REFRIGERANT R32
INVERTER

AIR CONDITIONER

Wall mounted type

SERVICE MANUAL

INDOOR		ASYG07KPCE ASYG09KPCE ASYG12KPCE
OUTDOOR		AOYG07KPCA AOYG09KPCA AOYG12KPCA

SR_AS059EF_02
2022.07.07

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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4. CONTROL AND FUNCTIONS

5. FILED WORKING

REFRIGERANT R32
INVERTER

1. GENERAL INFORMATION

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GENERAL INFORMATION

1. Specifications

1-1. Indoor unit

Type					Wall mounted		
					Inverter heat pump		
Model name					**ASYG07KPCE**	**ASYG09KPCE**	**ASYG12KPCE**
Power supply					230 V ~ 50 Hz		
Power supply intake					Outdoor unit		
Available voltage range					198—264 V		
Capacity		Cooling	Rated	kW	2.00	2.50	3.40
				Btu/h	6,800	8,500	11,600
			Min.—Max.	kW	0.9—2.8	0.9—3.0	0.9—3.7
				Btu/h	3,100—9,600	3,100—10,200	3,100—12,600
		Heating	Rated	kW	2.50	2.80	3.80
				Btu/h	8,500	9,500	13,000
			Min.—Max.	kW	0.9—3.4	0.9—3.8	0.9—4.80
				Btu/h	3,100—11,600	3,100—12,900	3,100—16,400
Input power		Cooling	Rated	kW	0.48	0.71	1.00
			Min.—Max.		0.25—1.03	0.25—1.05	0.25—1.14
		Heating	Rated		0.63	0.79	1.14
			Min.—Max.		0.25—1.39	0.25—1.39	0.25—1.60
		Fan	HIGH	W	21.5		26.9
			MED		12.5		14.5
			LOW		6.3		7.1
			QUIET		3.0		3.0
Current		Cooling	Rated	A	2.7	3.5	4.7
		Heating			3.2	3.8	5.6
EER		Cooling		kW/kW	4.17	3.52	3.40
COP		Heating			3.97	3.54	3.33
Sensible capacity		Cooling		kW	1.9	2.1	2.6
Power factor		Cooling		%	77	87	92
		Heating			85	90	89
Moisture removal				L/h (pints/h)	1.0 (1.80)	1.3 (2.30)	1.8 (3.20)
Maximum operating current *1		Cooling		A	6.5		
		Heating			9.0		
Fan	Airflow rate	Cooling	HIGH	m^3/h	580		630
			MED		460		490
			LOW		340		360
			QUIET		240		240
		Heating	HIGH		580		630
			MED		460		490
			LOW		380		380
			QUIET		260		260
	Type × Q'ty				Crossflow fan × 1		
	Motor output			W	27		
Sound pressure level *2		Cooling	HIGH	dB (A)	45		46
			MED		38		40
			LOW		31		33
			QUIET		22		22
		Heating	HIGH		45		46
			MED		40		40
			LOW		36		35
			QUIET		26		27
Heat exchanger type		Dimensions (H × W × D)		mm	210 × 600 × 26.6		
		Fin pitch			1.3		
		Rows × Stages			2 × 10		
		Pipe type			Copper tube		
		Fin type			Aluminum		
Enclosure		Material			Polystyrene		
		Color			White Approximate color of Munsell N 9.25/		
Dimensions (H × W × D)		Net		mm	270 × 784 × 224		
		Gross			279 × 864 × 334		
Weight		Net		kg	8.0		
		Gross			11.0		
Connection pipe		Size	Liquid	mm (in)	Ø6.35 (Ø1/4)		
			Gas		Ø9.52 (Ø3/8)		
		Method			Flare		
Drain hose		Material			PP+HDPE		
		Tip diameter		mm	Ø13.8 (I.D.), Ø15 to Ø16.8 (O.D.)		
Operation range		Cooling		°C	18 to 32		
				%RH	80 or less		
		Heating		°C	16 to 30		
Remote controller type					Wireless (Option: 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.

GENERAL INFORMATION

Specifications for Lot10						
Model name				**ASYG07KPCE**	**ASYG09KPCE**	**ASYG12KPCE**
Energy efficiency class	Cooling			A^{++}		
	Heating (Average)			A^{+}		
P design	Cooling		kW	2.0 (35 °C)	2.5 (35 °C)	3.4 (35 °C)
	Heating (Average)			2.2 (-10 °C)	2.4 (-10 °C)	2.5 (-10 °C)
SEER	Cooling		kWh/kWh	6.7		6.3
SCOP	Heating (Average)			4.0		4.1
Annual energy consumption	QCE		kWh/a	104	131	189
	QHE (Average)			769	840	853
Sound power level	Cooling	HIGH	dB (A)	57	58	59
	Heating			58	58	59

GENERAL INFORMATION

1-2. Outdoor unit

Type				Inverter heat pump		
Model name				**AOYG07KPCA**	**AOYG09KPCA**	**AOYG12KPCA**
Power supply				230 V ~ 50 Hz		
Power supply intake				Outdoor unit		
Available voltage range				198—264 V		
Starting current			A	3.2	3.8	5.6
Fan	Airflow rate	Cooling	m^3/h	1,650		1,700
		Heating		1,450		1,470
	Type × Q'ty			Propeller fan × 1		
	Motor output		W	23		
Sound pressure level *1		Cooling	dB (A)	45	47	49
		Heating		46	47	51
Sound power level		Cooling	dB (A)	57	59	62
		Heating		58	59	62
Heat exchanger type		Dimensions (H × W × D)	mm	504 × 650 × 18.2		504 × 630 × 36.4
		Fin pitch		1.3		
		Rows × Stages		1 × 24		2 × 24
		Pipe type		Copper		
		Fin type	Type (Material)	Corrugate (Aluminum)		
			Surface treatment	PC Fin		
Compressor	Type × Q'ty			DC Rotary × 1		
	Motor output		W	850		
Refrigerant		Type (Global warming potential)		R32 (675)		
		Charge	g	550		590
Refrigerant oil		Type		POE		
		Amount	cm^3	240		
Enclosure		Material		Steel sheet		
		Color		Beige Approximate color of Munsell 10YR 7.5/1.0		
Dimensions (H × W × D)	Net		mm	541 × 663 × 290		
	Gross			596 × 798 × 369		
Weight	Net		kg	23		25
	Gross			25		27
Connection pipe	Size	Liquid	mm (in)	Ø6.35 (Ø1/4)		
		Gas		Ø9.52 (Ø3/8)		
	Method			Flare		
	Pre-charge length		m	15		
	Max. length			20		
	Max. height difference			15		
Operation range		Cooling	°C	-10 to 46		
		Heating		-15 to 24		
Drain hose		Material		PP		
		Tip diameter	mm	Ø13.0 (I. D.), Ø16.0 to Ø16.8 (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.

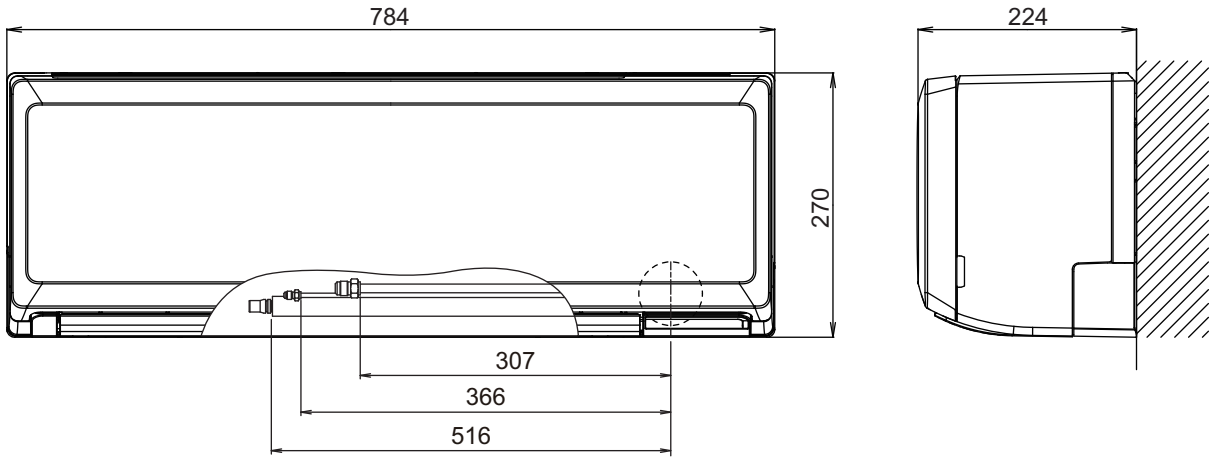
GENERAL INFORMATION

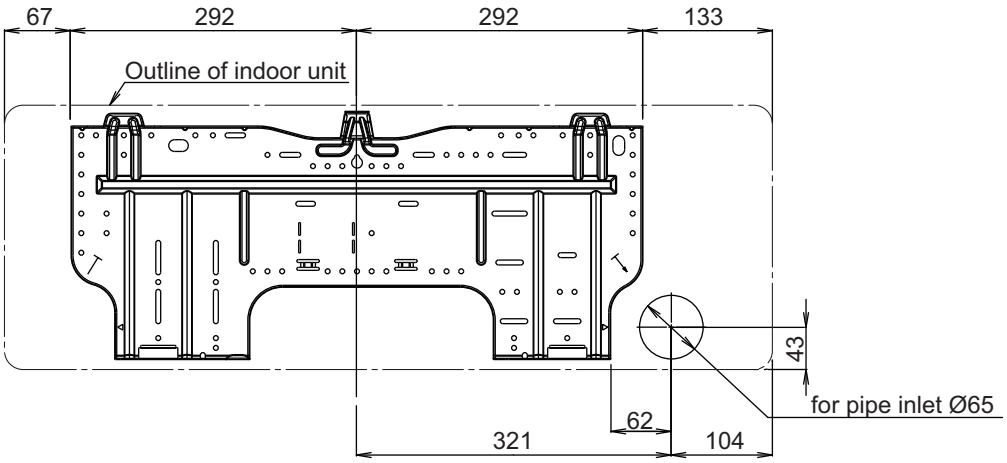
2. Dimensions

2-1. Indoor unit

■ Models: ASYG07KPCE, ASYG09KPCE, and ASYG12KPCE

Unit: mm



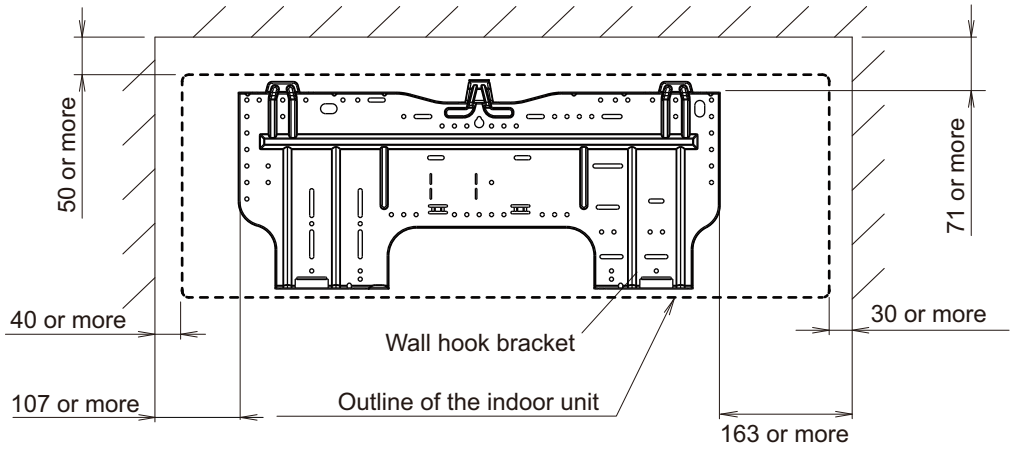


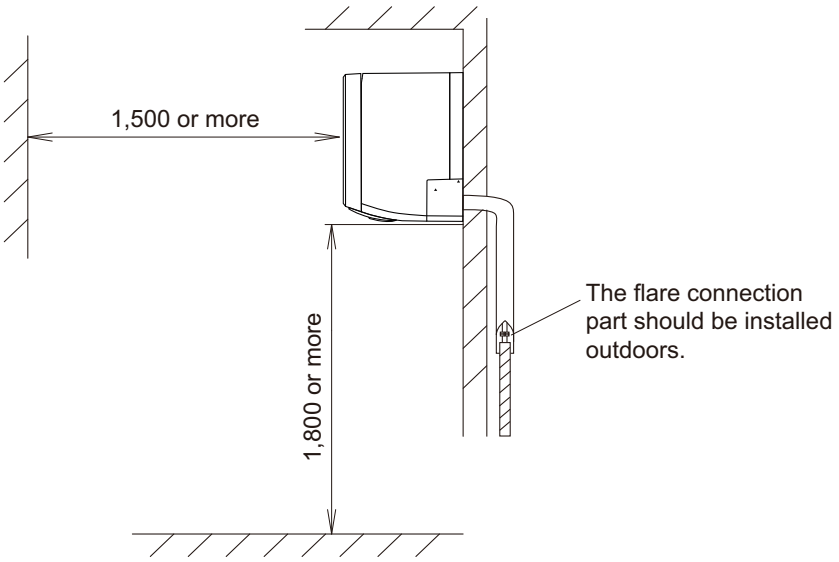
GENERAL INFORMATION

● Installation space requirement

Provide sufficient installation space for product safety.

Unit: mm



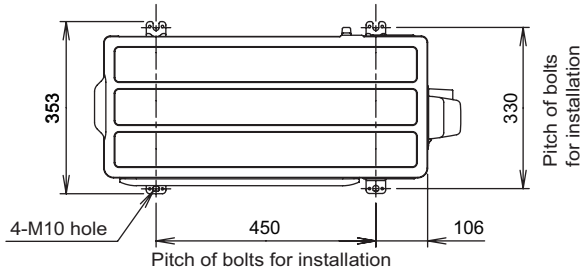


GENERAL INFORMATION

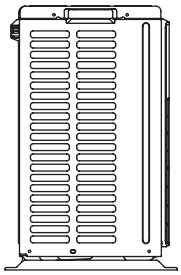
2-2. Outdoor unit

■ Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA

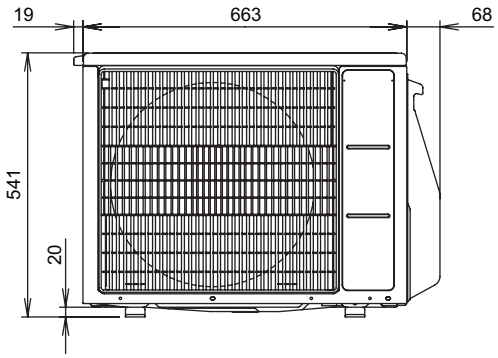
Unit: mm



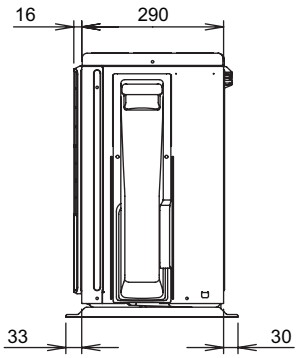
Top view



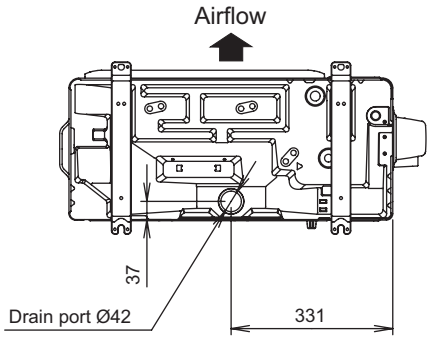
Side view



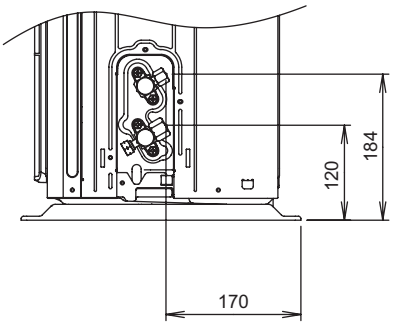
Front view



Side view



Bottom view



Side view (Valve part)

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TECHNICAL DATA AND PARTS LIST

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.

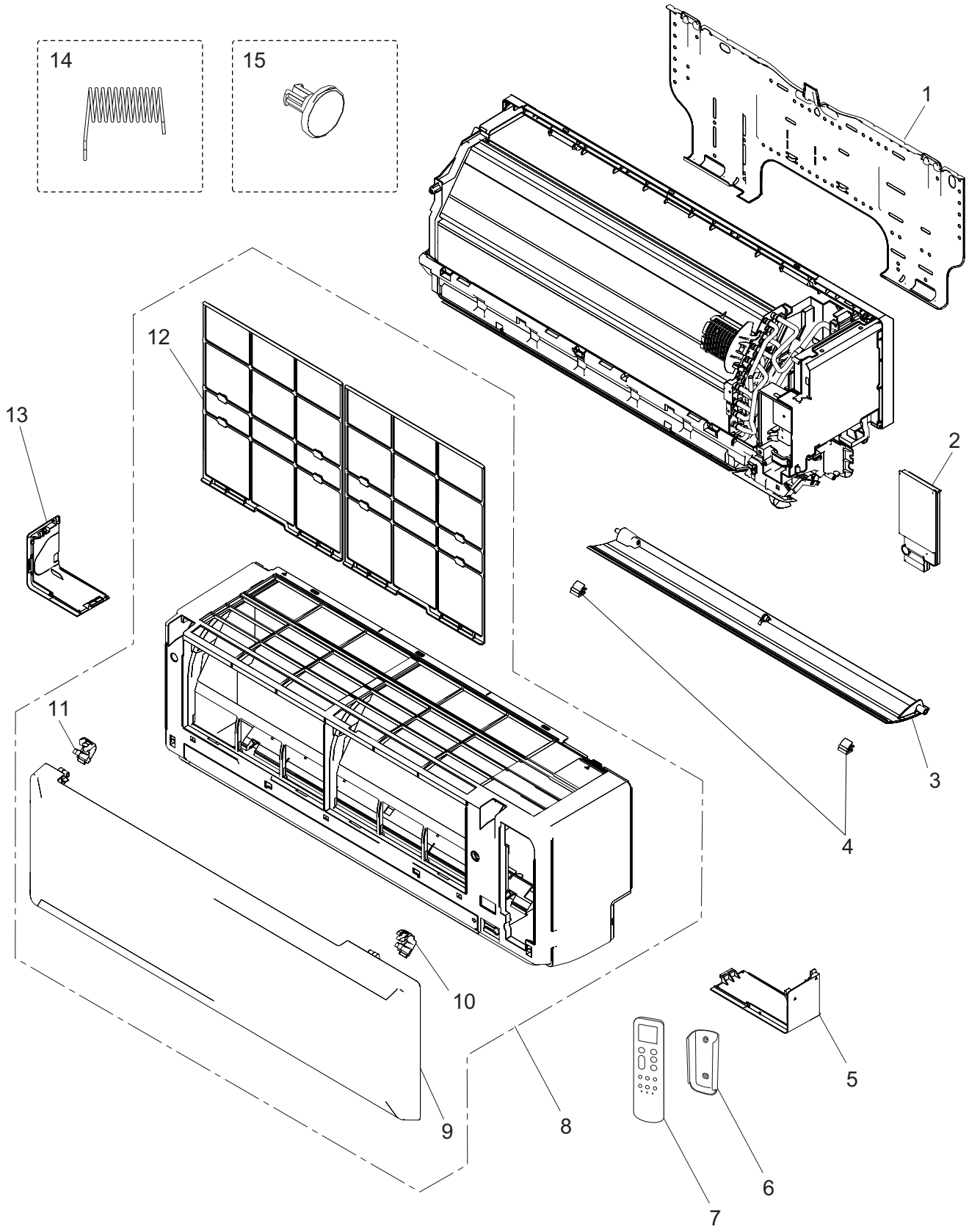
- Service parts information and design are subject to change without notice for product improvement.
- For the latest information of the service parts, refer to our Service Portal.
  https://fujitsu-general.force.com/portal/
- Precise figure of the service parts listed in this manual may differ from the actual service parts.

