

AIR CONDITIONER

**Duct type**

## SERVICE MANUAL

---

INDOOR



ADUH09LUAS1  
ADUH12LUAS1



ADUH18LUAS1

OUTDOOR



AOUH09LUAS1



AOUH12LUAS1  
AOUH18LUAS1

**FUJITSU GENERAL LIMITED**

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## 1. GENERAL INFORMATION

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# 1. Specifications

## 1-1. Indoor unit

Type				Duct				
				Inverter heat pump				
Model name				ADUH09LUAS1	ADUH12LUAS1	ADUH18LUAS1		
Power supply				208/230 V ~ 60 Hz				
Available voltage range				187—253 V				
Capacity	Cooling	Rated		kW	2.64	3.52	5.02	
				Btu/h	9,000	12,000	17,100	
		Min.—Max.		kW	0.90—3.20	0.90—4.00	0.90—5.90	
				Btu/h	3,100—11,000	3,100—13,600	3,100—20,100	
	Heating	47 °FDB (Outdoor temp.)	Rated		kW	3.52	4.69	6.33
					Btu/h	12,000	16,000	21,600
			Min.—Max.		kW	0.90—4.70	0.90—5.70	0.90—7.50
				Btu/h	3,100—16,000	3,100—19,400	3,100—25,600	
		17 °FDB (Outdoor temp.)	Rated		kW	2.17	3.08	4.22
					Btu/h	7,400	10,500	14,400
Max.			kW	3.08	4.98	5.75		
		Btu/h	10,500	17,000	19,600			
Input power	Cooling	Rated		kW	0.66	0.94	1.37	
		Max.			1.05	2.06	2.05	
	Heating	47 °FDB (Outdoor temp.)	Rated		0.89	1.30	1.71	
			Max.		1.89	1.79	2.57	
		17 °FDB (Outdoor temp.)	Rated		0.78	1.07	1.49	
			Max.		1.42	2.01	2.56	
	Current	Cooling	Rated		A	3.3	4.2	6.1
		Heating				4.5	5.8	7.6
EER	Cooling			kW/kW	4.00	3.74	3.66	
				Btu/hW	13.6	12.8	12.5	
COP	Heating			kW/kW	3.96	3.60	3.70	
				Btu/hW	13.5	12.3	12.6	
SEER	Cooling			Btu/hW	20.0	20.2	20.2	
HSPF	Heating			Btu/hW	11.7	11.5	11.4	
Power factor	Cooling			%	87.0	97.3	97.6	
	Heating				86.0	97.5	97.8	
Moisture removal				pints/h (L/h)	1.5 (0.7)	2.7 (1.3)	4.2 (2.0)	
Maximum operating current *1	Cooling			A	6.8	9.8	11.8	
	Heating				9.3	11.3	14.8	
Fan	Airflow rate	Cooling	HIGH	CFM (m <sup>3</sup> /h)	353 (600)	383 (650)	553 (940)	
			MED		324 (550)	353 (600)	518 (880)	
			LOW		294 (500)	324 (550)	482 (820)	
			QUIET		265 (450)	283 (480)	441 (750)	
		Heating	HIGH		353 (600)	383 (650)	553 (940)	
			MED		324 (550)	353 (600)	518 (880)	
			LOW		294 (500)	324 (550)	482 (820)	
			QUIET		265 (450)	283 (480)	441 (750)	
	Type × Q'ty				Sirocco × 2		Sirocco × 3	
	Motor output		W		81			
Recommended static pressure				inWG (Pa)	0 to 0.36 (0 to 90)			
Sound pressure level *2	Cooling		HIGH	dB (A)	28	29	32	
			MED		27	28	30	
			LOW		26	27	29	
			QUIET		25	26	27	
	Heating		HIGH		28	29	32	
			MED		26	28	30	
			LOW		25	27	29	
			QUIET		24	24	27	
Heat exchanger type	Dimensions (H × W × D)		in (mm)	294 × 500 × 39.9		294 × 700 × 39.9		
	Fin pitch		FPI	1.3				
	Rows × Stages		3 × 14					
	Pipe type		Copper tube					
	Fin type		Aluminum					
Enclosure	Material		Steel sheet					
	Color		—					
Dimensions (H × W × D)	Net			in (mm)	7-13/16 × 27-9/16 × 24-7/16 (198 × 700 × 620)		7-13/16 × 35-7/16 × 24-7/16 (198 × 900 × 620)	
	Gross				10-7/8 × 38-1/8 × 30-3/8 (276 × 968 × 772)		10-7/8 × 46 × 30-3/8 (276 × 1,168 × 772)	
Weight	Net			lb (kg)	37 (17)		44 (20)	
	Gross				49 (22)		57 (26)	
Connection pipe	Size	Liquid			Ø1/4 (Ø6.35)			
		Gas			Ø3/8 (Ø9.52)		Ø1/2 (Ø12.70)	
Operation range	Method			Flare				
		Cooling	°F (°C)		64 to 90 (18 to 32)			
			%RH		80 or less			
Heating	°F (°C)		60 to 86 (16 to 30)					
Drain hose	Material		HARD PVC					
	Size		in (mm)	Ø3/4 (Ø20.7) [I.D.] Ø1-1/16 (Ø26.6) [O.D.]				

