3 PHASE TYPE ROOM AIR CONDITIONER
Single / Simultaneous operation multi type

SERVICE INSTRUCTION

Models	Indoor unit	Outdoor unit
	·**Single type**	
	AU*G36LRLA	AO* G36LATT
	AU*G45LRLA	AO* G45LATT
	AU*G54LRLA	AO* G54LATT
		AOTG60LATT
	AR*G36LMLA	
	ARTG36LHTB	
	AR*G45LMLA	
	AR*G45LHTA	
	ARTG45LHTB	
	AR*G54LHTA	
	ARTG54LHTB	
	ARTG60LHTA	
	AB*G36LRTA	
	AB*G45LRTA	
	AB*G54LRTA	
	·**Simultaneous operation multi type**	
	AU*G18LVLB	
	AU*G22LVLA	
	AU*G24LVLA	
	AR*G18LLLA	
	AR*G22LMLA	
	AR*G24LMLA	
	AB*G18LVTB	
	AB*G22LVTA	
	AB*G24LVTA	

Refrigerant
R410A

FUJITSU GENERAL LIMITED

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Refrigerant R410A
INVERTER

AIR CONDITIONER

3 phase type

Single / Simultaneous operation multi type

1 . DESCRIPTION OF EACH CONTROL OPERATION

1-1. COOLING OPERATION

1-1-1 COOLING CAPACITY CONTROL

A sensor (room temperature thermistor) built in the indoor unit will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.
The maximum frequency is limited in the range shown in Figure 1 based on the fan speed mode and the outdoor temperature.

- If the room temperature is 2 °C higher than a set temperature, the compressor operation frequency will attain to maximum frequency.

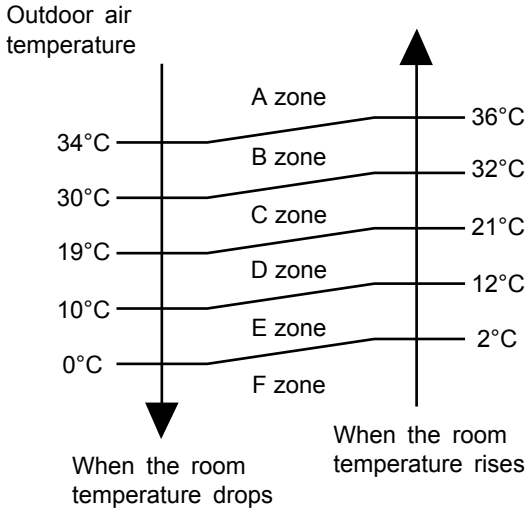
- If the room temperature is 2.5 °C lower than a set temperature, the compressor will be stopped.

- When the room temperature is between +2 °C to -2.5 °C of the setting temperature, the compressor frequency is controlled within the range shown in Table1.

(Table 1 : Compressor Frequency Range)

	Minimum frequency	Maximum frequency
AO *G36LATT	15rps	55rps
AO *G45LATT	15rps	80rps
AO *G54LATT	15rps	80rps
AOTG60LATT	15rps	80rps

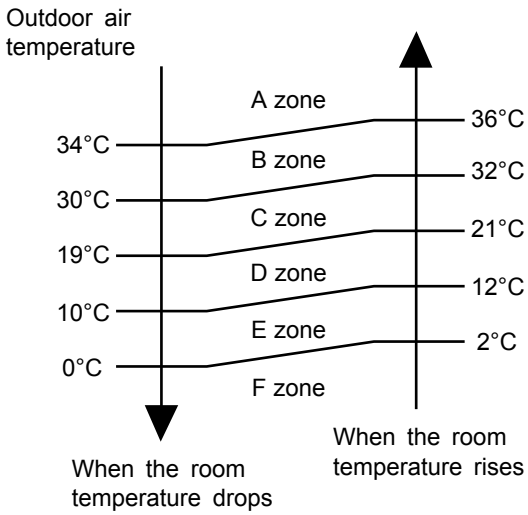
(Fig 1-1 : Limit of Maximum Frequency based on Outdoor Temperature for Single type)



[rps]

		Fan speed mode	High	Med	Low	Quiet
DC indoor unit connection	AO *G36LATT	A zone	55	45	38	29
		B zone	55	45	38	29
		C zone	47	38	36	29
		D~ F zone	38	33	29	23
	AO *G45LATT	A zone	77	53	46	35
		B zone	77	53	46	35
		C zone	57	46	41	35
		D~ F zone	47	41	37	28
	AO *G54LATT	A zone	80	59	52	38
		B zone	80	59	52	38
		C zone	64	52	46	38
		D~ F zone	55	46	40	29
AC indoor unit connection (High static pressure)	AO *G36LATT	A zone	55	53	45	
		B zone	55	53	45	
		C zone	53	45	38	
		D~ F zone	45	40	36	
	AO *G45LATT (AOTG45LATT)	A zone	64	56	54(47)	
		B zone	64	56	54(47)	
		C zone	57(56)	46(47)	46(41)	
		D~ F zone	46	45	41(39)	
	AO *G54LATT (AOTG54LATT)	A zone	72	64(62)	61(55)	
		B zone	72	64(62)	61(55)	
		C zone	64(62)	55	52(46)	
		D~ F zone	52(55)	47	46(45)	
	AOTG60LATT	A zone	78	67	59	
		B zone	78	67	59	
		C zone	67	59	52	
		D~ F zone	59	55	47	

(Fig 1-2 : Limit of Maximum Frequency based on Outdoor Temperature for Multi type)



[rps]

Fan speed mode		High	Med	Low	Quiet	Recital
AO *G36LATT	A zone	55	53	41	31	
	B zone	55	53	41	31	
	C zone	55	41	38	31	
	D~ F zone	41	38	33	27	
AO *G36LATT	A zone	55	53	53	31	In the case of the Indoor unit of Duct or Ceiling type
	B zone	55	53	53	31	
	C zone	53	41	41	31	
	D~ F zone	41	38	33	27	
AO *G45LATT	A zone	77	56	46	35	
	B zone	77	56	46	35	
	C zone	59	46	41	35	
	D~ F zone	46	41	37	30	
AO *G54LATT	A zone	80	62	52	38	
	B zone	80	62	52	38	
	C zone	65	52	46	38	
	D~ F zone	52	46	40	33	
AO *G54LATT	A zone	80	62	62	38	In the case of the Indoor unit of Duct or Ceiling type
	B zone	80	62	62	38	
	C zone	62	52	52	38	
	D~ F zone	52	46	40	33	

1-2. HEATING OPERATION

1-2-1 HEATING CAPACITY CONTROL

A sensor (room temperature thermistor) built in the indoor unit will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation frequency of the compressor.
The maximum frequency is limited in the range shown in Figure 2 based on the outdoor temperature.

- If the room temperature is lower 3 °C than a set temperature, the compressor operation frequency will attain to maximum frequency.

- If the room temperature is higher 2.5 °C than a set temperature, the compressor will be stopped.

- When the room temperature is between +2.5 °C to -3 °C of the setting temperature, the compressor frequency is controlled within the range shown in Table 2.

(Table 2 : Compressor Frequency Range)

	Minimum frequency	Maximum frequency
AO *G36LATT	18rps	80rps
AO *G45LATT	18rps	85rps
AO *G54LATT	18rps	85rps
AOTG60LATT	18rps	85rps

1-3. DRY OPERATION

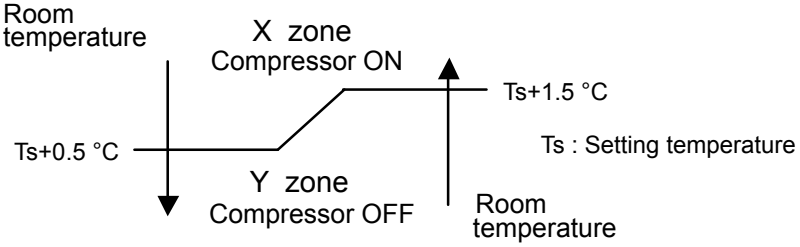
1-3-1 INDOOR UNIT CONTROL

The compressor rotation frequency shall change according to set temperature and room temperature variation which the room temperature sensor of the indoor unit has detected as shown in the Fig 2.

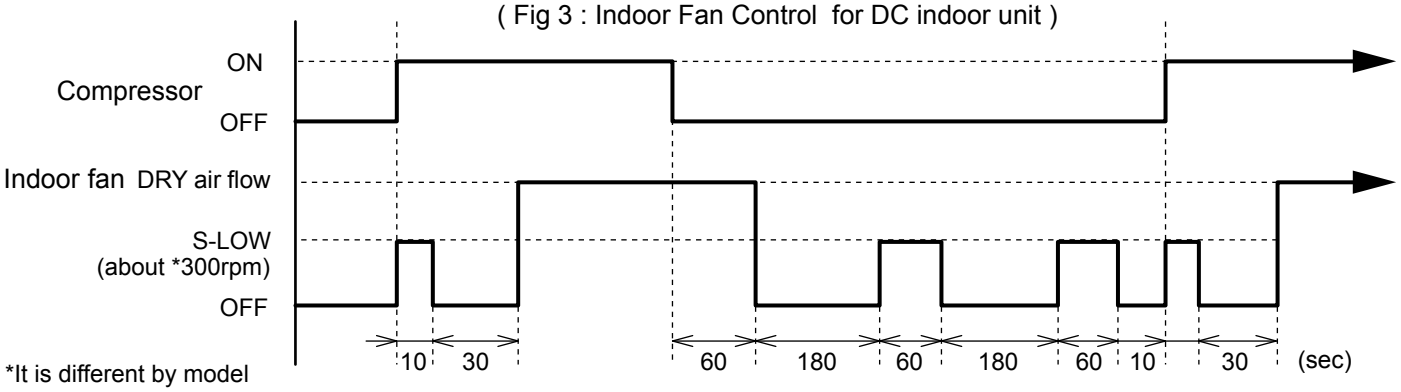
(Table 3 : Compressor Frequency Range) [rps]

			Frequency	Recital
DC indoor unit connection	AO *G36LATT	X zone	31	
		Y zone	0	
	AO *G36LATT	X zone	29	In the case of the Indoor unit of Duct type
		Y zone	0	
	AO *G45LATT	X zone	35	
		Y zone	0	
	AO *G54LATT	X zone	38	
		Y zone	0	
AC indoor unit connection (High static pressure)	AO *G36LATT	X zone	31	
		Y zone	0	
	AO *G45LATT	X zone	35	
		Y zone	0	
	AO *G54LATT	X zone	38	
		Y zone	0	
	AOTG60LATT	X zone	41	
		Y zone	0	

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

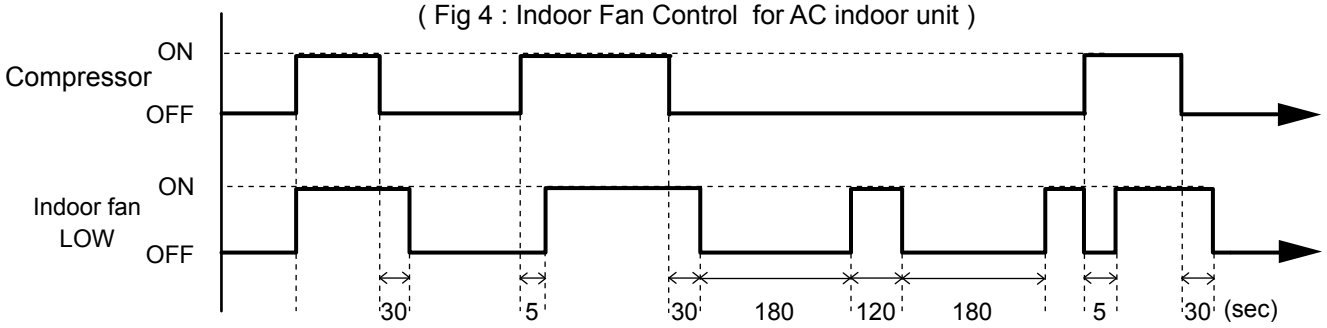


(Fig 3 : Indoor Fan Control for DC indoor unit)



*It is different by model

(Fig 4 : Indoor Fan Control for AC indoor unit)



1-4. AUTO CHANGEOVER OPERATION

When the air conditioner is set to the Auto mode by remote controller, operation starts in the optimum mode from among the Heating, Cooling, Dry and Monitoring mode. During operation, the optimum mode is automatically switched in accordance with temperature changes. The temperature can be set between 18°C and 30°C in 1°C steps.

① When operation starts, indoor fan and outdoor fan are operated for around 2 minutes or 3 minutes. (This time is different for different types of indoor unit.)
Room temperature and outdoor temperature are sensed,
and the operation mode is selected in accordance with the table below. **<Monitoring mode>**

(Table 4 : Operation mode selection table)

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

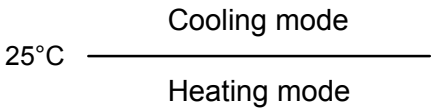
TR : Room temperature
Ts : Setting temperature

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

(1). Same operation mode is selected as outdoor unit.
If outdoor unit is operating in Cooling, Dry, and Heating mode, indoor unit will be operated by the same operation mode.

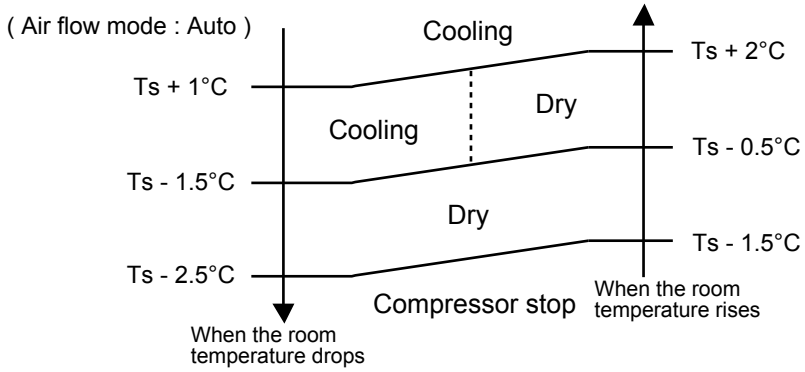
(2). Selected by the outdoor temperature.
If outdoor unit is operating in other than Cooling, Dry, and Heating mode, indoor unit will be operated according to the outdoor temperature as below.

(Fig. 5 : Outdoor temperature zone selection)



② When Cooling or Dry mode was selected at ① and air flow mode is Auto, the air conditioner operates as follow.
- The same operation as COOLING OPERATION AND DRY OPERATION.
- When the room temperature has remained at set temperature -1.5°C, operation is automatically switched to Dry mode.
- If the room temperature reaches set temperature +2°C during Dry mode, operation returns to Cooling.

(Fig.6 : Auto changeover : Cooling - Dry)

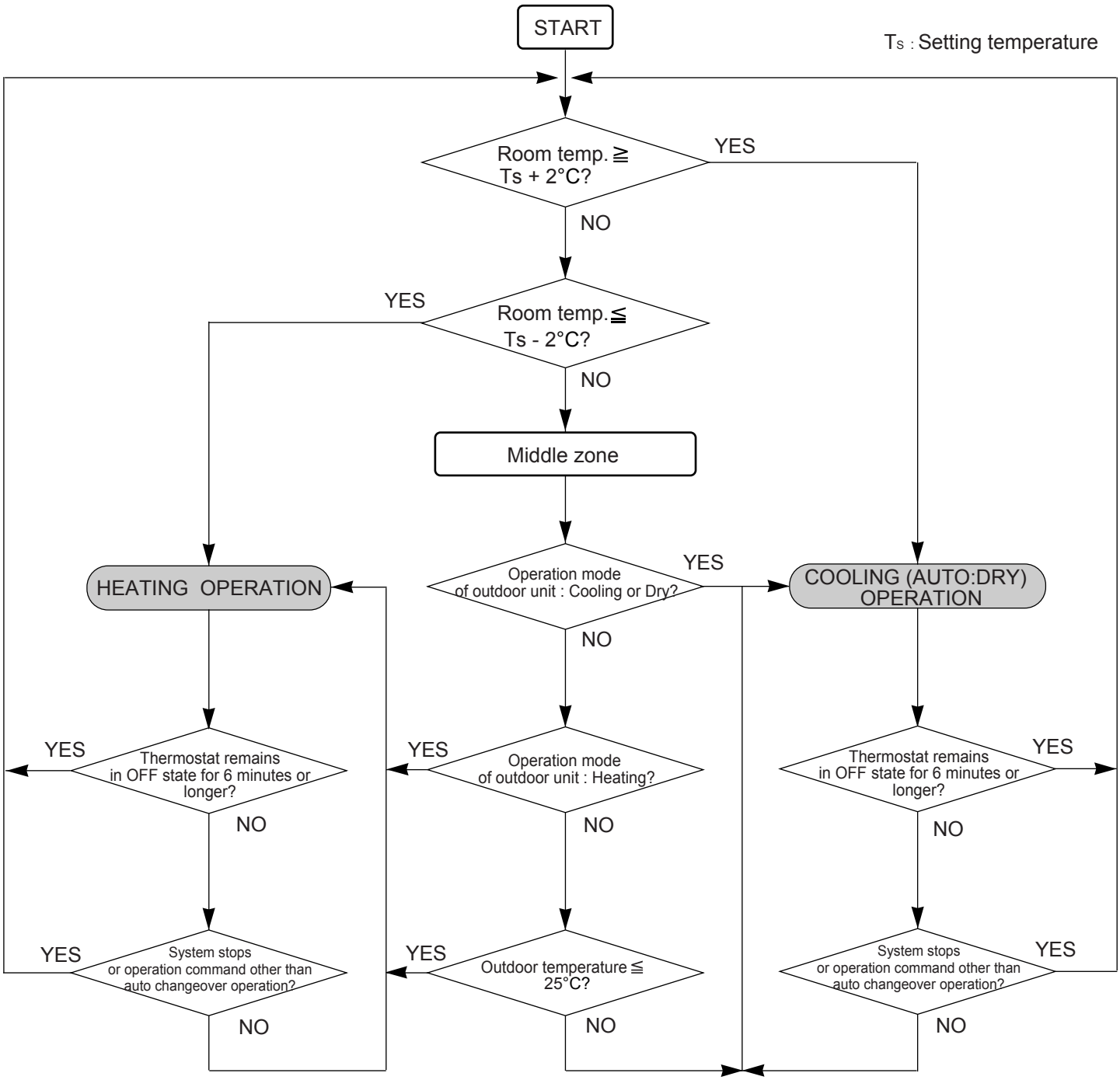


TR : Room temperature
Ts : Setting temperature

③ When Heating was selected at ①, the same operation as HEATING OPERATION of page 01-02 is performed.

④ When the compressor was stopped for 6 consecutive minutes by the temperature control function after the Cooling(Auto:Dry) or Heating mode was selected at ① above, operation is switched to Monitoring and the operation mode is selected again.

■ AUTO CHANGEOVER operation flow chart



1-5. INDOOR FAN CONTROL

1. Fan speed

(Table 5 : Indoor Fan Speed)

[Multi type]

AU *G18LVLB

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	840
	Me+	800
	Me	750
	Lo	650
	Quiet	500
	Cool air prevention	400
Cooling Fan	Hi	790
	Me	660
	Lo	570
	Quiet	460
	*Soft Quiet	400
Dry	Auto	460
	S-Lo	300

AU *G22/ 24LVLA

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	960
	Me+	930
	Me	880
	Lo	740
	Quiet	580
	Cool air prevention	400
Cooling Fan	Hi	960
	Me	850
	Lo	650
	Quiet	500
	*Soft Quiet	400
Dry	Auto	500
	S-Lo	300

AB *G18LVTB

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1040
	Me+	1000
	Me	950
	Lo	800
	Quiet	740
	Cool air prevention	500
Cooling Fan	Hi	1040
	Me	950
	Lo	800
	Quiet	740
	*Soft Quiet	500
Dry	Auto	740
	S-Lo	300

AB *G22/ 24LVTA

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1300
	Me+	1200
	Me	1150
	Lo	1000
	Quiet	780
	Cool air prevention	500
Cooling Fan	Hi	1330
	Me	1150
	Lo	1000
	Quiet	780
	*Soft Quiet	500
Dry	Auto	780
	S-Lo	300

AR *G18LLLA
(Normal static pressure: 25Pa)

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1380
	Me+	—
	Me	1300
	Lo	1220
	Quiet	1140
	Cool air prevention	—
Cooling Fan	Hi	1380
	Me	1300
	Lo	1220
	Quiet	1140
	*Soft Quiet	600
Dry	Auto	1140
	S-Lo	600

AR *G22/ 24LMLA
(Normal static pressure: 35Pa)

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	830
	Me+	—
	Me	700
	Lo	600
	Quiet	550
	Cool air prevention	—
Cooling Fan	Hi	830
	Me	700
	Lo	600
	Quiet	550
	*Soft Quiet	350
Dry	Auto	550
	S-Lo	350

*Note, during Economy operation and operation mode is Fan, air flow is 1 step downs.
(Hi > Me, Me > Lo, Lo > Quiet, Quiet > Soft Quiet)

[Single type]

AU *G36LRLA

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	660
	Me+	600
	Me	540
	Lo	470
	Quiet	430
	Cool air prevention	300
Cooling Fan	Hi	660
	Me	540
	Lo	470
	Quiet	430
	*Soft Quiet	300
Dry	Auto	430
	S-Lo	270

AU *G45LRLA

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	690
	Me+	650
	Me	610
	Lo	550
	Quiet	470
	Cool air prevention	300
Cooling Fan	Hi	690
	Me	610
	Lo	550
	Quiet	470
	*Soft Quiet	300
Dry	Auto	470
	S-Lo	270

AU *G54LRLA

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	720
	Me+	680
	Me	630
	Lo	570
	Quiet	480
	Cool air prevention	300
Cooling Fan	Hi	720
	Me	630
	Lo	570
	Quiet	480
	*Soft Quiet	300
Dry	Auto	480
	S-Lo	270

*Note, during Economy operation and operation mode is Fan, air flow is 1 step downs.
(Hi > Me, Me > Lo, Lo > Quiet, Quiet > Soft Quiet)

AB *G36LRTA

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1100
	Me+	1000
	Me	910
	Lo	750
	Quiet	650
	Cool air prevention	500
Cooling Fan	Hi	1100
	Me	910
	Lo	750
	Quiet	650
	*Soft Quiet	500
Dry	Auto	650
	S-Lo	250

AB *G45LRTA

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1200
	Me+	1100
	Me	1000
	Lo	830
	Quiet	680
	Cool air prevention	500
Cooling Fan	Hi	1200
	Me	1000
	Lo	830
	Quiet	680
	*Soft Quiet	500
Dry	Auto	680
	S-Lo	250

AB *G54LRTA

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1340
	Me+	1250
	Me	1150
	Lo	950
	Quiet	790
	Cool air prevention	500
Cooling Fan	Hi	1360
	Me	1150
	Lo	950
	Quiet	790
	*Soft Quiet	500
Dry	Auto	790
	S-Lo	250

AR *G36LMLA
(Normal static pressure: 47Pa)

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1220
	Me+	—
	Me	1020
	Lo	840
	Quiet	670
	Cool air prevention	—
Cooling Fan	Hi	1200
	Me	1020
	Lo	840
	Quiet	670
	*Soft Quiet	420
Dry	Auto	670
	S-Lo	420

AR *G45LMLA
(Normal static pressure: 30Pa)

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	1300
	Me+	—
	Me	1020
	Lo	840
	Quiet	670
	Cool air prevention	—
Cooling Fan	Hi	1310
	Me	1020
	Lo	840
	Quiet	670
	*Soft Quiet	420
Dry	Auto	670
	S-Lo	420

AR *G45/ 54LHTA
(Normal static pressure: 100Pa)

Operation mode	Air flow mode	Speed (rpm)
Heating Cooling Fan	Hi	1300
	Me	1150
	Lo	1000

ARTG36LHTB
(Normal static pressure: 60Pa)

Operation mode	Air flow mode	Speed (rpm)
Heating	Hi	990
	Me+	—
	Me	850
	Lo	700
	Quiet	—
	Cool air prevention	—
Cooling Fan	Hi	990
	Me	850
	Lo	700
	Quiet	—
	*Soft Quiet	370
Dry	Auto	700
	S-Lo	370

ARTG45LHTB
(Normal static pressure: 60Pa)

Operation mode	Air flow mode	Speed (rpm)
Heating Cooling Fan	Hi	1040/ 1000
	Me	880/ 840
	Lo	740/ 700
Dry	Lo	740/ 700
	Intermittent	420/ 380
	S-Lo	420/ 380

ARTG54LHTB/ 60LHTA
(Normal static pressure: 60Pa)

Operation mode	Air flow mode	Speed (rpm)
Heating Cooling Fan	Hi	1090/ 1050
	Me	900/ 860
	Lo	780/ 740
Dry	Lo	780/ 740
	Intermittent	420/ 380
	S-Lo	420/ 380

*Note, during Economy operation and operation mode is Fan, air flow is 1 step downs.
(Hi > Me, Me > Lo, Lo > Quiet, Quiet > Soft Quiet)

2. FAN OPERATION

The airflow can be switched in 5 steps such as Auto, Quiet, Low, Med, High, while the indoor fan only runs.

