°C	70°C	80°C	90°C	100°C
Resistance Value (kΩ)	25.6	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.











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)

VALVE THERMISTOR A, B

CN39	1	BLACK	1	1	BLACK		2-WAY VALVE A
	3	WHITE	2	2	BLACK		3-WAY VALVE A
	4	WHITE	3	3	BLACK		2-WAY VALVE B
	5	WHITE	4	4	BLACK		3-WAY VALVE B
	6	WHITE	5	5	BLACK		2-WAY VALVE B
	7	WHITE	6	6	BLACK		3-WAY VALVE B
	8	WHITE	7	7	BLACK		2-WAY VALVE B
	9	WHITE	8	8	BLACK		3-WAY VALVE B
		WHITE					

VALVE THERMISTOR C

CN40	1	BLACK	1	1	BLACK		2-WAY VALVE C
	2	RED	2	2	BLACK		3-WAY VALVE C
	4	RED	3	3	BLACK		2-WAY VALVE C
	5	RED	4	4	BLACK		3-WAY VALVE C
	6	RED	5	5			
	7	RED	6	6			
	8	RED	7	7			
	9	RED	8	8			
		RED					

► If the voltage does not appear, replace Main PCB.

Trouble shooting 22 OUTDOOR UNIT Error Method: 3-way valve Temperature Thermistor Error	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Outdoor Unit Main PCB Circuit 3-way valve Temperature Thermistor	Detective details: When 3-way valve 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 erroneous connection.
- Check if thermistor cable is open.

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



Check Point 2 : Remove connector and check Thermistor resistance value

Thermistor Characteristics (Approx. value)

Temperature	-10°C	-5°C	0°C	5°C	10°C	15°C	20°C	30°C
Resistance Value (kΩ)	312	233	176	134	103	80.3	62.9	39.6

Temperature	40°C	50°C	60°C	70°C	80°C	90°C	100°C
Resistance Value (kΩ)	25.6	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.**



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)

VALVE THERMISTOR A, B

CN39	1	BLACK	1 1	BLACK	2-WAY VALVE A
	3	WHITE	2 2		
	4	WHITE	3 3	BLACK	3-WAY VALVE A
	5	WHITE	4 4		
	6	WHITE	5 5	BLACK	2-WAY VALVE B
	7	WHITE	6 6		
	8	WHITE	7 7	BLACK	3-WAY VALVE B
	9	WHITE	8 8		

WHITE

VALVE THERMISTOR C

CN40	1	BLACK	1 1	BLACK	2-WAY VALVE C
	2	RED	2 2		
	4	RED	3 3	BLACK	3-WAY VALVE C
	5	RED	4 4		
	6	RED	5 5		
	7	RED	6 6		
	8	RED	7 7		
	9	RED	8 8		

RED

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

Trouble shooting 23 <u>OUTDOOR UNIT Error Method:</u> Connected Indoor unit error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit	<u>Detective details:</u> When the total capacity of the connected indoor units exceed the connectable range of the total capacity.
---	---

<u>Forecast of Cause :</u> 1. The selection of connected indoor unit is incorrect 2.Main PCB failure

Check Point 1 : Check the total capacity of indoor unit
<ul style="list-style-type: none"> · Check the total capacity of the connected indoor units. >>If abnormal condition is found, correct it by referring to Installation Manual or Data & Technical Manual.



Check Point 2 : Replace Main PCB
▶ <u>If Check Point 1 do not improve the symptom, change Main PCB.</u>

Trouble shooting 24 <u>OUTDOOR UNIT Error Method:</u> Main CPU - Sub CPU communication error	<u>Indicate or Display:</u> Refer to error code table.
---	---

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit	<u>Detective details:</u> When it cannot receive an effective signal for 10sec between the Main CPU and Sub CPU in outdoor unit.
---	--

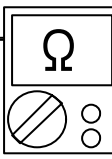
<u>Forecast of Cause :</u> 1. Main PCB failure
--

Check Point 1 : Replace Main PCB
▶ <u>Change Main PCB.</u>

Trouble shooting 25 <u>INDOOR UNIT Error Method:</u> Forced auto switch error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Indoor Unit Controller PCB Circuit Forced auto switch	<u>Detective details:</u> <ul style="list-style-type: none"> ▪ For AS*A09-18LACM When the Forced auto switch becomes ON for 10 consecutive seconds. ▪ For AG*F09-14LAC When the Forced auto switch becomes ON for 30 consecutive seconds.
--	---

<u>Forecast of Cause :</u> 1. Forced auto switch failure 2.Controller PCB failure
--

Check Point 1 : Check the Forced auto switch <ul style="list-style-type: none"> • Check if Forced auto switch is kept pressed. • Check ON/OFF switching operation by using a meter. >><u>If Forced auto switch is detective, replace it.</u>	
---	--

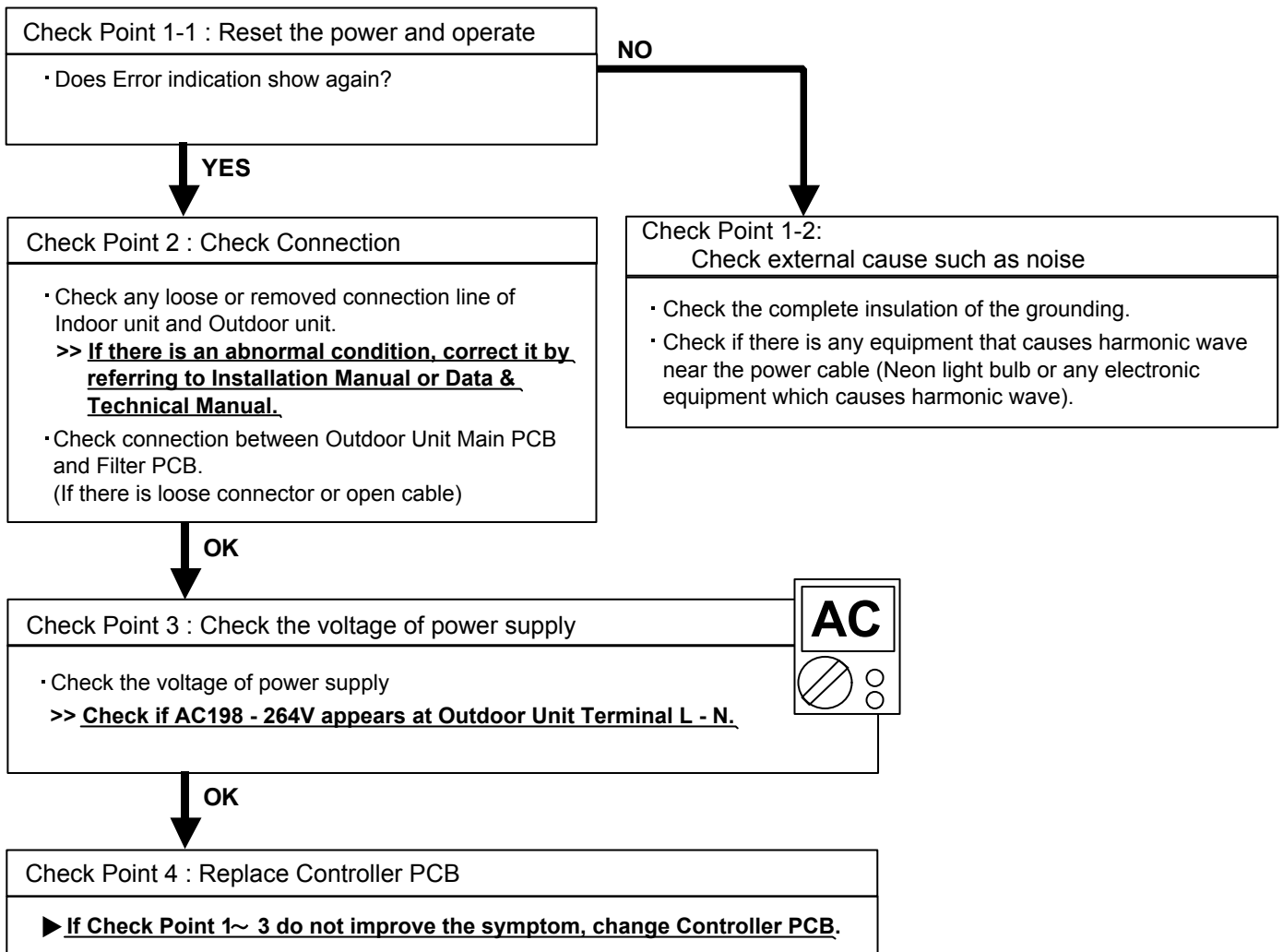


Check Point 2 : Replace Controller PCB ▶ <u>If Check Point 1 do not improve the symptom, change Controller PCB.</u>
--

Trouble shooting 26 INDOOR UNIT Error Method: Power supply frequency detection error	<u>Indicate or Display:</u> Refer to error code table.
---	--

<u>Detective Actuators:</u> Indoor Unit Controller PCB Circuit	<u>Detective details:</u> The power supply frequency cannot be recognized after 4sec of power ON.
---	--