Type	Duct		
	Inverter heat pump		
Model name	ADUH09LUAS1	ADUH12LUAS1	ADUH18LUAS1
<p><b>NOTES:</b></p> <ul style="list-style-type: none"> <li>• Specifications are based on the following conditions: <ul style="list-style-type: none"> <li>– Cooling: Indoor temperature of 80 °FDB/67 °FWB(26.67 °CDB/19.44 °CWB), and outdoor temperature of 95 °FDB/75 °FWB (35 °CDB/23.9 °CWB).</li> <li>– Heating: Indoor temperature of 70 °FDB/59 °FWB (21.11 °CDB/15 °CWB), and outdoor temperature of 47 °FDB /43 °FWB (8.33 °CDB/6.11°CWB).</li> <li>– Standard static pressure: 0.10 inWG (25 Pa)</li> <li>– Pipe length: 24 ft 7 in (7.5 m), Height difference: 0 m. (Between outdoor unit and indoor unit.)</li> </ul> </li> <li>• Protective function might work when using it outside the operation range.</li> <li>• *1: Maximum current: <ul style="list-style-type: none"> <li>– The maximum value when operated within the operation range.</li> <li>– The total current of indoor unit and outdoor unit.</li> </ul> </li> <li>• *2: Sound pressure level: <ul style="list-style-type: none"> <li>– Measured values in manufacturer's anechoic chamber.</li> <li>– Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.</li> </ul> </li> <li>• *3: Available on Google Play™ store or on App Store®. Optional WLAN adapter is also required. For details, refer to the setting manual.</li> </ul>			



## 1-2. Outdoor unit

Type			Inverter heat pump			
Model name			AOUH09LUAS1	AOUH12LUAS1	AOUH18LUAS1	
Power supply			208/230 V ~ 60 Hz			
Power supply intake			Outdoor unit			
Available voltage range			187—253 V			
Starting current			A	4.6	6.4	
Fan	Airflow rate	Cooling	CFM (m <sup>3</sup> /h)	906 (1,540)	1,171 (1,990)	
		Heating			1,089 (1,850)	1,395 (2,370)
	Type × Q'ty	Propeller fan × 1				
Motor output			W	23	49	
Sound pressure level *1			Cooling	44	48	
			Heating	48	52	
Heat exchanger type	Dimensions (H × W × D)		in (mm)	Main1: 19-13/16 × 34-11/16 × 11/16 (504 × 881 × 18.19) Main2: 19-13/16 × 33-1/2 × 11/16 (504 × 851 × 18.19)	Main1: 23-1/8 × 34-11/16 × 11/16 (588 × 881 × 18.19) Main2: 23-1/8 × 33-1/2 × 11/16 (588 × 851 × 18.19)	
	Fin pitch	FPI				
	Rows × Stages			Main1: 1 × 24 Main2: 1 × 24	Main1: 1 × 28 Main2: 1 × 28	
	Pipe type	Copper				
	Fin type	Type (Material)	Aluminum			
		Surface treatment	PC fin			
Compressor	Type	DC rotary × 1				
	Motor output	W	900	DC twin rotary × 1		
Refrigerant	Type	R410A				
	Charge	lb oz	2lbs.3oz.	2lbs.10oz.	2lbs.12oz.	
		g	1,000	1,200	1,250	
Refrigerant oil	Type	RB68				
	Amount	in <sup>3</sup> (cm <sup>3</sup> )	20.7 (340)	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)	21-5/16 × 31-7/16 × 11-7/16 (542 × 799 × 290)	24-7/8 × 31-7/16 × 11-7/16 (632 × 799 × 290)		
	Gross		23-11/16 × 37 × 14-3/4 (602 × 940 × 375)	27-1/4 × 37 × 14-3/4 (692 × 940 × 375)		
Weight	Net	lb (kg)	70 (32)	84 (38)	86 (39)	
	Gross		77 (35)	95 (43)		
Connection pipe	Size	Liquid	in (mm)			
		Gas	Ø 1/4 (Ø 6.35)			
	Method			Flare		
	Pre-charge length			49 (15)	66 (20)	
	Max. length			66 (20)		
	Max. height difference			49 (15)		
Operation range	Cooling	°F (°C)	14 to 115 (-10 to 46)			
	Heating		-5 to 75 (-21 to 24)			
Drain hose	Material	PP				
	Tip diameter	in (mm)	Ø 1/2 (Ø 13.0) (I. D.), Ø 5/8 to 11/16 (Ø 16.0 to 16.8) (O. D.)			