TECHNICAL DATA AND PARTS LIST

2. Indoor unit parts list

2-1. Models: ASYG07KPCE, ASYG09KPCE, and ASYG12KPCE

■ Exterior parts

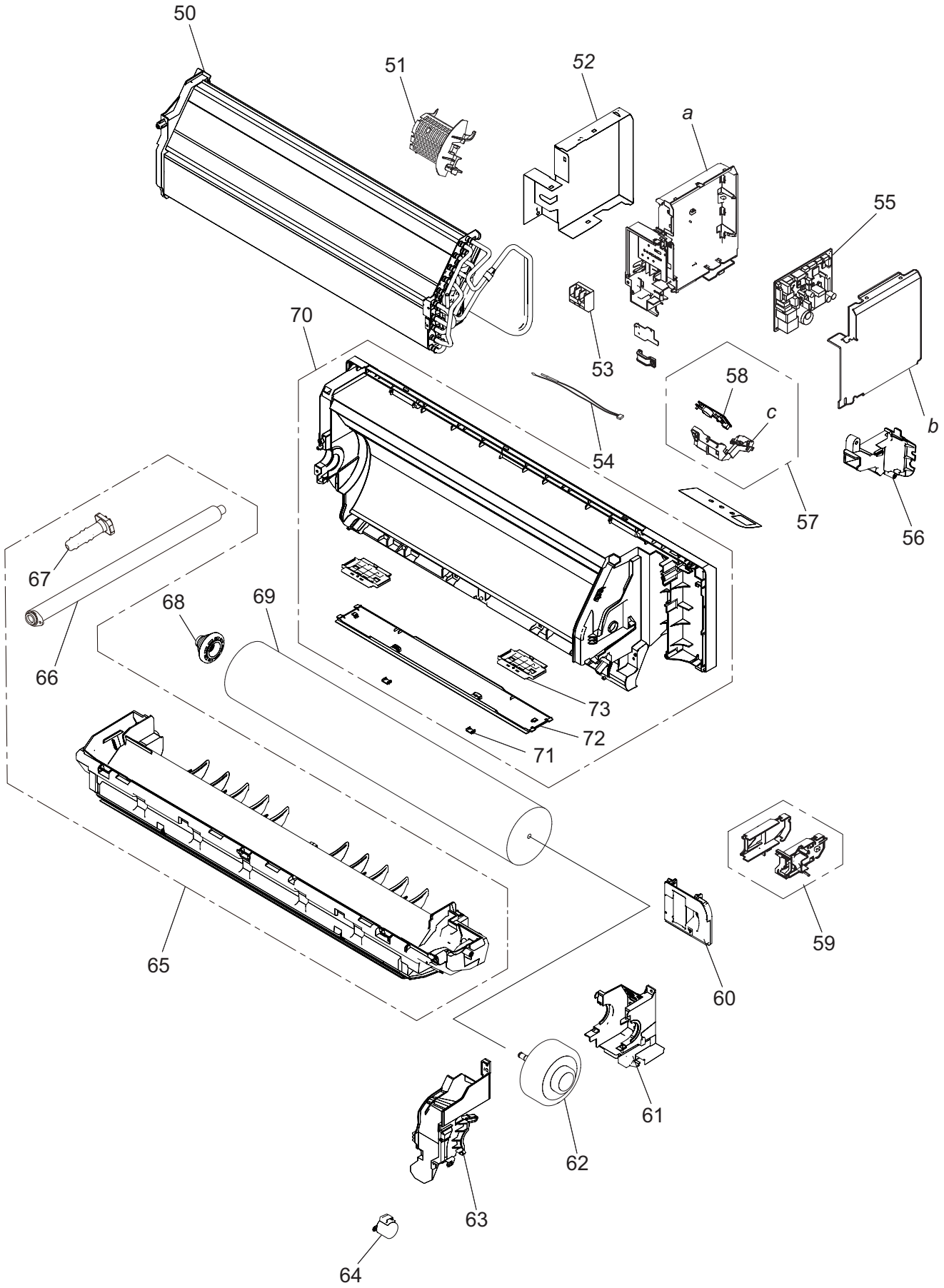


TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name	Service part
1	9388147017	Bracket panel	♦
2	9387597066	Wire cover assy	♦
3	9333888002	Louver assy (Up/Down)	♦
4	9387476002	Screw cap	♦
5	9333872018	Under cover R	♦
6	9334098004	Remote controller holder	♦
7	9334138076	Remote controller assy	♦
8	9333886084	Front panel total assy	♦
9	9333913001	Intake grille assy	♦
10	9333704005	Grille clamper R	♦
11	9333719009	Grille clamper L	♦
12	9333868004	Air filter	♦
13	9333871011	Under cover L	♦
14	9333951003	Louver spring	♦
15	9333608013	Bush	♦

TECHNICAL DATA AND PARTS LIST

■ Chassis



TECHNICAL DATA AND PARTS LIST

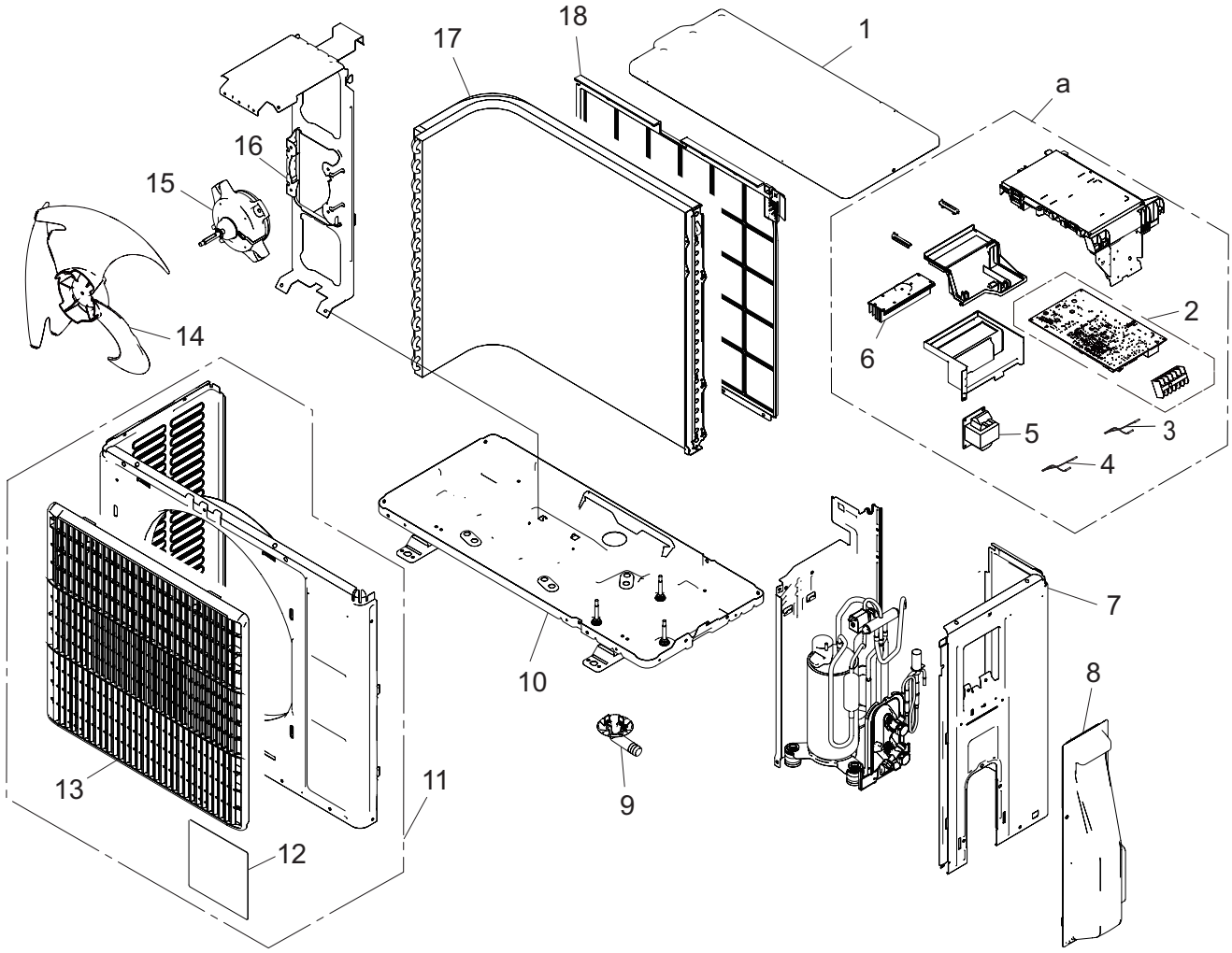
Item no.	Part no.	Part name	Service part
50	9333897028	Evaporator total assy	♦
51	9387467017	Room thermistor holder	♦
52	9333865003	Box shield	♦
53	9901013010	Terminal	♦
54	9900627065	Thermistor assy	♦
55	9711141040	Main PCB (for 07 model)	♦
	9711141057	Main PCB (for 09 model)	♦
	9711141064	Main PCB (for 12 model)	♦
56	9334049006	Cable guide	♦
57	9711146021	Display assy	♦
58	9711147028	Indicator PCB	♦
59	9383765018	WLAN adapter holder assy	♦
60	9383729041	Wire cover assy	♦
61	9334040003	Motor case assy	♦
62	9603688004	DC fan motor	♦
63	9333849003	Motor cover assy	♦
64	9901011030	Step motor	♦
65	9333911007	Drain pan total assy	♦
66	9316904002	Drain hose assy	♦
67	9316177017	Drain cap	♦
68	9333628004	Bearing D assy	♦
69	9333606026	Crossflow fan assy	♦
70	9333882031	Base assy	♦
71	9334137000	Screw cap	♦
72	9334136003	Under cover C	♦
73	9388139012	Pipe bracket A	♦
a	—	Control box	—
b	—	Control cover	—
c	—	Display case assy	—

TECHNICAL DATA AND PARTS LIST

3. Outdoor unit parts list

3-1. Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA

■ Exterior parts and chassis

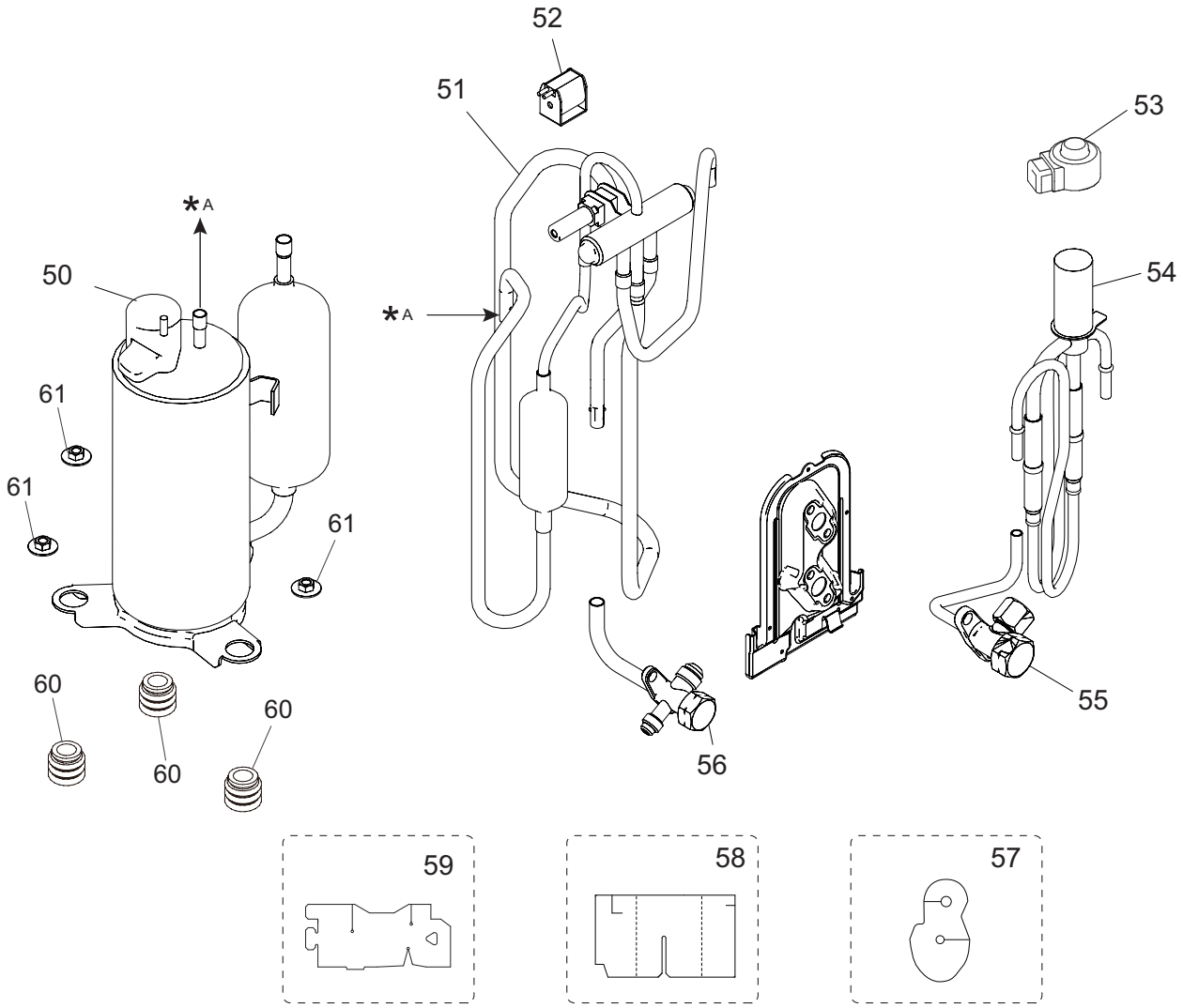


TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name	Service part
1	9322556165	Top panel assy	♦
2	9709687154	Main PCB (for 07 model)	♦
	9709687178	Main PCB (for 09 model)	♦
	9709687192	Main PCB (for 12 model)	♦
3	9900727062	Thermistor assy	♦
4	9900565053	Thermistor assy (outdoor temp)	♦
5	9901012013	Reactor assy	♦
6	9333787008	Heat sink	♦
7	9322552112	Cabinet right assy	♦
8	9322570000	Switch cover assy	♦
9	9322144003	Drain pipe	♦
10	9323501003	Base assy	♦
11	9322555328	Front panel assy	♦
12	9387859003	Emblem	♦
13	9322135001	Blow grille	♦
14	9322136008	Propeller fan	♦
15	9603553005	DC fan motor	♦
16	9322553089	Motor bracket assy (for 07-09 model)	♦
	9322553096	Motor bracket assy (for 12 model)	♦
17	9322272003	Condenser total assy (for 07-09 model)	♦
	9322273000	Condenser total assy (for 12 model)	♦
18	9322811059	Protective net	♦
a	—	Inverter assy	—

TECHNICAL DATA AND PARTS LIST

■ Compressor



TECHNICAL DATA AND PARTS LIST

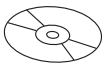
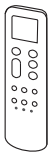
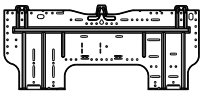
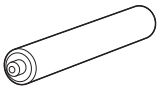
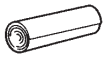
Item no.	Part no.	Part name	Service part
50	9324124003	Compressor assy (for 07-09 model)	♦
	9324125000	Compressor assy (for 12 model)	♦
51	9322392015	4-way valve assy	♦
52	9970110153	Solenoid	♦
53	9970222009	Expansion valve coil	♦
54	9322403001	Pulse motor valve	♦
55	9322472007	2-way valve assy	♦
56	9322473004	3-way valve assy	♦
57	9322389008	Sound insulator H	♦
58	9334109007	Sound insulator F	♦
59	9324110006	Sound insulator B	♦
60	9322386007	Cushion rubber	♦
61	9313437008	Special nut	♦

TECHNICAL DATA AND PARTS LIST

4. Accessories

4-1. Indoor unit

■ Models: ASYG07KPCE, ASYG09KPCE, and ASYG12KPCE

Part name	Exterior	Q'ty	Part name	Exterior	Q'ty
Operating manual		1	Tapping screw (large)		5
Operating manual (CD-ROM)		1	Tapping screw (small)		2
Installation manual		1	Remote controller		1
Wall hook bracket		1	Remote controller holder		1
Battery		2	Cloth tape		1

4-2. Outdoor unit

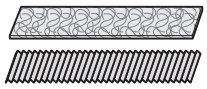
■ Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA