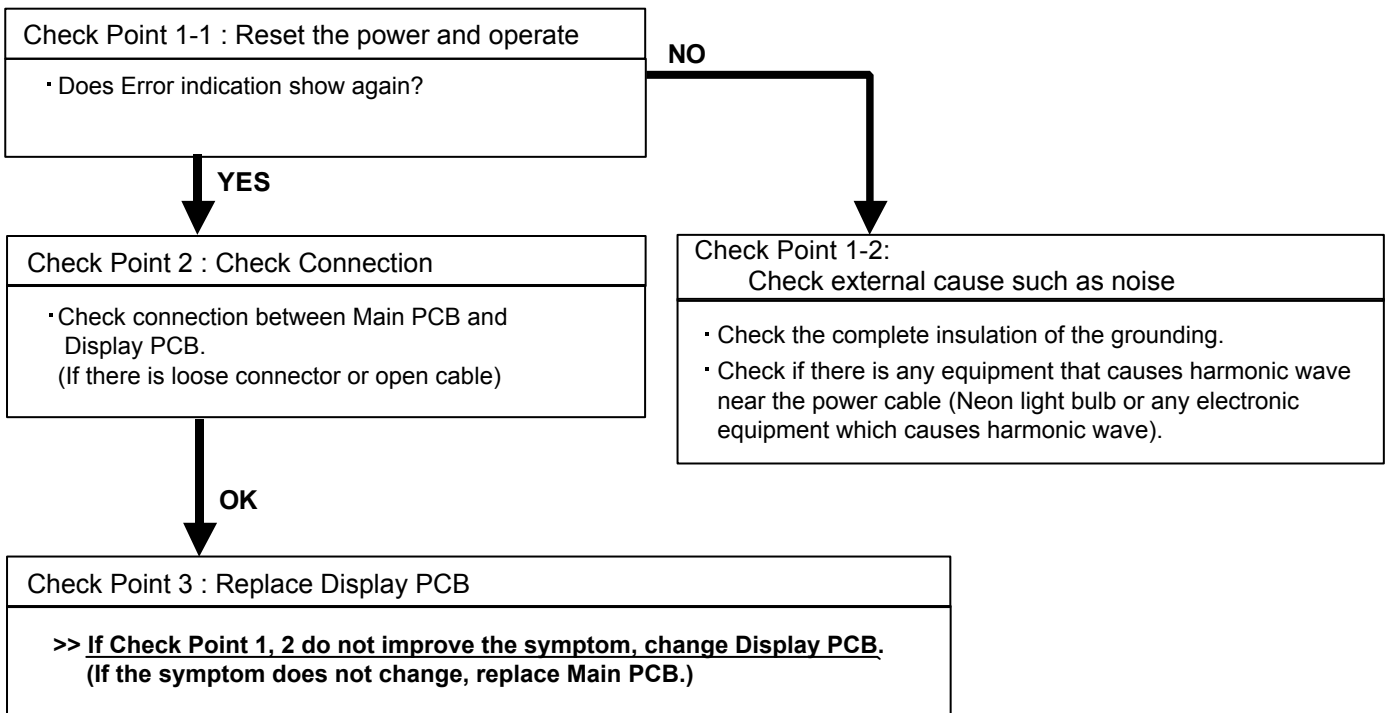
Forecast of Cause :
1. Connection failure 2. External cause 3. Controller PCB failure



Trouble shooting 27 OUTDOOR UNIT Error Method: Communication Error (Main PCB ---> Display PCB)	<u>Indicate or Display:</u> Refer to error code table.
--	--

<u>Detective Actuators:</u> Indoor Unit Main PCB Circuit Display PCB	<u>Detective details:</u> When the Display PCB cannot receive the signal from the Main PCB.
--	--

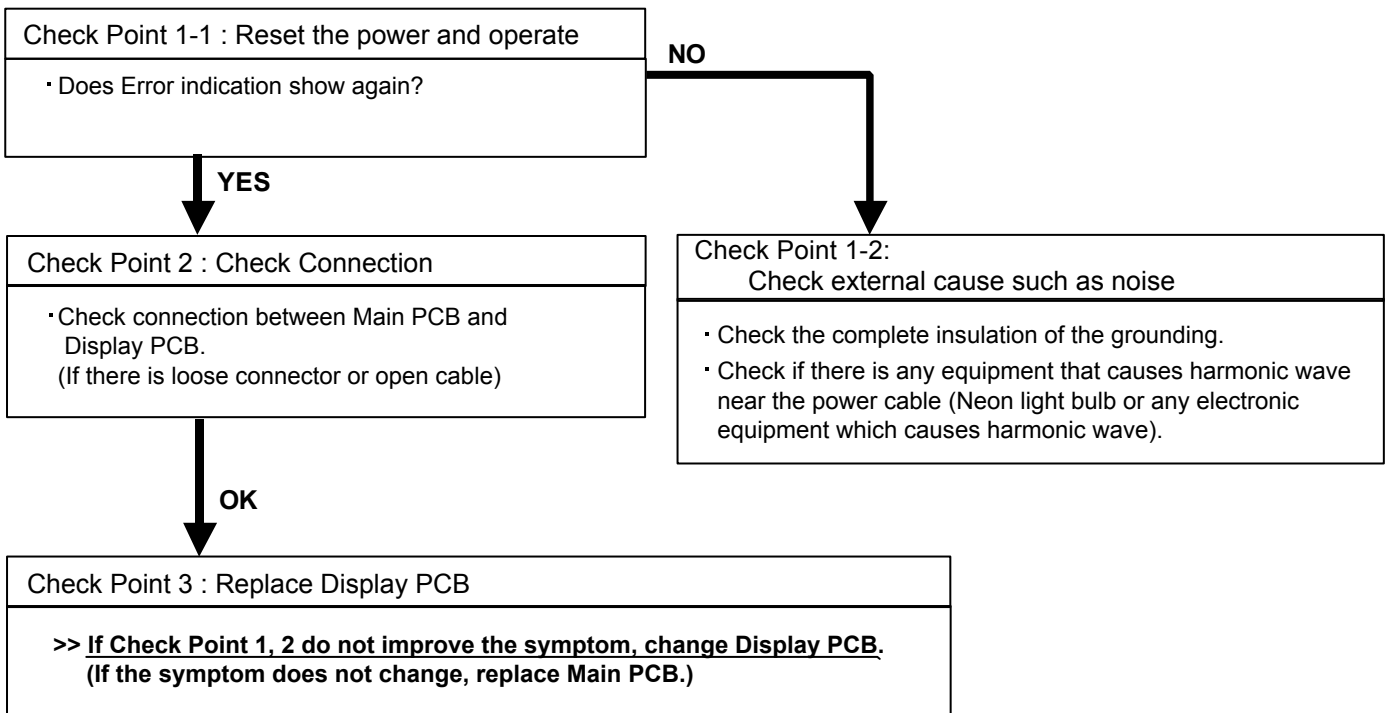
<u>Forecast of Cause:</u> 1. Connection failure 2. External cause 3. Display PCB failure 4. Main PCB failure



Trouble shooting 28 OUTDOOR UNIT Error Method: Communication Error (Main PCB <--- Display PCB)	<u>Indicate or Display:</u> Refer to error code table.
--	--

<u>Detective Actuators:</u> Indoor Unit Main PCB Circuit Display PCB	<u>Detective details:</u> When the Main PCB cannot receive the signal from the Display PCB.
--	--

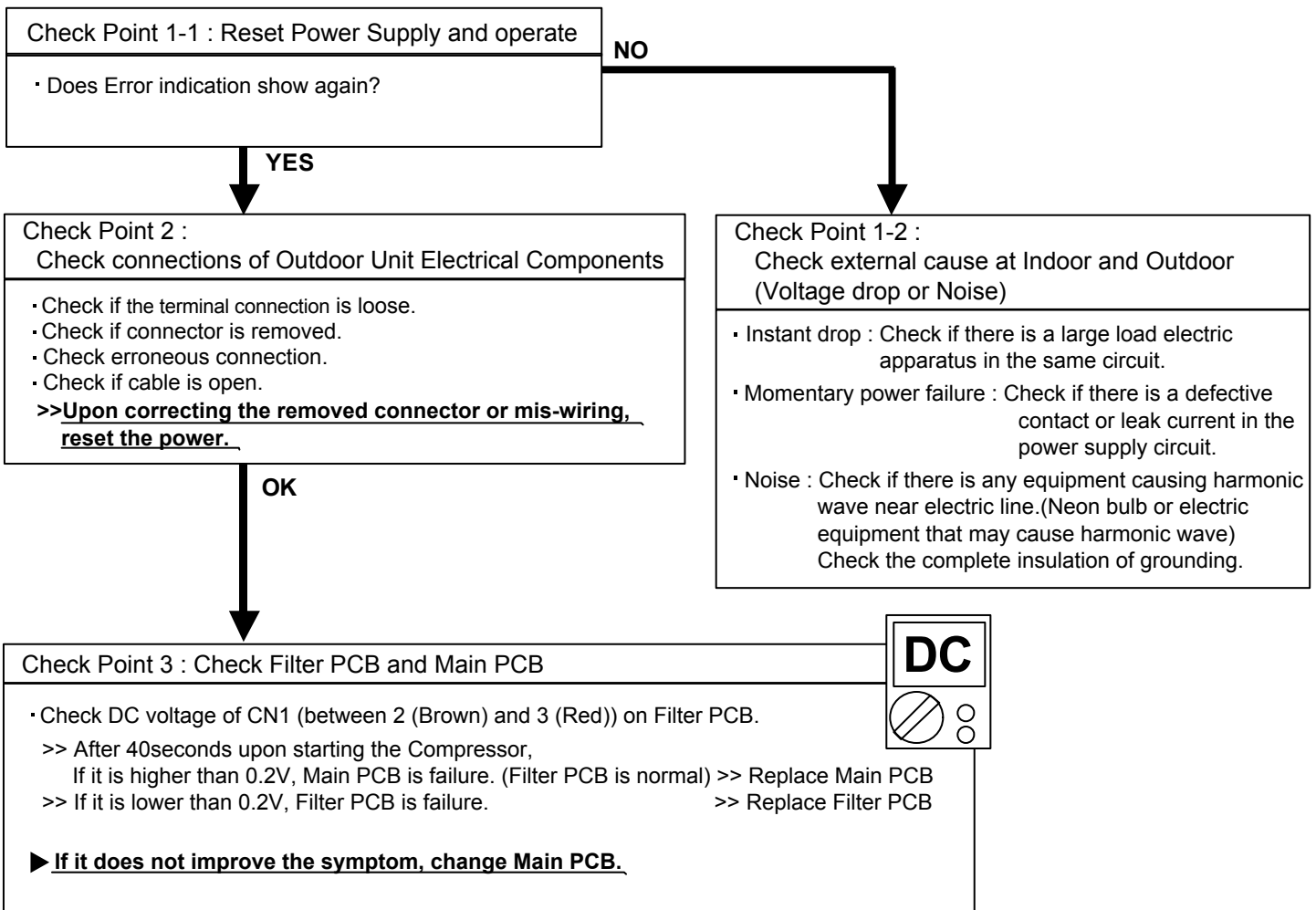
<u>Forecast of Cause:</u> 1. Connection failure 2. External cause 3. Display PCB failure 4. Main PCB failure



