

AIR CONDITIONER

Ceiling type

SERVICE MANUAL

INDOOR



ABHG36KRTA
ABHG45KRTA

OUTDOOR



AOHG36KQTA



AOHG45KQTA

FUJITSU GENERAL LIMITED

Notices:

- Product specifications and design are subject to change without notice for future improvement.
- For further details, please check with our authorized dealer.

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1. GENERAL INFORMATION

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1. GENERAL INFORMATION

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1. Specifications

1-1. Indoor unit

Type				Ceiling		
				Inverter heat pump		
Model name				ABHG36KRTA	ABHG45KRTA	
Power supply				3N 400 V ~ 50 Hz		
Power supply intake				Outdoor unit		
Available voltage range				342—457 V		
Capacity	Cooling	Rated	kW	9.5	12.1	
			Btu/h	32,400	41,300	
		Min.—Max.	kW	2.8—10.6	4.0—12.6	
	Heating	Rated	Btu/h	9,600—36,100	13,600—43,000	
			kW	10.8	13.5	
		Min.—Max.	kW	2.7—12.5	4.2—15.0	
Input power	Cooling	Rated	kW	3.13	4.84	
			Max.	4.52	5.03	
		Heating	Rated	kW	3.03	4.18
	Max.			4.31	4.79	
	Current		Cooling	Rated	A	6.0
		Heating	A		5.8	7.6
EER	Cooling		kW/kW	3.04	2.50	
COP	Heating		kW/kW	3.56	3.23	
Power factor	Cooling		%	75.3	79.6	
	Heating		%	75.1	78.2	
Moisture removal			L/h (pints/h)	2.6 (4.6)	4.5 (7.9)	
Maximum operating current *1	Cooling		A	10.5	13.6	
	Heating		A	10.5	13.6	
Fan	Airflow rate	Cooling	HIGH	1,850	1,900	
			MED	1,470	1,510	
			LOW	1,300	1,380	
			QUIET	1,050	1,130	
		Heating	HIGH	1,800	1,850	
			MED	1,470	1,510	
			LOW	1,300	1,380	
			QUIET	1,050	1,130	
	Type × Q'ty			Sirocco × 4		
	Motor output			W		
Sound pressure level *2	Cooling	HIGH	44	45		
		MED	40	41		
		LOW	37	39		
		QUIET	32	34		
	Heating	HIGH	44	45		
		MED	40	41		
		LOW	37	39		
		QUIET	32	34		
		Dimensions (H × W × D)			mm	
		Fin pitch			mm	
Rows × Stages			3 × 14			
Pipe type			Copper			
Fin type			Aluminum			
Enclosure	Material			Steel sheet		
	Color			White Approximate color of Munsell N9.25/		
Dimensions (H × W × D)	Net		mm			
	Gross		mm			
Weight	Net		kg			
	Gross		kg			
Connection pipe	Size	Liquid	mm (in)			
		Gas	mm (in)			
Method			Flare			
Drain hose	Material			PVC		
	Tip diameter			mm		
Operation range	Cooling		°C	18 to 32		
	Heating		%RH	80 or less		
Remote controller (Option)			°C			
				16 to 30		
Remote controller (Option)				Wired remote controller, Wireless remote controller, Mobile app*3 (FGLair™)		

NOTES:

- Specifications are based on the following conditions:
 - Cooling: Indoor temperature of 27 °CDB/19 °CWB, and outdoor temperature of 35 °CDB/24 °CWB.
 - Heating: Indoor temperature of 20 °CDB/15 °CWB, and outdoor temperature of 7 °CDB/6 °CWB.
 - Pipe length: 5 m, Height difference: 0 m. (Between outdoor unit and indoor unit.)
- Protective function might work when using it outside the operation range.
- *1: Maximum current is maximum value when operated within the operation range.
- *2: Sound pressure level:
 - Measured values in manufacturer's anechoic chamber.
 - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.
- *3: Available on Google Play™ store or on App Store®. Optional WLAN adapter is also required. For details, refer to the setting manual.

Specifications for ErP Lot10				
Model name			ABHG36KRTA	
Energy efficiency class	Cooling		A ⁺	
	Heating (Average)		A	
Pdesign	Cooling	kW	9.5 (35°C)	
	Heating (Average)		8.7 (-10°C)	
SEER	Cooling	kWh/kWh	5.6	
SCOP	Heating (Average)		3.9	
Annual energy consumption	QCE		kWh/a	594
	QHE (Average)			3,117
Sound power level	Cooling	HIGH	dB (A)	59
	Heating			59

1-2. Outdoor unit

Type			Inverter heat pump	
Model name			AOHG36KQTA	AOHG45KQTA
Power supply			3N 400 V ~ 50 Hz	
Power supply intake			Outdoor unit	
Available voltage range			342—457 V	
Starting current			6.0	8.8
Fan	Airflow rate	Cooling	3,750	4,450
		Heating	3,750	4,450
	Type × Q'ty		Propeller fan × 1	
Motor output		W	100	120
Sound pressure level *1	Cooling	dB (A)	55	58
	Heating		55	59
Sound power level	Cooling	dB (A)	70	72
	Heating		70	73
Heat exchanger type	Dimensions (H × W × D)	mm	Main1: 756 × 905 × 18.19 Main2: 756 × 905 × 18.19	Main1: 966 × 905 × 18.19 Main2: 966 × 905 × 18.19
	Fin pitch		Main1: 1.45 Main2: 1.45	
	Rows × Stages		Main1: 1 × 36 Main2: 1 × 36	Main1: 1 × 46 Main2: 1 × 46
	Pipe type		Copper	
	Fin type	Type (Material) Surface treatment	Aluminum Blue fin	
Compressor	Type		DC Twin rotary	
Motor output		W	1,500	1,830
Refrigerant	Type (Global warming potential)		R32 (675)	
	Charge	g	1,900	2,400
Refrigerant oil	Type		FW68D	RmM68AF
	Amount	cm ³	600	800
Enclosure	Material		Steel sheet	
	Color		Beige Approximate color of Munsell 10YR 7.5/1.0	
Dimensions (H × W × D)	Net	mm	788 × 940 × 320	998 × 940 × 320
	Gross		966 × 1,027 × 445	1,176 × 1,027 × 445
Weight	Net	kg	53	62
	Gross		62	72
Connection pipe	Size	Liquid	Ø9.52 (Ø3/8)	
		Gas	Ø15.88 (Ø5/8)	
	Method		Flare	
	Pre-charge length	m	30	
	Max. length		30	
Max. height difference	30			
Operation range	Cooling	°C	-10 to 46	
	Heating		-15 to 24	
Drain hose	Material		LDPE	
	Tip diameter	mm	Ø 13.0 (I. D.), Ø 16.0 to Ø 16.7 (O. D.)	

NOTES:

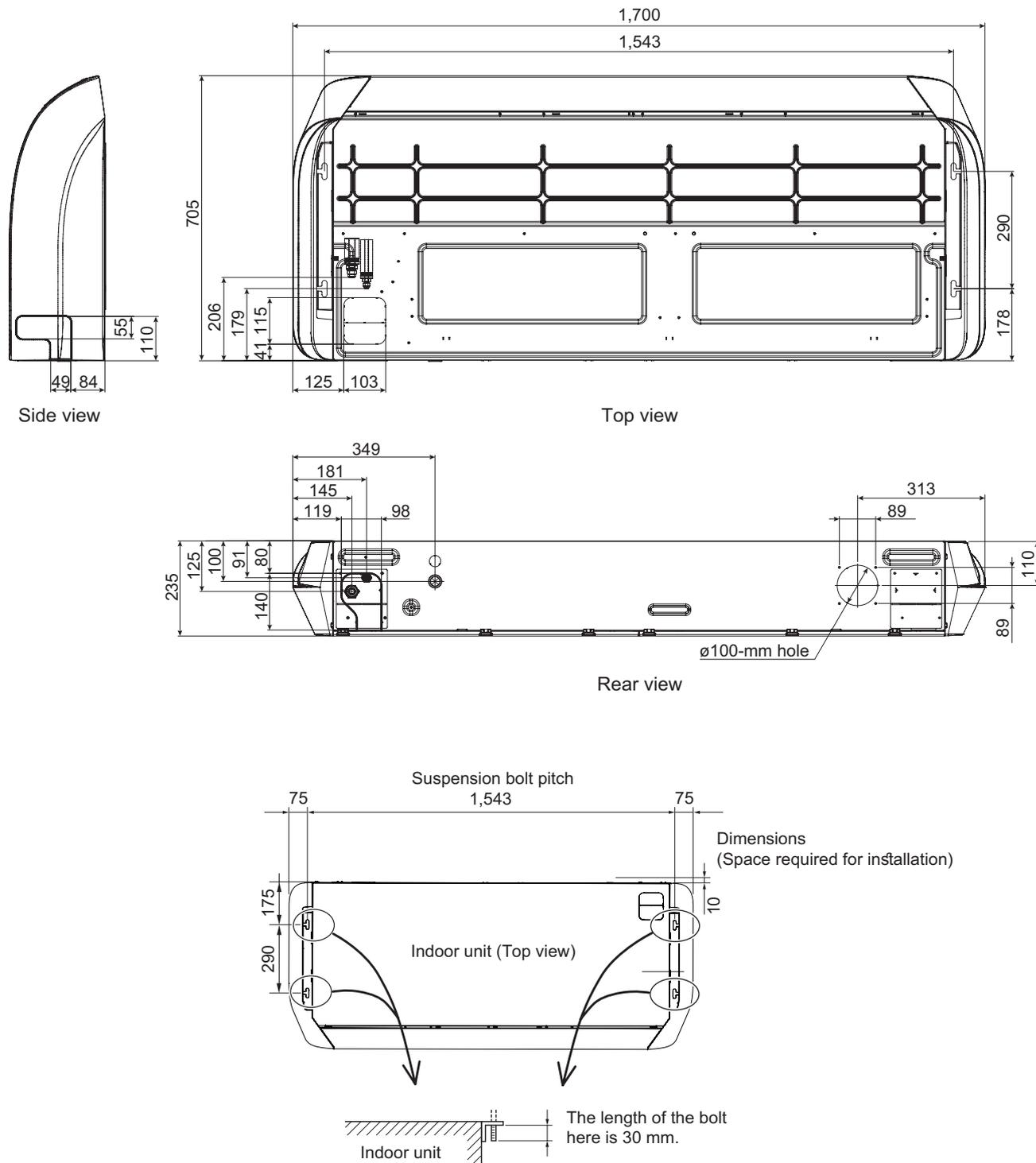
- Specifications are based on the following conditions:
 - Cooling: Indoor temperature of 27 °CDB/19 °CWB, and outdoor temperature of 35 °CDB/24 °CWB.
 - Heating: Indoor temperature of 20 °CDB/15 °CWB, and outdoor temperature of 7 °CDB/6 °CWB.
 - Pipe length: 5 m, Height difference: 0 m.
- Protective function might work when using it outside the operation range.
- *1: Sound pressure level
 - Measured values in manufacturer's anechoic chamber.
 - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.

2. Dimensions

2-1. Indoor unit

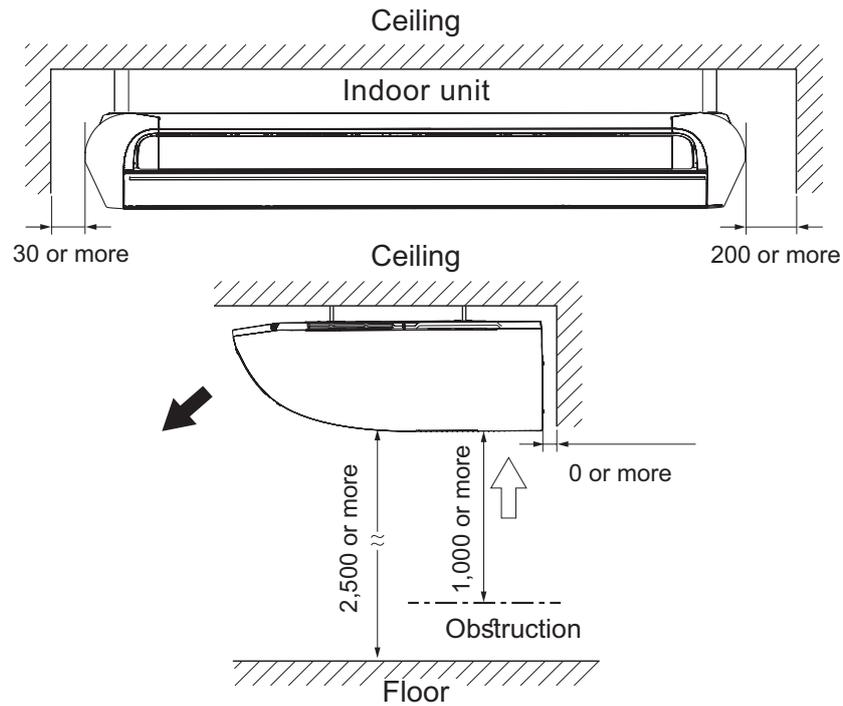
■ Models: ABHG36KRTA and ABHG45KRTA

Unit: mm



● Installation space requirement

Unit: mm

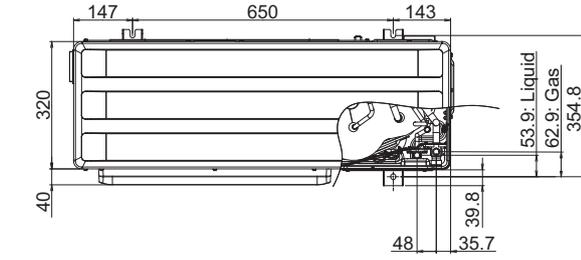


Required ceiling height varies according to the ceiling mode setting of function setting No. 20.

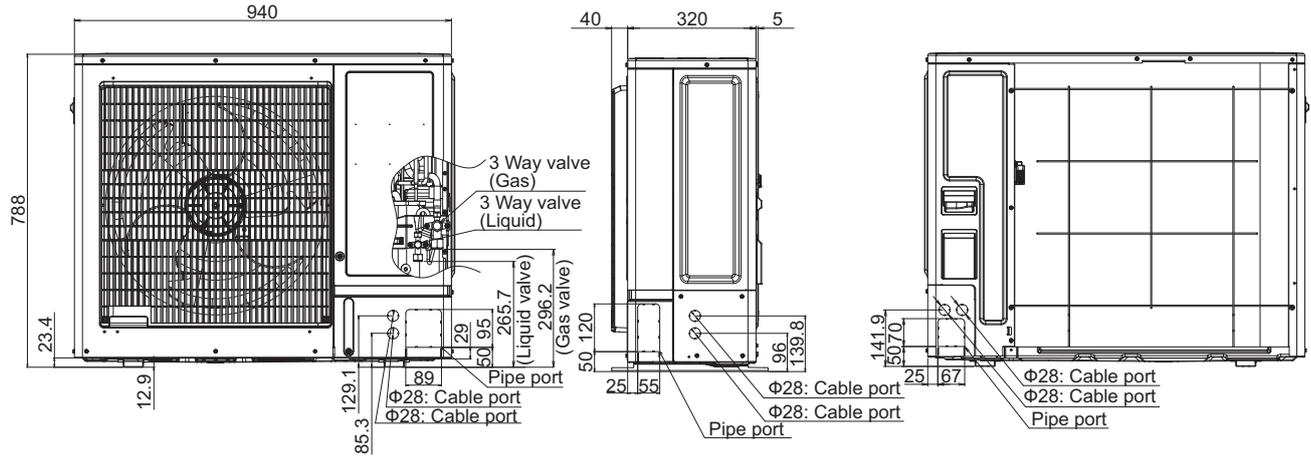
Ceiling height (m)		
Ceiling mode	Standard	High ceiling
36 and 45 models	3.5	4.3

2-2. Outdoor unit

Model: AOHG36KQTA



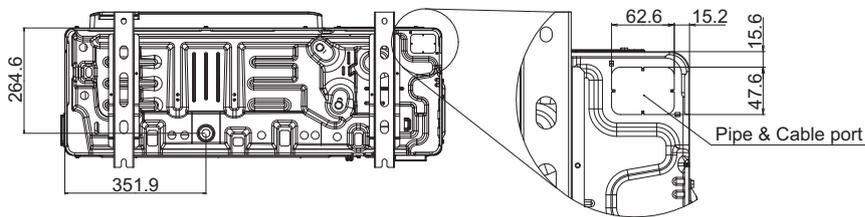
Top view



Front view

Side view

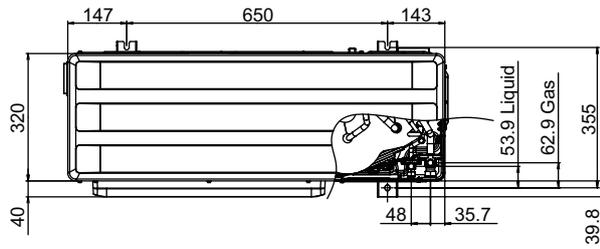
Rear view



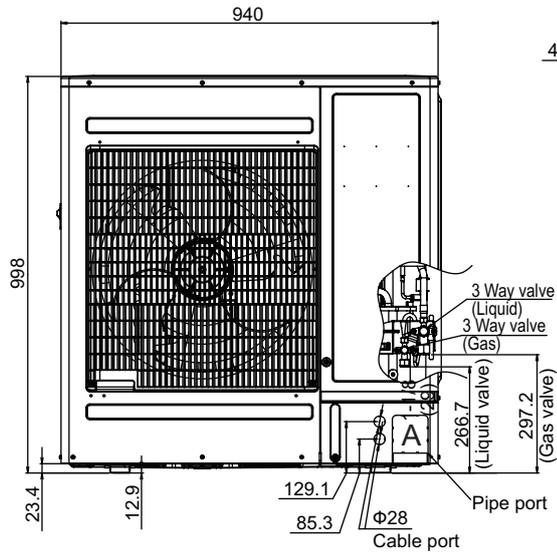
Bottom view

Model: AOHG45KQTA

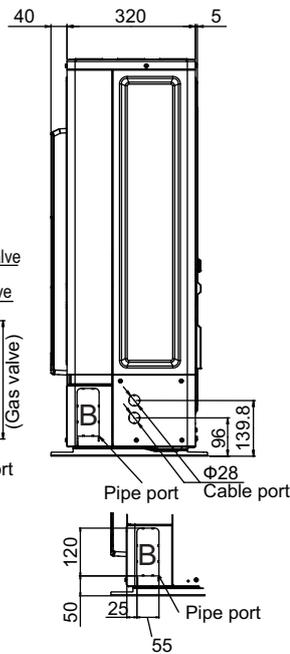
Unit: mm



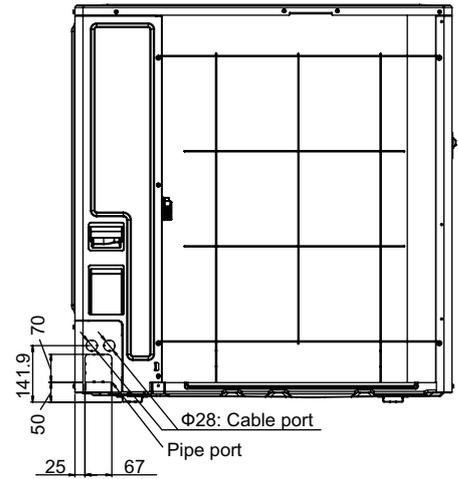
Top view



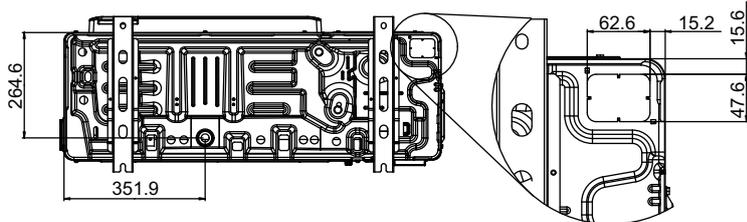
Front view



Side view



Rear view



Bottom view

Pipe & Cable port

2. TECHNICAL DATA AND PARTS LIST

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2. TECHNICAL DATA AND PARTS LIST

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1. Precautions

When you start servicing, pay attention to the following points. For detailed precautions, refer to the installation manual of the products.

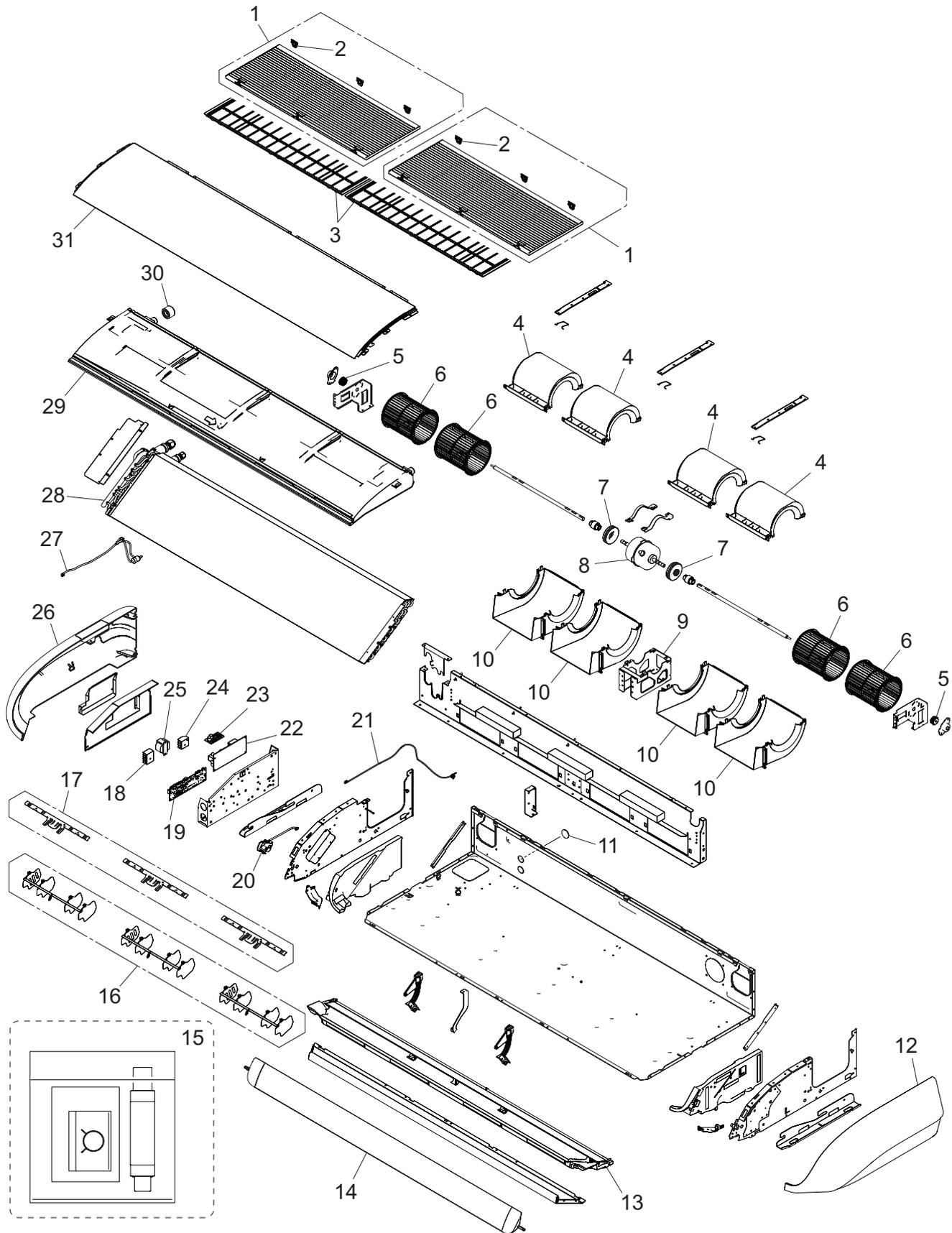
⚠ CAUTION

-
- Service personnel
 - Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
 - Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
 - Servicing shall be performed only as recommended by the manufacturer.
 - Work
 - Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. When repairing the refrigerant system, refer to the precautions written in the installation manual of the products before you start servicing.
 - Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
 - All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.
 - Work in confined spaces shall be avoided.
 - The area around the workspace shall be sectioned off.
 - Ensure that the conditions within the area have been made safe by control of flammable material.
 - Electric shock may occur. After turning off the power, always wait 5 minutes before touching electrical components.
 - Do not touch the fins of the heat exchanger. Touching the heat exchanger fins could result in damage to the fins or personal injury such as skin rupture.
 - Do not place any other electrical products or household belongings under the product.
 - Condensation dripping from the product might get them wet, and may cause damage or malfunction to the property.
 - Checking for presence of refrigerant
 - The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres.
 - Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.
-
- Service parts information and design are subject to change without notice for product improvement.
 - For the latest information of the service parts, refer to our Service Portal.
<https://fujitsu-general.force.com/portal/>
 - Precise figure of the service parts listed in this manual may differ from the actual service parts.

2. Indoor unit parts list

2-1. Models: ABHG36KRTA and ABHG45KRTA

■ Chassis



TECHNICAL DATA
AND PARTS LIST

TECHNICAL DATA
AND PARTS LIST

Item no.	Part no.	Part name	Service part
1	9384321008	Intake grille A sub assy	◆
2	9383344008	Grille hinge (3 pcs.)	◆
3	9383342004	Air filter A	◆
4	9384307002	Casing U assy	◆
5	9357921006	Bearing B assy	◆
6	9384110008	Sirocco fan assy	◆
7	9383443008	Rubber (Vibration proof)	◆
8	9603815004	Brushless DC motor	◆
9	9384236005	Motor mount assy	◆
10	9384311009	Casing B assy	◆
11	9352173011	Cap (Power)	◆
12	9383406003	Side panel L	◆
13	9384308009	Top panel cover assy (4-fan)	◆
14	9384144003	Flap assy (4-fan)	◆
15	9384324009	Hose sub assy	◆
16	9383384004	L and R louver	◆
17	9383385001	Base (Louver)	◆
18	9900896027	Terminal (5P)	◆
19	9711524010	Main PCB (for 36 model)	◆
	9711524027	Main PCB (for 45 model)	◆
20	9384312013	Gear box sub assy (including stepping motor)	◆
21	9900960049	Thermistor (Room)	◆
22	9710661044	Power supply PCB (for 36 model)	◆
	9710661037	Power supply PCB (for 45 model)	◆
23	9710019005	2-way remote PCB	◆
24	9306489045	Terminal (3P)	◆
25	9707457056	Reactor assy	◆
26	9384320001	Side panel R sub assy	◆
27	9900892029	Thermistor (Pipe)	◆
28	9384287007	Evaporator total assy	◆
29	9384364005	Drain pan total assy (4-fan)	◆
30	9358746004	Drain cap	◆
31	9384241009	Front panel (4-fan) assy	◆

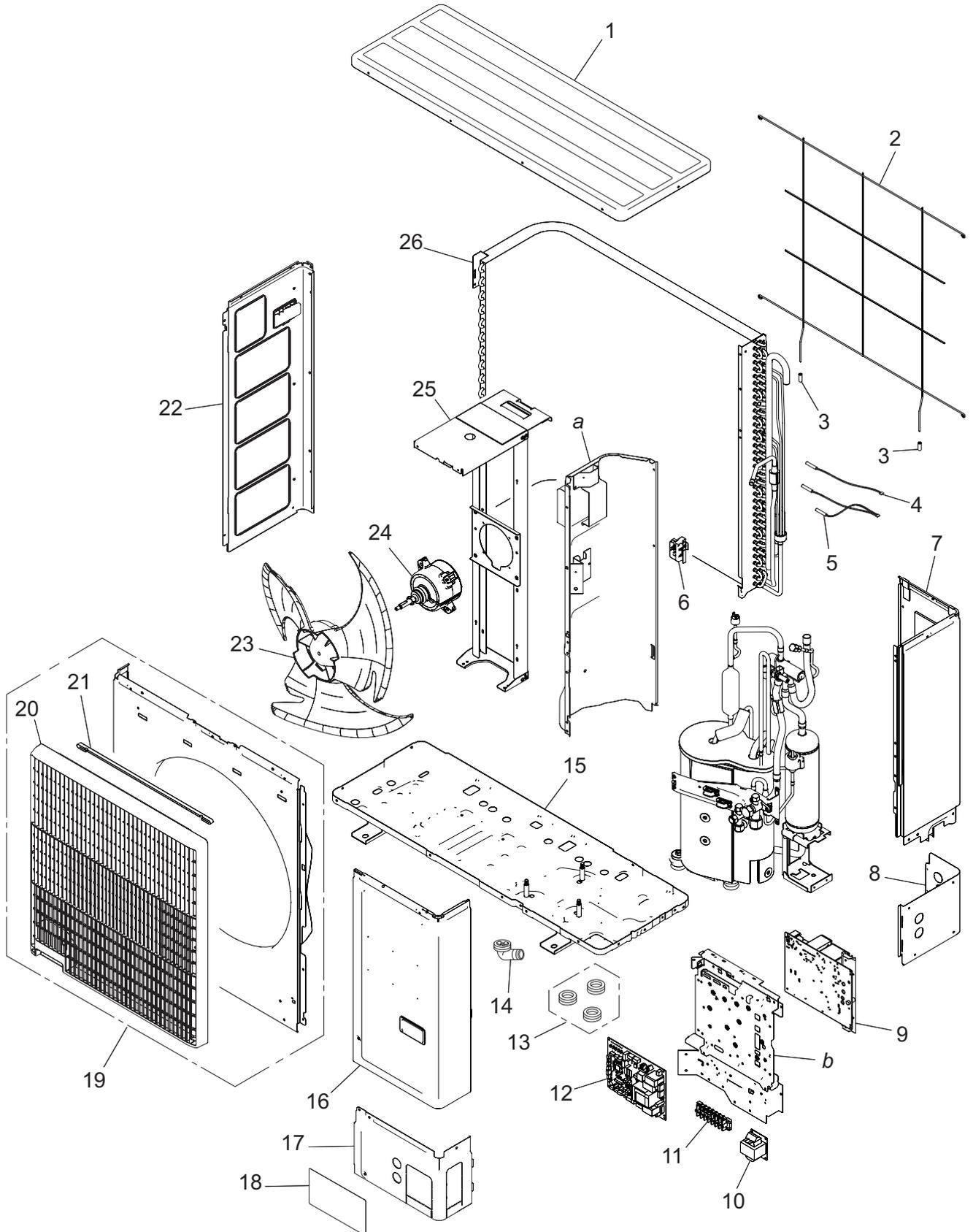
3. Outdoor unit parts list

3-1. Model: AOHG36KQTA

■ Exterior parts and chassis

TECHNICAL DATA
AND PARTS LIST

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AND PARTS LIST

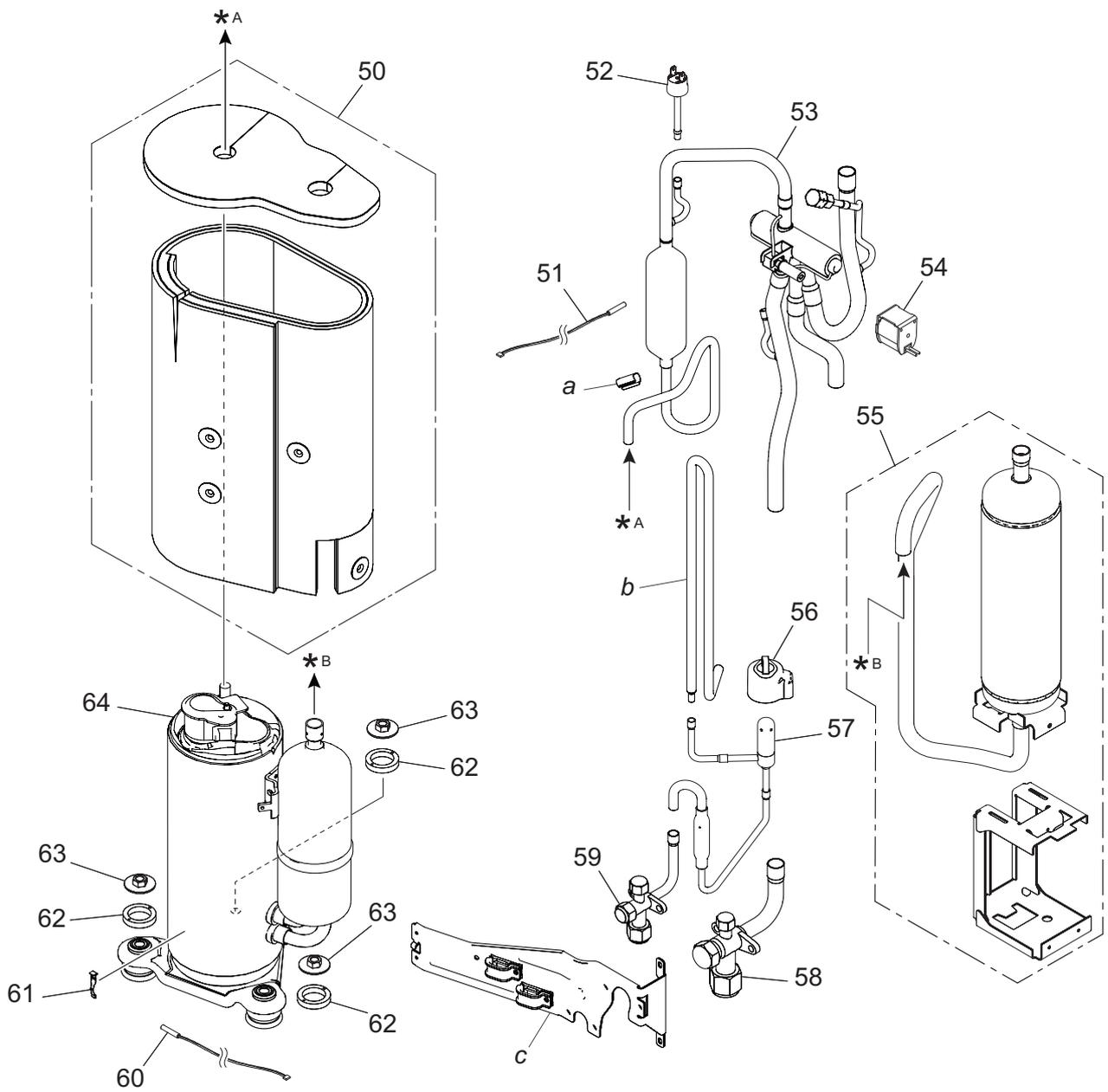


Item no.	Part no.	Part name	Service part
1	9383880001	Top panel assy	◆
2	9383779008	Protective net	◆
3	9375361013	Net rubber	◆
4	9900984038	Thermistor (Heat exchanger)	◆
5	9900727154	Thermistor assy	◆
6	9383607004	Thermo holder	◆
7	9383874000	Right panel assy	◆
8	9383879005	Rear pipe cover	◆
9	9709684139	Inverter PCB	◆
10	9900634025	Reactor assy	◆
11	9901053016	Terminal	◆
12	9711431332	Main PCB (Service)	◆
13	313166024302	Drain cap	◆
14	9303029015	Drain assy	◆
15	9350255009	Base assy (Service)	◆
16	9383876004	Service panel assy	◆
17	9383878008	Front pipe cover	◆
18	9372171059	Emblem rear	◆
19	9383863004	Front panel assy	◆
20	9383604003	Blow grille	◆
21	9383689000	Blow grille insulation	◆
22	9383882005	Left panel assy	◆
23	9383336003	Propeller fan	◆
24	9603732011	Brushless motor	◆
25	9383862007	Motor bracket assy	◆
26	9374420612	Condenser sub assy	◆
<i>a</i>	—	Separate wall assy	—
<i>b</i>	—	Control box unit	—