Part name	Exterior	Q'ty	Part name	Exterior	Q'ty
Drain pipe		1			

TECHNICAL DATA AND PARTS LIST

5. Optional parts

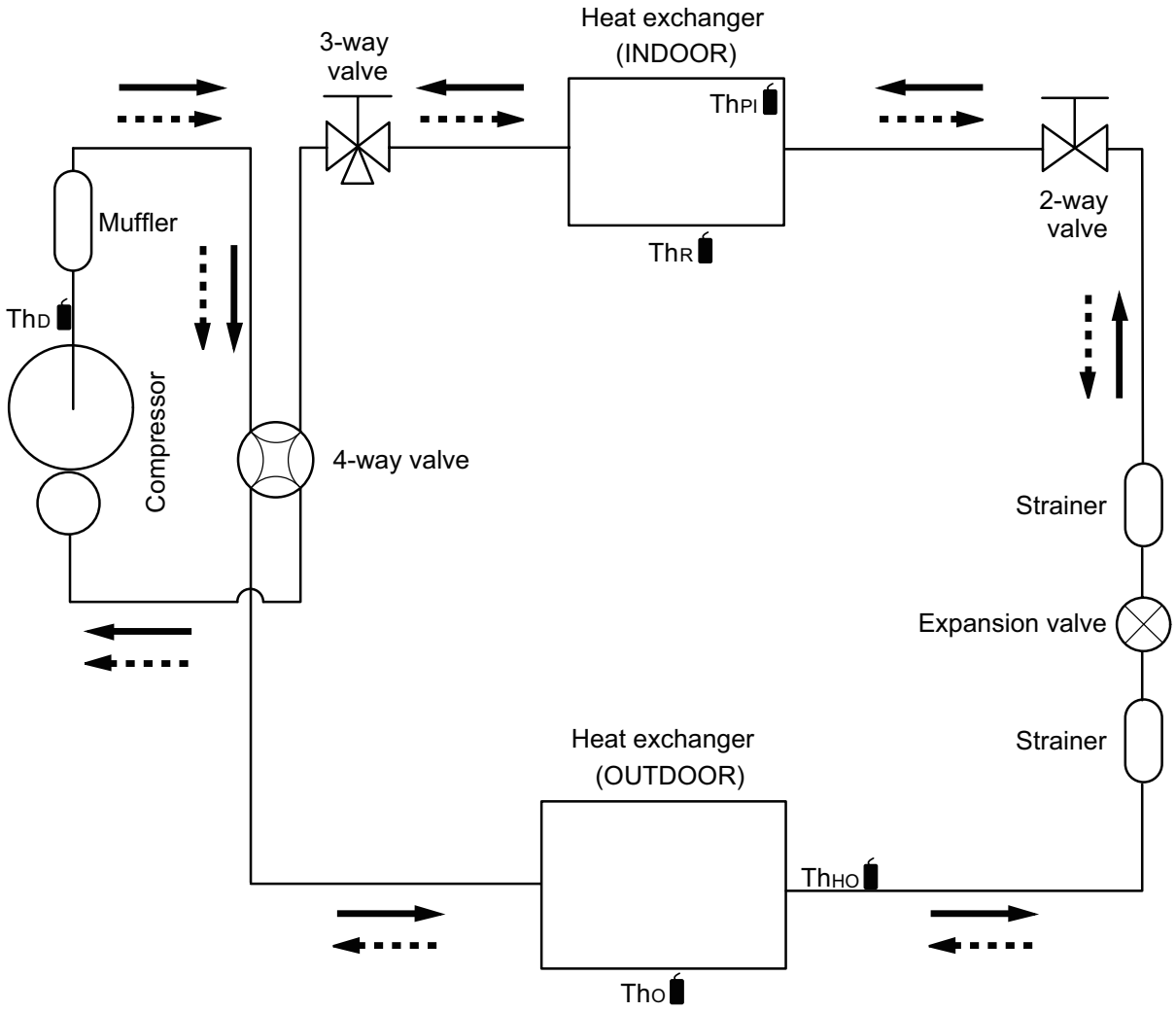
5-1. Others

Exterior	Part name	Model name	Summary
	Air Cleaning Filter	UTR-FA16-5	Air Cleaning Filter can be mounted to the indoor unit.
	Wireless LAN adapter	UTY-TFSXF2	Remotely manage an air conditioning system using mobile devices such as smartphones and tablets. Appropriate application for each region is required to use this option. For details, contact FGL sales company.

TECHNICAL DATA AND PARTS LIST

6. Refrigerant system diagrams

6-1. Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA



ThD : Thermistor (Discharge temperature)

ThO : Thermistor (Outdoor temperature)

ThHO: Thermistor (Heat exchanger out temperature)

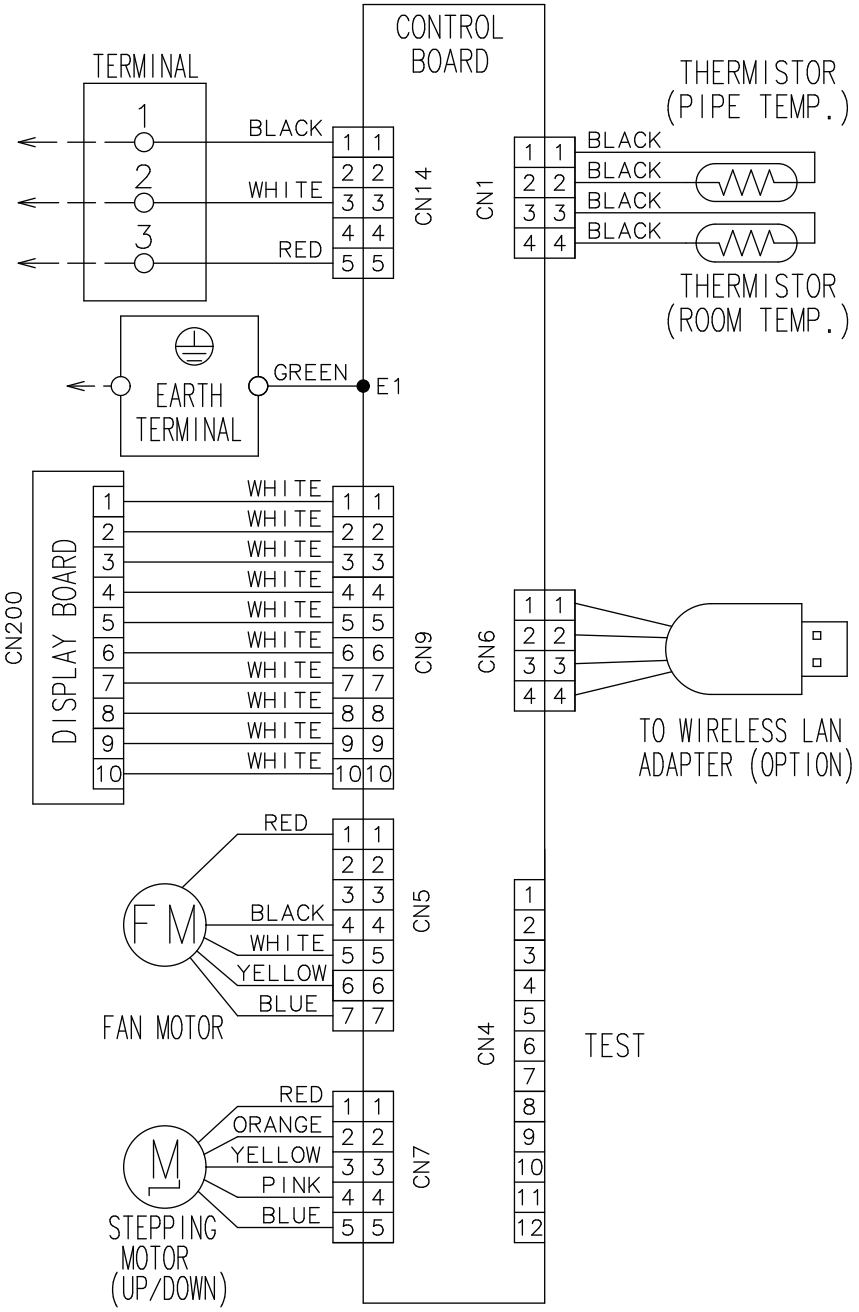
ThPI : Thermistor (Pipe temperature)

ThR : Thermistor (Room temperature)

7. Wiring diagrams

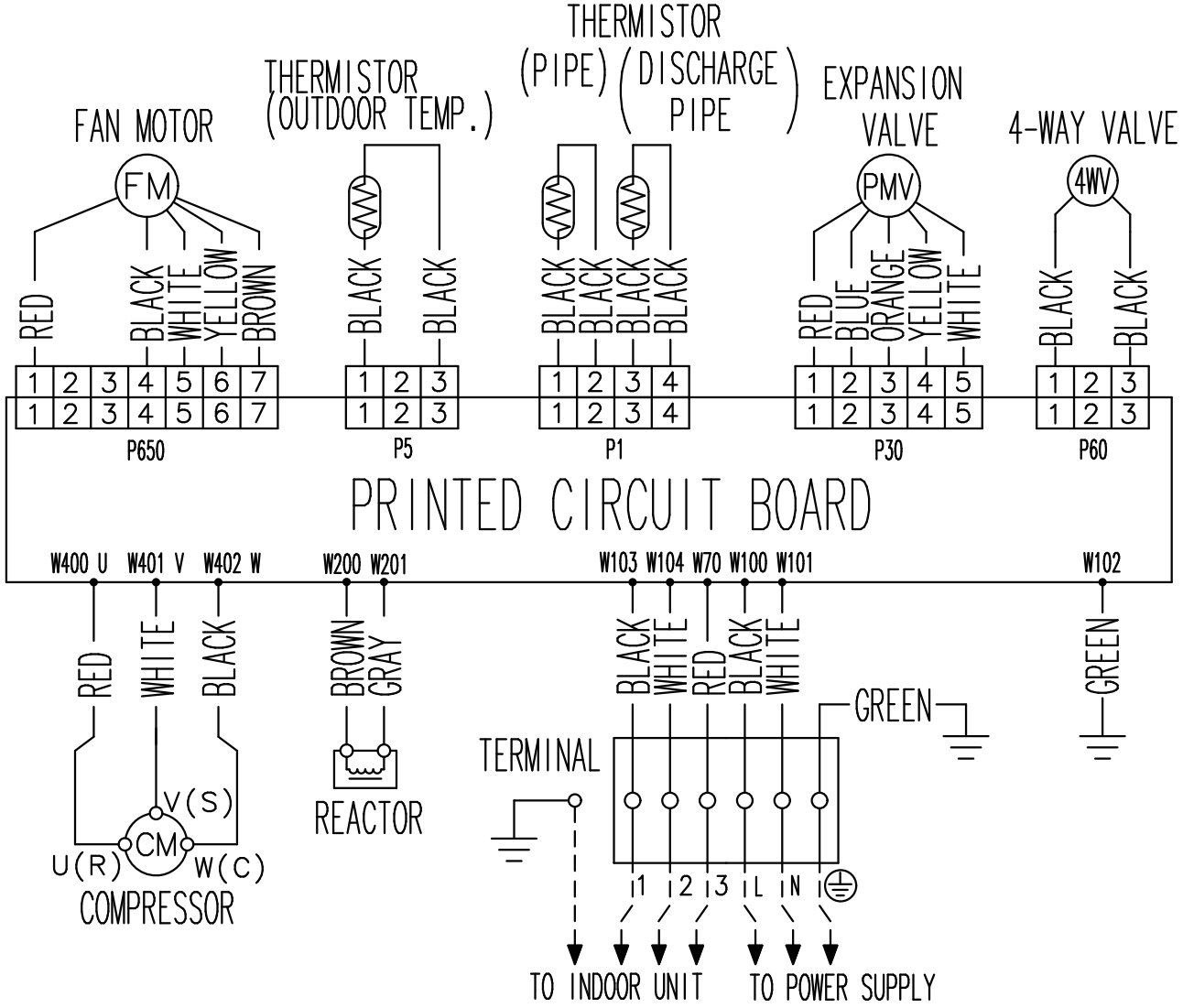
7-1. Indoor unit

■ Models: ASYG07KPCE, ASYG09KPCE, and ASYG12KPCE



7-2. Outdoor unit

■ Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA



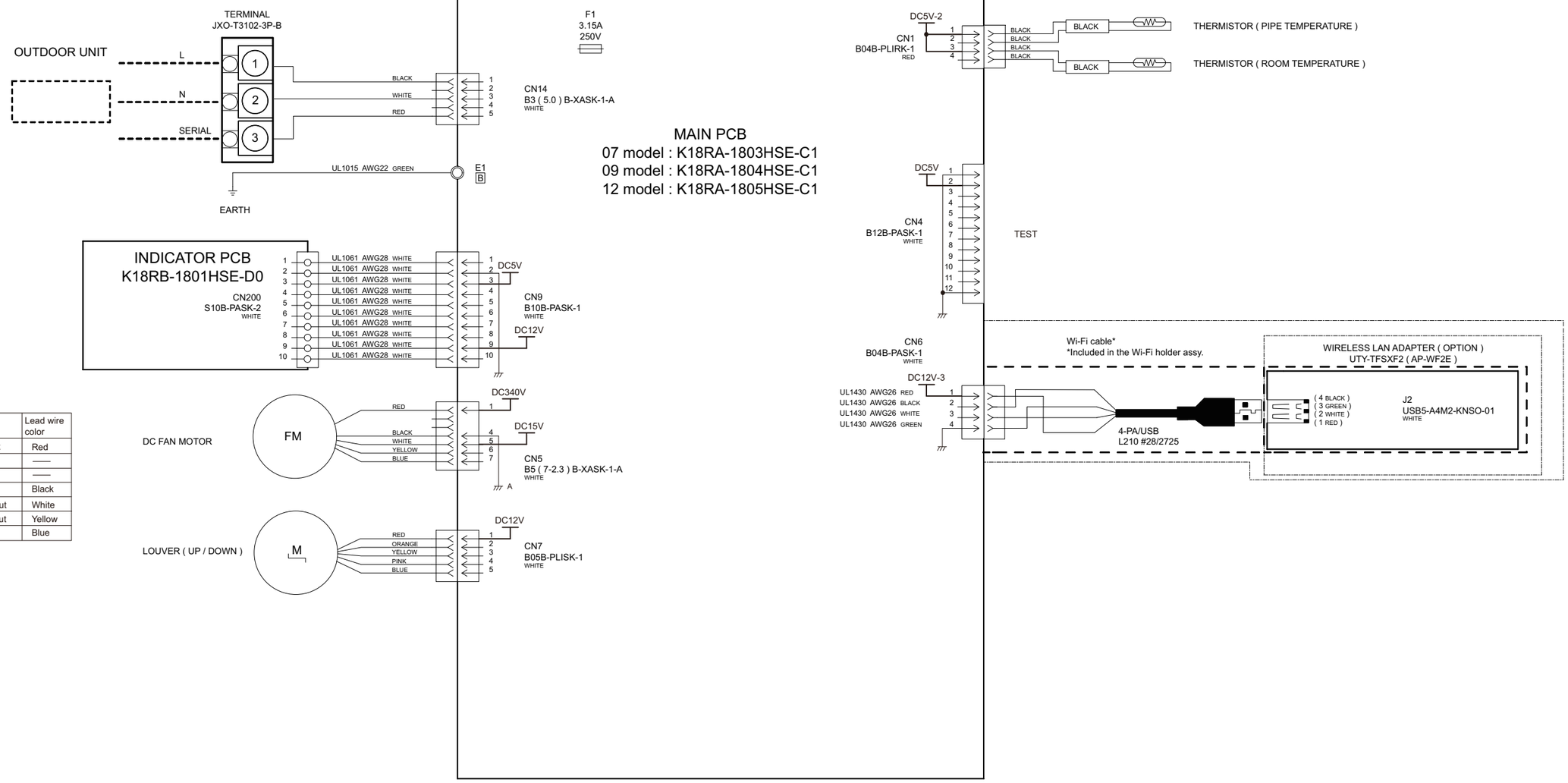
8. PC board diagrams

8-1. Models: ASYG07KPCE, ASYG09KPCE, and ASYG12KPCE

CONTROL UNIT
07 model : EZ-0180BHSE
09 model : EZ-0180CHSE
12 model : EZ-0180DHSE

CN1 Thermistor Characteristics.

Thermistor \ Temperature	(0℃)	(20℃)	(30℃)
Thermistor (Pipe temp.)	176.03 kΩ 1.10 V	62.91 kΩ 2.21 V	39.57 kΩ 2.79 V
Thermistor (Room temp.)	33.62 kΩ 1.15 V	12.54 kΩ 2.22 V	8.04 kΩ 2.77 V

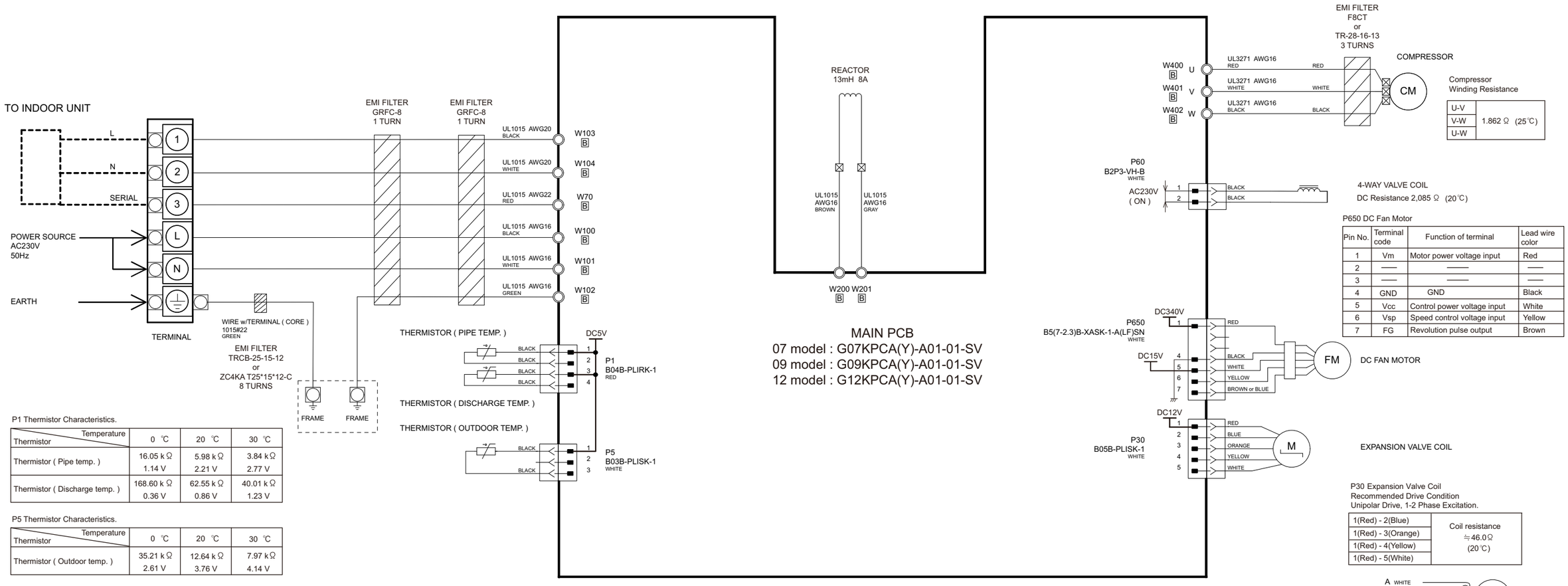


CN5 DC Fan motor

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	Blue

8-2. Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA

INVERTER ASSEMBLY
07, 09, 12 models : EZ-0192THUE



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

MAIN PCB
07 model : G07KPCA(Y)-A01-01-SV
09 model : G09KPCA(Y)-A01-01-SV
12 model : G12KPCA(Y)-A01-01-SV

P1 Thermistor Characteristics.