※ The High Static Pressure Duct type is 4 steps such as Auto, Low, Med, High.

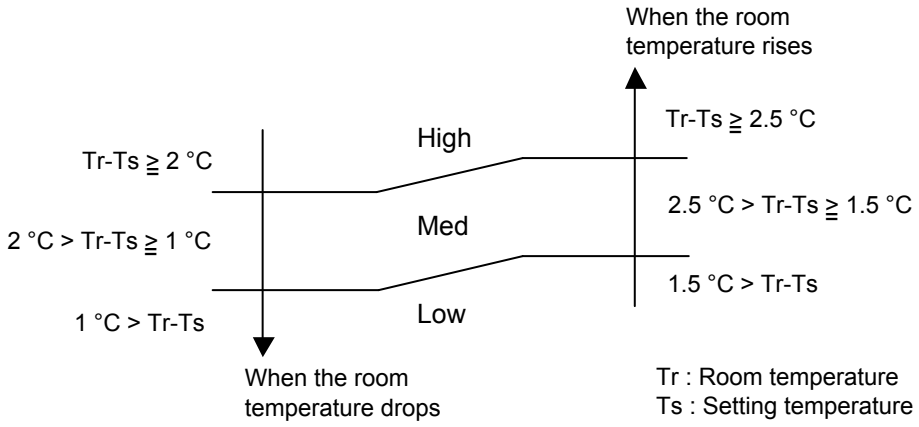
3. COOLING OPERATION (Auto : Cooling)

Switch the airflow [Auto], and the indoor fan motor will run according to a room temperature, as shown in Figure 7.

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 5.

※ The High Static Pressure Duct type is 4 steps such as Auto, Low, Med, High.

(Fig 7 : Airflow change - over (Cooling : Auto))



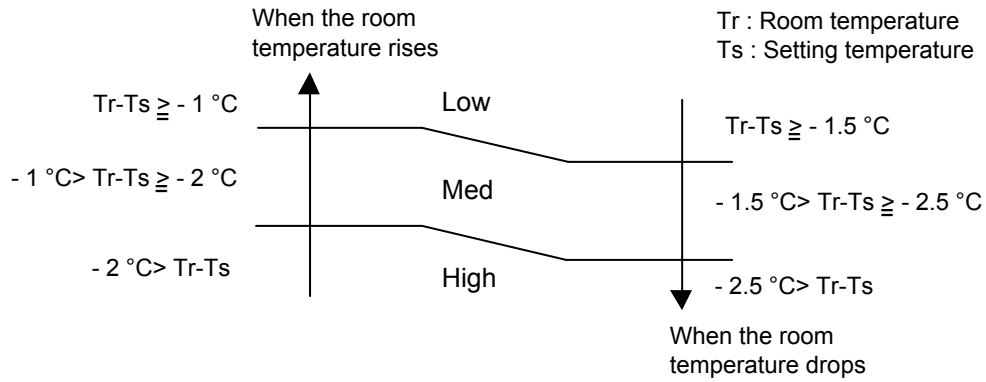
4. HEATING OPERATION (Auto : Heating)

Switch the airflow [AUTO], and the indoor fan motor will run according to a room temperature, as shown in Figure 8.

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 5.

※ The High Static Pressure Duct type is 4 steps such as Auto, Low, Med, High.

(Fig 8 : Airflow change - over (Heating : Auto))

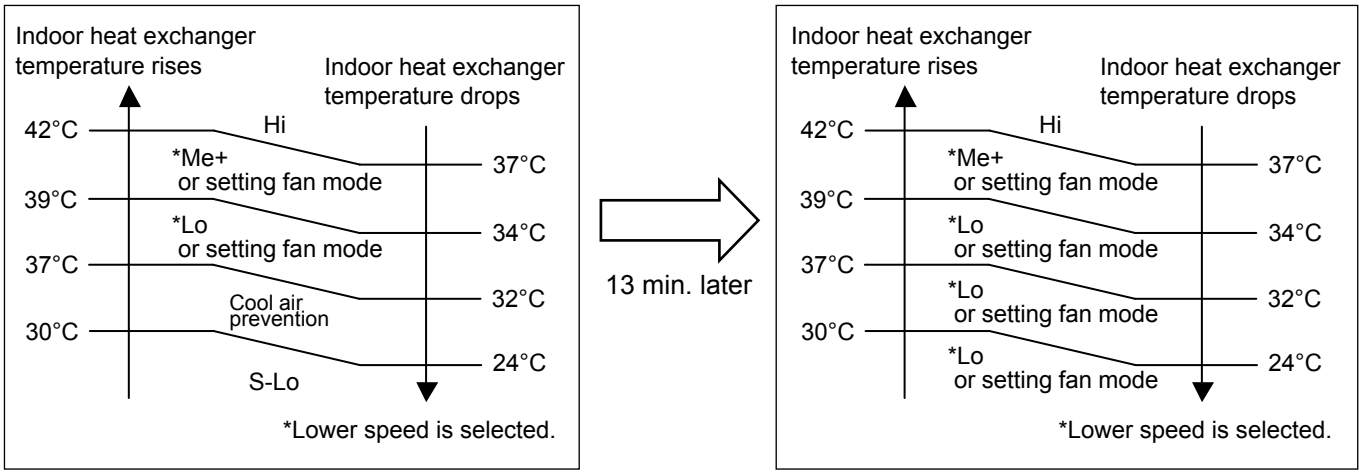


5. COOL AIR PREVENTION CONTROL (Heating mode)

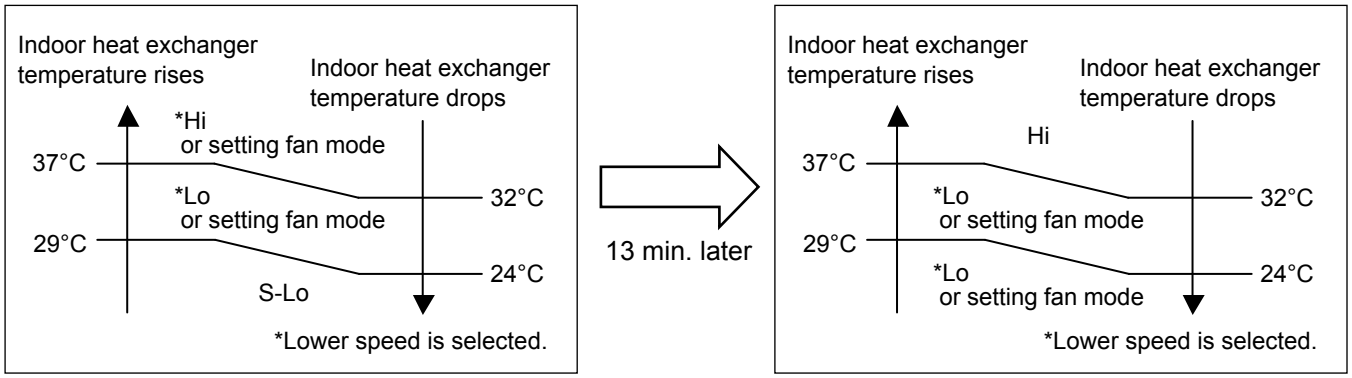
The maximum value of the indoor fan speed is set as shown in Figure 9, based on the detected temperature by the indoor heat exchanger sensor on heating mode.
When the compressor does not operate, the indoor fan motor operates [S-Lo] or [Stop] mode.

(Fig 9 : Cool Air Prevention Control)

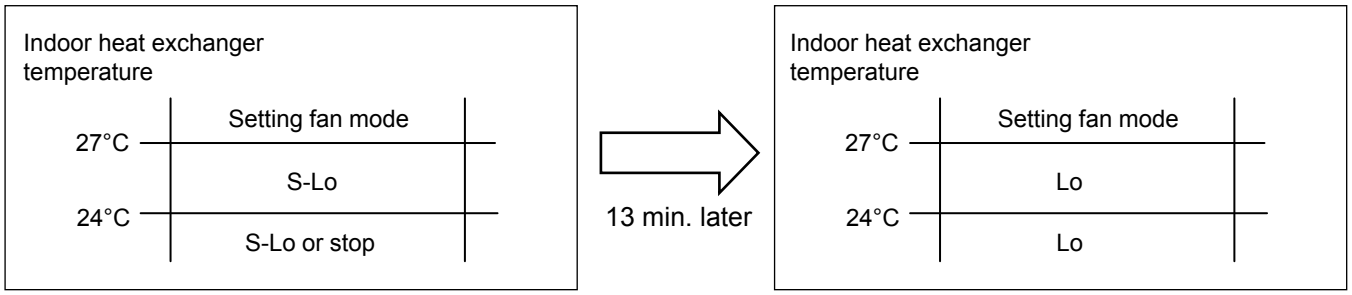
[Cassette, Ceiling type]



[Duct type]



[High Static Duct type]



6. DRY OPERATION

Refer to the Fig 3,4.
During the DRY mode operation, the fan speed setting can not be changed.

1-6. OUTDOOR FAN CONTROL

1. Outdoor Fan Motor

Following table shows the fan speed of the outdoor unit.

(Table 6 : Fan speed of the outdoor unit)

Cooling

AO *G36/ 45LATT	Upper fan	850/ 780/ 520/ 480/ 400/ 350/ 280 rpm
	Lower fan	800/ 750/ 520/ 350/ 280/ 0 rpm
AO *G54LATT AOTG60LATT	Upper fan	900/ 850/ 780/ 520/ 480/ 400/ 350/ 280 rpm
	Lower fan	800/ 750/ 520/ 350/ 280/ 0 rpm

Heating

AO *G36/ 45LATT	Upper fan	870/ 780/ 520/ 350/ 200/ 170/ 150 rpm
	Lower fan	840/ 750/ 520/ 350/ 200/ 170/ 150 rpm
AO *G54LATT AOTG60LATT	Upper fan	900/ 870/ 780/ 520/ 350/ 200/ 170/ 150 rpm
	Lower fan	900/ 840/ 750/ 520/ 350/ 200/ 170/ 150 rpm

- The outdoor fan speed is decided depending on the compressor and the outdoor temperature.
- The compressor and the fan start-up at the same time,
  and the fan stops after the compressor stops and 60 seconds has passed.
- The fan doesn't operates for 10 seconds after the fan stops.
- The upper fan and the lower fan operates at 500 rpm for 20 seconds after the start-up.
- However, the fan operates at 200rpm when the initial rotation speed is 300rpm or less.

1-7. LOUVER CONTROL

1. For Floor / Ceiling type < AB *G18LVTB, AB *G22/ 24LVTA >

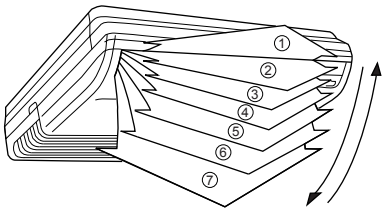
1-1. VERTICAL LOUVER CONTROL

(Function Range)

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

①⇄②⇄③⇄④⇄⑤⇄⑥⇄⑦

(Fig 10 : Air Direction Range)



(Operation Range)

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

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

- During Auto mode operation, for the first minute after the start-up, air-flow will be horizontal ①; the air direction cannot be adjusted during this period.

- During Cooling and Dry mode operation, if the Vertical Louvers are left in the ⑤ to ⑦,

  <Operation continues for 30 minutes>
  they will automatically return to position ④.

  <Operation stops within 30 minutes>
  they will automatically return to position ④ in next Cooling start-up.

  For the dew condensation prevention of the Vertical Louvers.

- During Heating start-up and Defrost operation, to prevent the thing that the cool air blows to the person directly, the louver is set to ①.

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.

The type of operation	Range of swing
Cooling / Dry	① to ④
Heating	③ to ⑦
Fan(① to ④)	① to ④
Fan(⑤ to ⑦)	③ to ⑦

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

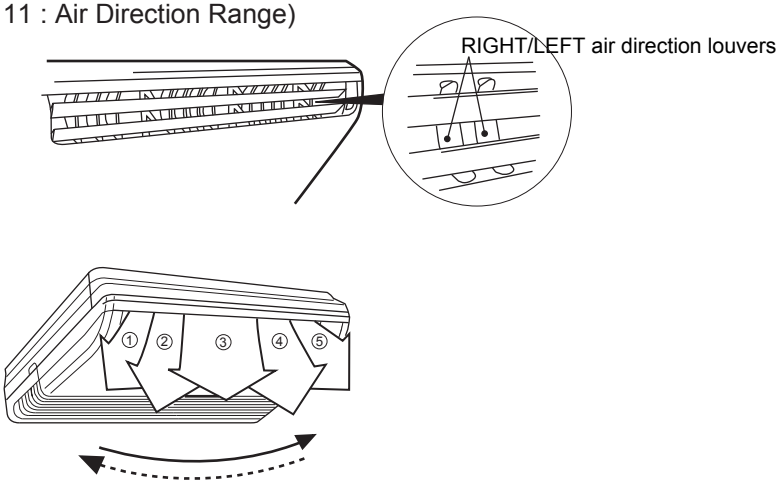
1-3. HORIZONTAL LOUVER CONTROL

(Function Range)

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

①⇄②⇄③⇄④⇄⑤

(Fig 11 : Air Direction Range)



Use the air direction adjustments within the ranges shown above.
The remote control unit's display does not change.

1-4. 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.

The type of operation	Range of swing
Cooling / Heating / Dry / Fan	① to ⑤ (All range)

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

2. For Ceiling Type < AB *G36/ 45/ 54LRTA >

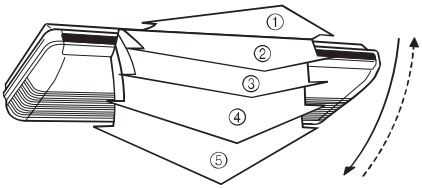
2-1. VERTICAL LOUVER CONTROL

(Function Range)

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

①⇄②⇄③⇄④⇄⑤

(Fig 12 : Air Direction Range)



(Operation Range)

During Cooling / Heating / Dry / Fan mode : ①–②–③–④–⑤

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 ⑤

・During Auto mode operation, for the first minute after start-up, air -flow will be horizontal ①; the air direction cannot be adjusted during this period.

・During Cooling and Dry operation, if the Vertical Louvers are left in the ④ to ⑤,

<Operation continues for 30 minutes>
they will automatically return to position ③.

<Operation stops within 30 minutes>
they will automatically return to position ③ in next Cooling start-up.

For the dew condensation prevention of the Vertical Louvers.

・During Heating start-up and Defrost operation, to prevent the thing that the cool air blows to the person directly, the louver is set to ①.

2-2. 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.

The type of operation	Range of swing
Cooling / Dry	① to ④
Heating	③ to ⑤
Fan	① to ⑤

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

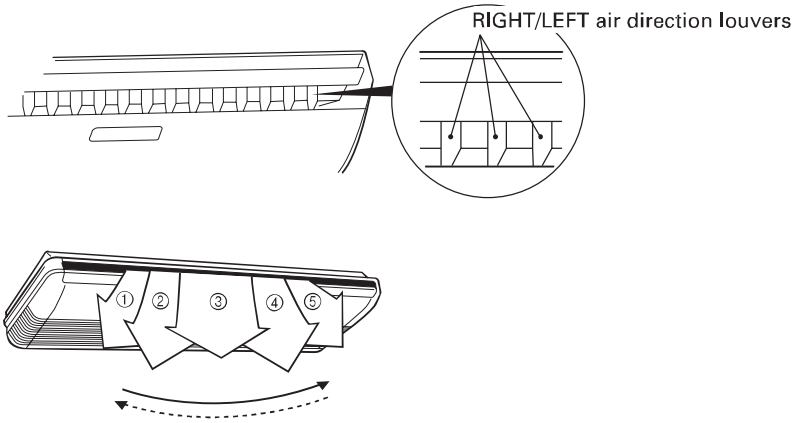
2-3. HORIZONTAL LOUVER CONTROL

(Function Range)

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

①⇄②⇄③⇄④⇄⑤

(Fig 13 : Air Direction Range)



Use the air direction adjustments within the ranges shown above.
The remote control unit's display does not change.

2-4. 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.

The type of operation	Range of swing
Cooling / Heating / Dry / Fan	① to ⑤ (All range)

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

3. For Compact Cassette Type < AU *G18LVLB, AU *G22/ 24LVLA >

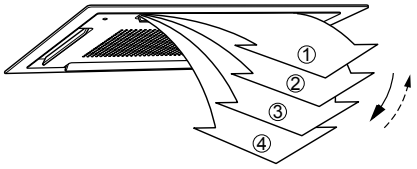
3-1. VERTICAL LOUVER CONTROL

(Function Range)

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

①⇄②⇄③⇄④

(Fig 14 : Air Direction Range)



(Operation Range)

During Cooling / Heating / Dry / Fan mode : ①─②─③─④

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

・During Auto mode operation, for the first minute after start-up, air-flow will be horizontal ① ; the air direction cannot be adjusted during this period.

・During Heating operation, to prevent the thing that the cool air blows to the person directly, the louver is set to ①.

3-2. 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.

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

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

4. For Cassette Type < AU *G36/ 45/ 54LRLA >

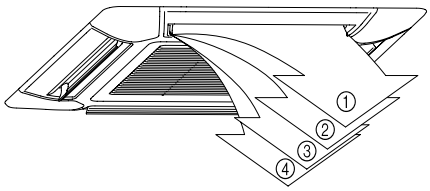
4-1. VERTICAL LOUVER CONTROL

(Function Range)

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

①⇄②⇄③⇄④

(Fig 15 : Air Direction Range)



(Operation Range)

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

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

・During Auto mode operation, for the first minute after start-up, air-flow will be horizontal ①; the air direction cannot be adjusted during this period.

・During Heating operation, to prevent the thing that the cool air blows to the person directly, the louver is set to ①.

4-2. 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.

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

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

1-8. COMPRESSOR CONTROL

1. OPERATION FREQUENCY RANGE

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

(Table 7 : Compressor Operation Frequency Range)

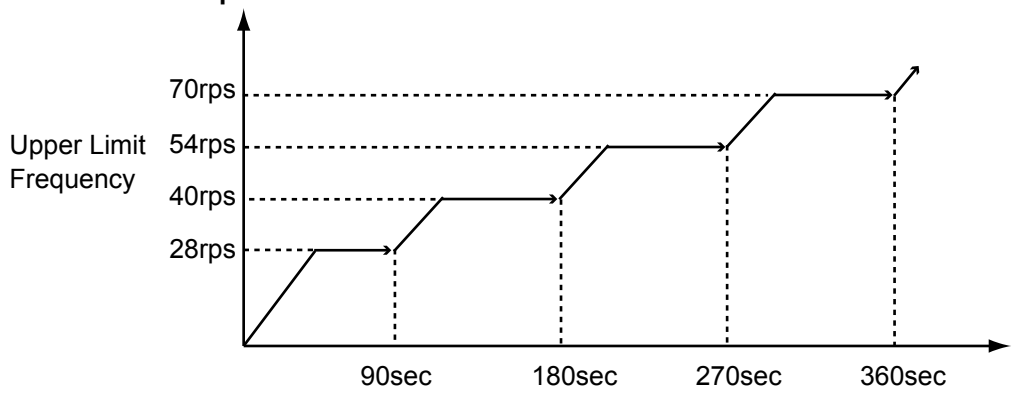
	Cooling		Heating		Dry	
	Min	Max	Min	Max	DC indoor unit	AC indoor unit
AO *G36LATT	15rps	55rps	18rps	80rps	31 (29)rps	31rps
AO *G45LATT	15rps	80rps	18rps	85rps	35rps	35rps
AO *G54LATT	15rps	80rps	18rps	85rps	38rps	38rps
AOTG60LATT	15rps	80rps	18rps	85rps	——	41rps

2. OPERATION FREQUENCY CONTROL AT START UP (Common in all models)

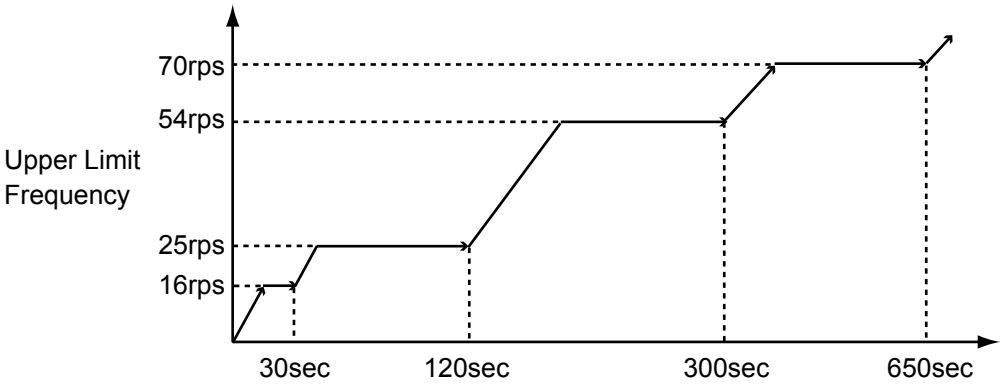
The compressor frequency soon after the start-up is controlled as shown in Figure 16.

(Fig 16 : Compressor Control at Start-up)

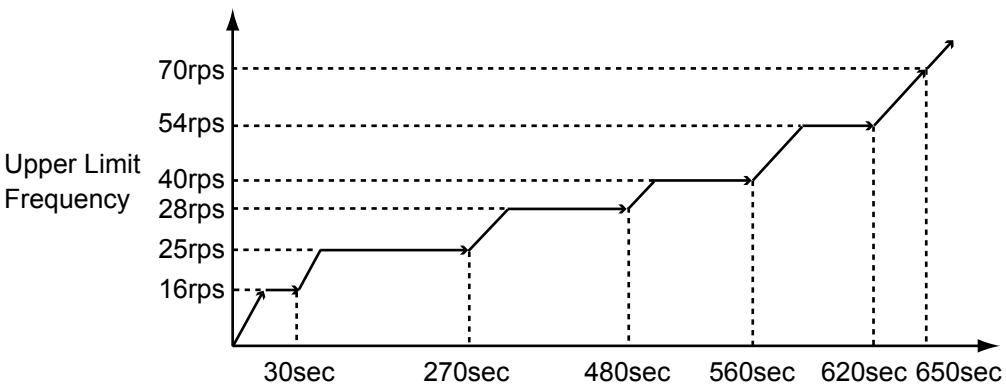
< Normal start-up >



< Cold start at Heating mode (Compressor start after long time.)>
[Outdoor air temp.< 10°C]



< Cold start at Heating mode (Compressor start after long time.)>
[Outdoor air temp.≧ 10°C]



1-9. TIMER OPERATION CONTROL

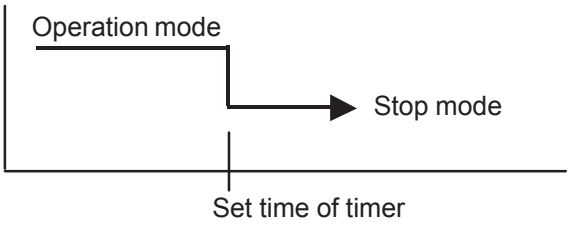
1-9-1 Wireless Remote Controller

AR- RAH1E, RAH2E

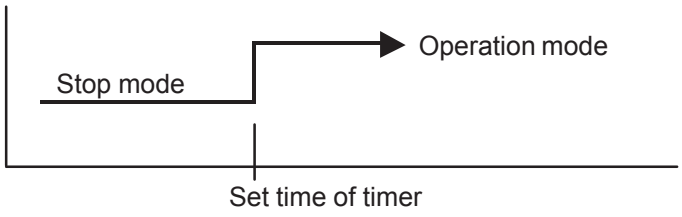
- ON / TIMER
- OFF / TIMER
- PROGRAM TIMER
- SLEEP TIMER

1. ON / OFF TIMER

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

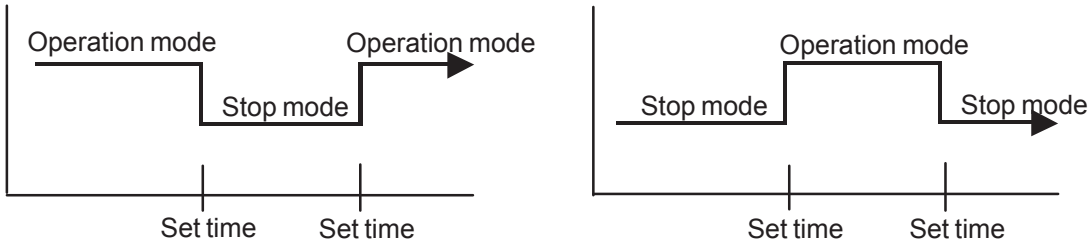


・ON timer : When the clock reaches the set time, the air conditioner will be turned on.