Compressor

TECHNICAL DATA
AND PARTS LIST

TECHNICAL DATA
AND PARTS LIST



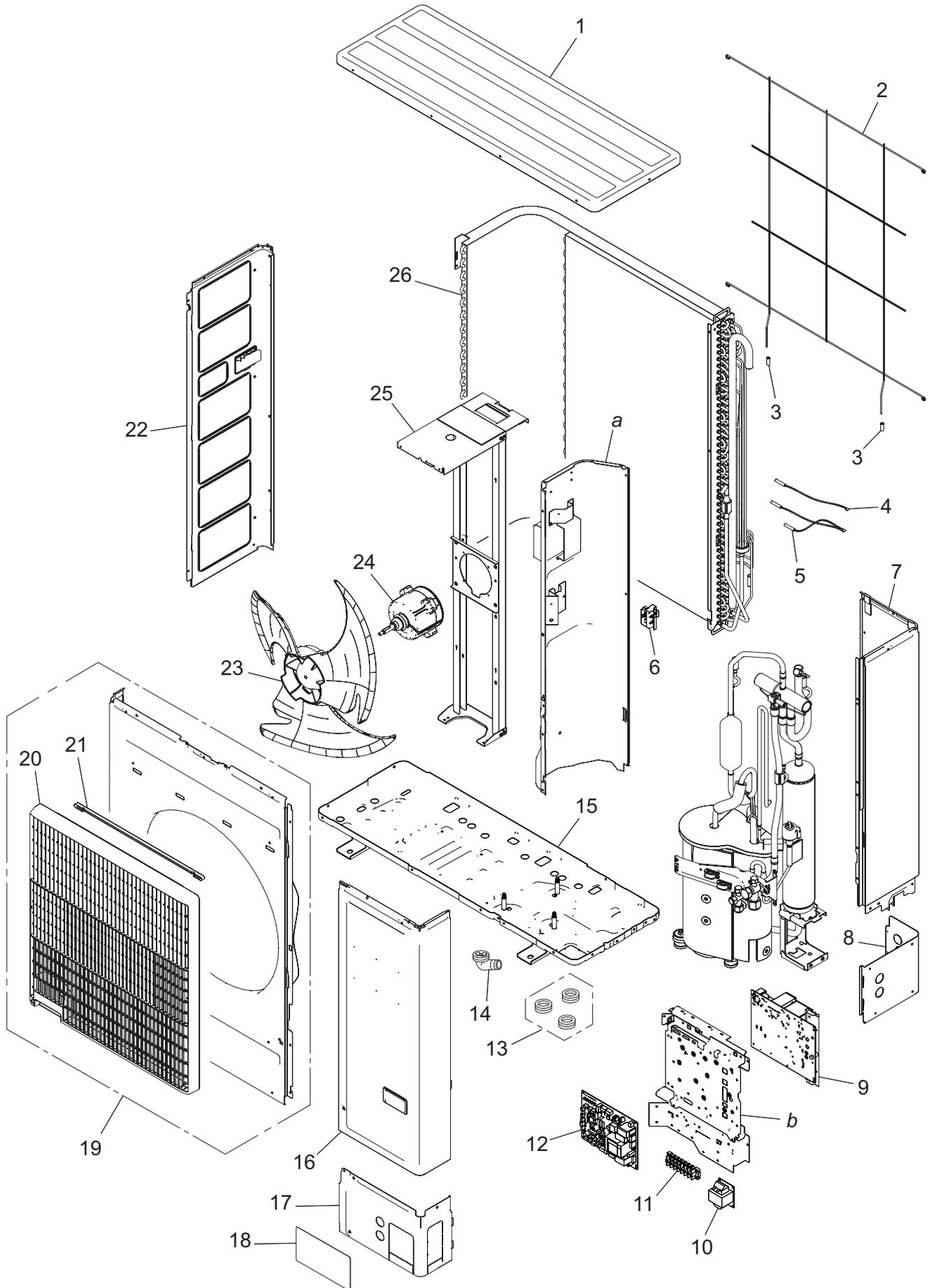
Item no.	Part no.	Part name	Service part
50	9383858000	Sound insulation unit	◆
51	9900565091	Thermistor (Outdoor temp.)	◆
52	9900186029	Pressure switch	◆
53	9374425648	4-way valve assy	◆
54	9970194016	Solenoid	◆
55	9384848017	Accumulator assy (service)	◆
56	9970209000	Expansion valve coil	◆
57	9370947328	Expansion valve assy	◆
58	9379079013	3-way valve assy	◆
59	9377958037	3-way valve assy	◆
60	9900985035	Thermistor (Compressor)	◆
61	9810028006	Thermistor stopper	◆
62	9379179072	Rubber washer E	◆
63	9377973016	Special nut	◆
64	9383821011	Compressor assy	◆
a	—	Thermostat holder	—
b	—	Joint pipe D	—
c	—	Wiring fixation unit	—

3-2. Model: AOHG45KQTA

■ Exterior parts and chassis

TECHNICAL DATA
AND PARTS LIST

TECHNICAL DATA
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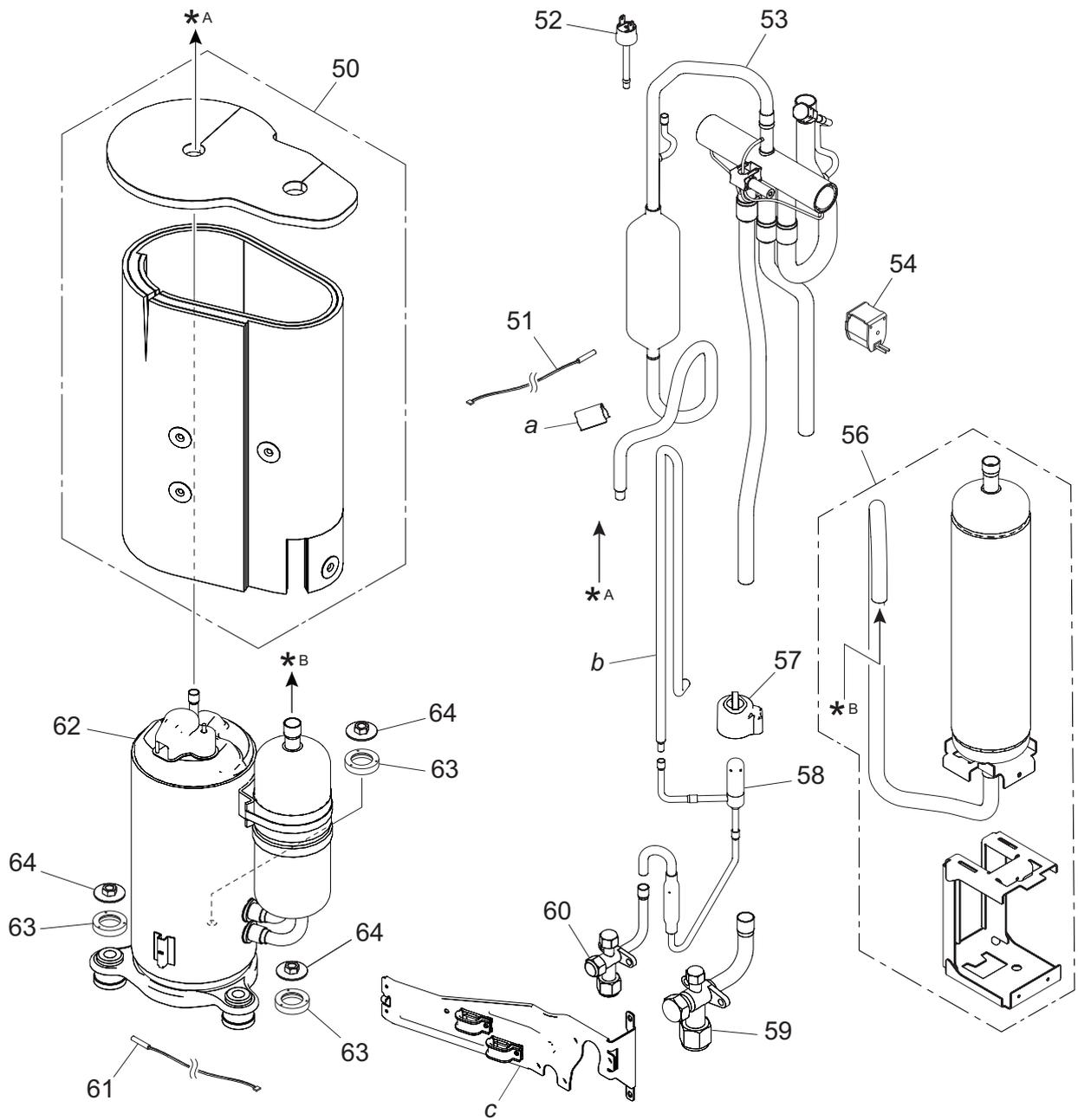


Item no.	Part no.	Part name	Service part
1	9383880001	Top panel assy	◆
2	9381013005	Protective net	◆
3	9375361013	Net rubber	◆
4	9900984038	Thermistor (Heat exchanger)	◆
5	9900727154	Thermistor assy	◆
6	9383607004	Thermo holder	◆
7	9383874017	Right panel sub assy	◆
8	9383879005	Rear pipe cover	◆
9	9709684153	Inverter PCB (for 45 model)	◆
	9709684146	Inverter PCB (for 54 model)	◆
10	9900634025	Reactor assy	◆
11	9901053016	Terminal	◆
12	9711431349	Main PCB (Service) (for 45 model)	◆
	9711431141	Main PCB (Service) (for 54 model)	◆
13	313166024302	Drain cap	◆
14	9303029015	Drain assy	◆
15	9350255009	Base assy (Service)	◆
16	9383876011	Service panel sub assy	◆
17	9383878008	Front pipe cover	◆
18	9372171059	Emblem rear	◆
19	9383863011	Front panel assy	◆
20	9383604003	Blow grille	◆
21	9383689000	Blow grille insulation	◆
22	9383882012	Left panel sub assy	◆
23	9383336003	Propeller fan	◆
24	9603733018	Brushless motor	◆
25	9383862021	Motor bracket assy	◆
26	9374420636	Condenser sub assy	◆
<i>a</i>	—	Separate wall assy	—
<i>b</i>	—	Control box unit	—

Compressor

TECHNICAL DATA
AND PARTS LIST

TECHNICAL DATA
AND PARTS LIST

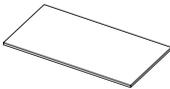
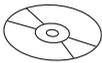
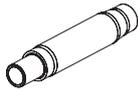
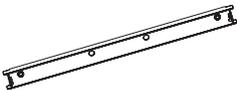
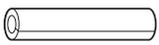


Item no.	Part no.	Part name	Service part
50	9383858017	Sound insulation unit	◆
51	9900565091	Thermistor (Outdoor temp.)	◆
52	9900186029	Pressure switch	◆
53	9374425662	4-way valve assy (for 45 model)	◆
	9374425655	4-way valve assy (for 54 model)	◆
54	9970194016	Solenoid	◆
56	9384848024	Accumulator assy (Service)	◆
57	9970209000	Expansion valve coil	◆
58	9370947311	Expansion valve assy	◆
59	9379079013	3-way valve assy	◆
60	9377958037	3-way valve assy	◆
61	9900985028	Thermistor (Compressor)	◆
62	9810627001	Compressor (for 45 model)	◆
	9810626004	Compressor (for 54 model)	◆
63	9379179089	Rubber washer F	◆
64	9377973016	Special nut	◆
<i>a</i>	—	Thermistor spring	—
<i>b</i>	—	Joint pipe D	—
<i>c</i>	—	Accumulator holder A	—
<i>d</i>	—	Wiring fixation unit	—

4. Accessories

4-1. Indoor unit

■ Models: ABHG36KRTA and ABHG45KRTA

Part name	Exterior	Q'ty	Part name	Exterior	Q'ty
Operating manual		1	Insulation		1
Operating manual (CD-ROM)		1	Drain hose		1
Installation manual		1	Hose band		1
Template		1	Cable tie (large)		4
M10 nut A (with flange)		4	Cable tie (small)		1
M10 nut B (with spring lock washer)		4	Remote controller cable hole cap		1
Washer		8	Tapping screw (White)		6
Coupler heat insulation (large)		1	Casing guard		1
Coupler heat insulation (small)		1	Tapping screw		3

4-2. Outdoor unit

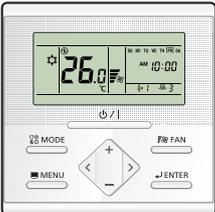
■ Models: AOHG36KQTA and AOHG45KQTA

Part name	Exterior	Q'ty	Part name	Exterior	Q'ty
Installation manual		1	Drain cap		3
Drain pipe		1	One-touch bush		2

5. Optional parts

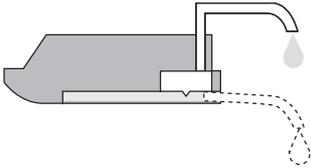
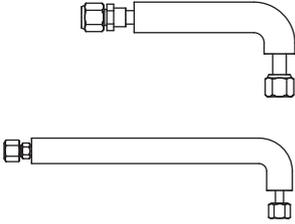
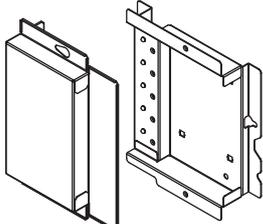
5-1. Indoor unit

■ Controllers

Exterior	Part name	Model name	Summary
	Wired remote controller	UTY-RNRGZ*	Easy finger touch operation with LCD panel. Backlit LCD enables easy operation in a dark room. Wire type: Non-polar 2-wire
	Wired remote controller	UTY-RLRG	High visibility and easy operation. Room temperature can be accurately controlled using the built-in thermo sensor. Wire type: Non-polar 2-wire
	Compact wired remote controller	UTY-RCRGZ1	Compact body and easy operation. Room temperature can be accurately controlled using the built-in thermo sensor. Wire type: Non-polar 2-wire
	Simple remote controller	UTY-RSRG	Compact remote controller concentrates on the basic functions such as Start/Stop, fan control, temperature setting, and operation mode. Wire type: Non-polar 2-wire
	Simple remote controller	UTY-RHRG	Compact remote controller concentrates on the basic functions such as Start/Stop, fan control, and temperature setting. Wire type: Non-polar 2-wire
	IR receiver kit with wireless remote controller	UTY-LBTGH	Unit control is performed by wireless remote controller.

NOTE: Available functions may differ by the remote controller. For details, refer to the operation manual.

Others

Exterior	Part name	Model name	Summary
	Drain pump unit	UTR-DPB24T	Optional drain lift-up mechanism allows more flexible installation.
	Auxiliary pipe assembly	UTP-FX35A	For piping of upward direction only. <ul style="list-style-type: none"> For liquid: 9.52 mm (3/8 in) For gas: 15.88 mm (5/8 in)
	External connect kit	UTY-XWZXZG	Use to connect with various peripheral devices and air conditioner PCB. For control output port.
	External input and output PCB	UTY-XCSX	Use to connect with external devices and air conditioner PCB.
	External input and output PCB box	UTZ-GXEA	For installing the External input and output PCB.
	Wireless LAN adapter	UTY-TFSXZ1	Remotely manage an air conditioning system using mobile devices such as smartphones and tablets. For connection indoor unit with UART interface. Appropriate application for each region is required to use this option. For details, contact FGL sales company.
	Modbus converter	UTY-VMSX	For connection between indoor unit with UART interface and a Modbus open network.
	KNX converter	UTY-VKSX	For connection between indoor unit with UART interface and a KNX open network.
	Network converter	UTY-VTGX	This converter is required when connecting single split system to VRF network system.

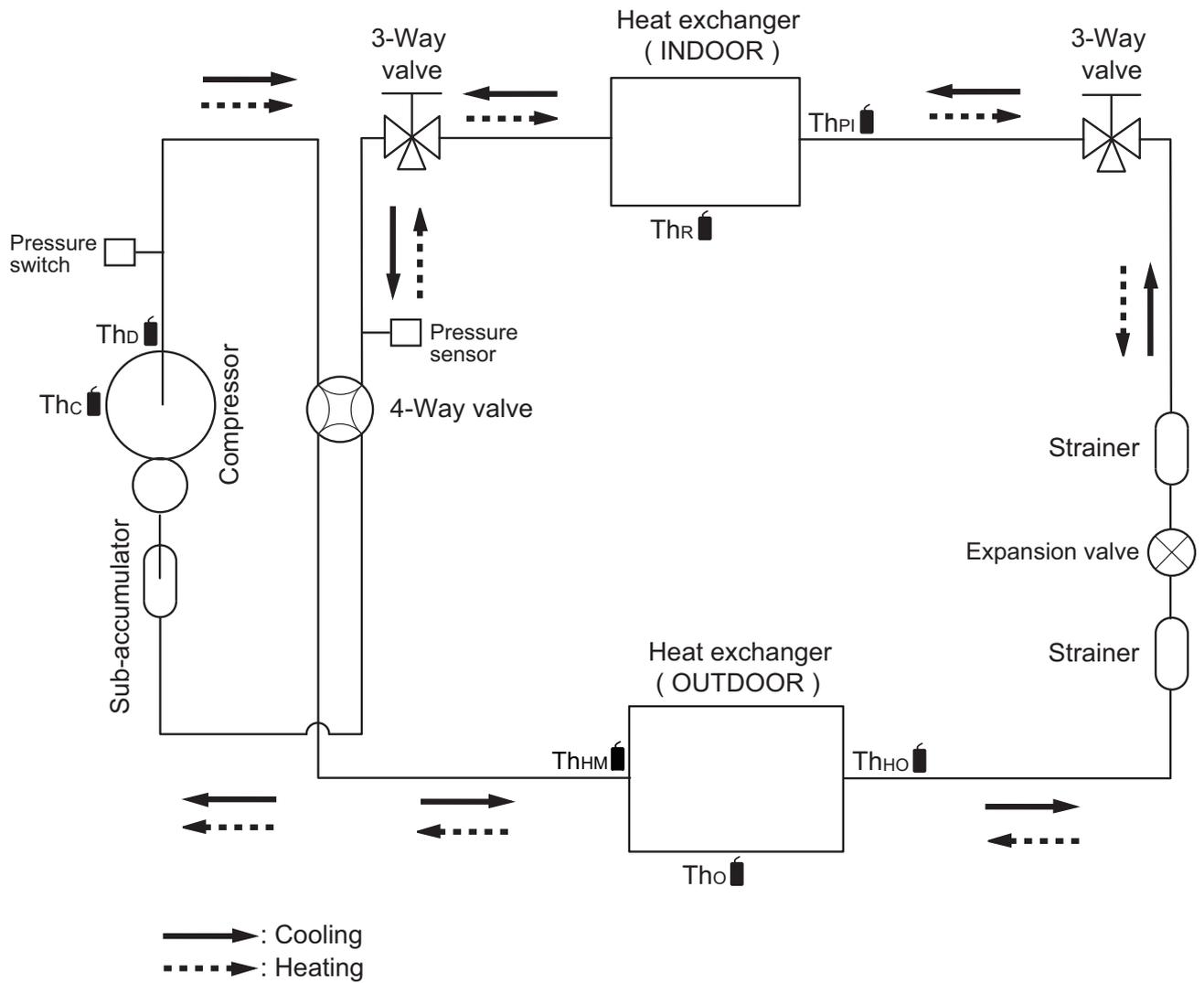
Exterior	Part name	Model name	Summary
	Network converter (AC power supply)	UTY-VTGXV	This converter is required when connecting single split system to VRF network system.
	External switch controller	UTY-TERX	Air conditioner switching can be controlled by connecting other external sensor switches.

NOTE: Combined use of following optional parts and Wireless LAN adapter (UTY-TFSXZ1) is not allowed.

- External input and output PCB (UTY-XCSX)
- Modbus converter
- KNX converter

6. Refrigerant system diagrams

6-1. Models: AOHG36KQTA and AOHG45KQTA



- Th_c : Thermistor (Compressor temperature)
- Th_D : Thermistor (Discharge temperature)
- Th_{HM} : Thermistor (Heat Exchanger Med temperature)
- Th_o : Thermistor (Outdoor temperature)
- Th_{HO} : Thermistor (Heat Exchanger Out temperature)
- Th_R : Thermistor (Room temperature)
- Th_{PI} : Thermistor (Pipe temperature)

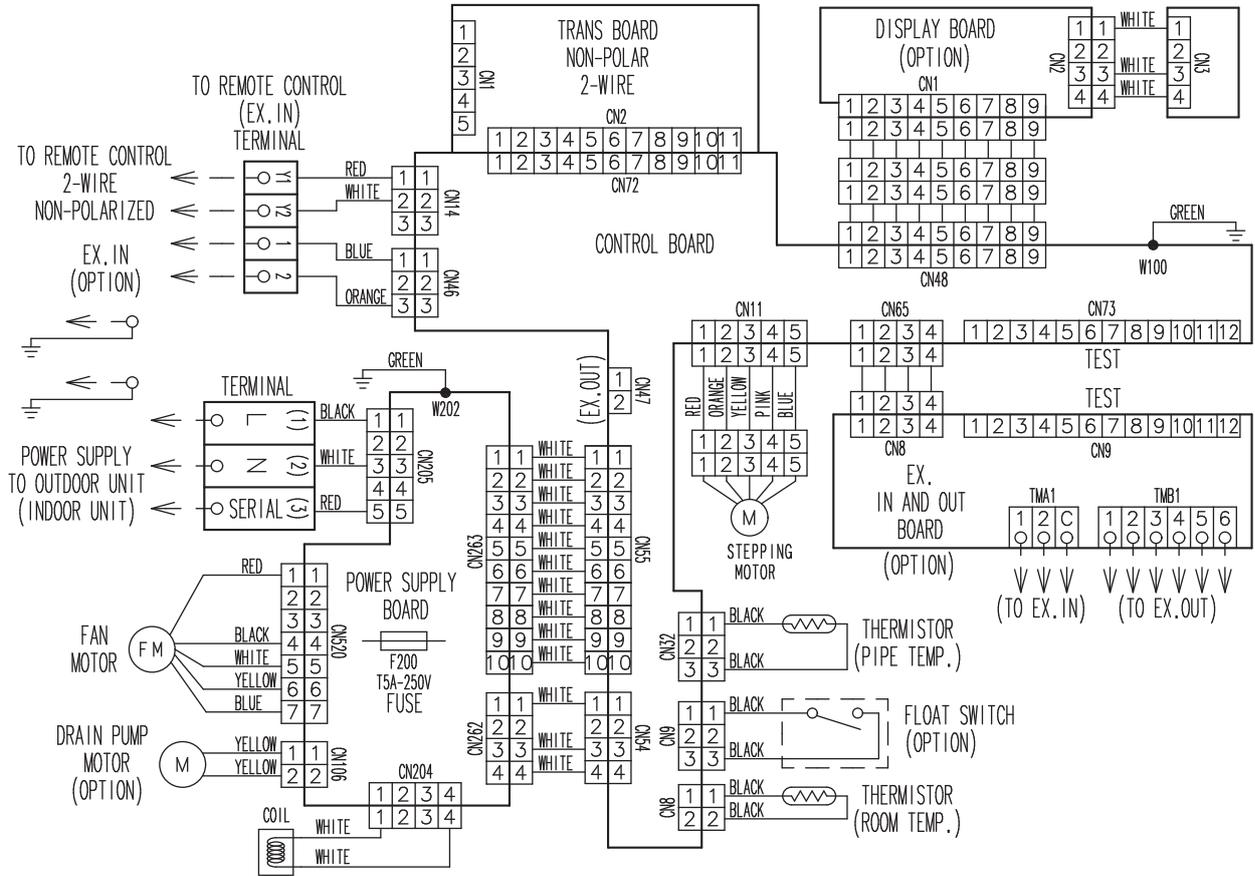
TECHNICAL DATA
AND PARTS LIST

TECHNICAL DATA
AND PARTS LIST

7. Wiring diagrams

7-1. Indoor unit

Models: ABHG36KRTA and ABHG45KRTA



TECHNICAL DATA AND PARTS LIST

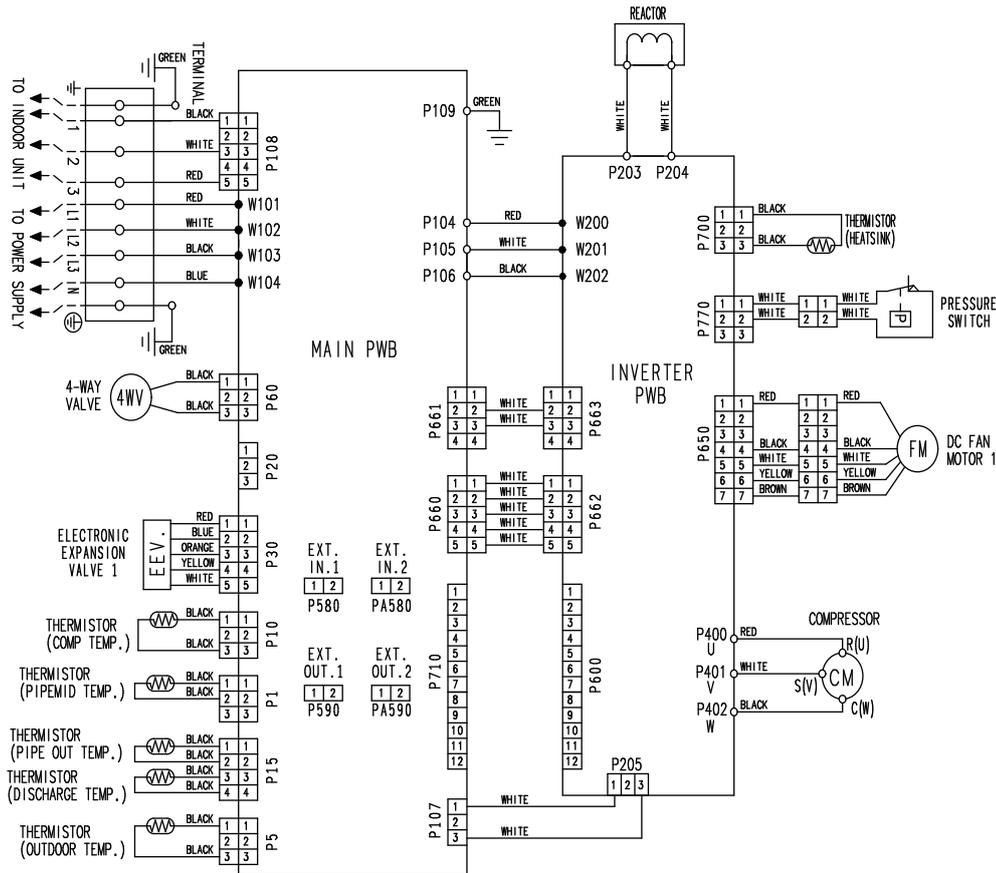
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7-2. Outdoor unit

