FUJITSU

Refrigerant R410A INVERTER

AIR CONDITIONER

Wall mounted type

SERVICE MANUAL

INDOOR

ASUG09LZAS
ASUG12LZAS
ASUG15LZAS

OUTDOOR

AOUG09LZAH1
AOUG12LZAH1
AOUG15LZAH1

FUJITSU GENERAL LIMITED

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Refrigerant R410A
INVERTER

1. GENERAL INFORMATION

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GENERAL INFORMATION

1. Specifications

1-1. Indoor unit

Type					Wall mounted		
					Inverter heat pump		
Model name					ASUG09LZAS	ASUG12LZAS	ASUG15LZAS
Power supply					208/230 V ~60 Hz		
Power supply intake					Outdoor unit		
Available voltage range					187—253 V		
Capacity		Cooling	Rated	kW	2.64	3.52	4.25
				Btu/h	9,000	12,000	14,500
			Min.—Max.	kW	0.91—3.52	0.91—3.99	0.91—5.39
				Btu/h	3,100—12,000	3,100—13,600	3,100—18,400
		Heating	Rated	kW	3.52	4.69	5.28
				Btu/h	12,000	16,000	18,000
			Min.—Max.	kW	0.91—6.45	0.91—6.48	0.91—7.00
				Btu/h	3,100—22,000	3,100—22,100	3,100—23,900
		Heating (17°F)*1	Rated	kW	2.17	2.93	3.28
				Btu/h	7,400	10,000	11,200
			Max.	kW	4.69	5.13	6.30
				Btu/h	16,000	17,500	21,500
		Heating (5°F)*2	Rated	kW	4.51	4.87	5.13
				Btu/h	15,400	16,600	17,500
			Max.	kW	4.51	4.87	6.15
				Btu/h	15,400	16,600	21,000
Input power		Cooling	Rated	kW	0.50	0.79	1.04
			Min.—Max.		0.11—0.85	0.11—0.99	0.15—1.56
		Heating	Rated		0.66	1.01	1.15
			Min.—Max.		0.17—1.93	0.17—1.94	0.15—2.19
		Heating (17°F)*1	Rated		0.62	0.91	1.04
			Max.		2.21		2.74
		Heating (5°F)*2	Rated		2.25		2.19
			Max.		2.25		2.90
Current		Cooling	Rated	A	2.5	3.8	4.8
		Heating			3.3	4.7	5.2
EER2		Cooling		kW/kW	5.28	4.46	4.09
				Btu/hW	18.0	15.2	13.9
COP2		Heating		kW/kW	5.34	4.64	4.60
				Btu/hW	18.2	15.8	15.7
SEER2		Cooling		Btu/hW	33.1	29.4	25.3
HSPF2		Heating		Btu/hW	13.3	12.7	
Power factor		Cooling		%	87	90	94
		Heating			87	93	96
Moisture removal				pints/h (L/h)	2.5 (1.2)	2.7 (1.3)	4.0 (1.9)
Maximum operating current*3		Cooling		A	9.4		9.9
		Heating			11.9		14.4
Fan	Airflow rate	Cooling	HIGH	CFM (m^3/h)	542 (920)		583 (990)
			MED		406 (690)		459 (780)
			LOW		312 (530)		312 (530)
			QUIET		206 (350)		241 (410)
		Heating	HIGH		542 (920)		600 (1,020)
			MED		406 (690)		459 (780)
			LOW		312 (530)		
			QUIET		206 (350)		241 (410)
	Type × Qty				Crossflow fan × 1		
	Motor output			W	59		
Sound pressure level*4		Cooling	HIGH	dB (A)	43		45
			MED		37		40
			LOW		31		32
			QUIET		23		26
		Heating	HIGH		43		45
			MED		36		39
			LOW		31		32
			QUIET		23		26
Heat exchanger type		Dimensions (H × W × D)		in (mm)	Main 1: 8-1/4 × 31-7/16 × 1-1/16 (210 × 798 × 26.6) Main 2: 5-5/16 × 31-7/16 × 13/16 (135 × 798 × 20.0) Sub 1: 3-5/16 × 31-7/16 × 1/2 (84 × 798 × 13.3) Sub 2: 3-5/16 × 31-7/16 × 1/2 (84 × 798 × 13.3)		
		Fin pitch		FPI	Man 1: 21 Main 2: 23 Sub 1: 18 Sub 2: 18		
		Rows × Stages			Main 1: 2 × 10 Main 2: 2 × 8 Sub 1: 1 × 4 Sub 2: 1 × 4		
		Pipe type			Copper		
		Fin type			Aluminum		
Enclosure		Material			Polystyrene		
		Color			White Approximate color of Munsell N 9.25/		
Dimensions (H × W × D)		Net		in (mm)	11 × 38-9/16 × 9-7/16 (280 × 980 × 240)		
		Gross			12-11/16 × 42-7/16 × 13-5/8 (322 × 1,078 × 346)		
Weight		Net		lb (kg)	29 (13)		
		Gross			37 (17)		
Connection pipe		Size	Liquid	in (mm)	Ø1/4 (Ø6.35)		
			Gas		Ø3/8 (Ø9.52)		Ø1/2 (Ø12.70)
		Method			Flare		

GENERAL INFORMATION

Type			Wall mounted		
			Inverter heat pump		
Model name			ASUG09LZAS	ASUG12LZAS	ASUG15LZAS
Drain hose	Material		PP+LLDPE		
	Tip diameter	in (mm)	Ø17/32 (Ø13.8) (I.D.), Ø5/8 to 21/32 (Ø15.8 to 16.7) (O.D.)		
Operation range	Cooling	°F (°C)	64 to 90 (18 to 32)		
		%RH	80 or less		
	Heating	°F (°C)	60 to 86 (16 to 30)		
Remote controller type			Wireless (Wired, Mobile app*5 [FGLair™] [option])		

NOTES:

- Specifications are based on the following conditions:
  - Cooling: Indoor temperature of 80°FDB (26.67°CDB)/67°FWB (19.44°CWB), and outdoor temperature of 95°FDB (35°CDB)/75°FWB (23.9°CWB).
  - Heating: Indoor temperature of 70°FDB (21.11°CDB)/59°FWB (15.56°CWB), and outdoor temperature of 47°FDB (8.33°CDB)/43°FWB (6.11°CWB).
  - *1: Heating (17°F): Indoor temperature of 70°FDB (21.11°CDB)/60°FWB (15.56°CWB), and outdoor temperature of 17°FDB (-8.33°CDB)/15°FWB (-9.44°CWB).
  - *2: Heating (5°F): Indoor temperature of 70°FDB (21.11°CDB)/60°FWB (15.56°CWB), and outdoor temperature of 5°FDB (-15.0°CDB)/4°FWB (-15.56°CWB).
  - Test conditions are based on AHRI 210/240 2023.
  - Pipe length: 25 ft (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)
- Protective function might work when using it outside the operation range.
- *3: Maximum current is maximum value when operated within the operation range.
- *4: 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.
- *5: Available on Google Play™ store or on App Store®. Optional WLAN Adapter is also required. For details, refer to the setting manual.

M condition						
Model name				ASUG09LZAS	ASUG12LZAS	ASUG15LZAS
Capacity	Cooling	Rated	kW	2.64	3.52	4.25
			Btu/h	9,000	12,000	14,500
		Min.—Max.	kW	0.91—3.52	0.91—3.99	0.91—5.39
			Btu/h	3,100—12,000	3,100—13,600	3,100—18,400
	Heating	Rated	kW	3.52	4.69	5.28
			Btu/h	12,000	16,000	18,000
		Min.—Max.	kW	0.91—6.45	0.91—6.48	0.91—7.00
			Btu/h	3,100—22,000	3,100—22,100	3,100—23,900
	Heating (17°F)*	Rated	kW	2.17	2.93	3.28
			Btu/h	7,400	10,000	11,200
		Max.	kW	4.69	5.13	6.30
			Btu/h	16,000	17,500	21,500
Input power	Cooling	Rated	kW	0.50	0.79	1.04
		Min.—Max.		0.11—0.85	0.11—0.99	0.15—1.56
	Heating	Rated		0.66	1.01	1.15
		Min.—Max.		0.17—1.93	0.17—1.94	0.15—2.19
	Heating (17°F)*	Rated		0.62	0.91	1.04
		Max.		2.21		2.74
Current	Cooling	Rated	A	2.5	3.8	4.8
	Heating			3.3	4.7	5.2
EER	Cooling		kW/kW	5.28	4.46	4.09
			Btu/hW	18.0	15.2	13.9
COP	Heating		kW/kW	5.34	4.64	4.60
			Btu/hW	18.2	15.8	15.7
SEER	Cooling		Btu/hW	33.1	29.4	25.3
HSPF	Heating		Btu/hW	14.0	13.8	13.3
Power factor	Cooling		%	87	90	94
	Heating			87	93	96

NOTES:

Specifications are based on the following conditions:

- Cooling: Indoor temperature of 80°FDB (26.67°CDB)/67°FWB (19.44°CWB), and outdoor temperature of 95°FDB (35°CDB)/75°FWB (23.9°CWB).
- Heating: Indoor temperature of 70°FDB (21.11°CDB)/59°FWB (15.56°CWB), and outdoor temperature of 47°FDB (8.33°CDB)/43°FWB (6.11°CWB).
- *: Heating (17°F): Indoor temperature of 70°FDB (21.11°CDB)/60°FWB (15.56°CWB), and outdoor temperature of 17°FDB (-8.33°CDB)/15°FWB (-9.44°CWB).
- Test conditions are based on AHRI 210/240 2017.
- Pipe length: 25 ft (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)

GENERAL INFORMATION

1-2. Outdoor unit

Type				Inverter heat pump		
Model name				**AOUG09LZAH1**	**AOUG12LZAH1**	**AOUG15LZAH1**
Power supply				208/230 V~ 60 Hz		
Power supply intake				Outdoor unit		
Available voltage range				187—253 V		
Starting current			A	3.3	4.7	5.2
Fan	Airflow rate	Cooling	CFM (m^3/h)	1,089 (1,850)	1,171 (1,990)	1,218 (2,070)
		Heating		1,089 (1,850)	1,089 (1,850)	1,348 (2,290)
	Type × Q'ty			Propeller fan × 1		
	Motor output		W	49		
Sound pressure level *		Cooling	dB (A)	46	47	49
		Heating		47	47	50
Heat exchanger type		Dimensions (H × W × D)	in (mm)	Main 1: 23-1/8 × 34-11/16 × 11/16 (588 × 881 × 18.19) Main 2: 23-1/8 × 33-1/2 × 11/16 (588 × 851 × 18.19)		
		Fin pitch	FPI	20		
		Rows × Stages		Main 1: 1 × 28 Main 2: 1 × 28		
		Pipe type		Copper		
		Fin type	Type (Material)	Aluminum		
			Surface treatment	PC fin		
Compressor	Type			DC rotary		
	Motor output		W	900		1,030
Refrigerant		Type		R410A		
		Charge	lb oz	2 lb 14 oz		2 lb 16 oz
			g	1,300		1,350
Refrigerant oil		Type		RB68		
		Amount	in^3 (cm^3)	24.4 (400)		
Enclosure		Material		Steel sheet		
		Color		Beige Approximate color of Munsell 10YR 7.5/1.0		
Dimensions (H × W × D)	Net		in (mm)	24-7/8 × 31-7/16 × 11-7/16 (632 × 799 × 290)		
	Gross			27-1/4 × 37 × 14-3/4 (692 × 940 × 375)		
Weight	Net		lb (kg)	86 (39)		88 (40)
	Gross			95 (43)		
Connection pipe	Size	Liquid	in (mm)	Ø1/4 (Ø6.35)		
		Gas		Ø3/8 (Ø9.52)		Ø1/2 (Ø12.70)
	Method			Flare		
	Pre-charge length		ft (m)	49 (15)		
	Max. length			66 (20)		
	Max. height difference			49 (15)		
Operation range		Cooling	°F (°C)	14 to 115 (-10 to 46)		
		Heating		-15 to 75 (-26 to 24)		

NOTES:

- Specifications are based on the following conditions:
  - Cooling: Indoor temperature of 80°FDB (26.67°CDB)/67°FWB (19.44°CWB), and outdoor temperature of 95°FDB (35°CDB) /75°FWB (23.9°CWB).
  - Heating: Indoor temperature of 70°FDB (21.11°CDB)/59°FWB (15°CWB), and outdoor temperature of 47°FDB (8.33°CDB)/43°FWB (6.11°CWB).
  - Pipe length: 24 ft 6 in (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)
- Protective function might work when using it outside the operation range.
- *: 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.

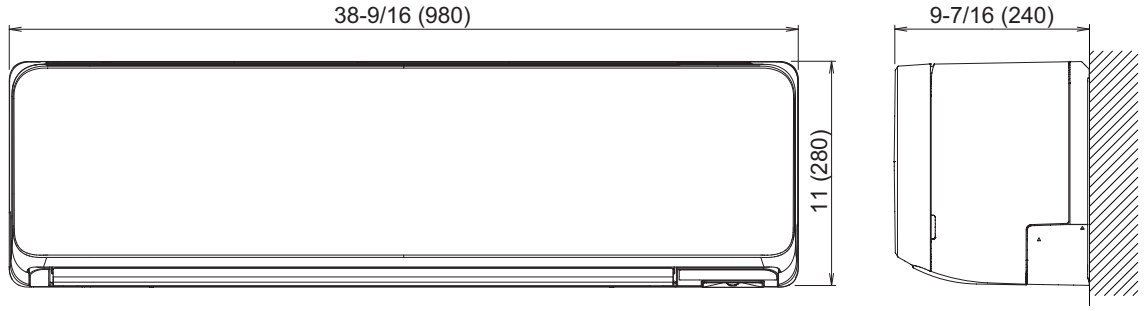
GENERAL INFORMATION

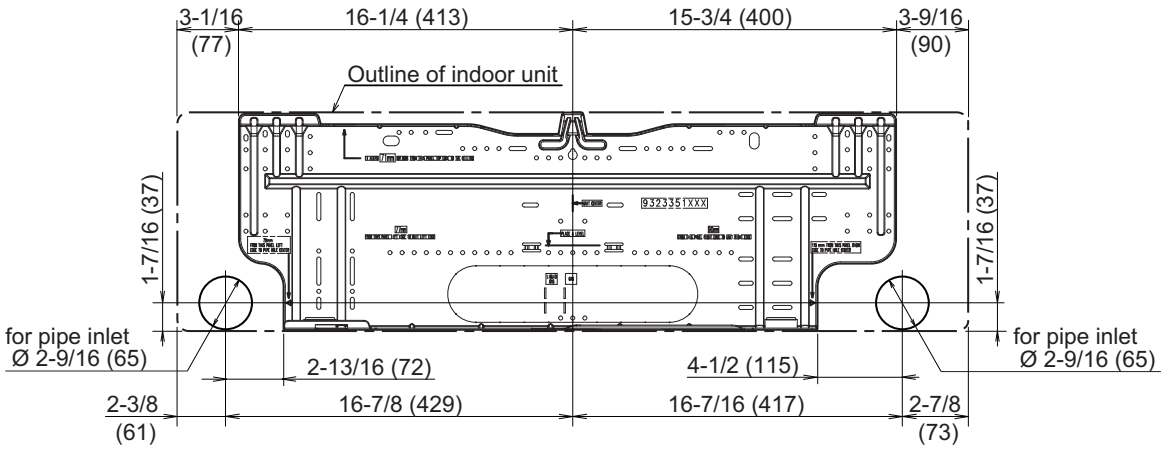
2. Dimensions

2-1. Indoor unit

■ Models: ASUG09LZAS, ASUG12LZAS, and ASUG15LZAS

Unit: in (mm)



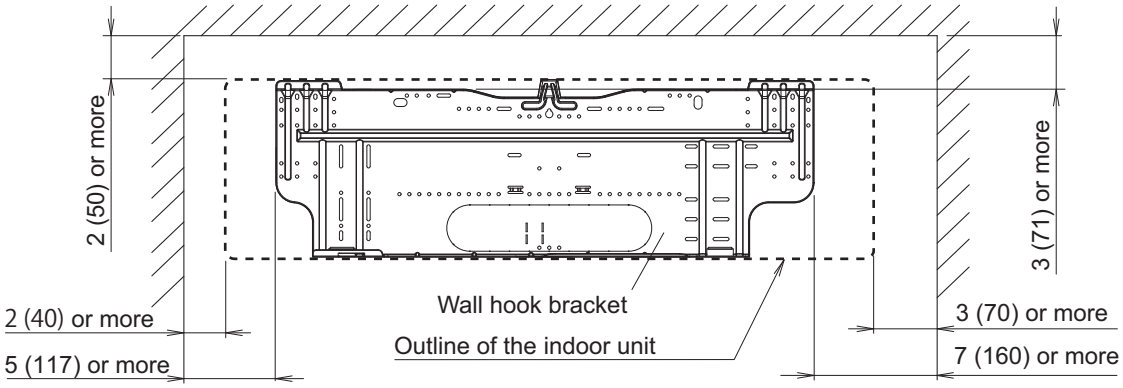


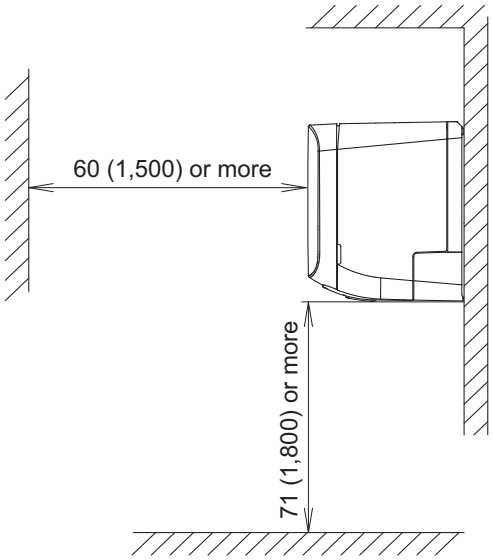
GENERAL INFORMATION

● Installation space requirement

Provide sufficient installation space for product safety.

Unit: in (mm)



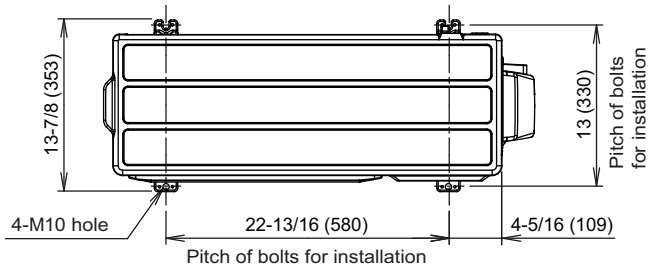


GENERAL INFORMATION

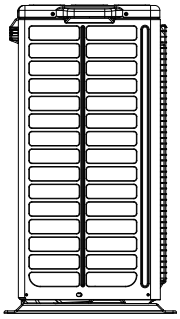
2-2. Outdoor unit

■ Models: AOUG09LZAH1, AOUG12LZAH1, and AOUG15LZAH1

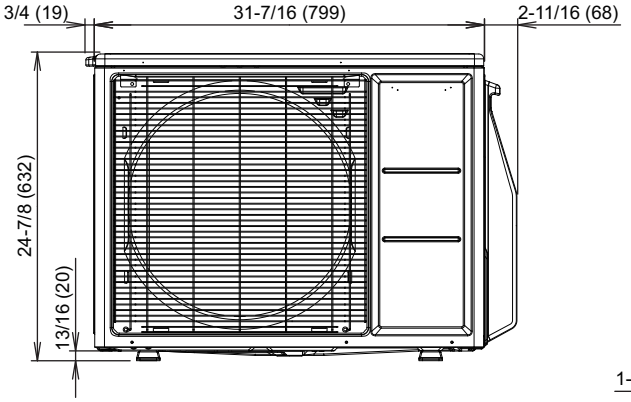
Unit: in (mm)



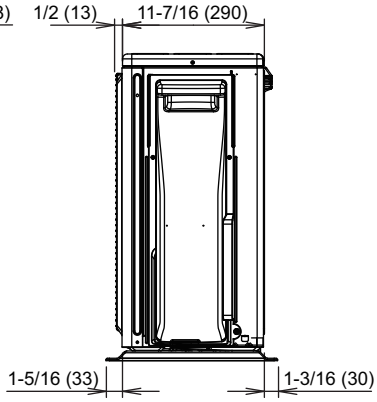
Top view



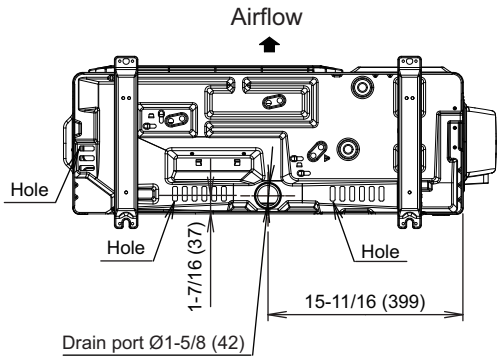
Side view



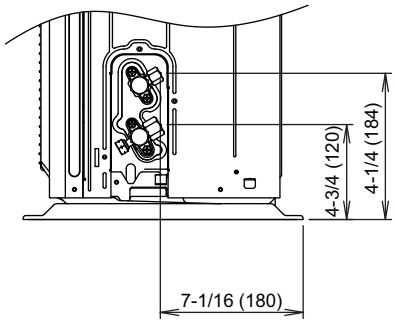
Front view



Side view



Bottom view



Side view (Valve part)

Refrigerant R410A
INVERTER

2. TECHNICAL DATA AND PARTS LIST

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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
  - Work in confined spaces shall be avoided.
  - The area around the workspace shall be sectioned off.
  - 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.

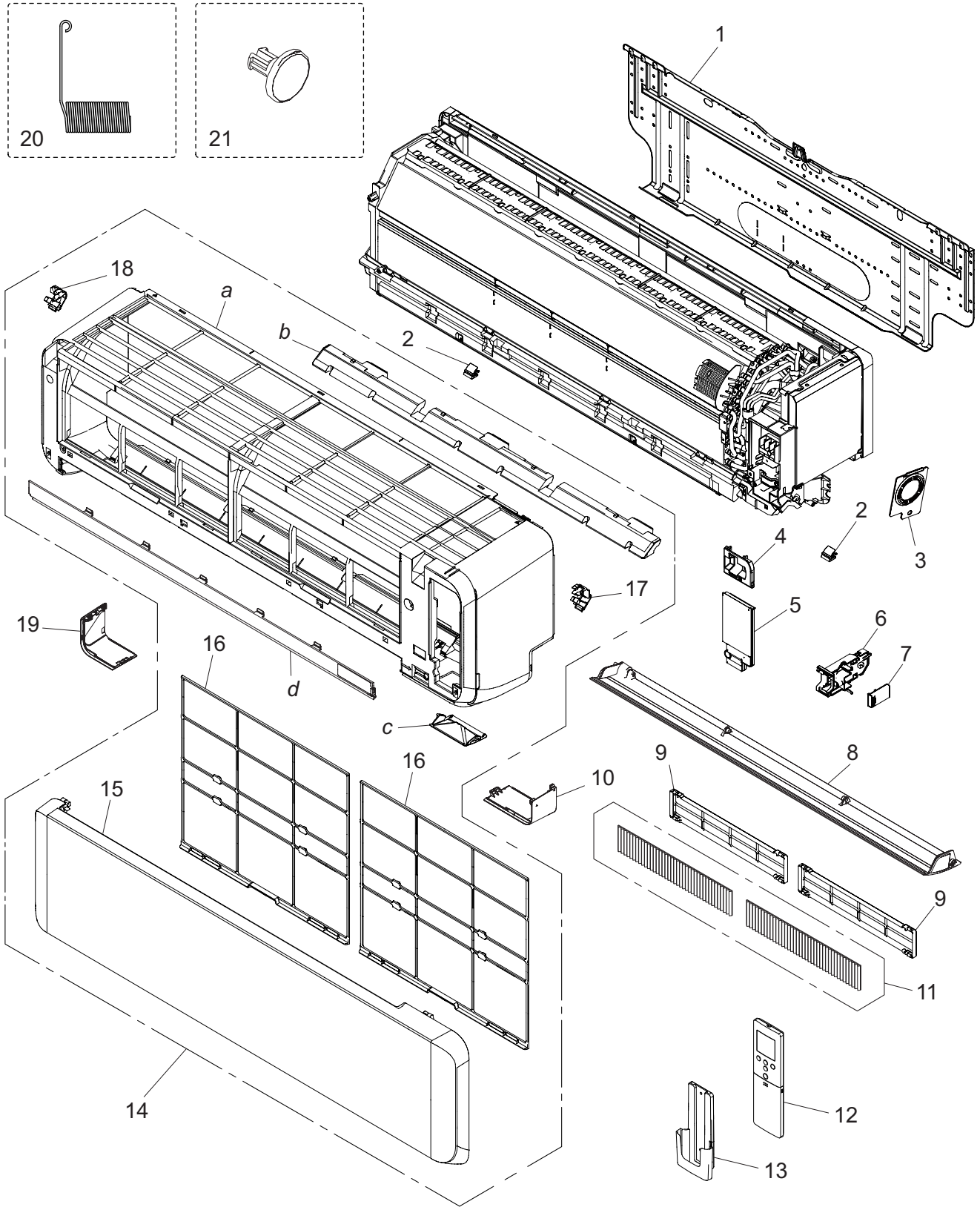
- Service parts information and design are subject to change without notice for product improvement.
- For the latest information of the service parts, refer to our Service Portal.
  https://fujitsu-general.force.com/portal/
- Precise figure of the service parts listed in this manual may differ from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