2. PROGRAM TIMER

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



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

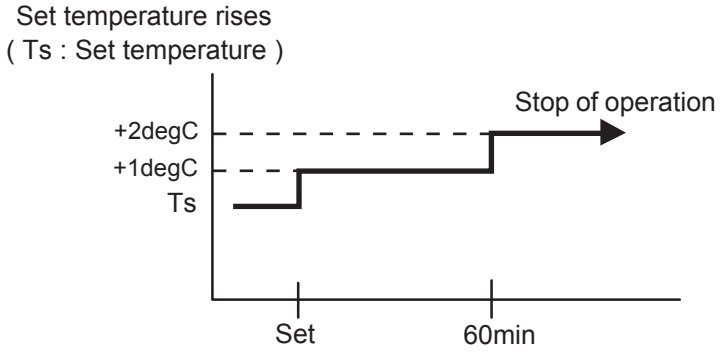
・SLEEP timer operation cannot be combined with ON timer operation.

3. SLEEP TIMER

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

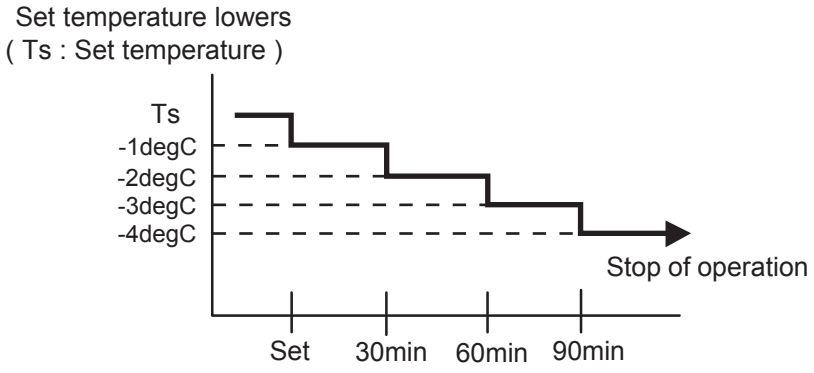
In the COOLING operation mode

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



In the HEATING operation mode

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



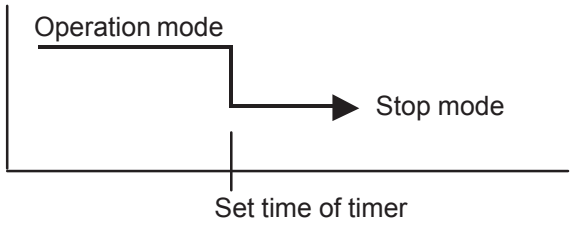
1-9-2 Wired Remote Controller

AR- WAE1E AR-WDD1E

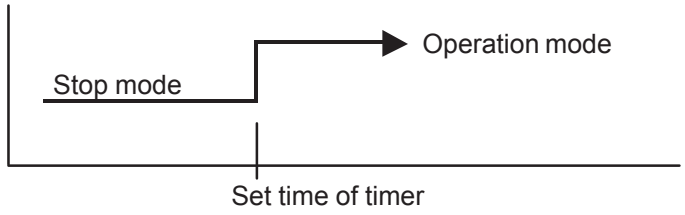
- ON / TIMER
- OFF / TIMER
- WEEKLY TIMER
- TEMPERATURE SET BACK TIMER

1. ON / OFF TIMER

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



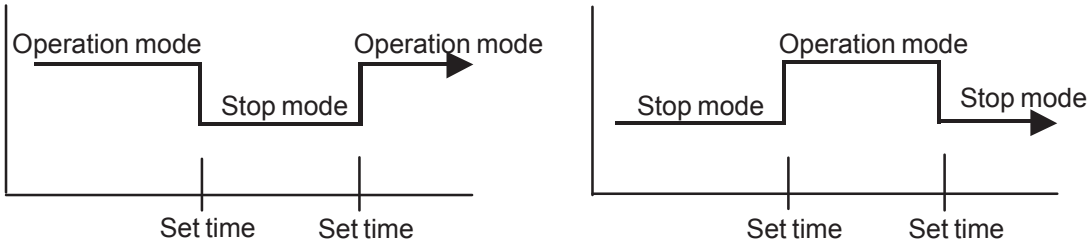
・ON timer : When the clock reaches the set time, the air conditioner will be turned on.



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.

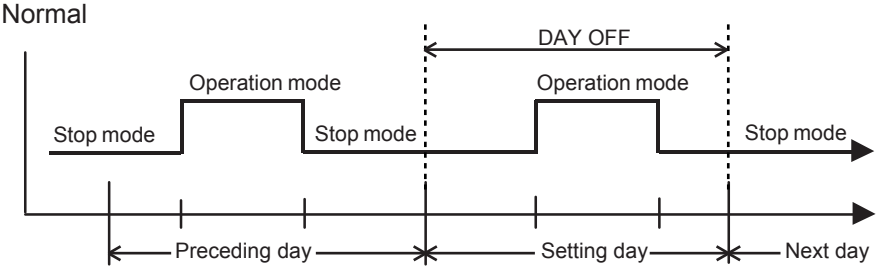


・The operating time can be set in 30 min increments only.
・The OFF time can be carried over to next day.
・The ON timer and the OFF timer functions cannot be set with using the weekly timer. Both ON and OFF time must be set.

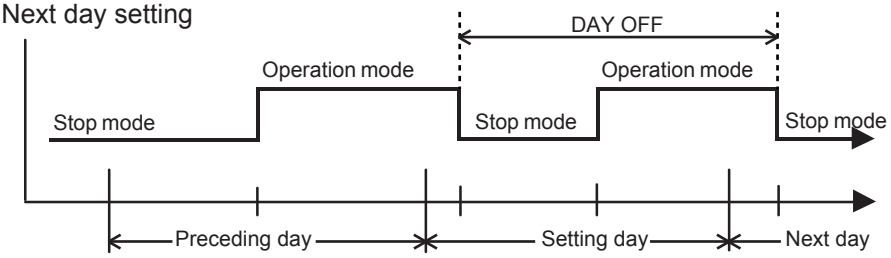
2-2. DAY OFF setting

- 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

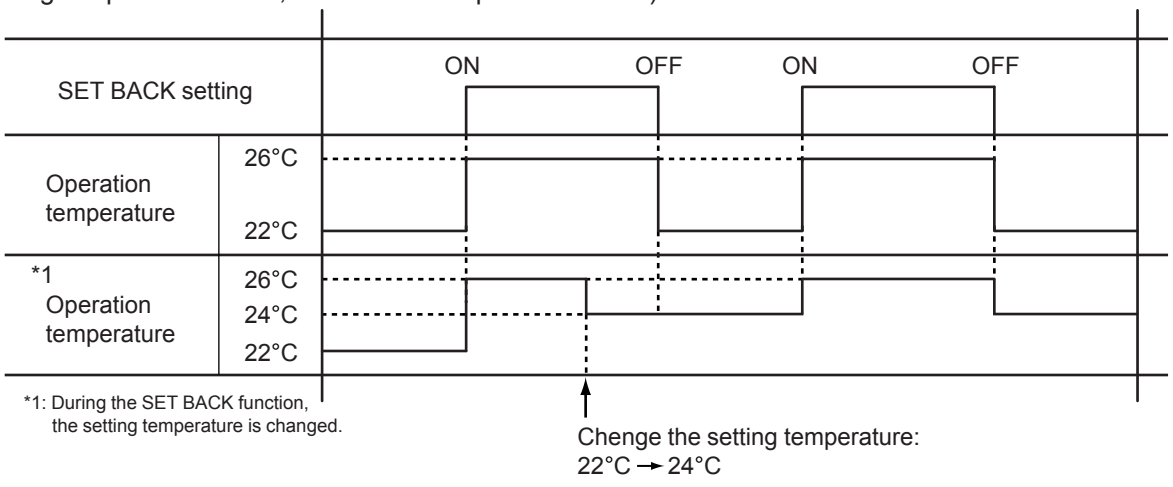


- The DAY OFF setting can only be set one time. The DAY OFF setting is cancelled automatically after the set day has passed.

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 COOLING/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)



1-10. ELECTRONIC EXPANSION VALVE CONTROL

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

(1) Pulse range of EEV

	Operation	Pulse range
All Models	Cooling / Dry	50～480 pulse
	Heating	40～480 pulse

(2) The EEV is set up at 480 pulses when the compressor is stopped.

(3) Initialization (Input of 528 pulses toward closing direction) is operated under the following condition.
* When the power is turned on.
* 4 hours has passed since the last initialization, and 3 minutes has passed after the compressor stop. (If 12 hours has passed since the last initialization, the compressor is compulsorily stopped.)

1-11. TEST OPERATION CONTROL

▪ With Wired Remote Controller

AR-WAF1E

Under the condition where the air conditioner stops, press the MASTER CONTROL button and the FAN CONTROL button simultaneously for 2 seconds or more, and the test operation control mode will appear.
During test running, "oi" 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.

AR-WDD1E

When [Menu button] is pressed twice while “Monitor” screen is displayed, it switches to the “Submenu” screen.
If [Menu button] is pressed while the “Submenu” screen is displayed, the display returns to the “Monitor” screen.
Press the [Screen switch button (Left)] and [Screen switch button (Right)] simultaneously for 5 seconds to switch to “Service” screen.
When you select [Test run] with the [Cursor button (Up/Down)] and press the [Enter button], following confirmation screen is displayed.
To start the test run, select “Yes” with the [Cursor button (Left/Right)], and press the [Enter button].In Set temp., test run is displayed.
Test run stops in 60 minutes. When the [On/Off button] is pressed during the test run, the test run will be canceled.
After completing the test run, wait enough until starting the operation.

▪ With Wireless Remote Controller

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

▪ With Outdoor Unit

Operate [ENTER](TEST RUN) switch on the display board.

1. Set the operation mode to "COOL" or "HEAT" by DIP-SW before power-on.
2. Press [ENTER](TEST RUN) switch for more than 3 seconds ⟶ "TEST RUN" LED will light on, If the compressor is operating at starting the test run, the compressor will stop, and a while , the test run will start.

1-12. PREVENT TO RESTART FOR 3 MINUTES (3 MINUTES ST)

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

1-13. 4-WAY VALVE EXTENSION SELECT

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

1-14. AUTO RESTART

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

(Table 8 : Operation contents memorized when the power is interrupted)

<table>
<tr><th></th><th>Wireless remote controller</th><th>Wired remote controller (Memory Backup : Disable)</th><th colspan="2">Wired remote controller (Memory Backup : Enable)</th></tr>
<tr><td>Operation mode
Set temperature
Set air flow
Set air flow direction
Swing
Economy operation
10°C Heat operation</td><td>○</td><td>○</td><td colspan="2">○</td></tr>
<tr><td>Thermistor detected position</td><td>—</td><td>×</td><td colspan="2">○</td></tr>
<tr><td rowspan="4">Timer mode</td><td rowspan="4">○</td><td rowspan="4">×</td><td>OFF Timer</td><td>×</td></tr>
<tr><td>ON Timer</td><td>×</td></tr>
<tr><td>WEEKLY Timer</td><td>○</td></tr>
<tr><td>Temperature SET BACK Timer</td><td>○</td></tr>
</table>

○ : Memorize
× : Not memorize

*It is necessary to set on the DIP-SW1-No,6 of the wired remote controller, to enable the memory backup. Refer to the installation manual of wired remote controller for details.

1-15. MANUAL AUTO OPERATION (When using the Wireless RC)

If MANUAL / AUTO Button is pushed for less than 10 seconds, the operation is controlled as shown in Table 9.
If the remote control is lost or battery power dissipated, this function will work without the remote control.

(Table 9)

Operation mode	Auto changeover
Setting temp.	24°C
Fan control mode	Auto
Timer mode	Continuous (No timer setting available)
Vertical louver	Normal
Horizontal louver	Normal
Swing	OFF
Economy	OFF

1-16. PUMP DOWN

Operate [PUMP DOWN] switch on the display board.

< PUMP DOWN Procedure >

(1) Confirm that power is off, and open the service panel.

(2) Turn the power on.

○ : Light OFF ● : Light ON

POWER MODE	ERROR	TEST RUN (L1)	PUMP DOWN (L2)	LOW NOISE (L3)	LOW NOISE (L4)	PEAK CUT (L5)	PEAK CUT (L6)	PEAK CUT (L7)
●	○	○	○	○	○	○	○	○

(3) Press [PUMP DOWN] switch for 3 seconds or more after 3 minutes after power on.

POWER MODE	ERROR	TEST RUN (L1)	PUMP DOWN (L2)	LOW NOISE (L3)	LOW NOISE (L4)	PEAK CUT (L5)	PEAK CUT (L6)	PEAK CUT (L7)
●	○	○	●	○	○	●	●	●

LED display lights on as shown in the above figure, and the fans and the compressor start operating.

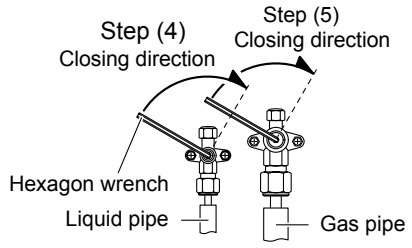
If the [PUMP DOWN] switch is pressed while the compressor is operating, the compressor will stop then start again in about 3 minutes.

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

POWER MODE	ERROR	TEST RUN (L1)	PUMP DOWN (L2)	LOW NOISE (L3)	LOW NOISE (L4)	PEAK CUT (L5)	PEAK CUT (L6)	PEAK CUT (L7)
●	○	○	●	○	○	○	●	●

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

POWER MODE	ERROR	TEST RUN (L1)	PUMP DOWN (L2)	LOW NOISE (L3)	LOW NOISE (L4)	PEAK CUT (L5)	PEAK CUT (L6)	PEAK CUT (L7)
●	○	○	●	○	○	○	○	●



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

POWER MODE	ERROR	TEST RUN (L1)	PUMP DOWN (L2)	LOW NOISE (L3)	LOW NOISE (L4)	PEAK CUT (L5)	PEAK CUT (L6)	PEAK CUT (L7)
●	○	○	●	○	○	○	○	○

Fans and compressor stop automatically.

(7) Turn the power off.

POWER MODE	ERROR	TEST RUN (L1)	PUMP DOWN (L2)	LOW NOISE (L3)	LOW NOISE (L4)	PEAK CUT (L5)	PEAK CUT (L6)	PEAK CUT (L7)
○	○	○	○	○	○	○	○	○

PUMP DOWN is completed.

1-17. COMPRESSOR PREHEATING

When the outdoor heat exchanger temperature is lower than 0°C and after 30 minutes has passed after power-on or operation stop, 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 2°C or greater, preheating is ended.

1-18. 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 10.

(Table 10 : Condition of starting Defrost Operation)

▪ 1st time defrosting after starting operation

Compressor contiguous operation time	Below 10 min.	Above 10 min.		
Compressor integrating operation time	Less than 17 min.	17 to 62 min.	62 min. to 4 hours	More than 4 hours
Operation temperature	Does not operate	- 9°C	- 5°C	- 3°C

▪ Defrosting after 2nd time upon starting operation

Compressor contiguous operation time	Below 10 min.	Above 10 min.		
Compressor integrating operation time	Less than 35 min.	35 min. to 215min	215 min. to 4 hours	More than 4 hours
Operation temperature	Does not operate	- 6°C	- 5°C	- 3°C

▪ Integrating defrost for intermittent operation

Compressor integrating operation time	Less than 10 min.*	More than 210 min.
Operating condition	OFF count of the compressor 40 times	Compressor OFF (at outside air temp.≦ 2°C)

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

2. CONDITION OF THE DEFROST OPERATION COMPLETION

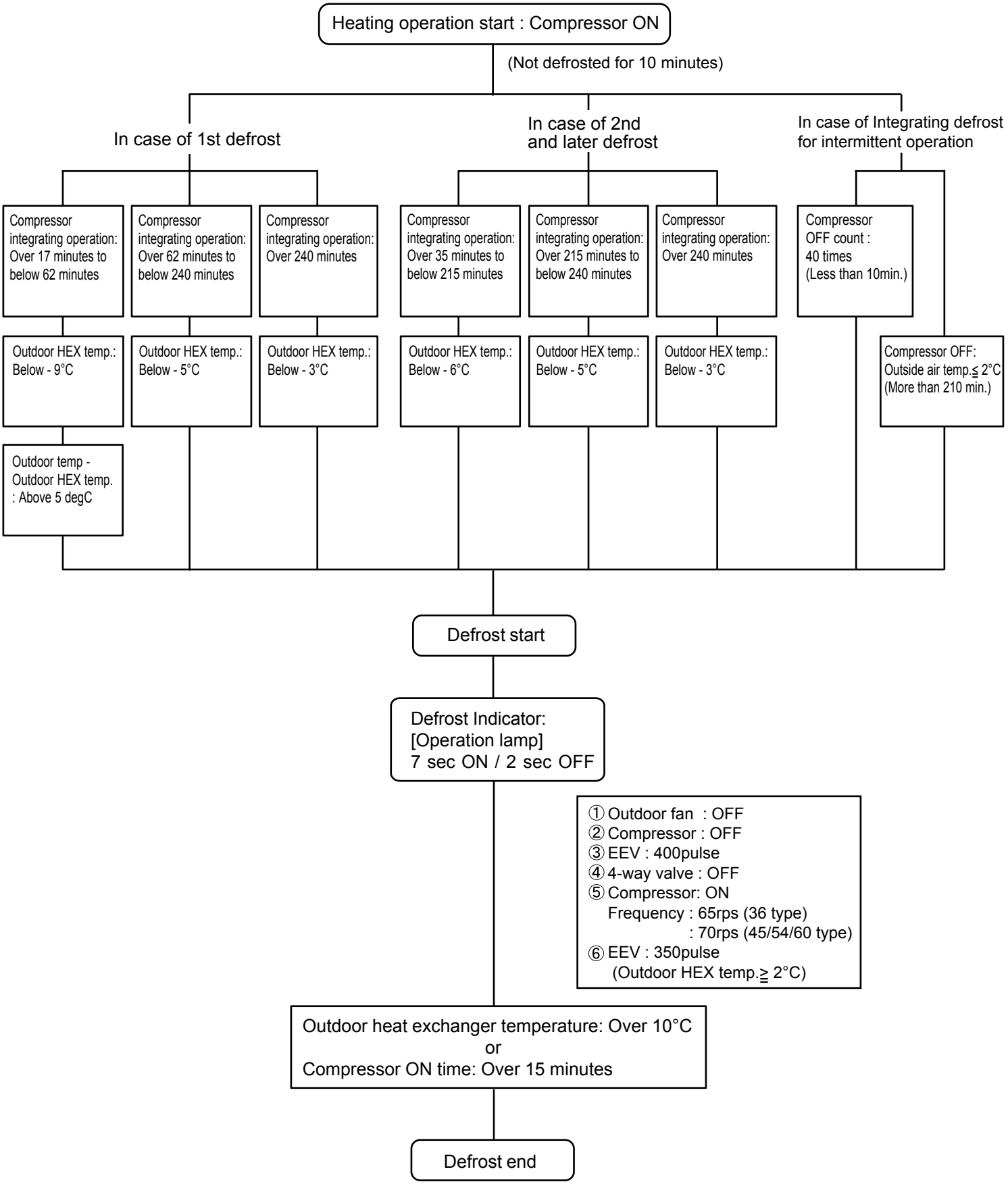
Defrost operation is released when the conditions become as shown in Table 11.

(Table 11 : 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 emperature as follows.



1-19. OFF DEFROST OPERATION CONTROL

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

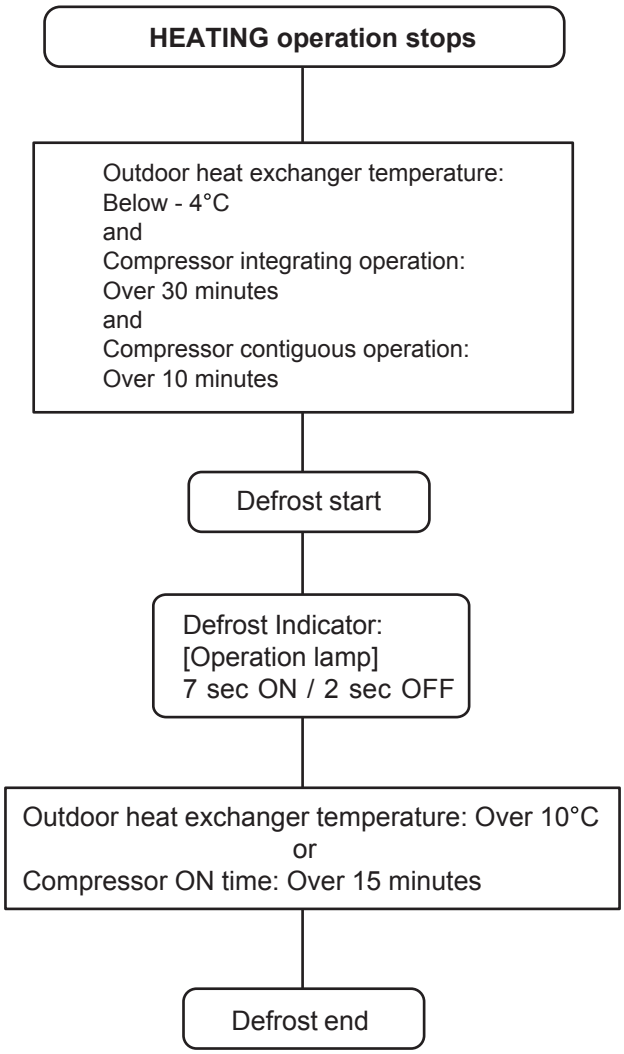
1. OFF DEFROST OPERATION CONDITION

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

2. OFF DEFROST END CONDITION

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

OFF Defrost Flow Chart



1-20. ECONOMY OPERATION

The ECONOMY operation functions by pressing ECONOMY button on the remote controller.
At the maximum output, ECONOMY Operation is approximately 70% of normal air conditioner operation for cooling and heating.
The ECONOMY operation is almost the same operation as below settings.

(Table 12)

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

1-21. 10°C HEAT OPERATION

10°C HEAT operation performs as below when pressing 10°C HEAT button.