Trouble shooting 29 OUTDOOR UNIT Error Method: CT error	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Outdoor Unit Main PCB Circuit Outdoor Unit Filter PCB Circuit (Input current sensor unit)	Detective details: When Input Current Sensor has detected 0A, while Inverter Compressor is operating at higher than 60Hz, after 1minute upon starting the Compressor. (Except during the defrost operation)
--	---

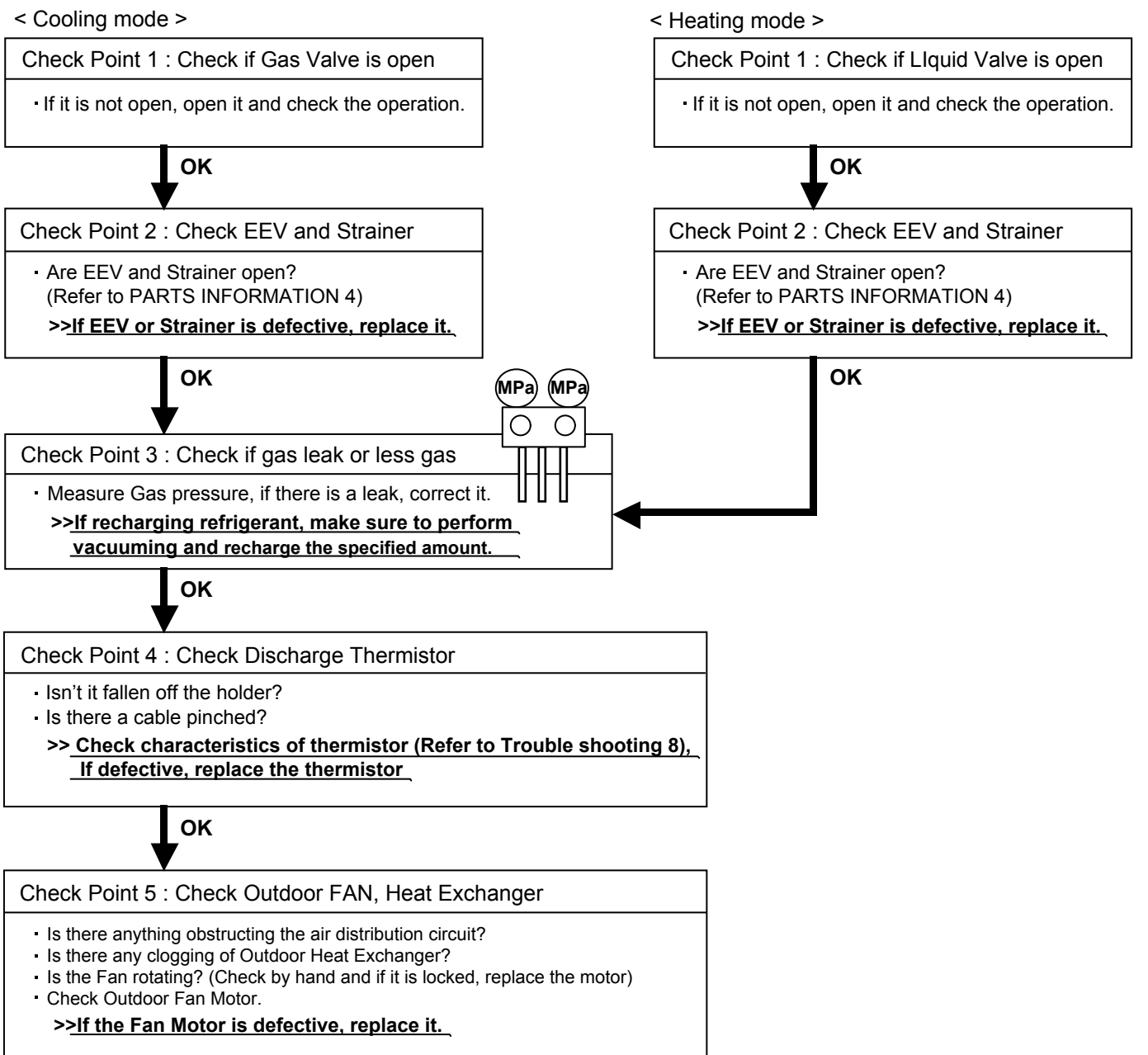
Forecast of Cause :
 1. Defective connection of electric components 2. External cause 3. Filter PCB failure 4. Main PCB failure



Trouble shooting 30 OUTDOOR UNIT Error Method: Discharge temperature error	Indicate or Display: Refer to error code table.
---	--

Detective Actuators: Outdoor Unit Main PCB Circuit Discharge Pipe Temperature Thermistor	Detective details: When the discharge temperature becomes higher than 110°C, the compressor stops.
---	--

Forecast of Cause : 1. Valve is close 2. EEV failure 3. Gas Leak, less 4. Discharge Thermistor failure 5. Outdoor Fan Operation failure 6. Outdoor Heat Exchanger clogged
--



Trouble shooting 31 OUTDOOR UNIT Error Method: Excessive high pressure protection on cooling	<u>Indicate or Display:</u> Refer to error code table.
---	--

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit Outdoor Fan Motor Heat Exchanger Temp. Thermistor Outdoor unit Electronic Expansion Valve	<u>Detective details:</u> Excessive high pressure protection on cooling mode has been activated.
---	---

<u>Forecast of Cause :</u> 1. Defective connection of electric components 2. Outdoor Fan Operation failure 3. Outdoor Heat Exchanger clogged 4. Thermistor failure 5. EEV failure 6. Main PCB failure

Check Point 1 : Check connections of Outdoor Unit Electrical Components
<ul style="list-style-type: none"> · Check if the terminal connection is loose. · Check if connector is removed. · Check erroneous connection. · Check if cable is open. >> <u>Upon correcting the removed connector or mis-wiring, reset the power.</u>



Check Point 2 : Check Outdoor Fan, Heat Exchanger
<ul style="list-style-type: none"> · 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 ? >> <u>If the Fan Motor is locked, replace it.</u>



Check Point 3 : Check Outdoor Fan
<ul style="list-style-type: none"> · Check Outdoor Fan Motor. (Refer to Trouble shooting 18) >> <u>If the Fan Motor is failure, replace it.</u>



Check Point 4 : Check Thermistor
<ul style="list-style-type: none"> · Check Thermistor. (Refer to Trouble shooting 5) >> <u>If the Thermistor is failure, replace it.</u>



Check Point 5 : Check Electronic Expansion Valve
<ul style="list-style-type: none"> · Check EEV. (PARTS INFORMATION 4)



Check Point 6 : Replace Main PCB
▶ <u>If Check Point 1~ 5 do not improve the symptom, change Main PCB.</u>

Trouble shooting 32 <u>OUTDOOR UNIT Error Method:</u> 4-way valve error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit Discharge Temperature Thermistor Outdoor Temperature Thermistor 2/3 way valve thermistor 4-way valve	<u>Detective details:</u> When the following condition is detected even only one time between 6min. - 15min. after compressor starts, compressor stops. <ul style="list-style-type: none"> ▪ Cooling operation Discharge temp. $\geq 50\text{degC}$ and Outdoor temp. $\geq 15\text{degC}$ and Minimum temp. of 2/3 way valve thermistor \geq Outdoor temp.+5degC ▪ Heating operation Discharge temp. $\geq 50\text{degC}$ and Outdoor temp. $\leq 15\text{degC}$ and Maximum temp. of 2/3 way valve thermistor \leq Outdoor temp.+5degC If the same operation within 60sec is repeated 3 times, the compressor stops permanently.
--	--

<u>Forecast of Cause :</u> 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
<ul style="list-style-type: none"> ▪ Check if connector is removed. ▪ Check erroneous connection. ▪ Check if thermistor cable is open. >><u>Upon correcting the removed connector or mis-wiring, reset the power.</u>



Check Point 2 : Check thermistor
<ul style="list-style-type: none"> ▪ Isn't it fallen off the holder? ▪ Is there a cable pinched? >> <u>Check characteristics of thermistor, If defective, replace the thermistor</u>



Check Point 3 : Check the solenoid coil and 4-way valve
<p>[Solenoid coil]</p> <ul style="list-style-type: none"> ▪ Remove CN30 from PCB and check the resistance value of coil. Resistance value is about 1.4kΩ >><u>If it is Open or abnormal resistance value, replace Solenoid Coil.</u> <p>[4-way valve]</p> <ul style="list-style-type: none"> ▪ Check each piping temperature, and the location of the valve by the temperature difference. >><u>If the value location is not proper, replace 4-way valve.</u>