TECHNICAL DATA AND PARTS LIST

2. Indoor unit parts list

2-1. Models: ASUG09LZAS, ASUG12LZAS, and ASUG15LZAS

■ Exterior parts and Accessories

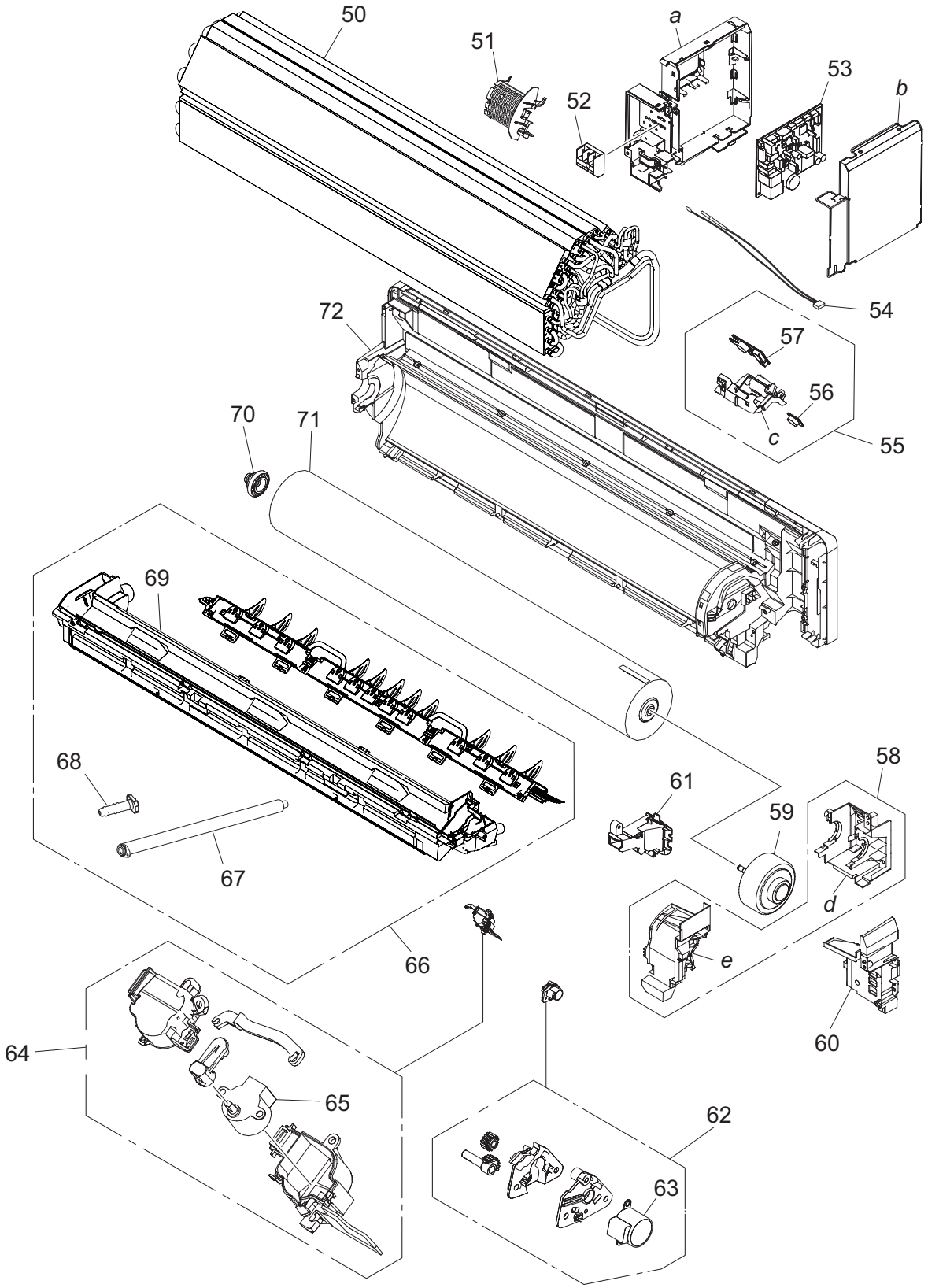


TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name	Service part
1	9323351004	Bracket panel	♦
2	9387476002	Screw cover	♦
3	9313951047	Conduit holder	♦
4	9383729027	Wire cover B	♦
5	9387597035	Wire cover assy	♦
6	9383765032	WLAN adapter holder assy	♦
7	9383634017	Wireless LAN adapter	♦
8	9387479010	Horizontal louver assy	♦
9	9332911008	Electric filter holder	♦
10	9323341005	Under cover L	♦
11	9317250009	Air clean filter assy	♦
12	9332438765	Remote controller	♦
13	9318912005	Remote controller holder	♦
14	9387596601	Front panel total assy	♦
15	9387756210	Intake grille assy	♦
16	9323340008	Air filter	♦
17	9333719009	Grille clamper L	♦
18	9333704005	Grille clamper R	♦
19	9323342002	Under cover R	♦
20	9383730030	Louver spring	♦
21	9333608006	Bush	♦
—	9901010019	Wire with connector (CN6 on main PCB—WLAN adapter)	♦
a	—	Front panel	—
b	—	Panel cover	—
c	—	Front panel cover	—
d	—	Front panel B	—

TECHNICAL DATA AND PARTS LIST

■ Chassis



TECHNICAL DATA AND PARTS LIST

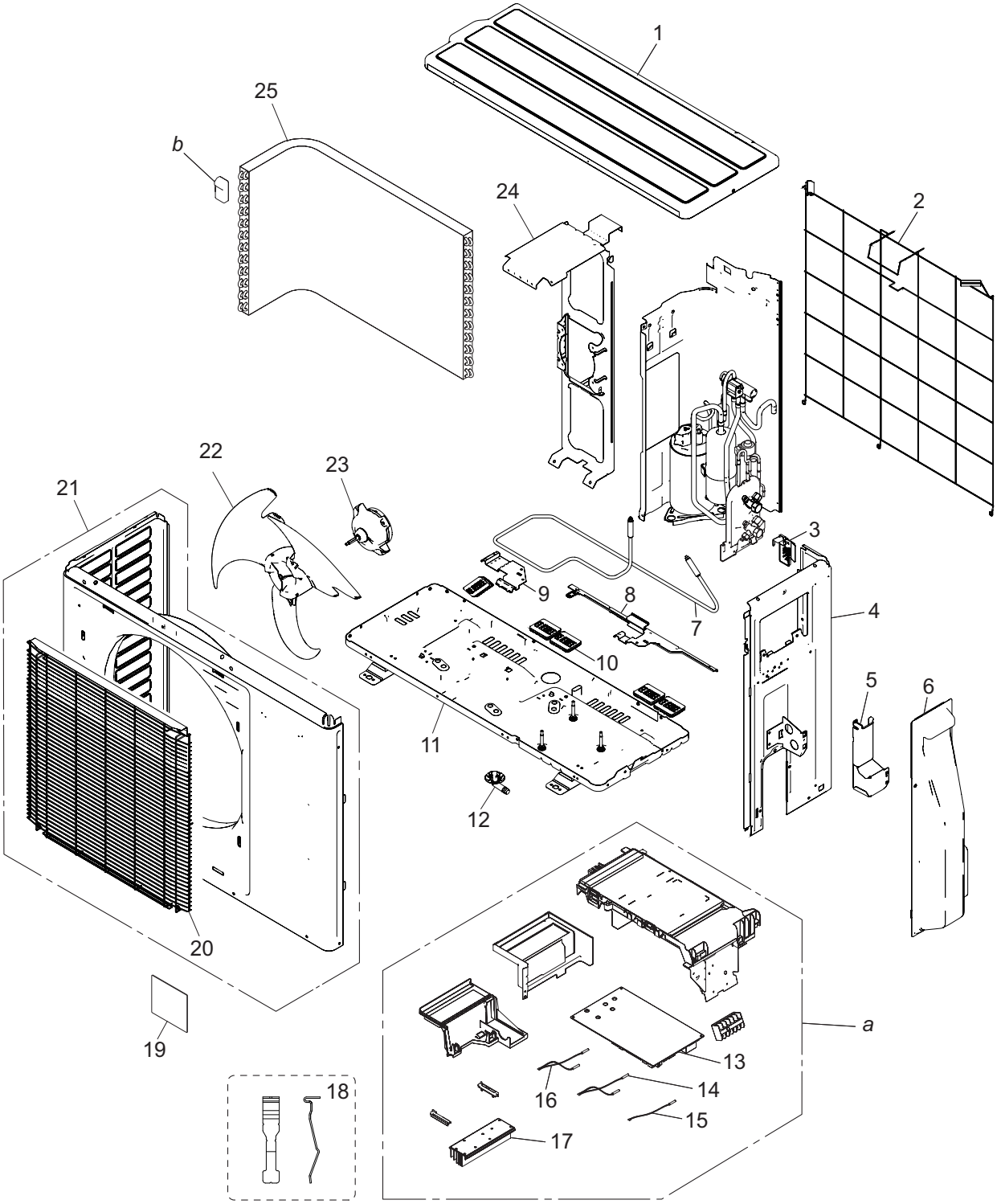
Item no.	Part no.	Part name	Service part
50	9383735127	Evaporator total assy (for 09-12 model)	♦
	9383735134	Evaporator total assy (for 15 model)	♦
51	9387467000	Room thermistor holder	♦
52	9306489045	Terminal	♦
53	9711141835	Main PCB (for 09 model)	♦
	9711141842	Main PCB (for 12 model)	♦
	9711141859	Main PCB (for 15 model)	♦
54	9900627041	Thermistor assy	♦
55	9711146014	Display assy	♦
56	9317755061	Pyroelectric sensor	♦
57	9711147011	Indicator PCB	♦
58	9387589054	Motor case assy	♦
59	9603821005	Brushless motor	♦
60	9383565007	Pipe bracket	♦
61	9387488043	Cable guide	♦
62	9387714012	Gear case assy	♦
63	9901011016	Stepping motor	♦
64	9383728006	Vertical louver stepping motor assy	♦
65	9901011023	Stepping motor	♦
66	9387590142	Drain pan total assy	♦
67	9316904002	Drain hose assy	♦
68	9316177017	Drain cap	♦
69	9387591071	Drain pan assy	♦
70	9333628004	Bearing D assy	♦
71	9387055054	Crossflow fan assy	♦
72	9387587081	Base assy	♦
a	—	Control box	—
b	—	Control cover	—
c	—	Display case	—
d	—	Motor case	—
e	—	Motor cover assy	—

TECHNICAL DATA AND PARTS LIST

3. Outdoor unit parts list

3-1. Models: AOUG09LZAH1, AOUG12LZAH1, and AOUG15LZAH1

■ Exterior parts and chassis

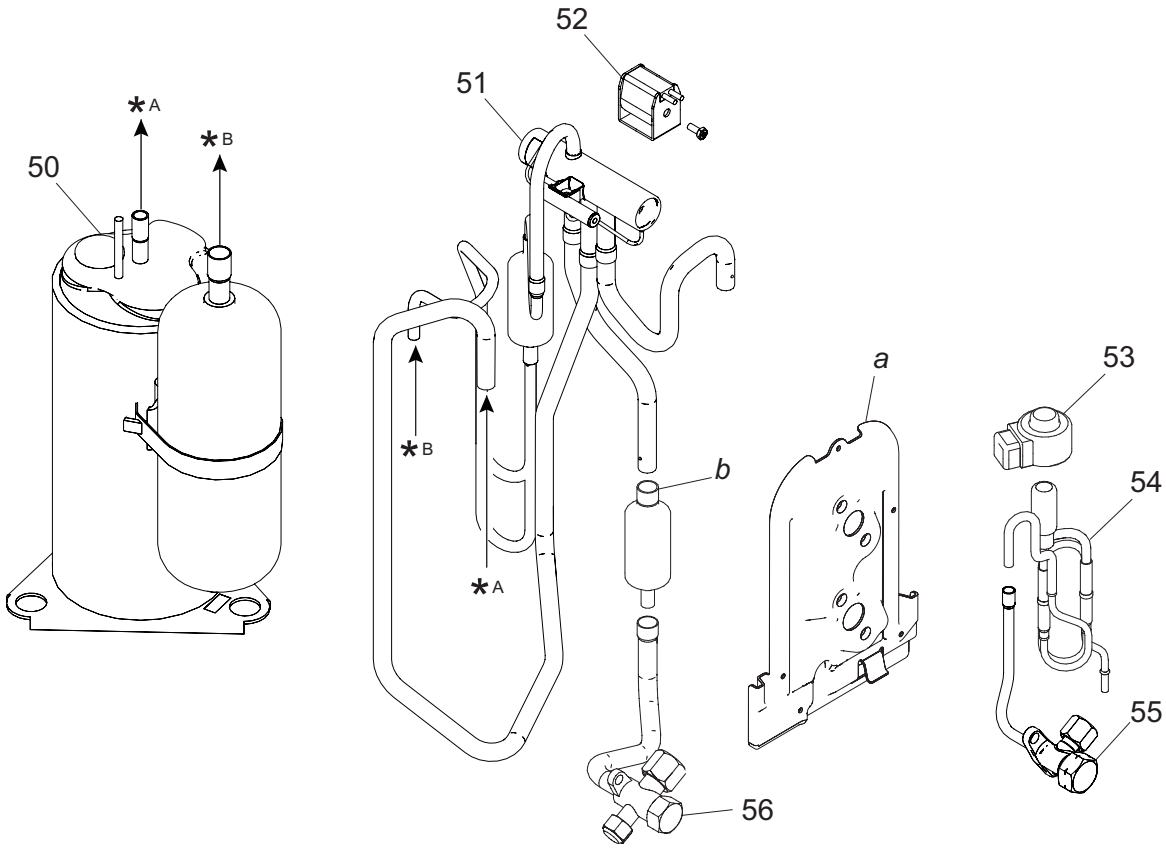


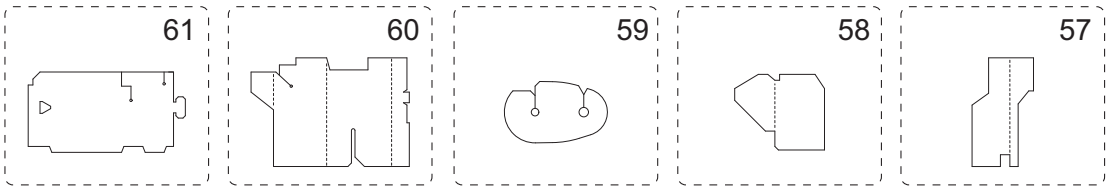
TECHNICAL DATA AND PARTS LIST

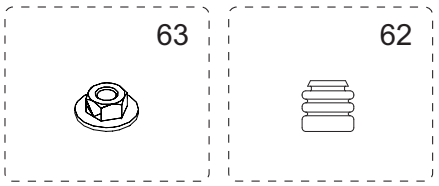
Item no.	Part no.	Part name	Service part
1	9322556028	Top panel assy	♦
2	9377854001	Protective net assy	♦
3	9322327000	Thermistor holder	♦
4	9322552242	Cabinet right assy	♦
5	9384276001	Conduit cover	♦
6	9322570062	Switch cover assy	♦
7	9901059025	Heater base	♦
8	9323540019	Heater holder A	♦
9	9323541016	Heater holder B	♦
10	9383720000	Drain cap assy	♦
11	9323550025	Base assy	♦
12	9322144003	Drain pipe	♦
13	9709684009	Main PCB (for 09 model)	♦
	9709684016	Main PCB (for 12 model)	♦
	9709684023	Main PCB (for 15 model)	♦
14	9900935054	Thermistor assy	♦
15	9900985011	Thermistor assy (Compressor temp.)	♦
16	9900565060	Thermistor assy (Outdoor temp.)	♦
17	9322420039	Heat sink	♦
18	9810028006	Thermistor stopper	♦
19	9317903011	Emblem	♦
20	9384273000	Fan Guard	♦
21	9322555182	Front panel assy	♦
22	9322150004	Propeller fan	♦
23	9603601003	Brushless motor	♦
24	9322553027	Motor bracket assy	♦
25	9317089616	Condenser total assy (for 09-12 model)	♦
	9317089654	Condenser total assy (for 15 model)	♦
a	—	Inverter assy	—
b	—	Hair pin cushion	—

TECHNICAL DATA AND PARTS LIST

■ Compressor







TECHNICAL DATA AND PARTS LIST

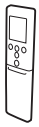
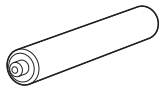
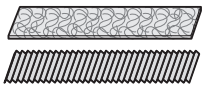
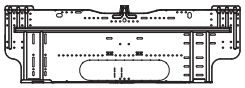
Item no.	Part no.	Part name	Service part
50	9810542007	Compressor (for 09-12 model)	♦
	9810541000	Compressor (for 15 model)	♦
51	9322446015	4-way valve assy	♦
52	9970194023	Solenoid	♦
53	9970173028	Expansion valve coil	♦
54	9322463029	Pulse motor valve assy	♦
55	9322474001	2-way valve assy	♦
56	9322850010	3-way valve assy (for 09-12 model)	♦
	9387831016	3-way valve assy (for 15 model)	♦
57	9322824004	S-insulator K	♦
58	9323045002	S-insulator V	♦
59	9322501004	S-insulator H	♦
60	9322847003	S-insulator F	♦
61	9322503008	S-insulator B	♦
a	—	Valve bracket	—
b	—	Muffler	—

TECHNICAL DATA AND PARTS LIST

4. Accessories

4-1. Indoor unit

■ Models: ASUG09LZAS, ASUG12LZAS, and ASUG15LZAS

Part name	Exterior	Q'ty	Part name	Exterior	Q'ty
Operating manual		1	Tapping screw (large)		5
Installation manual		1	Tapping screw (small)		2
Remote controller		1	Battery		2
Remote controller holder		1	Filter holder		2
Cloth tape		1	Air cleaning filters		1
Wall hook bracket		1			

4-2. Outdoor unit

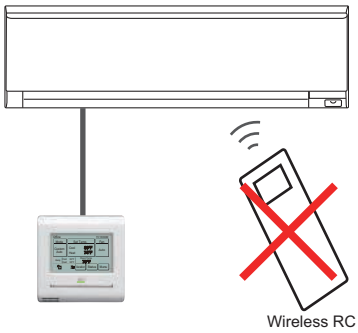
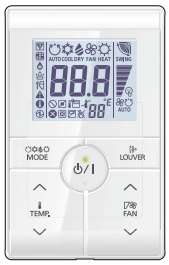
■ Models: AOUG09LZAH1, AOUG12LZAH1, and AOUG15LZAH1

Part name	Exterior	Qty	Part name	Exterior	Qty
Installation manual		1	Cable tie		2

5. Optional parts

5-1. Indoor unit

■ Controllers

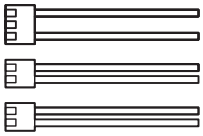
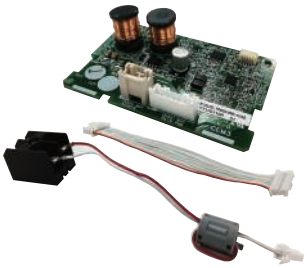
Exterior	Part name	Model name	Summary
	Wired Remote Controller	UTY-RNRUZ*	Easy finger touch operation with LCD panel. Backlit LCD enables easy operation in a dark room. Wire type: Non-polar 2-wire Optional Communication Kit is necessary for installation. **NOTE:** When this remote controller is connected, wireless remote controller cannot be used. 
	Simple Remote Controller	UTY-RSRY	Compact remote controller concentrates on the basic functions such as Start/Stop, fan control, temperature setting, and operation mode. Wire type: Non-polar 2-wire Optional Communication Kit is necessary for installation.
	Simple Remote Controller	UTY-RHRY	Compact remote controller concentrates on the basic functions such as Start/Stop, fan control, and temperature setting. Wire type: Non-polar 2-wire Optional Communication Kit is necessary for installation.

NOTES:

- Available functions may differ by the remote controller. For details, refer to the operation manual.
- When using the group controlling system of the Wired Remote Controller, using Wireless LAN adapter is prohibited.

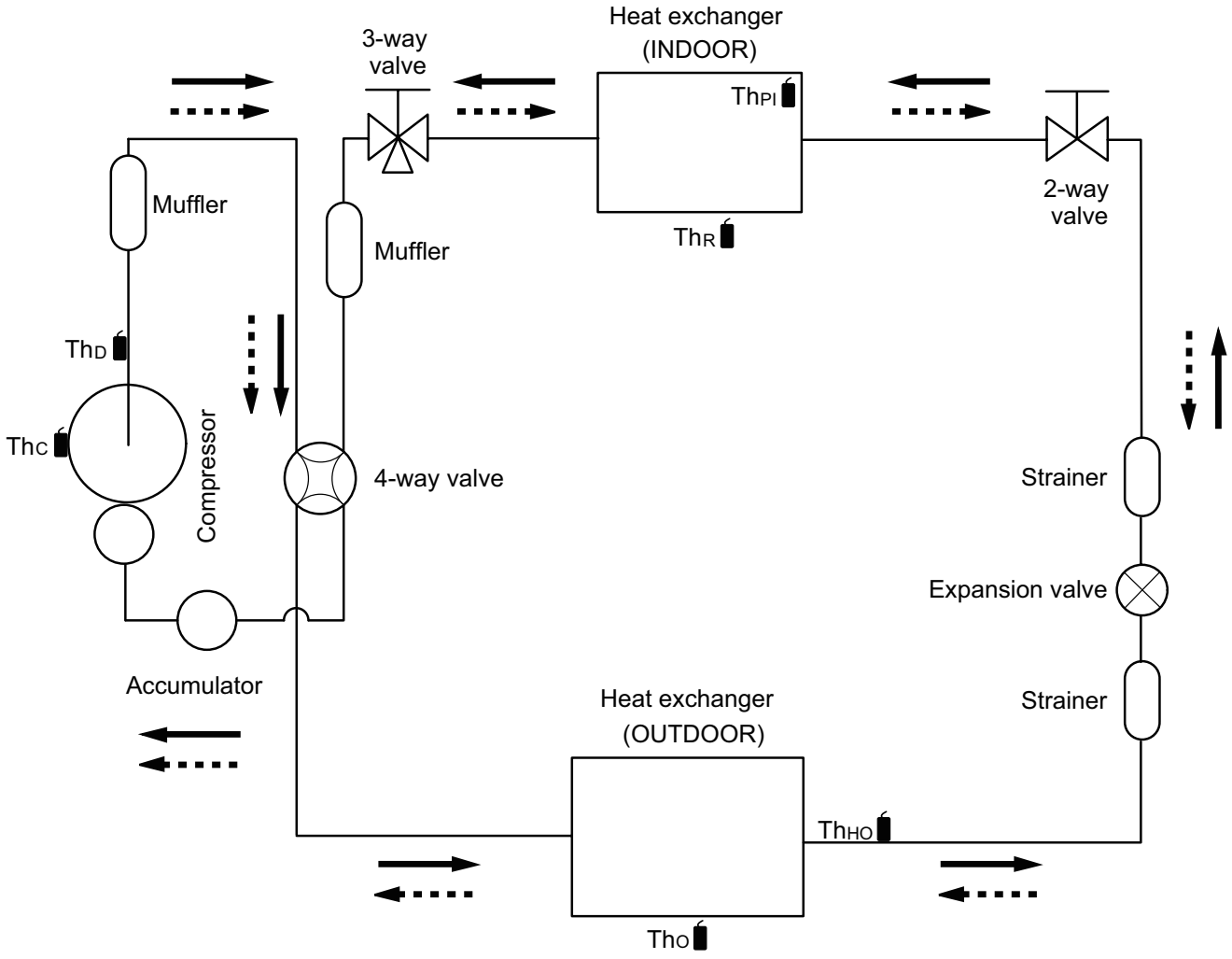
TECHNICAL DATA AND PARTS LIST

■ Others

Exterior	Part name	Model name	Summary
	External Connect Kit	UTY-XWZXZ5	Required when external device is connected.
	External Input and Output PCB	UTY-XCSXZ2	Use to connect with external devices and air conditioner PCB. Optional External Connect Kit is necessary for installation.
	Communication Kit	UTY-TWRXZ2	Use to connect Non-polar 2-core wired remote controller.

6. Refrigerant system diagrams

6-1. Models: AOUG09LZAH1, AOUG12LZAH1, and AOUG15LZAH1

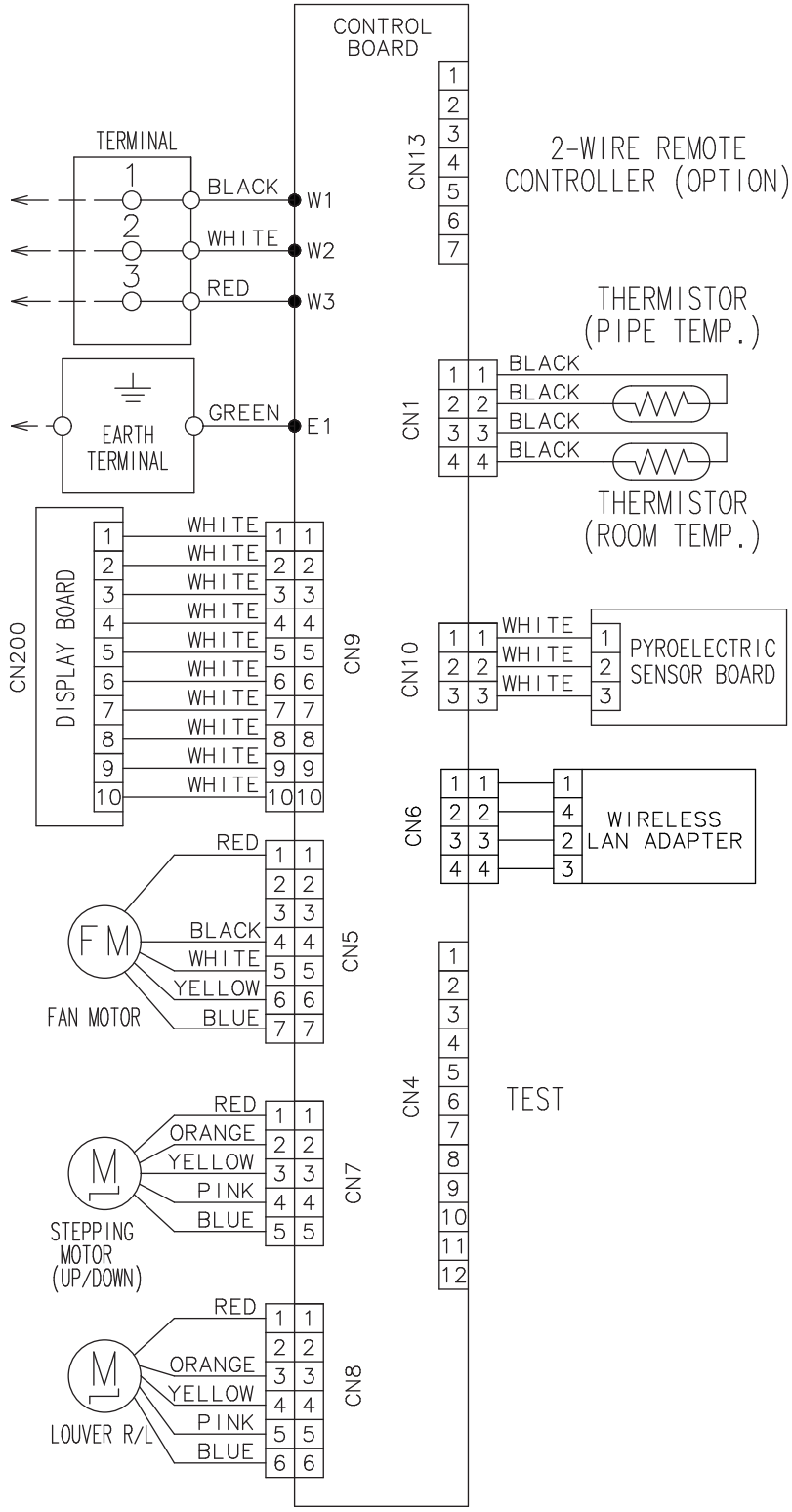


ThC : Thermistor (Compressor temperature)
ThD : Thermistor (Discharge temperature)
ThO : Thermistor (Outdoor temperature)
ThHO: Thermistor (Heat exchanger out temperature)
ThPI : Thermistor (Pipe temperature)
ThR : Thermistor (Room temperature)

7. Wiring diagrams

7-1. Indoor unit

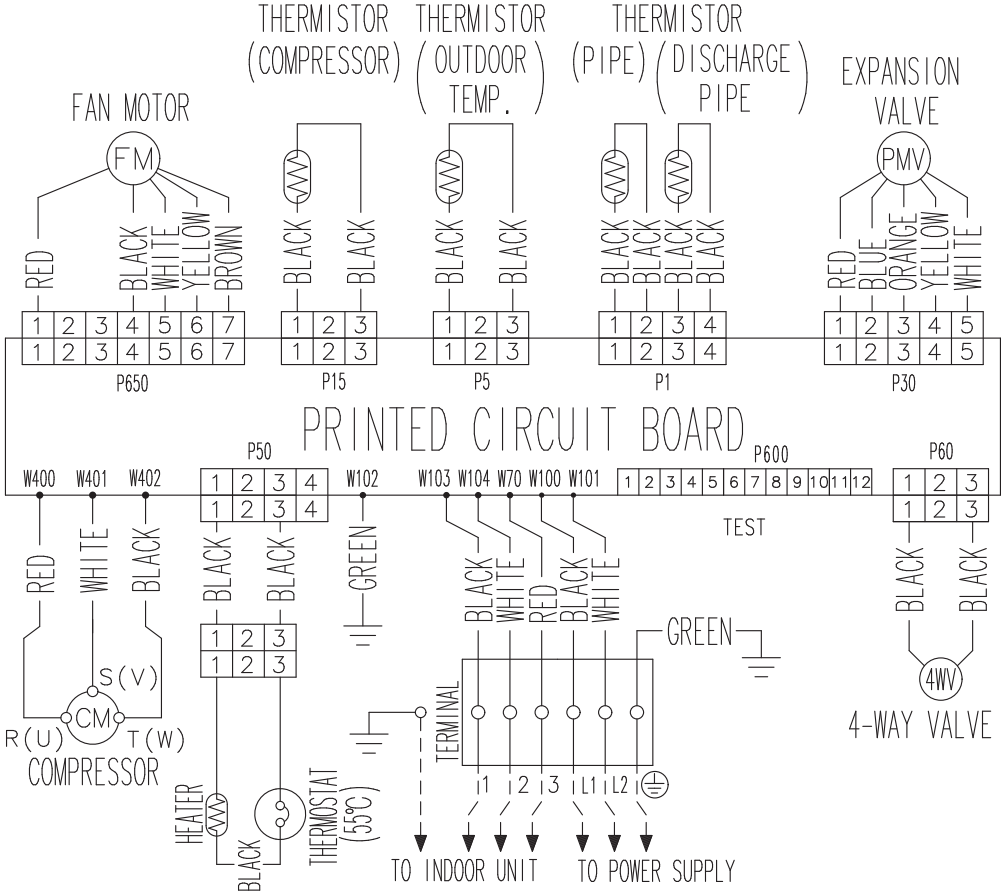
■ Models: ASUG09LZAS, ASUG12LZAS, and ASUG15LZAS



TECHNICAL DATA AND PARTS LIST

7-2. Outdoor unit

■ Models: AOUG09LZAH1, AOUG12LZAH1, and AOUG15LZAH1



8. PC board diagrams

8-1. Models: ASUG09LZAS, ASUG12LZAS, and ASUG15LZAS

CONTROL UNIT
ASUG09LZAS : EZ-0190EHSE
ASUG12LZAS : EZ-0190FHSE
ASUG15LZAS : EZ-0190GHSE

MAIN PCB
ASUG09LZAS : K18RA-1902HSE-C1
ASUG12LZAS : K18RA-1903HSE-C1
ASUG15LZAS : K18RA-1904HSE-C1

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

OUTDOOR UNIT
(POWER SOURCE)

L
N
SERIAL
UL1015 AWG22 BLACK
UL1015 AWG22 WHITE
UL1015 AWG22 RED
UL1015 AWG20 GREEN
W1 B
W2 B
W3 B
E1 B
EARTH

F4
3.15A
AC250V

INDICATOR PCB
K18RB-1800HSE-D0
CN200
S10B-PASK-2
WHITE
UL1061 AWG28 WHITE
DC5V
DC12V
CN9
B10B-PASK-1
WHITE

DC FAN MOTOR
FM
RED
BLACK
WHITE
YELLOW
BLUE
DC340V
DC15V
CN5
B5 (7-2.3) B-XASK-1-A
WHITE

LOUVER UP / DOWN
M
RED
ORANGE
YELLOW
PINK
BLUE
DC12V
CN7
B05B-PLISK-1
WHITE

LOUVER RIGHT / LEFT
M
RED
ORANGE
YELLOW
PINK
BLUE
CN8
B06B-PLIRK-1
RED

2-WIRE REMOTE CONTROL UNIT (OPTION)
UTY-TWRXZ2

CN13
B07B-PASK-1
WHITE
DC5V
DC12V
UL1061 AWG26 RED
UL1061 AWG26 WHITE
CN301
B07B-PASK-1
WHITE
CN300
B03B-XNISK-A-1
WHITE
UL1007 AWG22 RED
UL1007 AWG22 WHITE
REMOTE CONTROLLER (2-WIRE)
EMI FILTER
ZCAT1518-0730
2 TURNS
COMMUNICATION PCB
K16JS-1600HSE-CA0
CN1
SM05B-SRSS-TB
WHITE
1, 2, 3, 4, 5
FLASH

DC5V-2
CN1
B04B-PLIRK-1
RED
BLACK
THERMISTOR (PIPE TEMP.)
THERMISTOR (ROOMTEMP.)