**NOTES:**

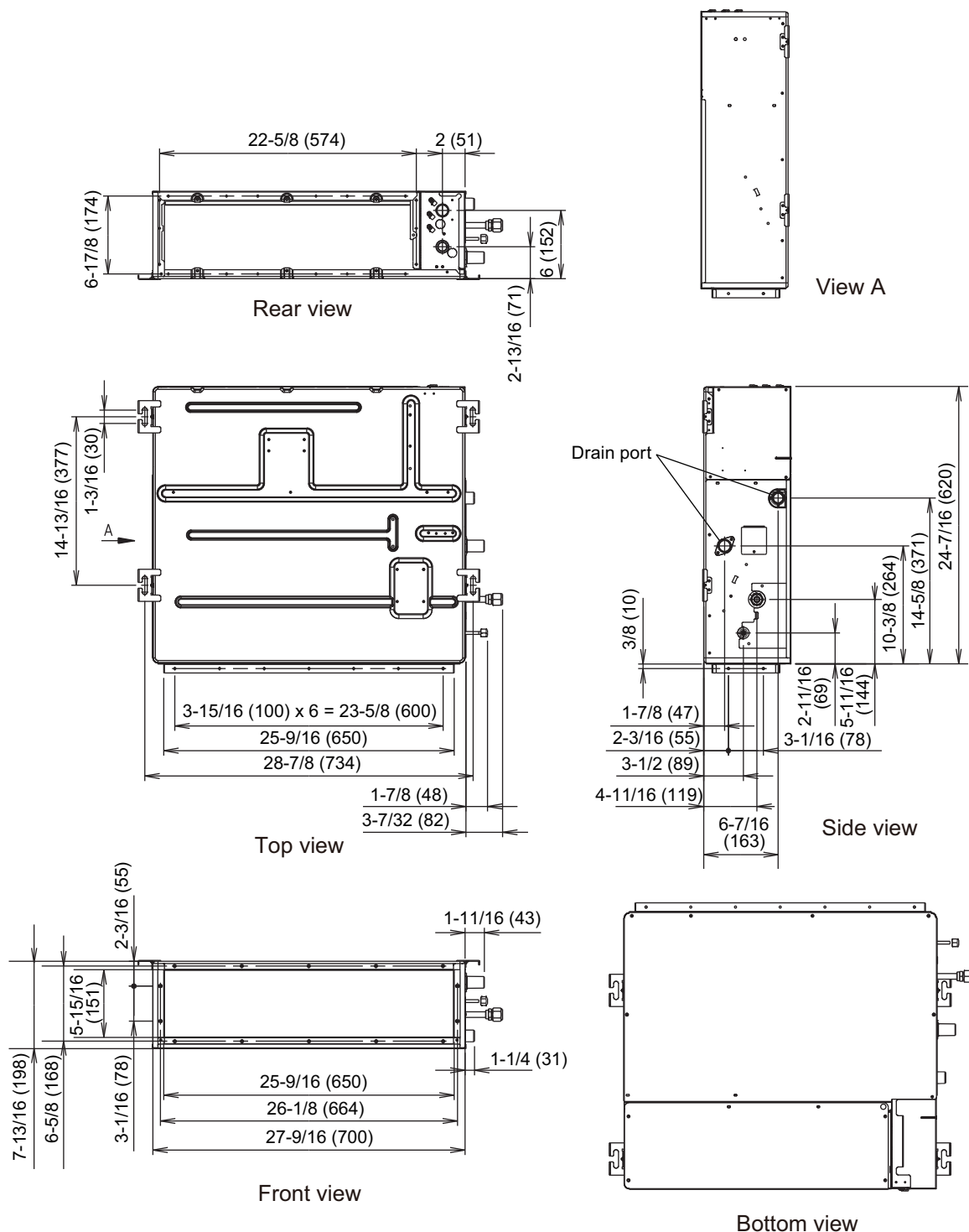
- Specifications are based on the following conditions:
  - Cooling: Indoor temperature of 80 °FDB (26.67 °CDB) / 67 °FWB (19.44 °CWB), and outdoor temperature of 95 °FDB (35 °CDB) / 75 °FWB (23.9 °CWB).
  - Heating: Indoor temperature of 70 °FDB (21.11 °CDB) / 59 °FWB (15 °CWB), and outdoor temperature 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.
- \*1: Sound pressure level
  - Measured values in manufacturer's anechoic chamber.
  - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.