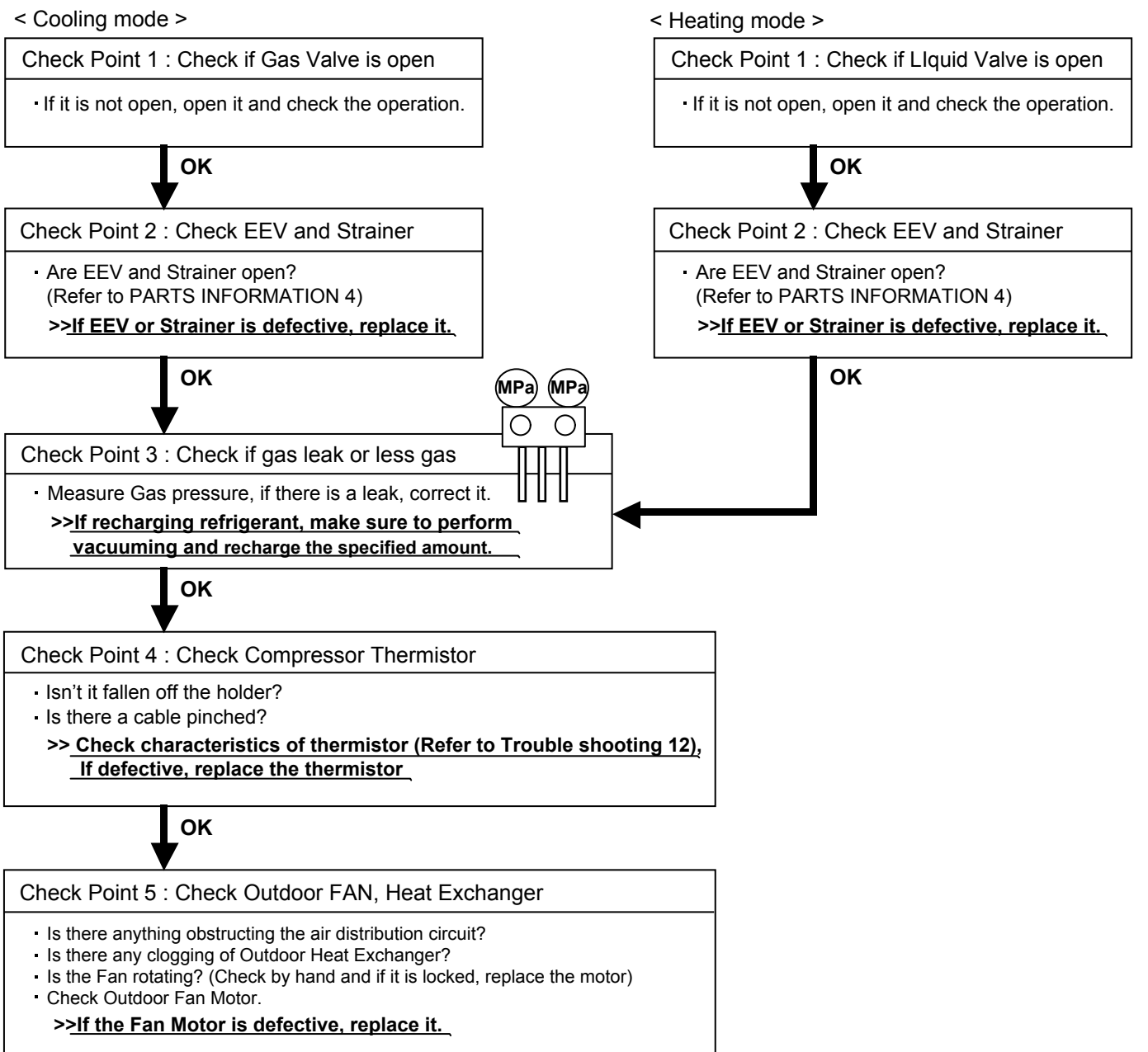


Check Point 4 : Replace Main PCB
▶ <u>If Check Point 1- 3 do not improve the symptom, replace Main PCB.</u>

Trouble shooting 33 OUTDOOR UNIT Error Method: Compressor temperature error	Indicate or Display: Refer to error code table.
--	--

Detective Actuators: Outdoor Unit Main PCB Circuit Compressor Temperature Thermistor	Detective details: When the compressor temperature becomes higher than 110°C, the compressor stops.
---	---

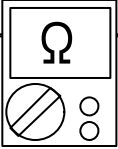
Forecast of Cause : 1. Valve is close 2. EEV failure 3. Gas Leak, less 4. Compressor Thermistor failure 5. Outdoor Fan Operation failure 6. Outdoor Heat Exchanger clogged



Trouble shooting 34 INDOOR UNIT Error Method: VDD permanence stop protection (Electric air clean)	<u>Indicate or Display:</u> Refer to error code table.
--	--

<u>Detective Actuators:</u> Electric air clean unit Indoor Unit Controller PCB Circuit	<u>Detective details:</u> When the air cleanness monitor trial protection operates 4 times.
--	--

<u>Forecast of Cause :</u> 1. Electric air clean unit failure 2. Controller PCB failure

Check Point 1 : Check the Electric air clean unit • Check the front panel is closed. • Check the Micro switch in Electric air clean unit. (Check ON/OFF switching operation by using a meter.) >>If Micro switch is detective, replace Electric air clean unit.	
--	--



Check Point 2 : Replace Controller PCB
▶ If Check Point 1 do not improve the symptom, change Controller PCB.

Trouble shooting 35 INDOOR UNIT Error Method: Reverse-VDD permanence stop protection (Electric air clean power supply circuit abnormal)	<u>Indicate or Display:</u> Refer to error code table.
--	--

<u>Detective Actuators:</u> Electric air clean unit Indoor Unit Controller PCB Circuit	<u>Detective details:</u> The air clean operation signal was detected for 1 minute at the time of air clean mode OFF.
--	--

<u>Forecast of Cause :</u> 1. Electric air clean unit failure 2. Controller PCB failure

Check Point 1 : Replace Electric air clean unit
▶ Change Electric air clean unit.



Check Point 2 : Replace Controller PCB
▶ If Check Point 1 do not improve the symptom, change Controller PCB.

Trouble shooting 36 OUTDOOR UNIT Error Method: Active Filter Module (AFM) error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit Active Filter Module	<u>Detective details:</u> When inverter input DC voltage is higher than 467V or lower than 237V. When a momentary power cut off occurred on low voltage.
---	---

<u>Forecast of Cause :</u> 1. External cause 2. Connector connection failure 3. Active Filter Module failure 4. Main PCB failure

Check Point 1 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)
<ul style="list-style-type: none"> • 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.



Check Point 2 : Check connection of Connector
<ul style="list-style-type: none"> • Check if connector is removed. • Check erroneous connection. • Check if cable is open. <p>>>Upon correcting the removed connector or mis-wiring, reset the power.</p>



Check Point 3 : Check Active Filter Module
<ul style="list-style-type: none"> • Check Active Filter Module. (PARTS INFORMATION 3) <p>>>If Active Filter Module is abnormal, replace it.</p>



Check Point 4 : Replace Main PCB
<p>▶ If Check Point 1~ 3 do not improve the symptom, change Main PCB.</p>

Trouble shooting 38 <u>OUTDOOR UNIT Error Method:</u> Main relay welded error	<u>Indicate or Display:</u> Refer to error code table.
--	---

<u>Detective Actuators:</u> Outdoor Unit Main PCB Circuit Main relay	<u>Detective details:</u> When the signal from the outdoor unit is input after 2min.20sec. from the time of operation stop under the Main relay is OFF condition.
---	---

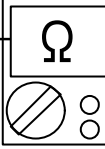
<u>Forecast of Cause :</u> 1. Main relay 2. Main PCB failure

Check Point 1 : Replace Main PCB
▶ <u>Change Main PCB.</u>

Trouble shooting 39 INDOOR UNIT Error Method: Damper error (Upper & Lower air flow) (Upper air flow)	<u>Indicate or Display:</u> Refer to error code table.
---	--

<u>Detective Actuators:</u> Indoor unit Controller PCB Circuit Limit switch Damper	<u>Detective details:</u> When damper opening recovery operation repeats 6 times.
---	--

<u>Forecast of Cause :</u> 1. Limit switch failure 2. Shorted connector/ wire 3. Damper faulure 4. Controller PCB failure

Check Point 1 : Check Limit switch <ul style="list-style-type: none"> • Check operation of limit switch. (any blocking by dust, etc.) • Remove Limit switch and check ON/OFF switching operation by using a meter. >><u>If Limit switch is detective, replace it.</u>	
--	---



Check Point 2 : Check Connector (CN18) / Wire <ul style="list-style-type: none"> • Check loose contact of CN18 /shorted wire (pinched wire). >><u>Replace Limit switch if the wire is abnormal</u>
--



Check Point 3 : Check Damper <ul style="list-style-type: none"> • Check the obstruction of damper movement. • Check the damper movement. >><u>Replace Damper if the damper is abnormal</u>




Check Point 4 : Replace Controller PCB ▶ <u>If Check Point 1~3 do not improve the symptom, change Controller PCB.</u>
--

Trouble shooting 40 INDOOR UNIT Error Method: Damper error	Indicate or Display: Refer to error code table.
---	--

Detective Actuators: Indoor unit Controller PCB Circuit Limit switch	Detective details: When close detecting sw and open detecting sw operates simultaneously.
---	---

Forecast of Cause : 1. Limit switch failure 2. Shorted connector/ wire 3. Controller PCB failure
--

Check Point 1 : Check Limit switch <ul style="list-style-type: none"> · Check operation of limit switch. (any blocking by dust, etc.) · Remove Limit switch and check ON/OFF switching operation by using a meter. >>If Limit switch is detective, replace it.	
---	---



Check Point 2 : Check Connector (CN18) / Wire <ul style="list-style-type: none"> · Check loose contact of CN18 /shorted wire (pinched wire). >>Replace Limit switch if the wire is abnormal



Check Point 3 : Replace Controller PCB ▶ If Check Point 1 & 2 do not improve the symptom, change Controller PCB.