CN1 Thermistor Characteristics.

Thermistor \ Temperature	32 ℉ (0 ℃)	68 ℉ (20 ℃)	86 ℉ (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

DC5V-2
CN10
B03B-PLISK-1
WHITE
DC5V
UL1061 AWG26 WHITE
CN1
B03B-PLISK-1
WHITE
PYROELECTRIC SENSOR
(HUMAN SENSOR)
FJZ-10

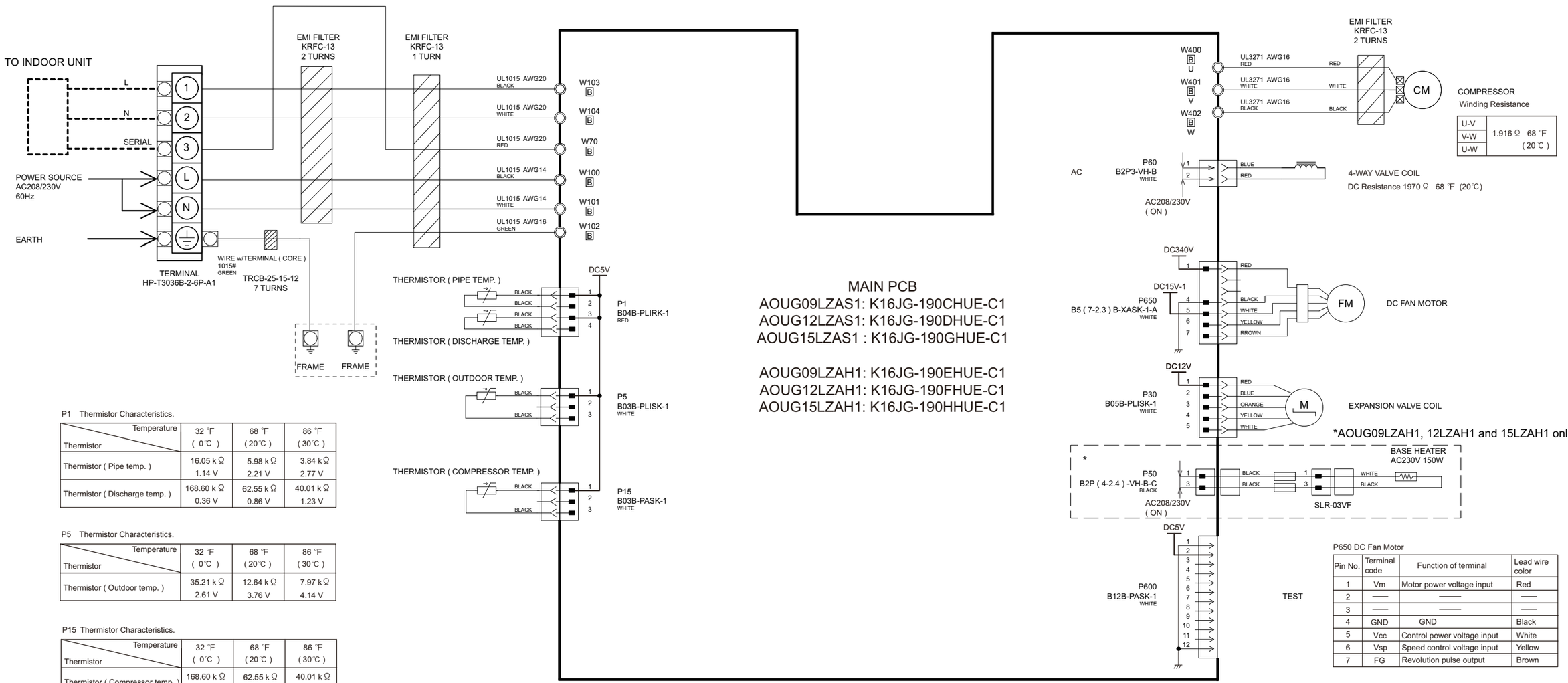
CN4
B12B-PASK-1
WHITE
TEST

WIRELESS LAN ADAPTER
AP-WF1E
DC12V-3
CN6
B04B-PASK-1
WHITE
BLACK
GREEN
WHITE
RED
UL1430 AWG26 x 4
(4 BLACK)
(3 GREEN)
(2 WHITE)
(1 RED)
J2
USB5-A4M2-KNSO-01
WHITE

8-2. Models: AOUG09LZAH1, AOUG12LZAH1, and AOUG15LZAH1

INVERTER ASSEMBLY
AOUG09LZAS1 : EZ-0190MHUE
AOUG12LZAS1 : EZ-0190PHUE
AOUG15LZAS1 : EZ-0190THUE

AOUG09LZAH1 : EZ-0190RHUE
AOUG12LZAH1 : EZ-0190SHUE
AOUG15LZAH1 : EZ-0190WHUE



P1 Thermistor Characteristics.

Thermistor \ Temperature	32 ℉ (0℃)	68 ℉ (20℃)	86 ℉ (30℃)
Thermistor (Pipe temp.)	16.05 k Ω 1.14 V	5.98 k Ω 2.21 V	3.84 k Ω 2.77 V
Thermistor (Discharge temp.)	168.60 k Ω 0.36 V	62.55 k Ω 0.86 V	40.01 k Ω 1.23 V

P5 Thermistor Characteristics.

Thermistor \ Temperature	32 ℉ (0℃)	68 ℉ (20℃)	86 ℉ (30℃)
Thermistor (Outdoor temp.)	35.21 k Ω 2.61 V	12.64 k Ω 3.76 V	7.97 k Ω 4.14 V

P15 Thermistor Characteristics.

Thermistor \ Temperature	32 ℉ (0℃)	68 ℉ (20℃)	86 ℉ (30℃)
Thermistor (Compressor temp.)	168.60 k Ω 0.36 V	62.55 k Ω 0.86 V	40.01 k Ω 1.23 V

P650 DC Fan Motor

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

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

1(Red) - 3(Blue)	Coil resistance ≒46.0Ω 68 ℉ (20℃)
1(Red) - 4(Orange)	
1(Red) - 5(Yellow)	
1(Red) - 6(White)	

TECHNICAL DATA
AND PARTS LIST

Refrigerant R410A
INVERTER

3. TROUBLESHOOTING

CONTENTS

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.

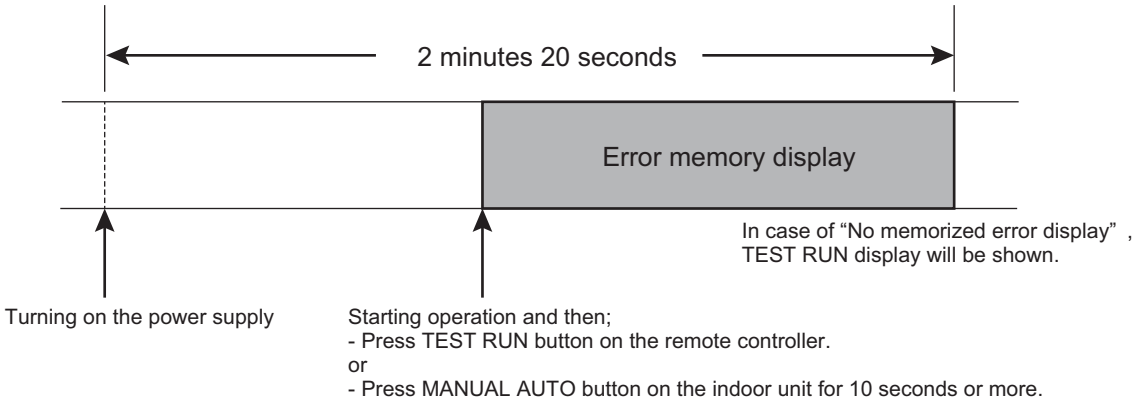
Errors, once displayed, will be automatically stored in the PC board of the indoor unit. Even if the power is disconnected, the memory containing the error history will not be erased.

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.

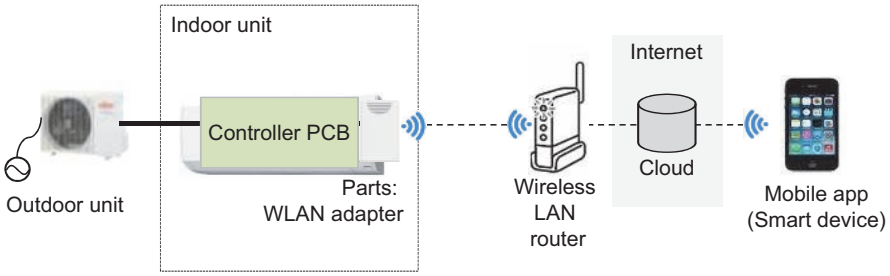
Error contents	Indoor unit display			Wired remote controller display
	Operation [⏻] (Green)	Timer [⏲] (Orange)	Economy [🌙] (Green)	
E: 11. Serial communication error (Serial reverse transfer error) (Outdoor unit)	1 times	1 times	Continuous	11
E: 11. Serial communication error (Serial forward transfer error) (Indoor unit)	1 times	1 times	Continuous	11
E: 12. Wired remote controller communication error (Indoor unit)	1 times	2 times	Continuous	12
E: 18. External communication error (Indoor unit)	1 times	8 times	Continuous	18
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: 58. Intake grille error (Indoor unit)	5 times	8 times	Continuous	58
E: 62. Outdoor unit main PCB error (Outdoor unit)	6 times	2 times	Continuous	62
E: 63. Inverter error (Outdoor unit)	6 times	3 times	Continuous	63
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: 72. Compressor thermistor error (Outdoor unit)	7 times	2 times	Continuous	72
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
E: A3. Compressor temperature error (Outdoor unit)	10 times	3 times	Continuous	A3

TROUBLESHOOTING

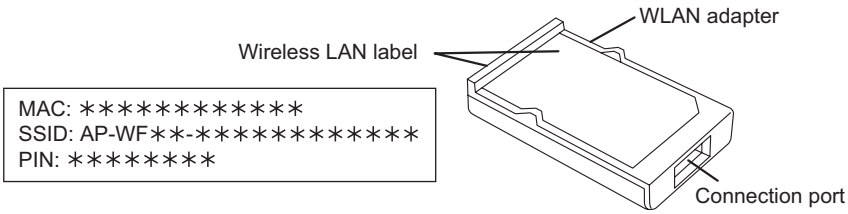
1-4. Error code table (Wireless LAN indicator)

TROUBLESHOOTING

- Wireless LAN control system diagram example



- Name of parts



- Wireless LAN indicator lamps
  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
Wireless LAN adapter Sleep mode (Indoor unit)	Off	No error

Flashing slowly: Repeating 7 seconds on/2 seconds off

1-5. Error code table (Mobile App)

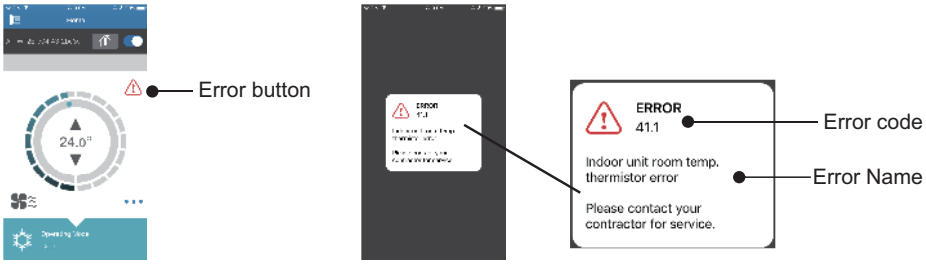
- Error display

  If there is an abnormality on the air conditioning, refer to ⚠ as follows.

  When the ⚠ (error button) on the home screen is tapped, error code and error name is displayed.

  – For Android

  – For iOS



TROUBLESHOOTING

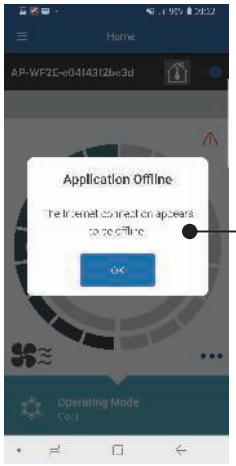
- Error code

Error message	Error contents	Error code
Serial communication error (Serial Reverse Transfer Error)	E: 11. Serial communication error (Serial reverse transfer error) (Outdoor unit)	11.1
		11.2
Serial communication error (Serial Forward Transfer Error)	E: 11. Serial communication error (Serial forward transfer error) (Indoor unit)	11.3
		11.4
Wired remote controller communication error	E: 12. Wired remote controller communication error (Indoor unit)	12.1
Indoor unit PCB model information error	E: 32. Indoor unit main PCB error (Indoor unit)	32.1
Manual auto switch error	E: 35. MANUAL AUTO button error (Indoor unit)	35.1
Room temp. sensor error	E: 41. Room temperature sensor error (Indoor unit)	41.1
Indoor unit Heat Ex. Middle temp. sensor error	E: 42. Indoor unit heat exchanger sensor error (Indoor unit)	42.2
Indoor unit fan motor error	E: 51. Indoor unit fan motor error (Indoor unit)	51.1
		51.2
Outdoor unit main PCB model information error	E: 62. Outdoor unit main PCB error (Outdoor unit)	62.1
		62.2
Inverter error	E: 63. Inverter error (Outdoor unit)	63.1
		63.2
PC circuit error	E: 64. PFC circuit error (Outdoor unit)	64.1
		64.3
		64.4
		64.8
Discharge temp. sensor error	E: 71. Discharge thermistor error (Outdoor unit)	71.1
Outdoor unit Heat Ex. liquid temp. sensor error	E: 73. Outdoor unit heat exchanger thermistor error (Outdoor unit)	73.3
Outdoor temp. sensor error	E: 74. Outdoor temperature thermistor error (Outdoor unit)	74.1
Current sensor error	E: 84. Current sensor error (Outdoor unit)	84.1
Trip detection	E: 94. Trip detection (Outdoor unit)	94.1
Compressor rotor position detection error	E: 95. Compressor motor control error (Outdoor unit)	95.1
		95.3
Outdoor unit fan motor error	E: 97. Outdoor unit fan motor error (Outdoor unit)	97.3
4-way valve error	E: 99. 4-way valve error (Outdoor unit)	99.1
Discharge temp. error	E: A1. Discharge temperature error (Outdoor unit)	A1.1

1-6. Error message for wireless LAN control (Mobile App)

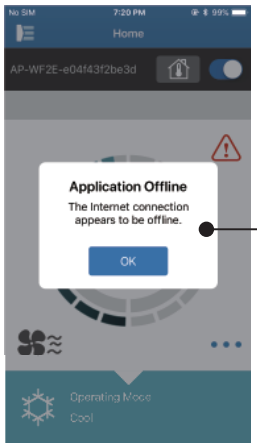
- Error display
  If there is an abnormality on the wireless control system, refer to error messages as follows.
  The error message disappears after 5 seconds and the normal screen is displayed.

For Android



Error message

For iOS



Error message

TROUBLESHOOTING

TROUBLESHOOTING

- Error message list
  - For Android

Registration error		
Error message	**Cause**	**Solution**
Wi-Fi must be enabled to set up new device	The user has disabled the wireless LAN connection on the smart device.	Enable the wireless LAN connection on the smart device.
We weren't able to sign you onto null. Please goto the Wi-Fi settings and join the network from there. Return to the app when you're done.	The smart device and air conditioner are connected to difference wireless LAN networks when attempting to register.	Connect the mobile device to the same network as air conditioner, then retry the registration.
Could not connect to the device at this time. Please reset the device and try again.	The air conditioner is not connected to the wireless LAN.	Check if the router connected to the air conditioner has Internet access. (You can check by connecting the smart device to the router, then opening the website.) If there is no access, connect the router to the Internet.
	Smart device is not connected to the same network as the air conditioner.	Connect the mobile device to the same network as the air conditioner, then retry the registration.
The device failed to connect with service.	Your Internet access may be down or a firewall may be blocking requests to the service.	Check if the router connected to the air conditioner has Internet access. (You can check by connecting the smart device to the router, then opening the website.) If there is no access, connect the router to the Internet.
Could not register the device. Make sure the device is ready for registration.	The air conditioner is not connected to the router.	Enter the wireless LAN setting on the smart device, then check if the SSID of the air conditioner (AP-WF∗∗-∗∗∗∗∗∗∗∗∗∗) is connected. If the air conditioner is connected, retry the registration.
	The router the air conditioner is connected to, has no Internet access.	Check if the router connected to the air conditioner has Internet access. (You can check by connecting the smart device to the router, then opening the website.) If there is no access, connect the router to the Internet.
	The air conditioner is already registered.	If there is a smart device that has already been registered to the air conditioner, unregister by using the registered smart device. Retry the registration with the smart device you wish to register. If you do not own the smart device registered to the air conditioner (lost, property of previous owner, etc.), ask your manufacturer service to unregister the smart device. Inform them the MAC address of the WLAN Adapter as written on the Wireless LAN label.
	If the problem persists even if the all of the above is conducted, contact your dealer or authorized service personnel. When asking for advice, inform them the MAC address of the WLAN Adapter as written on the Wireless LAN label.	
Please ensure your air conditioner is ready to pair, and that you have entered its SSID and password correctly.	Occurs when pairing is executed, when the user erroneously enter the SSID of the adapter.	Enter the SSID literally. (Uppercase and lowercase letters also match)

TROUBLESHOOTING

General error		
Error message	**Cause**	**Solution**
No connectivity to Wi-Fi or the cloud. Please check your network connection.	The smart device has no Internet access.	Connect the mobile device to the Internet.
An error occurred while trying to update your profile. Please try again later.		
Device is off-line and cannot be modified.	The router the air conditioner is connected to, has no Internet access.	Check if the router connected to the air conditioner has Internet access. (You can check by connecting the mobile device to the router, then opening the website.) If there is no access, connect the router to the Internet.
	The air conditioner is not connected to the router.	Check the wireless LAN indicator lamps on the air conditioner. If the indicator lamp is flashing or off, refer to "Error code table (Wireless LAN indicator)" on page 03-3

Sign in error		
Error message	**Cause**	**Solution**
Could not reach service.	The smart device has no Internet access.	Connect the smart device to the Internet.

– For iOS

Registration error		
Error message	**Cause**	**Solution**
You need an Internet connection to add new devices.	The user has disabled the wireless LAN connection on their smart device.	Enable the wireless LAN connection from the iOS setting.
Could not register same LAN device. Make sure both devices are in the same LAN and try again to register.	The smart device and air conditioner are connected to different wireless LAN networks when attempting to register.	Connect the smart device to the same network as the air conditioner, then retry the registration.
No registrable device was found. Make sure Wi-Fi setup was successful. This method only works if the Wi-Fi was recently performed.	The air conditioner is not connected to the wireless LAN.	Check if the router connected to the air conditioner has Internet access. (You can check by connecting the smart device to the router, then opening the website.) If there is no access, connect the router to the Internet.
	Smart device is not connected to the same network as the air conditioner.	Connect the mobile device to the same network as the air conditioner, then tap register button.
Could not register the device. Make sure the device is ready for registration.	The air conditioner is not connected to the router.	Enter the wireless LAN setting on the smart device, then check if the SSID of the air conditioner (AP-WF∗∗-∗∗∗∗∗∗∗∗∗∗) is connected. If the air conditioner is connected, retry the registration.

TROUBLESHOOTING

Registration error		
Error message	**Cause**	**Solution**
Could not register the device. Make sure the device is ready for registration.	The router the air conditioner is connected to, has no Internet access.	Check if the router connected to the air conditioner has Internet access. (You can check by connecting the smart device to the router, then opening the website.) If there is no access, connect the router to the Internet, then retry the registration.
	The air conditioner is already registered.	If there is a smart device that has already been registered to the air conditioner, unregister by using the registered smart device. Retry the registration with the smart device you wish to register. If you do not own the smart device registered to the air conditioner (lost, property of previous owner, etc.), ask your manufacturer service to unregister the smart device. Inform them the MAC address of the WLAN Adapter as written on the Wireless LAN label.
	If the problem persists even if the all of the above is conducted, contact your dealer or authorized service personnel. When asking for advice, inform them the MAC address of the WLAN Adapter as written on the Wireless LAN label.	
Please ensure your air conditioner is ready to pair, and that you have entered its SSID and password correctly.	Occurs when pairing is executed, when the user erroneously enter the SSID of the adapter.	Enter the SSID literally. (Uppercase and lowercase letters also match)

General error		
Error message	**Cause**	**Solution**
Failed to change password.	The smart device has no Internet access.	Connect the mobile device to the Internet.
Cloud not determine service reachability.		
Failed to update property.		
Could not retrieve schedules.		
The operation couldn't be completed. Operation timed out.		
"Device name" is off-line. (Device name varies depending on the air conditioner)	The router the air conditioner is connected to has no Internet access.	Check if the router connected to the air conditioner has Internet access. (You can check by connecting the mobile device to the router, then opening the website to check access.) If there is no access, connect the router to the Internet.
	The air conditioner is not connected to the router.	Check the wireless LAN indicator lamps on the air conditioner. If the indicator lamp is flashing or off, refer to "Error code table (Wireless LAN indicator)" on page 03-3

Sign in error		
Error message	**Cause**	**Solution**
Could not reach service.	The smart device has no Internet access.	Connect the smart device to the Internet.

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".

↓

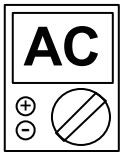
Check point 2. Check connection

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 187 V (AC 208 V -10%) to AC 253 V (AC 230 V +10%) appears at outdoor unit terminal L—N.

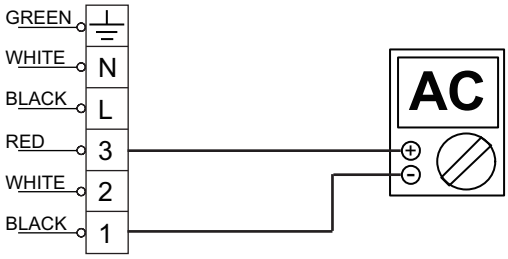


↓

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 03-69
- 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 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
			Indoor 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".

↓

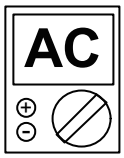
Check point 2. Check connection

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*.

↓

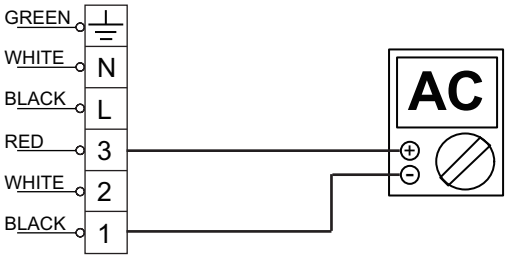
Check point 3. Check the voltage of power supply

Check the voltage of power supply
Check if AC 187 V (AC 208 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 (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. • If it is abnormal, check indoor unit fan motor. (Indoor unit fan motor in "Service parts information" on page 03-69) • If indoor unit fan motor is abnormal, replace indoor unit fan motor and main PCB.

↓

End

Check point 1-2. Check external cause such as noise
• Check the complete insulation of the grounding. • Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).

↓

End

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

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	2 time flash
		Economy indicator	Continuous flash
		Error code	E: 12
Detective actuator	Indoor unit	Main PCB	When the indoor unit cannot receive the signal from Wired remote controller more than 1 minute during normal operation.
	Wired remote control		
Forecast of cause			Terminal connection abnormal
			Wired remote control failure
			Main PCB failure

Check point 1. Check the connection of terminal

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

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

↓

Check point 2. Check connection

Check voltage at CN2 (terminal 1—3) of UTY-TWRXZ2 (Communication kit). (Power supply to the remote controller)
Upon correcting the removed connector or mis-wiring, reset the power.