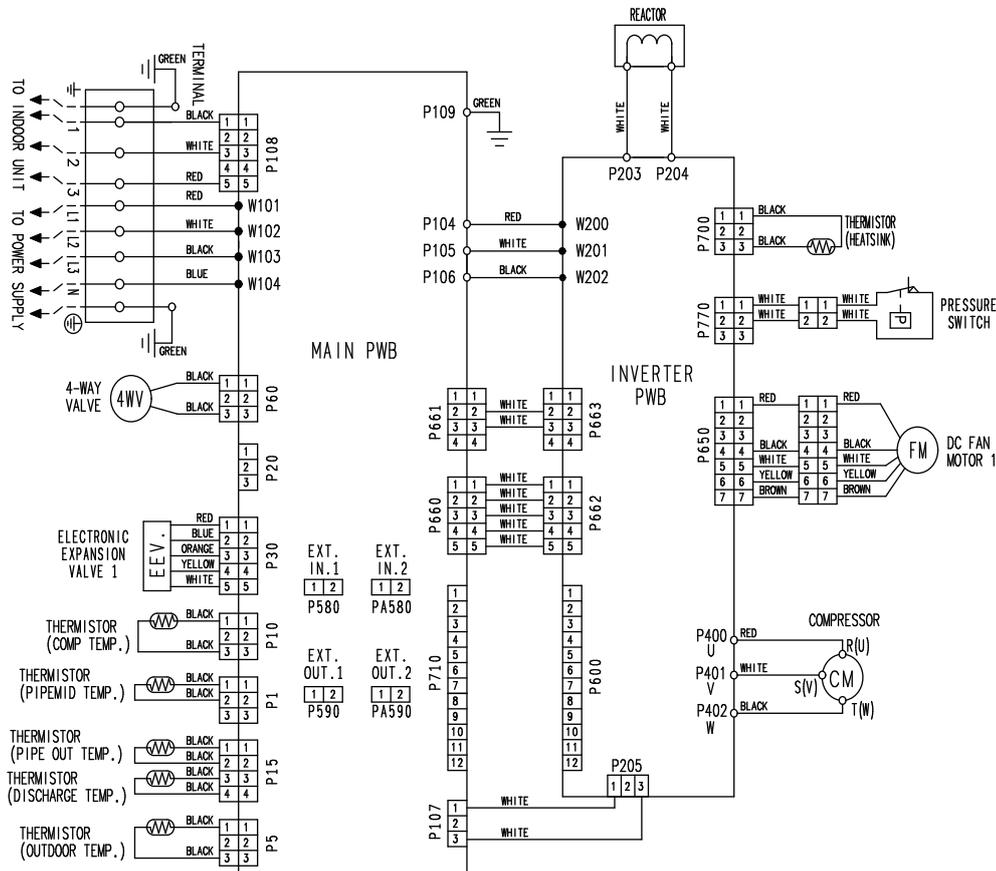
Model: AOHG36KQTA

TECHNICAL DATA AND PARTS LIST

TECHNICAL DATA AND PARTS LIST



Model: AOHG45KQTA



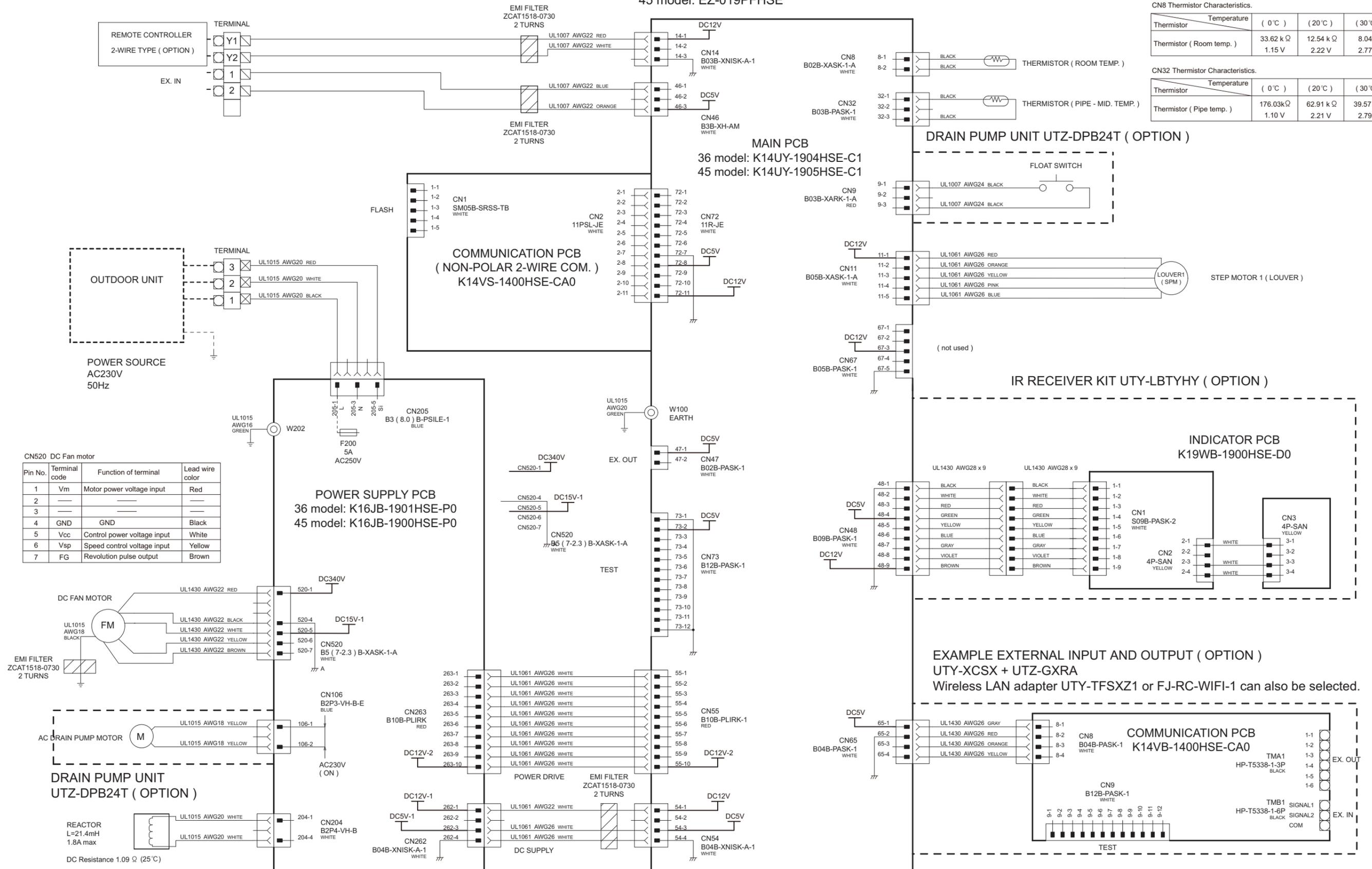
8. PC board diagrams

8-1. Models: ABHG36KRTA and ABHG45KRTA

TECHNICAL DATA AND PARTS LIST

TECHNICAL DATA AND PARTS LIST

CONTROL UNIT
36 model: EZ-019MHSE
45 model: EZ-019PFHSE



CN8 Thermistor Characteristics.

Thermistor	Temperature (0°C)	(20°C)	(30°C)
Thermistor (Room temp.)	33.62 k Ω	12.54 k Ω	8.04 k Ω
	1.15 V	2.22 V	2.77 V

CN32 Thermistor Characteristics.

Thermistor	Temperature (0°C)	(20°C)	(30°C)
Thermistor (Pipe temp.)	176.03k Ω	62.91 k Ω	39.57 k Ω
	1.10 V	2.21 V	2.79 V

CN520 DC Fan motor

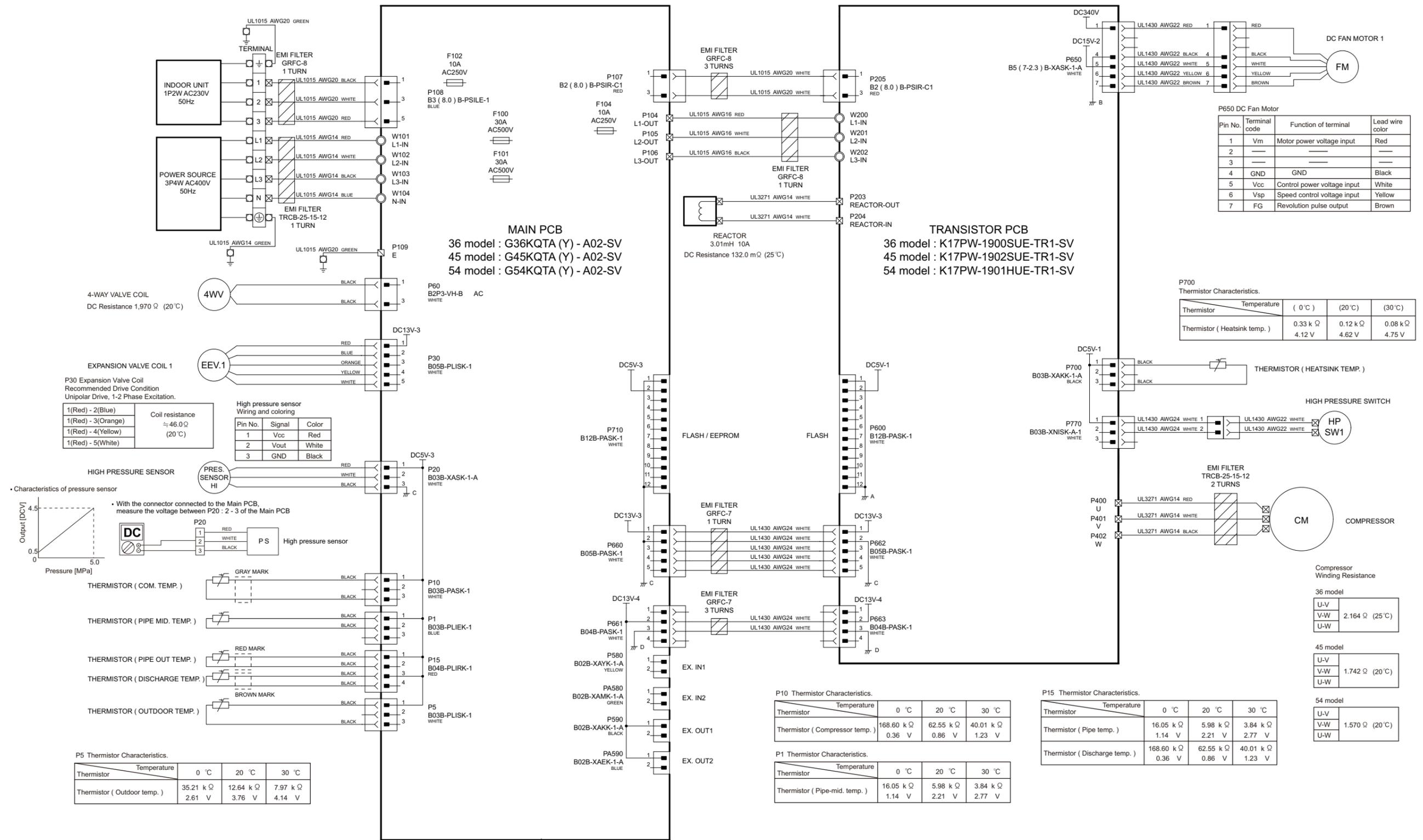
Pin No.	Terminal code	Function of terminal	Lead wire color
1	Vm	Motor power voltage input	Red
2			
3			
4	GND	GND	Black
5	Vcc	Control power voltage input	White
6	Vsp	Speed control voltage input	Yellow
7	FG	Revolution pulse output	Brown

8-2. Models: AOHG36KQTA and AOHG45KQTA

TECHNICAL DATA AND PARTS LIST

TECHNICAL DATA AND PARTS LIST

INVERTER ASSEMBLY
 36 model : EZ-0190HUE
 45 model : EZ-0193HUE
 54 model : EZ-0191HUE



3. TROUBLESHOOTING

CONTENTS

3. TROUBLESHOOTING

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1. Error code

When a problem occurs in the system or the connected device, the error content is notified by displaying the code.

NOTE: This function is only available in a system with indoor or IR receiver units equipped with indicator lamps to show the error content.

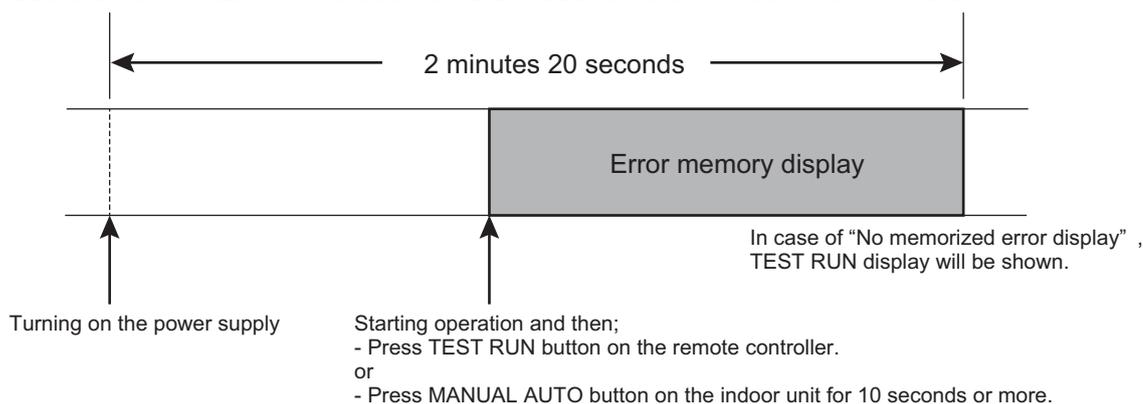
Errors, once displayed, will be automatically stored in the PC board of the indoor unit. Even if the power is disconnected, the memory containing the error history will not be erased.

If another error occurs later, the stored error memory will be updated automatically and replaced with the new one. (Previous error will be erased.)

1-1. How to check the error memory

When an error occurs, the operation lamp (Green) and the timer lamp (Orange) indicate the error content by blinking. To check the error memory, follow the procedures below.

1. Stop the operation of the air conditioner, and then disconnect the power supply.
2. Reconnect the power supply.
3. In one of the following two methods, the memorized error is only displayed during the “3 minutes ST”^{*} state period.
 - Start the operation and then press the TEST RUN button on the remote controller.
 - Press the MANUAL AUTO button on the indoor unit for 10 seconds or more.



*: The “3 minutes ST” period lasts 2 minutes and 20 seconds after turning on the power supply.

1-2. How to erase the error memory

The error memory can be erased in one of the following two methods.

- Manual erase: Pressing the MANUAL AUTO button on the indoor unit while the “Error memory display” is being shown. (Short beep emits for about 3 seconds.)
- Automatic erase: After continuing the normal operation of the air conditioner without error for 2 hours or longer after displaying the error memory as described in [How to check the error memory](#). (Except FAN operation mode.)

1-3. Error code table (Wired remote controller)

The operation, timer, and economy indicators operate according to the error contents.
For confirmation of the error contents, refer the flashing pattern as follows.

Error contents	Wired remote controller display
E: 11. Serial communication error (Serial reverse transfer error) (Outdoor unit)	11
E: 11. Serial communication error (Serial forward transfer error) (Indoor unit)	11
E: 12. Wired remote controller communication error (Indoor unit)	12
E: 15. Automatic air flow adjustment error (Indoor unit)	15
E: 22. Indoor unit capacity error (Indoor unit)	22
E: 23. Combination error (Outdoor unit)	23
E: 32. Indoor unit main PCB error (Indoor unit)	32
E: 33. Indoor unit motor electricity consumption detection error (Indoor unit)	33
E: 35. MANUAL AUTO button error (Indoor unit)	35
E: 39. Indoor unit power supply error for fan motor (Indoor unit)	39
E: 41. Room temperature sensor error (Indoor unit)	41
E: 42. Indoor unit heat exchanger sensor error (Indoor unit)	42
E: 51. Indoor unit fan motor error (Indoor unit)	51
E: 53. Drain pump error (Indoor unit)	53
E: 62. Outdoor unit main PCB error (Outdoor unit)	62
E: 63. Inverter error (Outdoor unit)	63
E: 64. PFC circuit error (Outdoor unit)	64
E: 65. Trip terminal L error (Outdoor unit)	65
E: 71. Discharge thermistor error (Outdoor unit)	71
E: 72. Compressor thermistor error (Outdoor unit)	72
E: 73. Heat exchanger (Middle/Outlet) temperature thermistor error (Outdoor unit)	73
E: 74. Outdoor temperature thermistor error (Outdoor unit)	74
E: 77. Heat sink thermistor error (Outdoor unit)	77
E: 84. Current sensor error (Outdoor unit)	84
E: 86. High pressure switch error (Outdoor unit)	86
E: 94. Trip detection (Outdoor unit)	94
E: 95. Compressor motor control error (Outdoor unit)	95
E: 97. Outdoor unit fan motor error (Outdoor unit)	97
E: 99. 4-way valve error (Outdoor unit)	99
E: A1. Discharge temperature error (Outdoor unit)	A1
E: A3. Compressor temperature error (Outdoor unit)	A3
E: AC. Heat sink temperature error (Outdoor unit)	AC

1-4. Error code table (Outdoor unit)

The operation status is determined by the lighting up and blinking of the LED lamp.
After check that ERROR LED lamp blinks, press the ENTER button once.

NOTE: For the positions of LED lamp and buttons, refer to "Function settings for outdoor unit" in Chapter 5. FIELD WORKING on page 05-6.

Error contents	POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT		
			L1	L2	L3	L4	L5	L6
E: 11. Serial communication error (Serial forward transfer error) (Indoor unit)	■ 2	●	■ 1	■ 1	○	○	●	●
E: 11. Serial communication error (Serial forward transfer error) (Indoor unit)	■ 2	●	■ 1	■ 1	○	●	○	○
E: 12. Wired remote controller communication error (Indoor unit)	■ 2	●	■ 5	■ 15	○	○	○	●
E: 23. Combination error (Outdoor unit)	■ 2	●	■ 5	■ 15	○	○	○	●
E: 32. Indoor unit main PCB error (Indoor unit)	■ 2	●	■ 5	■ 15	○	○	○	●
E: 35. MANUAL AUTO button error (Indoor unit)	■ 2	●	■ 5	■ 15	○	○	○	●
E: 41. Room temperature sensor error (Indoor unit)	■ 2	●	■ 5	■ 15	○	○	○	●
E: 42. Indoor unit heat exchanger sensor error (Indoor unit)	■ 2	●	■ 5	■ 15	○	○	○	●
E: 51. Indoor unit fan motor error (Indoor unit)	■ 2	●	■ 5	■ 15	○	○	○	●
E: 62. Outdoor unit main PCB error (Outdoor unit)	■ 2	●	■ 6	■ 2	○	○	○	●
E: 63. Inverter error (Outdoor unit)	■ 2	●	■ 6	■ 3	○	○	○	●
E: 65. Trip terminal L error (Outdoor unit)	■ 2	●	■ 6	■ 5	○	○	●	●
E: 71. Discharge thermistor error (Outdoor unit)	■ 2	●	■ 7	■ 1	○	○	○	●
E: 72. Compressor thermistor error (Outdoor unit)	■ 2	●	■ 7	■ 2	○	○	○	●
E: 73. Heat exchanger (Middle/Outlet) temperature thermistor error (Outdoor unit)	■ 2	●	■ 7	■ 3	○	○	●	○
E: 73. Heat exchanger (Middle/Outlet) temperature thermistor error (Outdoor unit)	■ 2	●	■ 7	■ 3	○	○	●	●
E: 74. Outdoor temperature thermistor error (Outdoor unit)	■ 2	●	■ 7	■ 4	○	○	○	●
E: 77. Heat sink thermistor error (Outdoor unit)	■ 2	●	■ 7	■ 7	○	○	○	●
E: 84. Current sensor error (Outdoor unit)	■ 2	●	■ 8	■ 4	○	○	○	●
E: 86. High pressure switch error (Outdoor unit)	■ 2	●	■ 8	■ 6	○	●	○	○
E: 94. Trip detection (Outdoor unit)	■ 2	●	■ 9	■ 4	○	○	○	●
E: 95. Compressor motor control error (Outdoor unit)	■ 2	●	■ 9	■ 5	○	○	○	●
E: 97. Outdoor unit fan motor error (Outdoor unit)	■ 2	●	■ 9	■ 7	○	○	●	●

Error contents	POWER/ MODE	ERROR	PUMP DOWN	LOW NOISE			PEAK CUT		
			L1	L2	L3	L4	L5	L6	
E: 99. 4-way valve error (Outdoor unit)	■ 2	●	■ 9	■ 9	○	○	○	●	
E: A1. Discharge temperature error (Outdoor unit)	■ 2	●	■ 10	■ 1	○	○	○	●	
E: A3. Compressor temperature error (Outdoor unit)	■ 2	●	■ 10	■ 3	○	○	○	●	
E: AC. Heat sink temperature error (Outdoor unit)	■ 2	●	■ 10	■ 12	○	○	●	●	

● : Light on ○ : Light off ■ (n) : n Times blinking

2. Troubleshooting with error code

2-1. E: 11. Serial communication error (Serial reverse transfer error) (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 11
Detective actuator	Outdoor unit	Main PCB	When the indoor unit cannot receive the serial signal from outdoor unit more than 2 minutes after power on, or the indoor unit cannot receive the serial signal more than 15 seconds during normal operation.
		Fan motor	
Forecast of cause			Connection failure
			External cause
			Main PCB failure
			Outdoor unit fan motor failure

Check point 1. Reset the power and operate

Does error indication show again?

→ If no, go to "Check point 1-2".



Check point 2. Check connection

Check any loose or removed connection line of indoor unit and outdoor unit.

Check connection condition is control unit. (If there is loose connector, open cable or mis-wiring.)

→ If there is an abnormal condition, correct it by referring to the installation manual or the "DESIGN & TECHNICAL MANUAL".



Check point 3. Check the voltage of power supply

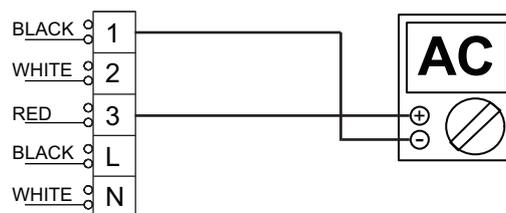
Check the voltage of power supply

Check if AC 198 V (AC 220 V -10%) to AC 264 V (AC 240 V +10%) appears at outdoor unit terminal L - N.



Check point 4. Check serial signal (Reverse transfer signal)

Check serial signal (Reverse transfer signal)



- Check if indicated value swings between AC 90 V and AC 270 V at the outdoor unit terminal 1—3.
- If it is abnormal, check the parts below.
 - Outdoor unit fan motor in "[Service parts information](#)" on page 03-49
- If outdoor fan motor is abnormal, replace outdoor unit fan motor and main PCB.
- If the checked parts are normal, replace the main PCB.



End

Check point 1-2. Check external cause such as noise

- Check the complete insulation of the grounding.
- 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).



End

2-2. E: 11. Serial communication error (Serial forward transfer error) (Indoor unit)

Indicator	Wired remote controller	Error code	E: 11
Detective actuator	Indoor unit	Main PCB	When the outdoor unit cannot receive the serial signal from indoor unit more than 10 seconds.
Forecast of cause			Connection failure
			External cause
			Main PCB failure

Check point 1. Reset the power and operate

Does error indication show again?

→ If no, go to "Check point 1-2".



Check point 2. Check connection

Check any loose or removed connection line of indoor unit and outdoor unit.

Check connection condition is control unit. (If there is loose connector, open cable or mis-wiring.)

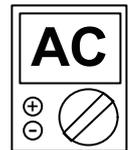
→ If there is an abnormal condition, correct it by referring to the installation manual or the "DESIGN & TECHNICAL MANUAL".



Check point 3. Check the voltage of power supply

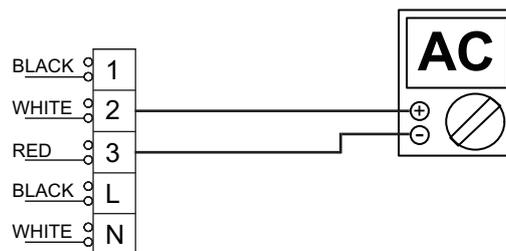
Check the voltage of power supply

Check if AC 198 V (AC 220 V -10%) to AC 264 V (AC 240 V +10%) appears at outdoor unit terminal L - N.



Check point 4. Check serial signal (Forward transfer signal)

Check serial signal (Forward transfer signal)



- Check if indicated value swings between AC 30 V and AC 130 V at outdoor unit terminal 2—3.
- If it is abnormal, replace main PCB.



End

Check point 1-2. Check external cause such as noise

- Check the complete insulation of the grounding.
- 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).



End

2-3. E: 12. Wired remote controller communication error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 12
Detective actuator	Indoor unit	Main PCB	When the indoor unit cannot receive the signal from Wired remote controller more than 1 minute during normal operation.
	Wired remote control		
Forecast of cause			Terminal connection abnormal
			Wired remote control failure
			Main PCB failure

Check point 1. Check the connection of terminal

After turning off the power, check & correct the followings.

- Check the connection of terminal between wired remote controller and indoor unit, and check if there is a disconnection of the cable.



Check Point 1-2 : Check Wired remote controller and main PCB

Check voltage at CN14 of main PCB (terminal 1—3, terminal 1—2). (Power supply to the remote controller)

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



- If it is DC 12 V, remote controller is failure. (Main PCB is normal)
 - Replace remote control
- If it is DC 0 V, main PCB is failure. (Check remote controller once again)
 - Replace main PCB



End

Check Point 2 : Wire installation wrong remote controller group setting

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



Check Point 2-1 : Check Indoor unit main PCB

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



End

2-4. E: 15. Automatic air flow adjustment error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 15
Detective actuator	Indoor unit	Main PCB	<ul style="list-style-type: none"> On automatic airflow adjustment operation, when the fan speed other than 0rpm is detected at the 0rpm operation. On automatic airflow adjustment operation, when the fan speed is not reach the target speed, after 2 minutes from the fan started. On automatic airflow adjustment operation operation, when the 72:750W,90:1000W of input power is detected.
Forecast of cause			Fan rotation failure
			Fan motor winding open
			Indoor unit main PCB

Check point 1. Check the rotation of fan

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



Check point 2. Check ambient temperature around the motor

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



Check point 3. Check indoor unit fan motor

Check indoor unit fan motor. (Refer to indoor unit fan motor in "[Service parts information](#)" on page 03-49.)
→ If indoor unit fan motor is abnormal, replace it.



Check point 4. Replace main PCB

If check point 1-3 does not improve the symptom, change main PCB.



End

2-5. E: 22. Indoor unit capacity error (Indoor unit)

Detective actuator	Indoor unit main PCB	When the total capacity of the indoor units does not match outdoor unit capacity while 3 minutes after power on.
Forecast of cause		Indoor unit selection is incorrect.
		Main PCB failure

Check point 1. Check the total capacity of indoor units

Check the total capacity of the indoor units.

→ If abnormal condition is found, correct it referring to the installation manual or DESIGN & TECHNICAL MANUAL.



Check point 2. Replace the main PCB

If check point 1 does not improve the symptom, replace the main PCB.



End

2-6. E: 23. Combination error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 23
Detective actuator	Indoor unit	The outdoor unit receives the serial signal of applied refrigerant information from indoor unit.	
Forecast of cause	Incorrect indoor unit is selected.		

Check point 1. Check the type of indoor unit

- Check the type of the connected indoor unit.
-> If there is an abnormal condition, correct it by refer to the installation manual or the "DESIGN & TECHNICAL MANAL".



Check point 2. Replace the main PCB

If check point 1 do not improve the symptom, replace the main PCB of the outdoor unit.



End

2-7. E: 32. Indoor unit main PCB error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 32
Detective actuator	Indoor 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			External cause
			Defective connection of electric components
			Main PCB failure

Check point 1. Reset power supply and operate

Does error indication show again?

→ If no, go to "Check point 1-2".



Check point 2. Check Indoor unit electric components

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



Check point 3. Replace the main PCB

Replace the main PCB.



End

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).



End

NOTE: EEPROM

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

2-8. E: 33. Indoor unit motor electricity consumption detection error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 33
Detective actuator	Indoor unit motor electricity consumption detection		When the voltage value or the current value of the motor go beyond the limits
Forecast of cause			Fan motor failure
			Main PCB failure

Check point 1. Check the rotation of fan

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



Check point 2. Check ambient temperature around the motor

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



Check point 3. Check indoor unit fan motor

Check indoor unit fan motor. (Refer to indoor unit fan motor in "[Service parts information](#)" on page 03-49.)
→ If indoor unit fan motor is abnormal, replace it.



Check point 4. Replace the main PCB

If check point 1-3 does not improve the symptom, replace the main PCB.



End

2-9. E: 35. MANUAL AUTO button error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 35
Detective actuator	Indoor unit controller PCB		When the MANUAL AUTO button becomes on for consecutive 60 or more seconds.
	Indicator PCB		
	Manual auto switch		
Forecast of cause			MANUAL AUTO button failure
			Controller PCB and indicator PCB failure

Check point 1. Check the MANUAL AUTO button

- Check if MANUAL AUTO button is kept pressed.
- Check ON/OFF switching operation by using a meter.



If MANUAL AUTO button is disabled (ON/OFF switching), replace it.



Check point 2. Replace the main PCB and indicator PCB

If Check Point 1 does not improve the symptom, replace the main PCB and indicator PCB.



End

2-10. E: 39. Indoor unit power supply error for fan motor (Indoor unit)

Indicator	Wired remote controller	Error code	E: 39
Detective actuator	Indoor unit main PCB		<ul style="list-style-type: none"> When a momentary power cut off When do not start fan motor
Forecast of cause			External cause
			Connector connection failure
			Main PCB failure

Check point 1. Check external cause at indoor and outdoor (Voltage drop or Noise)

- Instant drop: Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure: Check if there is a defective contact or leak current in the power supply circuit.
- Noise: Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave)
Check the complete insulation of grounding.



Check point 2. Check connection of Connector

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

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



Check point 3. Replace the main PCB

If check point 1 to 2 do not improve the symptom, replace the main PCB.



End

2-11. E: 41. Room temperature sensor error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 41
Detective actuator	Indoor unit main PCB	Room temperature thermistor is open or short is detected always.	
	Room temperature thermistor		
Forecast of cause			Connector failure
			Thermistor failure
			Main PCB failure

Check point 1. Check connection of connector

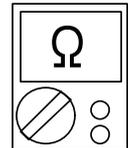
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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



Check point 2. Remove connector and check thermistor resistance value

- For the room thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-59.
- If thermistor is either open or shorted, replace it and reset the power.



Check point 3. Check voltage of main PCB

Make sure circuit diagram of each indoor unit and check terminal voltage at thermistor (DC 5.0 V).

NOTE: For details of thermistor connector, refer to "[Wiring diagrams](#)" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.



If the voltage does not appear, replace main PCB.



End

2-12. E: 42. Indoor unit heat exchanger sensor error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 42
Detective actuator	Indoor unit main PCB	Heat exchanger temperature thermistor	When heat exchanger temperature thermistor open or short circuit is detected.
Forecast of cause			Connector connection failure
			Thermistor failure
			Main PCB failure

Check point 1. Check connection of connector

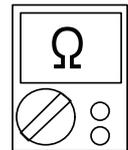
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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



Check point 2. Remove connector and check thermistor resistance value

- For the heat exchanger thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-59.
- If thermistor is either open or shorted, replace it and reset the power.



Check point 3. Check voltage of main PCB

Make sure circuit diagram of each indoor unit and check terminal voltage at thermistor (DC 5.0 V).

NOTE: For details of thermistor connector, refer to "[Wiring diagrams](#)" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.



If the voltage does not appear, replace main PCB.