## 2. Dimensions

### 2-1. Indoor unit

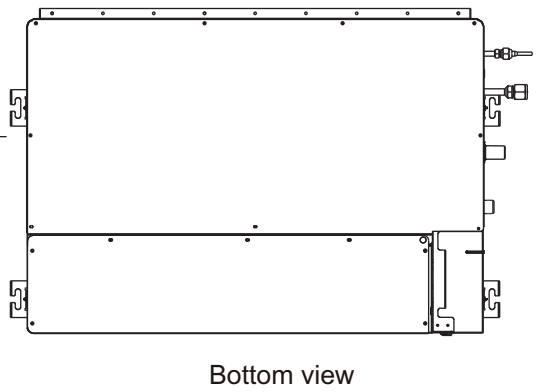
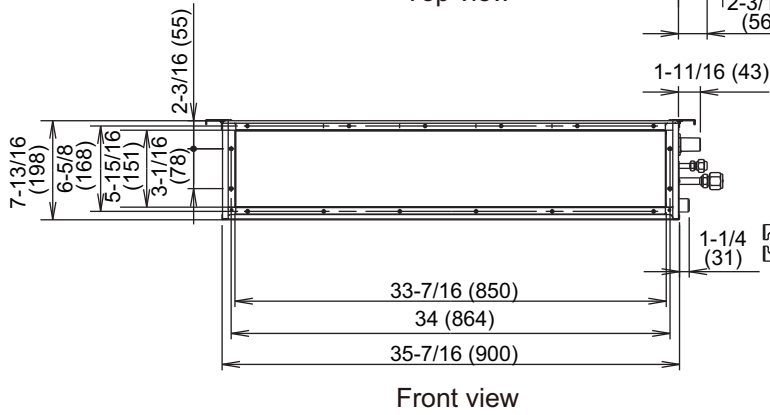
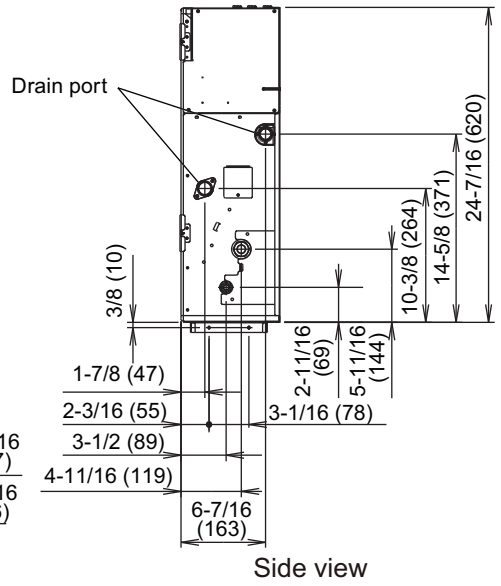
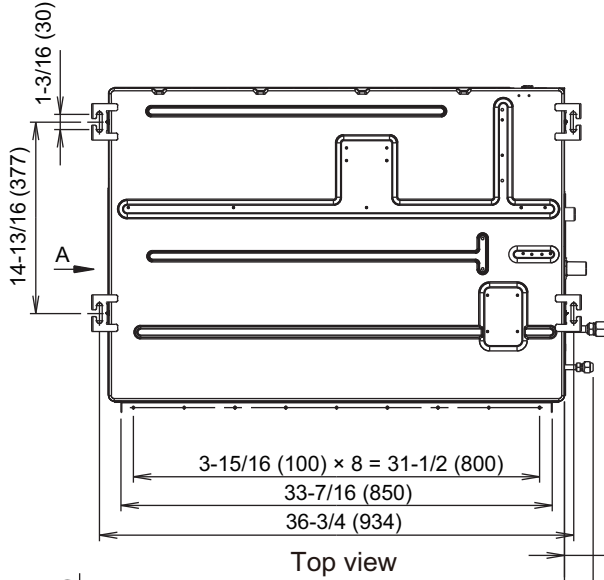
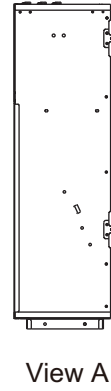
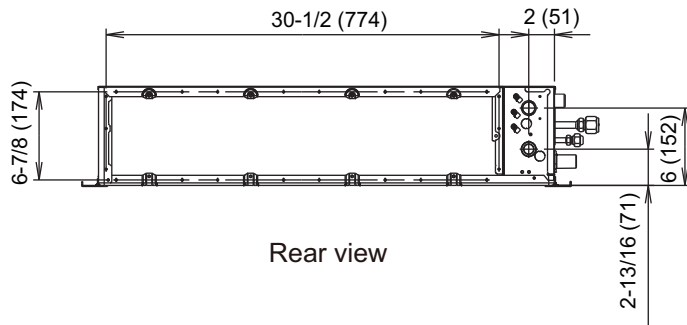
#### ■ Models: ADUH09LUAS1 and ADUH12LUAS1

Unit: in (mm)



Model: ADUH18LUAS1

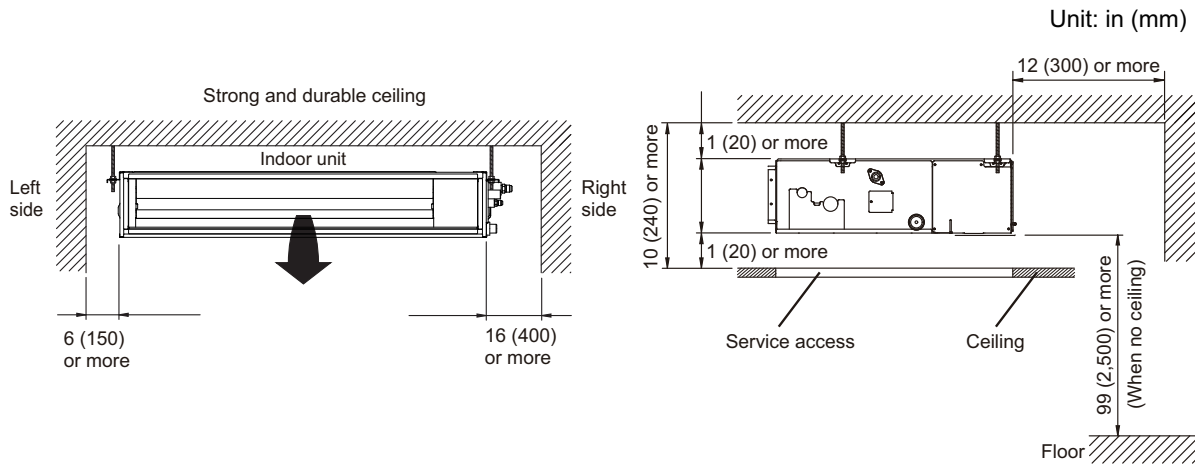
Unit: in (mm)