- If it is DC 5 V, remote controller is failure. (Main PCB is normal)
  - Replace Remote Control
- If it is DC 0 V, main PCB is failure. (Check remote controller once again)
  - Replace main PCB

↓

End

2-4. E: 18. External communication error (Indoor unit)

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	8 time flash
		Economy indicator	Continuous flash
		Error code	E: 18
Detective actuator	Indoor unit	External communication error	After receiving a signal from the external input and output PCB, the same signal has not been received for 15 seconds.
Forecast of cause			Connection failure
			WLAN adapter failure
			Main PCB

TROUBLESHOOTING

Check point 1. Check the connection

- Check any loose or removed connection between the main PCB to the WAN adapter.
  -> If there is an abnormal condition, correct it by refer to the installation manual or the “DESIGN & TECHNICAL MANUAL”.
- Check the connection condition on the WLAN adapter and the main PCB (If there is loose connector, open cable or mis-wiring.)

↓

Check point 2. Replace the WLAN adapter

If check point 1 do not improve the symptom, change WLAN adapter.

↓

Check point 3. Replace main PCB

If check point 2 do not improve the symptom, change main PCB

↓

End

2-5. 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 main PCB

Change 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

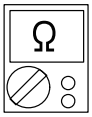
NOTE: EEPROM

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.

2-6. 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 consecutive 30 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 main PCB and indicator PCB
If Check Point 1 does not improve the symptom, change main PCB and indicator PCB.

↓

End

2-7. E: 41. Room temperature sensor error (Indoor unit)

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

TROUBLESHOOTING

Check point 1. Check connection of connector

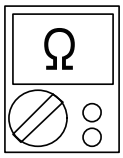
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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

↓

Check point 2. Remove connector and check thermistor resistance value

- For the room thermistor resistance value, refer to "Thermistor resistance values" on page 03-77.
- 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 02-14.

If the voltage does not appear, replace main PCB.

↓

End

2-8. E: 42. Indoor unit heat exchanger sensor error (Indoor unit)

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

TROUBLESHOOTING

Check point 1. Check connection of connector

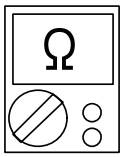
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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

↓

Check point 2. Remove connector and check thermistor resistance value

- For the heat exchanger thermistor resistance value, refer to "Thermistor resistance values" on page 03-77.
- 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 02-14.

If the voltage does not appear, replace main PCB.

↓

End

2-9. 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 condition that actual frequency of indoor fan is below 1/3 of target frequency is continued 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 03-69.)
→ If Indoor unit fan motor is abnormal, replace Indoor unit fan motor.

↓

Check point 4. Replace main PCB

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

↓

End

2-10. E: 58. Intake grille error (Indoor unit)

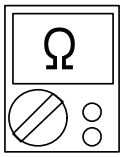
Indicator	Indoor unit	Operation indicator	5 time flash
		Timer indicator	8 time flash
		Economy indicator	Continuous flash
		Error code	E: 58
Detective actuator	Indoor unit main PCB		When the Micro switch is detected open while running the compressor.
	Micro switch		
Forecast of cause			Micro switch failure
			Shorted connector/wire
			Main PCB failure

TROUBLESHOOTING

Check point 1. Check limit switch

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

-> If micro switch is detective, replace it.



↓

Check point 2. Check connector (CN11)/wire

Check loose contact of CN11/shorted wire (pinched wire).
-> Replace micro switch if the wire is abnormal

↓

Check point 3. Replace main PCB

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

↓

End

2-11. 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 main PCB
Change 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

2-12. E: 63. Inverter error (Outdoor unit)

Indicator	Indoor unit	Operation indicator	6 time flash
		Timer indicator	3 time flash
		Economy indicator	Continuous flash
		Error code	E: 63
Detective actuator	Outdoor unit	Inverter PCB	Error information received from inverter PCB
Forecast of cause			External cause
			Power supply to inverter PCB wiring disconnection or open
			Inverter PCB failure

TROUBLESHOOTING

Check point 1. Turn the power on again?
Error displayed again?

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

↓

Check point 2. Check the wiring (power supply to inverter PCB)
• Connector and wiring connection state check • Cable open check

↓

Check point 3. Replace inverter PCB
Replace inverter PCB

↓

End

Check point 1-2. Check external cause
• Check if temporary voltage drop was not generated. • Check if momentary open was not generated. • Check if ground is connection correctly or there are no related cables near the power line.

↓

End

2-13. E: 64. PFC circuit error (Outdoor unit)

TROUBLESHOOTING

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

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 main PCB

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

↓

End

2-14. 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 03-34.)
→ 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

2-15. 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

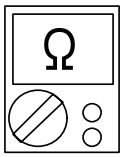
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

→ 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 03-77.
- 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 02-14.

If the voltage does not appear, replace main PCB.

↓

End

2-16. E: 72. Compressor thermistor error (Outdoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	7 time flash
		Timer indicator	2 time flash
		Economy indicator	Continuous flash
		Error code	E: 72
Detective actuator	Outdoor unit main PCB		When compressor temperature thermistor open or short circuit is detected at power on or while running the compressor
	Compressor temperature thermistor		
Forecast of cause			Connector failure
			Thermistor failure
			Main PCB failure

Check point 1. Check connection of connector

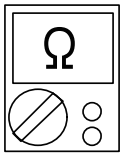
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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

↓

Check point 2. Remove connector and check thermistor resistance value

- For the compressor thermistor resistance value, refer to "Thermistor resistance values" on page 03-77.
- 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 02-14.

If the voltage does not appear, replace main PCB.

↓

End

2-17. 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

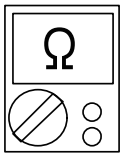
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

→ 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 03-77.
- 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 02-14.

If the voltage does not appear, replace main PCB.

↓

End

2-18. 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

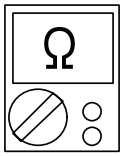
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

-> 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 03-77.
- 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 02-14.

If the voltage does not appear, replace main PCB.

↓

End

2-19. 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 main PCB

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

2-20. 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 main PCB

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

↓

Check point 3. Replace compressor

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

↓

End

2-21. 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 Compressor	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.
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 03-69.)

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

↓

Check point 3. Replace main PCB

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

↓

Check point 4. Replace compressor

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

↓

End

2-22. 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 03-69.)
→ 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 02-14.

Read wire	DC voltage
Red—Black	240 V — 400 V
White—Black	13.5 V — 16.5 V

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

↓

End

2-23. 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. > 20 °F (10 °C) (Cooling or Dry operation) Indoor heat exchanger temp. - Room temp. < -20 °F (-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 03-77.
→ 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 (at 68 °F (20 °C)). → 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 187 V (AC 208 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 main PCB
If Check Point 1 to 4 do not improve the symptom, replace main PCB.

↓

End

2-24. 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 ≥ 230 °F (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 03-69.
- 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 03-69.)

↓

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 03-77.

↓

Check point 5. Check the refrigerant amount
Check the refrigerant leakage.

↓

Check point 6. Replace main PCB
If check point 1 to 5 do not improve the symptom, replace the main PCB.

↓

End

TROUBLESHOOTING

2-25. E: A3. Compressor temperature error (Outdoor unit)

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	10 time flash
		Timer indicator	3 time flash
		Economy indicator	Continuous flash
		Error code	E: A3
Detective actuator	Outdoor unit main PCB		Protection stop by compressor temperature ≥ 226 °F (108 °C) during compressor operation generated 2 times within 24 hours.
	Compressor temperature thermistor		
Forecast of cause			3-way valve not opened
			EEV defective, strainer clogged
			Outdoor unit operation failure, foreign matter on heat exchanger
			Compressor temperature thermistor failure
			Insufficient refrigerant
			Main PCB failure

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

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

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

↓

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

- Check if EEV open.
  Refer to outdoor unit Electronic Expansion Valve (EEV) in "Service parts information" on page 03-69.
- 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 03-69.)

↓

Check point 4. Check the compressor thermistor

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

NOTE: For the characteristics of the thermistor, refer to "Thermistor resistance values" on page 03-77.

↓

Check point 5. Check the refrigerant amount
Check the refrigerant leakage.

↓

Check point 6. Replace 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".

↓

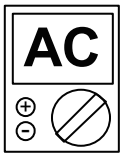
Check point 2. Check external cause at indoor and outdoor (voltage drop or noise)

- 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 187 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”.

↓

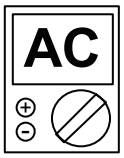
Check point 2. Check external cause at indoor and outdoor (voltage drop or noise)

- 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 187 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 varistor in main 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.

↓

Check point 4. Replace main PCB

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

- Indoor unit:
  - Check incorrect wiring between indoor unit and remote controller.
  - Check if there is an open cable connection.
- Are these indoor unit, outdoor unit, and remote controller suitable model names to connect?

-> If there is some abnormal condition, correct it by referring to the installation manual and “DESIGN & TECHNICAL MANUAL”.

↓

Turn off the power and check correct followings.

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

↓

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

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

↓

Check point 3. Check wired remote controller and controller PCB

Check voltage at CN2 (terminal 1—3) of UTY-TWBXF1(Communication kit).
(Power supply to remote controller)

- If it is DC 5 V, remote controller is failure. (The controller PCB is normal)
  -> Replace remote controller.
- If it is DC 0 V, controller PCB is failure. (Check the remote controller once again)
  -> Replace controller PCB.

↓

Check point 4. Replace main PCB

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

↓

End

3-4. No cooling/No heating

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

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

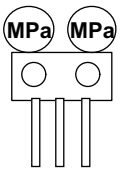
- Check connection pipe (specified pipe length and pipe diameter?)
- Check any loose or removed communication line.

→ 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 03-69.
- Check compressor.
  Refer to compressor in "Service parts information" on page 03-69.
  Refer to inverter compressor in "Service parts information" on page 03-69.



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

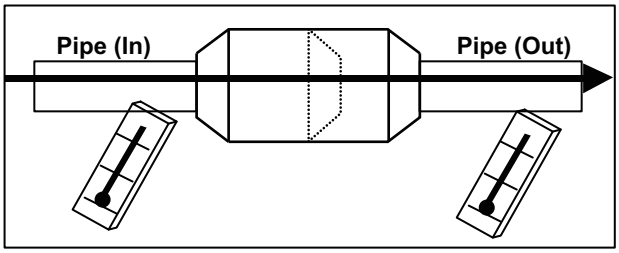
↓

End

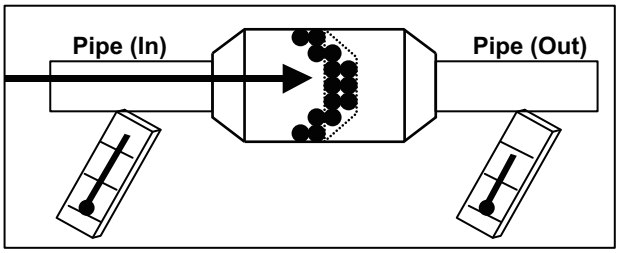
TROUBLESHOOTING

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)

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 03-69.

↓

End

TROUBLESHOOTING

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?

↓

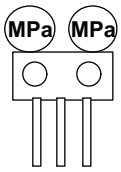
End

Diagnosis method when water is spitting out

Is the filter clogged?

↓

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



↓

End

3-7. Too warm

Forecast of cause	House insulation setting has not been changed.
	Temperature sensing location has not been changed.
	Installation location of the wired remote.
	Function settings have not been changed.

TROUBLESHOOTING

Check point 1. Check insulation level of structure of house

Is insulation level greater than R-13?
→ If no, go to "Check Point 4".

↓

Check point 2. Check function setting

If insulation level is greater than R-13 set function 95 to 01.

NOTE: For details of function setting number 95, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

Check Point 3. Check effects of function setting change

Is the space still too warm in relation to setpoint?

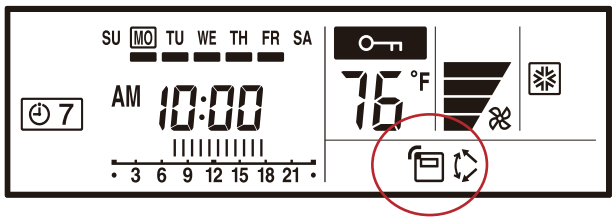
↓

Check Point 4. Verify room temperature sensing location

Do you want room temperature sensed at the wired remote controller (Wired remote sensor) or by they build in sensor inside the unit (Indoor unit sensor)?
→ If indoor unit sensor, go to "Check Point 5".
→ If wired remote sensor, go to "Check point 8".

Check Point 5. Check the remote controller display

Is the "Thermo Sensor Icon" displayed on the screen?



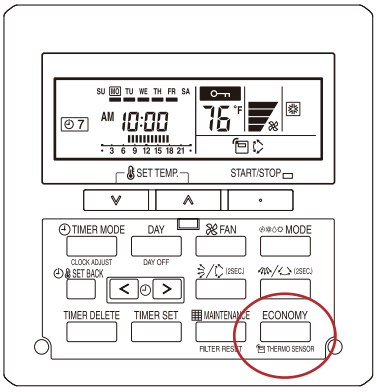
→ If no, go to "Check point 7".

↓

TROUBLESHOOTING

Check point 6. Check the remote controller

Hold down the THERMO SENSOR button until the thermo sensor icon is turned off.



→ If the space is still too warm, go to "Check point 7".

↓

End

Check point 7. Check function settings

Using the table on the right adjust function 31. (Room Temperature Control for indoor unit sensor)

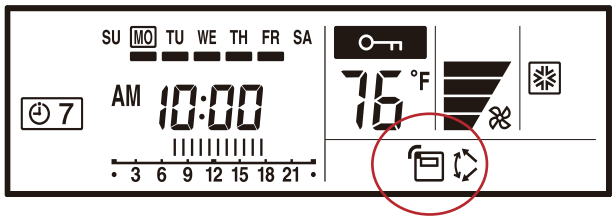
NOTE: For details of function setting number 31, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

End

Check point 8. Check the remote controller display

Is the "Thermo Sensor Icon" displayed on the screen?



→ If no, go to "Check point 8-1".

↓

Check point 9. Check the function Setting

Is function 48 (Room temperature sensor switching) set to 01?
→ If no, go to "Check point 9-1".

↓

TROUBLESHOOTING

Check point 10. Location of the remote controller
Is the mounting location of the wired remote controller affecting the temperature sensing? (Sunlight on the remote, heat source next to the remote) → If no, go to "Check point 12".

↓

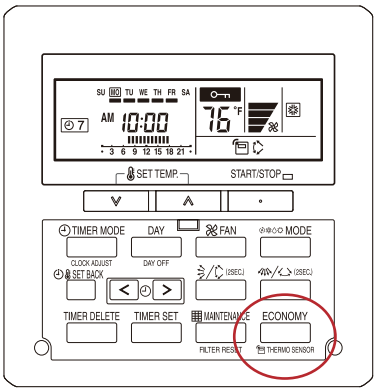
Check point 11. Location of the remote controller
Move the remote controller. → If the space is still too warm, go to "Check point 12".

↓

End

Check point 8-1. Check function setting
Is function 42 (Indoor room temperature sensor switching function) set to 01? **NOTE:** For details of function setting number 42, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

Check point 8-2. Check the remote controller
Press and hold down the THERMO SENSOR button to turn on the icon.  → If the space is still too warm, go to "Check point 9".

↓

End

Check point 9-1. Check function setting
Change setting of function 48 (Room temperature sensor switching) to 01. **NOTE:** For details of function setting number 48, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

Check point 9-2. Check the effects of function setting change
Did this function setting improve temperature control? → If the space is still too warm, go to "Check point 10".

↓

End

Check point 12. Check function setting
Using the table on the right adjust temperature correction by changing function setting 36. (Room Temperature control for wired remote controller sensor) **NOTE:** For details of function setting number 36, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

End

TROUBLESHOOTING

3-8. Too cool

Forecast of cause	House insulation setting has not been changed.
	Temperature sensing location has not been changed.
	Installation location of the wired remote.
	Function settings have not been changed.

TROUBLESHOOTING

Check point 1. Check insulation level of structure of house

Is insulation level greater than R-13?
→ If no, go to "Check Point 4".

↓

Check point 2. Check function setting

If insulation level is greater than R-13 set function 95 to 01.

NOTE: For details of function setting number 95, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

Check Point 3. Check effects of function setting change

Is the space still too cool in relation to setpoint?

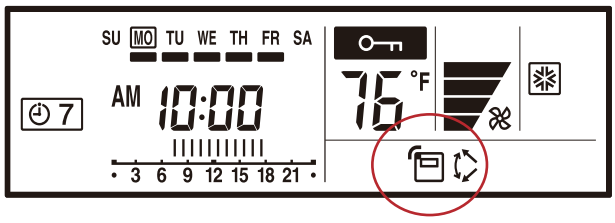
↓

Check Point 4. Verify room temperature sensing location

Do you want room temperature sensed at the wired remote controller (Wired remote sensor) or by they build in sensor inside the unit (Indoor unit sensor)?
→ If indoor unit sensor, go to "Check Point 5".
→ If wired remote sensor, go to "Check point 8".

Check Point 5. Check the remote controller display

Is the "Thermo Sensor Icon" displayed on the screen?



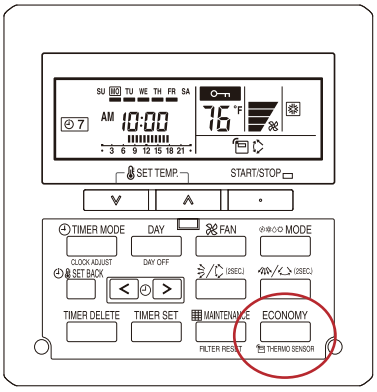
→ If no, go to "Check point 7".

↓

TROUBLESHOOTING

Check point 6. Check the remote controller

Hold down the THERMO SENSOR button until the thermo sensor icon is turned off.



→ If the space is still too cool, go to "Check point 7".

↓

End

Check point 7. Check function settings

Using the table on the right adjust function 30. (Room Temperature Control for indoor unit sensor)

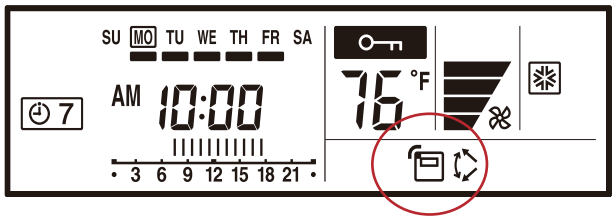
NOTE: For details of function setting number 30, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

End

Check point 8. Check the remote controller display

Is the "Thermo Sensor Icon" displayed on the screen?



→ If no, go to "Check point 8-1".

↓

Check point 9. Check the function Setting

Is function 48 (Room temperature sensor switching) set to 01?
→ If no, go to "Check point 9-1".

↓

TROUBLESHOOTING

Check point 10. Location of the remote controller
Is the mounting location of the wired remote controller affecting the temperature sensing? (Sunlight on the remote, heat source next to the remote) → If no, go to "Check point 12".

↓

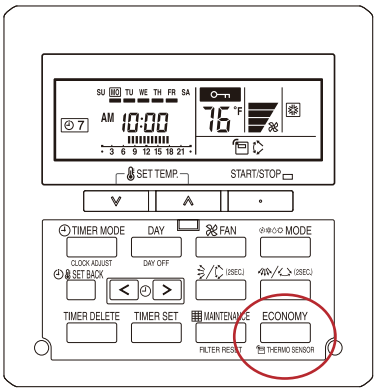
Check point 11. Location of the remote controller
Move the remote controller. → If the space is still too cool, go to "Check point 12".

↓

End

Check point 8-1. Check function setting
Is function 42 (Indoor room temperature sensor switching function) set to 01? **NOTE:** For details of function setting number 42, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

Check point 8-2. Check the remote controller
Press and hold down the THERMO SENSOR button to turn on the icon.  → If the space is still too cool, go to "Check point 9".

↓

End

Check point 9-1. Check function setting
Change setting of function 48 (Room temperature sensor switching) to 01. **NOTE:** For details of function setting number 48, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

Check point 9-2. Check the effects of function setting change
Did this function setting improve temperature control? → If the space is still too cool, go to "Check point 10".

↓

End

Check point 12. Check function setting
Using the table on the right adjust temperature correction by changing function setting 35. (Room Temperature control for wired remote controller sensor) **NOTE:** For details of function setting number 35, refer to "Function settings " in Chapter 5. FIELD WORKING on page 05-1.

↓

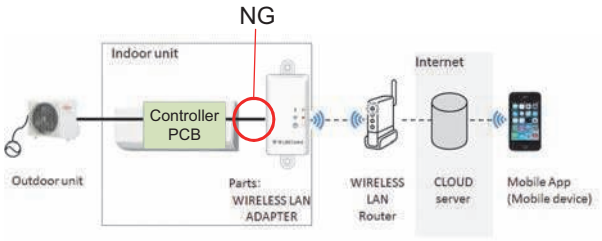
End

TROUBLESHOOTING

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 03-64.

↓

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 03-64.

↓

Check point 3. Replace controller PCB

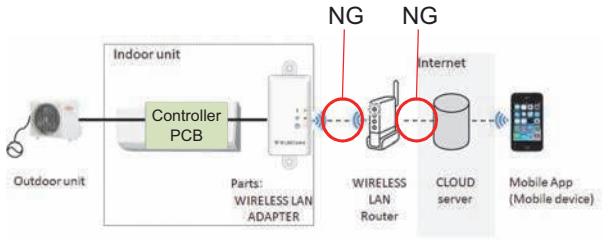
If check point 1 to 2 do not improve the symptom, replace the Wireless LAN adapter.

↓

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 03-64.

↓

End

TROUBLESHOOTING

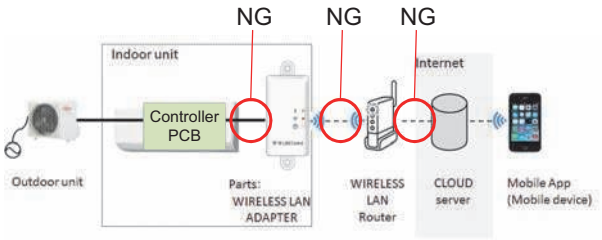
Check point 2-2. Check the transmission state
Check the wireless transmission state pf the wireless LAN router (LED status). -> If the wireless transmission from the wireless LAN router has not been outgoing, inquire to the wireless LAN router maker.

↓

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".

↓

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 03-64.

↓

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 CN6 (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 03-64.

↓

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 03-58. • 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:

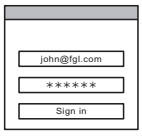
- Before starting this setting, wait for 60 seconds or more after the power supply is connected to the air conditioner (via breaker or plug).
- Check that the smartphone or tablet PC is linked to the wireless router to be connected to the air conditioner.
  The setting does not work if the same wireless 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

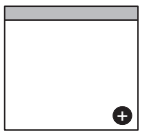
● Button mode

1. Launch the mobile app.

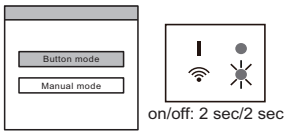
2. Sign in with your e-mail address and password following the screen on the mobile app.



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



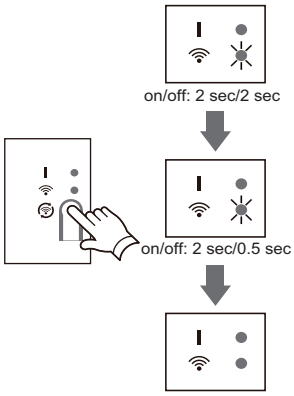
4. Confirm that the LED 2 blinks (on/off at 2 seconds intervals). Then select Button mode on the screen. If the LED 1 and 2 are off, push the setting button once.



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.

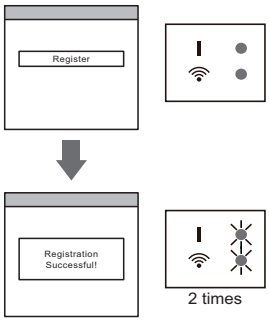
TROUBLESHOOTING

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.

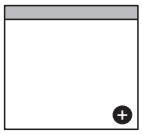
TROUBLESHOOTING

● Manual mode (For Android)

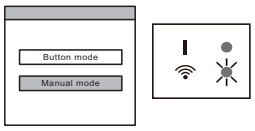
1. Launch the mobile app.

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.

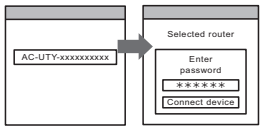


4. Select manual mode.



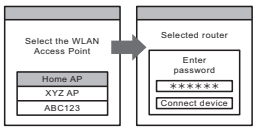
If both of the LED 1 and 2 are off, push the setting button once.

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



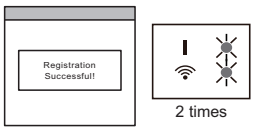
Input the PIN code written on the wireless LAN label.

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.



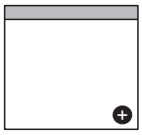
TROUBLESHOOTING

● Manual mode (For iOS)

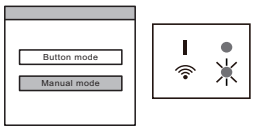
1. Launch the mobile app.

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.

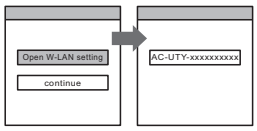


4. Select manual mode.



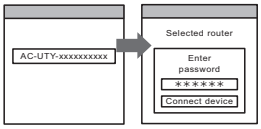
If both of the LED 1 and 2 are off, push the setting button once.

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

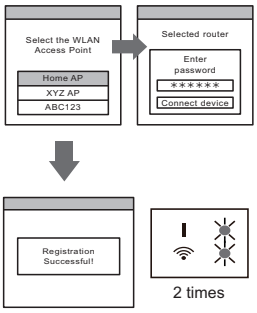


Select the SSID of the air conditioner to be connected.

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)

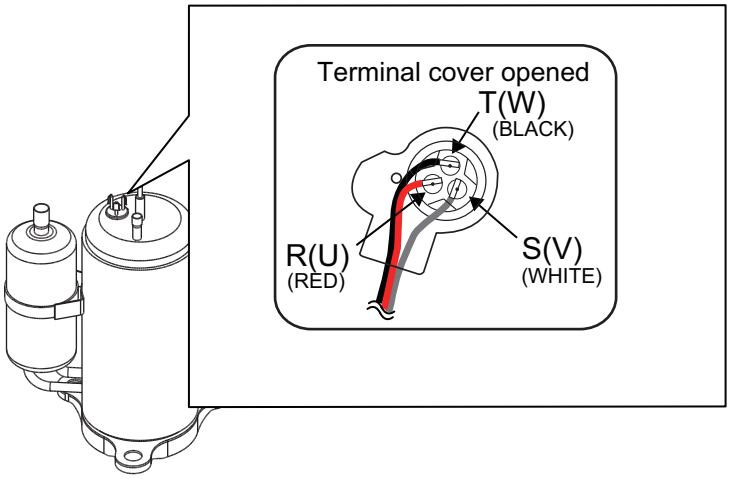
Does not start up	Stops soon after starting up	Abnormal noise
↓	↓	↓
Is there open or loose connection cable?	Is there open or loose connection cable?	Check if vibration noise by loose bolt or contact noise of piping is happening.
↓	↓	↓
Check main PCB, connection of compressor, and winding resistance. (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

TROUBLESHOOTING

Check point 1. Check connection

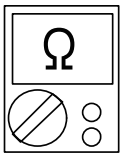
Check terminal connection of compressor.
(loose or incorrect wiring)

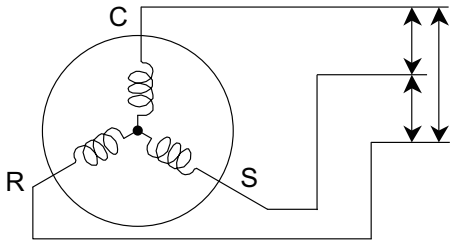


↓

Check point 2. Check winding resistance

Check winding resistance of each terminal.
Resistance value: 1.916 Ω at 68 °F (20°C)





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

↓

Check point 3. Replace inverter PCB

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

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

TROUBLESHOOTING

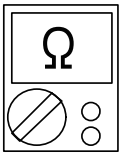
Check point 1. Check connections

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 02-14.