Thermistor \ Temperature	0 ℃	20 ℃	30 ℃
Thermistor (Pipe temp.)	16.05 kΩ 1.14 V	5.98 kΩ 2.21 V	3.84 kΩ 2.77 V
Thermistor (Discharge temp.)	168.60 kΩ 0.36 V	62.55 kΩ 0.86 V	40.01 kΩ 1.23 V

P5 Thermistor Characteristics.

Thermistor \ Temperature	0 ℃	20 ℃	30 ℃
Thermistor (Outdoor temp.)	35.21 kΩ 2.61 V	12.64 kΩ 3.76 V	7.97 kΩ 4.14 V

P30 Expansion Valve Coil
Recommended Drive Condition
Unipolar Drive, 1-2 Phase Excitation.

1(Red) - 2(Blue)	Coil resistance ≒46.0Ω (20℃)
1(Red) - 3(Orange)	
1(Red) - 4(Yellow)	
1(Red) - 5(White)	

Excitation order (1-2 phase excitation)

Connector terminal No.	Lead wire color	Phase	Excitation state							
			1	2	3	4	5	6	7	8
5	White	A	On	On	Off	Off	Off	Off	Off	On
4	Yellow	B̄	Off	On	On	On	Off	Off	Off	Off
3	Orange	Ā	Off	Off	Off	On	On	On	Off	Off
2	Blue	B	Off	Off	Off	Off	Off	On	On	On
1	Red	COM(+)	—	—	—	—	—	—	—	—

Valve operation
1→2→3→4→5→6→7→8 : Closing
8→7→6→5→4→3→2→1 : Opening

REFRIGERANT R32
INVERTER

3. TROUBLESHOOTING

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3. TROUBLESHOOTING

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TROUBLESHOOTING

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.

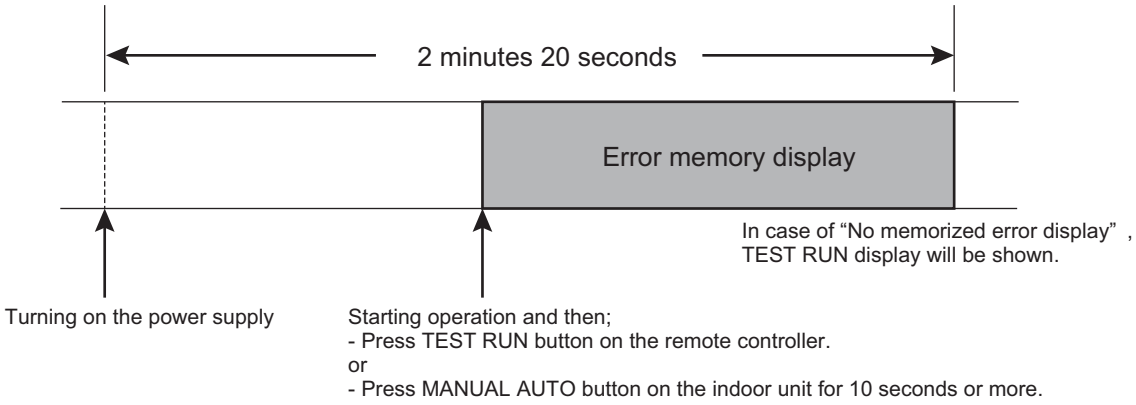
Errors, once displayed, will be automatically stored in the PC board of the indoor unit. Even if the power is disconnected, the memory containing the error history will not be erased.

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 (Indoor unit and 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.

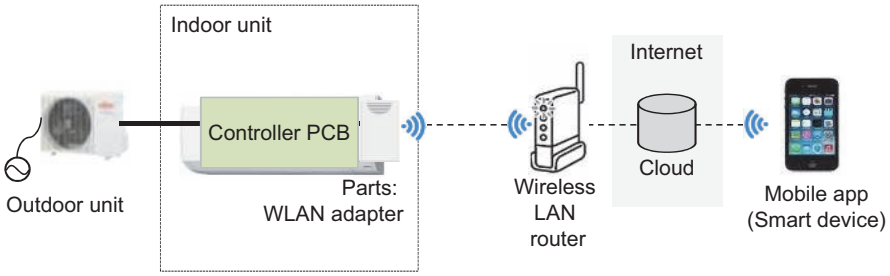
Error contents	Indoor unit display			Wired remote controller display
	Operation [⏻] (Green)	Timer [⏲] (Orange)	Economy [🐷] (Green)	
E: 11. Serial communication error (Serial reverse transfer error) (Outdoor unit)	1 times	1 times	Continuous	11
E: 11. Serial communication error (Serial forward transfer error) (Indoor unit)	1 times	1 times	Continuous	11
E: 18. External communication error between indoor unit and WLAN adapter	1 times	8 times	Continuous	18
E: 18. Communication error	1 times	8 times	Continuous	18
E: 18. Wireless LAN adapter non-energized	1 times	8 times	Continuous	18
E: 32. Indoor unit main PCB error (Indoor unit)	3 times	2 times	Continuous	32
E: 35. MANUAL AUTO button error (Indoor unit)	3 times	5 times	Continuous	35
E: 41. Room temperature sensor error (Indoor unit)	4 times	1 times	Continuous	41
E: 42. Indoor unit heat exchanger sensor error (Indoor unit)	4 times	2 times	Continuous	42
E: 51. Indoor unit fan motor error (Indoor unit)	5 times	1 times	Continuous	51
E: 62. Outdoor unit main PCB error (Outdoor unit)	6 times	2 times	Continuous	62
E: 64. PFC circuit error (Outdoor unit)	6 times	4 times	Continuous	64
E: 65. IPM error (Outdoor unit)	6 times	5 times	Continuous	65
E: 71. Discharge thermistor error (Outdoor unit)	7 times	1 times	Continuous	71
E: 73. Outdoor unit heat exchanger thermistor error (Outdoor unit)	7 times	3 times	Continuous	73
E: 74. Outdoor temperature thermistor error (Outdoor unit)	7 times	4 times	Continuous	74
E: 84. Current sensor error (Outdoor unit)	8 times	4 times	Continuous	84
E: 94. Trip detection (Outdoor unit)	9 times	4 times	Continuous	94
E: 95. Compressor motor control error (Outdoor unit)	9 times	5 times	Continuous	95
E: 97. Outdoor unit fan motor error (Outdoor unit)	9 times	7 times	Continuous	97
E: 99. 4-way valve error (Outdoor unit)	9 times	9 times	Continuous	99
E: A1. Discharge temperature error (Outdoor unit)	10 times	1 times	Continuous	A1

TROUBLESHOOTING

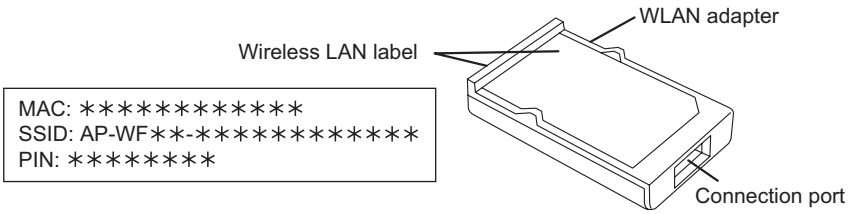
1-4. Error code table (Wireless LAN indicator)

TROUBLESHOOTING

- Wireless LAN control system diagram example



- Name of parts



- Wireless LAN indicator
  For confirmation of the error contents, refer to the following flashing patterns.
  Wireless LAN indicator lamp (orange) on the indoor unit operate according to the error contents.

Error contents	Wireless LAN LED (orange)	Error code
E: 18. External communication error between indoor unit and WLAN adapter	On: Connection information with router is available Off: Connection information with router is unavailable	18
Wireless LAN adapter error	Flashing slow	No error
Network communication error between wireless LAN router and WLAN adapter	On	No error
E: 18. Communication error	Flashing slow	18
E: 18. Wireless LAN adapter non-energized	Off	18

Flashing slowly: Repeating 7 seconds on/2 seconds off

2. Troubleshooting with error code

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

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	1 time flash
		Economy indicator	Continuous flash
		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".

↓

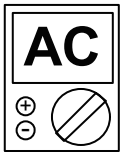
Check point 2. Check connection

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 270 V (AC 230 V -10%) to AC 253 V (AC 230 V +10%) appears at outdoor unit terminal L - N.

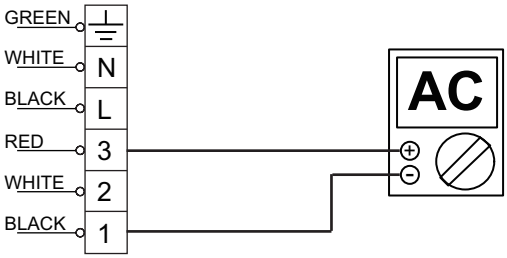


↓

TROUBLESHOOTING

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 03-48
- 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)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	1 time flash
		Economy indicator	Continuous flash
		Error code	E: 11
Detective actuator	Indoor unit	Main PCB	When the outdoor unit cannot properly receive the serial signal from indoor unit for 10 seconds or more.
		Fan motor	
	Outdoor unit	Main PCB	
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".

↓

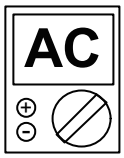
Check point 2. Check connection

Check any loose or removed connection line of indoor unit and outdoor unit.
→ If there is an abnormal condition, correct it by referring to the installation manual or the “DESIGN & TECHNICAL MANUAL”.
Check connection condition is control unit. (If there is loose connector, open cable or mis-wiring.)

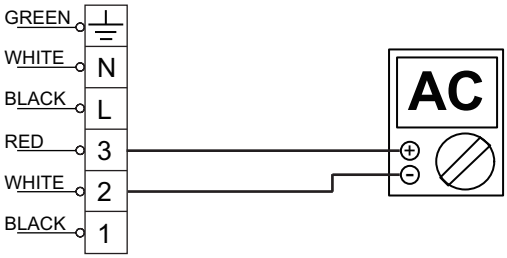
↓

Check point 3. Check the voltage of power supply

Check the voltage of power supply
Check if AC 270 V (AC 230 V -10%) to AC 253 V (AC 230 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 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

2-3. E: 32. Indoor unit main PCB error (Indoor unit)

Indicator	Indoor unit	Operation indicator	3 time flash
		Timer indicator	2 time flash
		Economy indicator	Continuous flash
		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

TROUBLESHOOTING

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 (Electronically 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.

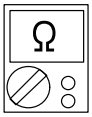
2-4. E: 35. MANUAL AUTO button error (Indoor unit)

Indicator	Indoor unit	Operation indicator	3 time flash
		Timer indicator	5 time flash
		Economy indicator	Continuous flash
		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

TROUBLESHOOTING

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

2-5. E: 41. Room temperature sensor error (Indoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	4 time flash
		Timer indicator	1 time flash
		Economy indicator	Continuous flash
		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

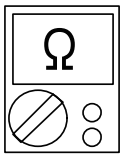
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

-> 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 03-55.
- 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 02-13.

(07-12 models: CN1)

If the voltage does not appear, replace main PCB.

↓

End

2-6. E: 42. Indoor unit heat exchanger sensor error (Indoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	4 time flash
		Timer indicator	2 time flash
		Economy indicator	Continuous flash
		Error code	E: 42
Detective actuator	Indoor unit main PCB		When heat exchanger temperature thermistor open or short circuit is detected.
	Heat exchanger temperature thermistor		
Forecast of cause			Connector connection failure
			Thermistor failure
			Main PCB failure

Check point 1. Check connection of connector

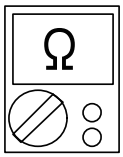
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

-> 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 03-55.
- 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 02-13.

(07-12 models: CN1)

If the voltage does not appear, replace main PCB.

↓

End

2-7. E: 51. Indoor unit fan motor error (Indoor unit)

Indicator	Indoor unit	Operation indicator	5 time flash
		Timer indicator	1 time flash
		Economy indicator	Continuous flash
		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

TROUBLESHOOTING

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 03-48.)
→ 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

2-8. E: 62. Outdoor unit main PCB error (Outdoor unit)

Indicator	Indoor unit	Operation indicator	6 time flash
		Timer indicator	2 time flash
		Economy indicator	Continuous flash
		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

TROUBLESHOOTING

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

2-9. E: 64. PFC circuit error (Outdoor unit)

Indicator	Indoor unit	Operation indicator	6 time flash
		Timer indicator	4 time flash
		Economy indicator	Continuous flash
		Error code	E: 64
Detective actuator	Outdoor unit	Main PCB	• When inverter input DC voltage is higher than 415 V 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

TROUBLESHOOTING

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

2-10. E: 65. IPM error (Outdoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	6 time flash
		Timer indicator	5 time flash
		Economy indicator	Continuous flash
		Error code	E: 65
Detective actuator	Outdoor unit	Main PCB	1. When more than normal operating current to IPM in main PCB flows, the compressor stops. 2. After the compressor restarts, if the same operation is repeated within 40 seconds, the compressor stops again. 3. If 1. and 2. repeats 5 times, the compressor stops permanently.
		Compressor	
Forecast of cause			Defective connection of electric components
			Outdoor fan operation failure
			Outdoor heat exchanger clogged
			Compressor failure
			Main PCB failure

Check point 1. Check connections of outdoor unit electrical components

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

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

↓

Check point 2. Check outdoor fan and heat exchanger

- Is there anything obstructing the air distribution circuit?
- Is there any clogging of outdoor heat exchanger?
- Is the fan rotating by hand when operation is off?

→ If the fan motor is locked, replace it.

↓

Check point 3. Check outdoor fan

Check outdoor fan motor. (Refer to "E: 97. Outdoor unit fan motor error (Outdoor unit)" on page 03-23.)
→ If the fan motor is failure, replace it.

↓

Check point 4. Check compressor
Check compressor. (Refer to inverter compressor in "Service parts information".)

↓

Check point 5. Replace main PCB
If Check point 1 to 4 do not improve the symptom, change main PCB.

↓

End

TROUBLESHOOTING

2-11. E: 71. Discharge thermistor error (Outdoor unit)

Indicator	Indoor unit	Operation indicator	7 time flash
		Timer indicator	1 time flash
		Economy indicator	Continuous flash
		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

TROUBLESHOOTING

Check point 1. Check connection of connector

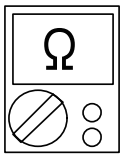
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

→ 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 03-55.
- 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 02-13.

(07-12 models: P1)

If the voltage does not appear, replace main PCB.

↓

End

2-12. E: 73. Outdoor unit heat exchanger thermistor error (Outdoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	7 time flash
		Timer indicator	3 time flash
		Economy indicator	Continuous flash
		Error code	E: 73
Detective actuator	Outdoor unit main PCB		When heat exchanger temperature thermistor open or short circuit is detected at power on or while running the compressor
	Heat exchanger temperature thermistor		
Forecast of cause			Connector failure
			Thermistor failure
			Main PCB failure

Check point 1. Check connection of connector

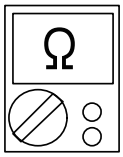
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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

↓

Check point 2. Remove connector and check thermistor resistance value

- For the outdoor unit heat exchanger thermistor resistance value, refer to "Thermistor resistance values" on page 03-55.
- 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 02-13.

If the voltage does not appear, replace main PCB.

↓

End

2-13. E: 74. Outdoor temperature thermistor error (Outdoor unit)

Indicator	Indoor unit	Operation indicator	7 time flash
		Timer indicator	4 time flash
		Economy indicator	Continuous flash
		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

TROUBLESHOOTING

Check point 1. Check connection of connector

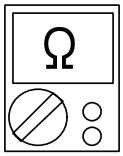
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

-> 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 03-55.
- 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 02-13.
(07-12 models: P5)

If the voltage does not appear, replace main PCB.

↓

End

2-14. E: 84. Current sensor error (Outdoor unit)

Indicator	Indoor unit	Operation indicator	8 time flash
		Timer indicator	4 time flash
		Economy indicator	Continuous flash
		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 56 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

2-15. E: 94. Trip detection (Outdoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	9 time flash
		Timer indicator	4 time flash
		Economy indicator	Continuous flash
		Error code	E: 94
Detective actuator	Outdoor unit	Main 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.
		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)

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 the main PCB

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

↓

Check point 3. Replace compressor

If Check point 2 do not improve the symptom, change compressor.

↓

End

2-16. E: 95. Compressor motor control error (Outdoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	9 time flash
		Timer indicator	5 time flash
		Economy indicator	Continuous flash
		Error code	E: 95
Detective actuator	Outdoor unit	Main PCB	1. When running the compressor, if the detected rotor location is out of phase with actual rotor location more than 90°, the compressor stops. 2. After the compressor restarts, if the same operation is repeated within 40 seconds, the compressor stops again. 3. If 1. and 2. repeats 5 times, the compressor stops permanently.
		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 03-48.)

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

↓

Check point 3. Replace the main PCB

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

↓

Check point 4. Replace compressor

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

↓

End

2-17. E: 97. Outdoor unit fan motor error (Outdoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	9 time flash
		Timer indicator	7 time flash
		Economy indicator	Continuous flash
		Error code	E: 97
Detective actuator	Outdoor unit	Main PCB	1. When outdoor fan rotation speed is less than 100 rpm in 20 seconds after fan motor starts, fan motor stops. 2. After fan motor restarts, if the same operation within 60 seconds is repeated 3 times in a row, compressor and fan motor stops. 3. If 1. and 2. repeats 5 times in a row, compressor and fan motor stops permanently.
		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 03-48.)
→ 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 02-13.

Read wire	DC voltage
Red—Black	207 V (AC 230 V -10 %) to 253 V (AC 230 V +10 %)
White—Black	15 ± 1.5 V

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

↓

End

2-18. E: 99. 4-way valve error (Outdoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	9 time flash
		Timer indicator	9 time flash
		Economy indicator	Continuous flash
		Error code	E: 99
Detective actuator	Indoor unit	main PCB	When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops. Indoor heat exchanger temp. - Room temp. > 10 °C (Cooling or Dry operation) Indoor heat exchanger temp. - Room temp. < -10 °C (Heating operation) If the same operation is repeated 5 times, the compressor stops permanently.
	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 03-55.
→ If defective, replace the thermistor.

↓

TROUBLESHOOTING

Check point 3. Check the solenoid coil and 4-way valve
• **Solenoid coil** Remove CN30 from PCB and check the resistance value of coil. Resistance value is about 1.88 kΩ ~ 2.29 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. Check the voltage of 4-way valve
Check the voltage CN30 of Main PCB. → Check if AC 270 V (AC 230 V -10%) to AC 253 V (AC 230 V +10%) appears at CN30 of Main PCB. • **Heating operation** → If it is not voltage, Replace Main PCB. • **Cooling operation** → If it is voltage, Replace Main PCB.

↓

Check point 5. Replace the main PCB
If Check Point 1 to 4 do not improve the symptom, replace the main PCB.