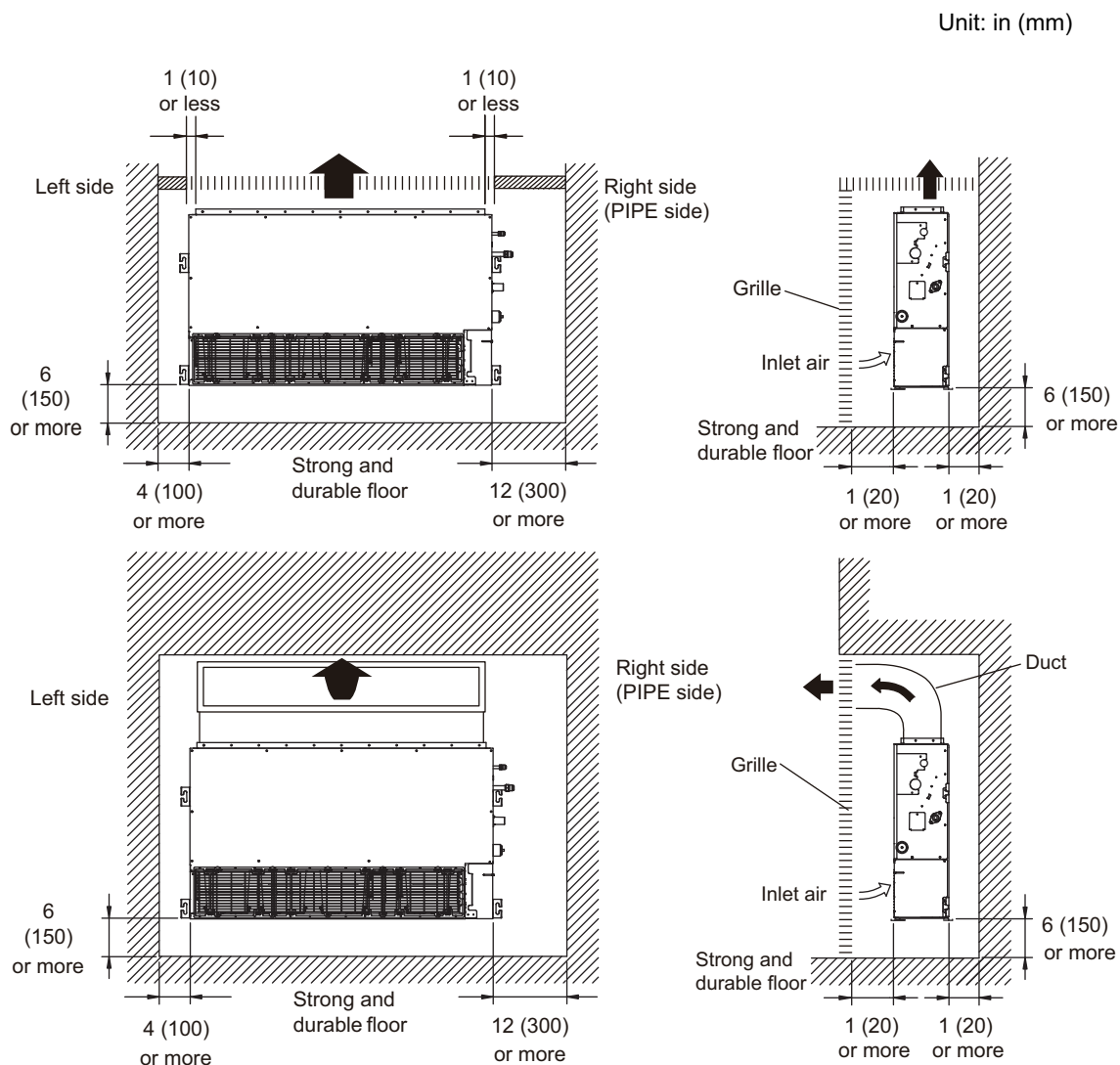
# Installation space requirement

Provide sufficient installation space for product safety.

## In ceiling-concealed installations:



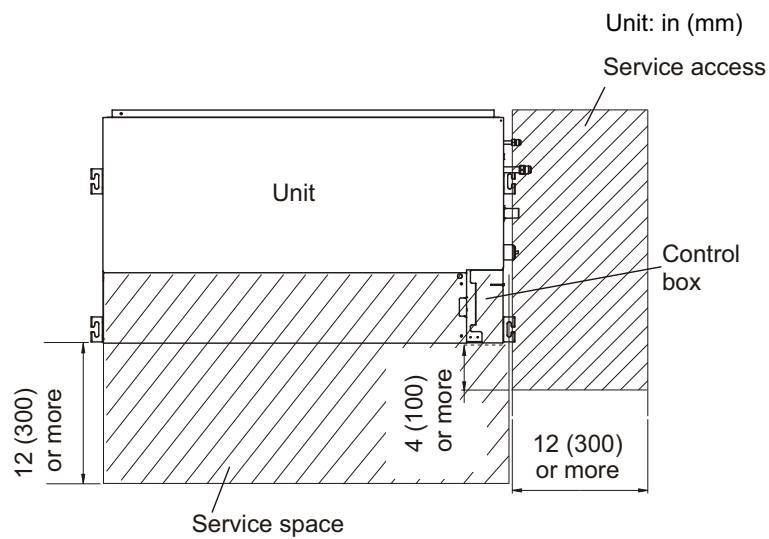
## In wall-concealed installations:



## ■ Maintenance space requirement

For future maintenance and service access, provide sufficient maintenance space.