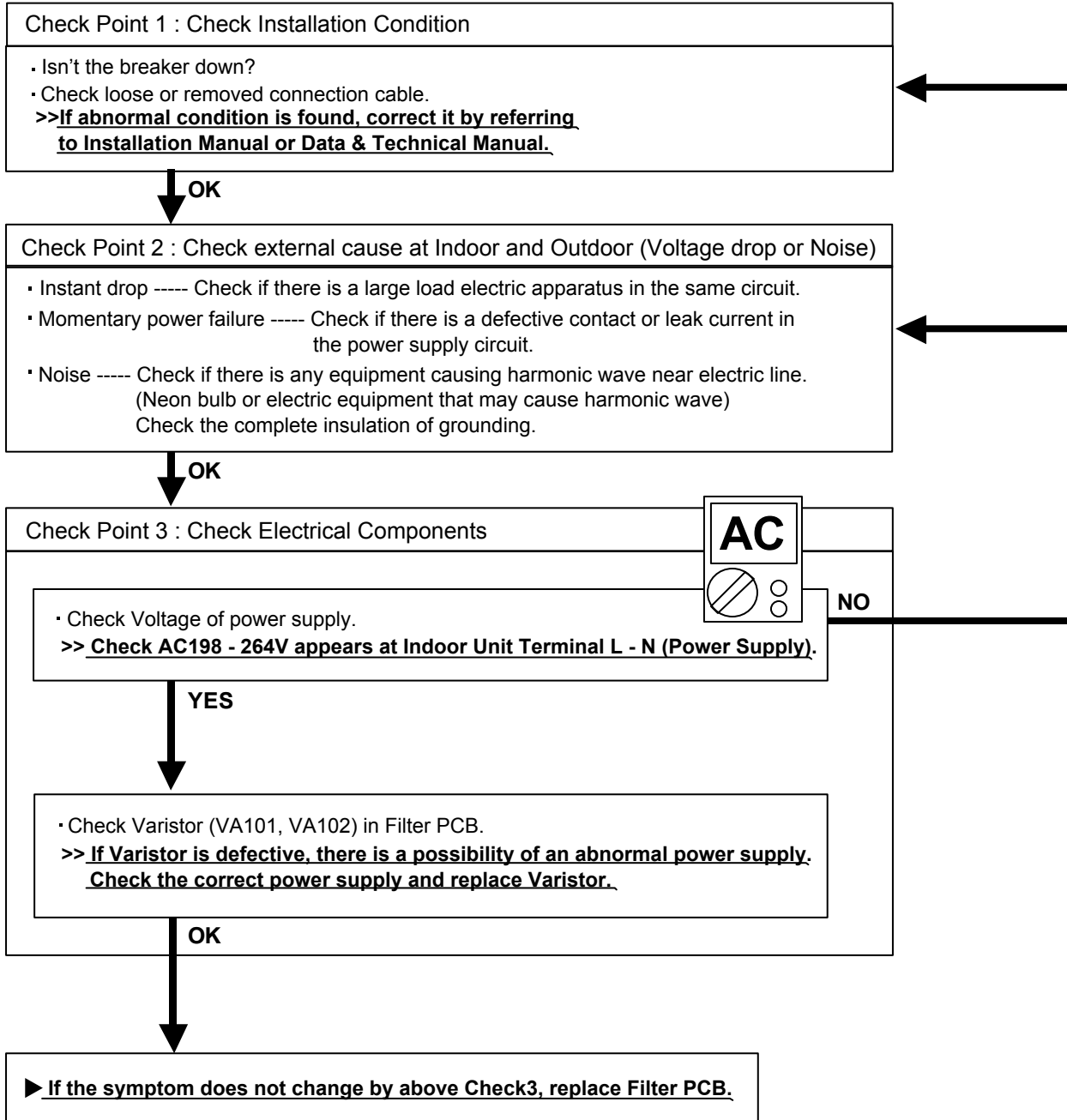
2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 41

Indoor Unit - No Power

Forecast of Cause:

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



Trouble shooting 42

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.**

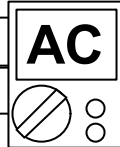
OK

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



NO

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

YES

- Check Fuse (F2, F4) in Main PCB.
- >> **If Fuse is open, check loose terminal or removed connector (CN1), and replace Fuse.**
- Check Varistor in Main PCB (VA103).
- >> **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.**

YES

- Check Active Filter Module. (PARTS INFORMATION 3)
- >> **If Active Filter Module is abnormal, replace it.**

OK

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

Trouble shooting 43

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 terminals between Indoor Units. 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

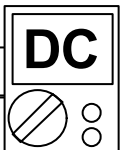
Check Point 2 : Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- 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 Electrical Components at Indoor and Outdoor

- Check Voltage at CN17 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 44

No Cooling / No Heating

Forecast of Cause:

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

Check Point 1 : Check Indoor Unit

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



Check Point 2 : Check Outdoor Unit Operation

- Check if Outdoor Unit is operating (If not, refer to Trouble shooting 42)
- Check any objects that obstruct the air flow route.
- Check clogged Heat Exchanger.
- Is the Valve open?



Check Point 3 : Check Site Condition

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



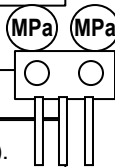
Check Point 4 : Check Indoor/ Outdoor Installation Condition

- Check connection pipe (specified pipe length & Pipe diameter?)
- Check any loose or removed communication line.
- >> **If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.**



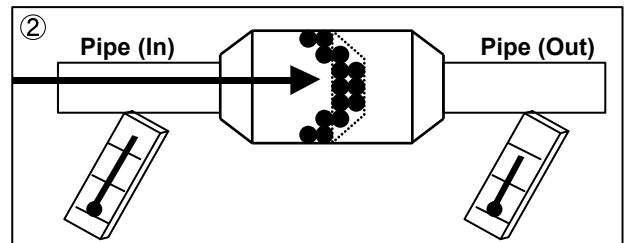
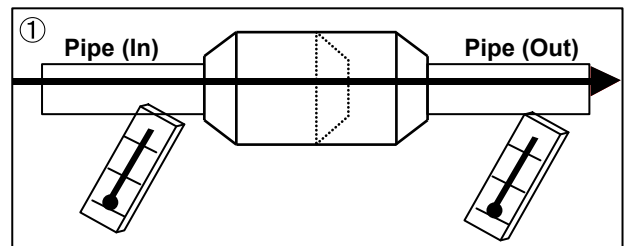
Check Point 5 : Check Refrigeration Cycle

- Check if Strainer is clogged (Refer to the figure at right).
- Measure Gas Pressure and if there is a leakage, correct it.
- >> **When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.**
- Check EEV (PARTS INFORMATION 4)
- Check Compressor (PARTS INFORMATION 1,2)



Attention

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

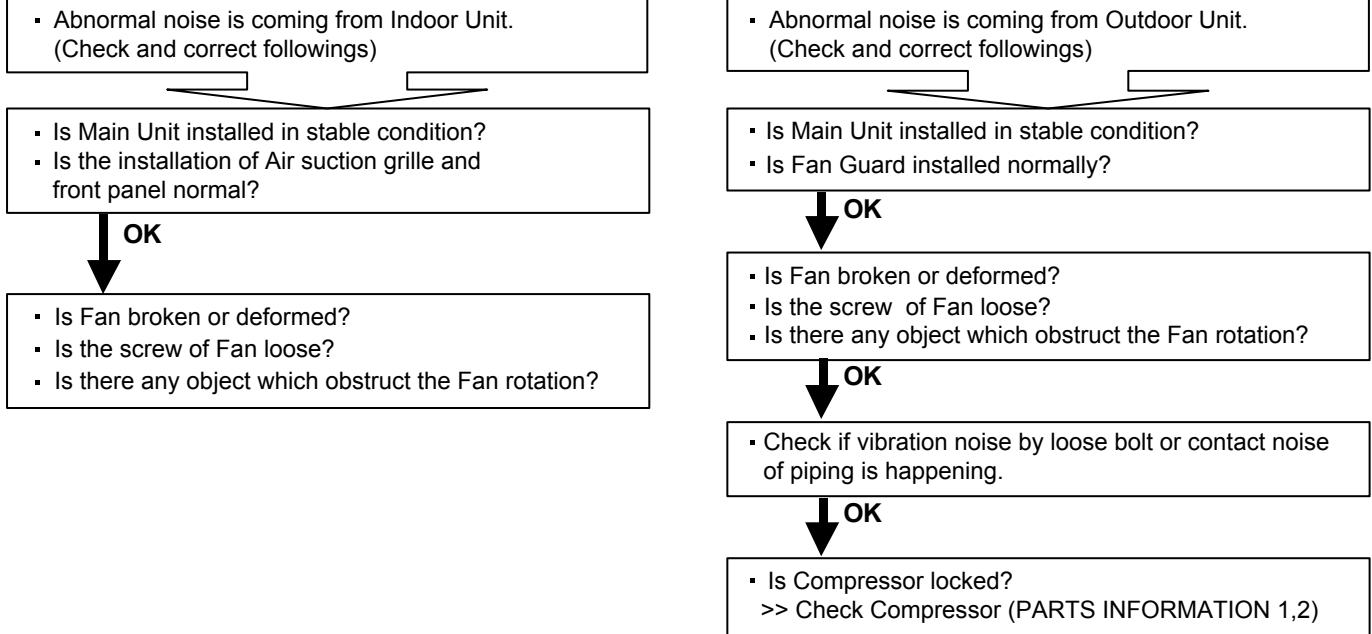


Trouble shooting 45
Abnormal Noise

Forecast of Cause :

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

Diagnosis method when Abnormal Noise is occurred

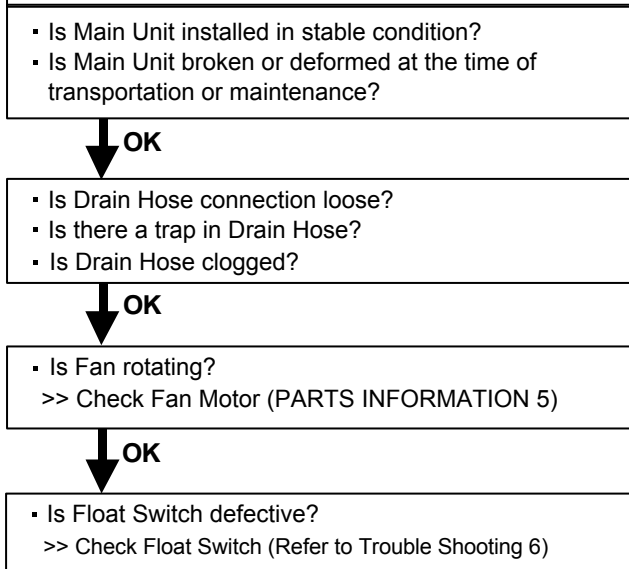


Trouble shooting 46
Water Leaking

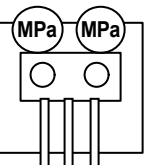
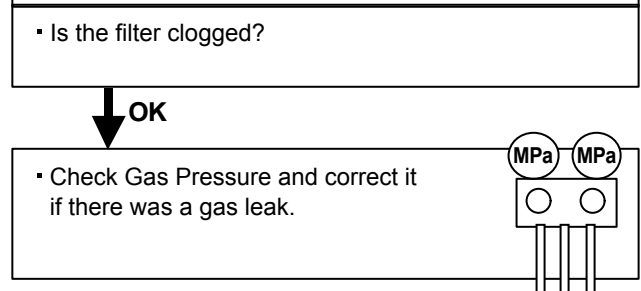
Forecast of Cause:

1. Erroneous installation
2. Drain hose failure
3. Float Switch failure

Diagnosis method when water leak occurs



Diagnosis method when water is spitting out.