↓

End

2-19. E: A1. Discharge temperature error (Outdoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	10 time flash
		Timer indicator	1 time flash
		Economy indicator	Continuous flash
		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 Electrronic Expansion Valve (EEV) or Capillary tube in "Service parts information" on page 03-48.
- 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 03-48.)

↓

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 03-55.

↓

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

TROUBLESHOOTING

3. Troubleshooting without error code

3-1. Indoor unit—No power

Forecast of cause	Power supply failure
	External cause
	Electrical components defective

TROUBLESHOOTING

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".

↓

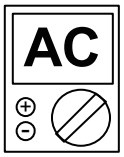
Check point 2. Check external cause at indoor and outdoor (voltage drop or noise)

- 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 207 to 253 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

TROUBLESHOOTING

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”.

↓

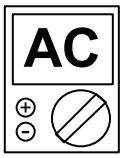
Check point 2. Check external cause at indoor and outdoor (voltage drop or noise)

- 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 207 to 253 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

TROUBLESHOOTING

Check point 1. Check indoor and outdoor installation condition

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. Replace main PCB

If check point 1 to 2 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

TROUBLESHOOTING

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

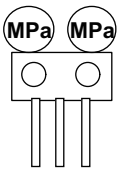
- Check connection pipe (specified pipe length and pipe diameter?)
- Check any loose or removed communication line.

→ 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 Electrronic Expansion Valve (EEV) or Capillary tube in "Service parts information" on page 03-48.
- Check compressor.
  Refer to compressor in "Service parts information" on page 03-48.
  Refer to inverter compressor in "Service parts information" on page 03-48.



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

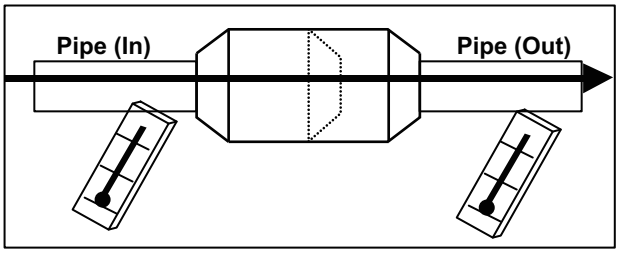
↓

End

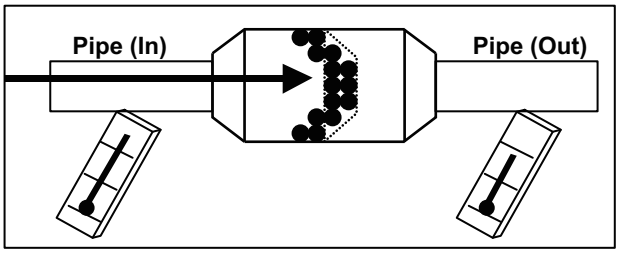
TROUBLESHOOTING

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)

TROUBLESHOOTING

Diagnosis method when abnormal noise is occurred

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

↓

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

↓

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

↓

End

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

↓

- 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?

↓

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 03-48.

↓

End

3-6. Water leaking

Forecast of cause	Erroneous installation
	Drain hose failure

TROUBLESHOOTING

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?

↓

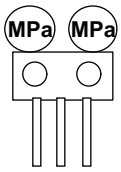
End

Diagnosis method when water is spitting out

Is the filter clogged?

↓

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



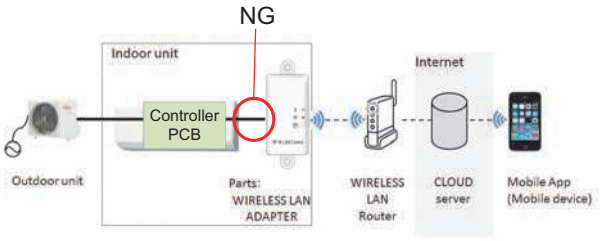
↓

End

4. Troubleshooting with error code (For wireless LAN adapter)

4-1. E: 18. External communication error between indoor unit and WLAN adapter

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	8 time flash
		Economy indicator	Continuous flash
		Error code	E: 18
	Wireless LAN adapter	LED1 (green)	Flashing fast
		LED2 (orange)	On
Detective actuator	Wireless LAN adapter PCB		After receiving a signal from the wireless LAN adapter, the same signal has not been received for 15 seconds. 
	Controller PCB		
Forecast of cause			Connection between indoor unit and wireless LAN adapter failure
			Wireless LAN adapter PCB failure
			Controller PCB failure

Check point 1. Check the connection

- Check any loose or removed connection of between the wireless LAN adapter PCB and controller PCB.
  -> If there is abnormal condition, correct it.

- Check the connection condition on the controller PCB.
  -> If there is loose connector, open cable or mis-wiring, correct it.

↓

Check point 2. Replace wireless LAN adapter.

If check point 1 do not improve the symptom, replace the wireless LAN adapter and cancel the registration of air conditioner on the mobile app.
After replacing the adapter, perform the pairing on the mobile app.

For the method of the mobile app, refer to "Mobile app setting method" on page 03-43.

↓

Check point 3. Replace controller PCB

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

↓

End

4-2. Wireless LAN adapter error

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	No indication
		Timer indicator	No indication
		Economy indicator	No indication
		Error code	—
	Wireless LAN adapter	LED1 (green)	Flashing fast
		LED2 (orange)	Flashing fast
Detective actuator	Wireless LAN adapter setting button		When the setting button becomes on for consecutive 60 seconds or more. 
	Wireless LAN adapter PCB		
Forecast of cause			Wireless LAN adapter setting button failure
			Wireless LAN adapter PCB failure

Check point 1. Check the setting button

Check if setting button is kept pressed.
-> If the setting button is held down by the foreign matter, remove the foreign matter or remove the cause of the button press.

↓

Check point 2. Replace wireless LAN adapter.

If check point 1 do not improve the symptom, replace the wireless LAN adapter and cancel the registration of air conditioner on the mobile app.
After replacing the adapter, perform the pairing on the mobile app.

For the method of the mobile app, refer to "Mobile app setting method" on page 03-43.

↓

Check point 3. Replace controller PCB

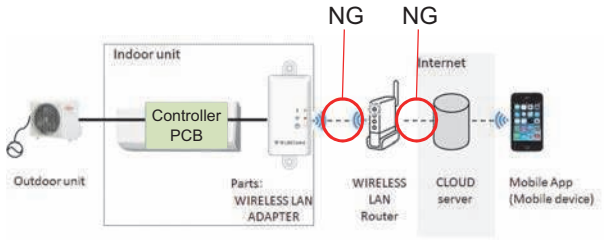
If check point 1 to 2 do not improve the symptom, replace the Wireless LAN adapter.

↓

End

4-3. Network communication error between wireless LAN router and WLAN adapter

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	No indication
		Timer indicator	No indication
		Economy indicator	No indication
		Error code	—
	Wireless LAN adapter	LED1 (green)	On
		LED2 (orange)	Flashing fast
Detective actuator	Wireless LAN router		When the not connection between wireless LAN adapter and wireless LAN router. 
	Wireless LAN adapter PCB		
Forecast of cause			Connection cable failure of wireless LAN router
			Connection between wireless LAN adapter and wireless LAN router failure
			Wireless LAN router failure
			Wireless LAN adapter PCB failure

Check point 1. Check the connection cable

Check the connection cable on the wireless LAN router.
-> If there is loose connector, open cable or mis-wiring, correct it.

↓

Check point 2. Check the connection status.

Check the connection status to the internet and wireless LAN router.
-> If the wireless LAN router is not connected to the internet, check the transmission between wireless LAN products (ex. PC or game console, etc.) other than air conditioner and wireless LAN router.

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

↓

Check point 3. Turn on the power again of air conditioner.

If check point 1 to 2 do not improve the symptom, turn on the power of the air conditioner again and wait for 60 seconds.

↓

Check point 4. Replace wireless LAN adapter.
If check point 3 do not improve the symptom, replace the wireless LAN adapter and cancel the registration of air conditioner on the mobile app. After replacing the adapter, perform the pairing on the mobile app. For the method of the mobile app, refer to "Mobile app setting method" on page 03-43.

↓

End

TROUBLESHOOTING

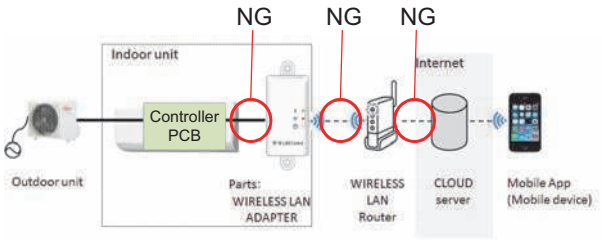
Check point 2-2. Check the transmission state
Check the wireless transmission state pf the wireless LAN router (LED status). -> If the wireless transmission from the wireless LAN router has not been outgoing, inquire to the wireless LAN router maker.

↓

End

4-4. E: 18. Communication error

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	8 time flash
		Economy indicator	Continuous flash
		Error code	E: 18
	Wireless LAN adapter	LED1 (green)	Flashing fast
		LED2 (orange)	Flashing fast
Detective actuator	Wireless LAN router		When the external communication error between indoor unit and WLAN adapter and network communication error between wireless LAN router and WLAN adapter has occurred simultaneously. 
	Wireless LAN adapter PCB		
	Indoor unit controller PCB		
Forecast of cause			Connection cable failure of wireless LAN router
			Wireless LAN router failure
			Connection between indoor unit and wireless LAN adapter failure
			Connection between wireless LAN adapter and wireless LAN router failure
			Wireless LAN adapter PCB failure
			Controller PCB failure

Check point 1. Check the connection cable

Check the connection cable on the wireless LAN router.
-> If there is loose connector, open cable or mis-wiring, correct it.

↓

Check point 2. Check the connection status.and transmission state

- Check the connection status to the internet and wireless LAN router.
  -> If the wireless LAN router is not connected to the internet, check the transmission between wireless LAN products (ex. PC or game console, etc.) other than air conditioner and wireless LAN router.
  If no, go to "Check point 4".

- Check the wireless transmission state of wireless LAN router (LED status).
  -> If the wireless transmission from the wireless LAN router has not been outgoing, inquire to wireless LAN router maker.

  If the display pattern is changed as follows, go to "Check point 3-2".
  – LED 1 (green): flashing fast
  – LED 2 (orange): on

  If no, go to "Check point 3-1".

↓

TROUBLESHOOTING

Check point 3-1. Turn on the power again of air conditioner.
If check point 1 to 2 do not improve the symptom, turn on the power of the air conditioner again and wait for 60 seconds. -> When the flashing pattern of the LED 2 (orange) is on, go to "Check point 3-2". -> When the flashing pattern of the LED 2 (orange) is flashing fast, go to "Check point 4".

↓

Check point 3-2. Check the connection.
• Check any loose or removed connection of between the wireless LAN adapter PCB and controller PCB. -> If there is abnormal condition, correct it. • Check the connection condition on the controller PCB. -> If there is loose connector, open cable or mis-wiring, correct it.

↓

Check point 4. Replace wireless LAN adapter.
If check point 2 to 3 do not improve the symptom, replace the wireless LAN adapter and cancel the registration of air conditioner on the mobile app. After replacing the adapter, perform the pairing on the mobile app. For the method of the mobile app, refer to "Mobile app setting method" on page 03-43.

↓

Check point 5. Replace controller PCB
If check point 4 do not improve the symptom, replace the controller PCB.

↓

End

4-5. E: 18. Wireless LAN adapter non-energized

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	8 time flash
		Economy indicator	Continuous flash
		Error code	E: 18
	Wireless LAN adapter	LED1 (green)	Off
		LED2 (orange)	Off
Detective actuator	Indoor unit controller PCB		When the voltage (DC 12 V) does not output from the controller PCB.
	Wireless LAN adapter PCB		
Forecast of cause			Indoor unit controller PCB failure
			Wireless LAN adapter PCB failure
			Wiring connection failure

TROUBLESHOOTING

Check point 1. Check the connection.

- Check any loose or removed connection of between the wireless LAN adapter PCB and controller PCB.
  -> If there is abnormal condition, correct it.

- Check the connection condition on the controller PCB.
  -> If there is loose connector, open cable or mis-wiring, correct it.

↓

Check point 2. Check the wireless LAN adapter PCB and the controller PCB

Check voltage at CN12 (terminal 1—2) of main PCB.
(Power supply to remote controller)

- If it is DC 0 V, controller PCB is failure.
  -> Replace controller PCB.
- If it is DC 12 V, wireless LAN adapter PCB is failure.
  -> Replace the wireless LAN adapter and cancel the registration of air conditioner on the mobile app.
  After replacing the adapter, perform the pairing on the mobile app.

  For the method of the mobile app, refer to "Mobile app setting method" on page 03-43.

↓

End

4-6. Wireless LAN adapter Sleep mode (Indoor unit)

Indicator	Indoor unit	Operation indicator	No indication
		Timer indicator	No indication
		Economy indicator	No indication
		Error code	—
	Wireless LAN adapter	LED1 (green)	Off
		LED2 (orange)	Off
Detective actuator	Sleep mode		When the state in which fly a wireless(SSID) have passed 1 hour.
Forecast of cause			Sleep mode

TROUBLESHOOTING

Check point 1. Cheak the sleep mode
Press the Wireless LAN adapter setting button the 3 seconds or more. -> If the display pattern is changed as follows, refer to "Network communication error between wireless LAN router and WLAN adapter" on page 03-37. • LED 1 (green): on • LED 2 (orange): flashing fast

4-7. Mobile app setting method

■ Air conditioner deregistration method

When the wireless LAN adapter is replaced, deregistration of all air conditioner is necessary on the mobile app.

1. Launch the mobile app.

2. Press and hold the registered device name of the air conditioner.

3. If the Unregister button is displayed, tap the button.

4. Tap the Yes button.

5. Deregstration of the air conditioner is completed.

TROUBLESHOOTING

■ Air conditioner registration pairing method

Choose the following modes to connect the air conditioner to the wireless LAN router.

NOTES:

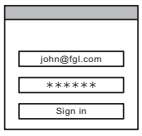
- Before starting this setting, wait for 60 seconds or more after the power supply is connected to the air conditioner (via breaker or plug).
- Check that the smartphone or tablet PC is linked to the wireless router to be connected to the air conditioner.
  The setting does not work if the same wireless LAN router is not connected.
- The displayed screen design may differ depending on the version of the mobile app.
- To control 2 or more air conditioners with the same smartphone or tablet PC, repeat the setup of the chosen mode.

Light pattern: ○ Off ● On ✳ Flashing

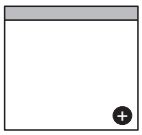
● Button mode

1. Launch the mobile app.

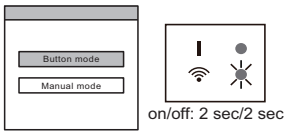
2. Sign in with your e-mail address and password following the screen on the mobile app.



3. Press the + button to add a new air conditioner.



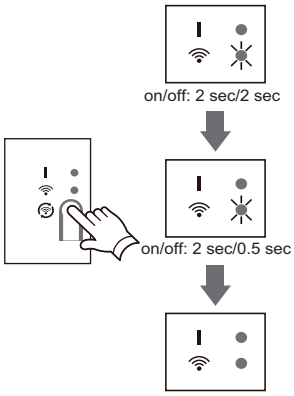
4. Confirm that the LED 2 blinks (on/off at 2 seconds intervals). Then select Button mode on the screen. If the LED 1 and 2 are off, push the setting button once.



5. Press the WPS button on the wireless LAN router to be connected.
   For the button location of the wireless LAN router and how to press it, refer to the operation manual of the wireless LAN router.

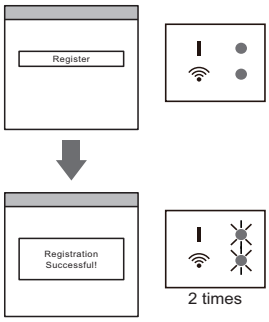
TROUBLESHOOTING

6. Confirm that the LED 2 blinks (on/off at 2 seconds intervals). Then press and hold the setting button on the WLAN Adapter for 3 seconds.



The light pattern of the LED 2 changes. (On/off: 2 sec./2 sec. → 2 sec./0.5 sec.)
Confirm both of the LED 1 and 2 are on to proceed.

7. Press Register button to start the connection with the wireless LAN router.



Both of the LED 1 and 2 flash 2 times and a message appear when the setup is completed.

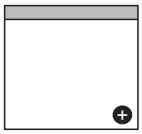
TROUBLESHOOTING

● Manual mode (For Android)

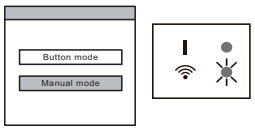
1. Launch the mobile app.

2. Sign in with your e-mail address and password following the screen on the mobile app.

3. Press the + button to add a new air conditioner.

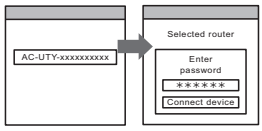


4. Select manual mode.



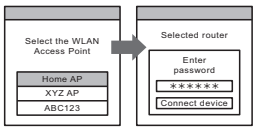
If both of the LED 1 and 2 are off, push the setting button once.

5. Select the SSID of the air conditioner to be connected.



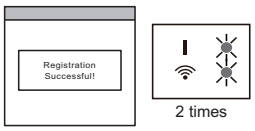
Input the PIN code written on the wireless LAN label.

6. Select the SSID of the wireless LAN router to be connected.



Input the wireless LAN router (wireless LAN access point) password then press Connect device button.

7. When setup is completed, both of the LED 1 and 2 flash 2 times, and a message appear.



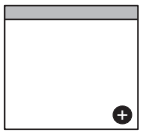
TROUBLESHOOTING

● Manual mode (For iOS)

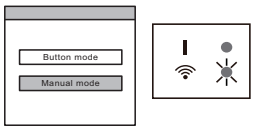
1. Launch the mobile app.

2. Sign in with your e-mail address and password following the screen on the mobile app.

3. Press the + button to add a new air conditioner.

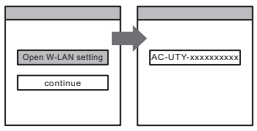


4. Select manual mode.



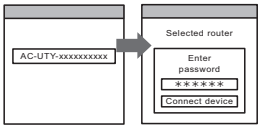
If both of the LED 1 and 2 are off, push the setting button once.

5. Select Open W-LAN setting button or activate the wireless LAN by pressing the Home button → Setting button → Wi-Fi button.

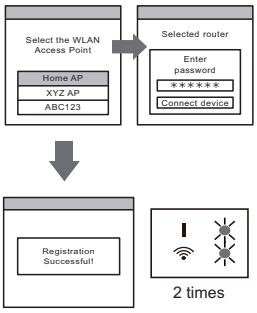


Select the SSID of the air conditioner to be connected.

6. Input the PIN code written on the wireless LAN label.



7. Select the SSID of the wireless LAN router to be connected.
Input the wireless LAN router (wireless LAN access point) password then press Connective device button.