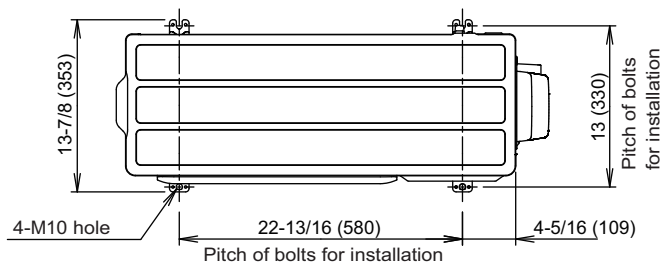
**NOTE:** Do not place any wiring or illumination in the maintenance space, as they will impede service.



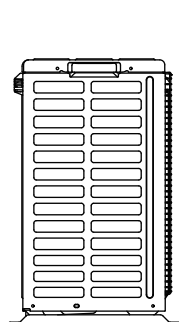
## 2-2. Outdoor unit

### ■ Models: AOUH09LUAS1

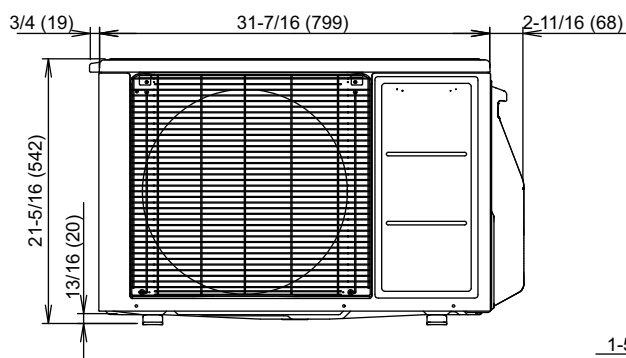
Unit: in (mm)



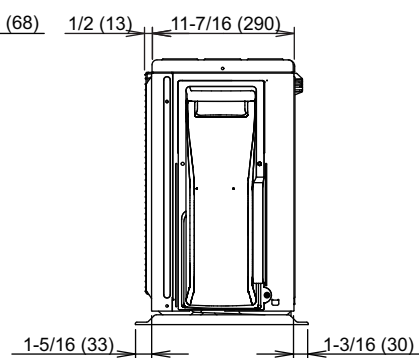
Top view



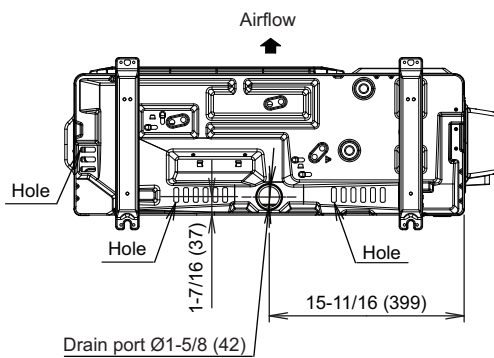
Side view



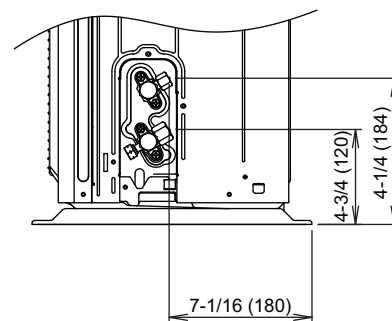
Front view



Side view



Bottom view



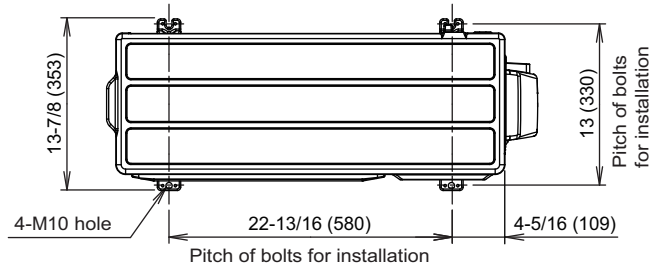
Side view (Valve part)

■ Models: AOUH12LUAS1 and AOUH18LUAS1

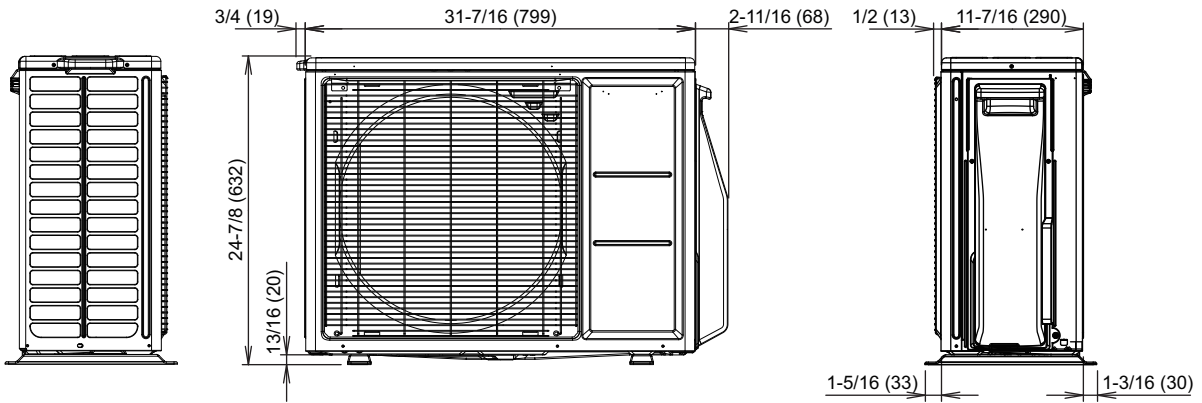
Unit: in (mm)