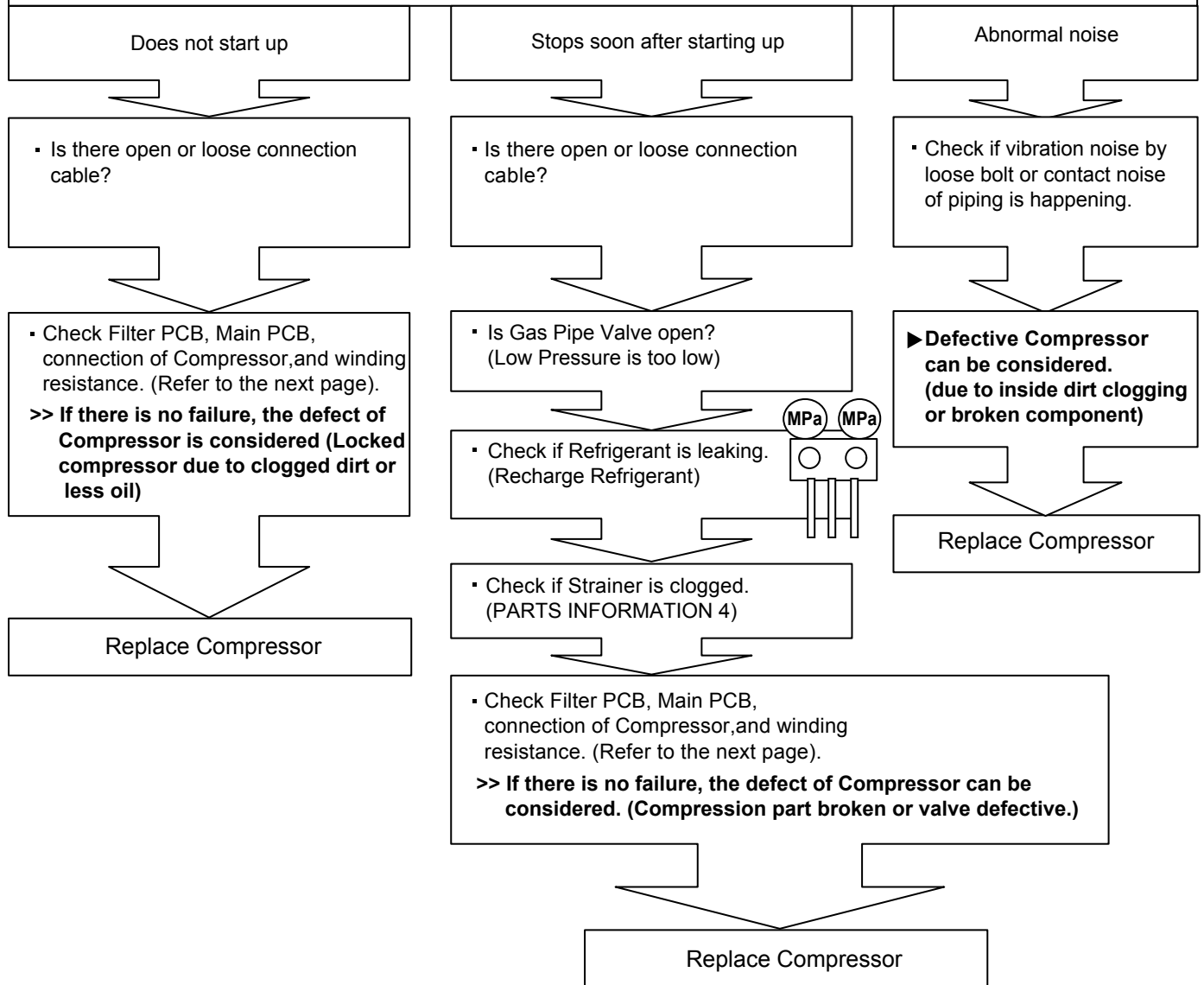


2-4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

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

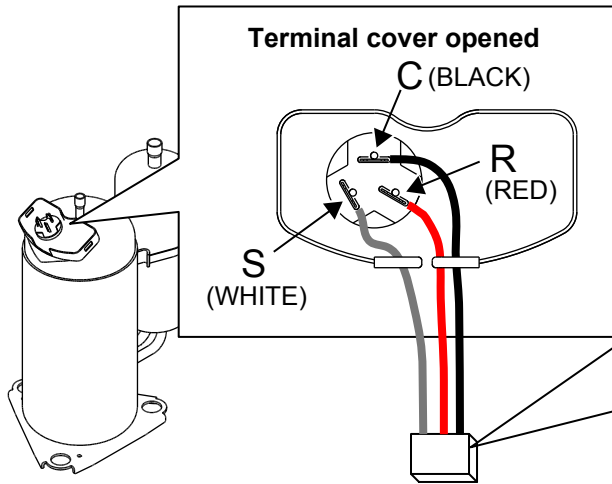


SERVICE PARTS INFORMATION 2

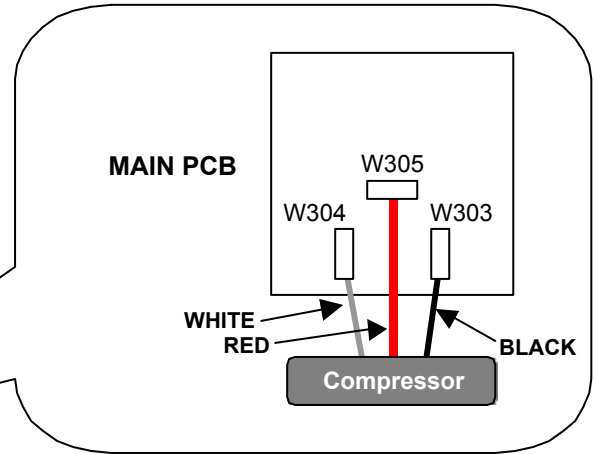
Inverter Compressor

Check Point 1 : Check Connection

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



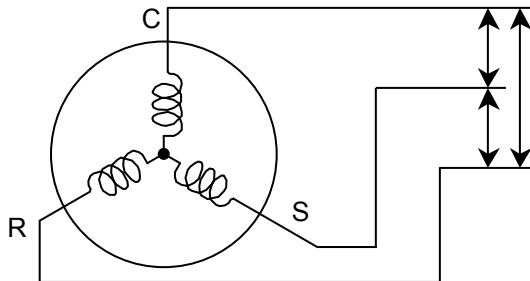
- Check connection of Main PCB (Loose or incorrect wiring)



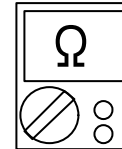
Check Point 2 : Check Winding Resistance

- Check winding resistance of each terminal

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



Resistance Value : 0.97 Ω
(at 20°C)



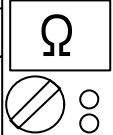
Check Point 3 : Replace Main PCB

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

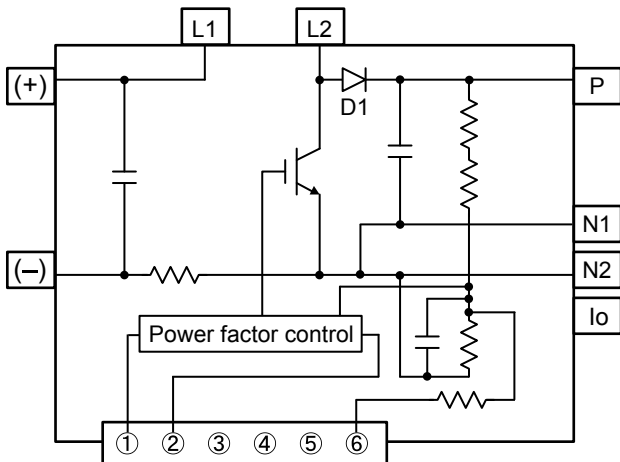
SERVICE PARTS INFORMATION 3

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(-)	
(+)	(-)	360kΩ ± 20%
(-)	N1	0 Ω
P	(+)	720kΩ ± 20%
L1	L2	1.01MΩ / 761kΩ (Ref. value 1) (Ref. value 2)
P	N1	360kΩ ± 20%
L1,L2	Control Box	∞ Ω
L2	N2	1.65MΩ / 1.14MΩ (Ref. value 1) (Ref. value 2)

Check the diode

Terminal		Resistance value
Tester(+)	Tester(-)	
L2	P	1.32MΩ / 663kΩ (Ref. value 1) (Ref. value 2)
P	L2	1.01MΩ / 762kΩ (Ref. value 1) (Ref. value 2)

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

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

► **If it is abnormal,replace ACTIVE FILTER MODULE**

Check Point 2 : Check the Output DC voltage (between P and N1)



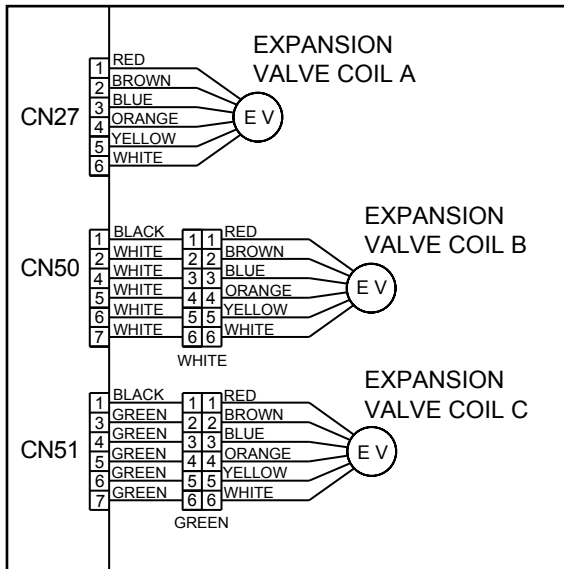
· Check the Output DC voltage (between P and N1) of compressor stopping and operating.
 >> If the output voltage of compressor operating is less than the output voltage of compressor stopping,
 Active Filter Module is defective. >> **Replace Active Filter Module**

SERVICE PARTS INFORMATION 4

Outdoor unit Electronic Expansion Valve (EEV)

Check Point 1 : Check Connections

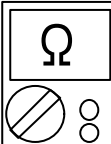
- Check connection of connector (Loose connector or open cable)



Check Point 2 : Check Coil of EEV

- Remove connector, check each winding resistance of Coil.