End

2-13. E: 51. Indoor unit fan motor error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 51
Detective actuator	Indoor unit	main PCB	When the actual rotation number of the indoor unit fan motor is below 1/3 of the target rotation number continuously for more than 56 seconds.
		Fan motor	
Forecast of cause			Fan rotation failure
			Fan motor winding open
			Motor protection by surrounding temperature rise
			Control PCB failure
			Indoor unit fan motor failure

Check point 1. Check rotation of fan

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



Check point 2. Check ambient temperature around motor

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



Check point 3. Check indoor unit fan motor

Check Indoor unit fan motor. (Refer to indoor unit fan motor in "[Service parts information](#)" on page 03-49.)
→ If Indoor unit fan motor is abnormal, replace Indoor unit fan motor.



Check point 4. Replace the main PCB

If Check Point 1 to 3 do not improve the symptom, replace the main PCB.



End

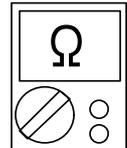
2-14. E: 53. Drain pump error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 53
Detective actuator	Indoor unit main PCB Float switch		When Float switch is ON for more than 3 minutes.
Forecast of cause			Float switch failure
			Shorted connector/wire failure
			Main PCB failure
			Drain pump failure Hose clogging

Check point 1. Check float switch

- Check operation of float switch. (any blocking by dust, etc.)
- Remove float switch and check ON/OFF switching operation by using a meter.

-> If float switch is abnormal, replace it.



Check point 2. Check connector and wire

Check loose contact of CN9 and shorted wire (pinched wire).
-> Replace float switch if the wire is abnormal



Check point 3. Check drain hose

Check drain hose.
-> If there is hose clogging. Please clear the clog.



Check point 4. Check voltage of power supply and drain pump

Check drain pump
-> If drain pump is not run on the working condition, check the voltage of the CN71 on the main PCB.

Measurement result

- 12V: Replace the drain pump
- Other than 12V: Replace the main PCB

NOTE: For details of thermistor connector, refer to "[Wiring diagrams](#)" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.



End

2-15. E: 62. Outdoor unit main PCB error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 62
Detective actuator	Outdoor unit	Main PCB	Access to EEPROM failed due to some cause after outdoor unit started.
Forecast of cause			External cause (Noise, temporary open, voltage drop) Main PCB failure

Check point 1. Reset power supply and operate

Does error indication show again?

If no, go to "Check point 1-2".



Check point 2. Replace the main PCB

Replace the main PCB.



End

Check point 1-2. Check external cause

- Check if temporary voltage drop was not generated.
- Check if momentary open was not generated.
- Check if ground is connection correctly or there are no related cables near the power line.



End

2-16. E: 63. Inverter error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 63
Detective actuator	Outdoor unit	Inverter PCB	Error information received from inverter PCB
Forecast of cause			External cause
			Power supply to inverter PCB wiring disconnection or open
			Inverter PCB failure

Check point 1. Turn the power on again?

Error displayed again?

If no, go to "[Check point 1-2](#)".



Check point 2. Check the wiring (power supply to inverter PCB)

- Connector and wiring connection state check
- Cable open check



Check point 3. Replace inverter PCB

Replace inverter PCB



End

Check point 1-2. Check external cause

- Check if temporary voltage drop was not generated.
- Check if momentary open was not generated.
- Check if ground is connection correctly or there are no related cables near the power line.



End

2-17. E: 64. PFC circuit error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 64
Detective actuator	Outdoor unit	Main PCB	<ul style="list-style-type: none"> When inverter input DC voltage is higher than 420V for over 3 seconds, the compressor stops. If the same operation is repeated 5 times, the compressor stops permanently.
Forecast of cause			External cause
			Connector connection failure
			Main PCB failure

Check point 1. Check external cause at indoor and outdoor (Voltage drop or Noise)

- Instant drop: Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure: Check if there is a defective contact or leak current in the power supply circuit.
- Noise: Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave)
Check the complete insulation of grounding.



Check point 2. Check connection of Connector

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

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



Check point 3. Replace the main PCB

If check point 1 to 2 do not improve the symptom, replace the main PCB.



End

2-18. E: 65. Trip terminal L error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 65
Detective actuator	Outdoor unit	Main PCB	When the signal from FO terminal of IPM is "L" (0 V) during the compressor stopping.
Forecast of cause			Main PCB failure

Check point 1. Check main PCB

Replace the outdoor unit main PCB.



End

2-19. E: 71. Discharge thermistor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 71
Detective actuator	Outdoor unit main PCB	When discharge pipe temperature thermistor open or short circuit is detected at power on or while running the compressor	
	Discharge pipe temperature thermistor		
Forecast of cause			Connector failure
			Thermistor failure
			Main PCB failure

Check point 1. Check connection of connector

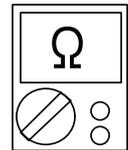
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

→ Reset power when reinstalling due to removed connector or incorrect wiring.



Check point 2. Remove connector and check thermistor resistance value

- For the discharge temperature thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-59.
- If thermistor is either open or shorted, replace it and reset the power.



Check point 3. Check voltage of main PCB

Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC 5.0 V).

NOTE: For details of thermistor connector, refer to "[Wiring diagrams](#)" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.



If the voltage does not appear, replace main PCB.



End

2-20. E: 72. Compressor thermistor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 72
Detective actuator	Outdoor unit main PCB	When compressor temperature thermistor open or short circuit is detected at power on or while running the compressor	
	Compressor temperature thermistor		
Forecast of cause			Connector failure
			Thermistor failure
			Main PCB failure

Check point 1. Check connection of connector

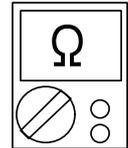
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

→ Reset power when reinstalling due to removed connector or incorrect wiring.



Check point 2. Remove connector and check thermistor resistance value

- For the compressor thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-59.
- If thermistor is either open or shorted, replace it and reset the power.



Check point 3. Check voltage of main PCB

Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC 5.0 V).

NOTE: For details of thermistor connector, refer to "[Wiring diagrams](#)" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.



If the voltage does not appear, replace main PCB.



End

2-21. E: 73. Heat exchanger (Middle/Outlet) temperature thermistor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 73
Detective actuator	Heat exchanger liquid temperature thermistor		• Heat exchanger liquid temperature thermistor short or open detected
	Heat exchanger middle temperature thermistor		• Heat exchanger middle temperature thermistor short or open detected
Forecast of cause			Connector failure
			Thermistor failure
			Main PCB failure

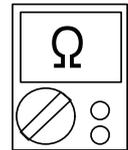
Check Point 1 : Check the connector connection and cable open

- Connector connection state check
- Cable open check



Check Point 2 : Check the thermistor

- For the outdoor unit heat exchanger thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-59.
- If thermistor is either open or shorted, replace it and reset the power.



Check point 3. Check voltage of main PCB

Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC 5.0 V).

NOTE: For details of thermistor connector, refer to "[Wiring diagrams](#)" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.



If the voltage does not appear, replace main PCB.



End

2-22. E: 74. Outdoor temperature thermistor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 74
Detective actuator	Outdoor unit main PCB	When outdoor temperature thermistor open or short circuit is detected at power on or while running the compressor	
	Outdoor temperature thermistor		
Forecast of cause			Connector failure
			Thermistor failure
			Main PCB failure

Check point 1. Check connection of connector

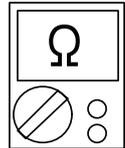
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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



Check point 2. Remove connector and check thermistor resistance value

- For the outdoor temperature thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-59.
- If thermistor is either open or shorted, replace it and reset the power.



Check point 3. Check voltage of main PCB

Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC 5.0 V).

NOTE: For details of thermistor connector, refer to "[Wiring diagrams](#)" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.



If the voltage does not appear, replace main PCB.



End

2-23. E: 77. Heat sink thermistor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 77
Detective actuator	Heat sink temperature thermistor	Heat sink temperature thermistor short or open detected	
Forecast of cause			Connector failure
			Thermistor failure
			Inverter PCB failure

Check point 1. Check connection of connector

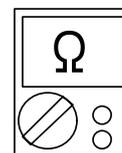
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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



Check point 2. Remove connector and check thermistor resistance value

- For the Heat sink thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-59.
- If thermistor is either open or shorted, replace it and reset the power.



Check point 3. Check voltage of inverter PCB

Make sure circuit diagram of outdoor unit and check terminal voltage at thermistor (DC 5.0 V).

NOTE: For details of thermistor connector, refer to "[Wiring diagrams](#)" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.



If the voltage does not appear, replace inverter PCB.



End

2-24. E: 84. Current sensor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 84
Detective actuator	Outdoor unit	main PCB	When input current sensor has detected 0 A, while inverter compressor is operating at higher than 50 rps, after 1 minute upon starting the compressor. (Except during the defrost operation)
Forecast of cause			Defective connection of electric components
			External cause
			Main PCB failure

Check point 1. Reset power supply and operate

Does error indication show again?

If no, go to "Check point 1-2".



Check point 2. Check connections of outdoor unit electrical components

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

Upon correcting the removed connector or miswiring, reset the power.



Check point 3. Replace the main PCB

If Check point 1, 2 do not improve the symptom, replace the main PCB.



End

Check point 1-2. Check external cause at Indoor and Outdoor (Voltage drop or Noise)

- Instant drop: Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure: Check if there is a defective contact or leak current in the power supply circuit.
- Noise: Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave)
Check the complete insulation of grounding.



End

2-25. E: 86. High pressure switch error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 86
Detective actuator	Outdoor unit main PCB	When pressure switch open is detected in 10 seconds after the power is turned on.	
	High pressure switch		
Forecast of cause	High pressure switch connector disconnection or open		
	High pressure switch characteristics failure		
	Main PCB failure		

Check point 1. Check the high pressure switch connection state

- Check connector and wiring connection state.
- Check if cable is open

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



Check point 2. Check the high pressure switch characteristics

- Check switch characteristics.
For the characteristics of the high pressure switch, refer to below.



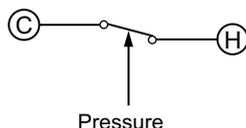
Check point 3. Replace main PCB

Change main PCB and check operation again.



End

- Type of contact



- Characteristics of pressure switch

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

36/45 model: P770

2-26. E: 94. Trip detection (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 94
Detective actuator	Outdoor unit	Inverter PCB	Protection stop by over-current generation after inverter compressor start processing completed generated consecutively 10 times. NOTE: The number of generations is reset when the compressor starts up.
		Main PCB	
		Compressor	
Forecast of cause			Outdoor unit fan operation defective, foreign matter on heat-exchanger, excessive rise of ambient temperature
			Main PCB failure
			Inverter compressor failure (lock, winding short)
			Inverter PCB

Check point 1. Check the outdoor unit fan operation, heat-exchanger, ambient temperature

- No obstructions in air passages?
- Heat exchange fins clogged
- Outdoor unit fan motor check
- Ambient temperature not raised by the effect of other heat sources?
- Discharged air not sucked in?



Check point 2. Replace inverter PCB

If Check point 1 do not improve the symptom, change inverter PCB.



Check point 3. Replace main PCB

If Check point 1, 2 do not improve the symptom, change main PCB.



Check point 4. Replace compressor

If Check point 3 do not improve the symptom, change compressor.



End

2-27. E: 95. Compressor motor control error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 95
Detective actuator	Outdoor unit	Main PCB	"Protection stop by "overcurrent generation at inverter compressor starting" restart" generated consecutively 10 times x 3 sets (total 30 times)
		Compressor	
Forecast of cause			Defective connection of electric components
			Main PCB failure
			Compressor failure

Check point 1. Check Noise from Compressor

Turn on Power and check operation noise.
→ If an abnormal noise show, replace compressor.



Check point 2. Check connection of around the compressor components

For compressor terminal, main PCB

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open. (Refer to inverter compressor in "[Service parts information](#)" on page 03-49.)

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



Check point 3. Replace main PCB

If Check point 1, 2 do not improve the symptom, change main PCB.



Check point 4. Replace compressor

If Check point 3 do not improve the symptom, change compressor.



End

2-28. E: 97. Outdoor unit fan motor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 97
Detective actuator	Outdoor unit	Main PCB	<ol style="list-style-type: none"> When outdoor fan rotation speed is less than 100 rpm in 20 seconds after fan motor starts, fan motor stops. After fan motor restarts, if the same operation within 60 seconds is repeated 3 times in a row, compressor and fan motor stops. If 1. and 2. repeats 5 times in a row, compressor and fan motor stops permanently.
		Fan motor	
Forecast of cause			Fan rotation failure
			Motor protection by surrounding temperature rise
			Main PCB failure
			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 ambient temperature around motor

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



Check point 3. Check outdoor unit fan motor

Check outdoor unit fan motor. (Refer to outdoor unit fan motor in "[Service parts information](#)" on page 03-49.)
→ If outdoor unit fan motor is abnormal, replace outdoor unit fan motor and main PCB.



Check point 4. Check output voltage of main PCB

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

NOTE: For details of wiring diagram, refer to "[Wiring diagrams](#)" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.



Read wire	DC voltage
Red—Black	306 V (DC 340 V -10%) to 374 V (DC 340 V +10%)
White—Black	15 ± 1.5 V

-> If the voltage is not correct, replace Main PCB.



End

2-29. E: 99. 4-way valve error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 99
Detective actuator	Indoor unit	main PCB	<p>When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops.</p> <p>Indoor heat exchanger temp. - Room temp. > 10 °C (Cooling or Dry operation)</p> <p>Indoor heat exchanger temp. - Room temp. < -10 °C (Heating operation)</p> <p>If the same operation is repeated 5 times, the compressor stops permanently.</p>
	Heat exchanger temperature thermistor		
	Room temperature thermistor		
	4-way valve		
Forecast of cause			Connector connection failure
			Thermistor failure
			Coil failure
			4-way valve failure
			Main PCB failure

Check point 1. Check connection of connector

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

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



Check point 2. Check each thermistor

- Isn't it fallen off the holder?
- Is there a cable pinched?

Check characteristics of room thermistor and indoor unit heat exchanger thermistor.

For the thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-59.

→ If defective, replace the thermistor.



Check point 3. Check the solenoid coil and 4-way valve

NOTE: Refer solenoid coil and 4-way valve in "[Service parts information](#)" on page 03-49.

- **Solenoid coil**
Remove P60 from PCB and check the resistance value of coil. Resistance value is 1.97 kΩ.
→ 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.

**Check point 4. Replace main PCB**

If Check Point 1 to 3 do not improve the symptom, replace main PCB.



End

2-30. E: A1. Discharge temperature error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: A1
Detective actuator	Outdoor unit main PCB		Protection stop by discharge temperature ≥ 110 °C during compressor operation generated 2 times within 24 hours.
	Discharge temperature thermistor		
Forecast of cause			3-way valve not opened
			EEV or capillary tube defective, strainer clogged
			Outdoor unit operation failure, foreign matter on heat exchanger
			Discharge temperature thermistor failure
			Insufficient refrigerant
			Main PCB failure

Check point 1. Check if 3-way valve is open

If the 3-way valve is closed, open the 3-way valve and check operation.

NOTE: For cooling operation, check gas side of the 3-way valve.
For heating operation, check liquid side of the 3-way valve.



Check point 2. Check any of the electronic expansion valve (EEV), capillary tube, or strainer, or all

- Check if EEV open or there is a capillary tube defect. Refer to outdoor unit Electronic Expansion Valve (EEV) or Capillary tube in "[Service parts information](#)" on page 03-49.
- Check the strainer clogging.



Check point 3. Check the outdoor unit fan and heat exchanger

- Check for foreign object at heat exchanger
- Check if fan can be rotated by hand.
- Check the motor. (Refer to outdoor unit fan motor in "[Service parts information](#)" on page 03-49.)



Check point 4. Check the discharge thermistor

The discharge temperature thermistor characteristics check. (Check by disconnecting thermistor from PCB.)

NOTE: For the characteristics of the thermistor, refer to "[Thermistor resistance values](#)" on page 03-59.



Check point 5. Check the refrigerant amount

Check the refrigerant leakage.



Check point 6. Replace the main PCB

If check point 1 to 5 do not improve the symptom, replace the main PCB.



End

2-31. E: A3. Compressor temperature error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: A3
Detective actuator	Outdoor unit main PCB		Protection stop by compressor temperature ≥ 108 °C during compressor operation generated 2 times within 24 hours.
	Compressor temperature thermistor		
Forecast of cause			3-way valve not opened
			EEV defective, strainer clogged
			Outdoor unit operation failure, foreign matter on heat exchanger
			Compressor temperature thermistor failure
			Insufficient refrigerant
			Main PCB failure

Check point 1. Check if 3-way valve is open

If the 3-way valve is closed, open the 3-way valve and check operation.

NOTE: For cooling operation, check gas side of the 3-way valve.
For heating operation, check liquid side of the 3-way valve.



Check point 2. Check the electronic expansion valve (EEV) and strainer

- Check if EEV open.
Refer to outdoor unit Electronic Expansion Valve (EEV) in "[Service parts information](#)" on page 03-49.
- Check the strainer clogging.



Check point 3. Check the outdoor unit fan and heat exchanger

- Check for foreign object at heat exchanger
- Check if fan can be rotated by hand.
- Check the motor. (Refer to outdoor unit fan motor in "[Service parts information](#)" on page 03-49.)



Check point 4. Check the compressor thermistor

The compressor temperature thermistor characteristics check. (Check by disconnecting thermistor from PCB.)

NOTE: For the characteristics of the thermistor, refer to "[Thermistor resistance values](#)" on page 03-59.



Check point 5. Check the refrigerant amount

Check the refrigerant leakage.



Check point 6. Replace the main PCB

If check point 1 to 5 do not improve the symptom, replace the main PCB.



End

2-32. E: AC. Heat sink temperature error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: AC
Detective actuator	Outdoor unit inverter PCB		Protection stop by heat sink temperature ≥ 80 °C during heat sink operation generated 2 times within 24 hours.
	Heat sink temperature thermistor		
Forecast of cause			Foreign matter on heat sink, heat sink dirty
			Foreign matter on heat exchanger, excessive ambient temperature rise
			Heat sink temp. thermistor defective

Check point 1. Check the heat sink state

Heat sink foreign matter, soiling check



Check point 2. Check the foreign matter and ambient temperature of heat exchanger

- Heat exchange foreign matter check
- Ambient temperature not raised by effect of other heat sources?
- Discharged air not sucked in?



Check point 3. Check the heat sink temperature thermistor

The heat sink temperature thermistor characteristics check. (Check by disconnecting thermistor from PCB.)

NOTE: For the characteristics of the thermistor, refer to "[Thermistor resistance values](#)" on page 03-59.



Check point 4. Replace inverter PCB

Replace inverter PCB



End

3. Troubleshooting without error code

3-1. Indoor unit—No power

Forecast of cause	Power supply failure
	External cause
	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 the installation manual or the "DESIGN & TECHNICAL MANUAL".



Check point 2. Check external cause at indoor and outdoor (voltage drop or noise)

- Instant drop: Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure: Check if there is a defective contact or leak current in the power supply circuit.
- Noise: Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave)
Check the complete insulation of grounding.



Check point 3. Check electrical components

Check the voltage of power supply.

Check if AC 198 to 264 V appears at outdoor unit terminal L—N.

-> If no, go to "[Check point 1](#)" and "[Check point 2](#)".



- Check fuse in filter PCB.
If fuse is open, check if the wiring between terminal and filter PCB is loose, and replace fuse.
- Check varistor in filter PCB.
If varistor is defective, there is a possibility of an abnormal power supply.
Check the correct power supply and replace varistor.
Upon checking the normal power supply, replace varistor.



End

3-2. Outdoor unit—No power

Forecast of cause	Power supply failure
	External cause
	Electrical components defective

Check point 1. Check installation condition

- Is the circuit breaker on or off?
- Check loose or removed connection cable.

→ If abnormal condition is found, correct it by referring to the installation manual or the "DESIGN & TECHNICAL MANUAL".



Check point 2. Check external cause at indoor and outdoor (voltage drop or noise)

- Instant drop: Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure: Check if there is a defective contact or leak current in the power supply circuit.
- Noise: Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave)
Check the complete insulation of grounding.

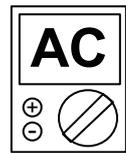


Check point 3. Check electrical components

Check the voltage of power supply.

Check if AC 198 to 264 V appears at outdoor unit terminal L - N

→ If no, go to "[Check point 1](#)" and "[Check point 2](#)".



- Check fuse in main PCB.
If fuse is open, check if the wiring between terminal and main PCB is loose, and replace fuse.



Check point 4. Replace the main PCB

If check point 1 to 3 do not improve the symptom, replace the main PCB.



End

3-3. No operation (Power is on)

Forecast of cause	Setting/ Connection failure
	External cause
	Electrical components defective

Check point 1. Check indoor and outdoor installation condition

- Indoor unit:
 - Check incorrect wiring between indoor unit and remote controller.
 - Check if there is an open cable connection.
 - Are these indoor unit, outdoor unit, and remote controller suitable model numbers to connect?
- > If there is some abnormal condition, correct it by referring to the installation manual and "DESIGN & TECHNICAL MANUAL".



Turn off the power and check correct followings.

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



Check point 2. Check external cause at indoor and outdoor (Voltage drop or Noise)

- Instant drop: Check if there is a large load electric apparatus in the same circuit.
- Momentary power failure: Check if there is a defective contact or leak current in the power supply circuit.
- Noise: Check if there is any equipment causing harmonic wave near electric line. (Neon bulb or electric equipment that may cause harmonic wave)
Check the complete insulation of grounding.



Check point 3. Check wired remote controller and controller PCB

Check voltage at CN14 (terminal 1—3, terminal 1—2) of main PCB.
(Power supply to remote controller)

- If it is DC 12 V, remote controller is failure. (The controller PCB is normal)
-> Replace remote controller.
- If it is DC 0 V, controller PCB is failure. (Check the remote controller once again)
-> Replace controller PCB.



Check point 4. Replace main PCB

If check point 1 to 3 do not improve the symptom, change main PCB.



End

3-4. No cooling/No heating

Forecast of cause	Indoor unit error
	Outdoor unit error
	Effect by surrounding environment
	Connection pipe/Connection wire failure
	Refrigeration cycle failure

Check point 1. Check Indoor unit

- Does Indoor unit fan run in the HIGH mode?
- Is air filter dirty?
- Is heat exchanger clogged?
- Check if energy save function is operated.



Check point 2. Check outdoor unit operation

- Check if outdoor unit is operating.
- Check any objects that obstruct the air flow route.
- Check if heat exchanger is clogged.
- Is the valve open?



Check point 3. Check site condition

- Is capacity of Indoor unit fitted to the room size?
- Any windows open or direct sunlight?



Check point 4. Check indoor/outdoor installation condition

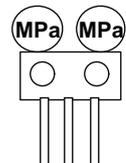
- Check connection pipe (specified pipe length and pipe diameter?)
- Check any loose or removed communication line.

→ If there is an abnormal condition, correct it by referring to the installation manual or the "DESIGN & TECHNICAL MANUAL".



Check point 5. Check Refrigeration cycle

- Check if strainer is clogged (Refer to the figure below).
- Measure gas pressure, and if there is a leakage, correct it.
- Check if EEV open or there is a capillary tube defect.
Refer to outdoor unit Electronic Expansion Valve (EEV) or Capillary tube in "[Service parts information](#)" on page 03-49.
- Check compressor.
Refer to compressor in "[Service parts information](#)" on page 03-49.
Refer to inverter compressor in "[Service parts information](#)" on page 03-49.



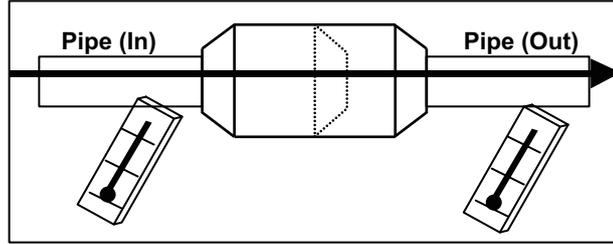
NOTE: When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.



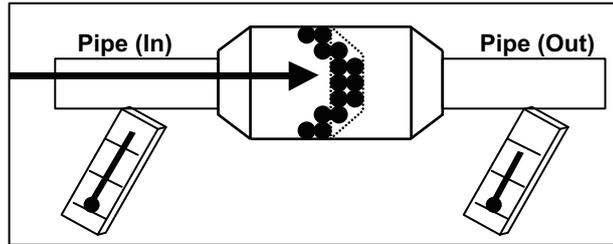
End

NOTES:

- Strainer normally does not have temperature difference between inlet and outlet as shown below.



- If there is a difference like shown below, there is a possibility of inside clogged. In this case, replace the strainer.



3-5. Abnormal noise

Forecast of cause	Abnormal installation (indoor unit/outdoor unit)
	Fan failure (indoor unit/outdoor unit)
	Compressor failure (outdoor)

Diagnosis method when abnormal noise is occurred

TROUBLESHOOTING

TROUBLESHOOTING

Abnormal noise is coming from Indoor unit.
(Check and correct followings)

Abnormal noise is coming from Outdoor unit.
(Check and correct followings)



- Is main unit installed in stable condition?
- Is the installation of air suction grille and front panel normal?

- Is main unit installed in stable condition?
- Is fan guard installed normally?



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

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



End

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



- Is compressor locked?
- Check Compressor
Refer to compressor and inverter compressor in "[Service parts information](#)" on page 03-49.



End

3-6. Water leaking

Forecast of cause

Erroneous installation

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?



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



Is fan rotating?



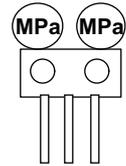
End

Diagnosis method when water is spitting out

Is the filter clogged?



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

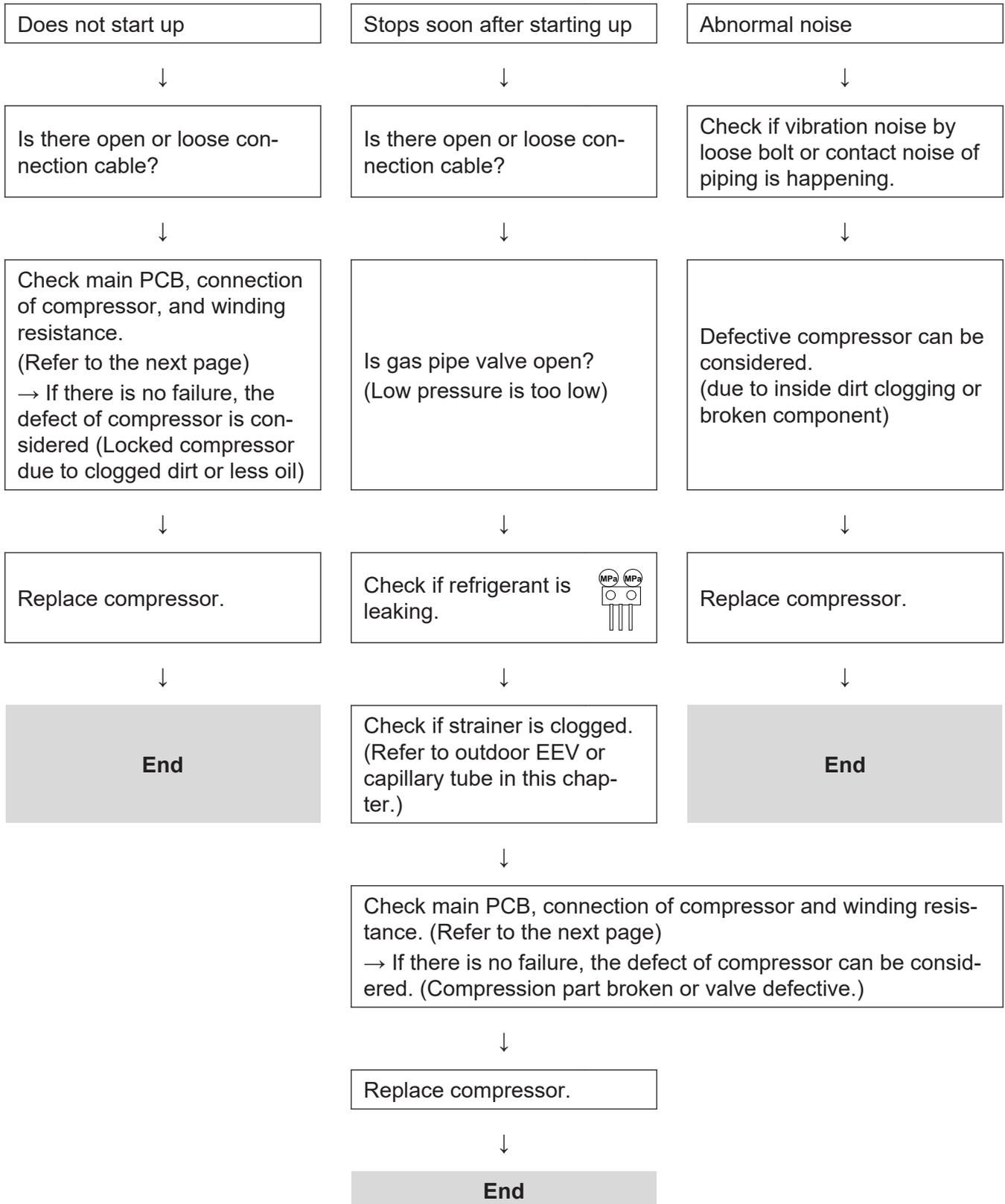


End

4. Service parts information

4-1. Compressor

Diagnosis method of compressor (If outdoor unit LED displays error, refer to troubleshooting)

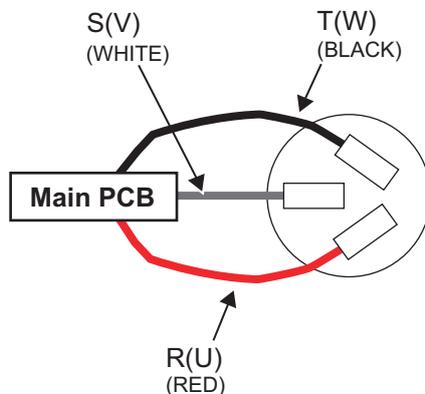


4-2. Inverter compressor

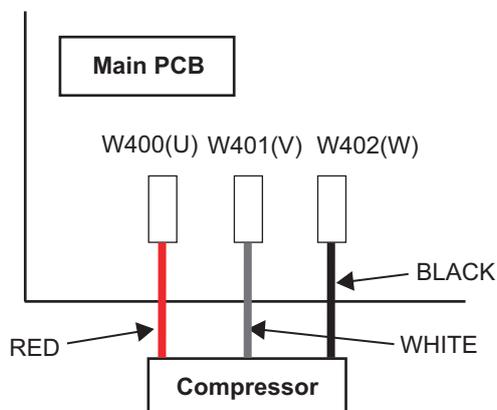
■ Model: AOHG36KQTA

Check point 1. Check connection

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



- Check terminal connection of main PCB (loose or incorrect wiring)

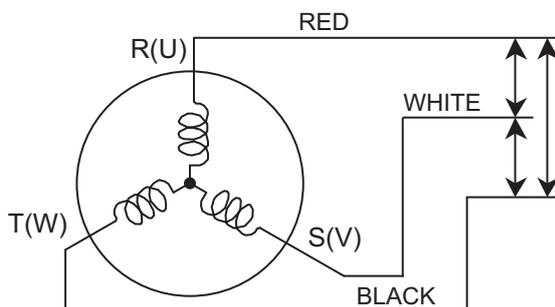


↓

Check point 2. Check winding resistance

Check winding resistance of each terminal.