When setup is completed, both of the LED 1 and 2 flash 2 times and a message appear.

5. Service parts information

5-1. Compressor

TROUBLESHOOTING

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

Does not start up	Stops soon after starting up	Abnormal noise
↓	↓	↓
Is there open or loose connection cable?	Is there open or loose connection cable?	Check if vibration noise by loose bolt or contact noise of piping is happening.
↓	↓	↓
Check main PCB, connection of compressor, and winding resistance. (Refer to the next page) → If there is no failure, the defect of compressor is considered (Locked compressor due to clogged dirt or less oil)	Is gas pipe valve open? (Low pressure is too low)	Defective compressor can be considered. (due to inside dirt clogging or broken component)
↓	↓	↓
Replace compressor.	Check if refrigerant is leaking. 	Replace compressor.
↓	↓	↓
End	Check if strainer is clogged. (Refer to outdoor EEV or capillary tube in this chapter.)	**End**
	↓	
	Check main PCB, connection of compressor and winding resistance. (Refer to the next page) → If there is no failure, the defect of compressor can be considered. (Compression part broken or valve defective.)	
	↓	
	Replace compressor.	
	↓	
	End	

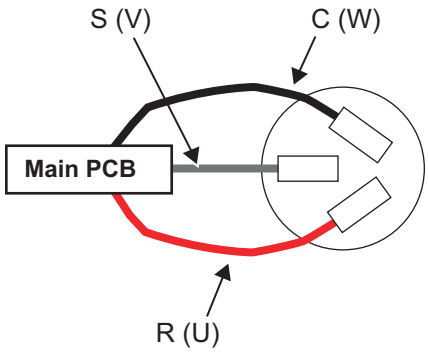
5-2. Inverter compressor

■ Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA

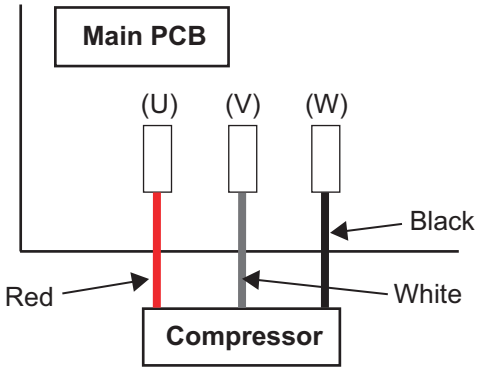
TROUBLESHOOTING

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



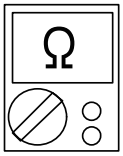
- Check the following terminal connections of the Main PCB. (Loosening or incorrect wiring.)
  - **(U):** Red
  - **(V):** White
  - **(W):** Black

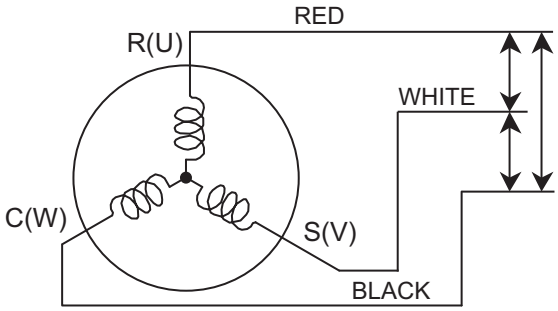


↓

Check point 2. Check the winding resistance.

Check the winding resistance of each terminal.
Resistance value: 1.862 Ω at 25 °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.

TROUBLESHOOTING

5-3. Outdoor unit Electronic Expansion Valve (EEV)

■ Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA

TROUBLESHOOTING

Check point 1. Check connections

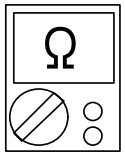
Check connection of connector. (Loose connector or open cable)

NOTE: For details of wiring diagram, refer to "Wiring diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-13.

Check point 2. Check coil of EEV

Remove connector, check each winding resistance of coil.

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



→ If Resistance value is abnormal, replace EEV.

Check point 3. Check voltage from main PCB

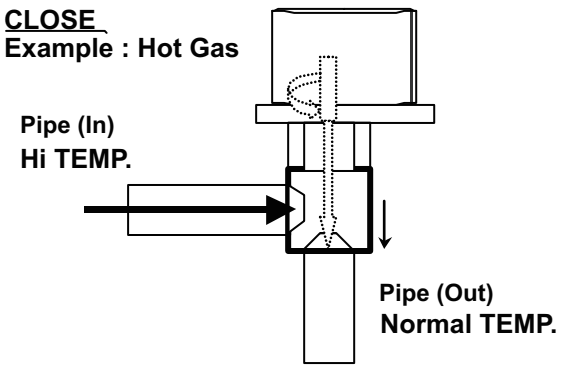
Remove connector and check voltage (DC 12 V)
→ If it does not appear, replace main PCB.

Check point 4. Check noise at start up

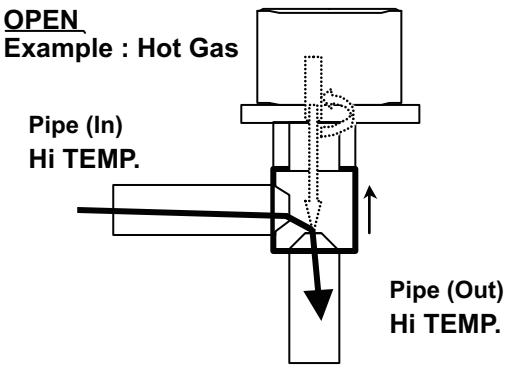
Turn on the power and check the operation noise.
→ If an abnormal noise does not show, replace main PCB.

Check point 5. Check opening and closing operation of valve

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



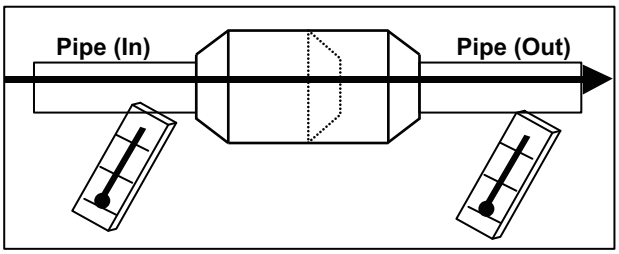
If it is open, it has no temp. difference between inlet and outlet



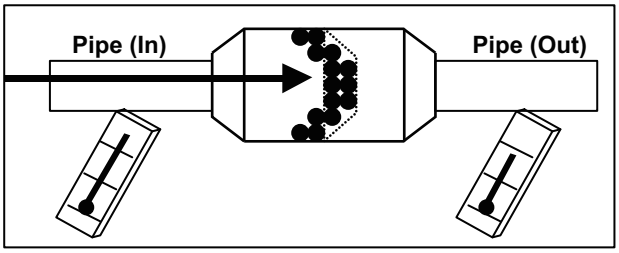
TROUBLESHOOTING

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.



5-4. Indoor unit fan motor

■ Models: ASYG07KPCE, ASYG09KPCE, and ASYG12KPCE

TROUBLESHOOTING

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

5-5. Outdoor unit fan motor

■ Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA

TROUBLESHOOTING

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 (Blue)	Feed back (FG)

6. Thermistor resistance values

6-1. 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

TROUBLESHOOTING

6-2. Outdoor unit

■ 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

TROUBLESHOOTING

TROUBLESHOOTING

■ 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

TROUBLESHOOTING

REFRIGERANT R32
INVERTER

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.

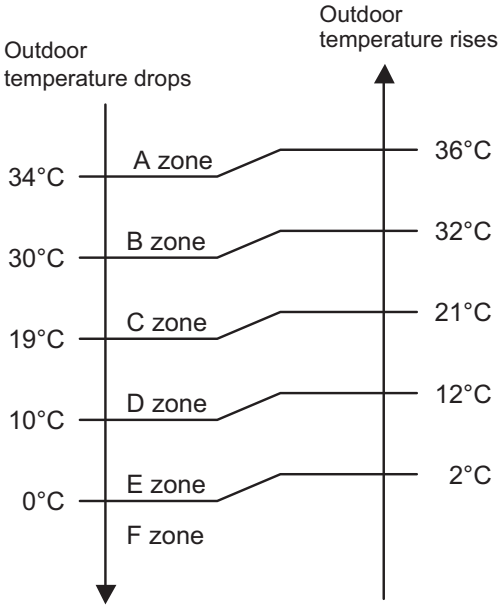
- If the room temperature is 6.0 °C higher than a set temperature, the operation rotation number of compressor will attain to maximum performance.
- If the room temperature is 1.0 °C lower than a set temperature, the compressor will be stopped.
- When the room temperature is within the range of +6.0°C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

CONTROL AND FUNCTIONS

- **Rotation number range of compressor**

Model name	Minimum rotation number	Maximum rotation number
ASYG07KPCE ASYG09KPCE	10 rps	84 rps
ASYG12KPCE	10 rps	90 rps

- **Limit of maximum speed based on outdoor temperature**



CONTROL AND FUNCTIONS

Unit: rps

Model name	Outdoor temperature zone	Indoor unit fan mode			
		HIGH	MED	LOW	QUIET
ASYG07KPCE ASYG09KPCE	A zone	84	49	36	24
	B zone	84	49	36	24
	C zone	84	49	36	24
	D zone	60	44	34	22
	E zone	60	44	34	22
	F zone	60	44	34	22
ASYG12KPCE	A zone	90	52	36	24
	B zone	90	52	36	24
	C zone	90	52	36	24
	D zone	64	46	34	22
	E zone	64	46	34	22
	F zone	64	46	34	22

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.

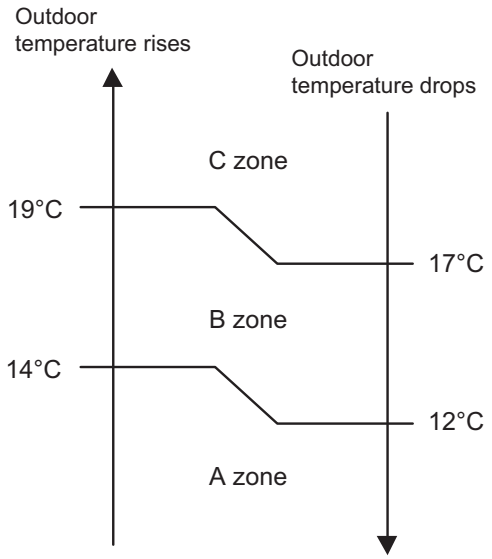
- **Rotation number range of compressor**

Unit: rps

Model name	Minimum rotation number	Maximum rotation number
ASYG07KPCE ASYG09KPCE ASYG12KPCE	10	114

CONTROL AND FUNCTIONS

- **Limit of maximum speed based on outdoor temperature**
  In heating operation, maximum rotation number is defined by outdoor temperature and fan mode.



Unit: rps

Model name	Outdoor temperature zone	Indoor unit fan mode			
		HIGH	MED	LOW	QUIET
ASYG07KPCE ASYG09KPCE	A zone	114	114	110	90
	B zone	114	114	96	84
	C zone	110	110	84	52
ASYG12KPCE	A zone	114	114	78	78
	B zone	114	114	78	73
	C zone	110	110	73	46

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.

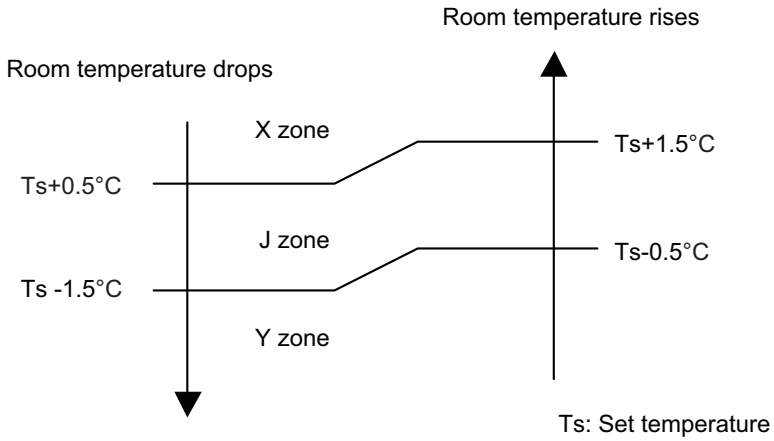
Zone is defined by set temperature and room temperature.

- **Rotation number range of compressor**

Unit: rps

Model name	Outdoor temperature zone	Operating rotation number
ASYG07KPCE	X zone	24
ASYG09KPCE	J zone	18
ASYG12KPCE	Y zone	0

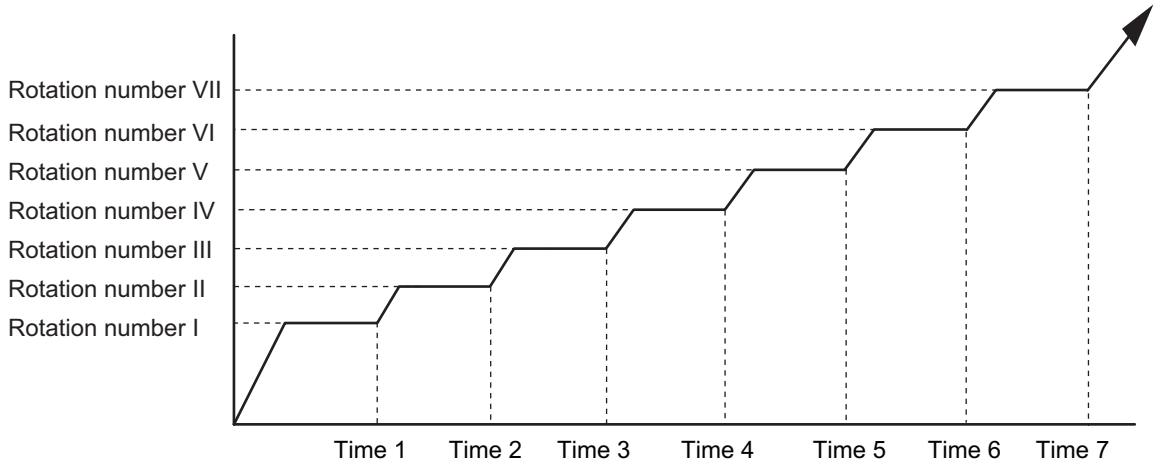
- **Compressor control based on room temperature**



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

■ Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA

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

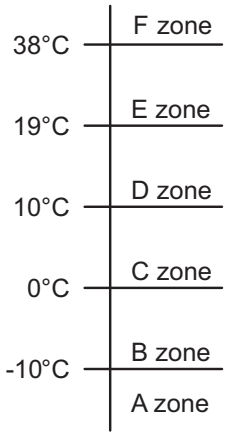


Rotation number (rps)	I	II	III	IV	V	VI	VII
	45	56	68	77	84	93	103
Time (sec)	1	2	3	4	5	6	7
	60	140	170	220	280	360	430

1-5. Limitation of compressor rotation number by outdoor temperature

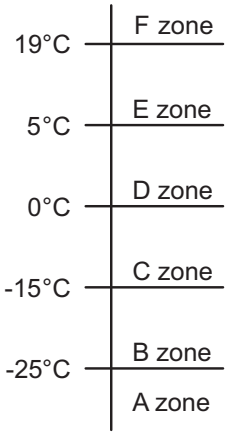
The minimum rotation number of compressor is limited by outdoor temperature as below.

- **Cooling/Dry mode**



Model name	Outdoor temperature zone	Limitation of compressor rotation number
AOYG07KPCA AOYG09KPCA	A zone	42 rps
	B zone	42 rps
	C zone	33 rps
	D zone	28 rps
	E zone	16 rps
	F zone	21 rps
AOYG12KPCA	A zone	38 rps
	B zone	38 rps
	C zone	33 rps
	D zone	28 rps
	E zone	16 rps
	F zone	21 rps

- **Heating mode**



Model name	Outdoor temperature zone	Limitation of compressor rotation number
AOYG07KPCA AOYG09KPCA AOYG12KPCA	A zone	43 rps
	B zone	43 rps
	C zone	30 rps
	D zone	18 rps
	E zone	16 rps
	F zone	16 rps

CONTROL AND FUNCTIONS

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°C	Cooling
Ts + 2°C ≥ Tr ≥ Ts - 2°C	Middle zone
Tr < Ts - 2°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.

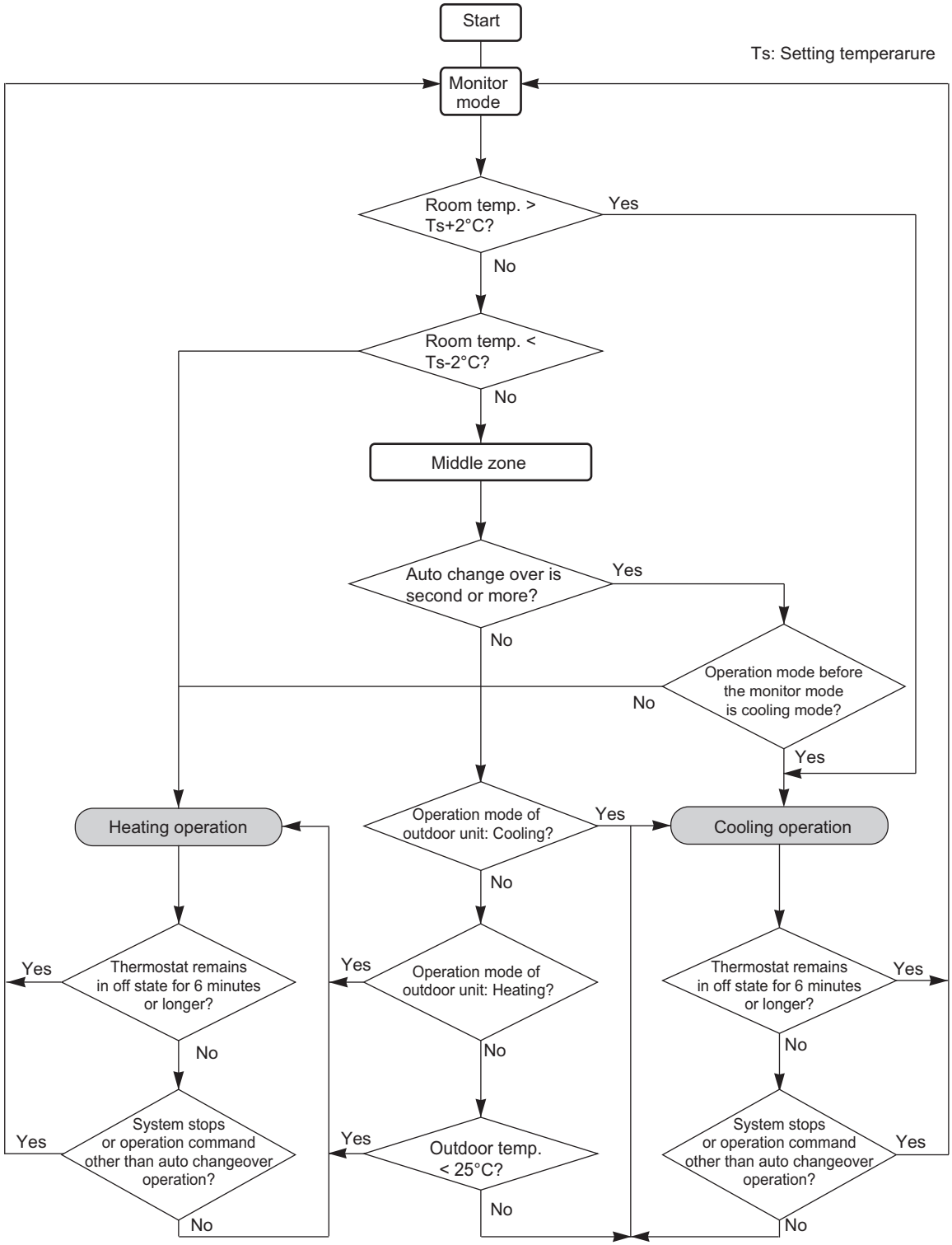
Outdoor temp.	Operation mode
25°C or more	Cooling
Less than 25°C	Heating

- 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.