Check point 2. Check coil of EEV

Remove connector, check each winding resistance of coil.

Read wire	Resistance value
1 (Red)—2 (Blue)	46 Ω ± 4 Ω at 68°F (20°C) 
1 (Red)—3 (Orange)	
1 (Red)—4 (Yellow)	
1 (Red)—5 (White)	

→ 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.

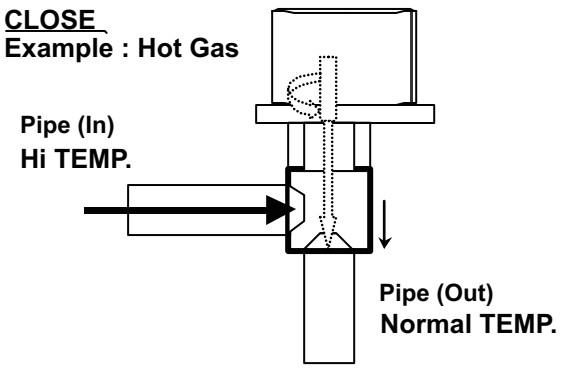
Check point 4. Check noise at start up

Turn on the power and check the operation noise.

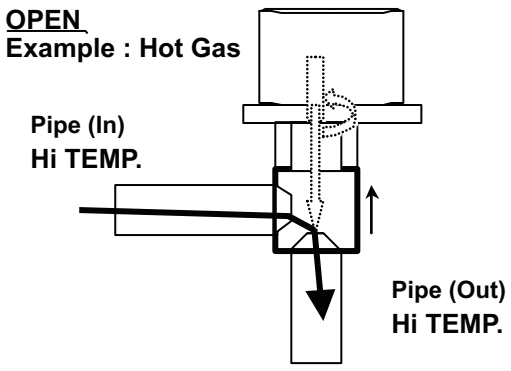
→ If an abnormal noise does not show, replace main PCB.

Check point 5. Check Opening and Closing Operation of Valve

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



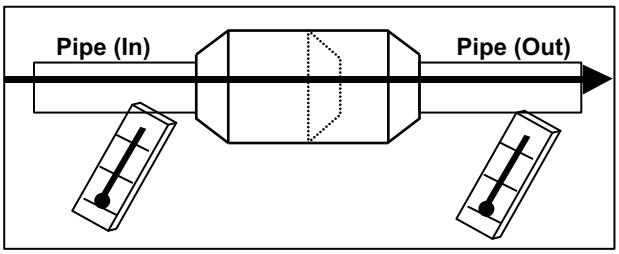
If it is open, it has no temp. difference between inlet and outlet



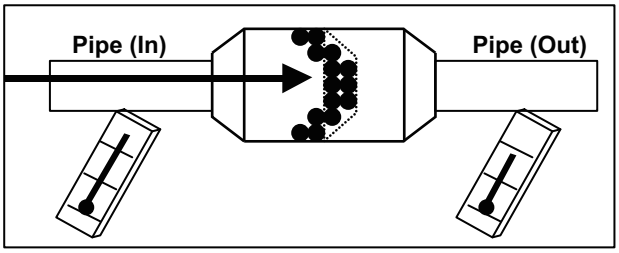
TROUBLESHOOTING

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

TROUBLESHOOTING

Check point 1. Check rotation of fan

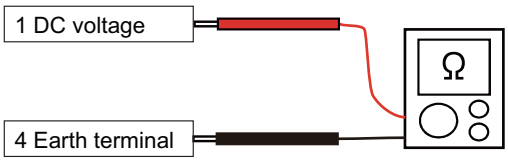
Rotate the fan by hand when operation is off.
(Check if fan is caught, dropped off or locked motor)
→ If fan or bearing is abnormal, replace it.

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



5-5. Outdoor unit fan motor

TROUBLESHOOTING

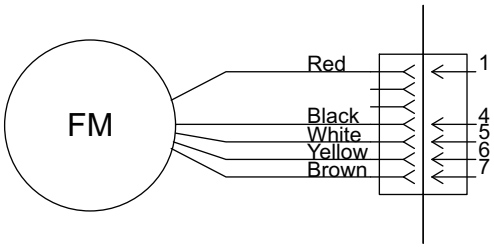
Check point 1. Check rotation of fan

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 main PCB.



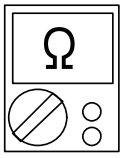
Pin number (wire color)	Terminal function (symbol)
1 (Red)	DC voltage (Vm)
2	No function
3	No function
4 (Black)	Earth terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown)	Feed back (FG)

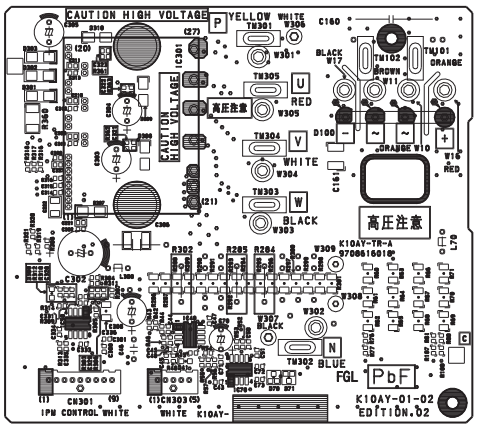
5-6. IPM on transistor PCB

TROUBLESHOOTING

Check point 1

1 Disconnect the connection wires between the transistor PCB—capacitor PCB and transistor PCB—inverter PCB.





2 Set the tester to the resistance mode, and measure the resistance between the following terminals.

TM301 (P)—TM305 (U)/TM304 (V)/TM303 (W)

TM302 (N)—TM305 (U)/TM304 (V)/TM303 (W)

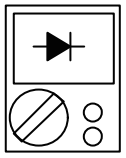
3 Judge the result of 2 as follows:

Terminal		Resistance value
Tester		
(+)	(-)	
P	U	Over 2 kΩ (Including ∞ Ω)
P	V	
P	W	
U	P	Over 20 kΩ (Including ∞ Ω)
V	P	
W	P	
N	U	
N	V	
N	W	
U	N	Over 2 kΩ (Including ∞ Ω)
V	N	
W	N	

Check point 2

4 Set tester to the diode mode, and measure the voltage value between the following terminals.

5 Judge the result of 4 as follows:



Terminal		Tester screen
Tester		
(+)	(-)	
P	U	∞
P	V	
P	W	
U	P	0.3 to 0.7 V
V	P	
W	P	
N	U	
N	V	
N	W	
U	N	∞
V	N	
W	N	

TROUBLESHOOTING

6. Thermistor resistance values

6-1. Indoor unit

■ Room temperature thermistor

Temperature °F (°C)	Resistance (kΩ)	Voltage (V)
14.0 (-10.0)	58.25	0.73
23.0 (-5.0)	44.03	0.93
32.0 (0.0)	33.62	1.15
41.0 (5.0)	25.93	1.39
50.0 (10.0)	20.18	1.66
59.0 (15.0)	15.84	1.94
68.0 (20.0)	12.54	2.22
77.0 (25.0)	10.00	2.50
86.0 (30.0)	8.04	2.77
95.0 (35.0)	6.51	3.03
104.0 (40.0)	5.30	3.27
113.0 (45.0)	4.35	3.49

■ Heat exchanger temperature thermistor

Temperature °F (°C)	Resistance (kΩ)	Voltage (V)
-22.0 (-30.0)	1,131.91	0.21
-13.0 (-25.0)	804.52	0.29
-4.0 (-20.0)	579.59	0.40
5.0 (-15.0)	422.89	0.53
14.0 (-10.0)	312.27	0.69
23.0 (-5.0)	233.21	0.88
32.0 (0.0)	176.03	1.10
41.0 (5.0)	134.23	1.36
50.0 (10.0)	103.34	1.63
59.0 (15.0)	80.28	1.92
68.0 (20.0)	62.91	2.21
77.0 (25.0)	49.70	2.51
86.0 (30.0)	39.57	2.79
95.0 (35.0)	31.74	3.06
104.0 (40.0)	25.64	3.30
113.0 (45.0)	20.85	3.53
122.0 (50.0)	17.06	3.73
131.0 (55.0)	14.05	3.90
140.0 (60.0)	11.64	4.02
149.0 (65.0)	9.69	4.19

TROUBLESHOOTING

6-2. Outdoor unit

■ Discharge temperature thermistor

Temperature °F (°C)	Resistance (kΩ)	Voltage (V)
-22.0 (-30.0)	1,013.11	0.06
-12.0 (-25.0)	729.09	0.09
-4.0 (-20.0)	531.56	0.12
5.0 (-15.0)	392.31	0.16
14.0 (-10.0)	292.91	0.21
23.0 (-5.0)	221.09	0.28
32.0 (0.0)	168.60	0.36
41.0 (5.0)	129.84	0.46
50.0 (10.0)	100.91	0.57
59.0 (15.0)	79.12	0.71
68.0 (20.0)	62.55	0.86
77.0 (25.0)	49.84	1.03
86.0 (30.0)	40.01	1.23
95.0 (35.0)	32.35	1.43
104.0 (40.0)	26.34	1.65
113.0 (45.0)	21.58	1.88
122.0 (50.0)	17.79	2.11
131.0 (55.0)	14.75	2.34
140.0 (60.0)	12.30	2.57
149.0 (65.0)	10.32	2.79
158.0 (70.0)	8.70	3.00
167.0 (75.0)	7.36	3.19
176.0 (80.0)	6.27	3.37
185.0 (85.0)	5.36	3.54
194.0 (90.0)	4.60	3.69
203.0 (95.0)	3.96	3.83
212.0 (100.0)	3.43	3.96
221.0 (105.0)	2.98	4.07
230.0 (110.0)	2.60	4.17
239.0 (115.0)	2.27	4.26
248.0 (120.0)	2.00	4.33

TROUBLESHOOTING

■ Compressor temperature thermistor

Temperature °F (°C)	Resistance (kΩ)	Voltage (V)
-22.0 (-30.0)	1,013.11	0.06
-12.0 (-25.0)	729.09	0.09
-4.0 (-20.0)	531.56	0.12
5.0 (-15.0)	392.31	0.16
14.0 (-10.0)	292.91	0.21
23.0 (-5.0)	221.09	0.28
32.0 (0.0)	168.60	0.36
41.0 (5.0)	129.84	0.46
50.0 (10.0)	100.91	0.57
59.0 (15.0)	79.12	0.71
68.0 (20.0)	62.55	0.86
77.0 (25.0)	49.84	1.03
86.0 (30.0)	40.01	1.23
95.0 (35.0)	32.35	1.43
104.0 (40.0)	26.34	1.65
113.0 (45.0)	21.58	1.88
122.0 (50.0)	17.79	2.11
131.0 (55.0)	14.75	2.34
140.0 (60.0)	12.30	2.57
149.0 (65.0)	10.32	2.79
158.0 (70.0)	8.70	3.00
167.0 (75.0)	7.36	3.19
176.0 (80.0)	6.27	3.37
185.0 (85.0)	5.36	3.54
194.0 (90.0)	4.60	3.69
203.0 (95.0)	3.96	3.83
212.0 (100.0)	3.43	3.96
221.0 (105.0)	2.98	4.07
230.0 (110.0)	2.60	4.17
239.0 (115.0)	2.27	4.26
248.0 (120.0)	2.00	4.33

TROUBLESHOOTING

TROUBLESHOOTING

■ Heat exchanger temperature thermistor

Temperature °F (°C)	Resistance (kΩ)	Voltage (V)
-22.0 (-30.0)	95.58	0.24
-12.0 (-25.0)	68.90	0.32
-4.0 (-20.0)	50.31	0.43
5.0 (-15.0)	37.19	0.57
14.0 (-10.0)	27.81	0.73
23.0 (-5.0)	21.02	0.92
32.0 (0.0)	16.05	1.14
41.0 (5.0)	12.38	1.39
50.0 (10.0)	9.63	1.65
59.0 (15.0)	7.56	1.93
68.0 (20.0)	5.98	2.21
77.0 (25.0)	4.77	2.49
86.0 (30.0)	3.84	2.77
95.0 (35.0)	3.11	3.02
104.0 (40.0)	2.53	3.26
113.0 (45.0)	2.08	3.48
122.0 (50.0)	1.71	3.68
131.0 (55.0)	1.42	3.85
140.0 (60.0)	1.19	4.00
149.0 (65.0)	1.00	4.13
158.0 (70.0)	0.84	4.25
167.0 (75.0)	0.71	4.35
176.0 (80.0)	0.61	4.43

■ Outdoor temperature thermistor

Temperature °F (°C)	Resistance (kΩ)	Voltage (V)
-22.0 (-30.0)	224.33	0.73
-12.0 (-25.0)	159.71	0.97
-4.0 (-20.0)	115.24	1.25
5.0 (-15.0)	84.21	1.56
14.0 (-10.0)	62.28	1.90
23.0 (-5.0)	46.58	2.26
32.0 (0.0)	35.21	2.61
41.0 (5.0)	26.88	2.94
50.0 (10.0)	20.72	3.25
59.0 (15.0)	16.12	3.52
68.0 (20.0)	12.64	3.76
77.0 (25.0)	10.00	3.97
86.0 (30.0)	7.97	4.14
95.0 (35.0)	6.40	4.28
104.0 (40.0)	5.18	4.41
113.0 (45.0)	4.21	4.51
122.0 (50.0)	3.45	4.59
131.0 (55.0)	2.85	4.65

Refrigerant R410A
INVERTER

4. CONTROL AND FUNCTIONS

CONTENTS

4. CONTROL AND FUNCTIONS

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1. Compressor frequency control

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.

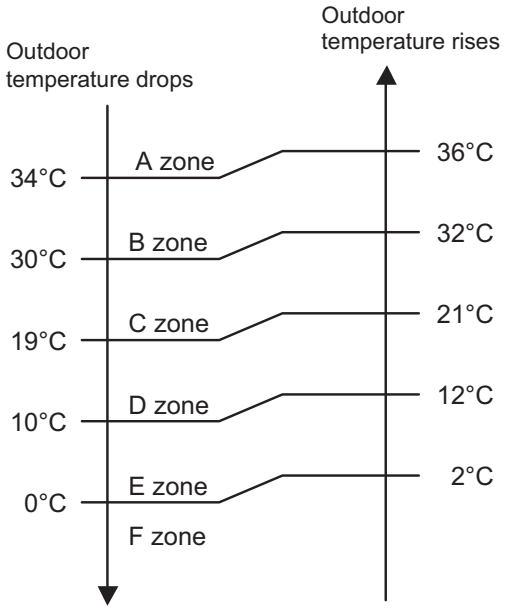
- If the room temperature is 6.0 °C higher than a set temperature, the operation rotation number of compressor will attain to maximum performance.
- If the room temperature is 1.0 °C lower than a set temperature, the compressor will be stopped.
- When the room temperature is within the range of +6.0°C 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 frequency	Maximum frequency
ASUG09LZAS	8 rps	58 rps
ASUG12LZAS	8 rps	74 rps
ASUG15LZAS	8 rps	80 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
ASUG09LZAS	A zone	58	42	30	24
	B zone	58	42	30	24
	C zone	58	42	30	24
	D zone	50	34	26	20
	E zone	50	34	26	20
	F zone	50	34	26	20
ASUG12LZAS	A zone	74	42	30	24
	B zone	74	42	30	24
	C zone	74	42	30	24
	D zone	50	34	26	20
	E zone	50	34	26	20
	F zone	50	34	26	20
ASUG15LZAS	A zone	80	42	28	22
	B zone	80	42	28	22
	C zone	80	42	28	22
	D zone	54	34	24	18
	E zone	54	34	24	18
	F zone	54	34	24	18

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 frequency of compressor.

- If the room temperature is 6.0 °C lower than a set temperature, the compressor operation frequency 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 compressor frequency is controlled within the range shown below.

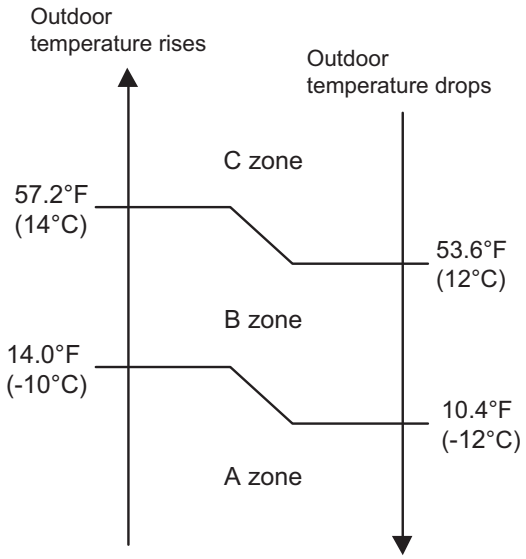
- **Compressor frequency range**

Unit: rps

Model name	Minimum frequency	Maximum frequency
ASUG09LZAS ASUG12LZAS ASUG15LZAS	8	130

CONTROL AND FUNCTIONS

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



Unit: rps

Model name	Outdoor temperature zone	Indoor unit fan mode			
		HIGH	MED	LOW	QUIET
ASUG09LZAS ASUG12LZAS	A zone	130	130	58	46
	B zone	130	130	58	46
	C zone	130	130	58	46
ASUG15LZAS	A zone	130	130	54	42
	B zone	130	130	54	42
	C zone	130	130	54	42

1-3. Dry operation

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

Zone is defined by set temperature and room temperature.

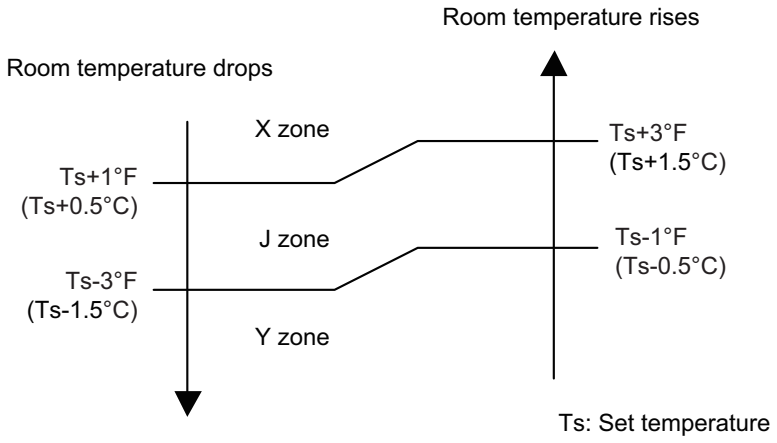
- **Compressor frequency range**

Unit: rps

Model name	Outdoor temperature zone	Operating frequency
ASUG09LZAS ASUG12LZAS	X zone	24
	J zone	18
	Y zone	0
ASUG15LZAS	X zone	22
	J zone	16
	Y zone	0

CONTROL AND FUNCTIONS

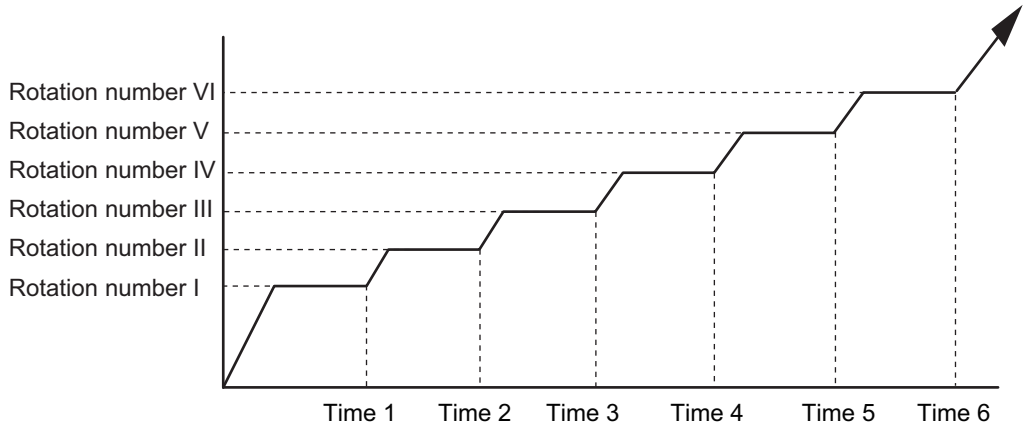
- **Compressor control based on room temperature**



1-4. Compressor frequency at normal start-up

■ Models: AOUG09LZAH1, AOUG12LZAH1, and AOUG15LZAH1

Compressor frequency soon after starting is controlled as below.

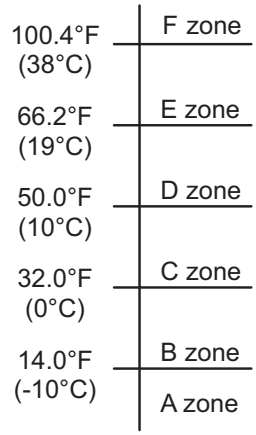


Frequency (rps)	I	II	III	IV	V	VI
	35	52	64	71	89	97
Time (sec)	1	2	3	4	5	6
	60	140	170	200	350	410

1-5. Compressor frequency limitation by outdoor temperature

The minimum compressor frequency is limited by outdoor temperature as below.

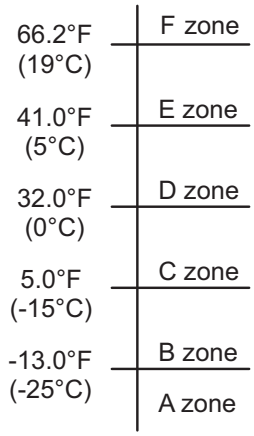
- **Cooling/Dry mode**



Model name	Outdoor temperature zone	Limitation of compressor frequency
AOUG09LZAH1 AOUG12LZAH1	A zone	37 rps
	B zone	37 rps
	C zone	37 rps
	D zone	28 rps
	E zone	1 rps
	F zone	22 rps
AOUG15LZAH1	A zone	33 rps
	B zone	33 rps
	C zone	33 rps
	D zone	25 rps
	E zone	10 rps
	F zone	20 rps

CONTROL AND FUNCTIONS

- **Heating mode**



Model name	Outdoor temperature zone	Limitation of compressor frequency
AOUG09LZAH1 AOUG12LZAH1	A zone	34 rps
	B zone	34 rps
	C zone	34 rps
	D zone	15 rps
	E zone	14 rps
	F zone	14 rps
AOUG15LZAH1	A zone	30 rps
	B zone	30 rps
	C zone	30 rps
	D zone	13 rps
	E zone	10 rps
	F zone	10 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 64.4°F (18°C) and 86.0°F (30°C) in 1.8°F (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 + 3.6°F (2°C)	Cooling
Ts + 3.6°F (2°C) ≥ Tr ≥ Ts - 3.6°F (2°C)	Middle zone
Tr < Ts - 3.6°F (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.

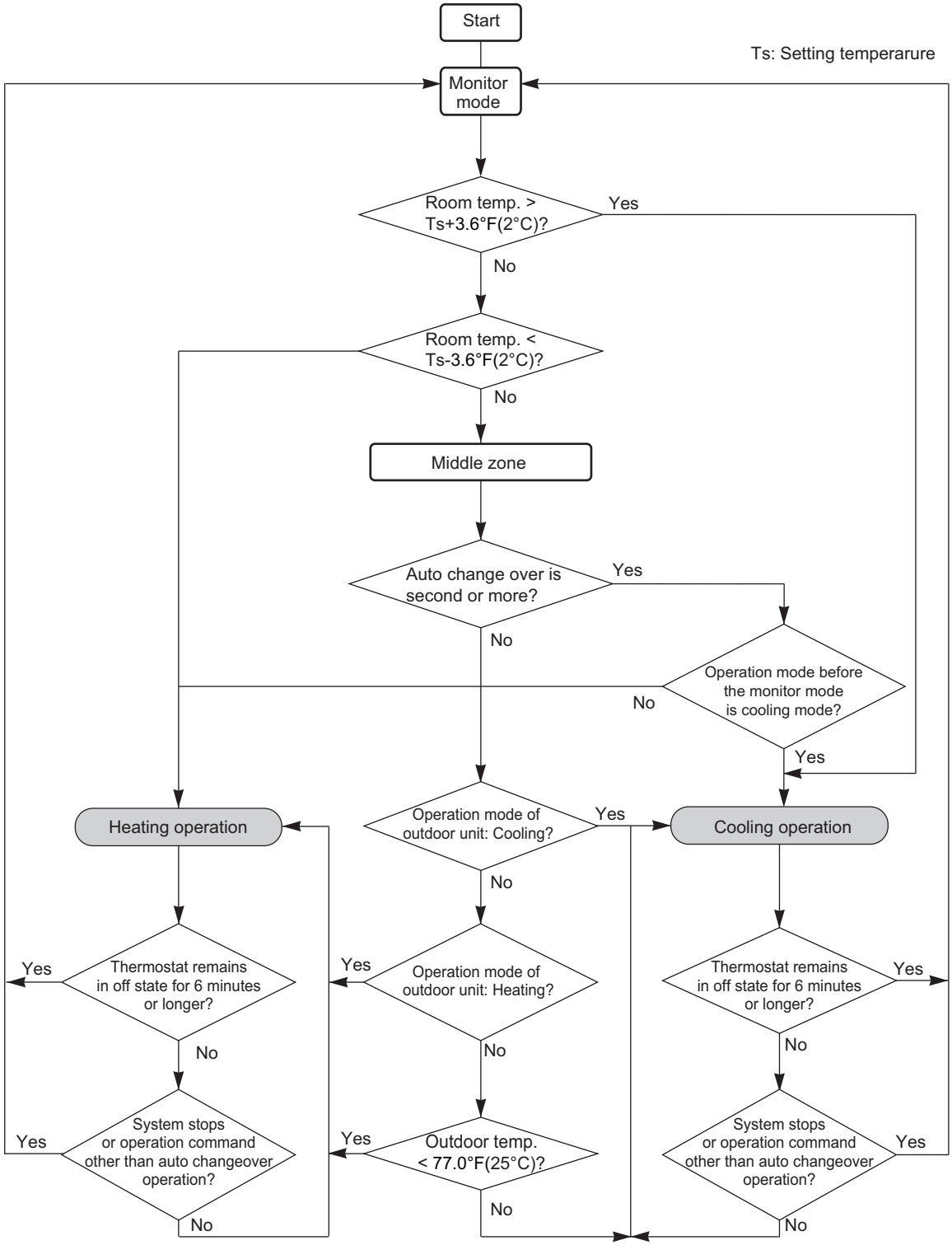
Outdoor temp.	Operation mode
77.0°F (25°C) or more	Cooling
Less than 77.0°F (25°C)	Heating

- 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)	
		ASUG09LZAS ASUG12LZAS	ASUG15LZAS
Heating	POWERFUL	1,270	1,370
	HIGH	1,200	1,300
	MED+	1,050	1,130
	MED	950	1,050
	LOW	780	780
	QUIET	590	650
	Cool air prevention	520	570
	S-LOW	520	520
Cooling/Fan	POWERFUL	1,270	1,340
	HIGH	1,200	1,270
	MED	950	1,050
	LOW	780	780
	QUIET	590	650
	Soft quiet	520*1	570*1
	S-LOW	520*2	520*2
Dry		X zone: 590 J zone:550	X zone: 650 J zone:610

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

■ Fan operation

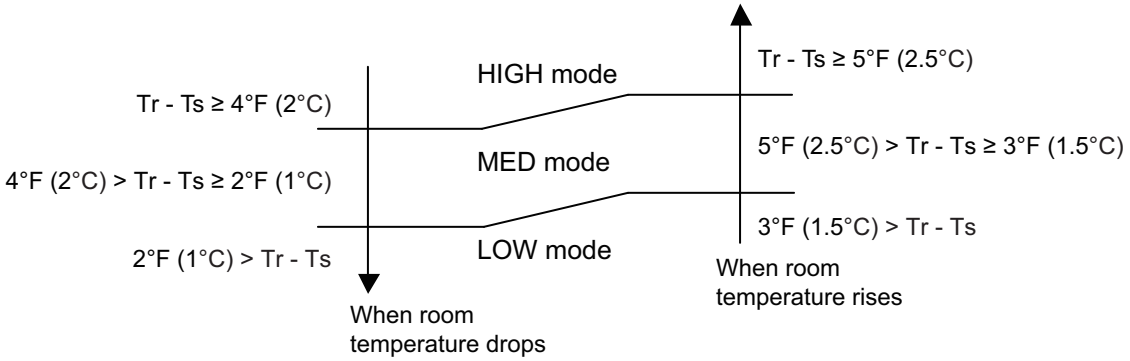
Airflow can be switched in 5 steps such as AUTO, QUIET, LOW, MED, HIGH while indoor unit fan only runs.
When fan mode is set at AUTO, it operates on MED fan speed.