Resistance value: 2.164 Ω at 25 $^{\circ}\text{C}$



→ If the resistance value is 0 Ω or infinite, replace compressor.

↓

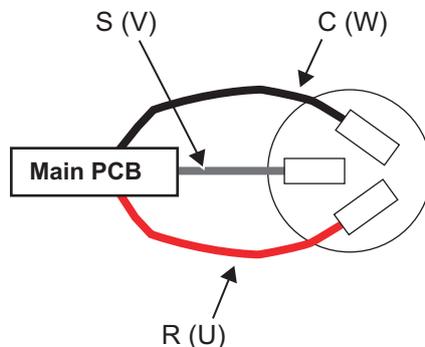
Check point 3. Replace inverter PCB

If check point 1 to 2 do not improve the symptom, replace main PCB.

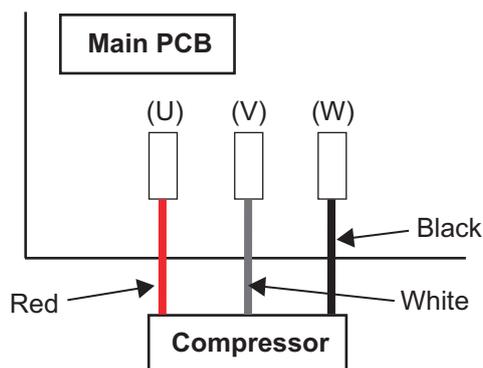
Model: AOHG45KQTA

Check point 1. Check the terminal connection.

- Check the following terminal connections of the compressor. (Loosening or incorrect wiring.)
 - **R (U):** Red
 - **S (V):** White
 - **C (W):** Black



- Check the following terminal connections of the Main PCB. (Loosening or incorrect wiring.)
 - **(U):** Red
 - **(V):** White
 - **(W):** Black

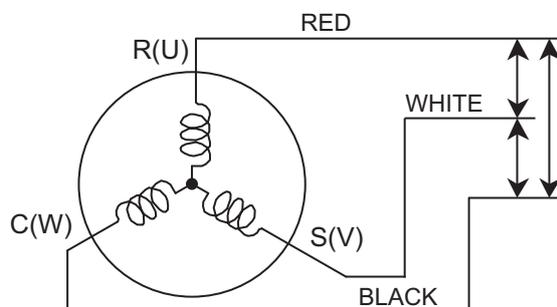


↓

Check point 2. Check the winding resistance.

Check the winding resistance of each terminal.

Resistance value: 1.774 Ω at 20 $^{\circ}\text{C}$



→ If the resistance value is 0 Ω or infinite, replace the compressor.

↓

Check point 3. Replace the Inverter PCB.

If check point 1 to 2 do not improve the symptom, replace the Inverter PCB.

4-3. Outdoor unit Electronic Expansion Valve (EEV)

■ Models: AOHG36KQTA and AOHG45KQTA

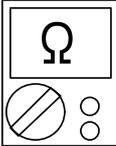
Check point 1. Check connections

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

NOTE: For details of wiring diagram, refer to "Wiring diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-17.

Check point 2. Check coil of EEV

Remove connector, check each winding resistance of coil.

Read wire	Resistance value
White - Red	$46 \Omega \pm 3 \Omega$ at 20°C 
Yellow - Red	
Orange - Red	
Blue - Red	

→ If Resistance value is abnormal, replace EEV.

Check point 3. Check voltage from main PCB

Remove connector and check voltage (DC 12 V)

→ If it does not appear, replace main PCB.



Check point 4. Check noise at start up

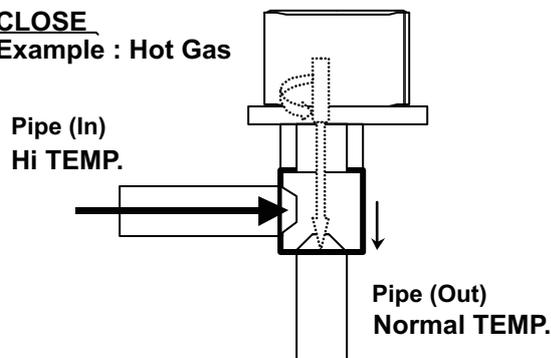
Turn on the power and check the operation noise.

→ If an abnormal noise does not show, replace main PCB.

Check point 5. Check opening and closing operation of valve

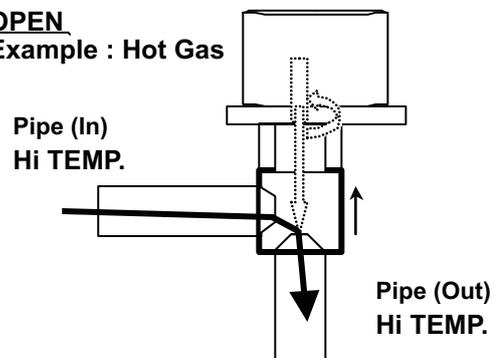
When valve is closed, it has a temp. difference between inlet and outlet

CLOSE
 Example : Hot Gas



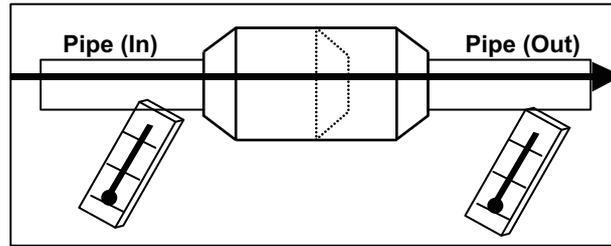
If it is open, it has no temp. difference between inlet and outlet

OPEN
 Example : Hot Gas

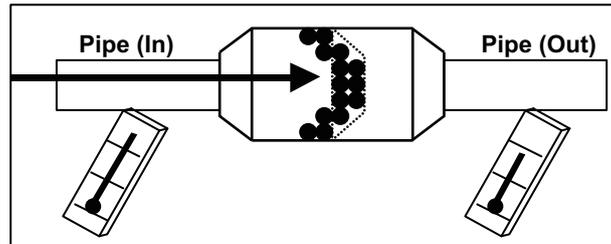


Check point 6. Check strainer

- Strainer normally does not have temperature difference between inlet and outlet as shown below.



- If there is a difference like shown below, there is a possibility of inside clogged. In this case, replace the strainer.



4-4. Indoor unit fan motor

■ Models: ABHG36KRTA and ABHG45KRTA

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.

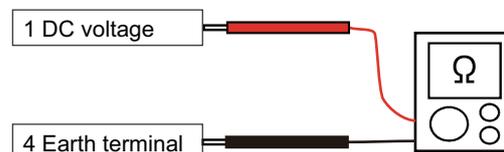
Check point 2. Check resistance of indoor fan motor

Refer to below. Circuit-test "Vm" and "GND" terminal

NOTE: Vm: DC voltage, GND: Earth terminal

→ If they are short-circuited (below 300 kΩ), replace indoor fan motor and controller PCB.

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



4-5. Outdoor unit fan motor

■ Models: AOHG36KQTA and AOHG45KQTA

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.

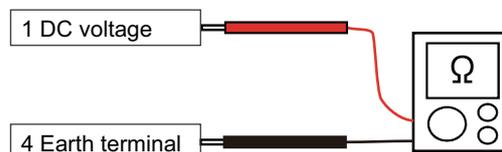
Check point 2. Check resistance of outdoor fan motor

Refer to below. Circuit-test "Vm" and "GND" terminal

NOTE: Vm: DC voltage, GND: Earth terminal

→ If they are short-circuited (below 300 kΩ), replace outdoor fan motor and controller PCB.

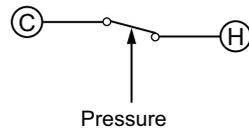
Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3	No function
4 (Black)	Earth terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown)	Feed back (FG)



4-6. Pressure switch

■ Models: AOHG36KQTA and AOHG45KQTA

- Type of contact



- Characteristics of pressure switch

Pressure switch 1	
Contact: Short → Open	4.2 — 4.05 MPa
Contact: Open → Short	3.2 ± 0.15 MPa

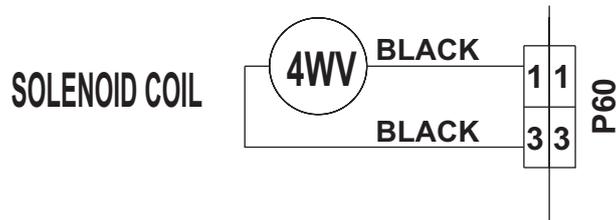
36/45 model: P770

4-7. 4-way valve coil (solenoid coil)/4-way valve

■ Models: AOHG36KQTA and AOHG45KQTA

Check point 1. Check connection

- Check the connection of connector P60.

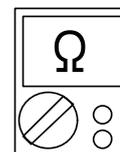


↓

Check Point 2 : Check solenoid coil

Remove P60 from PCB and check the resistance value of coil.

Resistance Value $\approx 1.97 \text{ k}\Omega$

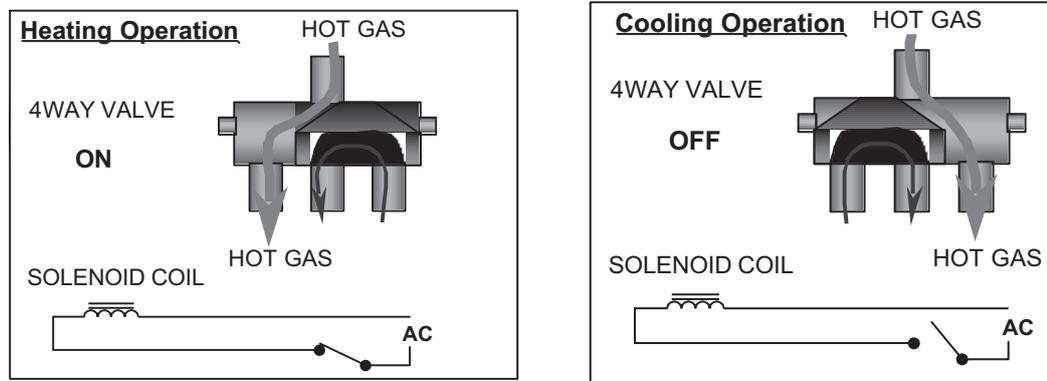


→ If it is Open or abnormal resistance value, replace solenoid coil.

↓

Check Point 3: Check operation of 4 way valve

Check each piping temperature, and confirm the location of the valve by the temperature difference



→ If the valve location is not proper, replace 4 way valve.

↓

Check Point 4: Replace main PCB

If none of Checks 1 to 3 apply, replace the main PCB.

5. Thermistor resistance values

5-1. Indoor unit

■ Room temperature thermistor

Temperature (°C)	Resistance (kΩ)	Voltage (V)
-10.0	58.25	0.73
-5.0	44.03	0.93
0.0	33.62	1.15
5.0	25.93	1.39
10.0	20.18	1.66
15.0	15.84	1.94
20.0	12.54	2.22
25.0	10.00	2.50
30.0	8.04	2.77
35.0	6.51	3.03
40.0	5.30	3.27
45.0	4.35	3.49

■ Heat exchanger temperature thermistor

Temperature (°C)	Resistance (kΩ)	Voltage (V)
-30.0	1,131.91	0.21
-25.0	804.52	0.29
-20.0	579.59	0.40
-15.0	422.89	0.53
-10.0	312.27	0.69
-5.0	233.21	0.88
0.0	176.03	1.10
5.0	134.23	1.36
10.0	103.34	1.63
15.0	80.28	1.92
20.0	62.91	2.21
25.0	49.70	2.51
30.0	39.57	2.79
35.0	31.74	3.06
40.0	25.64	3.30
45.0	20.85	3.53
50.0	17.06	3.73
55.0	14.05	3.90
60.0	11.64	4.02
65.0	9.69	4.19

5-2. Outdoor unit

■ Heat sink thermistor

Temperature (°C)	Resistance (kΩ)	Voltage (V)
-30.0	94.26	0.08
-25.0	67.95	0.11
-20.0	49.62	0.15
-15.0	36.68	0.20
-10.0	27.42	0.26
-5.0	20.73	0.34
0.0	15.83	0.43
5.0	12.21	0.55
10.0	9.50	0.68
15.0	7.46	0.84
20.0	5.90	1.01
25.0	4.71	1.21
30.0	3.78	1.42
35.0	3.06	1.64
40.0	2.50	1.88
45.0	2.05	2.11
50.0	1.69	2.35
55.0	1.40	2.58
60.0	1.17	2.81
65.0	0.99	3.02
70.0	0.83	3.22
75.0	0.70	3.41
80.0	0.60	3.58

■ Discharge temperature thermistor

Temperature (°C)	Resistance (kΩ)	Voltage (V)
-30.0	1,013.11	0.06
-25.0	729.09	0.09
-20.0	531.56	0.12
-15.0	392.31	0.16
-10.0	292.91	0.21
-5.0	221.09	0.28
0.0	168.60	0.36
5.0	129.84	0.46
10.0	100.91	0.57
15.0	79.12	0.71
20.0	62.55	0.86
25.0	49.84	1.03
30.0	40.01	1.23
35.0	32.35	1.43
40.0	26.34	1.65
45.0	21.58	1.88
50.0	17.79	2.11
55.0	14.75	2.34
60.0	12.30	2.57
65.0	10.32	2.79
70.0	8.70	3.00
75.0	7.36	3.19
80.0	6.27	3.37
85.0	5.36	3.54
90.0	4.60	3.69
95.0	3.96	3.83
100.0	3.43	3.96
105.0	2.98	4.07
110.0	2.60	4.17
115.0	2.27	4.26
120.0	2.00	4.33

■ Heat exchanger temperature thermistor

Temperature (°C)	Resistance (kΩ)	Voltage (V)
-30.0	95.58	0.24
-25.0	68.90	0.32
-20.0	50.31	0.43
-15.0	37.19	0.57
-10.0	27.81	0.73
-5.0	21.02	0.92
0.0	16.05	1.14
5.0	12.38	1.39
10.0	9.63	1.65
15.0	7.56	1.93
20.0	5.98	2.21
25.0	4.77	2.49
30.0	3.84	2.77
35.0	3.11	3.02
40.0	2.53	3.26
45.0	2.08	3.48
50.0	1.71	3.68
55.0	1.42	3.85
60.0	1.19	4.00
65.0	1.00	4.13
70.0	0.84	4.25
75.0	0.71	4.35
80.0	0.61	4.43

■ Outdoor temperature thermistor

Temperature (°C)	Resistance (kΩ)	Voltage (V)
-30.0	224.33	0.73
-25.0	159.71	0.97
-20.0	115.24	1.25
-15.0	84.21	1.56
-10.0	62.28	1.90
-5.0	46.58	2.26
0.0	35.21	2.61
5.0	26.88	2.94
10.0	20.72	3.25
15.0	16.12	3.52
20.0	12.64	3.76
25.0	10.00	3.97
30.0	7.97	4.14
35.0	6.40	4.28
40.0	5.18	4.41
45.0	4.21	4.51
50.0	3.45	4.59
55.0	2.85	4.65

4. CONTROL AND FUNCTIONS

CONTENTS

4. CONTROL AND FUNCTIONS

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1. Rotation number control of compressor

1-1. Cooling operation

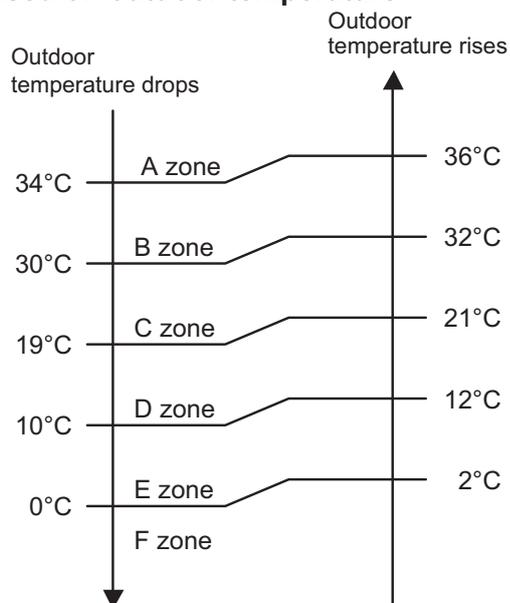
A sensor (room temperature thermistor) built in the indoor unit body will usually perceive difference or variation between a set temperature and present room temperature, and controls the operation rotation number of the compressor.

- If the room temperature is 6.0 °C higher than a set temperature, the operation rotation number of compressor will attain to maximum performance.
- If the room temperature is 1.0 °C lower than a set temperature, the compressor will be stopped.
- When the room temperature is within the range of +6.0°C to -1.0°C of the setting temperature, the rotation number of compressor is controlled within the range shown in the table below. However, the maximum rotation number is limited in the range shown in the figure below based on the indoor fan mode and the outdoor temperature.

• Rotation number range of compressor

Model name	Minimum frequency	Maximum frequency
ABHG36KRTA	15 rps	98 rps
ABHG45KRTA	20 rps	114 rps

• Limit of maximum speed based on outdoor temperature



Unit: rps

Model name	Outdoor temperature zone	Indoor unit fan mode			
		HIGH	MED	LOW	QUIET
ABHG36KRTA	A zone	98	79	64	44
	B zone	98	79	64	44
	C zone	85	64	54	44
	D zone		64	54	4436
	E zone		64	54	4436
	F zone		64	54	4436
ABHG45KRTA	A zone	114	79	61	40
	B zone	114	79	61	40
	C zone	96	61	49	40
	D zone		67	49	4232
	E zone		67	49	4232
	F zone		67	49	4232

1-2. Heating operation

A sensor (room temperature thermistor) built in indoor unit body will usually perceive difference or variation between setting temperature and present room temperature, and controls operation rotation number of compressor.

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

- **Rotation number range of compressor**

Model name	Minimum frequency	Maximum frequency
ABHG36KRTA	15	120
ABHG45KRTA	20	120

1-3. Dry operation

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

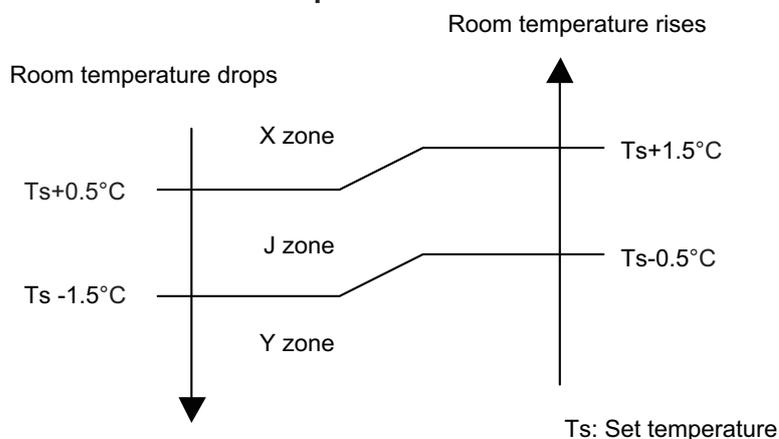
Zone is defined by set temperature and room temperature.

- **Rotation number range of compressor**

Unit: rps

Model name	Outdoor temperature zone	Operating frequency
ABHG36KRTA	X zone	44
	J zone	44
	Y zone	0
ABHG45KRTA	X zone	40
	J zone	40
	Y zone	0

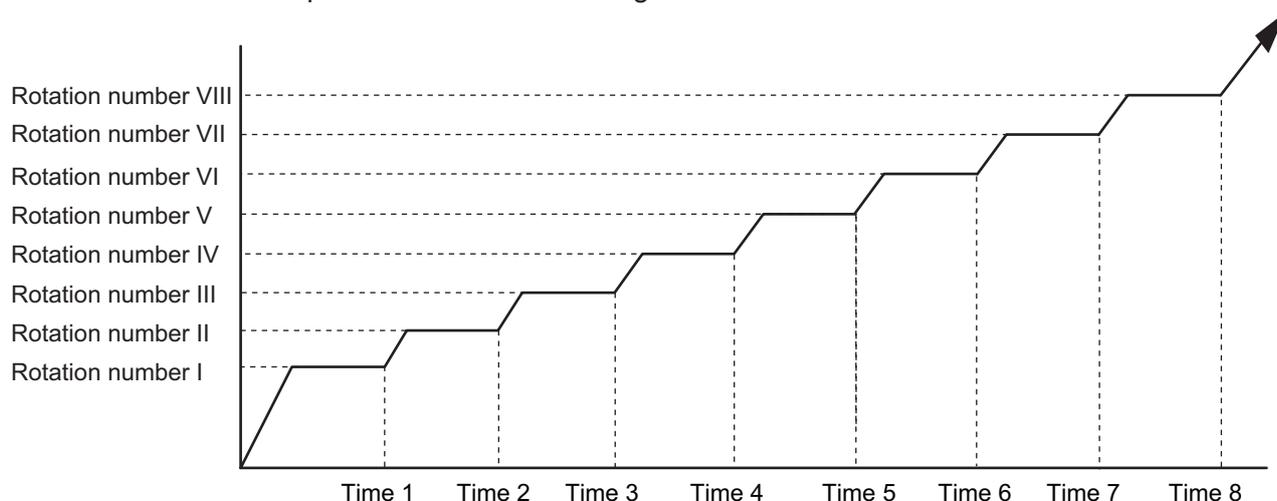
- **Compressor control based on room temperature**



1-4. Rotation number of compressor at normal start-up

■ Model: AOHG36KQTA

Rotation number of compressor soon after starting is controlled as below.



- Normal operation

Rotation number (rps)	I	II	III	IV	V	VI	VII	VIII
Time (sec)	1	2	3	4	5	6	7	8
	90	150	270	330	390	450	570	630

- Special operation

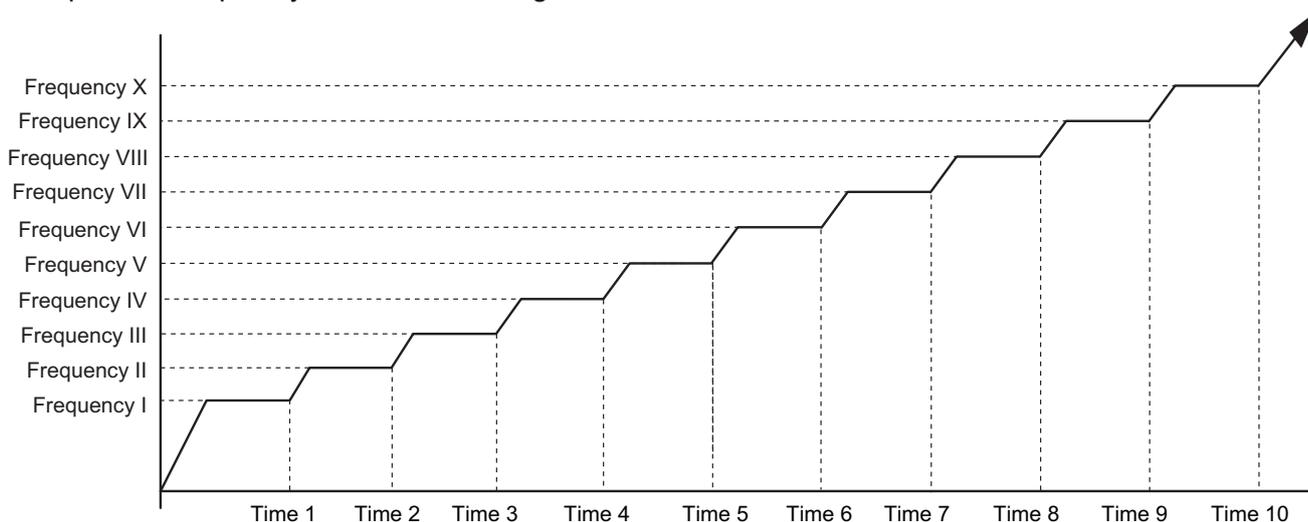
Rotation number (rps)	I	II	III	IV	V	VI	VII	VIII
Time (sec)	1	2	3	4	5	6	7	8
	225	305	605	665	725	785	855	1,000

NOTES:

- Normal operation:
 - Cooling and dry mode
 - Below 3 hours from the compressor stop and the compressor thermistor $\geq 15\text{ }^{\circ}\text{C}$
 - After defrost operation
 - Other than when the compressor starts for the first time since the breaker turns on
- Special operation:
 - Other than the normal operation condition
 - When the compressor starts for the first time since the breaker turns on

Model: AOHG45KQTA

Compressor frequency soon after starting is controlled as below.



- Normal operation

Frequency (rps)	I	II	III	IV	V	VI	VII	VIII	IX	X
Time (sec)	1	2	3	4	5	6	7	8	9	10
	60	120	180	240	360	420	480	540	600	660

- Special operation

Frequency (rps)	I	II	III	IV	V	VI	VII	VIII	IX	X
Time (sec)	1	2	3	4	5	6	7	8	9	10
	120	185	245	305	605	665	725	785	845	1,000

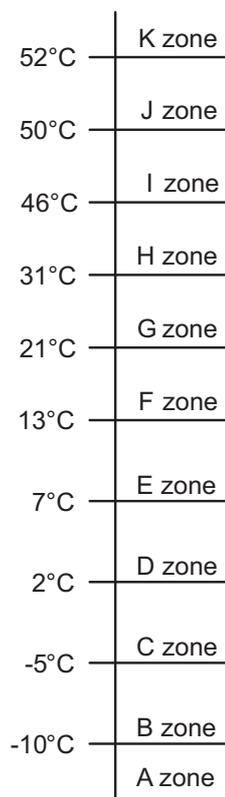
NOTES:

- Normal operation:
 - Cooling and dry mode
 - Below 3 hours from the compressor stop and the compressor thermistor $\geq 15\text{ }^{\circ}\text{C}$
 - After defrost operation
 - Other than when the compressor starts for the first time since the breaker turns on
- Special operation:
 - Other than the normal operation condition
 - When the compressor starts for the first time since the breaker turns on

1-5. Rotation number of compressor limitation by outdoor temperature

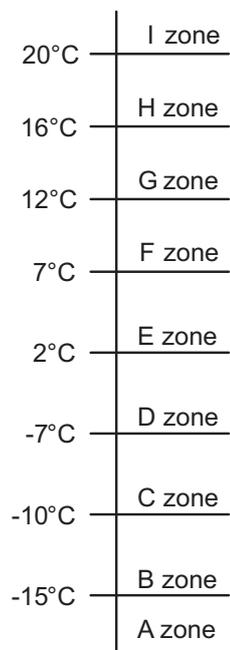
The minimum rotation number of compressor is limited by outdoor temperature as below.

- **Cooling/Dry mode**



Model name	Outdoor temperature zone	Limitation of compressor frequency
AOHG36KQTA	A zone	55 rps
	B zone	52 rps
	C zone	47 rps
	D zone	39 rps
	E zone	33 rps
	F zone	25 rps
	G zone	18 rps
	H zone	20 rps
	I zone	20 rps
	J zone	21 rps
	K zone	24 rps
AOHG45KQTA	A zone	60 rps
	B zone	57 rps
	C zone	48 rps
	D zone	36 rps
	E zone	27 rps
	F zone	24 rps
	G zone	20 rps
	H zone	20 rps
	I zone	20 rps
	J zone	26 rps
	K zone	30 rps

- Heating mode



Model name	Outdoor temperature zone	Limitation of compressor frequency
AOHG36KQTA	A zone	58 rps
	B zone	52 rps
	C zone	43 rps
	D zone	38 rps
	E zone	28 rps
	F zone	23 rps
	G zone	20 rps
	H zone	17 rps
	I zone	17 rps
AOHG45KQTA	A zone	55 rps
	B zone	51 rps
	C zone	42 rps
	D zone	39 rps
	E zone	28 rps
	F zone	24 rps
	G zone	21 rps
	H zone	16 rps
	I zone	20 rps

2. Auto changeover operation

When the air conditioner is set to AUTO mode by remote controller, operation starts in the optimum mode from among heating, cooling, dry and monitoring modes. During operation, the optimum mode is automatically switched in accordance with temperature changes. The temperature can be set between 18°C and 30°C in 1.0°C steps.

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

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

Tr: Room temperature

Ts: Setting temperature

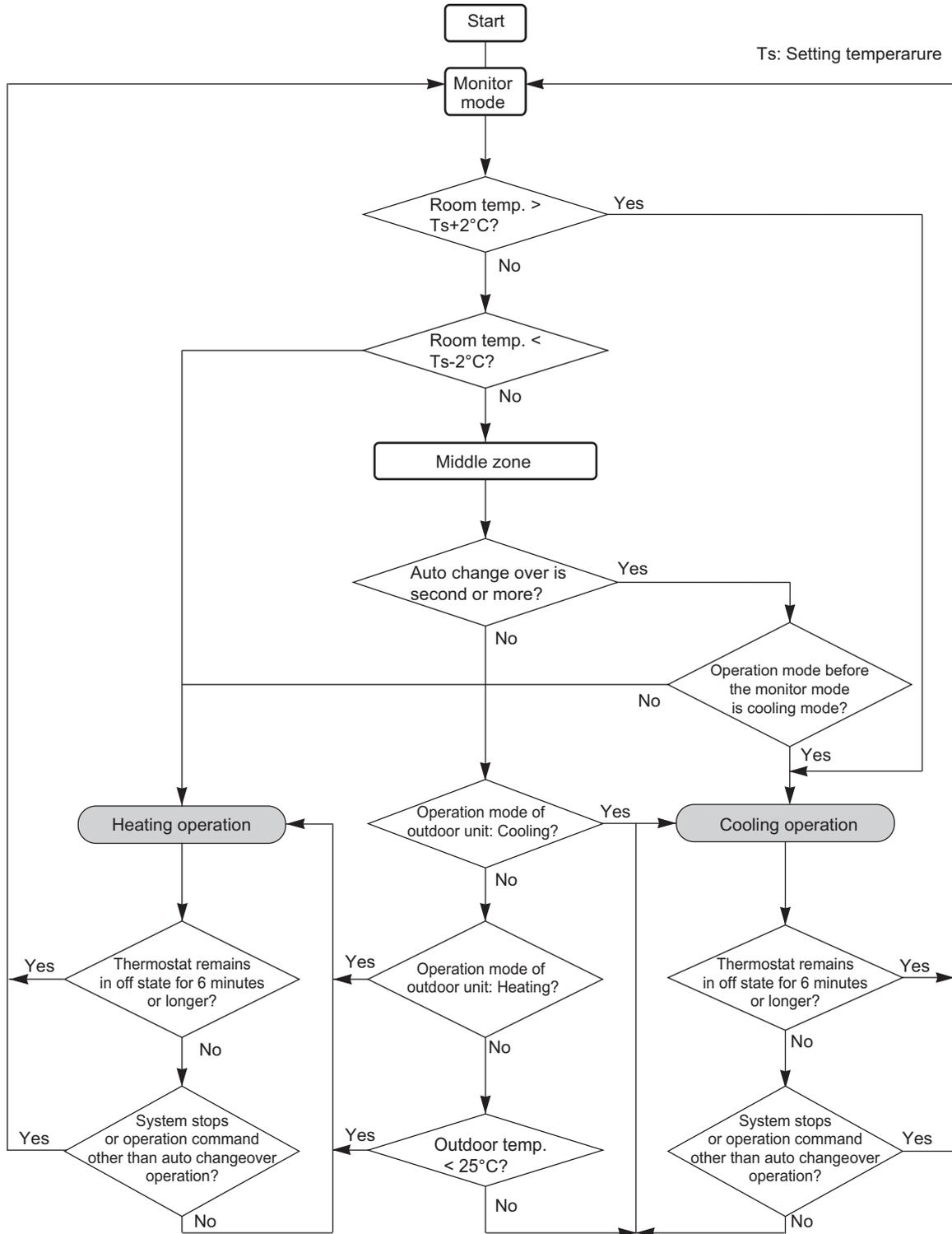
NOTE: When the operation mode is middle zone, indoor unit operation mode is selected as below.