(Table 13)

Operation mode	Heating
Setting temp.	10°C
Fan control mode	Auto
LED display	Economy
Defrost operation	Operate as normal

1 -22. VARIOUS PROTECTIONS

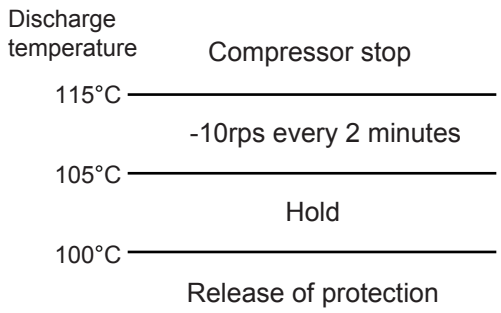
1. DISCHARGE GAS TEMPERATURE OVER RISE PREVENTION CONTROL

The discharge gas thermosensor (discharge thermistor : Outdoor side) will detect discharge gas temperature.
When the discharge temperature becomes more than 105°C, the compressor frequency -10rps,
and it continues the frequency -10rps every 2 minutes until the temperature becomes less than 105°C.

When the discharge temperature becomes less than 100°C,
the control of the compressor frequency is released.

When the discharge temperature becomes more than 115°C,
the compressor is stopped.

(Fig 17 : Discharge temperature control)



2. COMPRESSOR TEMPERATURE PROTECTION CONTROL

When the compressor temperature thermistor detects more than 110°C, the compressor is stopped at once.

3. LOW PRESSURE PROTECTION CONTROL <Cooling mode>

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

When the pressure sensor detected value is 0.68MPaG or less continues for 1minute, the compressor frequency -8rps.

<After the frequency of the compressor -8rps and 1 minute has passed>

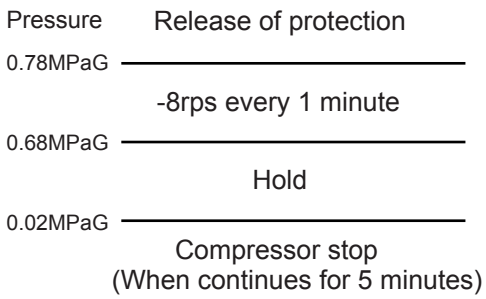
When the pressure sensor detected value is 0.68MPaG or less, continues for 1 minute, the compressor continues frequency -8rps every 1 minute until the detected value becomes more than 0.68MPaG.

When the detected value becomes more than 0.78MPaG, this protection is released.

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

The detected value of pressure sensor is 0.02MPaG or less, continues for 5 minutes, the compressor is stopped.

(Fig 18 : Low pressure protection control)



4. PRESSURE OVER RISE PROTECTION <Cooling mode>

When the outdoor unit heat-exchange temperature rises to temperature or greater, the compressor is stopped and trouble display is performed.
After 3 minutes ST, release of protection.

5. ANTI FREEZING PROTECTION <Cooling / Dry mode>

The compressor frequency is decrease on Cooling and Dry mode when the indoor heat exchanger temperature sensor detects the temperature lower than Temperature Ⅰ.
Then, the anti-freezing protection is released when it becomes higher than Temperature Ⅱ.

(Table 12 : Anti-freezing Protection Operation / Release Temperature)

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

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

6. HEATING OVERLOAD PROTECTION

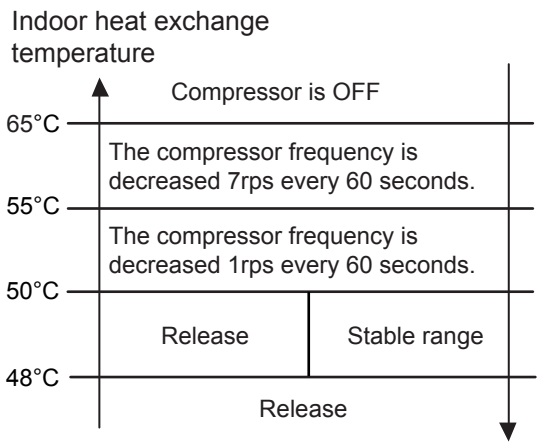
In Heating mode, the compressor frequency is controlled as following based on the detection value of the indoor heat-exchanger temperature sensor and pressure sensor.

6-1. HIGH TEMPERATURE RELEASE CONTROL <Heating mode>

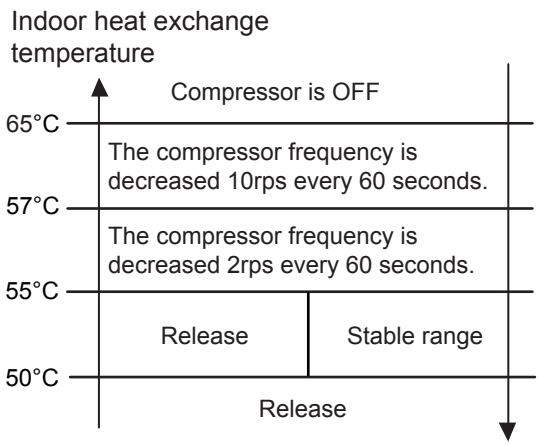
On heating mode, the compressor frequency is controlled as following based on the detection value of the indoor heat exchanger temperature sensor.

(Fig.19 : Heating Overload Protection Control)

[High Static Pressure Duct model]



[Excluding High Static Pressure Duct model]



7. CURRENT RELEASE CONTROL

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

(Table 13 : Current Release Operation Value / Release Value)

	Cooling	Heating
AO *G36LATT	6.0A / 5.5A	6.0A / 5.5A
AO *G45LATT	7.0A / 6.5A	7.0A / 6.5A
AO *G54LATT	8.0A / 7.5A	8.0A / 7.5A
AOTG60LATT	8.5A / 8.0A	8.5A / 8.0A

1-23. FORCED COOLING OPERATION (When using the Wireless RC)

The FORCED COOLING OPERATION starts up when MANUAL / AUTO button is pressed more than 10 seconds.
During the FORCED COOLING OPERATION, it keeps operation regardless of detection value of room temperature sensor.
Operation LED and Timer LED blinks simultaneously while the unit is on the FORCED COOLING OPERATION.
It is released after 60 minutes from starting time.

1-24. COMPRESSOR STOP CONTROL

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

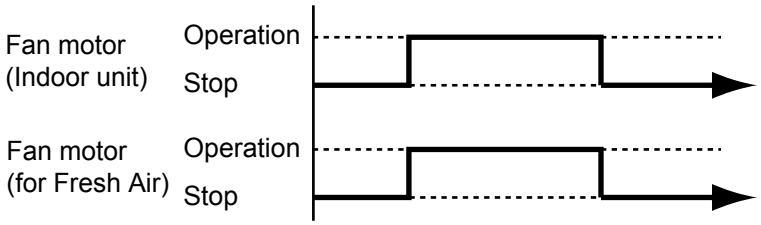
(Table 14 : Operation temperature of compressor stop control)

	Temperature Ⅰ	
	Cooling	Heating
Operation temperature	- 20°C	———

1-25. FRESH AIR CONTROL (For AU/ AR type)

The fan motor for Fresh Air is operated in synchronization with the indoor fan operation as shown in Figure 20.

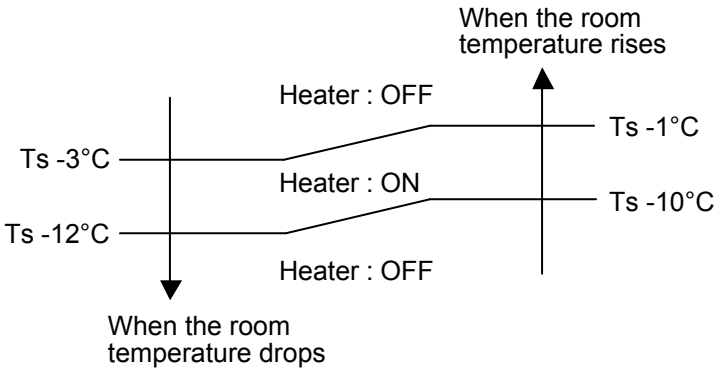
(Fig 20 : Fresh Air control)



1-26. EXTERNAL ELECTRICAL HEATER CONTROL (For AR type)

The External Electrical Heater is operated as shown in Figure 21.

(Fig 21 : External Electrical Heater control)



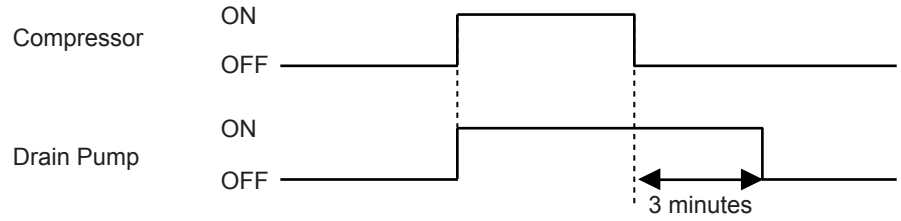
- Ts : Setting temperature
- When the compressor stop, External Electrical Heater is OFF.
- It operates only in Heating mode and when the indoor fan operates. (However, S-Low is excluded)

1-27. DRAIN PUMP OPERATION (For AU/ AR type)

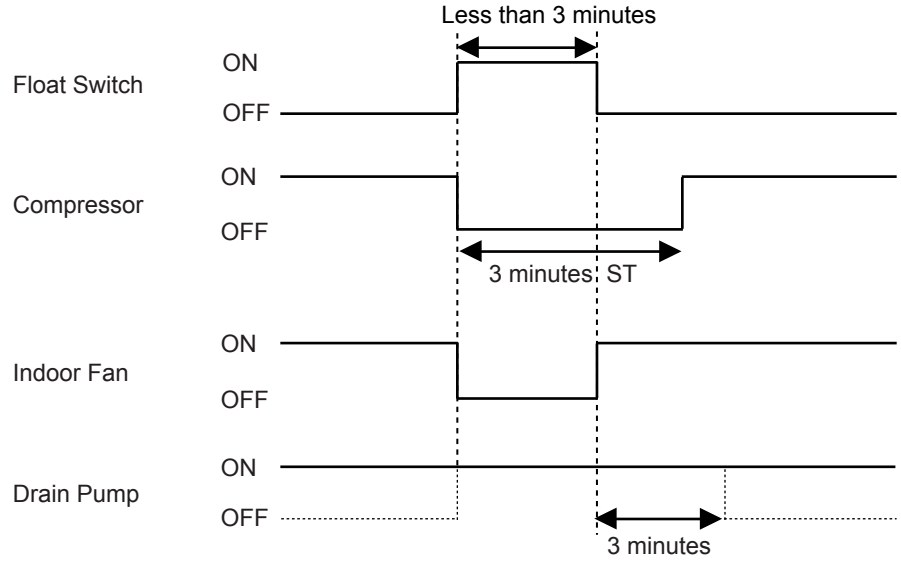
· During Cooling / Dry mode

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

(Fig 22 : Detail of Drain Pump Operation)



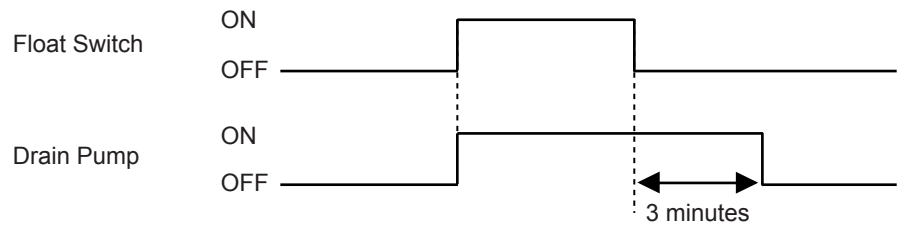
<Float Switch turns OFF less than 3 minutes>



· During Heating / Fan mode / Stop operation

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

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



1-28. LOW NOISE OPERATION

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

(Table 15 : Detail of LOW NOISE OPERATION)

Low Noise Mode		Outdoor Fan Speed (rpm)		Compressor Frequency (rps)			
				AO *G36LATT	AO *G45LATT	AO *G54LATT	AOTG60LATT
MODE1	Cooling	Upper fan	520	40	52	57	58
		Lower fan	520				
	Heating	Upper fan	520	46	52	55	58
		Lower fan	520				
MODE2	Cooling	Upper fan	520	29	32	36	37
		Lower fan	520				
	Heating	Upper fan	520	36	37	38	39
		Lower fan	520				

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

1-29. PEAK CUT OPERATION

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

(Table 16 : Outline of PEAK CUT OPERATION)

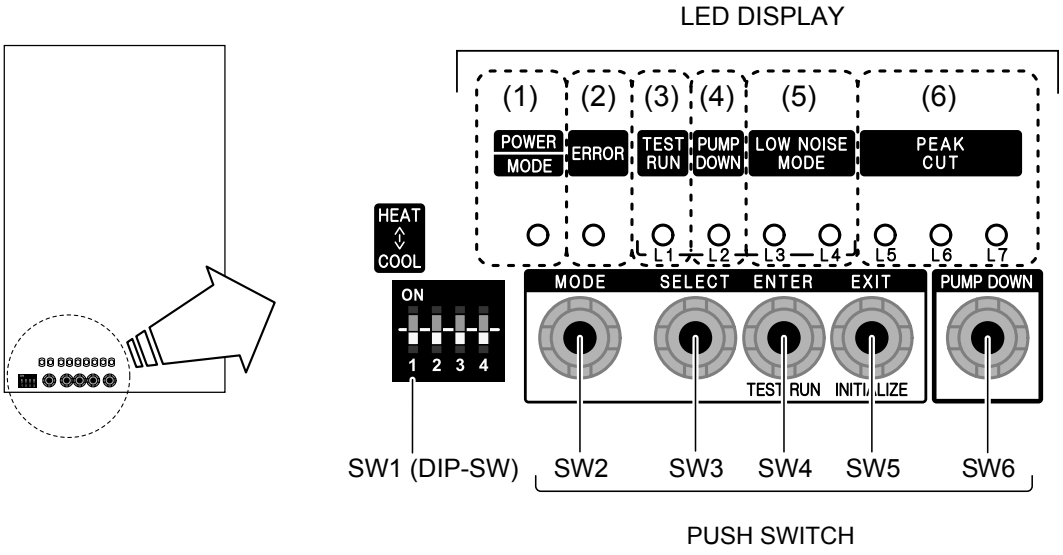
MODE1	MODE2	MODE3	MODE4
0% Forced thermostat-OFF	50%	75%	100%

*Percentage is rated electrical power ratio

1-30. DESCRIPTION OF DISPLAY UNIT

1-30-1 Layout of Display Unit

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



Display lamp		Function or operation method
(1) POWER / MODE	Green	Lights on while power on Local setting in outdoor unit or error code is displayed with blink.
(2) ERROR	Red	Blinks during abnormal air-conditioner operation. Number of blinks indicates kind of error and error code is displayed.
(3) TEST RUN (L1)	Orange	Lights on during test operation.
(4) PUMP DOWN (L2)	Orange	Lights on during pump down operation.
(5) LOW NOISE MODE (L3, L4)	Orange	Lights on during “Low noise” function when local setting is activated. (Lighting pattern of L3 and L4 indicates low noise level)
(6) PEAK CUT (L5, L6, L7)	Orange	Lights on during “Peak cut” function when local setting is activated. (Lighting pattern of L5, L6 and L7 indicates peak cut level)

Switch		Function or operation method
DIP-SWITCH	SW1	For selecting COOLING or HEATING during test operation. Positions 2 to 4 of Dip switch are not used.
MODE	SW2	To switch between “Local setting” and “Error code display”.
SELECT	SW3	To switch between the individual “Local settings” and the “Error code displays”.
ENTER / TEST RUN	SW4	To fix the individual “Local settings ” and the “Error code displays”.
EXIT / INITIALIZE	SW5	EXIT
PUMP DOWN	SW6	To start the pump down operation.

• Dip switches 1 to 4 at shipment from the factory are set as follows.

DIP switch			
1	2	3	4
COOL	OFF	OFF	OFF

1-30-2 Display mode

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

(Table :17 Display pattern)

NO.	Power / Mode LED	Display Item	LED			
			L1	L2	L3	L4
1	Present Value Of Each Item ◆1	Compressor frequency	○	○	○	●
		Upper fan speed (Outdoor unit)	○	○	●	○
		Lower fan speed (Outdoor unit)	○	○	●	●
		EEV pulse	○	●	○	○
		Pressure sensor value (Low pressure range)	○	●	○	●
		Pressure sensor value (High pressure range)	○	●	●	○
		Outdoor air temperature sensor value	○	●	●	●
		Discharge temperature sensor value	●	○	○	○
		Heat-exchanger temperature sensor value (Middle)	●	○	○	●
		Current value	●	○	●	○
		Compressor accumulated time	●	○	●	●
2	Error Code ◆2	Newest error code	○	○	○	◑
		Error code before 1 time	○	○	◑	○
		Error code before 2 times	○	◑	○	○

○ : Light OFF ● : Light ON ◆n : n Time Blinking ◑ : Blinking

(Table :18 Procedure for Present Value)

Procedure	Operation	Power / Mode	Error	L1	L2	L3	L4	L5	L6	L7
1	During status display, press the MODE SWITCH 1 time. (Status display : Outdoor unit is stopping and no error)	◆1	○	○	○	○	○	○	○	○
2	When the POWER / MODE LED blinking 1 time, press the ENTER SWITCH.	◆1	○	○	○	○	◑	○	○	○
3	Press the SELECT SWITCH and adjust to DISPLAY ITEM (from L1 to L4) that you want to confirm. (Refer to Table 17)	◆1	○	○	○	◑	○	○	○	○
4	Press the ENTER SWITCH. (Data is displayed by lighting LED. Refer to Table : 19)	◆1	○	○	○	●	○	DATA		
5	Selecting display items can be done by pressing the SELECT SWITCH. (Return to Procedure 3)	◆1	○	○	○	◑	○	○	○	○
	When the EXIT SWITCH is pressed, this mode ends and returns to the status display.	●	○	○	○	○	○	○	○	○

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

(Table 19 : Detail of LED Display Data)　　○ : Light OFF　● : Light ON　◆1 : 1 Time Blinking

Item No,	Display Item		Power Mode	Error	L1	L2	L3	L4	L5	L6	L7
1	Compressor Frequency (0 ~ 95rps)	0	◆1	○	○	○	○	●	○	○	○
		1 ~ 15	◆1	○	○	○	○	●	○	○	●
		16 ~ 30	◆1	○	○	○	○	●	○	●	○
		31 ~ 45	◆1	○	○	○	○	●	○	●	●
		46 ~ 60	◆1	○	○	○	○	●	●	○	○
		61 ~ 75	◆1	○	○	○	○	●	●	○	●
		76 ~ 90	◆1	○	○	○	○	●	●	●	○
		90 ~ 95	◆1	○	○	○	○	●	●	●	●
2	Outdoor Unit Upper Fan Speed (0 ~ 900rpm)	0	◆1	○	○	○	●	○	○	○	○
		1 ~ 150	◆1	○	○	○	●	○	○	○	●
		151 ~ 300	◆1	○	○	○	●	○	○	●	○
		301 ~ 450	◆1	○	○	○	●	○	○	●	●
		451 ~ 600	◆1	○	○	○	●	○	●	○	○
		601 ~ 750	◆1	○	○	○	●	○	●	○	●
		751 ~ 900	◆1	○	○	○	●	○	●	●	○
		901 ~	◆1	○	○	○	●	○	●	●	●
3	Outdoor Unit Lower Fan Speed (0 ~ 900rpm)	0	◆1	○	○	○	●	●	○	○	○
		1 ~ 150	◆1	○	○	○	●	●	○	○	●
		151 ~ 300	◆1	○	○	○	●	●	○	●	○
		301 ~ 450	◆1	○	○	○	●	●	○	●	●
		451 ~ 600	◆1	○	○	○	●	●	●	○	○
		601 ~ 750	◆1	○	○	○	●	●	●	○	●
		751 ~ 900	◆1	○	○	○	●	●	●	●	○
		901 ~	◆1	○	○	○	●	●	●	●	●
4	EEV Pulse (0 ~ 480pulse)	0	◆1	○	○	●	○	○	○	○	○
		1 ~ 80	◆1	○	○	●	○	○	○	○	●
		81 ~ 160	◆1	○	○	●	○	○	○	●	○
		161 ~ 240	◆1	○	○	●	○	○	○	●	●
		241 ~ 320	◆1	○	○	●	○	○	●	○	○
		321 ~ 400	◆1	○	○	●	○	○	●	○	●
		401 ~ 480	◆1	○	○	●	○	○	●	●	○
		481 ~	◆1	○	○	●	○	○	●	●	●
5	Pressure sensor value <Low pressure range> (0 ~ 2.1MPa)	~ 0.0	◆1	○	○	●	○	●	○	○	○
		0.01 ~ 0.3	◆1	○	○	●	○	●	○	○	●
		0.31 ~ 0.6	◆1	○	○	●	○	●	○	●	○
		0.61 ~ 0.9	◆1	○	○	●	○	●	○	●	●
		0.91 ~ 1.2	◆1	○	○	●	○	●	●	○	○
	Check the High Pressure Range if it is displayed [1.81 ~ 2.1]	1.21 ~ 1.5	◆1	○	○	●	○	●	●	○	●
		1.51 ~ 1.8	◆1	○	○	●	○	●	●	●	○
		1.81 ~ 2.1	◆1	○	○	●	○	●	●	●	●
6	Pressure sensor value <High pressure range> (2.1 ~ 4.2MPa)	~ 2.1	◆1	○	○	●	●	○	○	○	○
		2.11 ~ 2.4	◆1	○	○	●	●	○	○	○	●
		2.41 ~ 2.7	◆1	○	○	●	●	○	○	●	○
		2.71 ~ 3.0	◆1	○	○	●	●	○	○	●	●
		3.01 ~ 3.3	◆1	○	○	●	●	○	●	○	○
	Check the Low Pressure Range if it is displayed [~ 2.1]	3.31 ~ 3.6	◆1	○	○	●	●	○	●	○	●
		3.61 ~ 3.9	◆1	○	○	●	●	○	●	●	○
		3.91 ~ 4.2	◆1	○	○	●	●	○	●	●	●

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

Item No,	Display Item		Power Mode	Error	L1	L2	L3	L4	L5	L6	L7
7	Outdoor Air Temperature (-30 ~ 70°C)	~ -15	◆1	○	○	●	●	●	○	○	○
		-15 ~ -5	◆1	○	○	●	●	●	○	○	●
		-5 ~ 5	◆1	○	○	●	●	●	○	●	○
		5 ~ 15	◆1	○	○	●	●	●	○	●	●
		15 ~ 25	◆1	○	○	●	●	●	●	○	○
		25 ~ 35	◆1	○	○	●	●	●	●	○	●
		35 ~ 45	◆1	○	○	●	●	●	●	●	○
		45 ~	◆1	○	○	●	●	●	●	●	●
8	Discharge Temperature (-30 ~ 120°C)	~ 55	◆1	○	●	○	○	○	○	○	○
		55 ~ 65	◆1	○	●	○	○	○	○	○	●
		65 ~ 75	◆1	○	●	○	○	○	○	●	○
		75 ~ 85	◆1	○	●	○	○	○	○	●	●
		85 ~ 95	◆1	○	●	○	○	○	●	○	○
		95 ~ 105	◆1	○	●	○	○	○	●	○	●
		105 ~ 115	◆1	○	●	○	○	○	●	●	○
		115 ~	◆1	○	●	○	○	○	●	●	●
9	Heat-exchanger Temperature <Middle> (-30 ~ 80°C)	~ 53	◆1	○	●	○	○	●	○	○	○
		53 ~ 55	◆1	○	●	○	○	●	○	○	●
		55 ~ 57	◆1	○	●	○	○	●	○	●	○
		57 ~ 59	◆1	○	●	○	○	●	○	●	●
		59 ~ 61	◆1	○	●	○	○	●	●	○	○
		61 ~ 63	◆1	○	●	○	○	●	●	○	●
		63 ~ 65	◆1	○	●	○	○	●	●	●	○
		65 ~	◆1	○	●	○	○	●	●	●	●
10	Current (0 ~ 10A)	~ 0.0	◆1	○	●	○	●	○	○	○	○
		0.0 ~ 1.5	◆1	○	●	○	●	○	○	○	●
		1.5 ~ 3.0	◆1	○	●	○	●	○	○	●	○
		3.0 ~ 4.5	◆1	○	●	○	●	○	○	●	●
		4.5 ~ 6.0	◆1	○	●	○	●	○	●	○	○
		6.0 ~ 7.5	◆1	○	●	○	●	○	●	○	●
		7.5 ~ 9.0	◆1	○	●	○	●	○	●	●	○
		9.0 ~	◆1	○	●	○	●	○	●	●	●
11	Compressor Accumulated Time (H) <Round up by 1 hour>	0	◆1	○	●	○	●	●	○	○	○
		0 ~ 10000	◆1	○	●	○	●	●	○	○	●
		10000 ~ 20000	◆1	○	●	○	●	●	○	●	○
		20000 ~ 30000	◆1	○	●	○	●	●	○	●	●
		30000 ~ 40000	◆1	○	●	○	●	●	●	○	○
		40000 ~ 50000	◆1	○	●	○	●	●	●	○	●
		50000 ~ 60000	◆1	○	●	○	●	●	●	●	○
		60000 ~	◆1	○	●	○	●	●	●	●	●

1-30-3 Error history mode

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

(Table : 20 Procedure for History Mode)

Procedure	Operation	Power / Mode	Error	L1	L2	L3	L4	L5	L6	L7
1	During status display, press the MODE SWITCH 2 times. (Status display : Outdoor unit is stopping and no error)	◆2	○	○	○	○	○	○	○	○
2	When the POWER / MODE LED blinking 2 times, press the ENTER SWITCH.	◆2	○	○	○	○	◑	○	○	○
3	Press the SELECT SWITCH and adjust to DISPLAY ITEM (from L1 to L4) that you want to confirm. (Refer to Table : 17)	◆2	○	○	○	◑	○	○	○	○
4	Press the ENTER SWITCH, Error code is displayed by lighting LED. (Refer to Table : 21)	◆2	●	◆n	◆n	○	○	○	○	○

○ : Light OFF ● : Light ON ◑ : Blinking ◆2 : 2 Times Blinking ◆n : n Times Blinking

Note.
- Selecting display items can be done by pressing the SELECT SWITCH. (Return to Procedure 3)
- When the EXIT SWITCH is pressed, this mode ends and returns to the status display.