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)



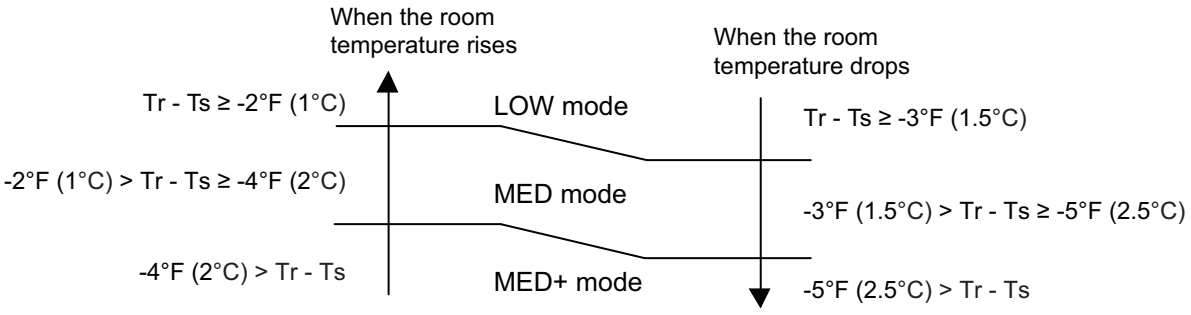
■ Dry operation

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.

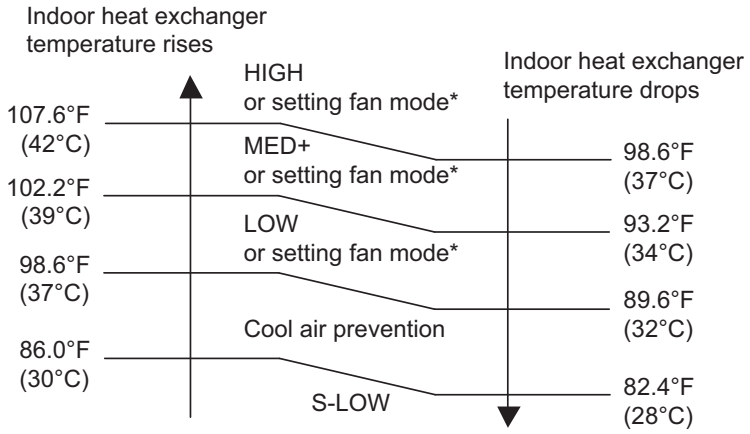
Airflow change over (Heating: Auto)



■ Cool air prevention control (heating mode)

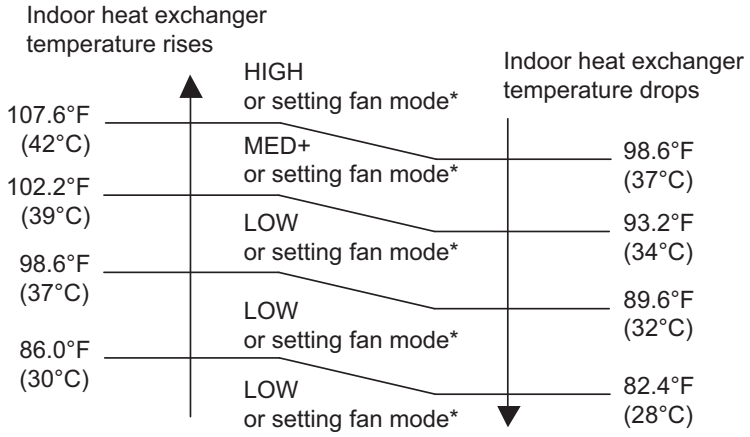
The maximum value of the indoor fan speed is set as shown below, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

- **Normal operation**



*: Lower speed is selected.

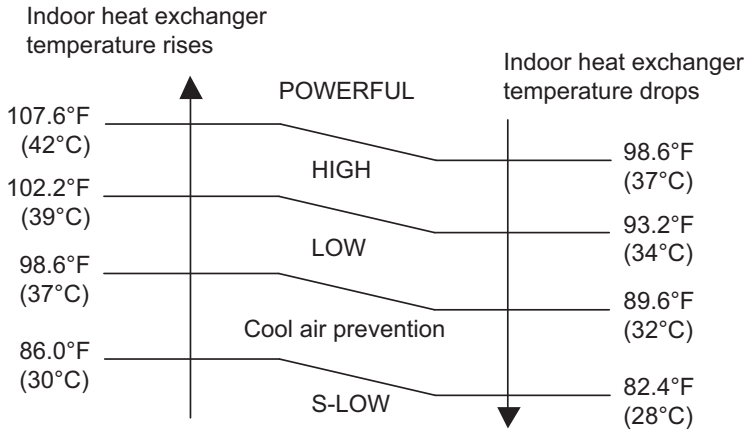
7 minutes later:



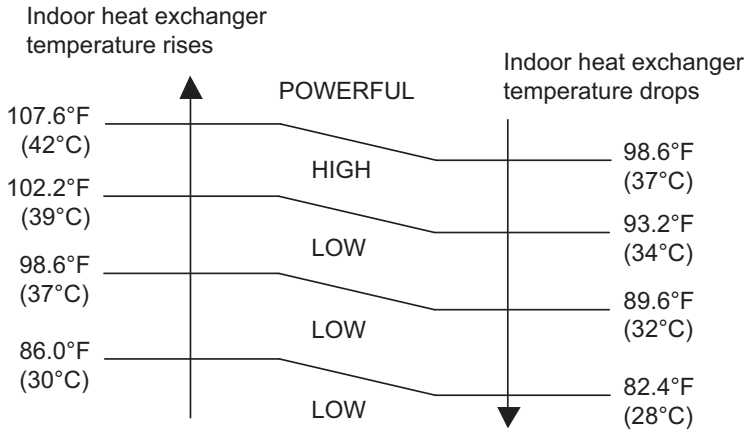
*: Lower speed is selected.

CONTROL AND FUNCTIONS

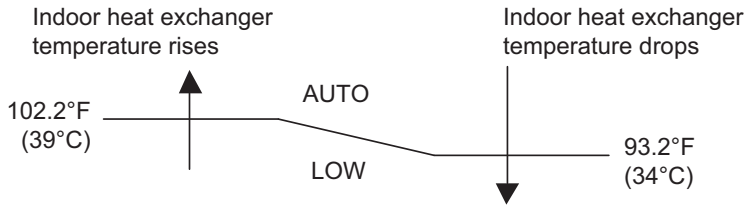
- **Powerful operation**



7 minutes later:

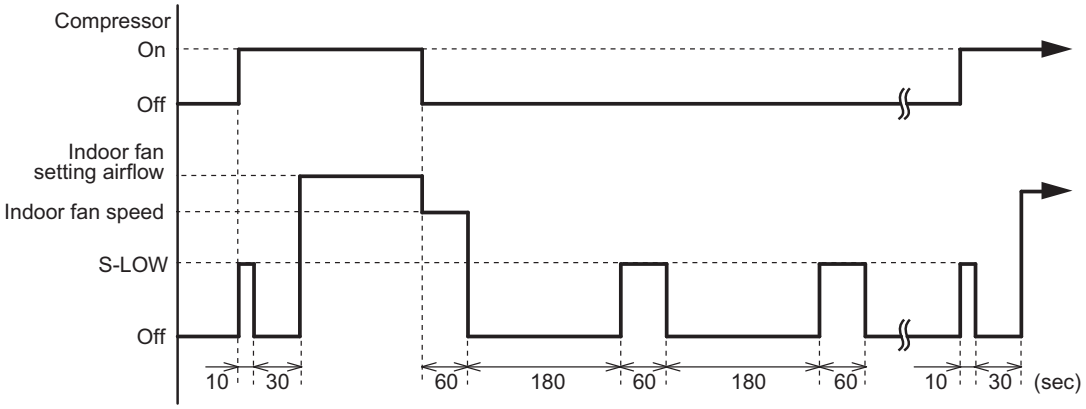


- **MIN. HEAT operation**



■ 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

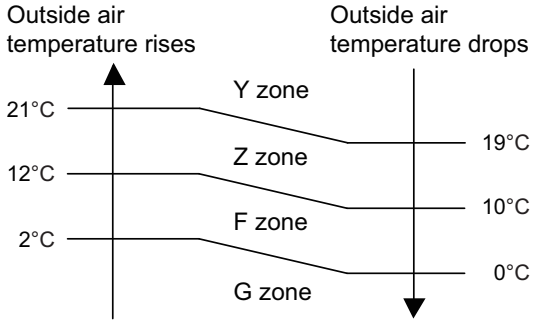
This outdoor unit has a DC fan motor. (Control method is different between AC and DC motors.)

■ Fan speed

● Model: AOUG09LZAH1

Fan speed is defined by outdoor temperature and compressor frequency.

- **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	—	1,100	—	—	—	—
S-HIGH1	1,050	1,100	—	—	—	—
HIGH	1,050	1,100	—	—	—	—
10	—	1,100	—	—	—	—
9	1,050	1,100	1,050	850	320	270
8	870	870	870	850	320	270
7	760	780	760	770	320	270
6	760	760	760	630	270	230
5	560	760	560	440	270	230
4	440	550	440	320	270	230
3	440	500	440	320	270	230
2	440	420	440	320	270	230
1	440	420	440	320	270	230

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

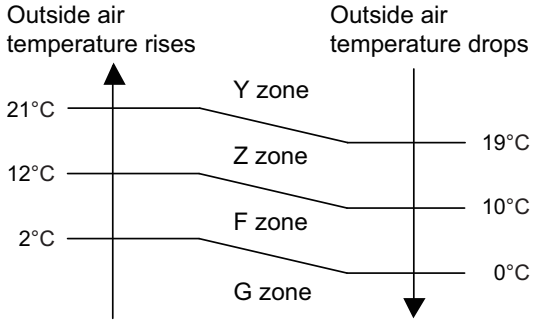
Fan speed after defrost control: 1,100 rpm

CONTROL AND FUNCTIONS

● Model: AOUG12LZAH1

Fan speed is defined by outdoor temperature and compressor frequency.

- **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	—	1,100	—	—	—	—
S-HIGH1	1,050	1,100	—	—	—	—
HIGH	1,050	1,100	—	—	—	—
10	—	1,100	—	—	—	—
9	1,050	1,100	1,050	850	320	270
8	810	870	810	850	320	270
7	810	760	810	770	320	270
6	560	760	560	630	270	230
5	560	680	560	440	270	230
4	440	530	440	320	270	230
3	440	500	440	320	270	230
2	440	420	440	320	270	230
1	440	420	440	320	270	230

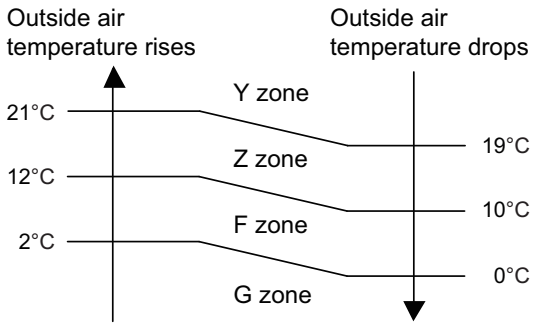
NOTE: After defrost control on the heating mode, the fan speed is kept higher regardless of the compressor frequency.
Fan speed after defrost control: 1,100 rpm

CONTROL AND FUNCTIONS

● Model: AOUG15LZAH1

Fan speed is defined by outdoor temperature and compressor frequency.

- **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	—	1,100	—	—	—	—
S-HIGH1	1,050	1,100	—	—	—	—
HIGH	1,050	1,100	—	—	—	—
10	—	1,100	—	—	—	—
9	1,050	1,100	1,050	850	320	270
8	840	920	840	850	320	270
7	750	920	750	770	320	270
6	690	710	690	630	270	230
5	560	620	560	440	270	230
4	440	560	440	320	270	230
3	440	500	440	320	270	230
2	440	440	440	320	270	230
1	440	440	440	320	270	230

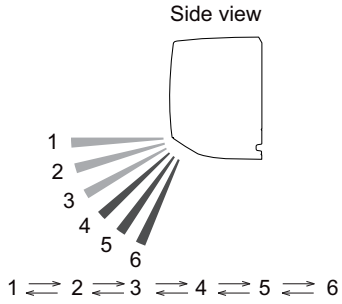
NOTE: After defrost control on the heating mode, the fan speed is kept higher regardless of the compressor frequency.
Fan speed after defrost control: 1,100 rpm

CONTROL AND FUNCTIONS

4. Louver control

4-1. Horizontal louver control

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



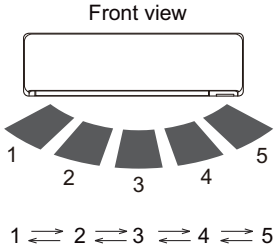
- Remote controller display is not changed.
- Up/down airflow direction is set automatically as shown, in accordance with the type of operation selected.

  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. Vertical louver control

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



Remote controller display is not changed.

CONTROL AND FUNCTIONS

4-3. Swing operation

- To select up/down airflow swing operation
  When the swing signal is received, the horizontal 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 left/right airflow swing operation
  When the swing signal is received, the vertical louver starts to swing.
  - Swinging range
    - All mode: 1 ↔ 5
  - When the indoor fan is S-LOW or stop mode, the swing operation is interrupted and it stops at either left end or right end.

- To select up/down and left/right airflow swing operation
  When the swing signal is received, both of the vertical and the horizontal louvers start to swing.

CONTROL AND FUNCTIONS

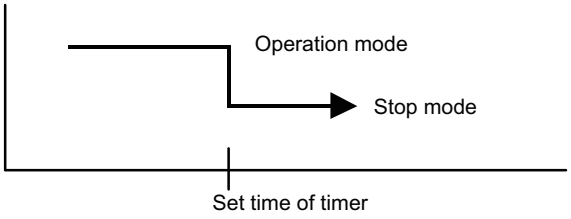
5. Timer operation control

5-1. Wireless remote control

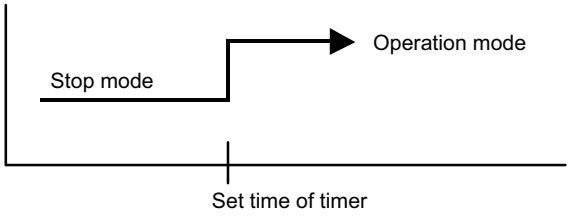
On/Off timer	Program timer	Sleep timer	Weekly timer
○	○	○	○

■ On/Off timer

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

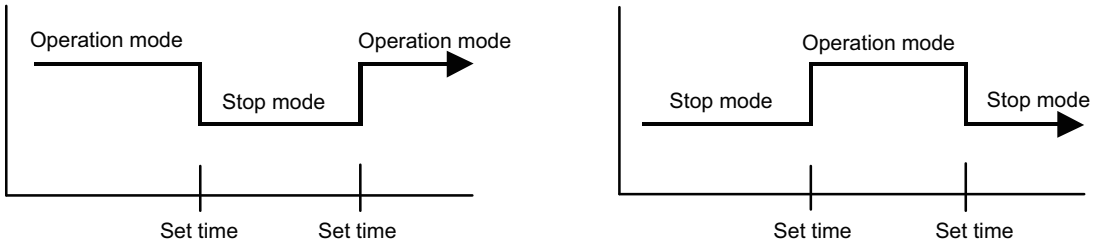


- On timer: When the clock reaches the set timer, the air conditioner will be turned on.



■ 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.

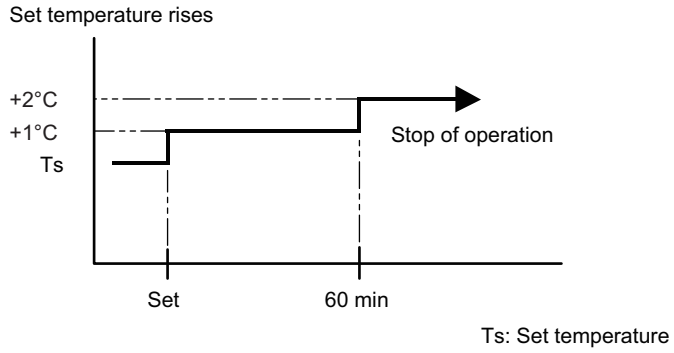
CONTROL AND FUNCTIONS

CONTROL AND FUNCTIONS

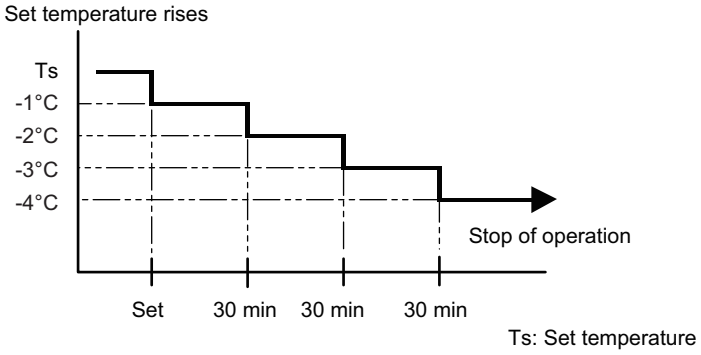
■ Sleep timer

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

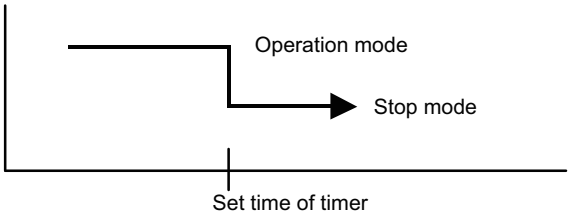
On and off timer can be combined, and up to 4 reservations per day and 28 reservations per week. Before setting the program, set the week and time of the air conditioner at first. If the week and time are not set, the weekly timer will not operate correctly at the setting time.

5-2. Wired remote control

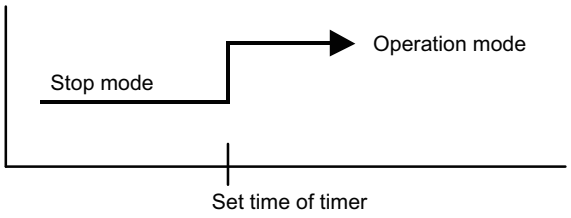
On/Off timer	Program timer	Sleep timer	Weekly timer	Temperature Setback Timer
○	○	○	○	○

■ On/Off timer

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

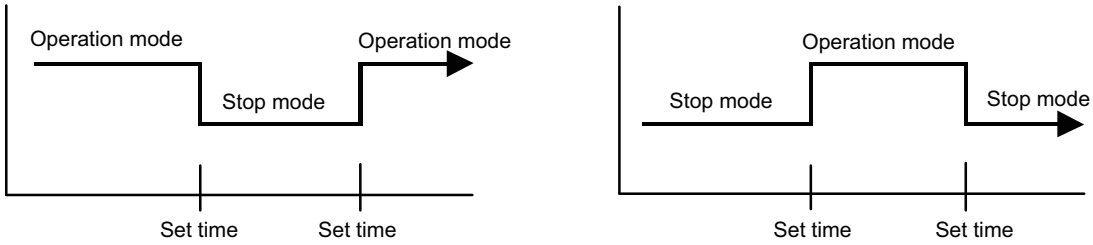


- On timer: When the clock reaches the set timer, the air conditioner will be turned on.



■ 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.

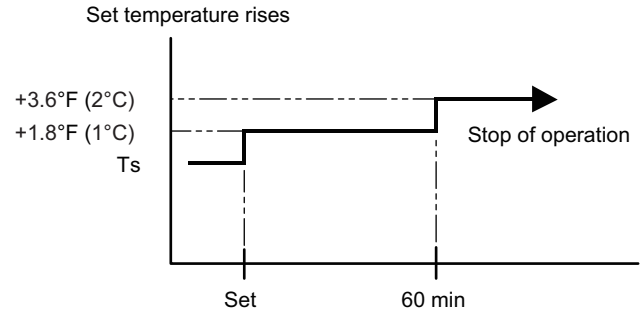
CONTROL AND FUNCTIONS

CONTROL AND FUNCTIONS

■ Sleep timer

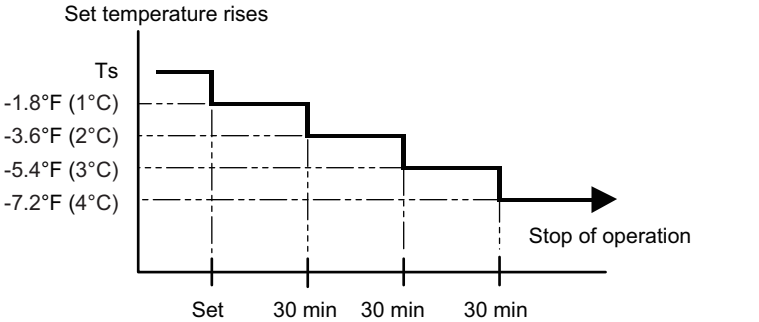
If the sleep timer is set, the room temperature is monitored and the operation is stopped automatically. If the operation mode or the set temperature is change after the sleep timer is set, the operation is continued according to the changed setting of the sleep timer from that time on.

- In the cooling operation mode
  When the sleep timer is set, the setting temperature is increased 1.8°F (1°C). It increases the setting temperature another 1.8°F (1°C) after 1 hour. After that, the setting temperature is not changed and the operation is stopped at the setting time.



Ts: Set temperature

- In the heating operation mode
  When the sleep timer is set, the setting temperature is decreased 1.8°F (1°C). It decreases the setting temperature another 1.8°F (1°C) every 30 minutes. Upon lowering 7.2°F (4°C), the setting temperature is not changed and the operation is stopped at the setting time.



Ts: Set temperature

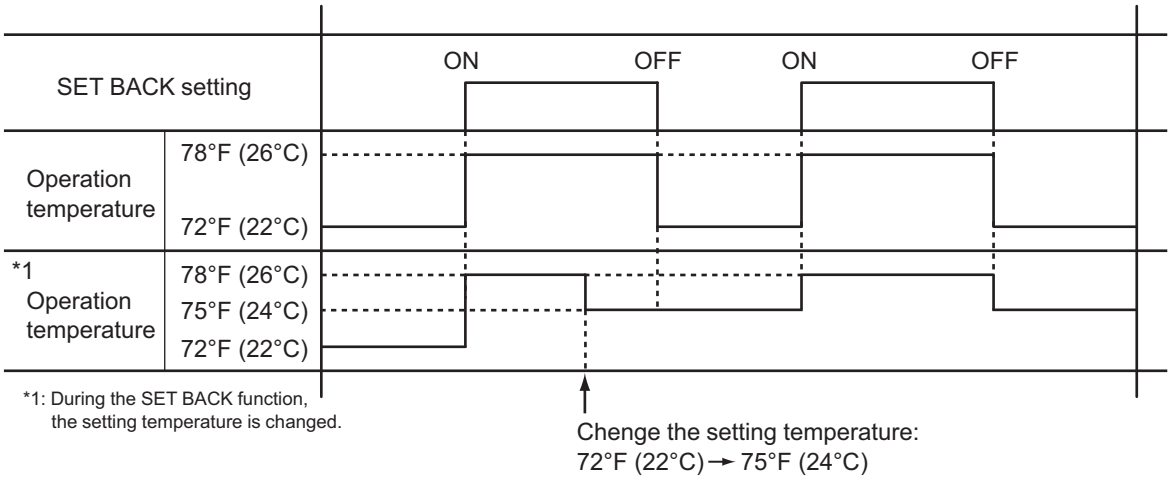
■ Weekly timer

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 Setback Timer

- The temperature setback timer only changes the set temperature for 7 days, it cannot be used to start or stop air conditioner operation.
- The temperature setback 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 64°F (18°C) even if the SET BACK temperature is set to 63°F (17°C) or lower.

Case of Temperature Setback Timer on the Cooling operation. (Setting temperature :72°F [22°C], SET BACK temperature :78°F [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 ≤ 15.8°F (-9°C) and Tn-Ta ≥ 9.0°F (5°C)	Tn ≤ 23.0°F (-5°C)

– **2nd time and after**

Compressor integrating operation time	Less than 40 min.	More than 40 min.
Condition	Does not operate	Tn-Tn10 < -9.0°F (-5°C) (Tn ≤ -6°C) Tn-Tnb < -3.6°F (-2°C) (Tn ≤ -6°C) Tn ≤ -20°C (Ta ≥ 14.0°F (-10°C)) Tn ≤ -7°C or Tn ≤ -25°C (Ta < 14.0°F (-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)	13°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: 24.8°F (-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)	13°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
MIN. HEAT operation
Outdoor low noise operation
Remote control setting
WLAN indicator lamp 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	75.2°F (24°C)
Horizontal louver setting	Standard
Vertical louver setting	According to memory position
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
Horizontal louver setting	Standard
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. MIN. HEAT operation

MIN. HEAT operation performs as below setting when pressing MIN. HEAT button.

Operation mode	Heating
Setting temperature	50°F (10°C)
Fan mode	AUTO
LED display	Economy
Defrost operation	Operate as normal

7-5. 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 +2°F (1°C)	Setting temperature -2°F (1°C)

CONTROL AND FUNCTIONS

7-6. POWERFUL operation

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

Compressor frequency		Maximum
Fan mode		POWERFUL
Vertical airflow direction louver setting	Cooling	3
	Dry	
	Heating	6

Release condition:

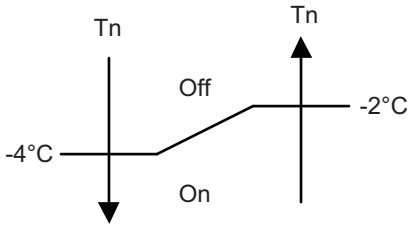
- Cooling/Dry
  Room temperature ≤ Setting temperature -0.5°C or Operation time has passed 20 minutes.
- Heating
  Room temperature ≥ Setting temperature +0.5°C or Operation time has passed 20 minutes.

CONTROL AND FUNCTIONS

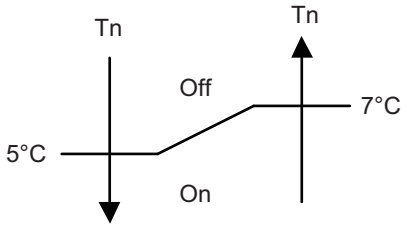
7-7. Compressor preheating

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	50
Retry set number	3

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

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.