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



- **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

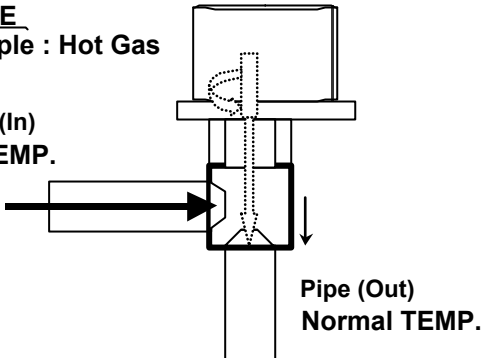
- Turn on Power and check operation noise.
- **If an abnormal noise does not show, replace Main PCB.**

Check Point 5 : Check Opening and Closing Operation of Valve

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

CLOSE
Example : Hot Gas

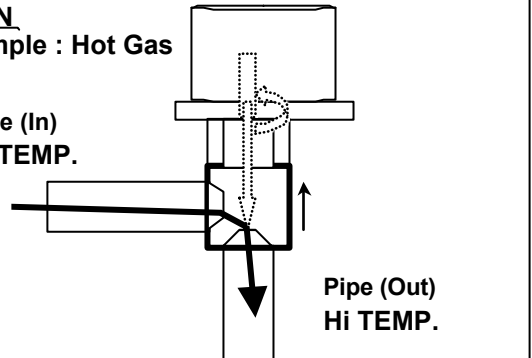
Pipe (In)
Hi TEMP.



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

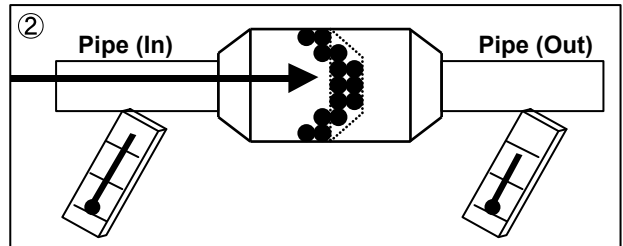
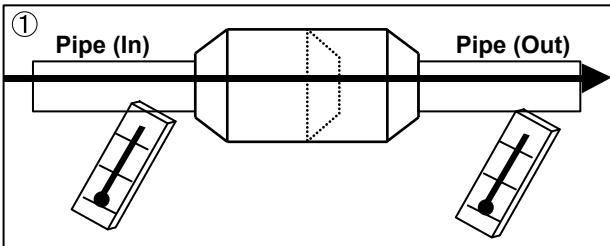
OPEN
Example : Hot Gas

Pipe (In)
Hi TEMP.



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.

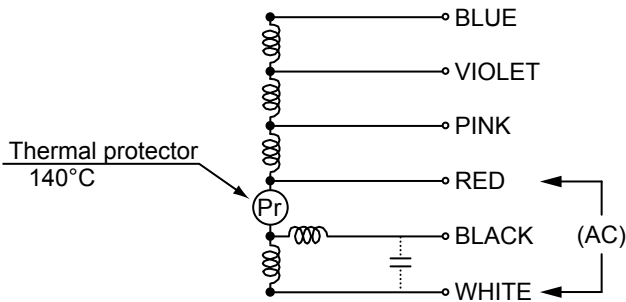
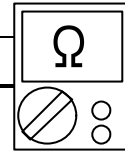


SERVICE PARTS INFORMATION 5

Indoor Unit Fan Motor

Check Point : AB*14/ 18LBAJ

- Check each winding resistance of the motor
- ▶ **If Resistance value is abnormal, replace motor.**



AB*14LBAJ

Read Wire	Resistance value
White – Red	445 $\Omega \pm 8\%$
Red – Black	346 $\Omega \pm 8\%$
Red – Pink	80.0 $\Omega \pm 8\%$
Pink – Violet	80.0 $\Omega \pm 8\%$
Violet – Blue	124 $\Omega \pm 8\%$

at 20°C

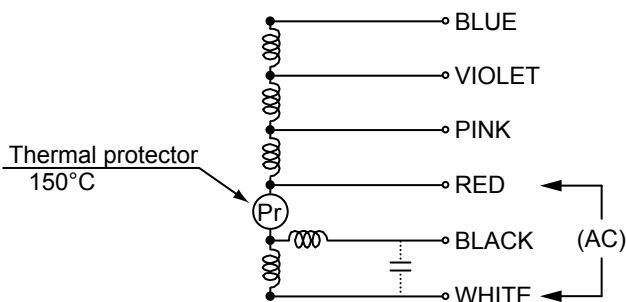
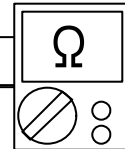
AB*18LBAJ

Read Wire	Resistance value
White – Red	291 $\Omega \pm 8\%$
Red – Black	204 $\Omega \pm 8\%$
Red – Pink	78.5 $\Omega \pm 8\%$
Pink – Violet	78.5 $\Omega \pm 8\%$
Violet – Blue	182 $\Omega \pm 8\%$

at 20°C

Check Point : AR*9LUAB/ 12/ 14/ 18LUAD

- Check each winding resistance of the motor
- ▶ **If Resistance value is abnormal, replace motor.**



AR*9LUAB

Read Wire	Resistance value
White – Red	367 $\Omega \pm 8\%$
Red – Black	145 $\Omega \pm 8\%$
Red – Pink	62.6 $\Omega \pm 8\%$
Pink – Violet	62.6 $\Omega \pm 8\%$
Violet – Blue	160 $\Omega \pm 8\%$

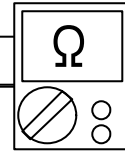
at 20°C

AR*12/ 14/ 18LUAD

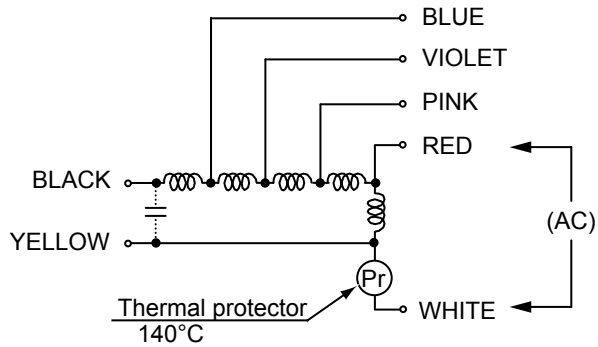
Read Wire	Resistance value
White – Red	90.3 $\Omega \pm 8\%$
Red – Black	152 $\Omega \pm 8\%$
Red – Pink	42.9 $\Omega \pm 8\%$
Pink – Violet	42.9 $\Omega \pm 8\%$
Violet – Blue	222 $\Omega \pm 8\%$

at 20°C

Check Point : AU*12/ 14/ 18LBAB



- Check each winding resistance of the motor
- ▶ **If Resistance value is abnormal, replace motor.**



AU*12/ 14LBAB

Read Wire	Resistance value
White – Red	427 $\Omega \pm 8\%$
Blue – Black	191 $\Omega \pm 8\%$
Red – Pink	92.8 $\Omega \pm 8\%$
Pink – Violet	92.8 $\Omega \pm 8\%$
Violet – Blue	191 $\Omega \pm 8\%$

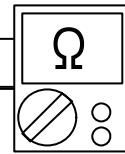
at 20°C

AU*18LBAB

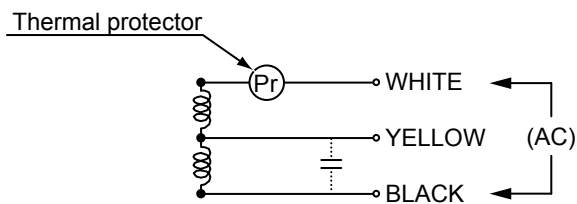
Read Wire	Resistance value
White – Red	431 $\Omega \pm 8\%$
Blue – Black	10.7 $\Omega \pm 8\%$
Red – Pink	55.5 $\Omega \pm 8\%$
Pink – Violet	35.7 $\Omega \pm 8\%$
Violet – Blue	55.5 $\Omega \pm 8\%$

at 20°C

Check Point : AS*7/ 9/ 12LMACW



- Check each winding resistance of the motor
- ▶ **If Resistance value is abnormal, replace motor.**