GENERAL INFORMATION

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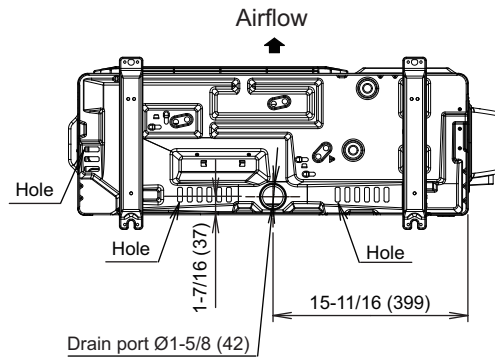
Top view



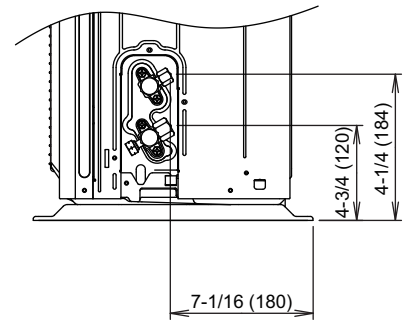
Side view

Front view

Side view



Bottom view



Side view (Valve part)





## 2. TECHNICAL DATA AND PARTS LIST

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## 2. TECHNICAL DATA AND PARTS LIST