(Table : 21 Error Code)

● : Light ON ◆1 ~ ◆15 : 1~ 15 Times Blinking

POWER MODE	ERROR	TEST RUN (L1)	PUMP DOWN (L2)	LOW NOISE (L3)	LOW NOISE (L4)	PEAK CUT (L5)	PEAK CUT (L6)	PEAK CUT (L7)	Description
◆2	●	◆1	◆1	○	○	○	●	●	Serial forward transmission error immediately after operation
				○	○	●	○	○	Serial forward transmission error during operation
		◆2	◆2	○	○	○	○	●	Indoor unit capacity error
		◆5	◆15	○	○	○	○	●	Indoor unit error
		◆6	◆1	○	○	○	○	●	Over voltage
				○	○	○	●	●	Power supply frequency error
			◆2	○	○	○	○	●	Outdoor unit PCB model information error
				○	○	●	●	○	Inverter communication error
				○	○	●	●	●	PFC communication error
			◆3	○	○	○	○	●	Inverter error
			◆4	○	○	●	●	●	PFC AD detection error
				○	●	○	○	○	PFC hardware error
			◆5	○	○	○	●	●	IPM error (Trip terminal L error)
			◆8	○	○	○	●	○	Rush current limiting resister temp rise protection
		◆7	◆1	○	○	○	○	●	Discharge temp. sensor error
			◆2	○	○	○	○	●	Compressor temp. sensor error
			◆3	○	○	○	●	○	Heat Ex. middle temp. sensor error
				○	○	○	●	●	Outdoor unit Heat Ex. liquid temp. sensor error
			◆4	○	○	○	○	●	Outdoor temp. sensor error
			◆7	○	○	○	○	●	Heat sink temp. sensor error
				○	○	○	●	○	PFC heat sink temp. sensor error
		◆8	◆4	○	○	○	○	●	Current sensor 1 error (stoppage permanently)
			◆6	○	○	●	○	○	High pressure switch 1 error
				○	○	●	●	○	Pressure sensor error
		◆9	◆4	○	○	○	○	●	Trip detection (stoppage permanently)
			◆5	○	○	○	○	●	Compressor motor control error (stoppage permanently)
				○	○	●	○	●	Compressor motor loss of synchronization (stoppage permanently)
			◆7	○	○	○	●	●	Outdoor unit fan motor 1 error (Duty error)
			◆8	○	○	○	●	●	Outdoor unit fan motor 2 error (Duty error)
			◆9	○	○	○	○	●	4-way valve error
		◆10	◆1	○	○	○	○	●	Discharge temp. 1 error (stoppage permanently)
			◆3	○	○	○	○	●	Compressor 1 temp. error (stoppage permanently)
			◆5	○	○	○	○	●	Low pressure error

1-30-4 ERROR CHECK MODE

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

(Table : 22 Procedure for Error Check Mode)

○ : Light OFF ● : Light ON ◆2 : 2 Times Blinking ◆**n** : **n** Times Blinking

Procedure	Operation	Power / Mode	Error	L1	L2	L3	L4	L5	L6	L7
1	Check that the "ERROR" LED blinking (Hi-speed), and then short press the ENTER SWITCH 1 time.	●	Blinking Hi-speed	○	○	○	○	○	○	○
2	Error code is displayed by lighting LED. (Refer to Table : 21)	◆2	●	◆n	◆n	○	○	○	○	○
3	When the MODE SWITCH is pressed for more than 3 seconds, the Error history is cleared.	◆2	◆2	◆2	◆2	◆2	◆2	◆2	◆2	◆2

※ Confirm Chapter 2 " TROUBLE SHOOTING" in detail.

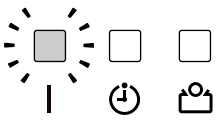
Note.
・When the EXIT SWITCH is pressed, this mode ends and returns to the status display.

1-31. DEMAND RESPONSE OPERATION (For Aust model)

・This product is designed to be compatible with Air Conditioning Demand Response program. To utilize the function, Demand Response (DR) adapter kit that interconnects your air conditioner and Demand Response Enabling Device (DRED) needs to be installed in your air conditioning system, and you need a separate arrangement.

・When your electricity supplier activates one of the following 3 DR modes, the air conditioner switches over to the appropriate operation, and the OPERATION indicator (green) on the indoor unit blinks to inform you it has been entered to the DR mode.

OPERATION indicator (Indoor unit)



Blinking pattern and the interval are as follows:

ON (4 seconds) → OFF (0.5 seconds) → ON (0.5 seconds) → OFF (0.5 seconds) → ON (4 seconds) ...

The indicator will keep blinking until the unit finishes the function.

Notes:
- Shape, number, and the arrangement of the indicators are unit-dependent.
- Some indoor units may not have the indicators unless the optional control panel or IR receiver kit has been installed.

(Table : 23 Demand Response Mode)

DR mode	Description of operation in this mode
DR mode 1	Compressor off.
DR mode 2	The air conditioner continues to cool or heat during the Demand Response event, but the electrical energy consumed by the air conditioner in a half hour period is not more than 50% of the total electrical energy that would be consumed if operating at the rated capacity in a half hour period.
DR mode 3	The air conditioner continues to cool or heat during the Demand Response event, but the electrical energy consumed by the air conditioner in a half hour period is not more than 75% of the total electrical energy that would be consumed if operating at the rated capacity in a half hour period.

Refrigerant R410A
INVERTER

AIR CONDITIONER

3 phase type

Single / Simultaneous operation multi type

2. TROUBLE SHOOTING

2. TROUBLE SHOOTING

2-1 ERROR DISPLAY

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

1. ERROR DISPLAY

Please refer the blinking pattern as follows.

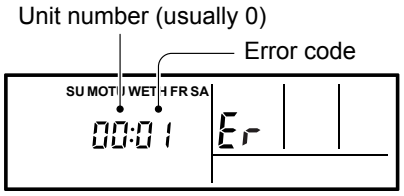
The Operation, Timer, Economy lamps operate as follows according to the error contents.

Error Contents	Indoor Unit Display			Wired Remote Controller Display	Trouble shooting
	Operation (Green)	Timer (Orange)	Economy (Green)		
Serial communication error	1 time	1 time	Blinking Hi-speed	11	1,2
Wired remote controller communication error	1 time	2 times	Blinking Hi-speed	12	3
Unit number or Refrigerant circuit address setting error	2 times	1 time	Blinking Hi-speed	21	4
Indoor unit capacity error	2 times	2 times	Blinking Hi-speed	22	5
Connection unit number error (indoor secondary unit)	2 times	4 times	Blinking Hi-speed	24	6
Primary unit, secondary unit setup error	2 times	7 times	Blinking Hi-speed	27	7
Indoor unit PCB model information error	3 times	2 times	Blinking Hi-speed	32	8
Manual auto switch error	3 times	5 times	Blinking Hi-speed	35	9
Room temp. sensor error	4 times	1 time	Blinking Hi-speed	41	10
Indoor unit Heat Ex. middle temp. sensor error	4 times	2 times	Blinking Hi-speed	42	11
Indoor unit fan motor error	5 times	1 time	Blinking Hi-speed	51	12
Drain pump error	5 times	3 times	Blinking Hi-speed	53	13
Indoor unit error	5 times	15 times	Blinking Hi-speed	5U	4,5,6,7,9,12,13
Outdoor unit main PCB model information error or communication error	6 times	2 times	Blinking Hi-speed	62	14
Inverter error	6 times	3 times	Blinking Hi-speed	63	15
PFC circuit error	6 times	4 times	Blinking Hi-speed	64	16
Trip terminal L error	6 times	5 times	Blinking Hi-speed	65	17
Discharge temp. sensor error	7 times	1 time	Blinking Hi-speed	71	18
Compressor temp. sensor error	7 times	2 times	Blinking Hi-speed	72	19
Outdoor unit Heat Ex. liquid temp. sensor error	7 times	3 times	Blinking Hi-speed	73	20
Outdoor temp. sensor error	7 times	4 times	Blinking Hi-speed	74	21
Heat sink temp. sensor error	7 times	7 times	Blinking Hi-speed	77	22
Current sensor error	8 times	4 times	Blinking Hi-speed	84	23
Pressure sensor error	8 times	6 times	Blinking Hi-speed	86	24
Trip detection	9 times	4 times	Blinking Hi-speed	94	25
Compressor rotor position detection error (permanent stop)	9 times	5 times	Blinking Hi-speed	95	26
Outdoor unit fan motor 1 error	9 times	7 times	Blinking Hi-speed	97	27
Outdoor unit fan motor 2 error	9 times	8 times	Blinking Hi-speed	98	
4-way valve error	9 times	9 times	Blinking Hi-speed	99	28
Discharge temp. error	10 times	1 time	Blinking Hi-speed	A1	29
Compressure temp. error	10 times	3 times	Blinking Hi-speed	A3	30
Low pressure error	10 times	5 times	Blinking Hi-speed	A5	31

2-1-2 WIRED REMOTE CONTROLLER DISPLAY

1. SELF - DIAGNOSIS

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



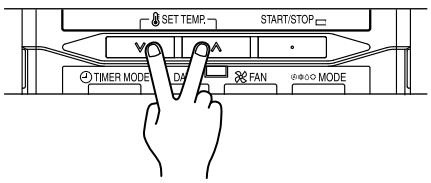
ex. Self-diagnosis check

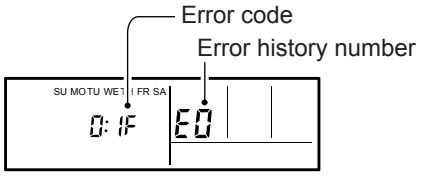
2. ERROR CODE HISTORY DISPLAY

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

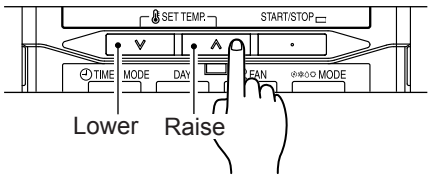
1. Stop the air conditioner operation.

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





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



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

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

2-2 TROUBLE SHOOTING WITH ERROR CODE

Trouble shooting 1 **OUTDOOR UNIT Error Method:** **Serial communication error** **(Serial reverse transfer error)**	**Indicate or Display:** **Refer to error code table.**
Detective Actuators: Outdoor unit Main PCB Outdoor unit fan motor	**Detective details:** When the indoor unit cannot receive the serial signal from Outdoor unit more than 2minutes after power ON, or the indoor unit cannot receive the serial signal more than 15seconds during normal operation.

Forecast of Cause:

1. Connection failure 2. External cause 3. Main PCB failure 4. Outdoor unit fan motor failure

Check Point 1-1 : Reset the power and operate

- Does error indication reappear?

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

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

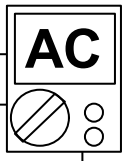
YES

Check Point 2 : Check connection

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

OK

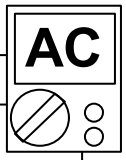
Check Point 3 : Check the voltage of power supply



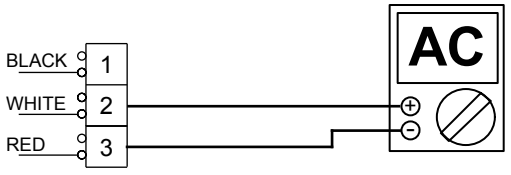
- Check the voltage of power supply
  >> Check if AC198(AC220V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal 1 - 2, L1 - N, L2 - N, L3 - N.

OK

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



- Check serial signal (Reverse transfer signal)
  >> Check if indicated value swings between AC70V and AC130V at outdoor unit terminal 2 - 3.
  >> If it is abnormal, Check the parts as follows.
  - Outdoor unit fan motor (PARTS INFORMATION 5)
  >> If Outdoor fan motor is abnormal, replace Outdoor unit fan motor and Main PCB.
  >> If the parts are normal, replace Main PCB.



Trouble shooting 2 **INDOOR UNIT Error Method:** **Serial communication error** **(Serial forward transfer error)**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause:

1. Connection failure 2. External cause 3. Controller PCB failure 4. Power PCB failure

Check Point 1-1 : Reset the power and operate

- Does error indication reappear?

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

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

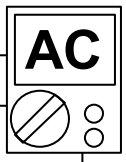
YES

Check Point 2 : Check connection

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

OK

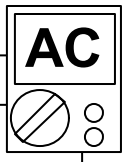
Check Point 3 : Check the voltage of power supply



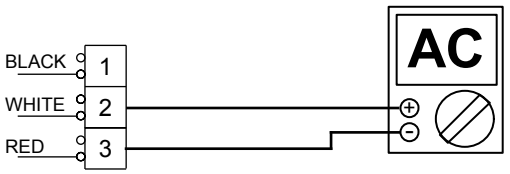
- Check the voltage of power supply
  >> Check if AC198(AC220V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal 1 - 2, L1 - N, L2 - N, L3 - N.

OK

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



- Check serial signal (Forward transfer signal)
  >> Check if indicated value swings between AC70V and AC130V at outdoor unit terminal 2 - 3.
  >> If it is abnormal, replace Controller PCB and Power PCB.



Trouble shooting 3 **INDOOR UNIT Error Method:** **Wired remote controller communication error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Wired remote controller	Upon receiving the signal more than 1 time from Wired remote controller, but the same signal has not been received more than 1 minute.

Forecast of Cause:

1. Connection failure 2. Wired remote controller failure 3. Controller PCB failure

Check Point 1 : Check the connection of terminal

Check & correct the followings.

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

OK

Check Point 2 : Check Wired Remote Controller and Controller PCB

- Check voltage at connector of Wired remote controller of Controller PCB. (Power supply to Wired remote controller)
  >> AR* G45/ 54LHTA : CN6, 1 - 3 pin
  >> ARTG45/ 54LHTB, 60LHTA : CN140, 1 - 3 pin
  >> Other models : CN14, 1 - 3 pin

If it is DC12V, Wired Remote Controller is failure. (Controller PCB is normal)
>> Replace Wired Remote Controller
If it is DC 0V, Controller PCB is failure.
>> Replace Controller PCB

Trouble shooting 4 **INDOOR UNIT Error Method:** **Unit number or Refrigerant circuit address setting error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB	When the addresses set in indoor units are not consecutive in the same refrigerant circuit.

Forecast of Cause :

1. Dip SW incorrect setting 2. Controller PCB failure

Check Point 1 : Check the DIP-SW of Controller PCB setting

- Check the DIP-SW of controller setting.
  >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
  >> Upon correcting incorrect setting, reset the power.

OK

Check Point 2 : Replace Controller PCB

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

Trouble shooting 5 **OUTDOOR UNIT Error Method:** **Indoor unit capacity error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor Unit Main PCB	When the total capacity of indoor units does not match outdoor capacity while 3 minutes after power-on.

Forecast of Cause :

1. The selection of indoor units is incorrect 2. Main PCB failure

Check Point 1 : Check the total capacity of indoor unit

- 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.

OK

Check Point 2 : Replace Main PCB

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

Trouble shooting 6 **INDOOR UNIT Error Method:** **Connection unit number error (indoor secondary unit)**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit	When there are 4 or more indoor units in the same refrigerant system.

Forecast of Cause :

1. Indoor unit connection failure

Check Point 1 : Check the indoor unit number connection

- Check the indoor unit number connection.
  >> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
  >> Upon correcting incorrect setting, reset the power.

Trouble shooting 7 **INDOOR UNIT Error Method:** **Primary unit, secondary unit setup error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB	・When there is no master unit in the same refrigerant system. ・When 2 or more master units are connected in the same reffigerant system. ・When slave indoor unit receives serial reverse transfer signal. ・When address [0] indoor unit is set as slave unit.

Forecast of Cause :

1. Mis-wiring 2.Indoor unit address setting incorrect 3. Controller PCB failure

Check Point 1 : Check wiring connection condition

・Check wiring connection condition of all slave indoor units.
・Check wiring connection condition in same refrigerant system.
>> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
>> Upon correcting incorrect setting, reset the power.

OK

Check Point 2 : Check the DIP-SW of Controller PCB setting

・Check the DIP-SW of controller setting.
>> If there is an abnormal condition, correct it by referring to Installation Manual or Data & Technical Manual.
>> Upon correcting incorrect setting, reset the power.

OK

Check Point 3 : Replace Controller PCB

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

Trouble shooting 8 **INDOOR UNIT Error Method:** **Indoor unit PCB model information error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause:

1. External cause 2. Defective for connection in controller unit 3. Controller PCB failure

Check Point 1-1 : Reset power supply and operate

- Does error indication show reappear?

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

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

YES ↓

Check Point 2 : Check connections condition in control unit

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

OK ↓

Check Point 3 : Replace Controller PCB

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

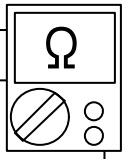
Trouble shooting 9 **INDOOR UNIT Error Method:** **Manual auto switch Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Indicator PCB Manual auto switch	When the Manual Auto Switch becomes ON for consecutive 60 or more seconds.

Forecast of Cause :

1. Manual auto switch failure 2. Controller PCB and Indicator PCB failure

Check Point 1 : Check the Manual auto switch



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

>> If Manual auto switch is disabled (on/off switching), replace it.

OK

Check Point 2 : Replace Controller PCB and Indicator PCB

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

Trouble shooting 10 **INDOOR UNIT Error Method:** **Room temp. sensor error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Room temperature thermistor	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 if connector is erroneous connection.
- Check if thermistor cable is open.

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-10	-5	0	5	10	15	20	25
Resistance Value (kΩ)	58.2	44.0	33.6	25.9	20.2	15.8	12.5	10.0

Temperature (°C)	30	35	40	45
Resistance Value (kΩ)	8.0	6.5	5.3	4.3

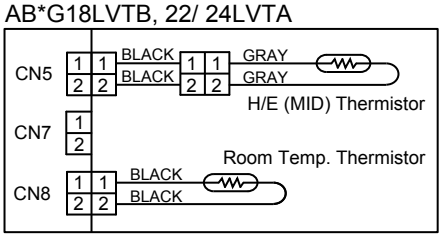
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

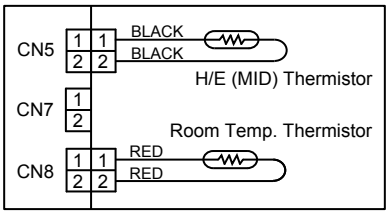
Check Point 3 : Check voltage of Controller PCB (DC5.0V)

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

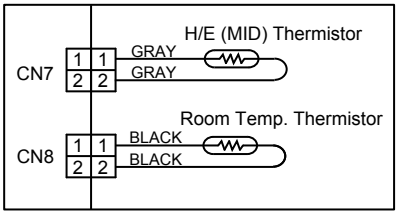
- AB*G18LVTB, 22/ 24LVTA



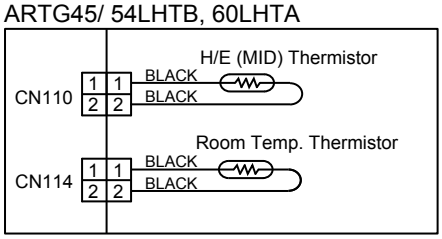
- AU*G36/ 45/ 54LRLA



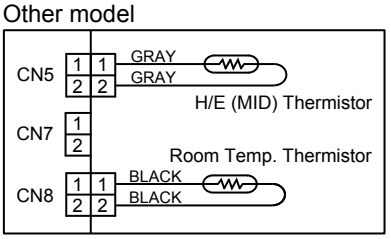
- AR*G45/ 54LHTA



- ARTG45/ 54LHTB, 60LHTA



- Other model



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

Trouble shooting 11 **INDOOR UNIT Error Method:** **Indoor unit Heat Ex. middle temp. sensor error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Heat exchanger temperature thermistor (Middle)	When Heat exchanger temperature thermistor (Middle) 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 if connector is erroneous connection.
- Check if thermistor cable is open.

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature (°C)	-30	-20	-10	-5	0	5	10	15	20
Resistance Value (kΩ)	1131.9	579.6	312.3	233.2	176.0	134.2	103.3	80.3	62.9

Temperature (°C)	25	30	35	40	45	50	55	60	63
Resistance Value (kΩ)	49.7	39.6	31.7	25.6	20.8	17.1	14.1	11.6	10.4

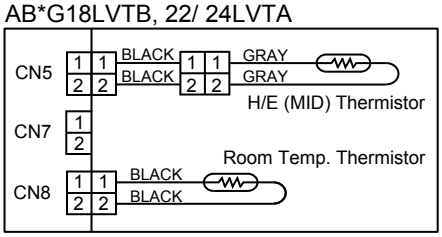
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

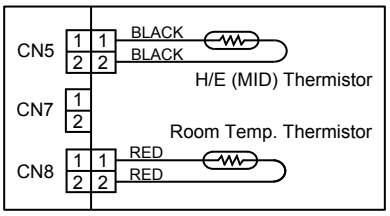
Check Point 3 : Check voltage of Controller PCB (DC5.0V)

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

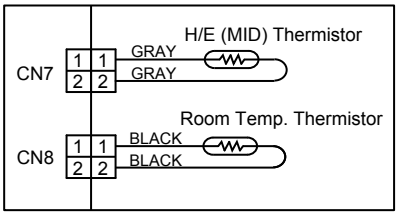
- AB*G18LVTB, 22/ 24LVTA



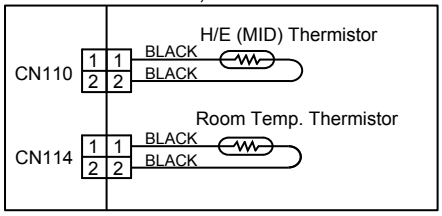
- AU*G36/ 45/ 54LRLA



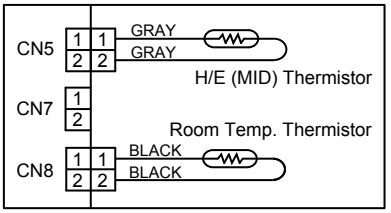
- AR*G45/ 54LHTA



- ARTG45/ 54LHTB, 60LHTA



- Other model



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

Trouble shooting 12 **INDOOR UNIT Error Method:** **Indoor unit fan motor error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Indoor unit Power PCB Indoor fan motor	When the condition that actual rev. of Indoor Fan is 1/3 or less. Or the condition of fan speed is 0rpm is continued more than 56 seconds.