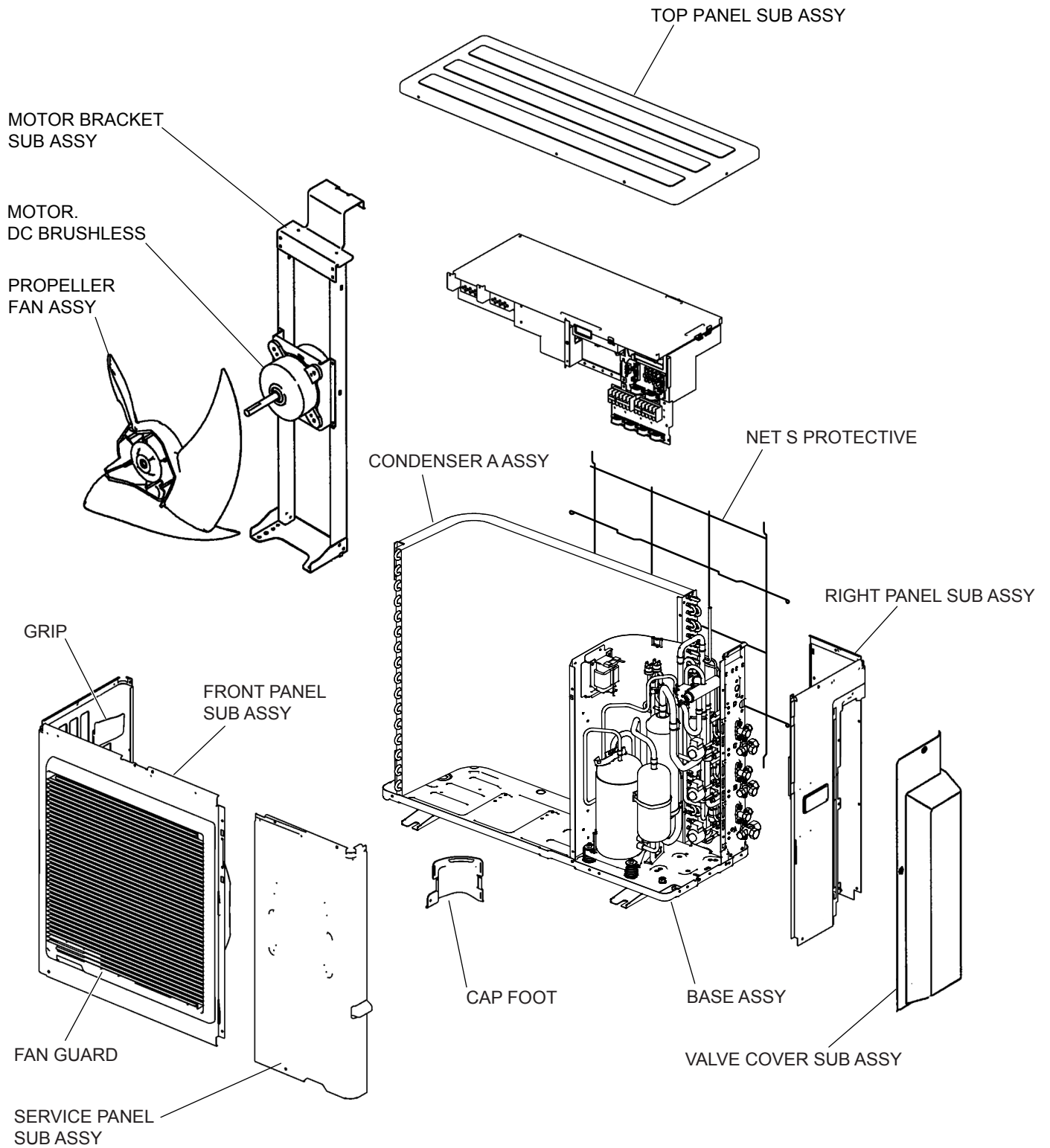
Read Wire	Resistance value
Black – Yellow	138 $\Omega \pm 8\%$
White – Yellow	136 $\Omega \pm 8\%$

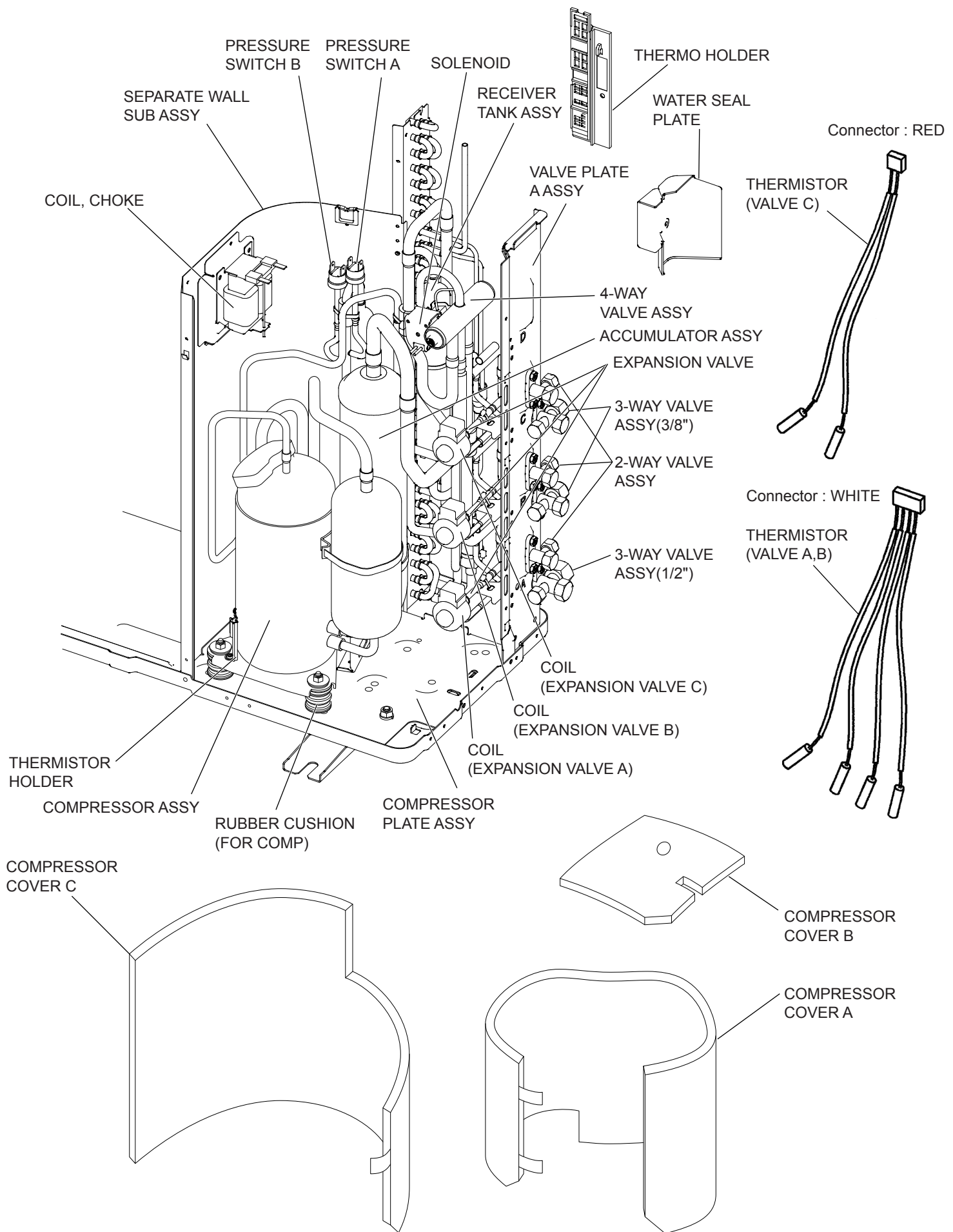
at 20°C

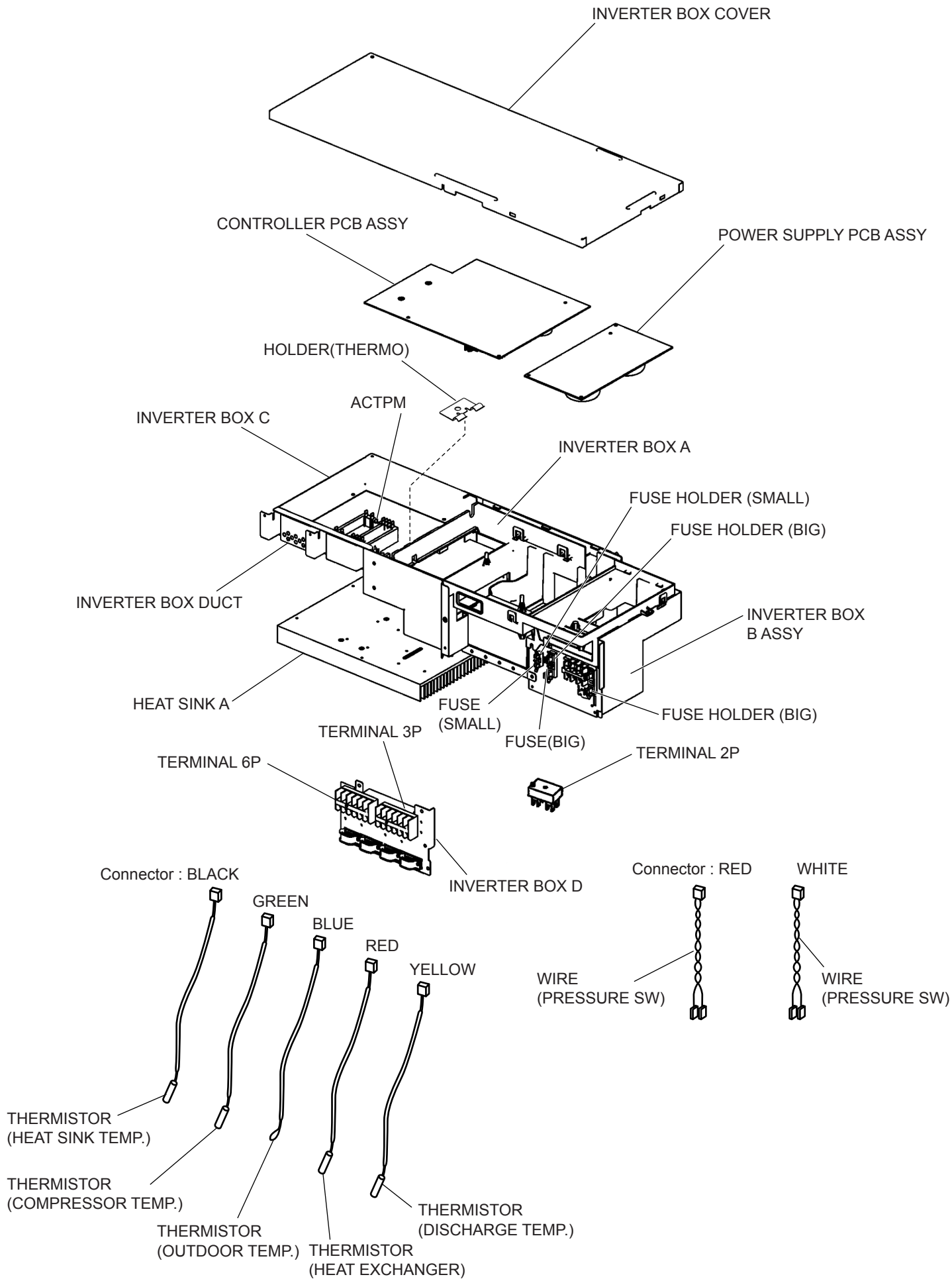
***Universal Floor / Ceiling
Duct / Cassette
Wall Mounted / Floor type
INVERTER (MULTI)***

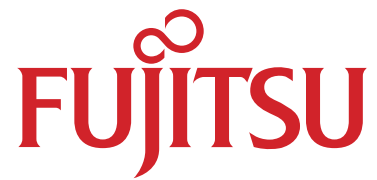
3 . REPLACEMENT PARTS

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