CONTROL AND FUNCTIONS

Operation flow chart



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)	
		ASYG07KPCE ASYG09KPCE	ASYG12KPCE
Heating	POWERFUL	1,370	1,470
	HIGH	1,300	1,400
	MED+	1,190	1,280
	MED	1,080	1,140
	LOW	930	930
	QUIET	700	700
	Cool air prevention	630	630
	S-LOW	580	580
Cooling/Fan	POWERFUL	1,370	1,470
	HIGH	1,300	1,400
	MED	1,080	1,140
	LOW	850	890
	QUIET	650	630
	Soft quiet	580*1	580*1
	S-LOW	580*2	580*2
Dry		X zone: 650 J zone: 650	X zone: 650 J zone: 650

*1: Fan mode only
*2: Cooling mode only

■ Fan operation

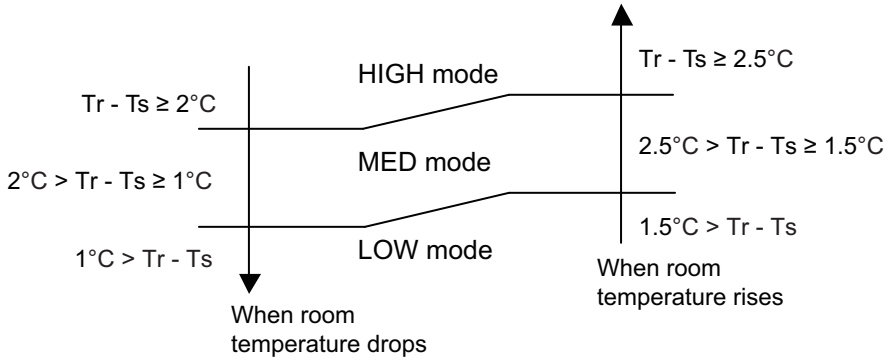
Airflow can be switched in 5 steps such as AUTO, QUIET, LOW, MED, HIGH while indoor unit fan only runs.
When fan mode is set at AUTO, it operates on MED fan speed.

CONTROL AND FUNCTIONS

■ 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)



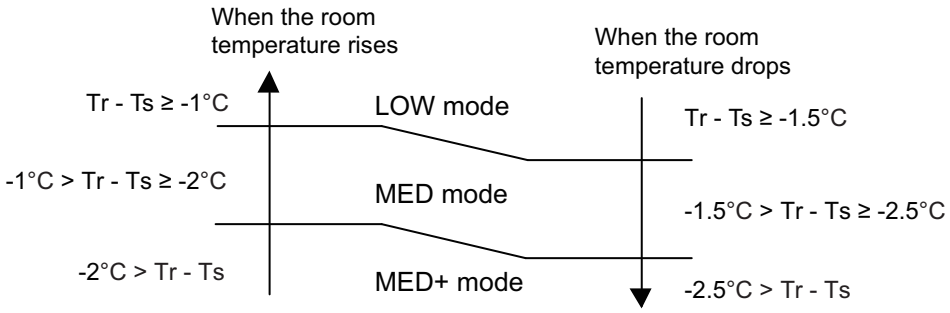
■ Dry operation

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.

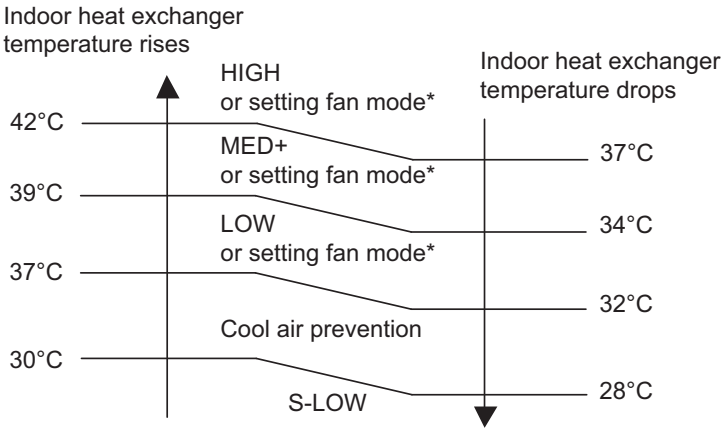
Airflow change over (Heating: Auto)



■ Cool air prevention control (heating mode)

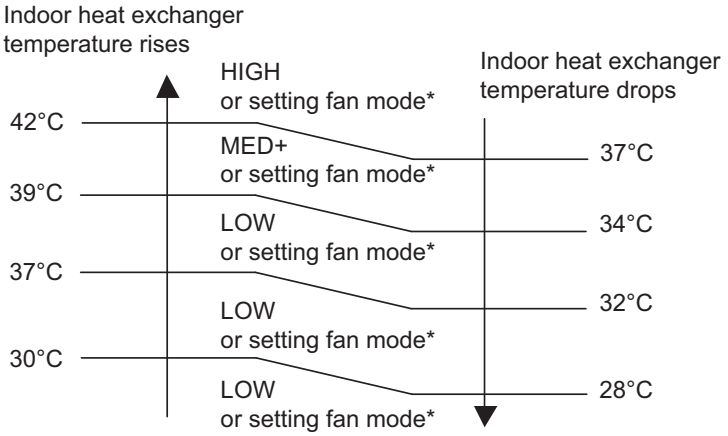
The maximum value of the indoor fan speed is set as shown below, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

- **Normal operation**



*: Lower speed is selected.

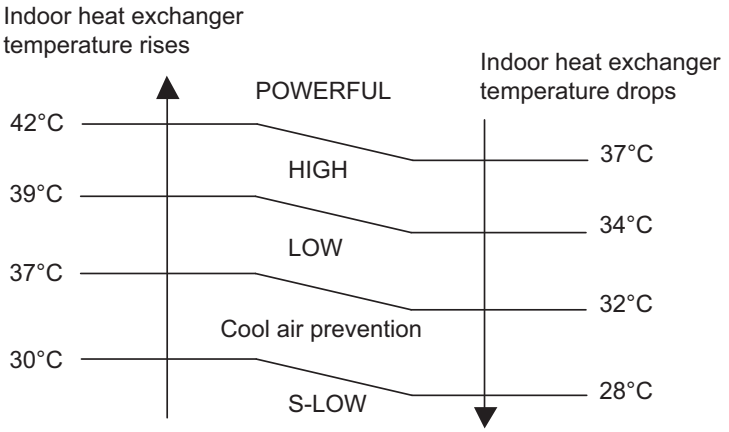
7 minutes later:



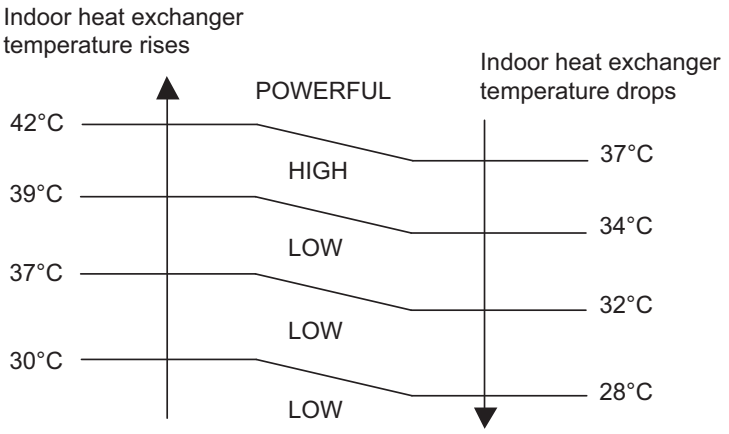
*: Lower speed is selected.

CONTROL AND FUNCTIONS

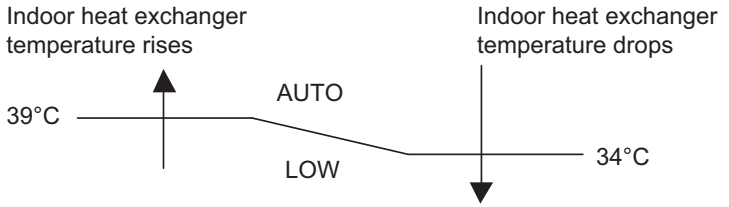
- **Powerful operation**



7 minutes later:

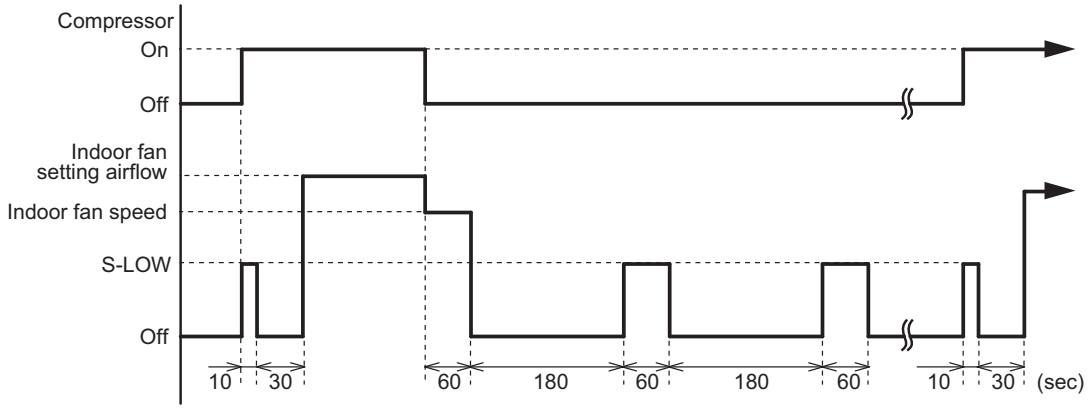


- **10 °C HEAT operation**



■ 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.



3-2. Outdoor fan control

■ Outdoor fan motor

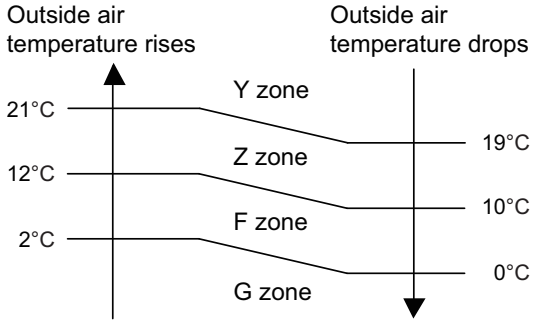
This outdoor unit has a DC fan motor. (Control method is different between AC and DC motors.)

■ Fan speed

● Models: AOYG07KPCA and AOYG09KPCA

Fan speed is defined by outdoor temperature and rotation number of the compressor.

- **Outside air temperature zone selection**



Unit: rpm

Fan step	Cooling	Heating	Dry	Cooling or dry at low outdoor temp.		
	Y zone		Y zone	Z zone	F zone	G zone
S-HIGH2	—	930	—	—	—	—
S-HIGH1	950	930	—	—	—	—
HIGH	950	930	—	—	—	—
10	—	690	—	—	—	—
9	950	690	950	950	950	950
8	780	690	780	780	270	250
7	780	690	780	780	270	250
6	780	690	780	540	270	200
5	780	690	780	360	240	170
4	780	550	780	270	210	170
3	680	510	680	270	190	170
2	610	480	610	270	190	170
1	580	480	580	270	170	170

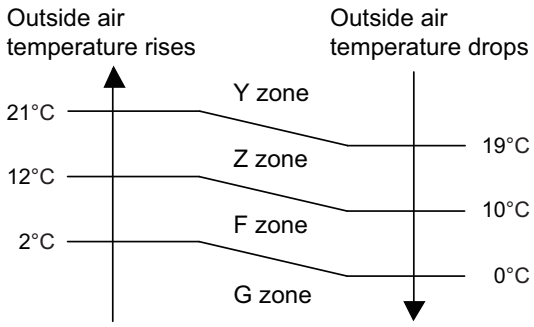
NOTE: After defrost control on the heating mode, the fan speed is kept higher regardless of the rotation number of compressor.
Fan speed after defrost control: 930 rpm

CONTROL AND FUNCTIONS

● Model: AOYG12KPCA

Fan speed is defined by outdoor temperature and rotation number of the compressor.

- **Outside air temperature zone selection**



Unit: rpm

Fan step	Cooling	Heating	Dry	Cooling or dry at low outdoor temp.		
	Y zone		Y zone	Z zone	F zone	G zone
S-HIGH2	—	1,020	—	—	—	—
S-HIGH1	950	1,020	—	—	—	—
HIGH	950	1,020	—	—	—	—
10	—	790	—	—	—	—
9	950	790	950	950	950	950
8	900	790	900	900	350	300
7	900	790	900	900	350	300
6	900	790	900	560	350	300
5	900	730	900	420	320	230
4	800	630	800	350	290	230
3	680	530	680	350	270	230
2	580	470	580	350	270	230
1	540	470	540	350	250	230

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

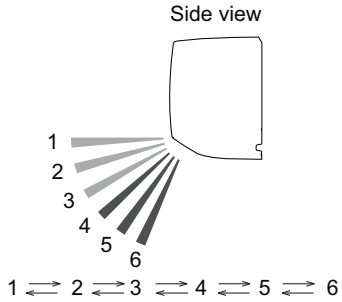
Fan speed after defrost control: 1,020 rpm

CONTROL AND FUNCTIONS

4. Louver control

4-1. Vertical airflow direction louver control

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



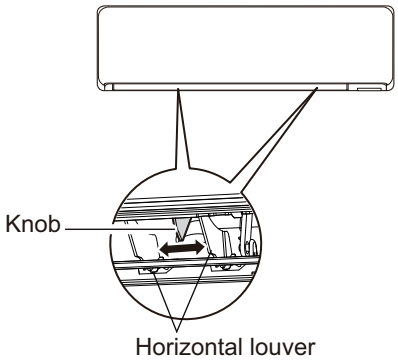
- Remote controller display is not changed.
- Vertical airflow direction is set automatically as shown, in accordance with the type of operation selected.

  Cooling / Dry mode : Horizontal flow 1

  Heating mode : Downward flow 6
- 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. Adjust the horizontal louver

Move the horizontal louvers to adjust airflow direction you prefer.



CONTROL AND FUNCTIONS

4-3. 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 to 3): 1 ↔ 4
    - Heating mode/fan mode (4 to 6): 3 ↔ 6
  – 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.

- To select horizontal airflow swing operation
  No function

CONTROL AND FUNCTIONS

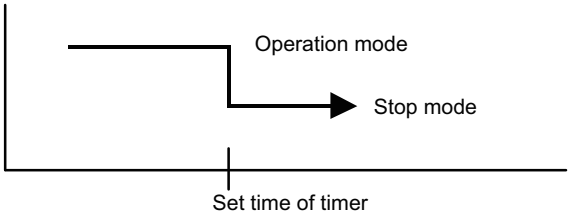
5. Timer operation control

5-1. Wireless remote control

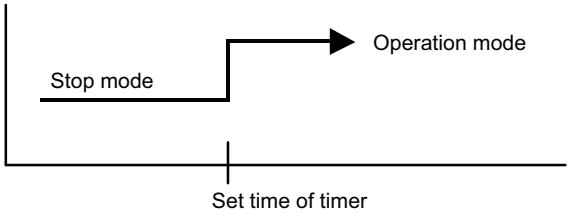
On/Off timer	Program timer	Sleep timer	Weekly timer
○	○	○	—

■ On/Off timer

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

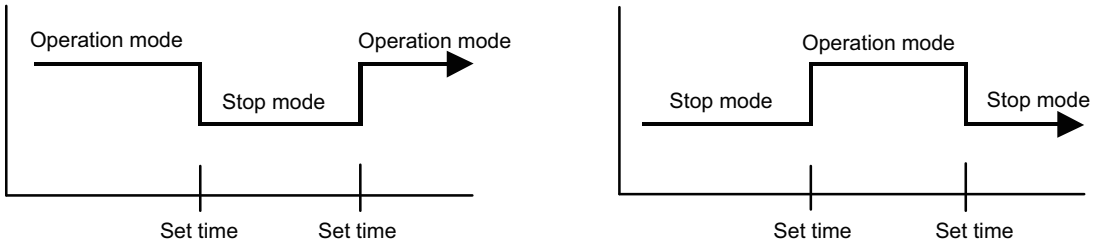


- On timer: When the clock reaches the set timer, the air conditioner will be turned on.



■ Program timer

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



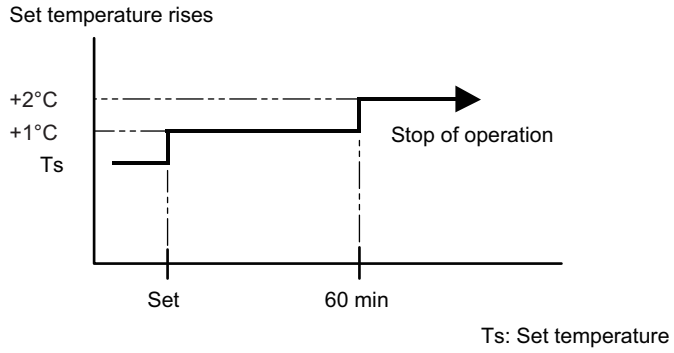
- Operation will start from the timer setting (either off timer and on timer) whichever is closest to the clock current timer setting. The order of operations is indicated by the allow in the remote controller screen.
- Sleep timer operation cannot be combined with on timer operation.