Forecast of Cause:

1. Fan motor failure
2. Motor protection by surrounding temperature rise
3. Power PCB failure
4. Controller PCB failure

Check Point 1 : Check rotation of Fan

- Check if the Fan motor is lock.
  (Can the Fan be rotated by hand when operation is off.)
- Check the Fan loosening.
  (Lock-nut loosening, defective propeller fan)

>> If Fan motor or bearing is abnormal, replace it.

OK

Check Point 2 : Check ambient temp. around motor

- Check excessively high temperature around the motor.
  (If there is any surrounding equipment that causes heat)

>> Upon the temperature coming down, restart operation.

OK

Check Point 3 : Check Indoor unit fan motor

- Check Indoor unit fan motor. (PARTS INFORMATION 4)

>>If Indoor unit fan motor is abnormal, replace Indoor unit fan motor.

OK

Check Point 4 : Replace Power PCB and Controller PCB

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

Trouble shooting 13 **INDOOR UNIT Error Method:** **Drain pump error**	**Indicate or Display:** **Refer to error code table.**

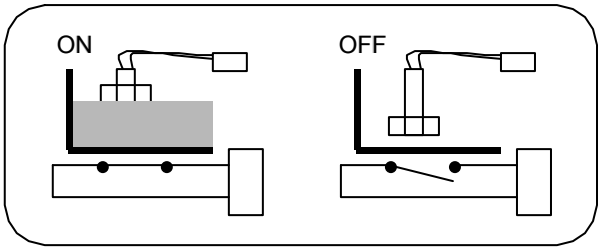
Detective Actuators:	**Detective details:**
Indoor unit Controller PCB Float switch	When Float switch is ON for more than 3 minutes.

Forecast of Cause :

1. Float switch failure 2. Shorted connector and wire 3. Drain hose clog 4. Controller PCB failure

Check Point 1 : Check Float switch

- Check operation of float switch. (Any blocking by dust, etc.)
  >> If Float switch does not operate, replace it.



OK

Check Point 2 : Check connector (CN9) and wire

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

OK

Check Point 3 : Check Drain hose

- Check clogged Drain hose.
  ▶ **If clogged, clear the clog.**

OK

Check Point 4 : Replace Controller PCB

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

Trouble shooting 14-1 **OUTDOOR UNIT Error Method:** **Outdoor unit main PCB model information error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause:

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

Check Point 1-1 : Reset Power Supply and operate

- Does Error indication show again?

NO

YES

Check Point 2 :
Check Indoor unit electric components

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

Check Point 1-2 :
Check external cause such as noise

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

OK

Check Point 3 : Replace Main PCB

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

Note : EEPROM

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

Trouble shooting 14-2 **OUTDOOR UNIT Error Method:** **Inverter Communication Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Outdoor unit Inverter PCB	▪ There is no communication from the Inverter PCB for longer than a certain period of time.

Forecast of Cause : 1. Noise 2. Main to Inverter PCBs wiring connection defective
3. Main PCB defective 4. Inverter PCB defective

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

Error displayed again?

NO →

Check Point 1-2 : Noise

☐ Check if ground is connected correctly or there are no related cables near the power line.

YES ↓

Check Point 2 : Check the main to Inverter PCB wiring

☐ Connector connection state check
☐ Cable open check

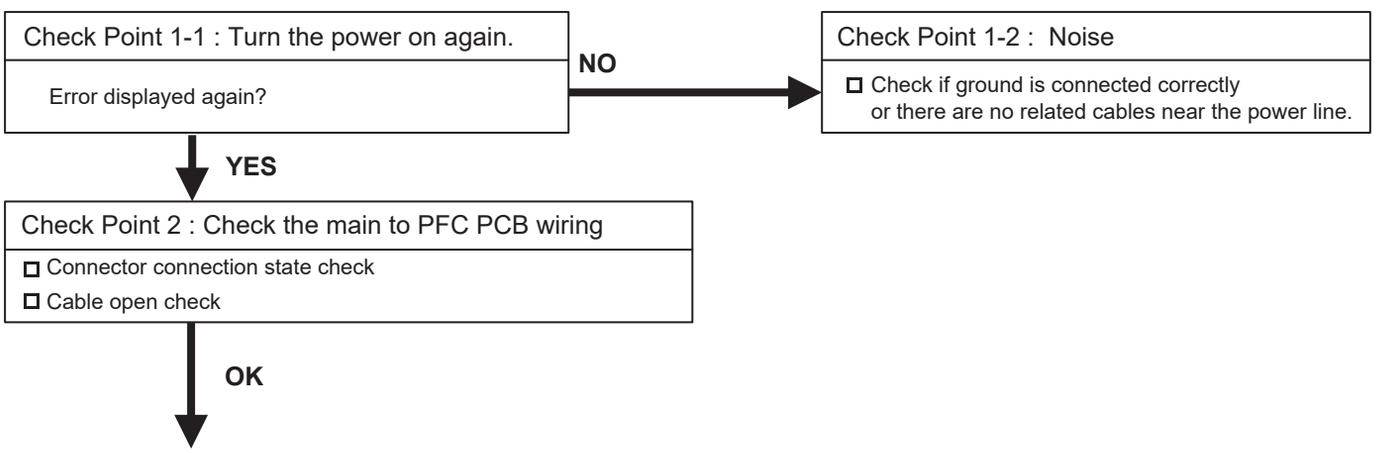
OK ↓

Try replaceing either or both the Main PCB and the Inverter PCB.

Trouble shooting 14-3 **OUTDOOR UNIT Error Method:** **Power Factor Correction (PFC) Communication Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Outdoor unit PFC PCB	▪There is no communication from the PFC PCB for longer than a certain period of time.

Forecast of Cause : 1. Noise 2. Main to PFC PCBs wiring connection defective
3. Main PCB defective 4. PFC PCB defective



Try replaceing either or both the Main PCB and the PFC PCB.

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

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Outdoor unit Inverter PCB	・When there is communication error between Main PCB and Inverter PCB. ・When "Inverter PCB cement resistor difference voltage between both ends" detects 18 V and above twice continuously.

Forecast of Cause :

1. Connection failure 2. Main PCB failure 3. Inverter PCB failure

Check Point 1 : Check connections in control unit

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

OK

Check Point 2 : Replace Main PCB and Inverter PCB

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

Trouble shooting 16 **OUTDOOR UNIT Error Method:** **PFC circuit Error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Outdoor unit PFC PCB	・When communication error between Main PCB and PFC PCB continues for 10 seconds. ・When PFC PCB circuit error continues for 10 seconds. ・When PFC PCB output voltage is more than DC760V for 30 seconds.

Forecast of Cause :

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

Check Point 1 : Check connections of between Main PCB and PFC PCB

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

OK

Check Point 2 : Check output voltage of Main PCB

・Check voltage of Main PCB.
(Measure at Main PCB side connector)

>>1 pin(Brown) - 2 pin(Red) DC15V ±5%

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

OK

Check Point 3 : Replace PFC PCB

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

Trouble shooting 17 **OUTDOOR UNIT Error Method:** **Trip terminal L error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators: Outdoor unit Inverter PCB	**Detective details:** When the signal from FO terminal of IPM in Inverter PCB is "L"(=0V) while the compressor stops.

Forecast of Cause :

1. Inverter PCB failure

Check Point 1 : Replace Inverter PCB
▶ **Change Inverter PCB.**

Trouble shooting 18 **OUTDOOR UNIT Error Method:** **Discharge temp. sensor error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause :

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

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature(°C)	-30	-20	-10	0	10	20	30	40	50
Resistance Value (kΩ)	1013.1	531.6	292.9	168.6	100.9	62.5	40.0	26.3	17.8

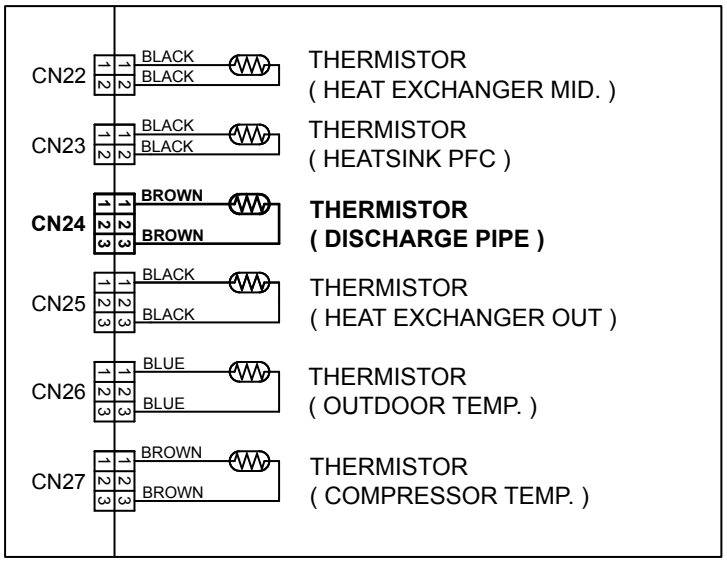
Temperature(°C)	60	70	80	90	100	110	120
Resistance Value (kΩ)	12.3	8.7	6.3	4.6	3.4	2.6	2.0

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

OK

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

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



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

Trouble shooting 19 **OUTDOOR UNIT Error Method:** **Compressor temp. sensor error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause :

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

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature(°C)	-30	-20	-10	0	10	20	30	40	50
Resistance Value (kΩ)	1013.1	531.6	292.9	168.6	100.9	62.5	40.0	26.3	17.8

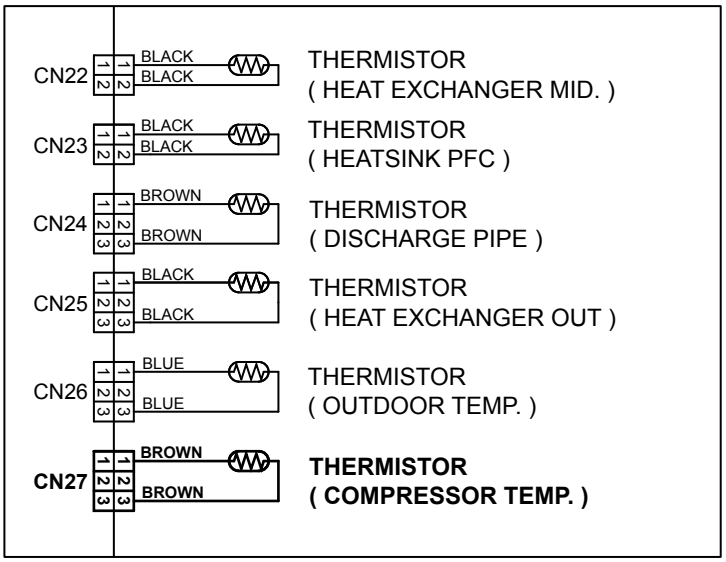
Temperature(°C)	60	70	80	90	100	110	120
Resistance Value (kΩ)	12.3	8.7	6.3	4.6	3.4	2.6	2.0

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

OK

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

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



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

Trouble shooting 20 **OUTDOOR UNIT Error Method:** **Outdoor unit Heat Ex. liquid temp. sensor error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause :

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

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature(°C)	-30	-20	-10	0	10	20	30	40	50
Resistance Value (kΩ)	95.6	50.3	27.8	16.1	9.6	6.0	3.8	2.5	1.7

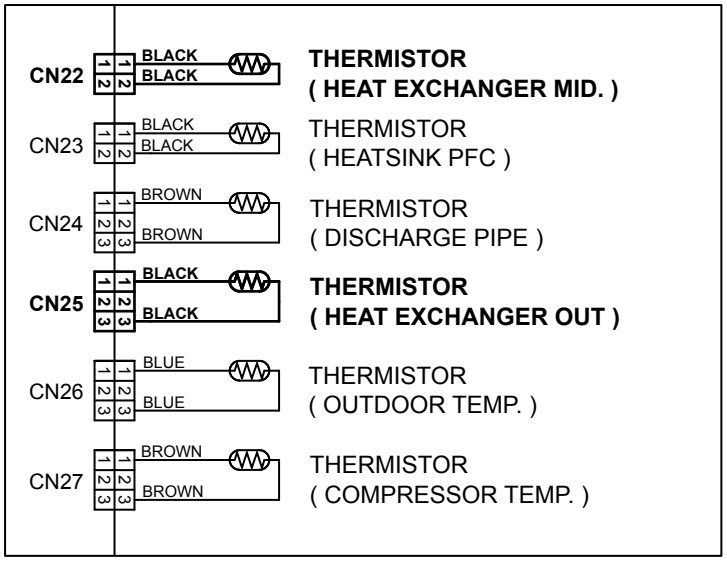
Temperature(°C)	60	70	80
Resistance Value (kΩ)	1.2	0.8	0.6

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

OK

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

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



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

Trouble shooting 21 **OUTDOOR UNIT Error Method:** **Outdoor temp. sensor error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause :

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

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature(°C)	-30	-20	-10	0	10	20	30	40
Resistance Value (kΩ)	224.3	115.2	62.3	35.2	20.7	12.6	8.0	5.2

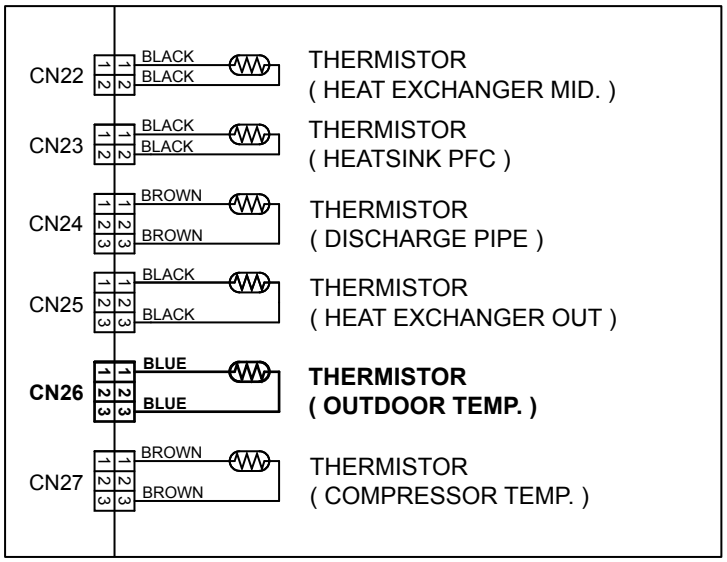
Temperature(°C)	50	60	70	80
Resistance Value (kΩ)	3.5	2.4	1.6	1.2

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

OK

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

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



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

Trouble shooting 22 **OUTDOOR UNIT Error Method:** **Heat sink temp. sensor error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Inverter PCB Heat sink temperature thermistor (PFC) Heat sink temperature thermistor (INV)	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. Inverter PCB failure

Check Point 1 : Check connection of connector

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

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

OK

Check Point 2 : Remove connector and check thermistor resistance value

Thermistor characteristics (Approx. value)

Temperature(°C)	-30	-20	-10	0	10	20	30	40
Resistance Value (kΩ)	94.3	49.6	27.4	15.8	9.5	5.9	3.8	2.5

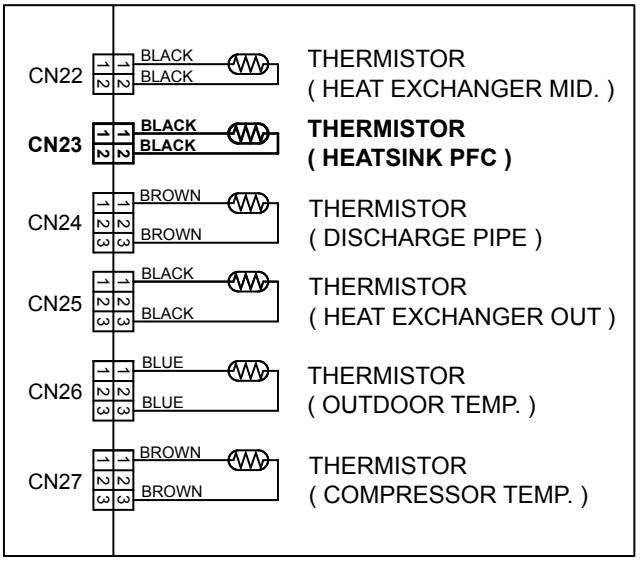
Temperature(°C)	50	60	70	80	89.5
Resistance Value (kΩ)	1.7	1.2	0.8	0.6	0.4

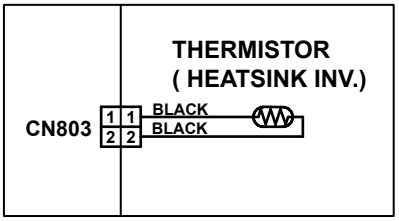
▶ **If Thermistor is either open or shorted, replace it and reset the power.**

OK

Check Point 3 : Check voltage of Inverter 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 Inverter PCB.**

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

Detective Actuators:	**Detective details:**
Outdoor unit Inverter PCB Outdoor unit Filter PCB	・After compressor runs for 1 minute or more, and while it runs in 50Hz or more. ・When outdoor current value (A/D data) of Input Current Sensor has detected [00H].

Forecast of Cause :

1. Connection failure 2. External cause 3. Filter PCB failure 4. Inverter PCB failure

Check Point 1-1 : Reset power supply and operate

・Does error indication reappear?

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

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

YES

Check Point 2 :
Check connections condition in control unit

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

OK

Check Point 3 : Check Filter PCB

Check Filter PCB : CN200, 1 - 3 pin
>> 40 seconds after compressor starts.
If it is higher than 0.2V, Inverter PCB is failure.
>> Replace Inverter PCB
If it is lower than 0.2V, Filter PCB is failure.
>> Replace Filter PCB

Trouble shooting 24 **OUTDOOR UNIT Error Method:** **Pressure sensor error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Pressure sensor	30 seconds or more after power-on, when pressure sensor detection value detects the condition below continuously for 30 seconds or more. ・Ps ≦ -0.26 or Ps ≧ 5.63 [MPa]

Forecast of Cause :

1. Connector connection failure 2. Pressure sensor failure 3. Main PCB failure

Check Point 1 : Check connection of the Pressure sensor

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

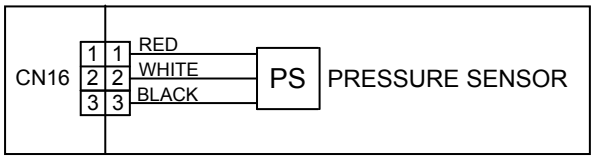
>> Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Check output voltage of Main PCB

- Check voltage of Main PCB.
  (Measure at Main PCB side connector)

>>1 pin(Red) - 3 pin(Black) DC5V ±5%



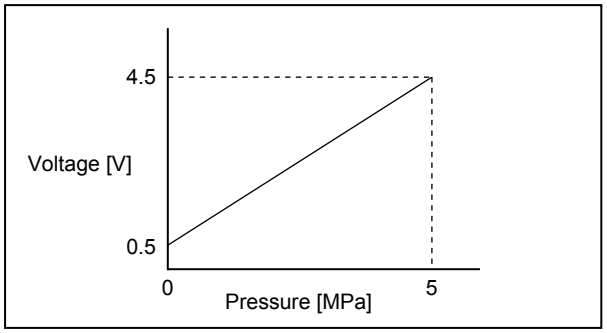
▶ **If the voltage is not correct, replace Main PCB.**

OK

Check Point 3 : Check output voltage of Pressure Sensor

- Check voltage of Main PCB.
  (Measure at Main PCB side connector)

>>2 pin(White) - 3 pIn(Black) Voltage is refer to the following graph.



▶ **If the voltage is not correct, replace Presure Sensor.**

Trouble shooting 25 **OUTDOOR UNIT Error Method:** **Trip detection**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Inverter PCB Compressor	① When over current flows in Inverter PCB, the compressor stops. ② After the compressor restarts, if the same error is repeated within 40sec, the compressor stops reappear. ③ If ① and ② repeats 5 times, the compressor stops permanently.

Forecast of Cause :

1. Connection failure
2. Outdoor fan operation failure
3. Outdoor heat exchanger clogged
4. Compressor failure
5. Inverter PCB failure

Check Point 1 : Check connections condition in control unit

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

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

OK

Check Point 2 : Check Outdoor heat exchanger

- Is there any obstructing the air flow route?
- Is there any clogging of outdoor unit Heat exchanger?

>> If clogged, clear the clog.

OK

Check Point 3 : Check Outdoor fan

- Check Outdoor fan motor. (Refer to Trouble shooting 27)

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

OK

Check Point 4 : Check Compressor

- Compressor check is refer to SERVICE PARTS INFORMATION 2.

>> If it is abnormal, replace compressor.

OK

Check Point 5 : Replace Inverter PCB

▶ **If Check Point 1 ~ 4 do not improve the symptom, replace Inverter PCB.**

Trouble shooting 26 **OUTDOOR UNIT Error Method:** **Compressor rotor position detection error (permanent stop)**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Inverter PCB Compressor	When "compressor location detection error" is detected consecutively 5 times, within 40 seconds after start-up.

Forecast of Cause :

1. Connector connection failure 2. Inverter PCB failure 3. Compressor failure

Check Point 1 : Check connections condition in control unit

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

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

OK

Check Point 2 : Check Compressor

Compressor check is refer to SERVICE PARTS INFORMATION 2.

>> If it is abnormal, replace compressor.

OK

Check Point 3 : Replace Inverter PCB

▶ If Check Point 1 and 2 do not improve the symptom, replace Inverter PCB.

Trouble shooting 27 **OUTDOOR UNIT Error Method:** **Outdoor unit fan motor error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause:

1. Fan motor failure 2. Motor protection by surrounding temperature rise 3. Main PCB failure

Check Point 1 : Check rotation of Fan

- Check if the Fan motor is lock.
  (Can the Fan be rotated by hand when operation is off.)
- Check the Fan loosening.
  (Lock-nut loosening, defective propeller fan)

>> If Fan Motor or bearing is abnormal, replace it.

OK

Check Point 2 : Check ambient temp. around motor

- Check excessively high temperature around the motor.
  (If there is any surrounding equipment that causes heat)

>> Upon the temperature coming down, restart operation.

OK

Check Point 3 : Check Outdoor unit fan motor

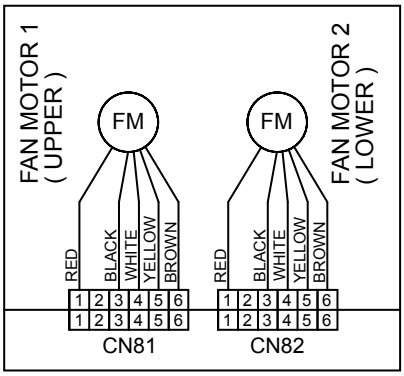
- Check Outdoor unit fan motor. **(PARTS INFORMATION 5)**

>>If Outdoor fan motor is abnormal, replace Outdoor fan motor and Main PCB.

OK

Check Point 3 : Check output voltage of Main PCB

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



Read wire	DC voltage
Red - Black	280V (AC220V-10%) ~ 373V (AC240+10%)
White - Black	15±1.5V

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

Trouble shooting 28 **OUTDOOR UNIT Error Method:** **4-way valve error**	**Indicate or Display:** **Refer to error code table.**

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

Forecast of Cause :

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

Check Point 1 : Check connection of Connector

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

OK

Check Point 2 : Check thermistor of Indoor unit

・Isn't it fallen off the holder?
・Is there a cable pinched?
>> Check characteristics of thermistor, (Refer to Trouble shooting 10,11),
If defective, replace the thermistor.

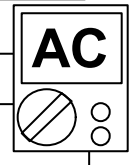
OK

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

[Solenoid coil]
・Remove CN30 from PCB and check the resistance value of coil.
Resistance value is about 1.4kΩ
>> If it is Open or abnormal resistance value, replace Solenoid Coil.