7-11. Outdoor unit low noise operation

The outdoor unit low noise operation functions by OUTDOOR UNIT LOW NOISE button on the remote controller.

This operation stops the PFC control, and changes the current value.

- **Models: AOUG09LZAH1 and AOUG12LZAH1**

Operation mode	Current	
	Trigger condition	Release condition
Cooling/Dry mode	4.5 A	4.0 A
Heating mode	3.0 A	2.5 A

- **Model: AOUG15LZAH1**

Operation mode	Current	
	Trigger condition	Release condition
Cooling/Dry mode	4.5 A	4.0 A
Heating mode	3.5 A	3.0 A

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

Trigger condition	104°C
Compressor frequency	-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 compressor frequency 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		39.2°F (4°C)
Release condition	Outdoor temp. ≥ 50°F (10°C)*1 Outdoor temp. ≥ 53.6°F (12°C)*2	44.6°F (7°C)
	Outdoor temp. < 50°F (10°C)*1 Outdoor temp. < 53.6°F (12°C)*2	55.4°F (13°C)

*1: During the outdoor temperature dropping

*2: During the outdoor temperature rising

8-3. Current release control

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

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

■ Models: AOUG09LZAH1 and AOUG12LZAH1

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	122.0°F (50°C) ≤ Ta	4.5 A	4.0 A
	114.8°F (46°C) ≤ Ta < 122.0°F (50°C)	4.5 A	4.0 A
	104.0°F (40°C) ≤ Ta < 114.8°F (46°C)	6.0 A	5.5 A
	53.6°F (12°C) ≤ Ta < 104.0°F (40°C)	8.5 A	8.0 A
	35.6°F (2°C) ≤ Ta < 53.6°F (12°C)	8.5 A	8.0 A
	Ta < 35.6°F (2°C)	8.5 A	8.0 A
Heating	62.6°F (17°C) ≤ Ta	7.0 A	6.5 A
	53.6°F (12°C) ≤ Ta < 62.6°F (17°C)	9.0 A	8.5 A
	41.0°F (5°C) ≤ Ta < 53.6°F (12°C)	10.0 A	9.5 A
	Ta < 41.0°F (5°C)	10.0 A	9.5 A

■ Model: AOUG15LZAH1

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	50°C ≤ Ta	4.5 A	4.0 A
	46°C ≤ Ta < 50°C	4.5 A	4.0 A
	40°C ≤ Ta < 46°C	6.0 A	5.5 A
	12°C ≤ Ta < 40°C	9.0 A	8.5 A
	2°C ≤ Ta < 12°C	9.0 A	8.5 A
	Ta < 2°C	9.0 A	8.5 A
Heating	17°C ≤ Ta	7.0 A	6.5 A
	12°C ≤ Ta < 17°C	9.0 A	8.5 A
	5°C ≤ Ta < 12°C	11.0 A	10.5 A
	Ta < 5°C	12.5 A	12.0 A

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	149.0°F (65°C)

8-5. Low outdoor temperature protection

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

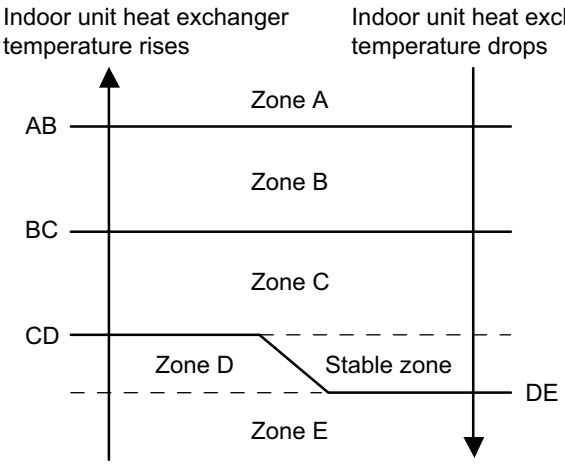
Operation mode	Cooling/Dry
Trigger condition	-15°C
Release condition	-10°C

CONTROL AND FUNCTIONS

8-6. High temperature and high pressure release control

The compressor is controlled as follows.

■ Models: AOUG09LZAH1, AOUG12LZAH1, and AOUG15LZAH1



AB: 145.4°F (63°C)
BC: 131.0°F (55°C)
CD: 127.4°F (53°C)
DE: 122.0°F (50°C)

Zone	Operation	
Zone A	Compressor is stopped.	
Zone B	The compressor frequency 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

Refrigerant R410A
INVERTER

5. FILED WORKING

CONTENTS

5. FILED WORKING

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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:

- Cover for the electrical enclosure on the outdoor unit is in place.
- There is no wiring mistake.
- Piping air tightness test and vacuuming have been performed firmly.
- All the necessary wiring work for outdoor unit has been finished.

After reconfirming the items listed above, connect the power supply of the indoor unit.

NOTES:

- Settings will not be changed if invalid numbers or setting values are selected.
- When optional wired remote controller is used, refer to the installation manual enclosed with the remote controller.

FIELD WORKING

FIELD WORKING

Entering function setting mode:

While pressing the POWERFUL button and TEMP. (∧) button simultaneously, press the RESET button to enter the function setting mode.

Selecting the function number and setting value:

1. Press the MIN. HEAT button. TEMP. (∧) (∨) buttons to select the function number. Press the MIN. HEAT button to switch between the left and right digits.
2. Press the POWERFUL button to proceed to value setting. To return the function number selection, press the POWERFUL button again.
3. Press the TEMP. (∧) (∨) buttons to select the setting value. To switch between the left and right digits, press the MIN. HEAT button.
4. Press the MODE button once. Confirm that you hear the beep sound.
5. Press the START/STOP button to fix the function setting. Confirm that you hear the beep sound.
6. Press the RESET button to end the function setting mode.
7. 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.

NOTES:

- The air conditioner custom code is set to A prior to shipment.
- 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.

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)	00	Remote controller address setting
2)	11	Filter sign
3)	30/31	Room temperature control for indoor unit sensor
4)	35/36	Room temperature control for wired remote controller sensor
5)	40	Auto restart
6)	42	Room temperature sensor switching
7)	44	Remote controller custom code
8)	46	External input control
9)	48	Room temperature sensor switching (Aux.)
10)	49	Indoor unit fan control for energy saving for cooling
11)	61	Control switching of external heaters
12)	62	Operating temperature switching of external heaters
13)	66	Outdoor temperature zone boundary temperature A
14)	67	Outdoor temperature zone boundary temperature B
15)	95	Heat insulation condition (building insulation)

FIELD WORKING

1) Remote controller address setting

NOTE: Because this setting is normally done automatically when 2-wire-type wired remote controller is installed, setting is unnecessary.

Multiple indoor units can be operated by using one wired remote controller.

Set the unit number of each indoor unit.

Function number	Setting value	Setting description	Factory setting
00	00	Unit no. 0	♦
	01	Unit no. 1	
	02	Unit no. 2	
	03	Unit no. 3	
	04	Unit no. 4	
	05	Unit no. 5	
	06	Unit no. 6	
	07	Unit no. 7	
	08	Unit no. 8	
	09	Unit no. 9	
	10	Unit no. 10	
	11	Unit no. 11	
	12	Unit no. 12	
	13	Unit no. 13	
	14	Unit no. 14	
	15	Unit no. 15	

2) 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	♦

3) Room temperature control for indoor unit sensor

NOTE: Before performing this setting, refer to Function 95.
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 78°F and the setting value is “03” (-2°F), the corrected temp. will be 80°F (78°F - [-2°F]).

The temperature correction values show the difference from the Standard setting “00” (manufacturer’s recommended value).
*When Function 95-01 (High insulation) is set, the Standard setting “00” will be the same as “No correction 0.0 °F (0.0 °C)” (01).

FIELD WORKING

Function number		Setting value	Setting description		Factory setting
30 (For cooling)	31 (For heating)	00	Standard setting*		♦
		01	No correction 0.0 °F (0.0 °C)		
		02	-1 °F (-0.5 °C)	More cooling Less heating	
		03	-2 °F (-1.0 °C)		
		04	-3 °F (-1.5 °C)		
		05	-4 °F (-2.0 °C)		
		06	-5 °F (-2.5 °C)		
		07	-6 °F (-3.0 °C)		
		08	-7 °F (-3.5 °C)		
		09	-8 °F (-4.0 °C)		
		10	+1 °F (+0.5 °C)	Less cooling More heating	
		11	+2 °F (+1.0 °C)		
		12	+3 °F (+1.5 °C)		
		13	+4 °F (+2.0 °C)		
		14	+5 °F (+2.5 °C)		
		15	+6 °F (+3.0 °C)		
		16	+7 °F (+3.5 °C)		
		17	+8 °F (+4.0 °C)		

4) Room temperature control for wired remote controller sensor

NOTE: Before performing this setting, refer to Function 95.
Depending on the installed environment, correction of the wire remote temperature sensor may be required. Select the appropriate control setting according to the installed environment.

To change this setting, set Function 42 to “Both“ (01).

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

*When Function 95-01 (High insulation) is set, the Standard setting "00" will be the same as "No correction 0.0 °C" (01).

Function number		Setting value	Setting description		Factory setting
35 (For cooling)	36 (For heating)	00	Standard setting*		♦
		01	No correction 0.0 °F (0.0 °C)		
		02	-1 °F (-0.5 °C)	More cooling Less heating	
		03	-2 °F (-1.0 °C)		
		04	-3 °F (-1.5 °C)		
		05	-4 °F (-2.0 °C)		
		06	-5 °F (-2.5 °C)		
		07	-6 °F (-3.0 °C)		
		08	-7 °F (-3.5 °C)		
		09	-8 °F (-4.0 °C)		
		10	+1 °F (+0.5 °C)	Less cooling More heating	
		11	+2 °F (+1.0 °C)		
		12	+3 °F (+1.5 °C)		
		13	+4 °F (+2.0 °C)		
		14	+5 °F (+2.5 °C)		
		15	+6 °F (+3.0 °C)		
		16	+7 °F (+3.5 °C)		
		17	+8 °F (+4.0 °C)		

5) 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.

6) Room temperature sensor switching

(Only for wired remote controller)

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

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

00: Sensor on the indoor unit is active.

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

NOTE: Remote controller sensor must be turned on by using the remote controller.

7) 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	

8) External input control

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

Function number	Setting value	Setting description	Factory setting
46	00	Operation/Stop mode 1 (R.C. enabled)	♦
	01	(Setting prohibited)	
	02	Forced stop mode	
	03	Operation/Stop mode 2 (R.C. disabled)	

9) Room temperature sensor switching (Aux.)

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

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

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

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

10) Indoor unit fan control for energy saving for cooling

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

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

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

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

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

NOTES:

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

FIELD WORKING

11) Control switching of external heaters

Sets the control method for external heater to be used.

For details, refer to “External heater output” in Chapter 2-4. "Details of function" on page 05-15.

Function number	Setting value	Setting description	Factory setting
61	00	Auxiliary heater control 1	♦
	01	Auxiliary heater control 2	
	02	Heat pump prohibition control	
	03	Auxiliary heater control by outdoor temperature 1	
	04	Auxiliary heater control by outdoor temperature 2	

12) Operating temperature switching of external heaters

Sets the temperature conditions when the external heater is ON.

For details, refer to “External heater output” in Chapter 2-4. "Details of function" on page 05-15.

Function number	Setting value	Setting description		Factory setting
		Heater: On	Heater: Off	
62	00	-5.4 °F (-3 °C)	-1.8 °F (-1 °C)	♦
	01	-3.6 °F (-2 °C)	-1.8 °F (-1 °C)	
	02	-3.6 °F (-2 °C)	-1.8 °F (-1 °C)	
	03	-5.4 °F (-3 °C)	-1.8 °F (-1 °C)	
	04	-7.2 °F (-4 °C)	-1.8 °F (-1 °C)	
	05	-9.0 °F (-5 °C)	-1.8 °F (-1 °C)	

13) Outdoor temperature zone boundary temperature A

Setting required if changing of the outdoor temperature setting for heat pump prohibition zone is required when auxiliary heater control by outdoor temperature 1 and 2 are performed on the indoor unit. For details, refer to “External heater output” in Chapter 2-4. "Details of function" on page 05-15.

Function number	Setting value	Setting description	Factory setting
66	00	-4.0 °F (-20 °C)	♦
	01	-0.4 °F (-18 °C)	
	02	3.2 °F (-16 °C)	
	03	6.8 °F (-14 °C)	
	04	10.4 °F (-12 °C)	
	05	14.0°F (-10 °C)	
	06	17.6 °F (-8 °C)	
	07	21.2 °F (-6 °C)	
	08	24.8 °F (-4 °C)	

FIELD WORKING

14) Outdoor temperature zone boundary temperature B

Setting required if changing of the outdoor temperature setting for heat pump only zone is required when auxiliary heater control by outdoor temperature 1 is performed on the indoor unit. For details, refer to “External heater output” in Chapter 2-4. "Details of function" on page 05-15.

Function number	Setting value	Setting description	Factory setting
67	00	42.8 °F (6 °C)	♦
	01	14.0 °F (-10 °C)	
	02	17.6 °F (-8 °C)	
	03	21.2 °F (-6 °C)	
	04	24.8 °F (-4 °C)	
	05	28.4°F (-2 °C)	
	06	32.0 °F (0 °C)	
	07	35.6 °F (2 °C)	
	08	39.2 °F (4 °C)	
	09	42.8 °F (6 °C)	
	10	46.4 °F (8 °C)	
	11	50.0 °F (10 °C)	
	12	53.6 °F (12 °C)	
	13	57.2 °F (14 °C)	
	14	60.8 °F (16 °C)	
	15	64.4 °F (18 °C)	

15) Heat insulation condition (building insulation)

Heat insulation conditions differ according to the installed environment.

"Standard insulation" (00) allows system to rapidly respond to the cooling or heating load changes.

"High insulation" (01) is when the heat insulation structure of the building is high and does not require system to rapidly respond to cooling or heating load changes.

When "High insulation" (01) is selected:

- Overheating (overcooling) is prevented at the start-up.
- All room-temperature control settings (Function 30, 31, 35, and 36) will reset to "No correction 0.0 °F (0.0 °C)".

Function number	Setting value	Setting description	Factory setting
95	00	Standard insulation	♦
	01	High insulation	

NOTE: When changing Function 95, perform this setting before other room-temperature control settings (Function 30, 31, 35, and 36). If Function 95 is not set first, room-temperature control settings (Function 30, 31, 35, and 36) will be reset and you must re-do them again.

1-2. 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 START/STOP button until only the clock is displayed on the remote controller display.
2. Press the MODE button for at least 5 seconds to display the current custom code. (Initially set to A.)
3. Press the TEMP. (∧) (∨) 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 clock 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 clock indicator. 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.

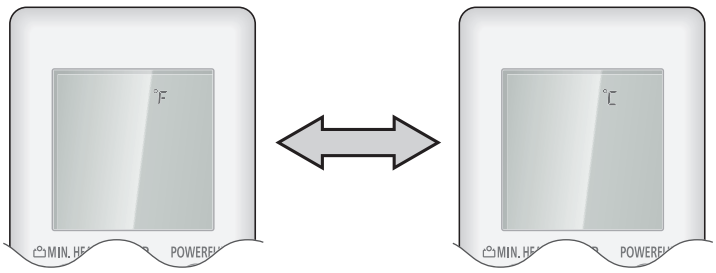
FIELD WORKING

1-3. Switching the temperature unit of remote controller

Displayed temperature unit on the remote controller LCD can be switched between °F (Fahrenheit) and °C (Celsius).

To change temperature unit, do as follows:

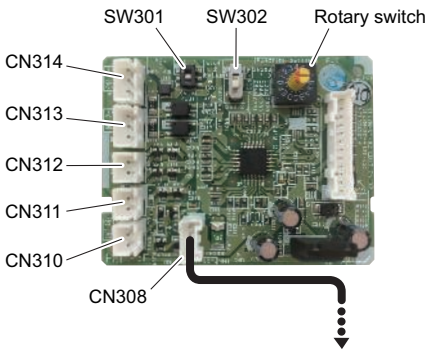
1. Press the TEMP. (Up) button (∧) for at least 5 seconds to display the current temperature unit. (Factory setting: °F)
2. Press the TEMP. (∧) (∨) buttons to switch the temperature unit between °F and °C.
3. With either of pressing the START/STOP button or no additional button operation for 30 seconds in step 2., the temperature unit currently selected will be set.



FIELD WORKING

2. External input and output

External input and output PCB



PCB	External input	External output	Connector	Input select	Input signal
External input and output (UTY-XCSXZ2)	Operation/Stop	—	CN313/ CN314	Dry contact/ Apply voltage	Edge/Pulse
	Forced stop				
	Forced thermostat off		CN313		Edge
	—	Operation status	CN310	—	—
		Error status	CN311		
		Indoor unit fan operation status	CN312		
		External heater output			

FIELD WORKING

2-1. External input

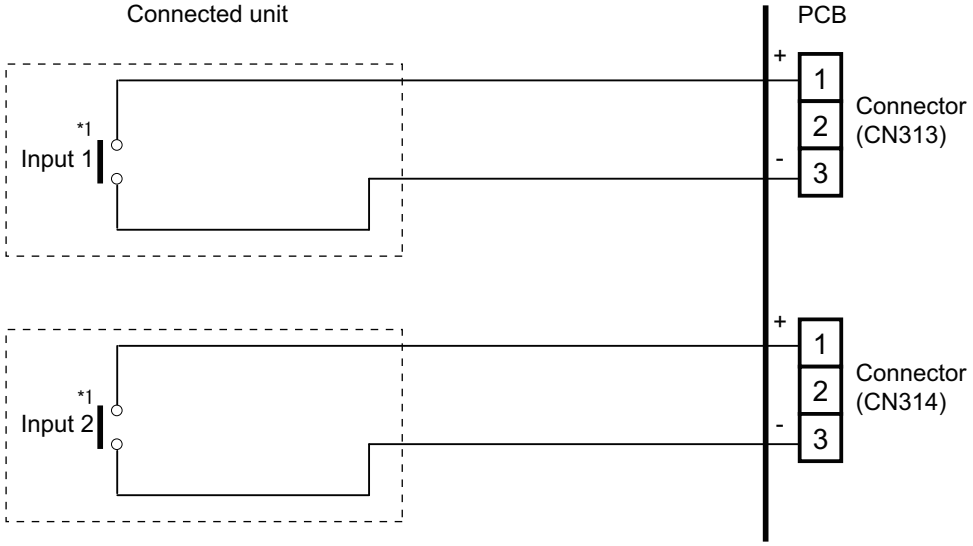
With using external input function, some functions on this product can be controlled from an external device.

- “Operation/Stop” mode or "Forced stop" mode can be selected with function setting of indoor unit.
- A twisted pair cable (22AWG) should be used. Maximum length of cable is 492 ft (150 m).
- The wire connection should be separate from the power cable line.

■ External Input and Output PCB

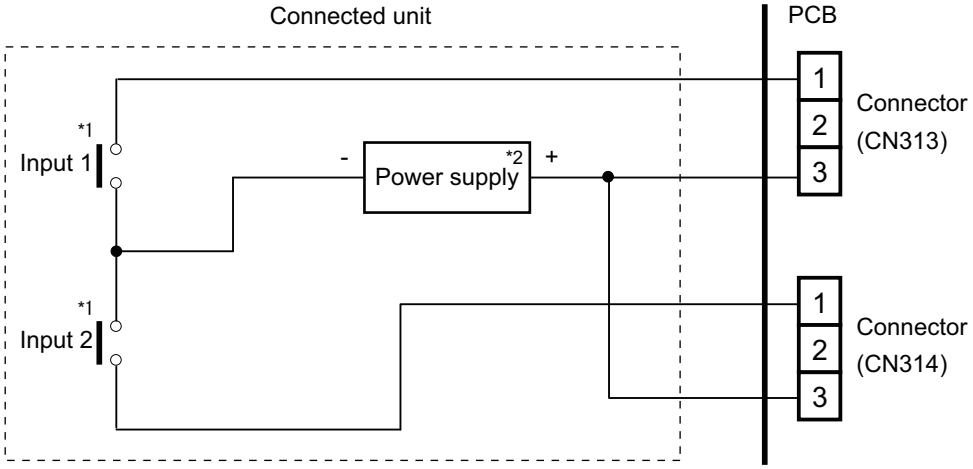
The indoor unit Operation/Stop can be set by using the input connector on the PCB.

- **Input select:**
  Use either one of these types of connectors according to the application. (Both types of connectors cannot be used simultaneously.)
  – Dry contact
  In case of internal power supply, set the slide switch of SW301 to "NON VOL" side.



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

  – Apply voltage
  In case of external power supply, set the slide switch of SW301 to "VOL" side.



*1: The switches can be used on the following condition: DC 12 V to 24 V, 1 mA to 15 mA.
*2: Make the power supply DC 12 to 24 V, 10 mA or more.

FIELD WORKING

FIELD WORKING

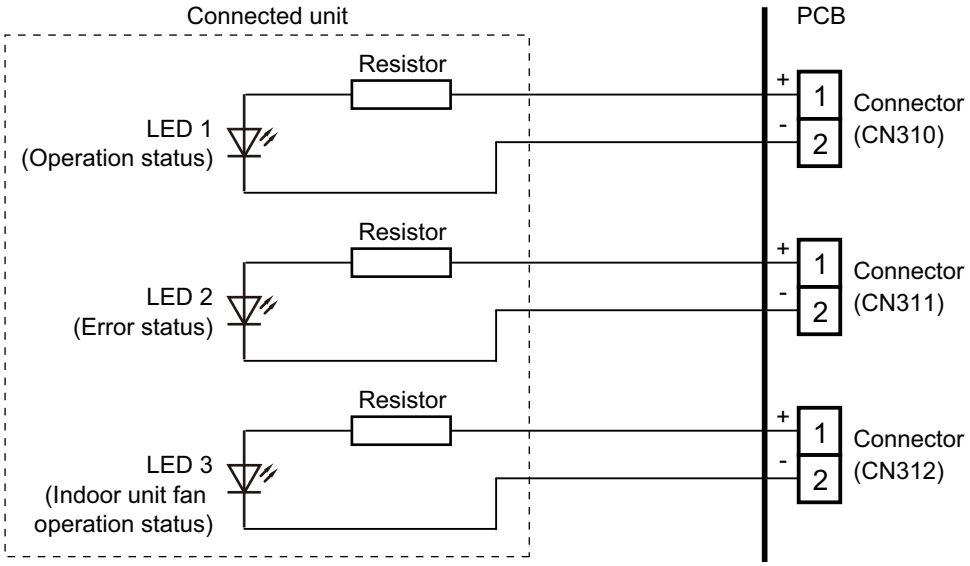
2-2. External output

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

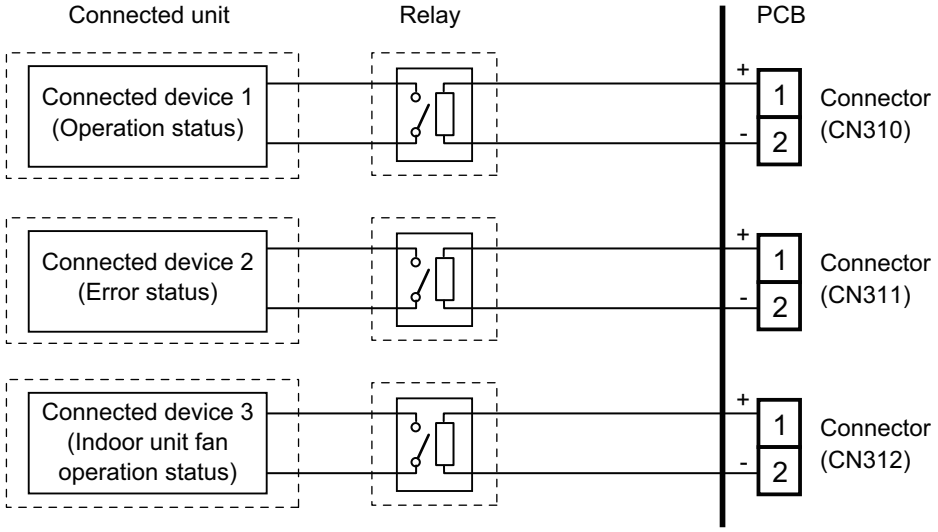
■ External Input and Output PCB

- A twisted pair cable (22AWG) should be used. Maximum length of cable is 82 ft (25 m).
- Output voltage: High DC 12 V±2 V, Low 0 V.
- Permissible current: 50 mA
- For details, refer to "Combination of external input and output" on page 05-14.

- **When indicator or other components are connected directly:**
  Example: Rotary SW on External Input and Output PCB is set to “1”.



- **When connecting with a device equipped with a power supply:**
  Example: Rotary SW on External Input and Output PCB is set to “1”.



FIELD WORKING

2-3. Combination of external input and output

By combining the function setting of the rotary switch setting of the External Input and Output PCB, you can select various combinations of functions.

Combination examples of external input and output are as follows:

External Input and Output PCB (Rotary SW)	External input		
	External Input and Output PCB		
	CN313	CN314	Signal type
1	Operation/Stop	Not available	Edge
	Operation	Stop	Pulse
2	Forced Thermostat OFF	Not available	Edge
3 - 9, A	(Setting prohibited)		
B	Forced Thermostat OFF	Not available	Edge
C	Forced Thermostat OFF	Not available	Edge
D	Forced Thermostat OFF	Not available	Edge

External Input and Output PCB (Rotary SW)	External output		
	External Input and Output PCB		
	CN310	CN311	CN312
1	Operation/Stop	Error status	Indoor unit fan operation status
2	Error status	Indoor unit fan operation status	External heater output
3 - 9, A	(Setting prohibited)		
B	Operation/Stop	Indoor unit fan operation status	External heater output
C	Operation/Stop	Error status	External heater output
D	Operation/Stop	Indoor unit fan operation status	Error status

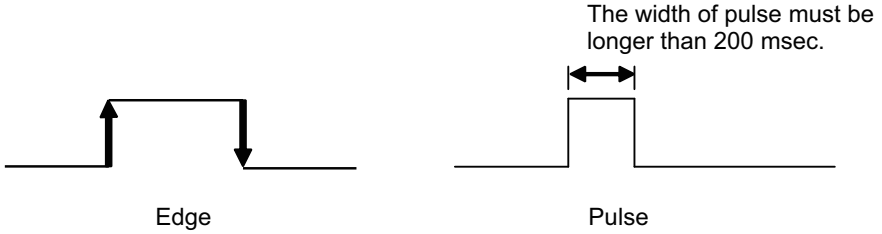
NOTE: Input of Operation/Stop depends on the setting of function setting 46.
- 00: Operation/Stop mode 1 (Remote controller enabled)
- 01: (Setting prohibited)
- 02: Forced stop
- 03: Operation/Stop mode 2 (Remote controller disabled)

■ Input signal type

External Input and Output PCB:

The input signal type can be selected.

Signal type (edge or pulse) can be switched by the DIP switch SW302 on the External Input and Output PCB.