CONTROL AND FUNCTIONS

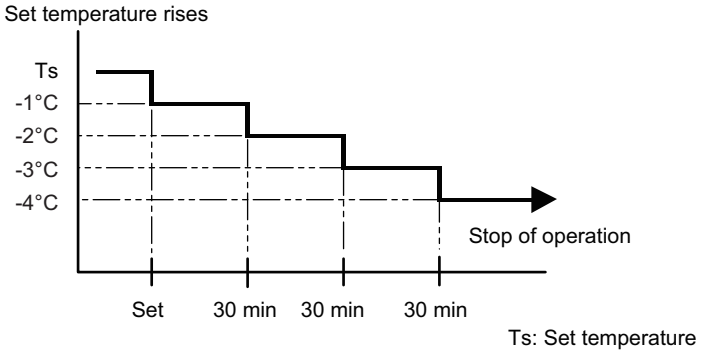
■ Sleep timer

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.



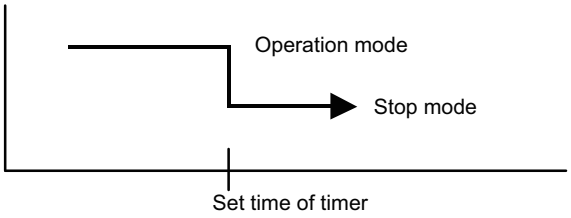
CONTROL AND FUNCTIONS

5-2. Wired remote control

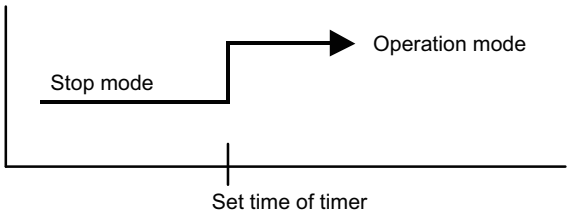
On/Off timer	Program timer	Sleep timer	Weekly timer	Temperature set back timer
○	○	○	○	○

■ On/Off timer

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



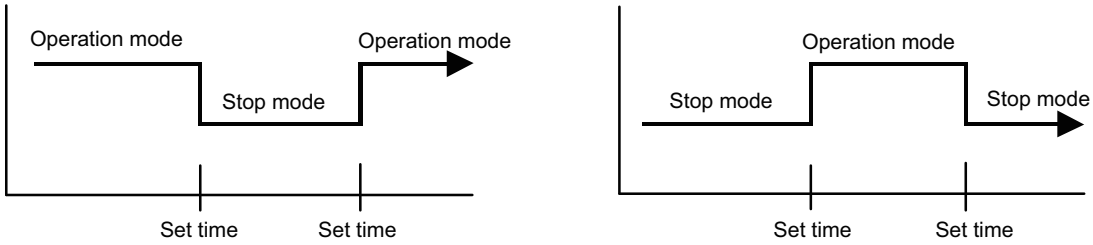
- On timer: When the clock reaches the set timer, the air conditioner will be turned on.



CONTROL AND FUNCTIONS

■ Program timer

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



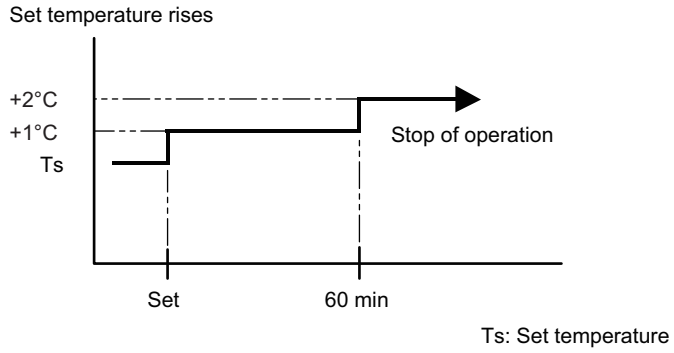
- Operation will start from the timer setting (either off timer and on timer) whichever is closest to the clock current timer setting. The order of operations is indicated by the allow in the remote controller screen.
- Sleep timer operation cannot be combined with on timer operation.

CONTROL AND FUNCTIONS

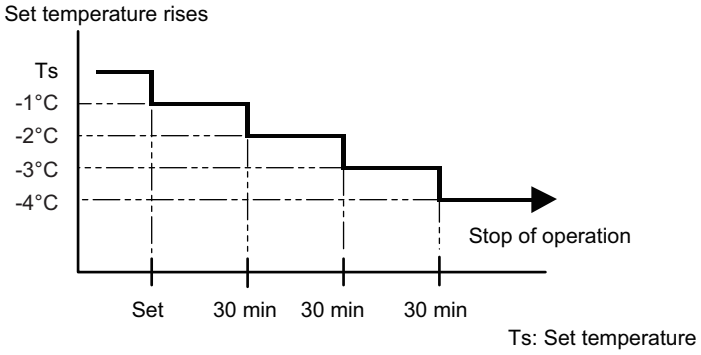
■ Sleep timer

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.



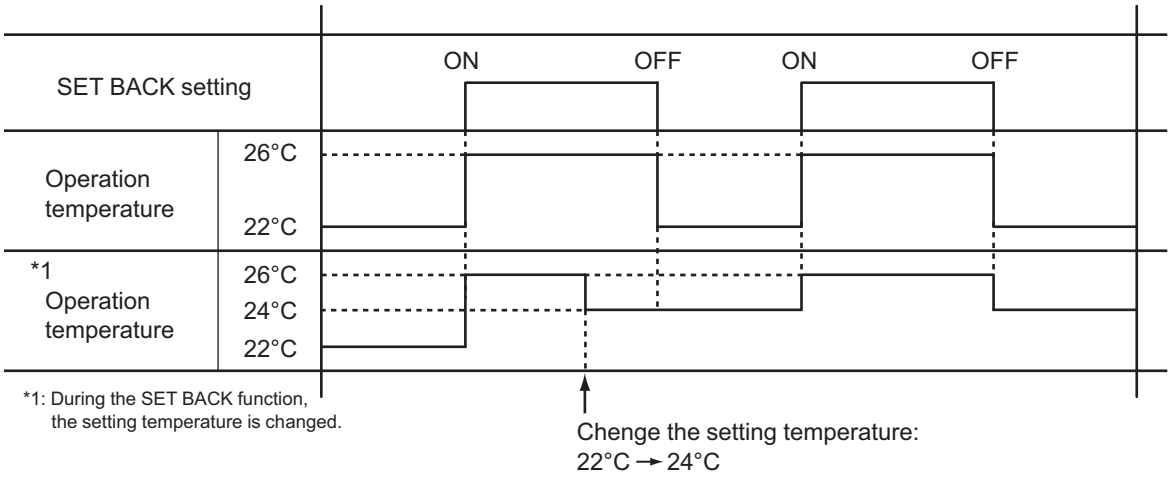
■ Weekly timer

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)



CONTROL AND FUNCTIONS

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	Tn ≤ -9°C and Tn-Ta ≥ 5 deg	Tn ≤ -5°C

– **2nd time and after**

Compressor integrating operation time	Less than 25 min.	More than 25 min.
Condition	Does not operate	Tn-Tn10 < -5 deg (Tn ≤ -6°C) Tn-Tnb < -2 deg (Tn ≤ -6°C) Tn ≤ -17°C (Ta ≥ -10 °C) Tn ≤ Ta-7°C or Tn ≤ -20°C (Ta < -10 °C)

– **Integrating defrost (Constant monitoring)**

Compressor integrating operation time	More than 240 min. (For long continuous operation)	More than 213 min. (For long continuous operation	Less than 10 min.* (For intermittent operation)
Condition	Tn ≤ -3°C	Tn ≤ -5°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)	16°C or more
Compressor operation time	15 minutes

CONTROL AND FUNCTIONS

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)	16°C or more
Compressor operation time	15 minutes

CONTROL AND FUNCTIONS

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
Remote control setting
WLAN LED setting

CONTROL AND FUNCTIONS

7-2. MANUAL AUTO operation

When the wireless remote controller is lost or battery power dissipated, this function will work without the remote controller.

When MANUAL AUTO button is pressed more than 3 seconds and less than 10 seconds, MANUAL AUTO operation starts as shown in the table below. To stop operation, press the MANUAL AUTO button for 3 seconds.

Operation mode	Auto changeover
Fan mode	AUTO
Timer mode	Continuous (no timer setting available)
Setting temperature	24°C
Vertical airflow direction louver setting	Standard
SWING	Off
ECONOMY	Off
Human sensor	Off

7-3. Forced cooling operation

The outdoor unit may not operate depending on the room temperature.

When FORCED COOLING OPERATION button is pressed more than 10 seconds, forced cooling operation starts as shown in the table below.

Operation mode	Cooling
Fan mode	HIGH
Timer mode	Continuous (no timer setting available)
Setting temperature	24°C
Vertical airflow direction louver setting	Standard
Horizontal airflow direction louver setting	According to memory position
SWING	Off
ECONOMY	Off
Human sensor	Off

- During the forced cooling operation, it operates regardless of room temperature sensor.
- The operation indicator lamp and the timer indicator lamp blink simultaneously during the forced cooling operation.
  They blink for 1 second ON and 1 second OFF on both the operation indicator lamp and the timer indicator lamp (same as test operation).

By performing one of the following action, test operation will be canceled:

- Pressing the remote controller START/STOP button
- Pressing FORCED COOLING OPERATION button for 3 seconds
- 60 minutes passed after starting forced cooling operation

NOTE: When HEAT operation is selected on the remote controller during forced cooling operation, heating test run will begin in about 3 minutes.

7-4. 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

7-5. 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.

Rotation number of compressor		Maximum
Fan mode		POWERFUL
Vertical airflow direction louver setting	Cooling	3
	Dry	
	Heating	6

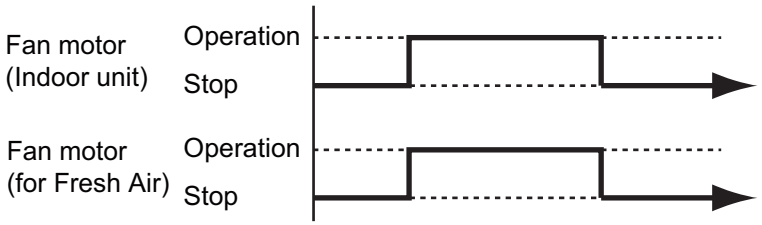
Release condition:

- 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.

CONTROL AND FUNCTIONS

7-6. Fresh air control

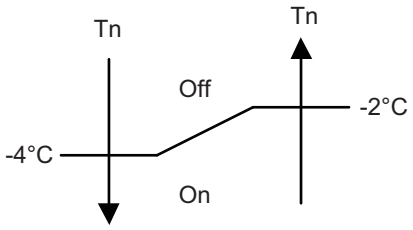
The fan motor for Fresh Air is operated in synchronization with the indoor fan operation as below.



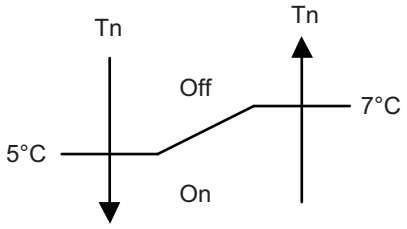
7-7. Compressor preheating

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

- **Triggering condition**
  - 30 minutes after compressor stopped.
  - Outdoor unit heat exchanger temperature (Tn)



When the jumper wire (JM2) is disconnected:



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 52 and 480 pulses
Heating mode	

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. 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	10
Retry set number	10

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

CONTROL AND FUNCTIONS

7-10. 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 140 seconds passes and the compressor is started.

CONTROL AND FUNCTIONS

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 rotation number of compressor 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 rotation number 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
Rotation number of compressor	-20 rps/120 seconds
Release condition	101°C
Compressor protection temperature	110°C

CONTROL AND FUNCTIONS

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. ≥ 10°C*1 Outdoor temp. ≥ 12°C*2	7°C
	Outdoor temp. < 10°C*1 Outdoor temp. < 12°C*2	13°C

*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.

■ Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	50°C ≤ Ta	4.0 A	3.5 A
	46°C ≤ Ta < 50°C	4.0 A	3.5 A
	40°C ≤ Ta < 46°C	5.0 A	4.5 A
	12°C ≤ Ta < 40°C	6.0 A	5.5 A
	2°C ≤ Ta < 12°C	6.0 A	5.5 A
	Ta < 2°C	6.0 A	5.5 A
Heating	17°C ≤ Ta	5.5 A	5.0 A
	12°C ≤ Ta < 17°C	7.0 A	6.5 A
	5°C ≤ Ta < 12°C	7.5 A	7.0 A
	Ta < 5°C	8.5 A	8.0 A

CONTROL AND FUNCTIONS

8-4. Cooling pressure over-rise protection

When the outdoor unit heat exchanger temperature reaches trigger condition below, the compressor is stopped and trouble display is performed.

Trigger condition	65°C

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

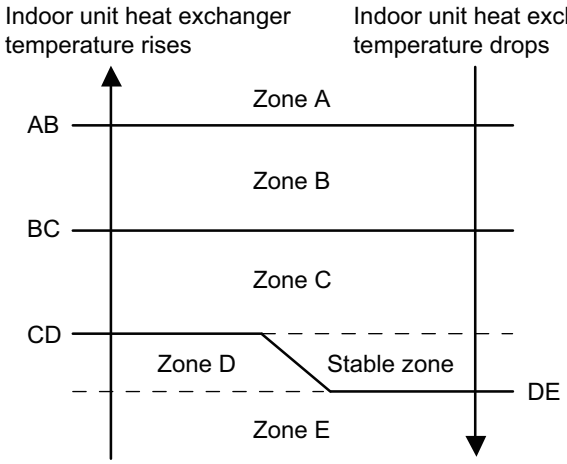
When the outdoor temperature sensor detects lower than the trigger condition below, the compressor is stopped.

Operation mode	Cooling/Dry
Trigger condition	-15°C
Release condition	-10°C

8-8. High temperature and high pressure release control

The compressor is controlled as follows.

■ Models: AOYG07KPCA, AOYG09KPCA, and AOYG12KPCA



AB: 63°C
BC: 55°C
CD: 53°C
DE: 50°C

Zone	Operation	
Zone A	Compressor is stopped.	
Zone B	The rotation number of compressor is decreased.	-25 rps/120 sec.
Zone C		-3 rps/60 sec.
Zone D	The protection is released and the operation is returned to normal mode.	
Zone E		

CONTROL AND FUNCTIONS

CONTROL AND FUNCTIONS

5. FILED WORKING

CONTENTS

5. FILED WORKING

1. Function settings 05-1

1-1. Function settings by using remote controller 05-1

1-2. Custom code setting for wireless remote controller 05-6

1. Function settings

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 wireless remote controller

The function number and the associated setting value are displayed on the LCD of the remote controller. Follow the instructions written in the local setup procedure supplied with the remote controller, and select appropriate setting according to the installation environment.

Before connecting the power supply of the indoor unit, reconfirm following items:

- Piping air tight test and vacuuming have been performed firmly.
- There is no wiring mistake.

Then, connect the power supply of the indoor unit.

FIELD WORKING

Entering function setting mode:

While pressing the FAN SPEED button and TEMP./SELECT (∧) button simultaneously, press the RESET button to enter the function setting mode.

STEP 1: Setting the remote controller custom code

Use the following steps to select the custom code of the remote controller. (The signal is correctly sent and received only when the custom codes of the air conditioner and the remote controller match.)

The custom codes that are set through this process are applicable only to the signal in the function setting.

For details on how to set the custom codes through the normal process, refer to "Custom code setting for wireless remote controller" on page 05-6.

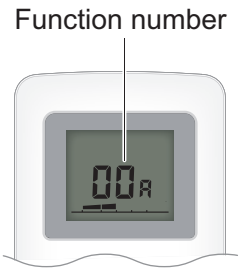
1. Press the TEMP./SELECT (∧) (∨) buttons to change the custom code between A →b →c →d. Match the code on the display to the air conditioner custom code. (Initially set to A.) If the custom code does not need to be selected, press the MODE button, and proceed to **STEP 2**.
2. Press the MODE button to accept the custom code, and proceed to **STEP 2**.

NOTES:

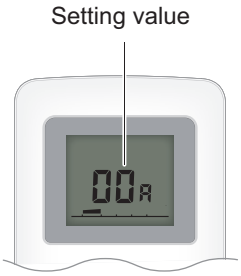
- The air conditioner custom code is set to A prior to shipment.
- The remote controller resets to custom code A when the batteries on the remote controller are replaced. If you use a custom code other than code A, reset the custom code after replacing the batteries.
- If you do not know the air conditioner custom code setting, try each of the custom codes (A →b →c →d) until you find the code that operates the air conditioner.

STEP 2: Selecting the function number and setting value

1. Press the TEMP./SELECT (∧) (∨) buttons to select the function number. To switch between the left and right digits, press the MODE button.
2. Press the FAN SPEED button to proceed the setting value. To return the function number selection, press the FAN SPEED button again.



3. Press the TEMP./SELECT (∧) (∨) buttons to select the setting value. To switch between the left and right digits, press the MODE button.
4. Press the TIMER button, and ⏻/I (START/STOP) button, in the order listed to confirm the settings.
5. Press the RESET button to cancel the function setting mode.
6. After completing the function setting, be sure to disconnect the power supply and then reconnect it.



⚠ CAUTION

After disconnecting the power supply, wait 30 seconds or more before reconnecting it. The function setting will not become active unless the power supply is disconnected and then reconnected.

FIELD WORKING

■ 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)	30/31	Room temperature control for indoor unit sensor
3)	40	Auto restart
4)	44	Remote controller custom code
5)	49	Indoor unit fan control for energy saving for cooling

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 (400 hours)	
	01	Long interval (1,000 hours)	
	02	Short interval (200 hours)	
	03	No indication	♦

FIELD WORKING

2) 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		

3) 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.

4) 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	

5) 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	♦

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.

FIELD WORKING

1-2. Custom code setting for wireless remote controller

■ Custom code setting for wireless remote controller

To interconnect the air conditioner and the wireless remote controller, assignment of the custom code for the wireless remote controller is required.

NOTE: Air conditioner cannot receive a signal if the air conditioner has not been set for the custom code.

When 2 or more air conditioners are installed in a room, and the remote controller is operating an air conditioner other than the one you wish to set, change the custom code of the remote controller to operate only the air conditioner you wish to set. (4 selections possible.)

Confirm the setting of the remote controller custom code and the function setting. If these do not match, the remote controller cannot be used to operate for the air conditioner.

1. Press the ⏻/I (START/STOP) button until the indicators on the remote controller turn off.
2. Press the MODE button for at least 5 seconds to display the current custom code. (Initially set to A.)
3. Press the TEMP./SELECT (∧) (∨) buttons to change the custom code between A →b →c →d. Match the code on the display to the air conditioner custom code. (Initially set to A.)
4. Press the MODE button again to return to the original display. The custom code will be changed.

NOTES:

- If no button is pressed within 30 seconds after the custom code is displayed, the system returns to the original display. In this case, start again from step 1.
- The air conditioner custom code is set to A prior to shipment. To change the custom code, contact your retailer.
- If you do not know the assigned code for the air conditioner, try each of the custom code (A →b →c →d) until you find the code which operates the air conditioner.

FIELD WORKING