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

OK



Check Point 4 : Check the voltage of 4-way valve

・Check the CN 30 voltage of Main PCB
Check if AC198V(AC220V-10%) - 264V(AC240V+10%) appears at CN 103 of Main PCB.
[Heating operation]
>> If it is not voltage, Replace Main PCB.
[Cooling operation]
>> If it is voltage, Replace Main PCB.

OK

Check Point 5 : Replace Controller PCB

▶ **If Check Point 1- 4 do not improve the symptom, replace Controller PCB of Indoor unit .**

Trouble shooting 29 **OUTDOOR UNIT Error Method:** **Discharge temp. error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Discharge pipe temperature thermistor	When the discharge temperature becomes higher than 115°C. When detecting it 2 times within 24 hours, 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

< Cooling mode >

Check Point 1 : Check if gas valve is open

- If it is not open, open it and check the operation.

OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
  (Refer to PARTS INFORMATION 3)
  >> If EEV or Strainer is defective, replace it.

OK

Check Point 3 : Check if gas leak or less gas

- Measure gas pressure, if there is a leak, correct it.
  >> If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

Check Point 4 : Check Discharge pipe thermistor

- Is it on the holder?
- Is there a cable pinched?
  >> Check characteristics of thermistor (Refer to Trouble shooting 18), If defective, replace the thermistor

OK

Check Point 5 : Check Outdoor heat exchanger

- Is there any obstructing the air flow route?
- Is there any clogging of outdoor unit Heat exchanger?
  >> If clogged, clear the clog.

OK

Check Point 6 : Check Outdoor fan

- Check Outdoor fan motor. (Refer to Trouble shooting 27)
  >> If the Fan motor is failure, replace it.

< Heating mode >

Check Point 1 : Check if liquid valve is open

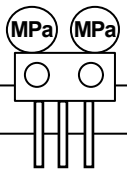
- If it is not open, open it and check the operation.

OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
  (Refer to PARTS INFORMATION 3)
  >> If EEV or Strainer is defective, replace it.

OK



Trouble shooting 30 **OUTDOOR UNIT Error Method:** **Compressure temp. error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators:	**Detective details:**
Outdoor unit Main PCB Compressor temperature thermistor	When the compressor temperature becomes 110°C or more. When detecting it 2 times within 24 hours, the compressor stops permanently.

Forecast of Cause :

1. Valve is close 2. EEV failure 3. Gas leak, less 4. Compressor thermistor failure
5. Outdoor fan failure 6. Outdoor heat exchanger clogged

< Cooling mode >

Check Point 1 : Check if gas valve is open

- If it is not open, open it and check the operation.

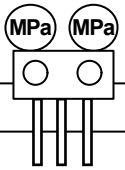
OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
  (Refer to PARTS INFORMATION 3)
  >> If EEV or Strainer is defective, replace it.

OK

Check Point 3 : Check if gas leak or less gas



- Measure Gas pressure, if there is a leak, correct it.
  >> If recharging refrigerant, make sure to perform vacuuming and recharge the specified amount.

OK

Check Point 4 : Check Compressor temperature thermistor

- Is it on the holder?
- Is there a cable pinched?
  >> Check characteristics of thermistor (Refer to Trouble shooting 19), If defective, replace the thermistor.

OK

Check Point 5 : Check Outdoor heat exchanger

- Is there any obstructing the air flow route?
- Is there any clogging of outdoor unit Heat exchanger?
  >> If clogged, clear the clog.

OK

Check Point 6 : Check Outdoor fan

- Check Outdoor fan motor. (Refer to Trouble shooting 27)
  >> If the Fan motor is failure, replace it.

OK

Check Point 7 : Replace Main PCB

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

< Heating mode >

Check Point 1 : Check if liquid valve is open

- If it is not open, open it and check the operation.

OK

Check Point 2 : Check EEV and Strainer

- Are EEV and Strainer open?
  (Refer to PARTS INFORMATION 3)
  >> If EEV or Strainer is defective, replace it.

OK

Trouble shooting 31 **OUTDOOR UNIT Error Method:** **Low pressure error**	**Indicate or Display:** **Refer to error code table.**

Detective Actuators: Outdoor unit Main PCB Pressure sensor	**Detective details:** In cooling operation, 1 minute or more after compressor's start-up, when pressure sensor detects 0.12 MPa or less for consecutive 5 minutes.

Forecast of Cause :

1. Connector connection failure 2. Pressure sensor failure 3. Main PCB failure 4. Gas leak, less

Check Point 1 : Check connections of the Pressure sensor

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

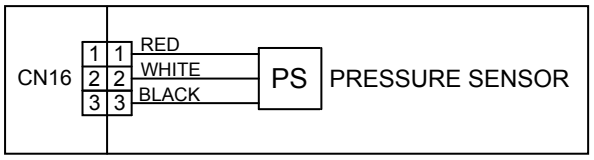
>> Upon correcting the removed connector or mis-wiring, reset the power.

OK

Check Point 2 : Check output voltage of Main PCB

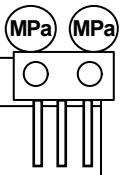
- Check voltage of Main PCB.
  (Measure at Main PCB side connector)

>>1 pin(Red) - 3 pin(Black) DC5V ±5%



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

OK



Check Point 3 : Check if gas leak or less gas

- Measure Gas pressure, if there is a leak, correct it.

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

OK

Check Point 4 : Replace Pressure sensor

▶ **If Check Point 1 ~ 3 do not improve the symptom, replace Pressure sensor.**

2-3 TROUBLE SHOOTING WITH NO ERROR CODE

Trouble shooting 32

Indoor Unit - No Power

Forecast of Cause:

1. Power supply failure 2. External cause
3. Electrical components defective

Check Point 1 : Check installation condition

- Isn't the breaker down?
- Check loose or removed connection cable.
  >> If abnormal condition is found, correct it by referring to manual.

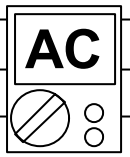
OK

Check Point 2 : Check external cause at indoor unit and outdoor unit(Voltage drop or noise)

- Instant voltage drop of ----- Check if there is abnormally large load in the same power supply power supply system.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply system.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check whether the ground connection is proper.

OK

Check Point 3 : Check electrical components



Check the voltage of power supply.
>> Check if AC198(AC220V-10%) - 264V(AC240V+10%) appears at indoor unit Terminal 1 - 2(Power supply).

NO

OK

- Check Fuse on Power PCB.
  >> If Fuse is open, check loose terminal, and replace Fuse.

- Check Varistor on Power PCB (VA101, VA102).
  >> If Varistor is defective, there is a possibility of an abnormal power supply. Check the correct power voltage and replace Power PCB.

OK

▶ If Check Point 1 ~ 3 do not improve the symptom, replace Power PCB and Controller PCB.

Trouble shooting 33

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 manual.

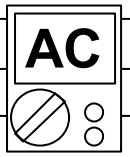
OK

Check Point 2 : Check external cause at indoor unit and outdoor unit(Voltage drop or noise)

- Instant voltage drop of ----- Check if there is a abnomally large load in the same power supply power supply system.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply system.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave) Check whether the ground connection is proper.

OK

Check Point 3 : Check electrical components



Check the voltage of power supply.

>> Check if AC198(AC220V-10%) - 264V(AC240V+10%) appears at outdoor unit terminal , L1 - N, L2 - N, L3 - N.

NO

OK

- Check Fuse(F1, F3) on Main PCB.

>> If Fuse is open, check loose terminal, and replace Fuse.

- Check Varistor on Main PCB (VA1 - VA5).

>> If Varistor is defective, there is a possibility of an abnormal power supply. Check the correct power voltage and replace Main PCB.

OK

▶ If Check Point 1 ~ 3 do not improve the symptom, replace Filter PCB, Main PCB, Inverter PCB and PFC PCB.

Trouble shooting 34

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 controller, or terminals between indoor units. Or, check if there is an open cable connection.
- Are these indoor unit, outdoor unit, and remote controller suitable model to connect?

>> If there is some abnormal condition, correct it by referring to manual.

OK

- Is there loose or removed serial communication line of between indoor unit and outdoor unit?

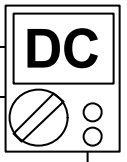
OK

Check Point 2 : Check external cause at indoor unit and outdoor unit(Voltage drop or noise)

- Instant voltage drop of power supply ----- Check if there is abnormally large load in the same power supply system.
- Momentary power failure ----- Check if there is a defective contact or leak current in the power supply system.
- Noise ----- Check if there is any equipment causing harmonic wave near electric line.
  (Neon bulb or electric equipment that may cause harmonic wave)
  Check whether the ground connection is proper.

OK

Check Point 3 : Check electrical components at indoor unit and outdoor unit



- Check voltage at CN6 (AR*G45/ 54LHTA), CN140 (ARTG45/ 54LHTB,60LHTA), and CN14 (Other indoor unit).

>> If it is DC12V, Wired Remote Controller is failure. >> Replace Wired Remote Controller
>> If it is DC 0V, Controller PCB is fallure. >> Replace Controller PCB

>> If Check Point 1, 2 do not improve the symptom, replace control parts of outdoor unit.

Trouble shooting 35

No Cooling / No Heating

Forecast of Cause:

1. Indoor unit error 2. Outdoor unit error
3. Effect by surrounding environment
4. Connection pipe / Connection wire failure 5. Refrigeration cycle failure

Check Point 1 : Check indoor unit

- Does indoor unit Fan run on high fan?
- Is Air filter dirty?
- Is Heat exchanger clogged?
- Check if energy save function is operated.

OK

Check Point 2 : Check outdoor unit operation

- Is outdoor unit is operating?
  (If not, refer to Trouble shooting 33)
- Is there any obstructing the air flow route?
- Is there any clogging on outdoor unit Hert exchanger?
- Is the valve open?

OK

Check Point 3 : Check site condition

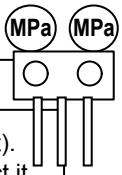
- Is capacity of indoor unit fitted to room size?
- Any windows open? Or direct sunlight?

OK

Check Point 4 :
Check indoor unit / outdoor unit installation condition

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

OK

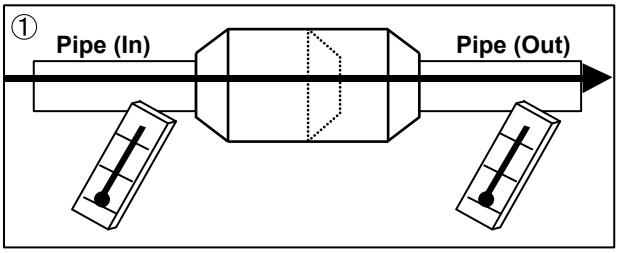


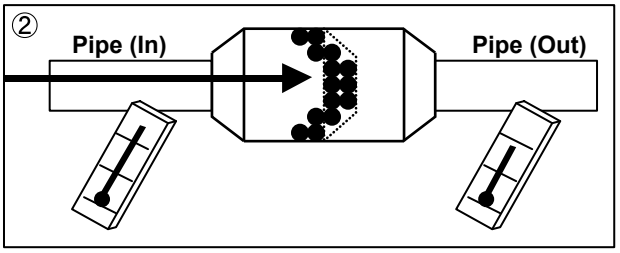
Check Point 5 : Check refrigeration cycle

- Check if Strainer is clogged (Refer to the figure at right).
- Measure gas pressure and if there is a leakage, correct it.
  >> <u>When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.</u>
- Check EEV
- Check Compressor

<u>Attention</u>

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 36

Abnormal Noise

Forecast of Cause :

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

Diagnosis method when abnormal noise is occurred

- Abnormal noise is coming from indoor unit. (Check and correct followings)
  - Is main unit installed in stable condition?
  - Is the installation of air suction grille and front panel normal?

OK

  - Is Fan broken or deformed?
  - Is the screw of Fan loose?
  - Is there any object which obstruct the Fan rotation?

- Abnormal noise is coming from outdoor unit. (Check and correct followings)
  - Is main unit installed in stable condition?
  - Is Fan guard installed normally?

OK

  - Is Fan broken or deformed?
  - Is the screw of Fan loose?
  - Is there any object which obstruct the Fan rotation?

OK

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

OK

  - Is Compressor locked? >> Check Compressor

Trouble shooting 37

Water Leaking

Forecast of Cause:

1. Erroneous installation 2. Drain hose failure

Diagnosis method when water leak occurs

- Is main unit installed in stable condition?
- Is main unit broken or deformed at the time of transportation or maintenance?

OK

- Is Drain hose connection loose?
- Is there a trap in Drain hose?
- Is Drain hose clogged?

OK

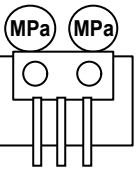
- Is Fan rotating? >> Check Fan motor

Diagnosis method when water is spitting out.

- Is the filter clogged?

OK

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



2-4 SERVICE PARTS INFORMATION

SERVICE PARTS INFORMATION 1

Compressor

Diagnosis method of Compressor (If outdoor unit LED displays error, refer to Trouble shooting)

Does not start up

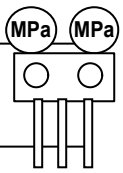
- Is there open or loose connection cable?
- Check connection of Compressor, and winding resistance. (Refer to the next page).

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

Replace Compressor

Stops soon after starting up

- Is there open or loose connection cable?
- Is Gas pipe valve open? (Low Pressure is too low)
- Check if Refrigerant is leaking. (Recharge Refrigerant)



- Check if Strainer is clogged. (PARTS INFORMATION 3)
- Check Inverter PCB connection of Compressor, and winding resistance. (Refer to the next page).

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

Replace Compressor

Abnormal noise

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

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

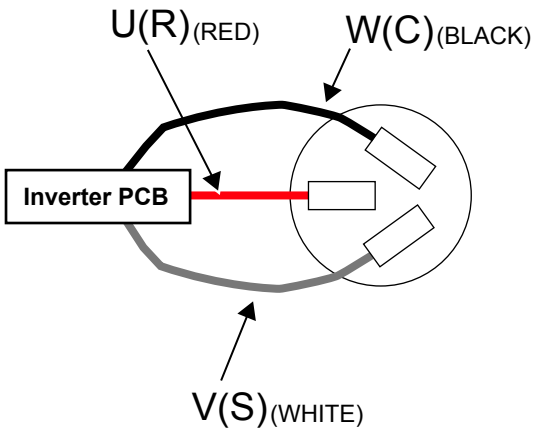
Replace Compressor

SERVICE PARTS INFORMATION 2

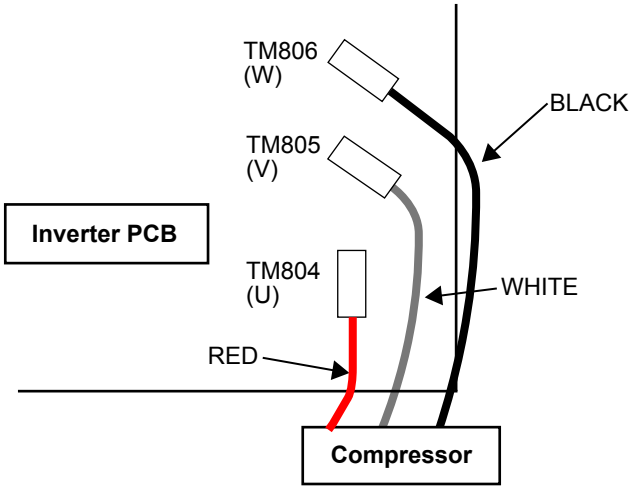
Inverter Compressor

Check Point 1 : Check connection

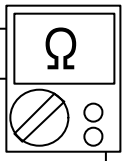
・Check terminal connection of Compressor
(Loose or incorrect wiring)



Check connection of Inverter PCB
(Loose or incorrect wiring)

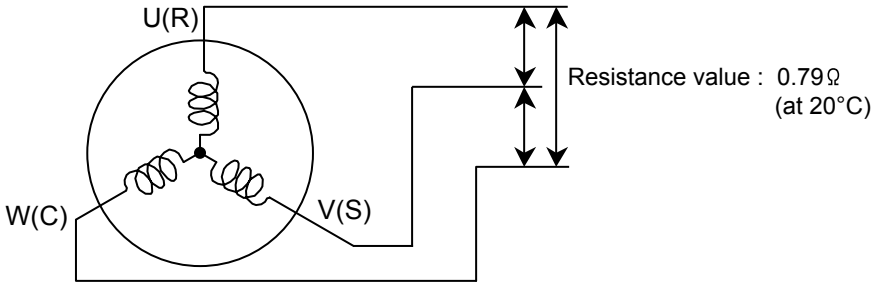


Check Point 2 : Check winding resistance



・Check winding resistance of each terminal

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



Check Point 3 : Replace Inverter PCB

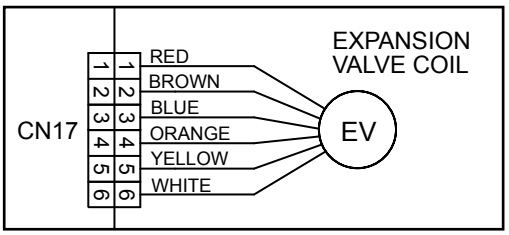
▶**If Check Point 1, 2 do not improve the symptom, replace Inverter PCB.**

SERVICE PARTS INFORMATION 3

Outdoor unit Electronic Expansion Valve
(EEV)

Check Point 1 : Check Connections

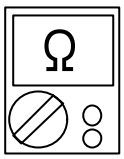
・Check connection of connector
(Loose connector or open cable)



Check Point 2 : Check Coil of EEV

・Remove connector, check each winding resistance of Coil.

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



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

Check Point 3 : Check noise at start up

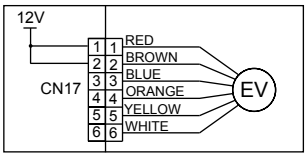
・Turn on Power and check operation noise.

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

Check Point 4 : Check voltage from Main PCB.

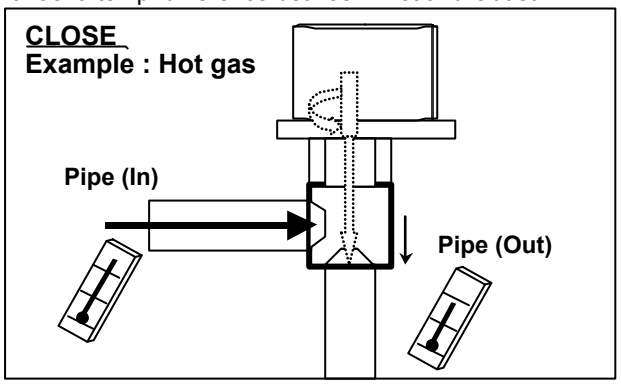
・Remove connector and check voltage (DC12V)

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

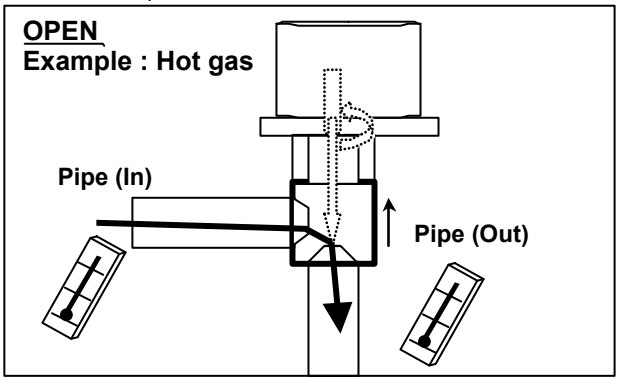


Check Point 5 : Check Opening and Closing operation of valve

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

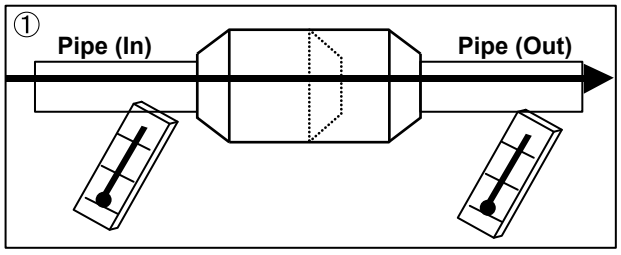


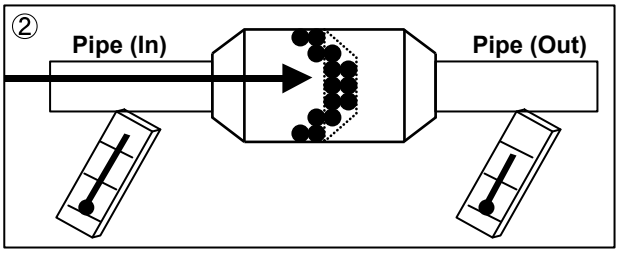
If it is open,
it has no temp. difference between Inlet and Outlet.



Check Point 6 : Check strainer

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





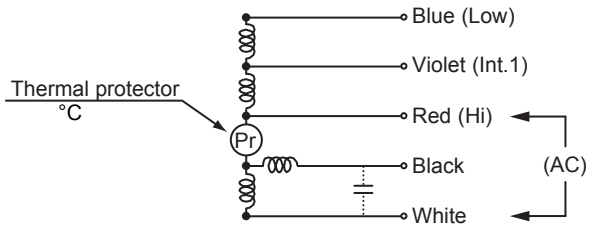
SERVICE PARTS INFORMATION 4

Indoor unit fan motor

For AR *G45/ 54LHTA

Check Point 1 : Check resistance of indoor fan motor

・Check each winding resistance of the motor
>>If Resistance value is abnormal, replace motor.



Lead wire color	Resistance value (20°C)
White - Red	7.73Ω ± 7%
Red - Black	7.08Ω ± 7%
Red - Violet	3.80Ω ± 7%
Violet - Blue	3.80Ω ± 7%

For other indoor unit

Check Point 1 : Check rotation of fan

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

Check Point 2 : Check resistance of indoor fan motor

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

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

SERVICE PARTS INFORMATION 5

Outdoor unit fan motor

Check Point 1 : Check rotation of fan

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

Check Point 2 : Check resistance of outdoor fan motor

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

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

Refrigerant R410A
INVERTER

AIR CONDITIONER

3 phase type

Single / Simultaneous operation multi type

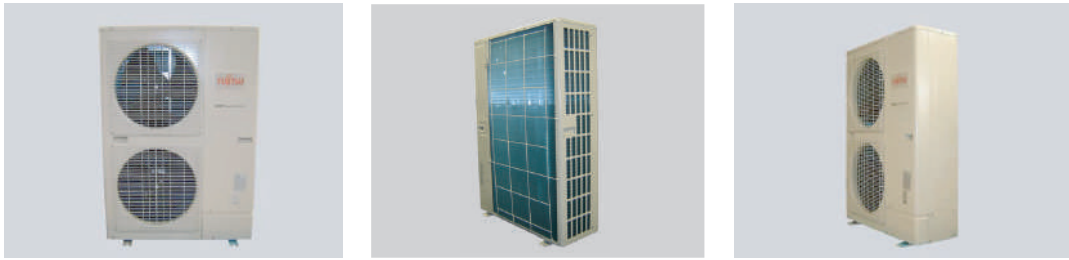
3. DISASSEMBLY PROCESS

3. DISASSEMBLY PROCESS

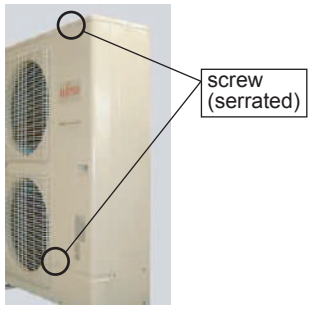
⚠ WARNING

Before servicing the unit, turn the power supply switch OFF,
Then, do not touch electric parts for 10 minutes due to the risk of electric shock.