- Same operation mode is selected as outdoor unit.
If outdoor unit is operating in cooling and heating mode, indoor unit will be operated by the same operation mode.
- Selected by outdoor temperature.
If outdoor unit is operating in other than cooling and heating mode, indoor unit will be operated according to the outdoor temperature as below.

Outdoor temp.	Operation mode
25°C or more	Cooling
Less than 25°C	Heating

- When the compressor was stopped for 6 consecutive minutes by temperature control function after the cooling or heating mode was selected as above, operation is switched to monitoring mode and the operation mode selection is done again.
- When the middle zone is selected on the predetermining of the operation mode, the operation mode before the changing to the monitoring mode is selected.

Operation flow chart



CONTROL AND FUNCTIONS

CONTROL AND FUNCTIONS

3. Fan control

Tr: Room temperature

Ts: Setting temperature

3-1. Indoor fan control

■ Fan speed

Indoor fan speed is defined as below.

Operation mode	Fan mode	Speed (rpm)	
		ABHG36KRTA	ABHG45KRTA
Heating	HIGH	1,090	1,120
	MED+	1,020	1,030
	MED	920	940
	LOW-	830	870
	QUIET	700	740
	Cool air prevention	500	500
Cooling/Fan	S-LOW	300	300
	HIGH	1,120	1,140
	MED	920	940
	LOW	830	870
	QUIET	700	740
	Soft quiet	500* ¹	500* ¹
Dry	S-LOW	300* ²	300* ²
		X zone: 700 J zone: 700	X zone: 740 J zone: 740

*1: Fan mode only

*2: Cooling mode only

■ Fan operation

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

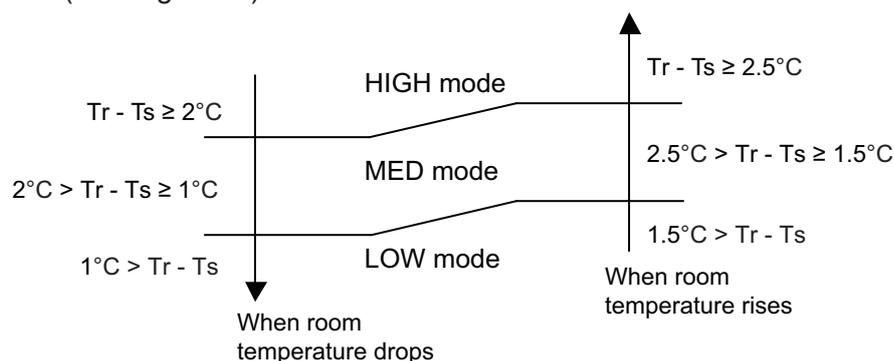
When fan mode is set at AUTO, it operates on MED fan speed.

■ Cooling operation

Switch the airflow AUTO, and indoor fan motor will run according to room temperature, as below.

On the other hand, if switched in HIGH—QUIET, indoor motor will run at a constant airflow of COOL operation modes QUIET, LOW, MED, HIGH as shown in “Fan speed” above.

Airflow change over (Cooling: Auto)



■ Dry operation

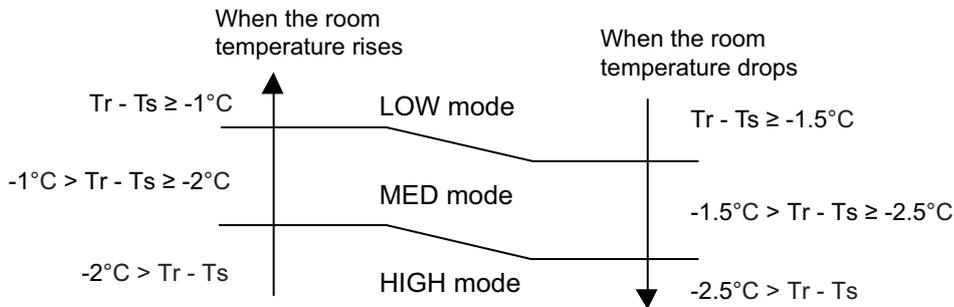
During dry operation, fan speed setting can not be changed as shown in “Fan speed” above.

■ Heating operation

Switch the airflow AUTO, and the indoor fan motor will run according to a room temperature, as below.

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 “Fan speed” above.

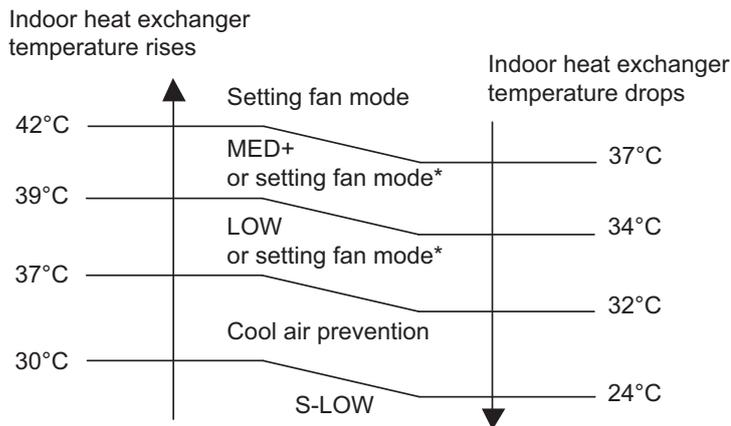
Airflow change over (Heating: Auto)



■ Cool air prevention control (heating mode)

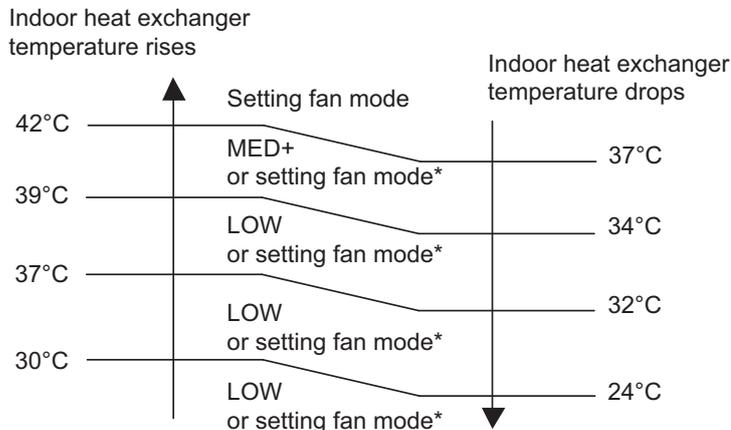
The maximum value of the indoor fan speed is set as shown below, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

• Normal operation



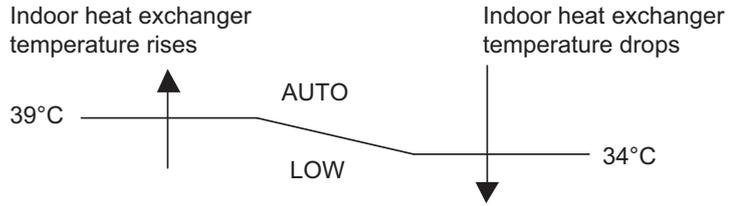
*: Lower speed is selected.

13 minutes later:



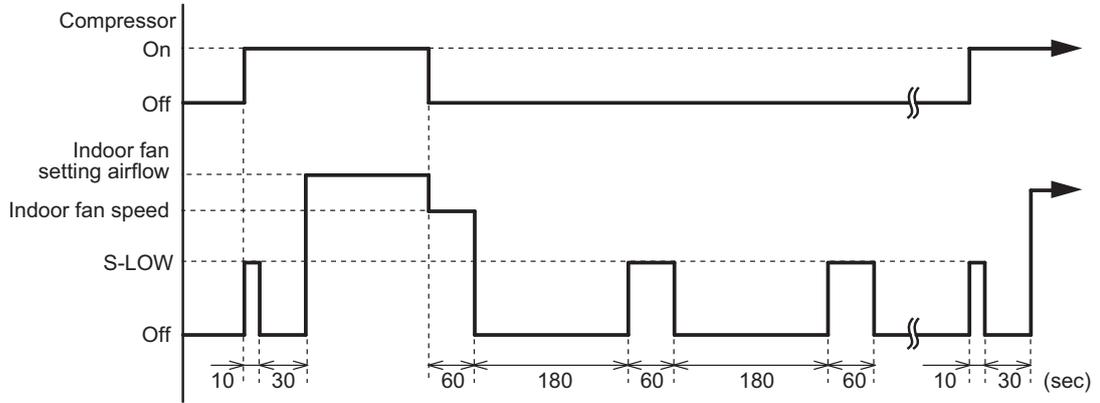
*: Lower speed is selected.

• 10 °C HEAT operation



■ Moisture return prevention control (cooling and dry mode)

Switch the airflow AUTO at cooling mode, and the indoor fan motor will run as shown below.



CONTROL AND FUNCTIONS

CONTROL AND FUNCTIONS

3-2. Outdoor fan control

■ Outdoor fan motor

This outdoor unit has a DC fan motor. (Control method is different between AC and DC motors.)

■ Fan speed

● Model: AOHG36KQTA

Fan speed is defined by outdoor temperature and compressor frequency.

Unit: rpm

Fan step	Cooling or dry	Heating
13	830	—
12	830	—
11	740	—
10	700	830
9	650	740
8	570	690
7	570	620
6	570	590
5	570	480
4	540	410
3	480	340
2	400	270
1	270	200
S-HIGH	—	830

- When the compressor frequency increases, the outdoor fan speed also changes to the higher speed.
- When the compressor frequency decreases, the outdoor fan speed also changes to the lower speed.

NOTE: After defrost control on the heating mode, the fan speed is kept higher regardless of the compressor frequency.

Fan speed after defrost control: 830 rpm

● Model: AOHG45KQTA

Fan speed is defined by outdoor temperature and compressor frequency.

Unit: rpm

Fan step	Cooling or dry	Heating
13	970	—
12	900	—
11	830	—
10	760	970
9	690	880
8	620	800
7	550	720
6	480	630
5	420	520
4	360	440
3	300	360
2	240	270
1	200	200
S-HIGH	—	990

- When the compressor frequency increases, the outdoor fan speed also changes to the higher speed.
- When the compressor frequency decreases, the outdoor fan speed also changes to the lower speed.

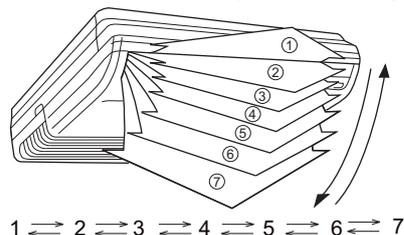
NOTE: After defrost control on the heating mode, the fan speed is kept higher regardless of the compressor frequency.

Fan speed after defrost control: 990 rpm

4. Louver control

4-1. Vertical airflow direction louver control

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



- Remote controller display is not changed.
- Vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.

Cooling/dry mode : Horizontal flow 1

Heating mode : Downward flow 7

- During AUTO operation, for the first a few minutes after beginning operation, airflow will be horizontal 1; the air direction cannot be adjusted during this period. The airflow direction setting will temporarily become 1 when the temperature of the airflow is low at the start of the Heating mode.
- After beginning of AUTO/HEAT mode operated and automatic defrosting operation, the airflow will be horizontal 1. However, the airflow direction cannot be adjusted at beginning AUTO operation mode.

4-2. Swing operation

- To select vertical airflow swing operation
When the swing signal is received, the vertical airflow direction louver starts to swing.
 - Swinging range
 - Cooling mode/dry mode/fan mode: 1 ↔ 7
 - Heating mode: 1 ↔ 7
 - When the indoor fan is S-LOW or stop mode, the swing operation is interrupted and it stops at either upper end or bottom end.

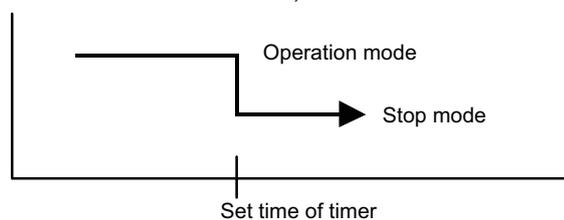
5. Timer operation control

5-1. Wireless remote control

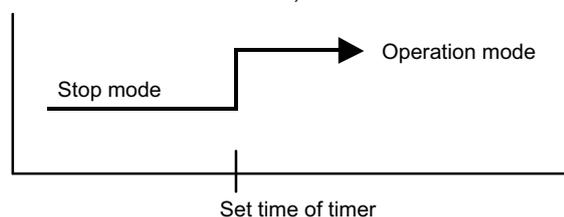
On/Off timer	Program timer	Sleep timer	Weekly timer
○	○	○	—

■ On/Off timer

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

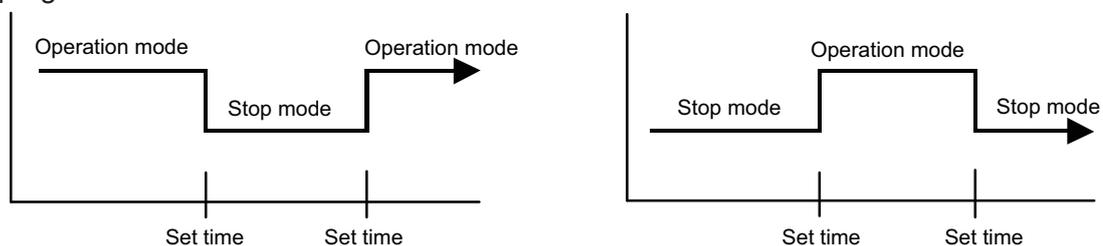


- On timer: When the clock reaches the set timer, the air conditioner will be turned on.



■ Program timer

- The program timer allows the off timer and the on timer to be used in combination one time.



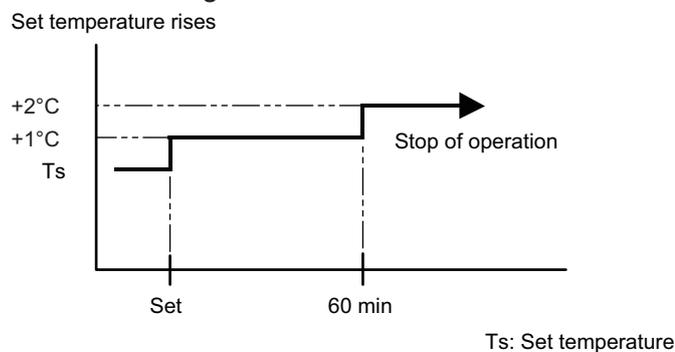
- Operation will start from the timer setting (either off timer and on timer) whichever is closest to the clock current timer setting. The order of operations is indicated by the allow in the remote controller screen.
- Sleep timer operation cannot be combined with on timer operation.

■ 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.

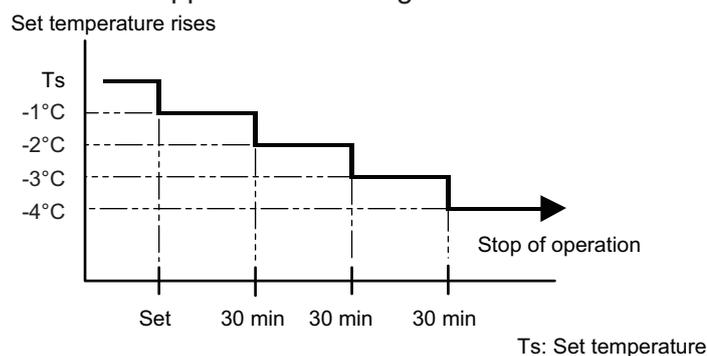
- In the cooling operation mode

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



- In the heating operation mode

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

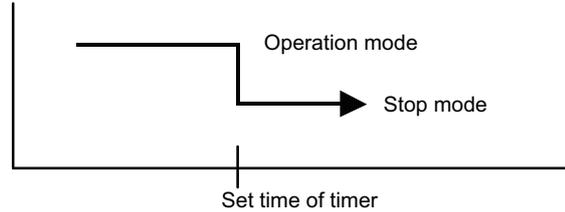


5-2. Wired remote control

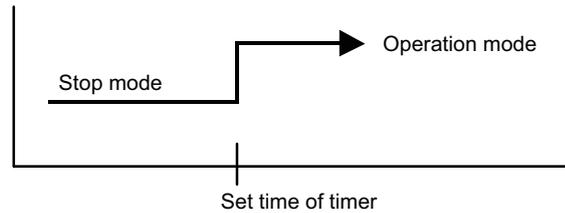
On/Off timer	Program timer	Sleep timer	Weekly timer	Temperature set back timer
○	○	○	○	○

■ On/Off timer

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

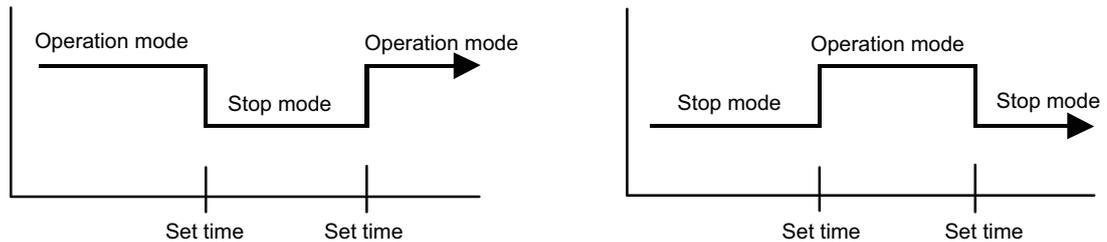


- On timer: When the clock reaches the set timer, the air conditioner will be turned on.



■ Program timer

- The program timer allows the off timer and the on timer to be used in combination one time.



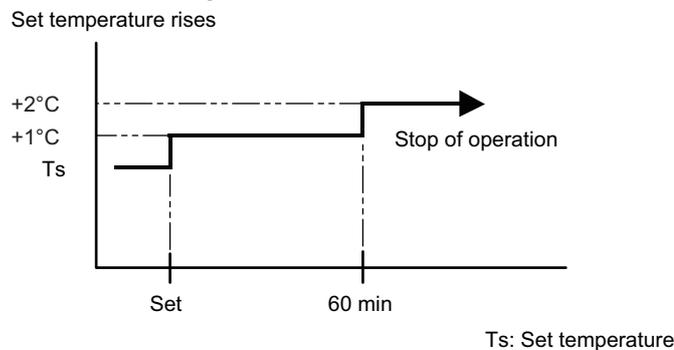
- Operation will start from the timer setting (either off timer and on timer) whichever is closest to the clock current timer setting. The order of operations is indicated by the allow in the remote controller screen.
- Sleep timer operation cannot be combined with on timer operation.

■ 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.

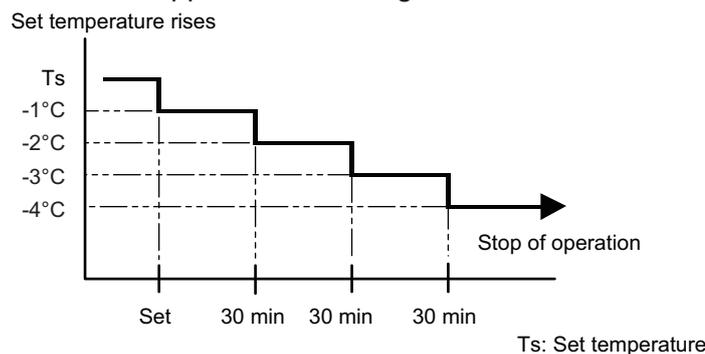
- In the cooling operation mode

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



- In the heating operation mode

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



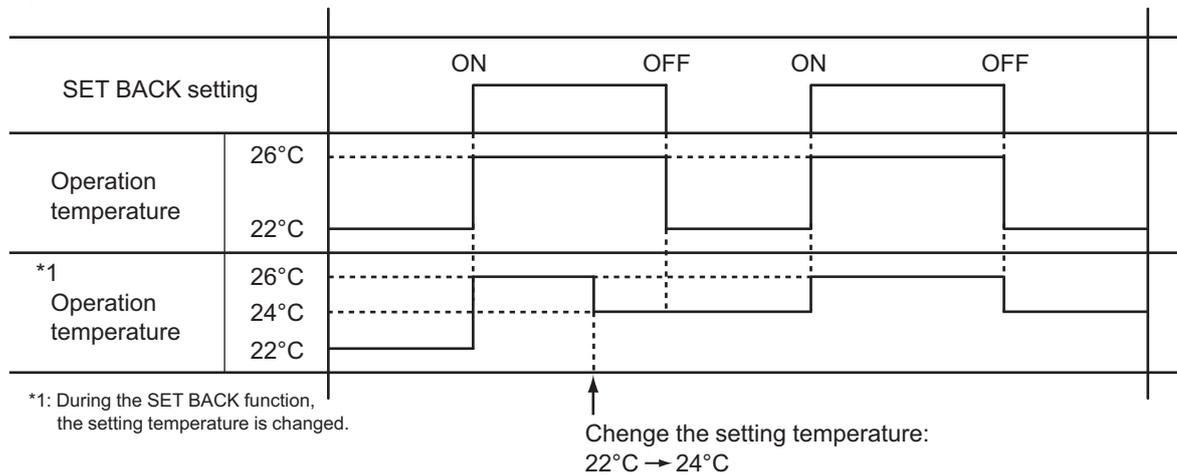
■ Weekly timer

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

■ 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)



6. Defrost operation control

Tn: Outdoor unit heat exchanger temperature

Ta: Outdoor temperature

Tn10: Temperature at 10 minutes after compressor start

Tnb: Temperature before 5 minutes

• Triggering condition

The defrost operation starts when outdoor unit heat exchanger temperature sensor detects the temperature lower than the values shown below.

– 1st time defrosting after starting operation

Compressor integrating operation time	Less than 17 min.	17 to 57 min.	More than 57 min.
Condition	Does not operate	$T_n \leq -9^\circ\text{C}$ and $T_n - T_a \geq 5$ deg	$T_n \leq -5^\circ\text{C}$

– 2nd time and after

Compressor integrating operation time	Less than 35 min.	More than 35 min.
Condition	Does not operate	$T_n - T_{n10} < -5$ deg ($T_n \leq -10^\circ\text{C}$) $T_n - T_{nb} < -2$ deg ($T_n \leq -10^\circ\text{C}$) $T_n \leq -25^\circ\text{C}$ ($T_a \geq -20^\circ\text{C}$) $T_n < T_a - 7^\circ\text{C}$ or $T_n \leq -25^\circ\text{C}$ ($T_a < -20^\circ\text{C}$)

– Integrating defrost (Constant monitoring)

Compressor integrating operation time	More than 240 min. (For long continuous operation)	More than 215 min. (For long continuous operation)	Less than 10 min.* (For intermittent operation)
Condition	$T_n \leq -3^\circ\text{C}$	$T_n \leq -5^\circ\text{C}$	Count of the compressor off: 40 times

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

• Release condition

The defrost operation is released when either one of the conditions below is satisfied.

Outdoor unit heat exchanger temperature (after 1 minute or later since compressor start)	12°C or more
Compressor operation time	15 minutes

6-1. Defrost operation in heating operation stopped

If the outdoor unit is frosted when stopping the heating operation, it stops after performing the automatic defrosting operation.

In this time, if the indoor unit operation lamp flashes slowly (6 sec on/2 sec off), the outdoor unit allow the heat exchanger to defrost, and then stop.

• Triggering condition

When all of the following conditions are satisfied in heating operation

- Compressor operation integrating time: 30 minutes or more
- Compressor continuous operation time: 10 minutes or more
- Outdoor unit heat exchanger temperature: -4°C or less

• Release condition

The defrost operation is released when either one of the conditions below is satisfied.

Outdoor unit heat exchanger temperature (after 1 minute or later since compressor start)	12°C or more
Compressor operation time	15 minutes

7. Various control

7-1. Auto restart

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

Operation contents memorized when the power is interrupted	
Operation mode	
Setting temperature	
Fan mode setting	
Timer mode and set time (set by wireless remote controller)	
Airflow direction setting	
Swing	
ECONOMY operation	
10 °C HEAT operation	
Outdoor low noise operation	

7-2. 10 °C HEAT operation

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

Operation mode	Heating
Setting temperature	10°C
Fan mode	AUTO
LED display	Economy
Defrost operation	Operate as normal

7-3. ECONOMY operation

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

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

7-4. POWERFUL operation

The POWERFUL operation starts by pressing POWERFUL button on the remote controller. The indoor unit and outdoor unit operate at maximum power as shown in the table below.

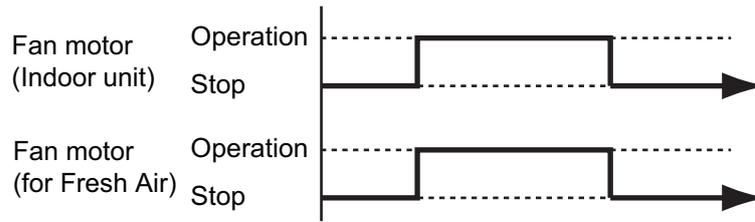
Compressor frequency		Maximum
Fan mode		POWERFUL
Vertical airflow direction louver setting	Cooling	3
	Dry	
	Heating	5

Release condition:

- Cooling/Dry
Room temperature ≤ Setting temperature -0.5°C or Operation time has passed 20 minutes.
- Heating
Room temperature ≥ Setting temperature +0.5°C or Operation time has passed 20 minutes.

7-5. Fresh air control

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



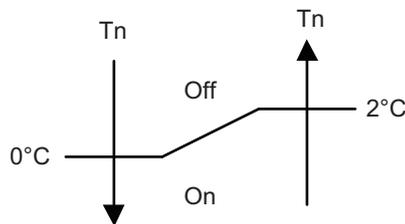
7-6. Compressor preheating

By preheating the compressor, warm airflow is quickly discharged when the operation is started.

- **Triggering condition 1**

- Outdoor temperature $\leq 20^{\circ}\text{C}$
When outdoor temperature reaches 26°C , compressor preheating stops.
- 30 minutes after compressor stopped

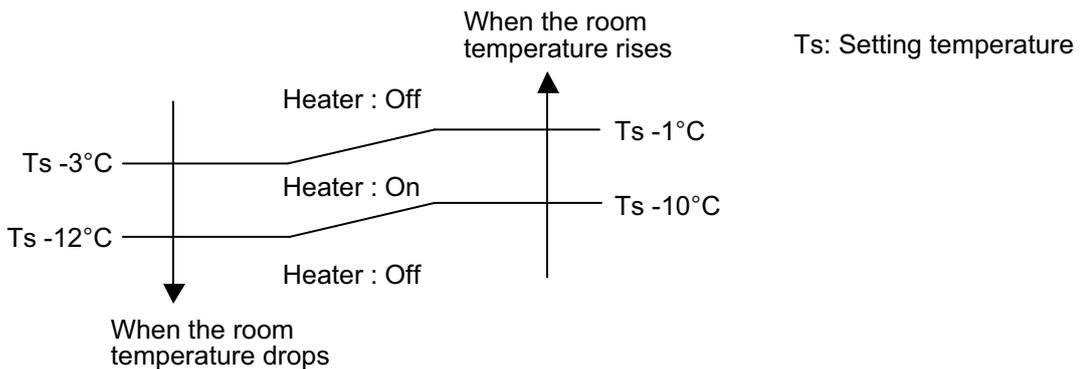
- **Triggering condition 2**



T_n : Outdoor unit heat exchanger temp.

7-7. External electrical heater control

The external electrical heater is operated as below.



NOTES:

- When the compressor stop, external electric heater is off.
- It operates only in heating mode and when the indoor fan operates. (However, S-LOW is excluded.)

7-8. Electronic expansion valve control

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

Operation mode	Pulse range
Cooling/dry mode	Between 47 and 480 pulses
Heating mode	Between 39 and 480 pulses

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

7-9. Drain pump control

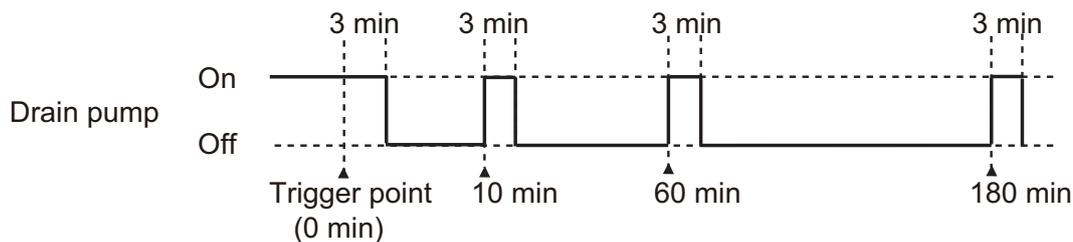
■ Drain control for cooling operation

● During the compressor in operation

- **Triggering condition**
The thermostat is turned on during cooling or dry mode.
- **Operation details**
The drain pump is turned on.
- **Release condition**
 - The thermostat is turned off.
Refer to "When the compressor is not in operation" for the operation after release.
 - The compressor is stopped.
Refer to "When the compressor is not in operation" for the operation after release.
 - The operation is switched to heating mode.
Refer to "When the compressor is not in operation" for the operation after release.
 - The float switch is turned on.
Refer to "Overflow control" for the operation after release.
 - The compressor is stopped by Anti-freezing control.
Refer to "The compressor is stopped by Anti-freezing control" for the operation after release.

● When the compressor is not in operation

- **Triggering condition**
 - The thermostat is turned off.
 - The compressor is stopped.
 - The operation is switched to heating mode.
 - The float switch is turned off.
- **Operation details**
 - Count 180 minutes.
 - Start drain pump intermittent operation.



- **Release condition**
 - 3 minutes drain pump operation is finished after 180 minutes count.
 - The operation is switched to cooling or dry mode.
Refer to "During the compressor in operation" for the operation after release.
 - The float switch is turned on.
Refer to "Overflow control" for the operation after release.
- **Operation after release**
The drain pump is turned off and the air conditioner operate according the settings.

● Overflow control

- **Triggering condition**

The float switch is turned on.

- **Operation details**

- The drain pump is turned on.
- When the operation mode is cooling or dry, operate the followings.
 - The compressor is stopped.
 - Then indoor fan control is turned off.

- **Release condition**

- The float switch is turned off.
 - In the case that on the cooling or dry mode the thermostat is on, refer to "[During the compressor in operation](#)" for the operation after release.
 - In other case, refer to "[When the compressor is not in operation](#)" for the operation after release.
- 3 minutes passed

- **Operation after release**

The compressor stopps permanently.

● The compressor is stopped by Anti-freezing control

- **Triggering condition**

During the compressor in operation, the compressor is stopped by Anti-freezing control.