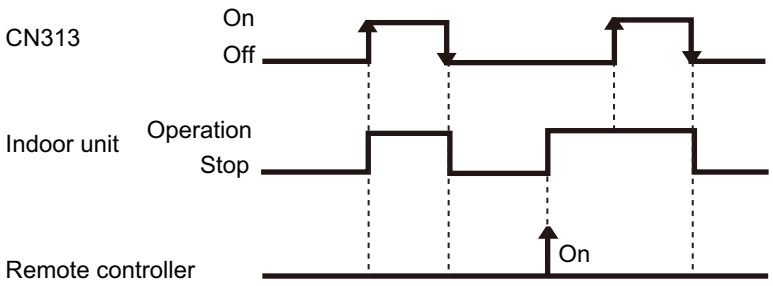


2-4. Details of function

■ Control input function

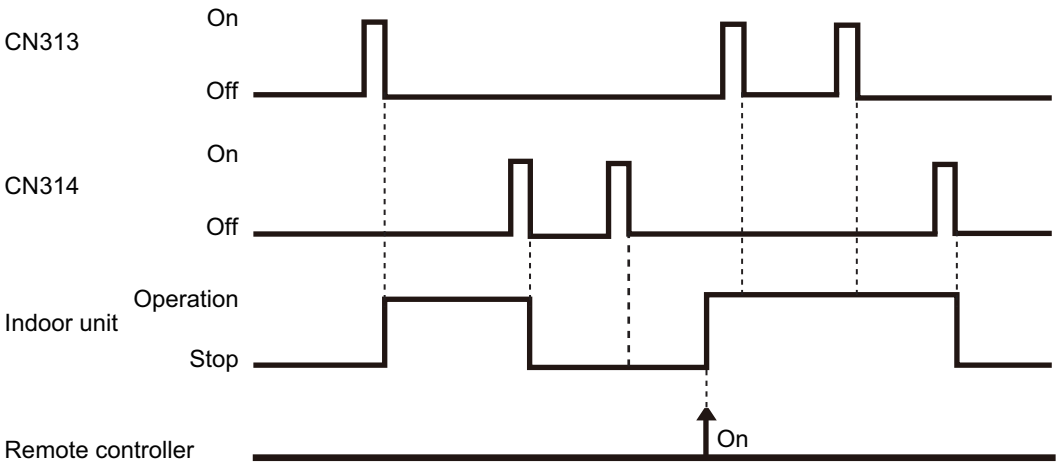
- **When function setting is "Operation/Stop" mode 1**
  - In the case of "Edge" input:

Function setting	Rotary SW on External Input and Output PCB	External input		Input signal	Command
46-00	1	External Input and Output PCB	CN313	Off → On	Operation
				On → Off	Stop



  - In the case of "Pulse" input:

Function setting	Rotary SW on External Input and Output PCB	External input		Input signal	Command
46-00	1	External Input and Output PCB	CN313	Pulse	Operation
			CN314	Pulse	Stop



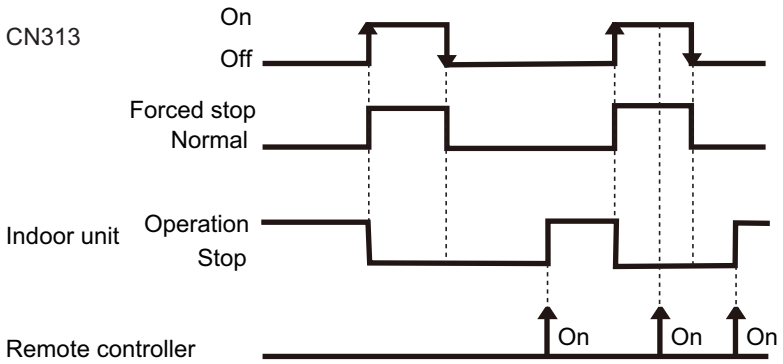
NOTES:

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

FIELD WORKING

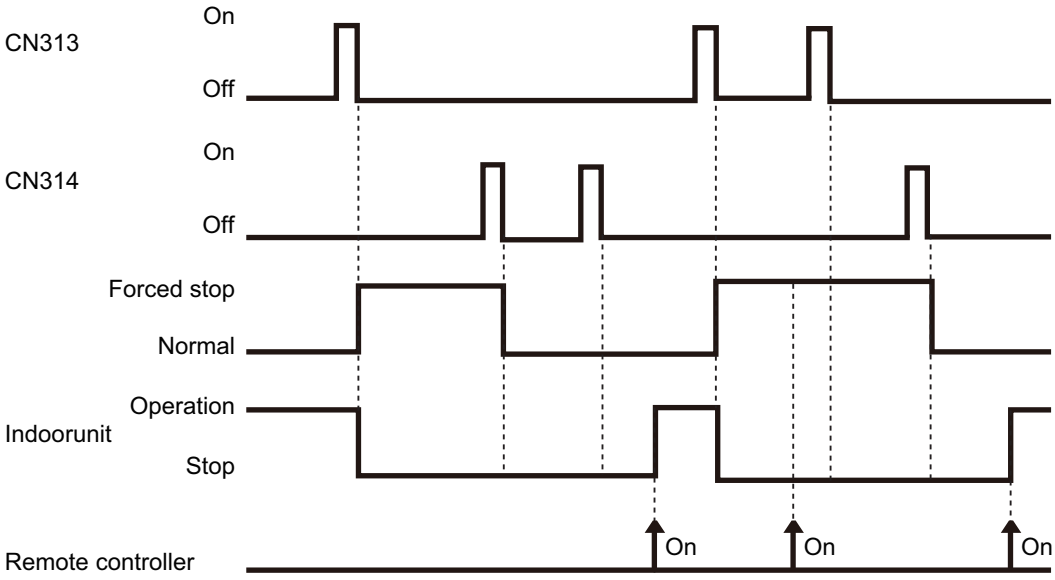
- **When function setting is “Forced stop” mode**
  - In the case of “Edge” input:

Function setting	Rotary SW on External Input and Output PCB	External input		Input signal	Command
46-02	1	External Input and Output PCB	CN313	Off → On	Forced stop
				On → Off	Normal



  - In the case of “Pulse” input:

Function setting	Rotary SW on External Input and Output PCB	External input		Input signal	Command
46-02	1	External Input and Output PCB	CN313	Pulse	Forced stop
			CN314	Pulse	Normal



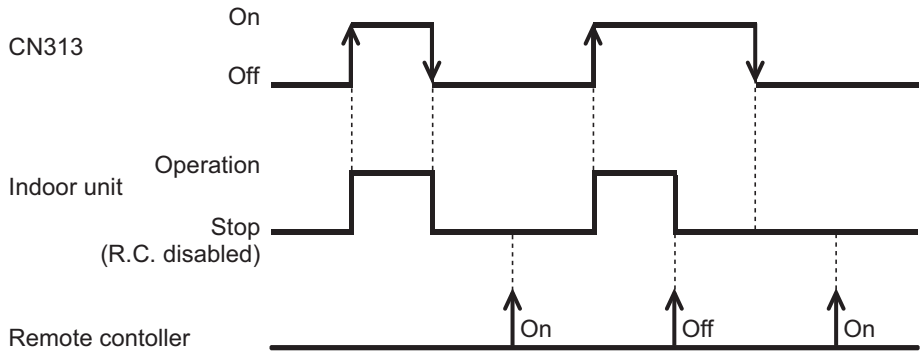
NOTES:

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

FIELD WORKING

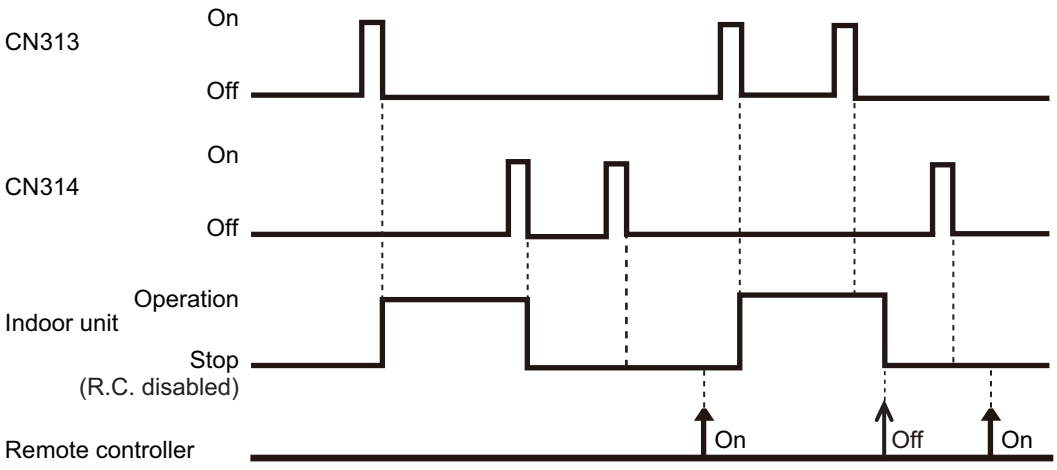
- **When function setting is “Operation/Stop” mode 2**
  - In the case of “Edge” input:

Function setting	Rotary SW on External Input and Output PCB	External input		Input signal	Command
46-03	1	External Input and Output PCB	CN313	Off → On	Operation
				On → Off	Stop (Remote controller disabled)



  - In the case of “Pulse” input:

Function setting	Rotary SW on External Input and Output PCB	External input		Input signal	Command
46-03	1	External Input and Output PCB	CN313	Pulse	Operation
			CN314	Pulse	Stop (Remote controller disabled)

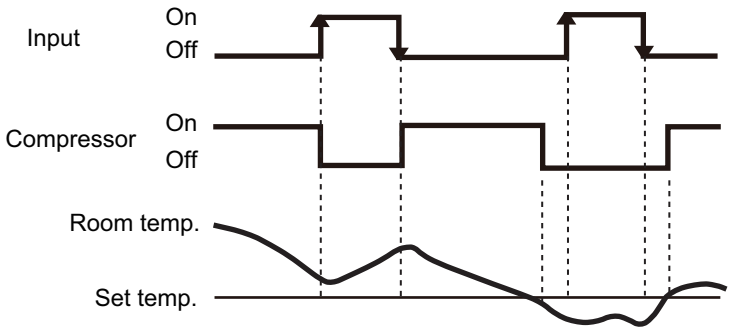


NOTE: When “Operation/Stop” mode 2 function is used with forming a remote controller group, connect the same equipment to each indoor unit within the group.

FIELD WORKING

- **Forced thermostat off function**

Rotary SW on External Input and Output PCB	External input		Input signal	Command
2 B C	External Input and Output PCB	CN313	Off → On	Thermostat off
			On → Off	Normal operation



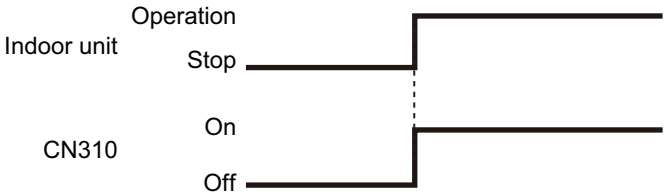
FIELD WORKING

■ Control output function

- **Operation/Stop status**

Rotary SW on External Input and Output PCB	External output		Output signal	Command
1 B C D	External Input and Output PCB	CN310	Off → On	Operation
			On → Off	Stop

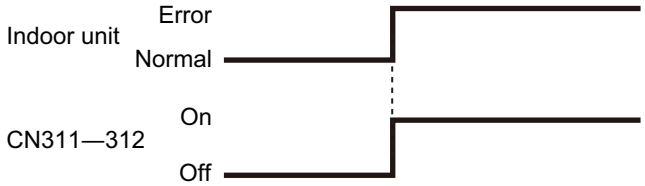
The output is low when the unit is stopped.



- **Error status**

Rotary SW on External Input and Output PCB	External output		Output signal	Command
1 C	External Input and Output PCB	CN311	Off → On	Error
			On → Off	Normal
D		CN312	Off → On	Error
			On → Off	Normal

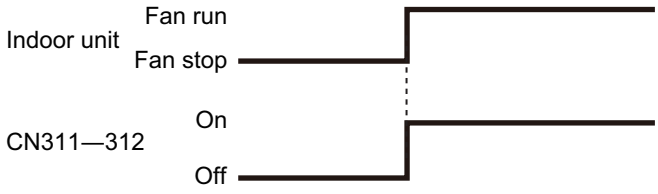
The output is ON when an error is generated for the indoor unit.



- **Indoor unit fan operation status**

Rotary SW on External Input and Output PCB	External output		Output signal	Command
1	External Input and Output PCB	CN312	Off → On	Fan run
			On → Off	Fan stop
2 B D		CN311	Off → On	Fan run
			On → Off	Fan stop

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



FIELD WORKING

- **External heater output**

Rotary SW on External Input and Output PCB	External output		Output signal	Command
2 B C	External Input and Output PCB	CN312	Off → On	Heater on
			On → Off	Heater off

FIELD WORKING

■ External heater output

Control	Primary heater	Auxiliary heater	Function setting	
			Indoor unit	Wired R. C.
			Control switching external heaters No. 61	Sensor activation*2
Auxiliary heater control 1	Heat pump	External device*1	61-00	—
Auxiliary heater control 2	Heat pump	External device	61-01	—
Heat pump prohibition control	External device	None	61-02	On (Enabled)
Auxiliary heater control by outdoor temperature 1	Heat pump	External device	61-03	On (Enabled)
Auxiliary heater control by outdoor temperature 2	Heat Pump	External device	61-04	On (Enabled)

NOTES:

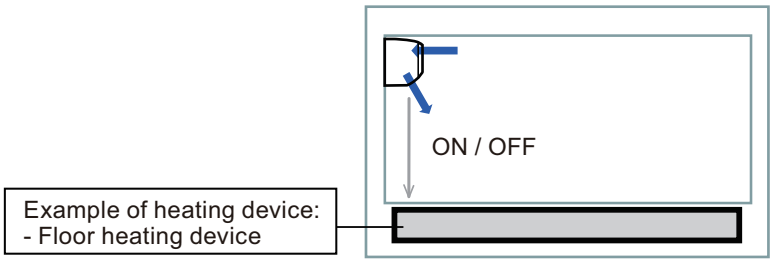
- After turning off the heater, 3 minutes of standby time is required by next power-on of the heater.
- For items marked "—" in the table, any of validate or invalidate of the setting are acceptable.
- *1: External device means Hot water, Electrical heater, etc.
- *2: Sensor activation:
  - Setting change from the factory setting is required.
  - Indoor unit fan setting will be on for safety reason without sensor activation of wired remote controller.

FIELD WORKING

FIELD WORKING

● Installation configuration of individual connection

External heating device is installed individually. (No use of indoor unit fan)



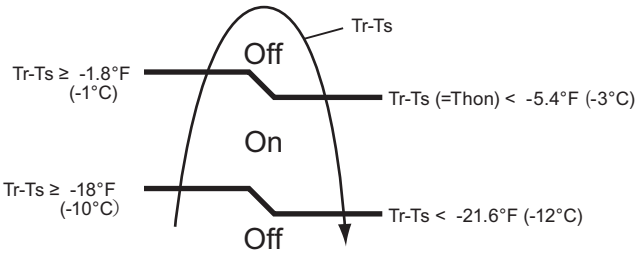
⚠ WARNING

- Design and install external heater appropriately with considering its protection.
- Inappropriate designing and installation of external heater may cause a fire by emitted heat from the external heater.
- Fujitsu General Ltd. is not responsible for inappropriate designing or installation of external heating device.

● Auxiliary heater control 1

Operation	Condition
Heater on	Heater is on as shown in following diagram of heating temperature.
Heater off	• Heater is off as shown in following diagram of heating temperature. • Other than heating mode • Error occurred • Forced thermostat off • Fan stop protection

- Temperature of heater on (Thon): Adjustable by function number 62 (Operating temperature switching of external heaters).
- All control temperatures will shift by adjusting “Thon”.



Tr: Room temperature
Ts: Set temperature
Thon: Heater on temperature

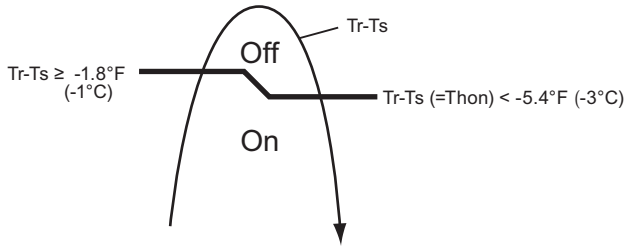
Example: When set temperature (Ts) is 72°F (22°C) (Factory setting),
- and room temperature (Tr) increases above 53.6°F (12°C), signal output is on.
- and room temperature (Tr) increases above 69.8°F (21°C), signal output is off.
- and room temperature (Tr) decreases below 66.2°F (19°C), signal output is on.
- and room temperature (Tr) decreases below 50°F (10°C), signal output is off.

FIELD WORKING

● Auxiliary heater control 2

Operation	Condition
Heater on	Heater is on as shown in following diagram of heating temperature.
Heater off	• Heater is off as shown in following diagram of heating temperature. • Other than heating mode • Error occurred • Forced thermostat off • Fan stop protection

- Temperature of heater on (Thon): Adjustable by function number 62 (Operating temperature switching of external heaters).
- All control temperatures will shift by adjusting “Thon”.



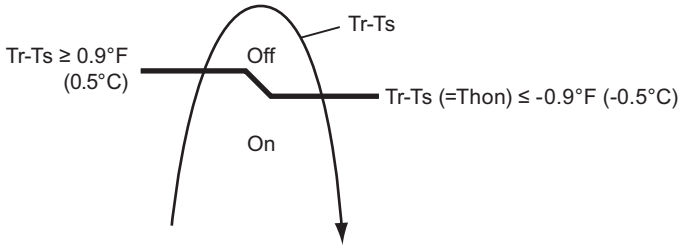
Tr: Room temperature
Ts: Set temperature
Thon: Heater on temperature

● Heat pump prohibition control

Perform heating by external heater only. Indoor unit is continuous thermostat off.

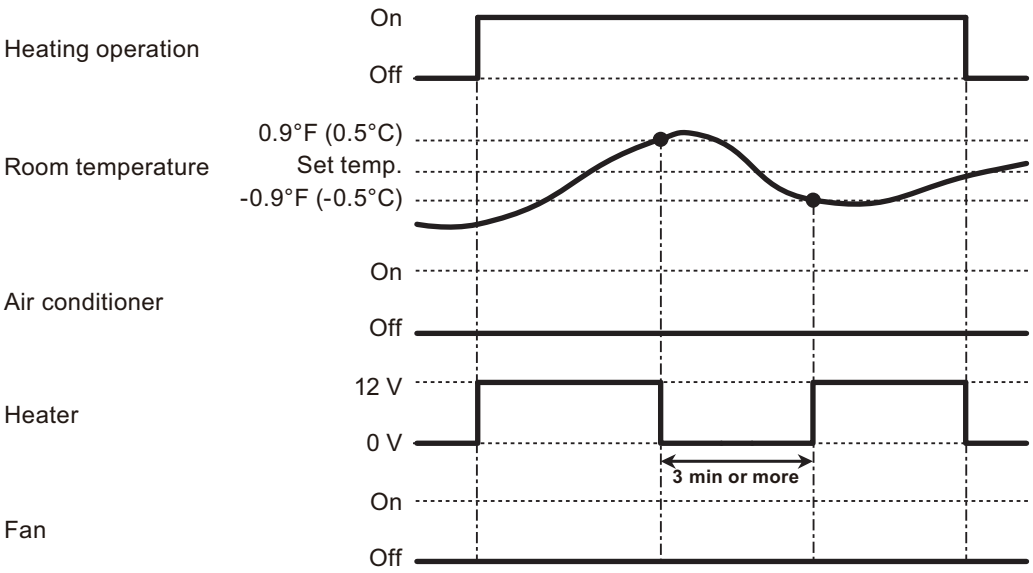
Operation	Condition
Heater on	Heater is on as shown in following diagram of heating temperature.
Heater off	• Heater is off as shown in following diagram of heating temperature. • Other than heating mode • Error occurred • Forced thermostat off

- Temperature of heater on (Thon): Adjustable by function number 62 (Operating temperature switching of external heaters).
- All control temperatures will shift by adjusting “Thon”.



Tr: Room temperature
Ts: Set temperature
Thon: Heater on temperature

- **Operation status**



NOTE: In following operations, compressor will be on.
- Other than heating
- Test run

FIELD WORKING

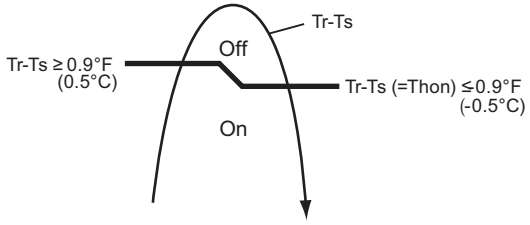
● Auxiliary heater control by outdoor temperature 1

This control selects heat pump or external heater according to the outdoor temperature. When outdoor temperature is high, the heating is performed by using heat pump only.

Operation	Condition
Heater on	Heater is on as shown in following diagram of heating temperature.
Heater off	• Heater is off as shown in following diagram of heating temperature. • Other than heating mode • Error occurred • Forced thermostat off • Heat pump only zone

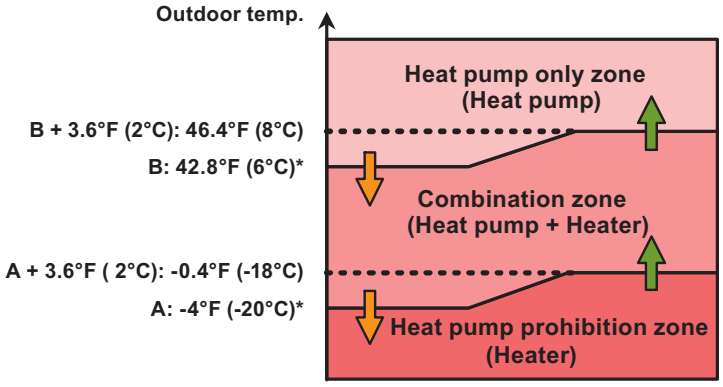
- Temperature of heater on (Thon): Adjustable by function number 62 (Operating temperature switching of external heaters).
- All control temperatures will shift by adjusting “Thon”.
- Outdoor temperature zone boundary A and B: Adjustable individually by function setting number 66 and 67.

- **External heater output**



Tr: Room temperature
Ts: Set temperature
Thon: Heater on temperature

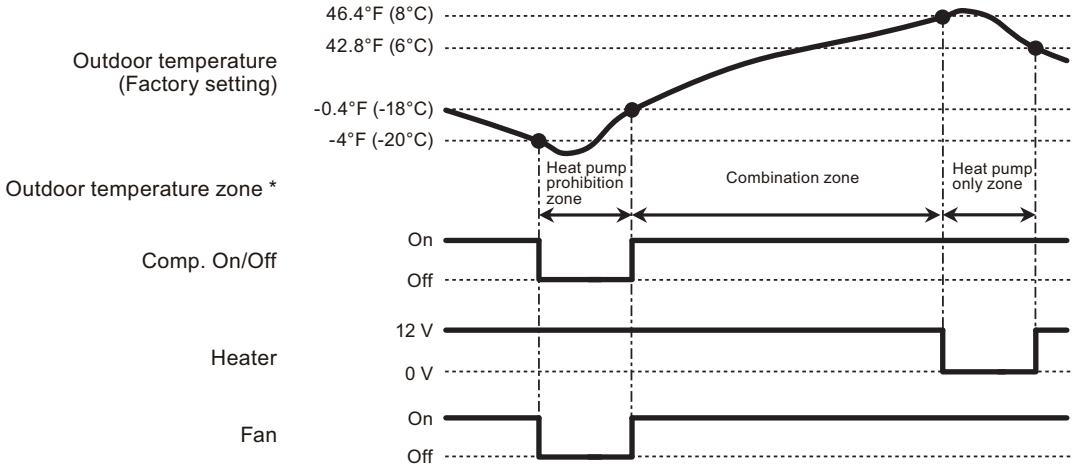
- **Outdoor temperature zone**



*: Adjustable by function setting 66 and 67

FIELD WORKING

- **Operation status**



* The outdoor temperature zone transition from one to another will stay in that zone for minimum of 30 min.

NOTE: In following operations, compressor will be on in heat pump prohibition zone.

- Other than heating
- Test run

FIELD WORKING

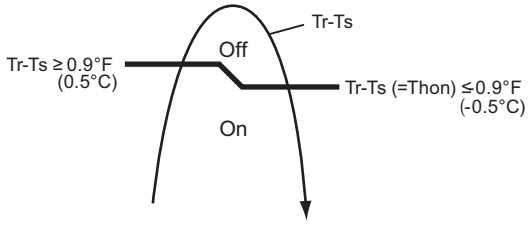
● Auxiliary heater control by outdoor temperature 2

This control selects heat pump or external heater according to the outdoor temperature. Even when outdoor temperature is high, the heating is performed by using both of heat pump and external heater.

Operation	Condition
Heater on	Heater is on as shown in following diagram of heating temperature.
Heater off	• Heater is off as shown in following diagram of heating temperature. • Other than heating mode • Error occurred • Forced thermostat off

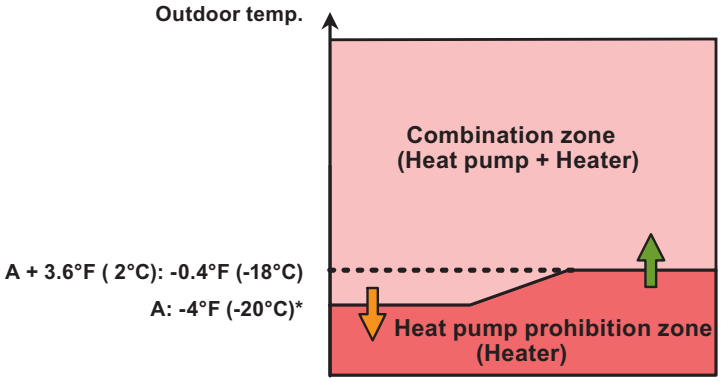
- Temperature of heater on (Thon): Adjustable by function number 62 (Operating temperature switching of external heaters).
- All control temperatures will shift by adjusting “Thon”.
- Outdoor temperature zone boundary A: Adjustable by function setting number 66.

- **External heater output**



Tr: Room temperature
Ts: Set temperature
Thon: Heater on temperature

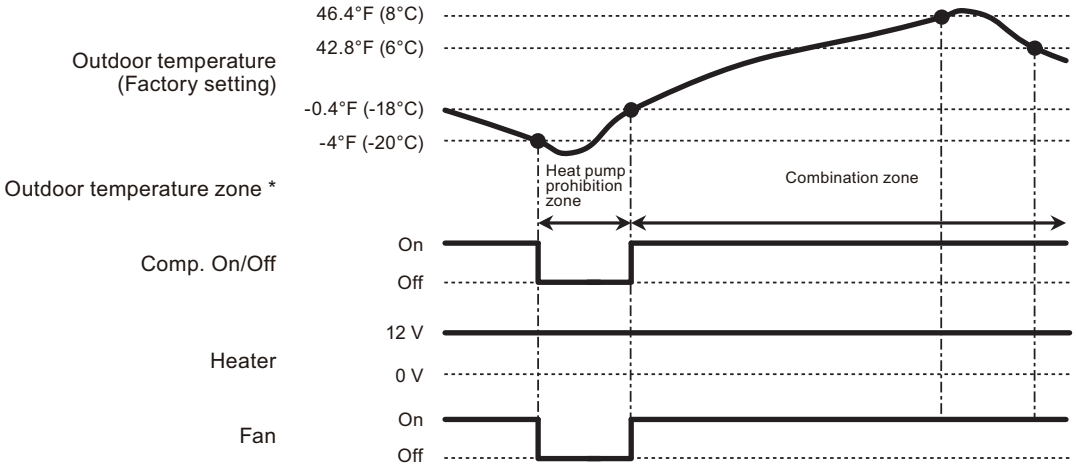
- **Outdoor temperature zone**



*: Adjustable by function setting 66

FIELD WORKING

- **Operation status**



* The outdoor temperature zone transition from one to another will stay in that zone for minimum of 30 min.

NOTE: In following operations, compressor will be on in heat pump prohibition zone.

- Other than heating
- Test run

FIELD WORKING