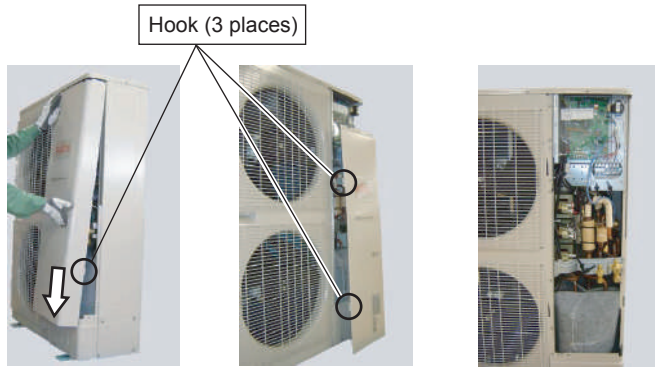
1. Appearance



2. SERVICE PANEL removal

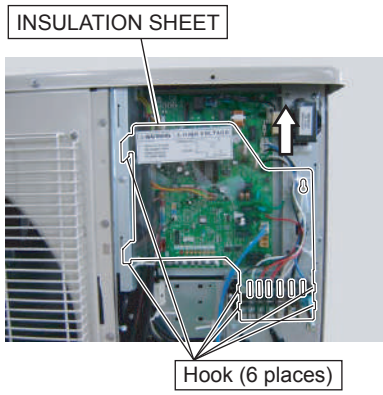


Remove the mounting screws.

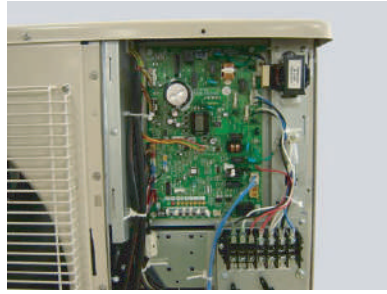


Remove the SERVICE PANEL
by sliding downward.

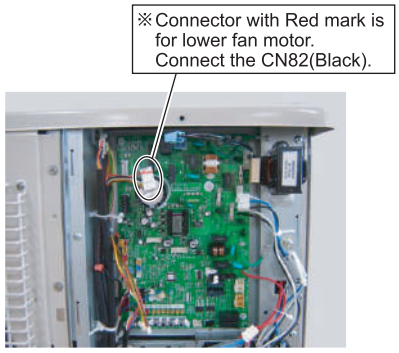
3. INSULATION SHEET removal



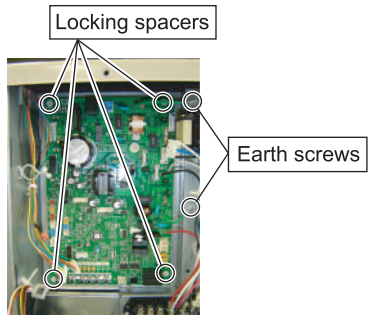
Remove the Hook. (6 places)
Remove the INSULATION SHEET
by sliding upward.



4. MAIN PCB removal

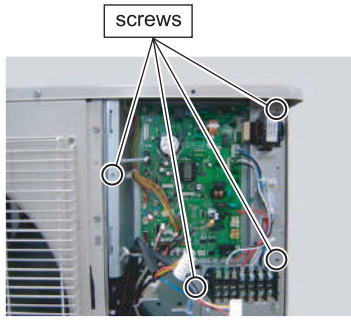


Remove the connectors.

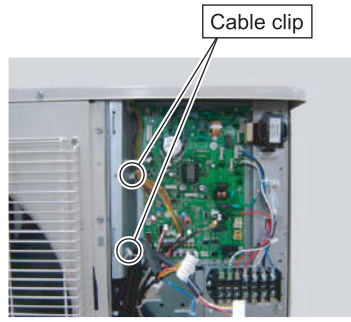


Remove the earth screws
and the locking spacers

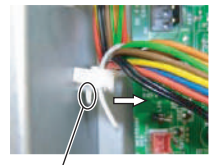
5. INVERTER, PFC, FILTER, and CAPACITOR PCB removal



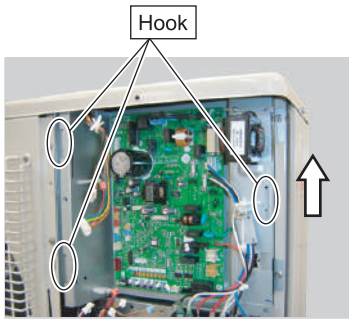
Remove the 4 mounting screws.



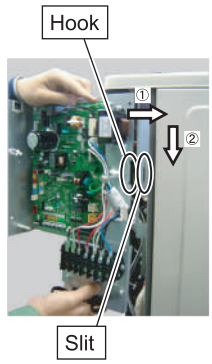
Remove the connectors
in the left side of Main PCB.
Remove the Cable clips.(2 places)



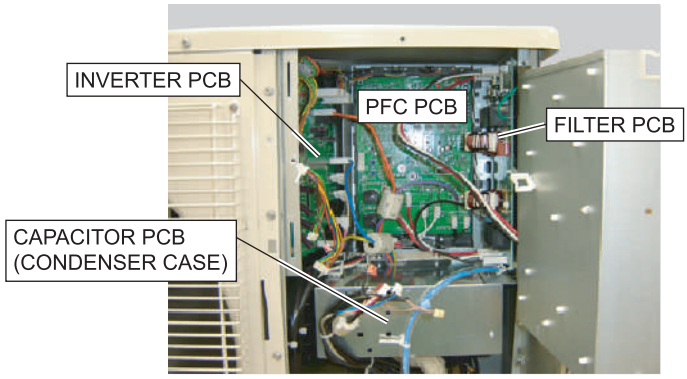
Push the knob in the
direction of the arrow.



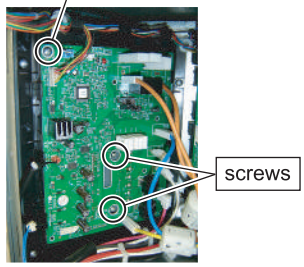
Remove the INVERTER CASE MAIN
by sliding upward.



Hang the Hook on the slit.

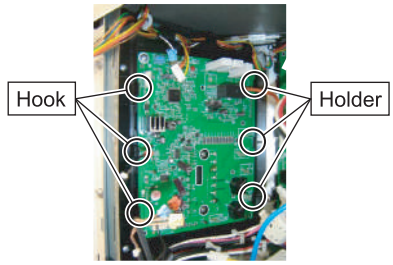


5-1. INVERTER PCB removal

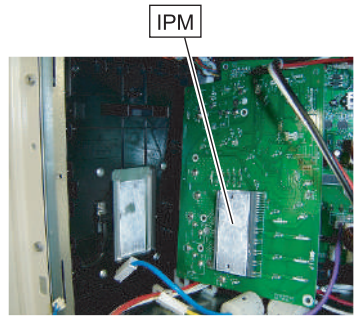


Remove the connectors and screws.

For screws of IPM.
Note the tightening torque at the installation.
Tightening torque is 1.2±0.2N•m

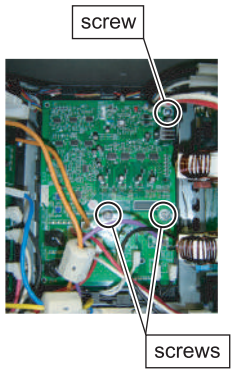


Remove the INVERTER PCB.



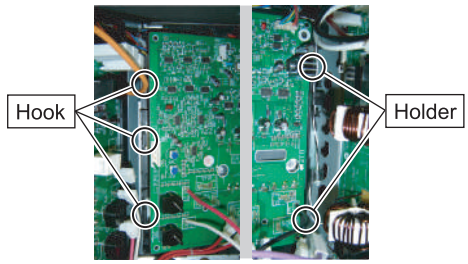
Spread the heat dissipation compound on the other side of IPM when you exchange INVERTER PCB by the repair.

5-2. PFC PCB removal

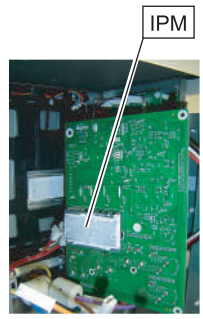


Remove the connectors and screws.

For screws of IPM.
Note the tightening torque at the installation.
Tightening torque is 1.2±0.2N•m

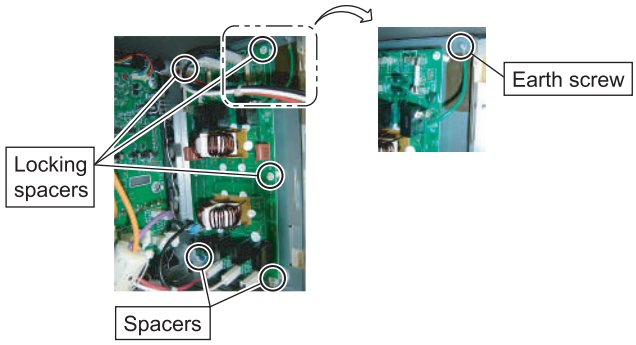


Remove the PFC PCB.



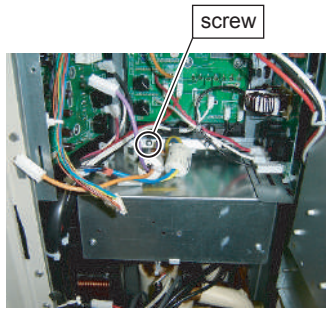
Spread the heat dissipation compound on the other side of IPM when you exchange PFC PCB by the repair.

5-3. FILTER PCB removal

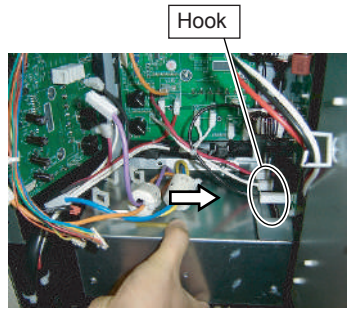


Remove the connectors, locking spacers, spacers, and earth screw.

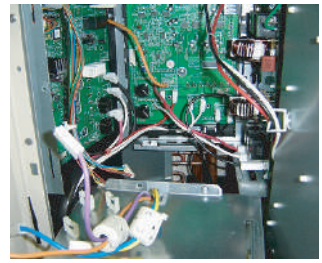
5-4. CAPACITOR PCB removal

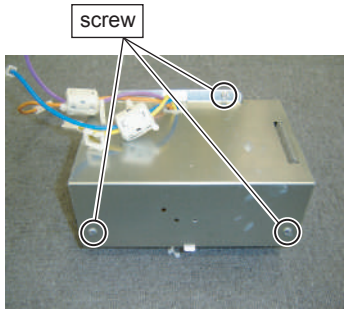


Remove the connectors, codes and screw.

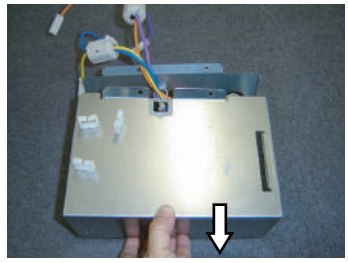


Remove the CONDENSER CASE by sliding rightward.

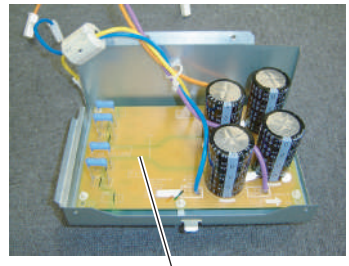


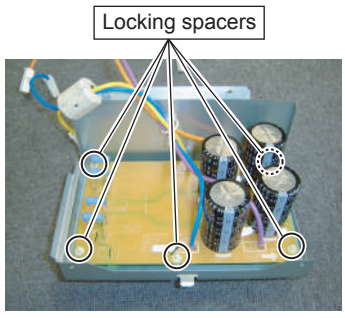


Remove the mounting screws.



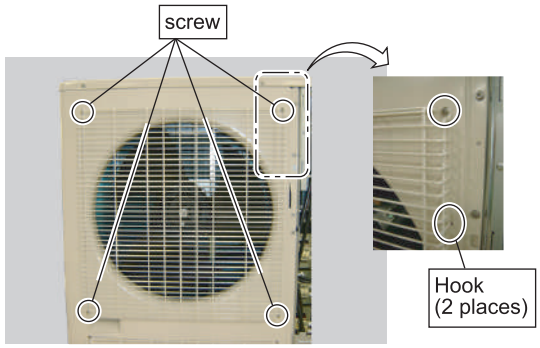
Remove the CONDENSER COVER by sliding toward.



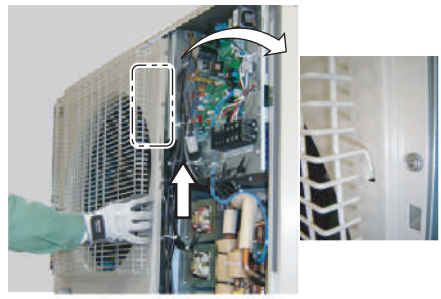


Remove the locking spacers.

6. FAN MOTOR removal



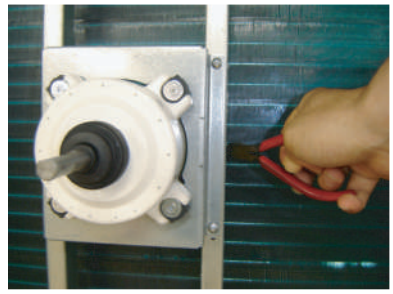
Remove the 4 mounting screws.



Remove the FAN GUARD by sliding upward.

Remove the Hex Socket Screw.
And remove the PROPELLER FAN.

Note at the installation.
Insert propeller Fan and Moter shaft reference D cutting position.
And the tightening torque at the installation.
Tightening torque is from 10 to 15N•m.

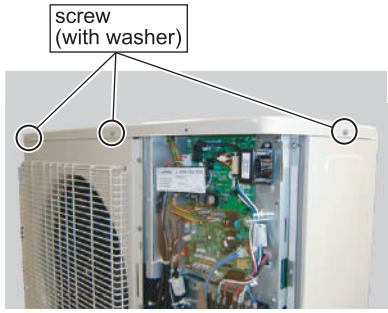


Cut the cable tie.(2 places)

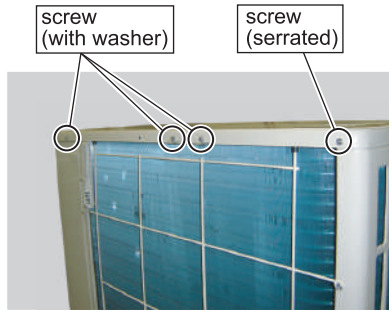
Loose the clamp, and
remove the lead wires.

Remove the 4 mounting screws.
Remove the FAN MOTOR.

7. TOP PANEL removal

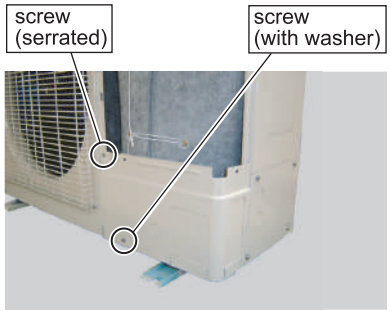


Remove the mounting screws.

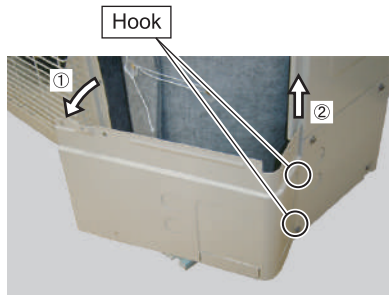


Remove the TOP PANEL.

8. PIPE COVER FRONT removal

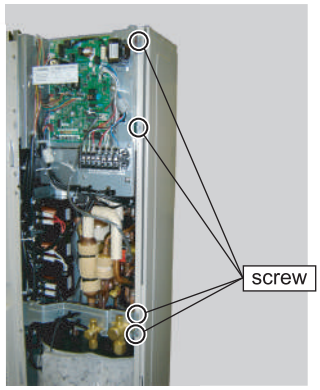


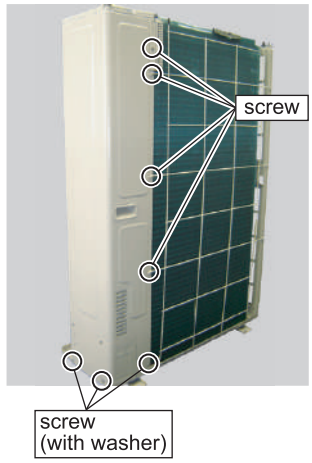
Remove the mounting screws.



Remove the PIPE COVER FRONT.

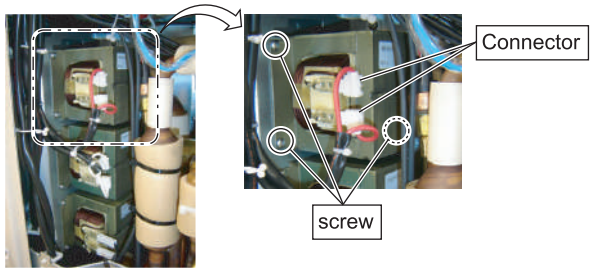
9. RIGHT PANEL removal





Remove the 11 mounting screws.
Remove the RIGHT PANEL by sliding upward.

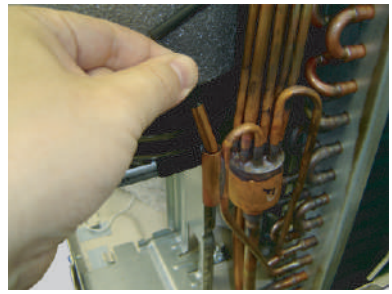
10. REACTOR removal



Remove the connectors.
Remove the 3 mounting screws.

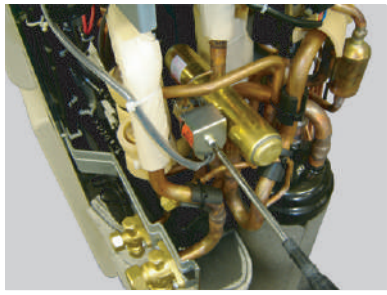
11. THERMISTOR removal

Remove the THERMISOTOR SPRING.



Remove the THERMISOTOR.

12. SOLENOID COIL (4way valve) removal



Remove the mounting screw.

Remove the SOLENOID COIL.

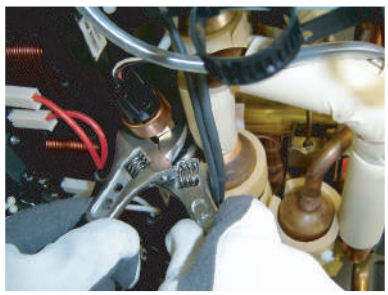
13. EEV COIL removal

Remove the EEV coil by hand.

14. PRESSURE SENSOR removal

⚠ CAUTION

Wear gloves to prevent the frostbite,
because a small amount of refrigerant leaks during work.



Remove the PRESSURE SENSOR
with wrench.

Note the tightening torque at the installation.
Tightening torque is 12±1.5N•m.

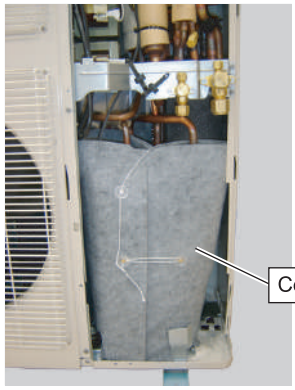
15. COMPRESSOR removal

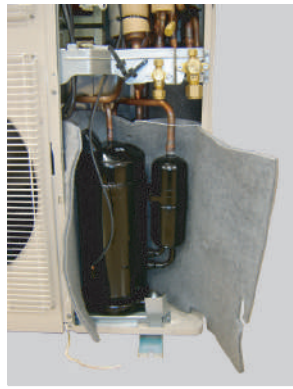
Precautions for exchange of Compressor.

Do not allow moisture or debris to get inside refrigerant pipes during work.

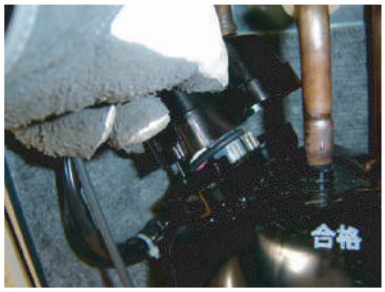
Procedure for compressor removal.

(1) Turn off power.
(2) Remove the SERVICE PANEL.
(3) Fully close the 3WAY VALVE(GAS) and 3WAY VALVE(LIQUID).
(4) Collect the refrigerant from the 3WAY VALVE.
Start the following work after completely collecting the refrigerant.
Do not reuse the refrigerant that has been collected.

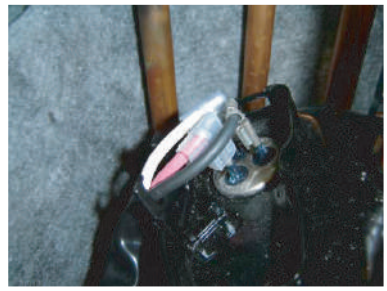




Remove the COMPRESSOR COVER-A.



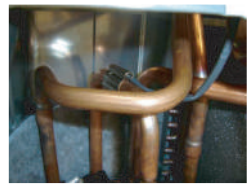
Remove the TERMINAL COVER.



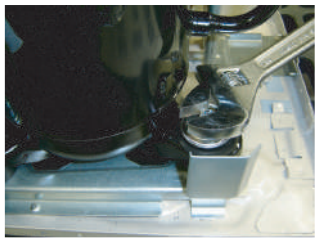
Remove the connectors.
[R(R) :RED, C(T) :BLACK, S(S) :WHITE]

Remove the Thermistor (comp.temp.)
and Thermistor (Discharge).

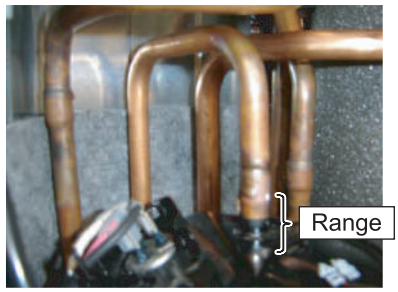
Cut the cable tie, and
remove the heat insulation.



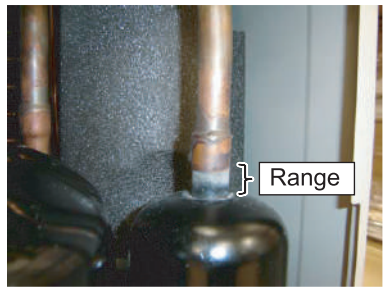
Remove the Thermistor(Discharge).



Remove the COMP BOLTS.
(3 places)



Cut the Discharge pipe in this range.



Cut the Suction pipe in this range.
Remove the COMPRESSOR.

Caution
・Keep their shape better.
・There is a possibility of catching fire to oil when removing by the welding without cutting it.

Procedure for compressor installation.

Reverse procedure to removing the compressor.

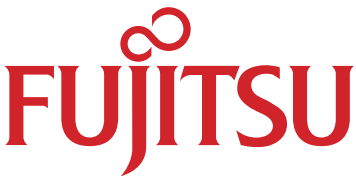
Precautions for installation of Compressor.

(1) When brazing, do not apply the flame to the terminal.
(2) When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.

16. Precautions for exchange of refrigerant-cycle-parts

(1) During exchange the following parts shall be protected by wet rag and not make the allowable temperature or more.
(2) Remove the heat insulation when there is the heat insulation near the welding place.
Move and cool it when its detaching is difficult.
(3) Cool the parts when there are parts where heat might be transmitted besides the replacement part.
(4) Interrupt the flame with the fire-retardant board when the flame seems to hit the following parts directly.
(5) Do not allow moisture or debris to get inside refrigerant pipes during work.
(6) When brazing, be sure to replace the air in the pipe with nitrogen gas to prevent forming oxidization scale.

Part name	Allowable temperature	Precautions in work
EXPANSION VALVE	120°C	Remove the coil before brazing. And install the coil after brazing.
4WAY VALVE	120°C	Remove the suction temp. sensor before brazing. And install the suction temp. sensor after brazing.
3WAY VALVE (GAS)	100°C	
3WAY VALVE (LIQUID)		
UNION JOINT	100°C	Remove the pressure sensor before brazing. And install the pressure sensor after brazing.
PRESSURE SENSOR	100°C	Tighten the flare part gripping it. (Tightening torque :12±1.5N m) Do the static electricity measures.



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