- **Operation details**

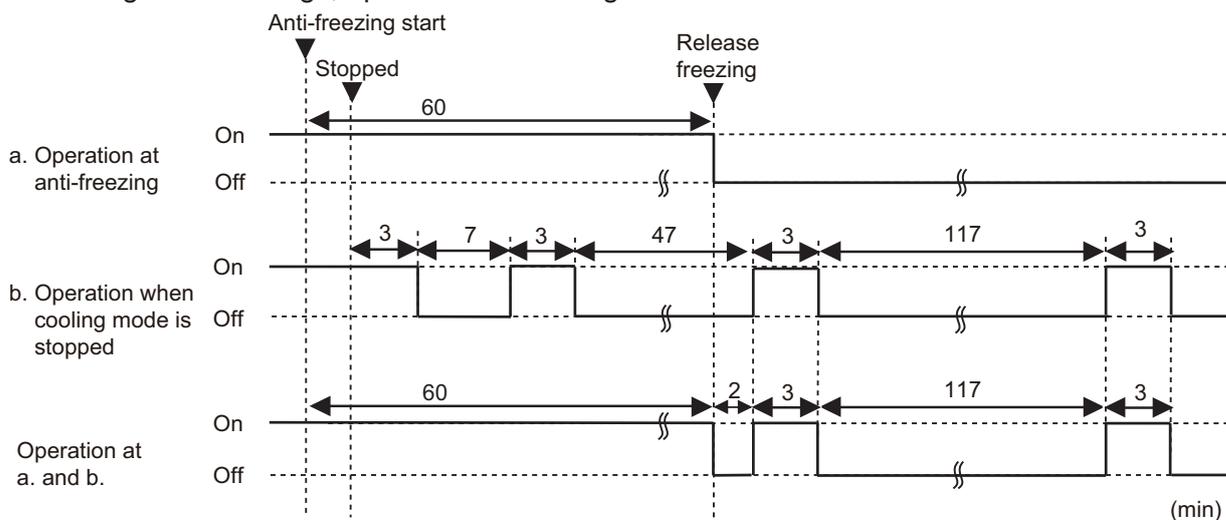
The drain pump is kept on in 60 minutes after Anti-freezing control released.

- **Release condition**

60 minutes passed

- **Operation after release**

According to the settings, operate the followings.



7-10. Prevention to restart for 3 minutes (3 minutes st)

When the compressor fails to start for the number of times below, it does not enter operation status for 3 minutes.

Retry number	30
Retry set number	3

When the compressor fails to start in the retry set number above, the compressor is stopped.

7-11. 4-way valve control

- If heating mode is selected at the compressor start, 4-way valve is energized for heating.
- When the air conditioner is switched between cooling and heating mode, compressor is stopped, and the 4-way valve is switched when the 3 minutes passes and the compressor is started.

7-12. Human sensor for energy saving

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

Operation mode	Operation details (If there is no one in the room for a while)
Cooling/Dry	The setting temperature is increased by maximum 2°C. (Maximum setting temperature: 30°C)
Heating	The setting temperature is decreased by maximum 2°C. (Minimum setting temperature: 16°C)
Auto	Energy saving function is performed automatically for the selected mode (cooling/heating/dry).

Details about detection with the human sensor:

The human sensor detects whether there are people in the room by looking for movement by people in the room.

7-13. Peak cut operation

The current value is limited to reduce the power consumption by external input.

Peak cut level	Level 1	Level 2	Level 3	Level 4
Peak cut for rated capacity	Forced thermostat off	50%	75%	100%

NOTES:

- During defrost operation, peak cut operation becomes invalid.
- Even during the peak cut operation, the operations of current overload, economy, and low noise are effective and the outdoor unit operates by lowest current of them.

8. Various protections

8-1. Discharge gas temperature over-rise prevention control

The discharge gas temperature sensor (discharge thermistor: outdoor unit side) detects the discharge gas temperature.

- When the discharge temperature becomes higher than the trigger condition, the compressor frequency is decreased as the table below, and it continues to decrease until the discharge temperature becomes lower than the trigger condition.
- When the discharge temperature becomes lower than the release condition, control of compressor frequency is released.
- When the discharge temperature becomes higher than the compressor protection temperature, the compressor is stopped and the indoor unit indicator lamp starts blinking.

Trigger condition	104°C
Compressor frequency	-14 rps/120 seconds
Release condition	101°C
Compressor protection temperature	110°C

8-2. Anti-freezing control (cooling and dry mode)

The rotation number of compressor is decrease in cooling and dry mode when the indoor unit heat exchanger temperature sensor detects the temperature lower than the trigger condition.

When the indoor unit heat exchanger temperature reaches release condition, the anti-freezing control is stopped.

Trigger condition	4°C	
Release condition	Outdoor temp. $\geq 10^{\circ}\text{C}^{*1}$	7°C
	Outdoor temp. $\geq 12^{\circ}\text{C}^{*2}$	
	Outdoor temp. $< 10^{\circ}\text{C}^{*1}$	13°C
	Outdoor temp. $< 12^{\circ}\text{C}^{*2}$	

*1: During the outdoor temperature dropping

*2: During the outdoor temperature rising

8-3. Current release control

The rotation number of compressor is controlled so that the outdoor unit input current does not exceeds current limit value set according to the outdoor temperature.

The rotation number of compressor returns according to the operation mode, when the current becomes lower than the release value.

■ Model: AOHG36KQTA

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	$52^{\circ}\text{C} \leq \text{Ta}$	3.5 A	3.0 A
	$50^{\circ}\text{C} \leq \text{Ta} < 52^{\circ}\text{C}$	5.5 A	5.0 A
	$42^{\circ}\text{C} \leq \text{Ta} < 50^{\circ}\text{C}$	6.0 A	5.5 A
	$2^{\circ}\text{C} \leq \text{Ta} < 42^{\circ}\text{C}$	7.5 A	7.0 A
	$\text{Ta} < 2^{\circ}\text{C}$	8.5 A	8.0 A
Heating	$20^{\circ}\text{C} \leq \text{Ta}$	5.5 A	5.0 A
	$16^{\circ}\text{C} \leq \text{Ta} < 20^{\circ}\text{C}$	6.0 A	5.5 A
	$12^{\circ}\text{C} \leq \text{Ta} < 16^{\circ}\text{C}$	7.0 A	6.5 A
	$2^{\circ}\text{C} \leq \text{Ta} < 12^{\circ}\text{C}$	7.5 A	7.0 A
	$\text{Ta} < 2^{\circ}\text{C}$	8.5 A	8.0 A

■ Model: AOHG45KQTA

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	$52^{\circ}\text{C} \leq \text{Ta}$	4.5 A	4.0 A
	$50^{\circ}\text{C} \leq \text{Ta} < 52^{\circ}\text{C}$	5.5 A	5.0 A
	$46^{\circ}\text{C} \leq \text{Ta} < 50^{\circ}\text{C}$	6.5 A	6.0 A
	$42^{\circ}\text{C} \leq \text{Ta} < 46^{\circ}\text{C}$	7.5 A	7.0 A
	$2^{\circ}\text{C} \leq \text{Ta} < 42^{\circ}\text{C}$	8.5 A	8.0 A
	$\text{Ta} < 2^{\circ}\text{C}$	9.0 A	8.5 A
Heating	$20^{\circ}\text{C} \leq \text{Ta}$	6.5 A	6.0 A
	$16^{\circ}\text{C} \leq \text{Ta} < 20^{\circ}\text{C}$	7.0 A	6.5 A
	$12^{\circ}\text{C} \leq \text{Ta} < 16^{\circ}\text{C}$	8.0 A	7.5 A
	$2^{\circ}\text{C} \leq \text{Ta} < 12^{\circ}\text{C}$	8.5 A	8.0 A
	$\text{Ta} < 2^{\circ}\text{C}$	9.0 A	8.5 A

8-4. Indoor unit fan motor over temperature protection

The fan motor over temperature protection activates after two judgments when fulfilling any of the following conditions.

- Detected that the rotation number of the fan motor stays 300 rpm or less for 10 seconds after 90 seconds from the fan operation started.
- IPM trip protection activates.
- Current overload protection activates.

At first, the function determines if any of the above conditions apply (First judgment). If any of the above conditions apply after the first judgment, the function will make the second judgment after 6 minutes. If any of the above conditions still apply in the second judgment, fan motor over temperature protection activates.

• Protection details

The function lowers the static pressure by 20 Pa. If the problem is not resolved even at the minimum static pressure, the unit operates as follows.

- Fan motor error will be displayed if the fan motor speed stays 300 rpm or less for 10 seconds after 90 seconds from the fan operation started.
- The fan stops 40 seconds after the activation of the IPM trip protection.
- The fan stops 50 seconds after the activation of the current overload protection.

8-5. Compressor temperature protection

When the compressor temperature sensor detects higher than the trigger condition below, the compressor is stopped. When the compressor temperature sensor detects the release condition, the protection is released.

Trigger condition	108°C
Release condition	80°C (3 minutes after compressor stop)

8-6. High pressure protection

Trigger condition	Pressure switch: Off (Open: Higher than 4.2 MPa) Compressor stop
Release condition	Pressure switch: On (Close: Lower than 3.2 MPa) (3 minutes after compressor stop) Compressor restart

8-7. Low outdoor temperature protection

When the outdoor temperature sensor detects lower than the trigger condition below, the compressor is stopped.

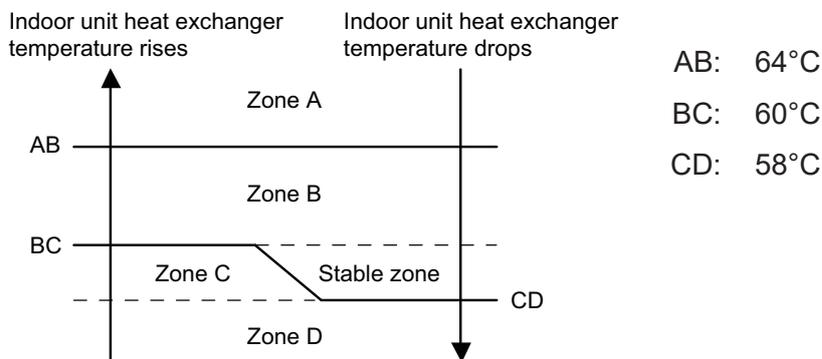
Operation mode	Cooling/Dry
Trigger condition	-20°C
Release condition	-15°C

8-8. High temperature and high pressure release control

The compressor is controlled as follows.

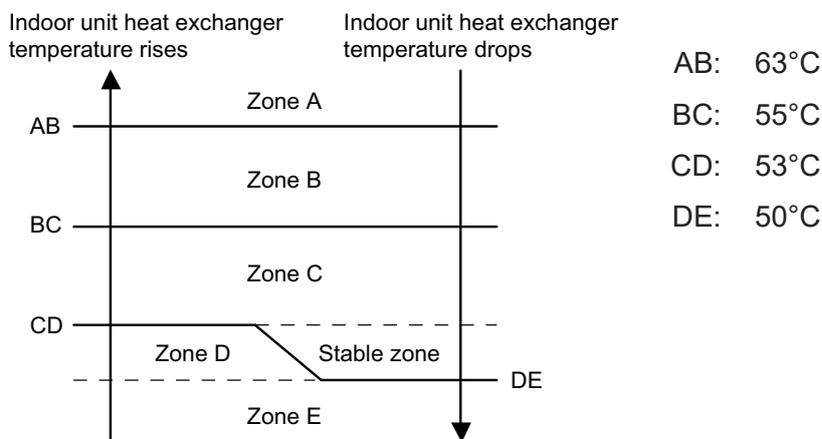
■ Models: AOHG36KQTA and AOHG45KQTA

• Cooling mode



Zone	Operation	
Zone A	Compressor is stopped.	
Zone B	The compressor frequency is decreased.	-7 rps/120 sec.
Zone C	The protection is released and the operation is returned to normal mode.	
Zone D		

• Heating mode



Zone	Operation	
Zone A	Compressor is stopped.	
Zone B	The compressor frequency is decreased.	-15 rps/120 sec.
Zone C		-2 rps/120 sec.
Zone D	The protection is released and the operation is returned to normal mode.	
Zone E		

5. FILED WORKING

CONTENTS

5. FILED WORKING

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1. Function settings for indoor unit

To adjust the functions of this product according to the installation environment, various types of function settings are available.

NOTE: Incorrect settings can cause a product malfunction.

1-1. Function settings by using remote controller

Some function settings can be changed on the remote controller. After confirming the setting procedure and the content of each function setting, select appropriate functions for your installation environment.

■ Setting procedure by using remote controller

Remote controller is not attached for this product. For details of the installing remote controller, refer to following information.

- Overview information: Operating manual of the remote controller
- Setting procedure: Installation manual of the remote controller

■ Contents of function setting

Each function setting listed in this section is adjustable in accordance with the installation environment.

NOTE: Setting will not be changed if invalid numbers or setting values are selected.

● Function setting list

	Function no.	Functions
1)	11	Filter sign
2)	20	Ceiling height
3)	28	Horizontal louver direction switching for dew condensation prevention
4)	30/31	Room temperature control for indoor unit sensor
5)	35/36	Room temperature control for wired remote controller sensor
6)	40	Auto restart
7)	42	Room temperature sensor switching
8)	44	Remote controller custom code
9)	46	External input control
10)	48	Room temperature sensor switching (Aux.)
11)	49	Indoor unit fan control for energy saving for cooling
12)	60	Switching functions for external output terminal

1) Filter sign

Select appropriate intervals for displaying the filter sign on the indoor unit according to the estimated amount of dust in the air of the room.

If the indication is not required, select "No indication" (03).

Function number	Setting value	Setting description	Factory setting
11	00	Standard (2,500 hours)	
	01	Long interval (4,400 hours)	
	02	Short interval (1,250 hours)	
	03	No indication	◆

2) Ceiling height

Select the appropriate ceiling height according to the place of installation.

Function number	Setting value	Setting description	Factory setting
20	00	Standard	◆
	01	High ceiling	

For the specific height for each setting value, refer to "Installation space" in Chapter 2. "Dimensions" in Chapter 1. GENERAL INFORMATION on page 01-4.

3) Horizontal louver direction switching for dew condensation prevention

Automatically switches the position of the horizontal louver if the airflow direction is set at lower than the dew condensation limit position in cooling or drying operation.

Select suitable adjustment position according to the customer's preference.

Function number	Setting value	Setting description	Factory setting
28	00	Adjust to dew condensation limit position	◆
	01	Adjust to cooling standard position	

4) Room temperature control for indoor unit sensor

Depending on the installed environment, correction of the room temperature sensor may be required. Select the appropriate control setting according to the installed environment.

The temperature of the room temperature sensor is corrected as follows:

Corrected temp. = Temp. of the room temp. sensor - Correction temp. value

Example of correction:

When the temperature of the room temp. sensor is 26°C and the setting value is "03" (-1.0°C), corrected temp. will be 27°C (26°C - [-1.0°C]).

The temperature correction values show the difference from the Standard setting "00" (manufacturer's recommended value).

Function number	Setting value	Setting description	Factory setting		
30 (For cooling)	31 (For heating)	00	Standard setting	◆	
		01	No correction 0.0 °C		
		02	-0.5 °C	More cooling Less heating	
		03	-1.0 °C		
		04	-1.5 °C		
		05	-2.0 °C		
		06	-2.5 °C		
		07	-3.0 °C		
		08	-3.5 °C		
		09	-4.0 °C		
		10	+0.5 °C	Less cooling More heating	
		11	+1.0 °C		
		12	+1.5 °C		
		13	+2.0 °C		
		14	+2.5 °C		
		15	+3.0 °C		
		16	+3.5 °C		
17	+4.0 °C				

5) Room temperature control for wired remote controller sensor

Depending on the installed environment, correction of the wire remote temperature sensor may be required. Select the appropriate control setting according to the installed environment.

To change this setting, set Function 42 to Both "01".

Ensure that the Thermo Sensor icon is displayed on the remote controller screen.

Function number		Setting value	Setting description	Factory setting	
35 (For cooling)	36 (For heating)	00	Standard setting	◆	
		01	No correction 0.0°C		
		02	-0.5 °C	More cooling Less heating	
		03	-1.0 °C		
		04	-1.5 °C		
		05	-2.0 °C		
		06	-2.5 °C		
		07	-3.0 °C		
		08	-3.5 °C		
		09	-4.0 °C		
		10	+0.5 °C	Less cooling More heating	
		11	+1.0 °C		
		12	+1.5 °C		
		13	+2.0 °C		
		14	+2.5 °C		
		15	+3.0 °C		
		16	+3.5 °C		
17	+4.0 °C				

6) Auto restart

Enables or disables automatic restart after a power interruption.

Function number	Setting value	Setting description	Factory setting
40	00	Enable	◆
	01	Disable	

NOTE: Auto restart is an emergency function such as for power outage etc. Do not attempt to use this function in normal operation. Be sure to operate the unit by remote controller or external device.

7) Room temperature sensor switching

(Only for wired remote controller)

When using the wired remote controller temperature sensor, change the setting to "Both" (01).

Function number	Setting value	Setting description	Factory setting
42	00	Indoor unit	◆
	01	Both	

00: Sensor on the indoor unit is active.

01: Sensors on both indoor unit and wired remote controller are active.

8) Remote controller custom code

(Only for wireless remote controller)

The indoor unit custom code can be changed. Select the appropriate custom code.

Function number	Setting value	Setting description	Factory setting
44	00	A	◆
	01	B	
	02	C	
	03	D	

9) External input control

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

Function number	Setting value	Setting description	Factory setting
46	00	Operation/Stop mode 1	◆
	01	(Setting prohibited)	
	02	Forced stop mode	
	03	Operation/Stop mode 2	

10) Room temperature sensor switching (Aux.)

To use the temperature sensor on the wired remote controller only, change the setting to "Wired remote controller" (01).

This function will only work if the function setting 42 is set at "Both" (01).

When the setting value is set to "Both" (00), more suitable control of the room temperature is possible by setting function setting 30 and 31 too.

Function number	Setting value	Setting description	Factory setting
48	00	Both	◆
	01	Wired remote controller	

11) Indoor unit fan control for energy saving for cooling

Enables or disables the power-saving function by controlling the indoor unit fan rotation when the outdoor unit is stopped during cooling operation.

Function number	Setting value	Setting description	Factory setting
49	00	Disable	
	01	Enable	
	02	Remote controller	◆

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

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

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

NOTE: Set to "00" or "01" when connecting a remote controller that cannot set the Fan control for energy saving function or connecting a network converter. To confirm if the remote controller has this setting, refer to the operating manual of each remote controller.

12) Switching functions for external output terminal

Functions of the external output terminal can be switched. For details, refer to “External input and output”.

Function number	Setting value	Setting description	Factory setting
60	00	Operation status	◆
	01—08	(Setting prohibited)	
	09	Error status	
	10	Indoor unit fan operation status	
	11	External heater	

2. Function settings for outdoor unit

Perform appropriate function setting locally according to the installation environment.

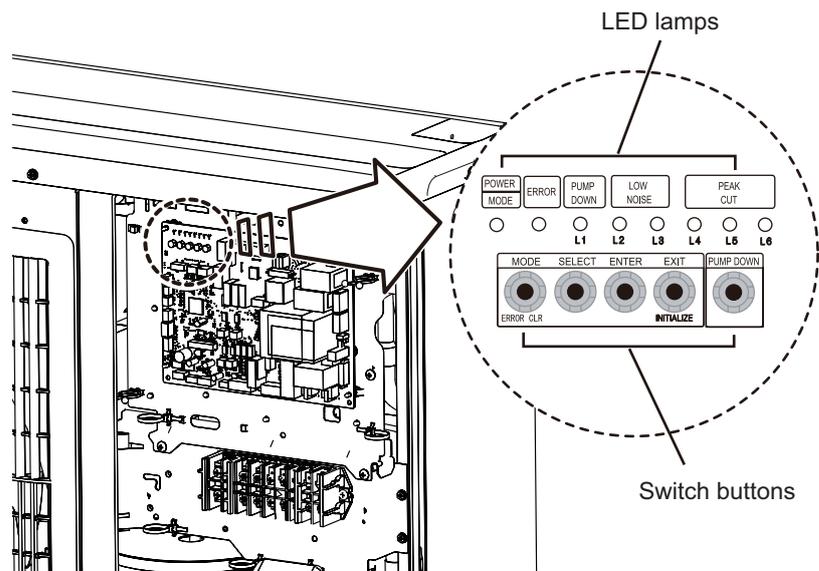
NOTE: Incorrect settings can cause a product malfunction.

⚠ CAUTION

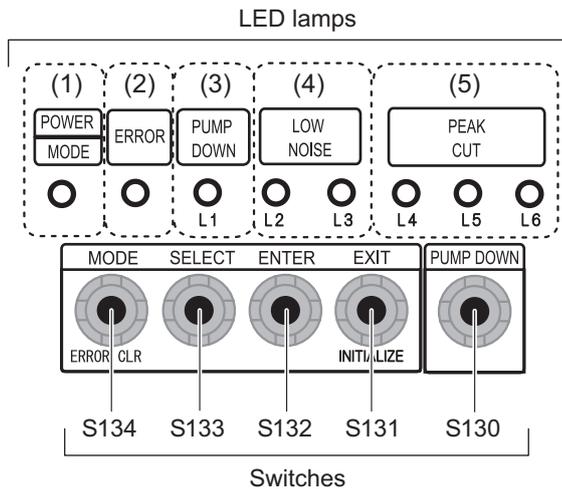
- Before setting up the switch buttons, discharge the static electricity from your body.
- Never touch the terminals or the patterns on the parts that are mounted on the PCB.

2-1. Control PCB and switch buttons location

Control PCB of the outdoor unit is located as shown in the following figure.



Switch buttons and the functions



LED lamp			Function or operation method
(1)	POWER/MODE	Green	Lights on while power on. Blinks to show the local setting on the outdoor unit or the error code.
(2)	ERROR	Red	Blinks during error operation.
(3)	PUMP DOWN (L1)	Orange	Lights on during pump down operation.
(4)	LOW NOISE MODE (L2 and L3)	Orange	Lights on during "Low noise mode" when local setting is activated. (Light pattern of L2 and L3 indicates the low noise level.)
(5)	PEAK CUT MODE (L4, L5, and L6)	Orange	Lights on during "Peak cut mode" when local setting is activated. (Light pattern of L4, L5, and L6 indicates the peak cut level.)

Switch		Function or operation method
S134	MODE	Switches between "Local setting" and "Error code display".
S133	SELECT	Switches between the individual "Local settings" and the "Error code displays".
S132	ENTER	Switches between the individual "Local settings" and the "Error code displays".
S131	EXIT	Returns to "Operation status display".
S130	PUMP DOWN	Starts the pump down operation.

FIELD WORKING

FIELD WORKING

2-2. Local setting procedure

NOTE: Before performing the function setting, be sure to stop the operation of the air conditioner.

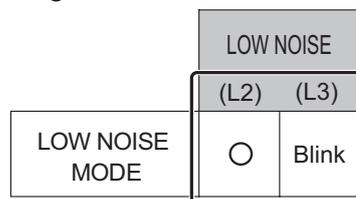
Low noise mode

1. Press the MODE switch button (S134) for 3 seconds or more to switch to "Local setting mode".
2. After confirming the LED lamp of POWER/MODE blinks 9 times, press the ENTER switch button (S132).

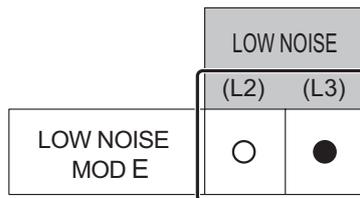
POWER MODE	ERROR	PUMP DOWN (L1)	LOW NOISE (L2) (L3)		PEAK CUT (L4) (L5) (L6)		
Blinks (9 times)	○	○	○	○	○	○	○

Sign "○": Lights off

3. Press the SELECT switch button (S133), and adjust the LED lamp as shown below. Then the LED lamp indicates the current setting.

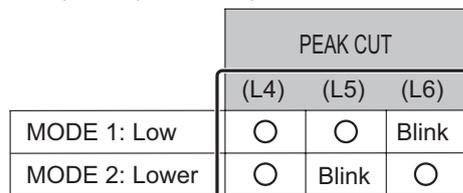


4. Press the ENTER switch button (S132).

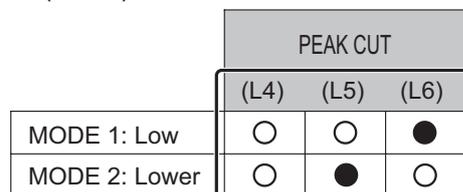


Sign "●": Lights on

5. Press the SELECT switch button (S133), and adjust the LED lamps as shown below.



6. Press the ENTER switch button (S132) and fix it.



7. To return to "Operating status display (Normal operation)", press the EXIT switch button (S131).

In case of missing how many times you pressed the SELECT and ENTER switch buttons:

1. To return to "Operation status display (Normal operation)", press the EXIT switch button once.
2. Restart from the beginning of setting procedure.

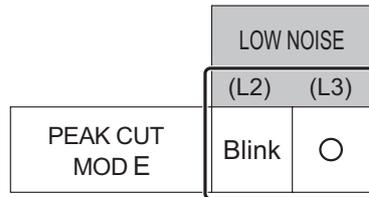
■ Peak cut mode

1. Press the MODE switch button (S134) for 3 seconds or more to switch to “Local setting mode”.
2. After confirming the LED lamp of POWER/MODE blinks 9 times, press the ENTER switch button (S132).

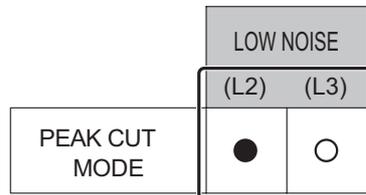
POWER MODE	ERROR	PUMP DOWN (L1)	LOW NOISE		PEAK CUT		
			(L2)	(L3)	(L4)	(L5)	(L6)
Blinks (9 times)	○	○	○	○	○	○	○

Sign “○”: Lights off

3. Press the SELECT switch button (S133), and adjust the LED lamp as shown below. Then the LED lamp indicates the current setting.



4. Press the ENTER switch button (S132).



Sign “●”: Lights on

5. Press the SELECT switch button (S133), and adjust the LED lamps as shown below.

	PEAK CUT		
	(L4)	(L5)	(L6)
0 % of rated input ratio	○	○	Blink
50 % of rated input ratio	○	Blink	○
75 % of rated input ratio	○	Blink	Blink
100 % of rated input ratio	Blink	○	○

6. Press the ENTER switch button (S132) and fix it.

	PEAK CUT		
	(L4)	(L5)	(L6)
0 % of rated input ratio	○	○	●
50 % of rated input ratio	○	●	○
75 % of rated input ratio	○	●	●
100 % of rated input ratio	●	○	○

7. To return to “Operating status display (Normal operation)”, press the EXIT switch button (S131).

NOTE: When pressed number is lost during setting, you must redo the setting procedure. Return to “Operation status display (Normal operation)” by pressing the EXIT switch button once, and restart from the beginning of the setting procedure.

3. External input and output for indoor unit

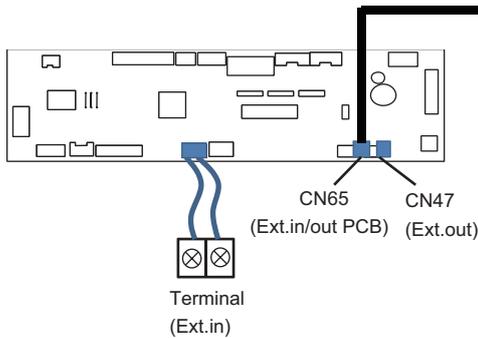


Fig. Indoor unit PCB

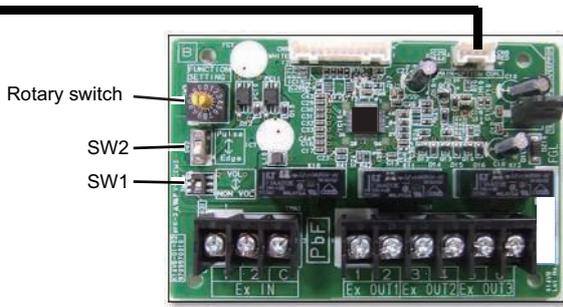


Fig. External input and output PCB

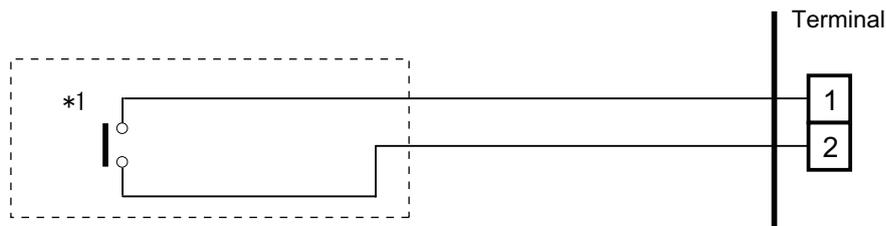
PCB	External input	External output	Connector	Input select	Input signal	External connect kit (Optional parts)
Indoor unit	Operation/Stop Forced stop	—	Terminal	Dry contact	Edge	—
	—	Operation status	CN47	—	—	UTY-XWZXZG
		Error status				
		Indoor unit fan operation status				
External heater output						
External input and output (UTY-XCSX)	Operation/Stop	—	Input 1/ Input 2	Dry contact/ Apply voltage	Edge/ Pulse	—
	Forced thermostat off		Input 1		Edge	
	—	Operation status	Output 1 Output 2 Output 3	—	—	—
		Error status				
Indoor unit status						
External heater output						

3-1. External input

- “Operation/Stop” mode or “Forced stop” mode can be selected with function setting of indoor unit.
- A twisted pair cable (22AWG) should be used. Maximum length of cable is 150 m.
- The wire connection should be separate from the power cable line.

■ Indoor unit

Indoor unit functions such as Operation/Stop can be done by using indoor unit terminals.



*1: The switch can be used on the following condition: DC 12 V to 24 V, 1 mA to 15 mA.

External input and output PCB

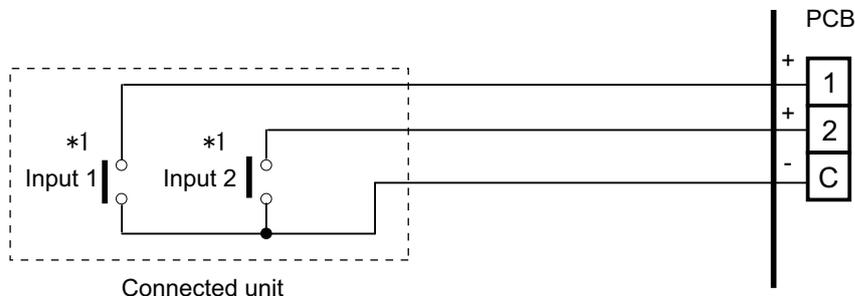
The indoor unit Operation/Stop can be set by using the input terminal on the PCB.

Input select

Use either one of these types of terminals according to the application. (Both types of terminals cannot be used simultaneously.)

- Dry contact

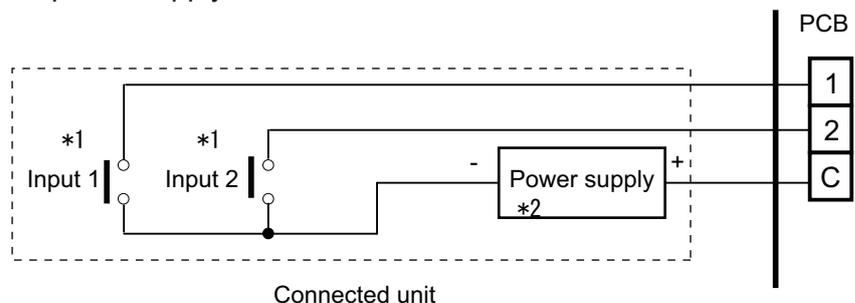
In case of internal power supply, set the slide switch of SW1 to "NON VOL" side.



*1: The switches can be used on the following condition: DC 12 V to 24 V, 1 mA to 15 mA.

- Apply voltage

In case of external power supply, set the slide switch of SW1 to "VOL" side.



*1: The switches can be used on the following condition: DC 12 V to 24 V, 1 mA to 15 mA.

*2: Make the power supply DC 12 V to 24 V 10 mA or more.

3-2. External output

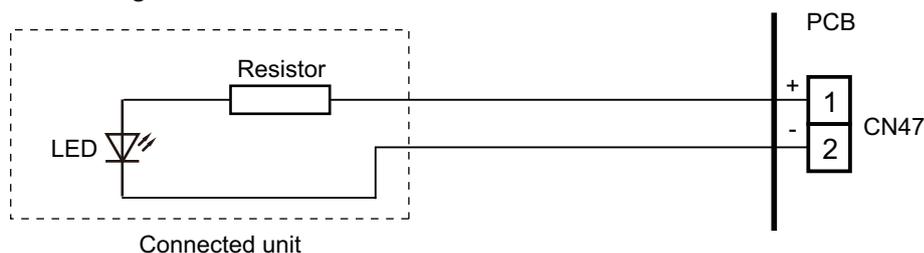
Use an external output cable with appropriate external dimension, depending on the number of cables to be installed.

Indoor unit

- A twisted pair cable (22AWG) should be used. Maximum length of cable is 25 m.
- Output voltage: High DC 12 V \pm 2 V, Low 0 V.
- Permissible current: 50 mA
- For details, refer to [Chapter 3-3. "Combination of external input and output"](#) on page 05-13.

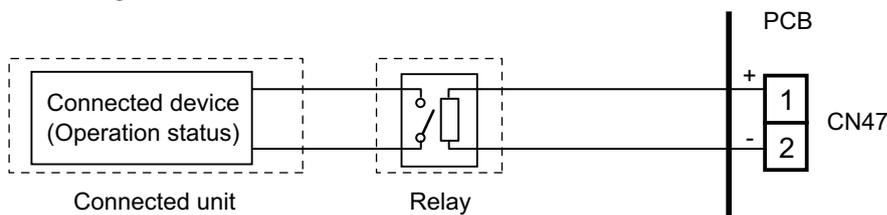
When indicator, etc. are connected directly

Example: Function setting 60 is set to "00"



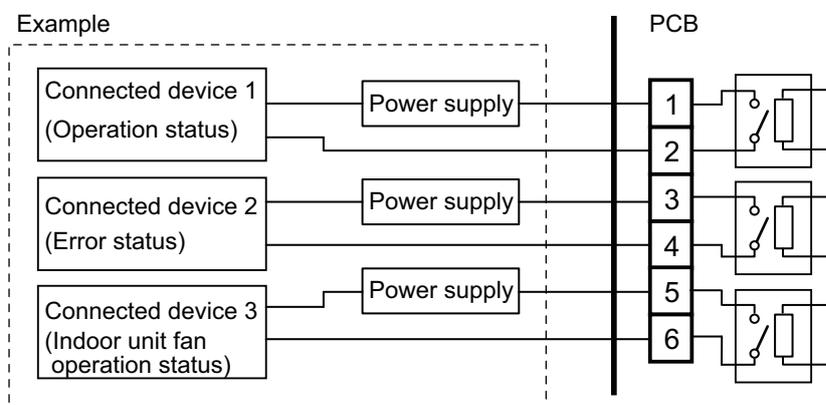
When connecting with a device equipped with a power supply

Example: Function setting 60 is set to "00"



External input and output PCB

- A twisted pair cable (22AWG) should be used.
- Permissible voltage and current: DC 5 V to 30 V / 3 A, AC 30 V to 250 V / 3 A
- For details, refer to [Chapter 3-3. "Combination of external input and output"](#) on page 05-13.



3-3. Combination of external input and output

By combining the function setting of the indoor unit and rotary switch setting of the External input and output PCB, you can select various combinations of functions.

Combination examples of external input and output are as follows:

Mode	Function setting	External input and output PCB (Rotary SW)	External input			
			Indoor unit Input	External input and output PCB		
			Terminal	Input 1	Input 2	Signal type
0-1	60-00	1	Operation/Stop	Operation/Stop	Not available	Edge
				Operation	Stop	Pulse
0-2	60-00	2	Operation/Stop	Forced Thermostat OFF	Not available	Edge
1—8	60-01 to 60-08	3 - 9, A	(Setting prohibited)			
9	60-09	B	Operation/Stop	Forced Thermostat OFF	Not available	Edge
10	60-10	C	Operation/Stop	Forced Thermostat OFF	Not available	Edge
11	60-11	D	Operation/Stop	Forced Thermostat OFF	Not available	Edge

Mode	Function setting	External input and output PCB (Rotary SW)	External output			
			Indoor unit Output	External input and output PCB		
			CN47	Output 1	Output 2	Output 3
0-1	60-00	1	Operation/Stop	Operation/Stop	Error status	Indoor unit fan operation status
0-2	60-00	2	Operation/Stop	Error status	Indoor unit fan operation status	External heater output
1—8	60-01 to 60-08	3 - 9, A	(Setting prohibited)			
9	60-09	B	Error status	Operation/Stop	Indoor unit fan operation status	External heater output
10	60-10	C	Indoor unit fan operation status	Operation/Stop	Error status	External heater output
11	60-11	D	External heater output	Operation/Stop	Indoor unit fan operation status	Error status

NOTE: Input of Operation/Stop depends on the setting of function setting 46.

00: Operation/Stop mode 1 (R.C. enabled)

01: (Setting prohibited)

02: Forced stop

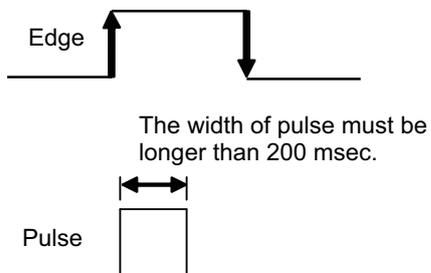
03: Operation/Stop mode 2 (R.C. disabled)

■ Input signal type

- Indoor unit
Input signal type is only "Edge".



- External input and output PCB
The input signal type can be selected.
Signal type (edge or pulse) can be switched by the DIP switch 2 (SW2) on the External input and output PCB.



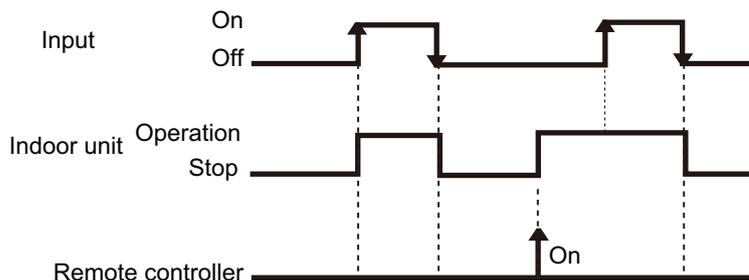
3-4. Details of function

■ Control input function

● When function setting is "Operation/Stop" mode 1

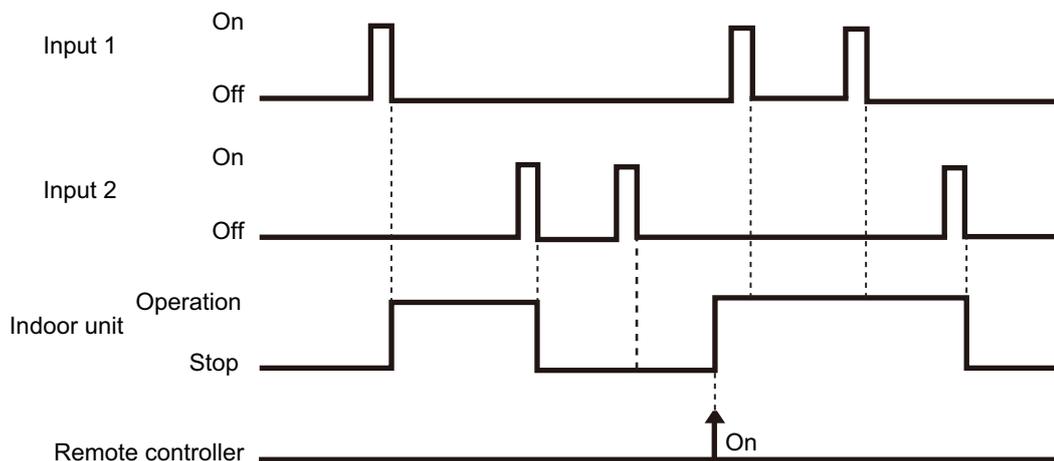
- In the case of "Edge" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-00	-	Input of indoor unit	Terminal	Off → On	Operation
				On → Off	Stop
	60-00 / 1	External input and output PCB	Input 1	Off → On	Operation
				On → Off	Stop



- In the case of "Pulse" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-00	60-00 / 1	External input and output PCB	Input 1	Pulse	Operation
			Input 2	Pulse	Stop



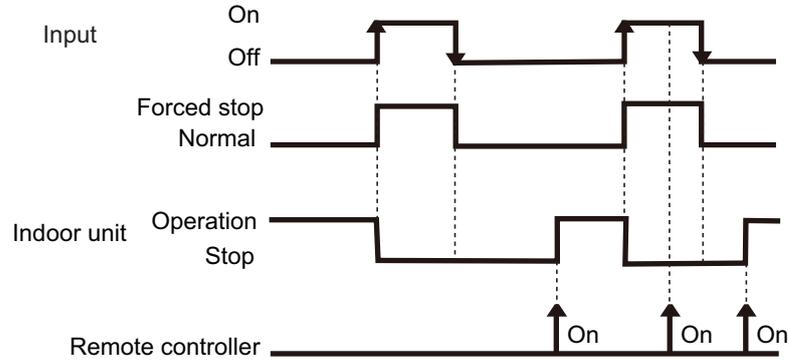
NOTES:

- The last command has priority.
- The indoor units within the same remote controller group operates in the same mode.

● When function setting is "Forced stop" mode

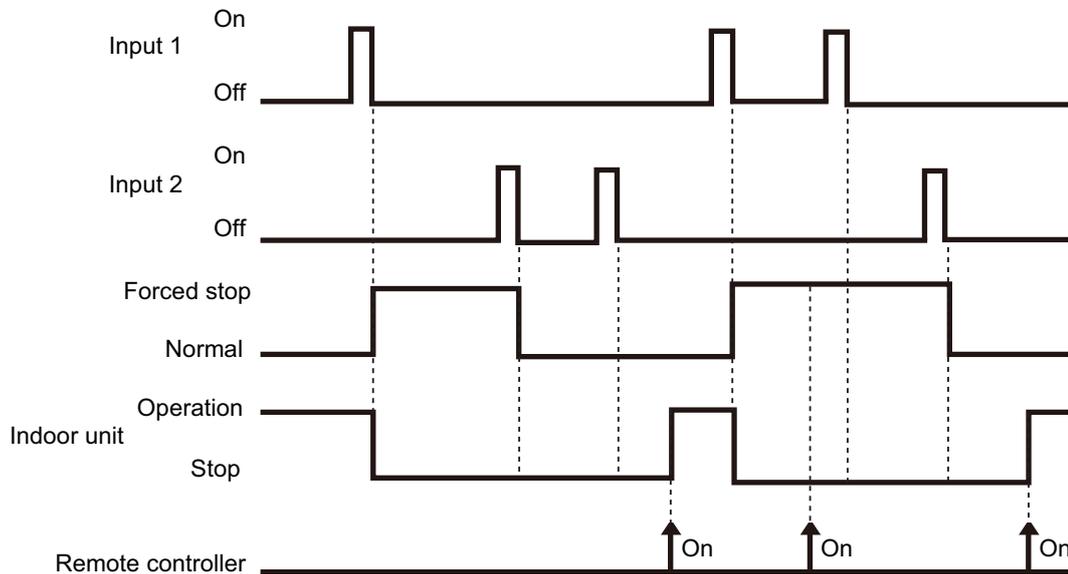
- In the case of "Edge" input

Function setting /		Rotary SW of External input and output PCB		External input		Input signal	Command
46-02	-	-	Input of indoor unit	Terminal	Off → On	Forced stop	
					On → Off	Normal	
	60-00 / 1	60-00 / 1	External input and output PCB	Input 1	Off → On	Forced stop	
					On → Off	Normal	



- In the case of "Pulse" input

Function setting /		Rotary SW of External input and output PCB		External input		Input signal	Command
46-02	60-00 / 1	60-00 / 1	External input and output PCB	Input 1	Pulse	Forced stop	
				Input 2	Pulse	Normal	



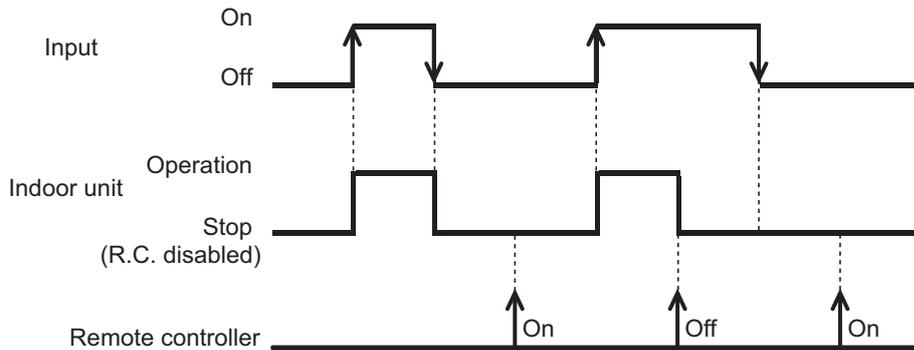
NOTES:

- When the forced stop is triggered, indoor unit stops and Operation/Stop operation by the remote controller is restricted.
- When forced stop function is used with forming a remote controller group, connect the same equipment to each indoor unit within the group.

● When function setting is "Operation/Stop" mode 2

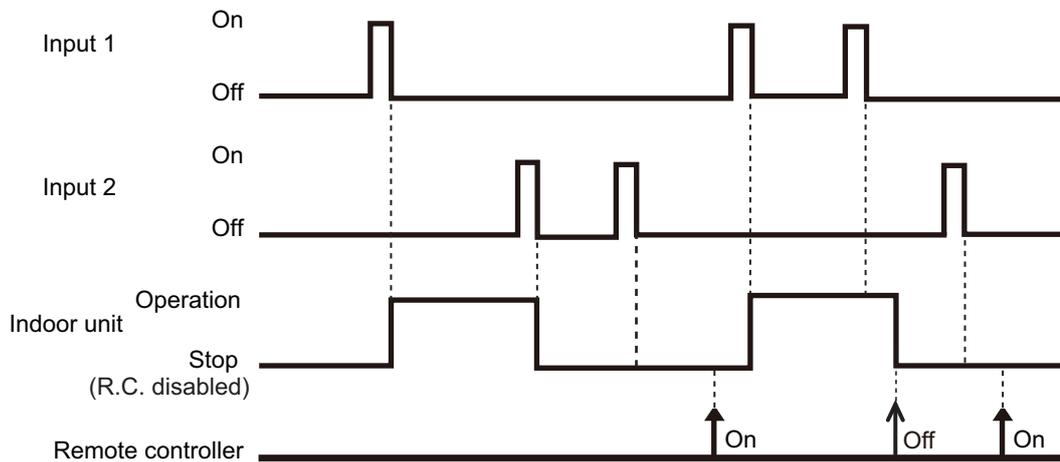
- In the case of "Edge" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-03	-	Input of indoor unit	Terminal	Off → On	Operation
				On → Off	Stop (R.C. disabled)
	60-00 / 1	External input and output PCB	Input 1	Off → On	Operation
				On → Off	Stop (R.C. disabled)



- In the case of "Pulse" input

Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
46-03	60-00 / 1	External input and output PCB	Input 1	Pulse	Operation
			Input 2	Pulse	Stop (R.C. disabled)



NOTES:

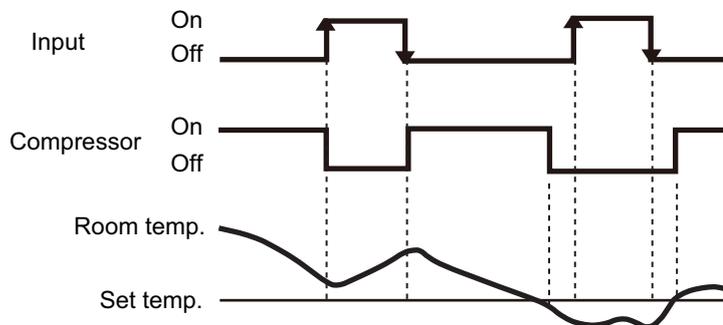
- When "Operation/Stop" mode 2 function is used with forming a remote controller group, connect the same equipment to each indoor unit within the group.

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■ Forced thermostat off function

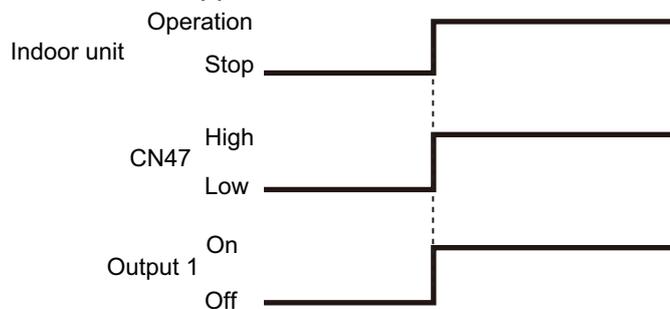
Function setting /	Rotary SW of External input and output PCB	External input		Input signal	Command
	60-00 / 2 60-09 / B 60-10 / C 60-11 / D	External input and output PCB	Input 1	Off → On	Thermostat off
				On → Off	Normal operation



■ Control output function

Function setting /	Rotary SW of External input and output PCB	External output		Output signal	Command
	60-00 / 1, 2	Output of indoor unit	CN47	Low → High	Operation
				High → Low	Stop
	60-00 / 1 60-09 / B 60-10 / C 60-11 / D	External input and output PCB	Output 1	Off → On	Operation
				On → Off	Stop

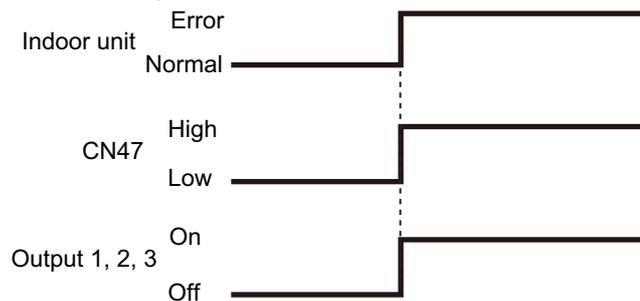
The output is low when the unit is stopped.



■ Error status

Function setting /	Rotary SW of External input and output PCB	External output		Output signal	Command
60-09 / B		Output of indoor unit	CN47	Low → High	Error
				High → Low	Normal
60-00 / 2	External input and output PCB		Output 1	Off → On	Error
				On → Off	Normal
60-00 / 1 60-10 / C			Output 2	Off → On	Error
				On → Off	Normal
60-11 / D			Output 3	Off → On	Error
				On → Off	Normal

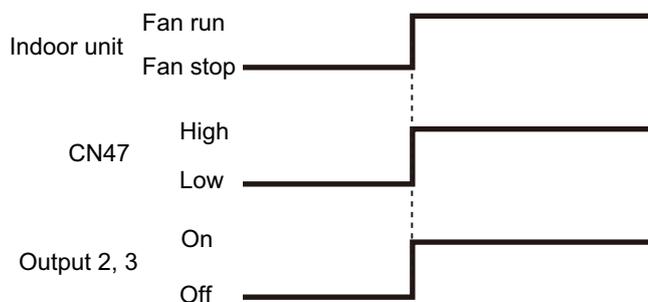
The output is ON when an error is generated for the indoor unit.



■ Indoor unit fan operation status

Function setting /	Rotary SW of External input and output PCB	External output		Output signal	Command
60-10 / C		Output of indoor unit	CN47	Low → High	Fan run
				High → Low	Fan stop
60-00 / 2 60-09 / B 60-11 / D	External input and output PCB		Output 2	Off → On	Fan run
				On → Off	Fan stop
60-00 / 1			Output 3	Off → On	Fan run
				On → Off	Fan stop

Output signal	Condition
On Low → High	The indoor unit fan is operating.
Off High → Low	The fan is stopped or during cold air prevention. During thermostat off when in dry mode operation.



External heater output

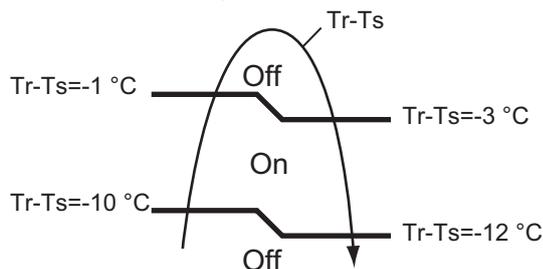
Function setting / Rotary SW of External input and output PCB	External output	Output signal	Command
60-11 / D	Output of indoor unit CN47	Low → High	Heater on
		High → Low	Heater off
60-00 / 2 60-09 / B 60-10 / C	External input and output PCB Output 3	Off → On	Heater on
		On → Off	Heater off

Output signal	Condition
Low → High Off → On	Heater turns on as shown in diagram of heating temperature
High → Low On → Off	Heater turns off as shown in diagram of heating temperature <ul style="list-style-type: none"> • Other than Heating mode • Error occurred • Forced thermo off • Fan stop protection

Specifications of the signal output performance are as shown as follows:

Example: When set temperature (T_s) is set at 22 °C;

- And room temperature (T_r) increase above 12 °C, signal output is on.
- And T_r increase above 21 °C, signal output is off.
- And T_r decrease below 19 °C, signal output is on.
- And T_r decrease below 10 °C, signal output is off.



The output also turns off in defrost operation.

4. External input and output for outdoor unit

With using external input and output functions, this product can be operated inter-connectedly with an external device.

Connector	Input	Output	Remarks
P580	Low noise mode	—	See external input/output settings for details.
PA580	Peak cut mode	—	
P590	—	—	
PA590	—	Compressor status	

4-1. External input

With using external input function, on/off status of “Low noise mode” and “Peak cut mode” can be specified by the external signal.

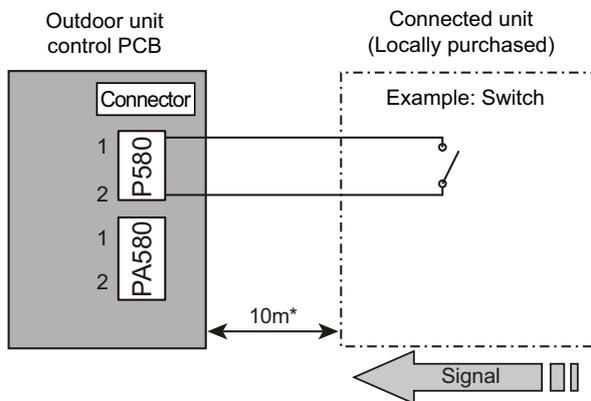
■ Low noise mode

In following condition, the operating noise of the outdoor unit reduces comparing from the one in normal operating condition:

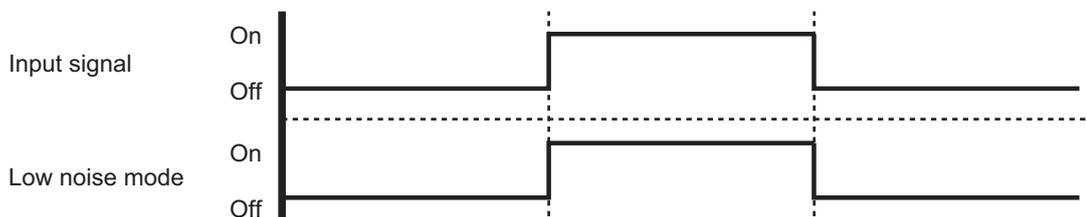
The air conditioner is set to the “Low noise mode” when closing the contact input of a commercial timer or on/off switch to a connector on the control PCB of the outdoor unit.

NOTE: Product performance may drop depending on some conditions such as the outdoor temperature.

• Circuit diagram example



- Contact capacity: DC 24 V or more, 10 mA or more.
- *: Make the distance from the PCB to the connected unit within 10 m.
- Construct a circuit as shown in this figure with using optional parts mentioned below.
- Input signal: On in “Low noise mode”
- Input signal: Off in normal operation
- To set the level of “Low noise mode”, refer to “Low noise mode” in ["Local setting procedure"](#) on page 05-8.



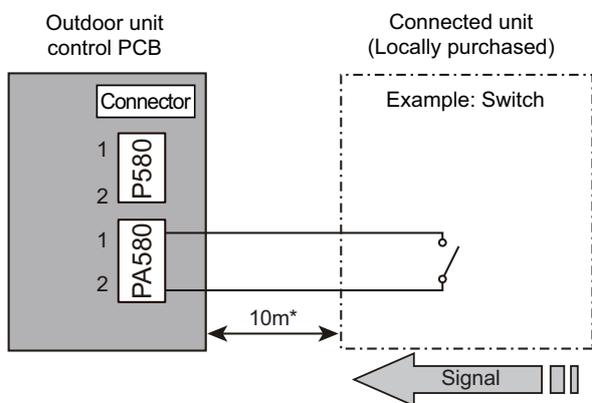
• Optional part

Part name	Model name	Exterior
External connect kit	UTY-XWZXZ3	External input wire

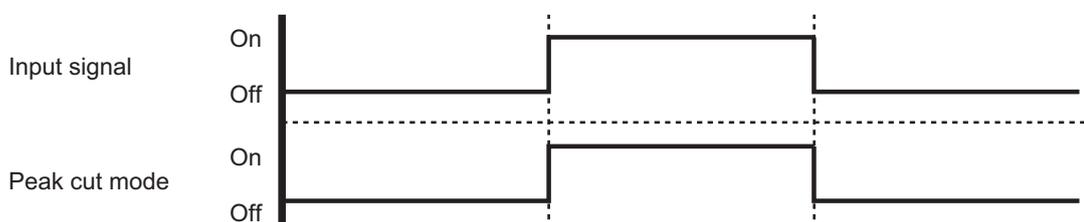
■ Peak cut mode

By performing following on-site work, operation that suppresses the current value can be enabled: The air conditioner is set to the “Peak cut mode” when closing the contact input of a commercial timer or on/off switch to a connector on the control PCB of the outdoor unit.

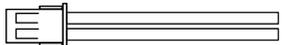
• Circuit diagram example



- Contact capacity: DC 24 V or more, 10 mA or more.
- *: Make the distance from the PCB to the connected unit within 10 m.
- Construct a circuit as shown in this figure with using optional parts mentioned below.
- Input signal: On in “Peak cut mode”
- Input signal: Off in normal operation
- To set the level of “Peak cut mode”, refer to “Peak cut mode” in ["Local setting procedure"](#) on page 05-8.



• Optional part

Part name	Model name	Exterior
External connect kit	UTY-XWZXZ3	External input wire 

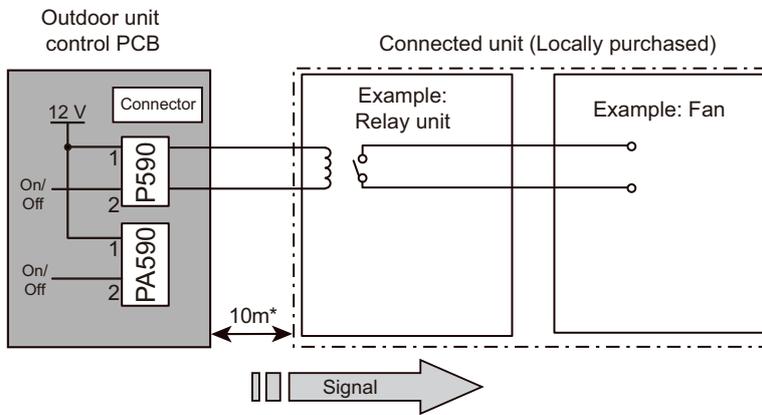
4-2. External output

With using external output function, some status signals are transmitted to the control PCB, and the related LED lamp indicates the status of this product.

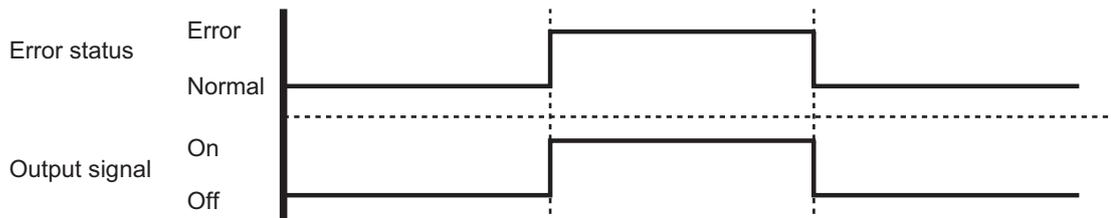
■ Error status output

Signal on air conditioner error status is generated when a malfunction occurs.

• Circuit diagram example



- Output voltage (Vcc): DC 12 V 50 mA or less
- *: Make the distance from the PCB to the connected unit within 10 m.



• Optional part

Part name	Model name	Exterior
External connect kit	UTY-XWZXZ3	External output wire 

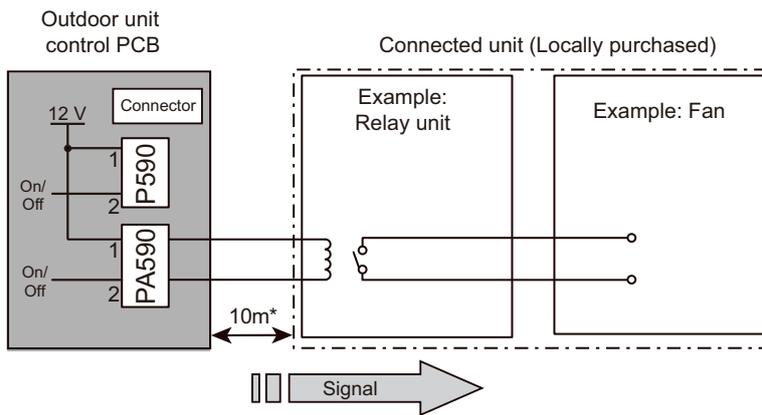
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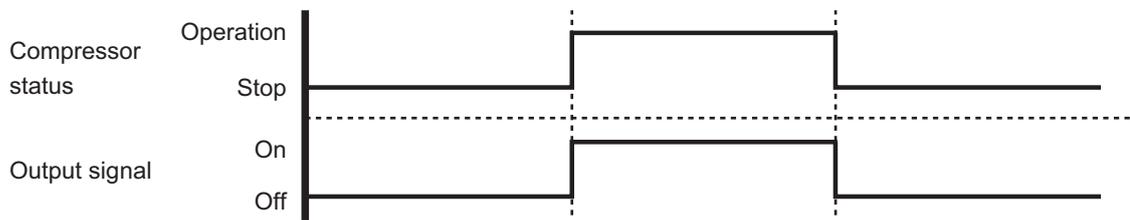
■ Compressor status output

Signal on compressor operation status is generated when the compressor is running.

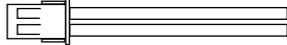
• Circuit diagram example



- Output voltage (Vcc): DC 12 V 50 mA or less
- *: Make the distance from the PCB to the connected unit within 10 m.



• Optional part

Part name	Model name	Exterior
External connect kit	UTY-XWZXZ3	External output wire 

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