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# 1. Precautions

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

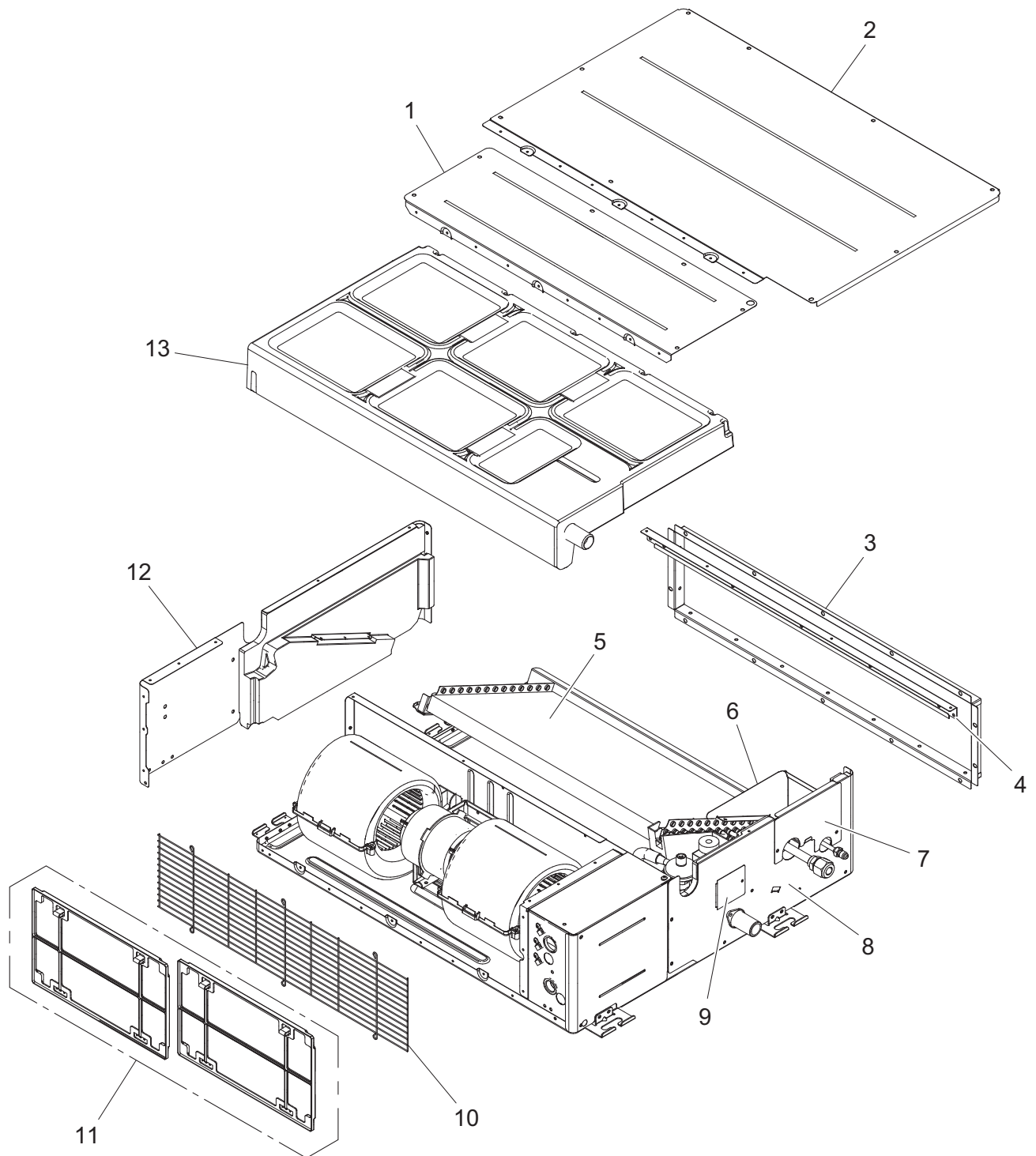
## CAUTION

- Service personnel
    - Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
    - Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
    - Servicing shall be performed only as recommended by the manufacturer.
  - Work
    - 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.

## 2. Indoor unit parts list

### 2-1. Models: ADUH09LUAS1 and ADUH12LUAS1

#### ■ Exterior parts and chassis

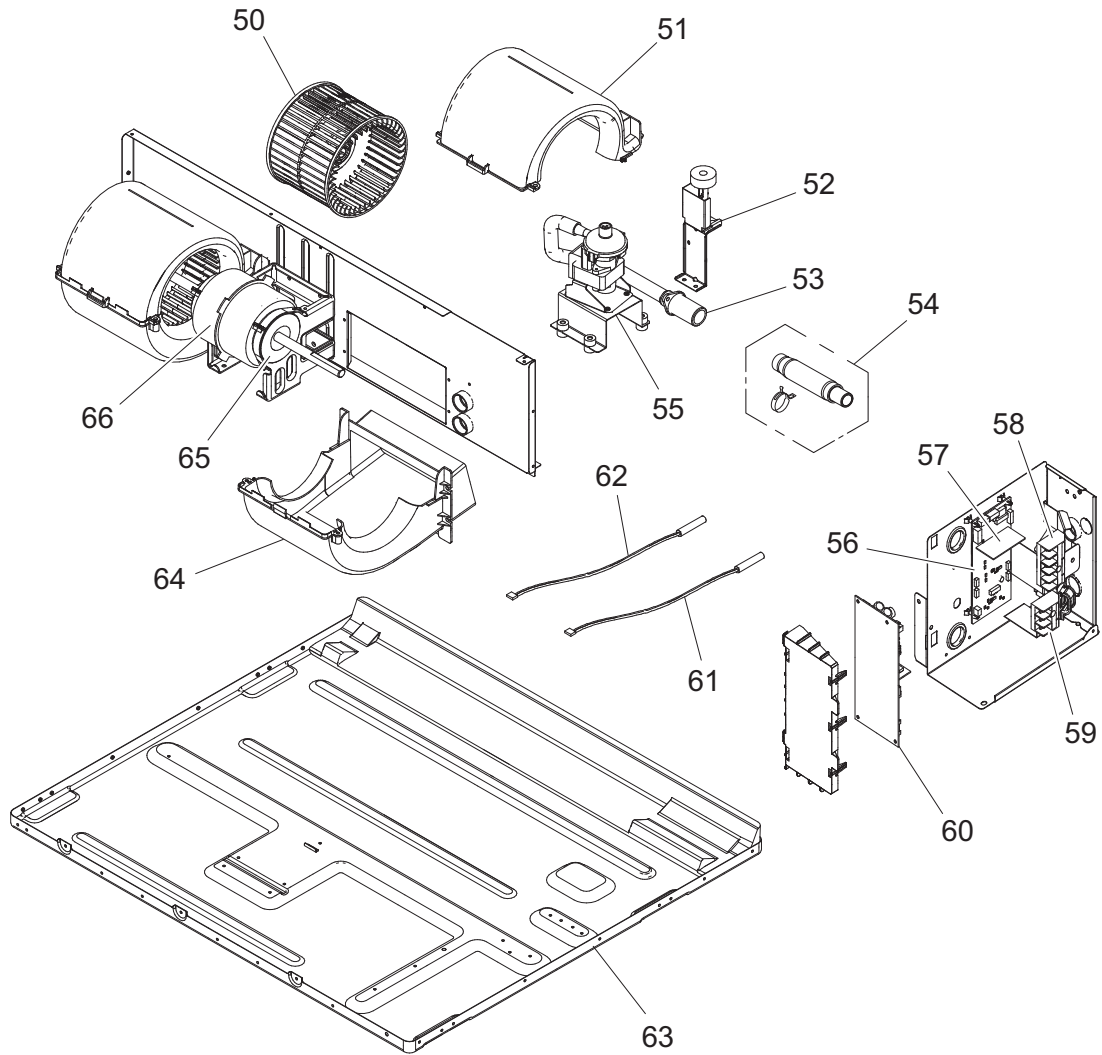


Item no.	Part no.	Part name	Service part
1	9380597001	Cabinet panel (2-fan)	◆
2	9380602019	Main panel (2-fan)	◆
3	9380042006	Outlet frame assy	◆
4	9380594000	Front panel (2-fan)	◆
5	9380682585	Evaporator total assy	◆
6	9379576017	Valve cover sub assy	◆
7	9379900003	Pipe panel sub assy	◆
8	9379907019	Side panel L sub assy	◆
9	9379915007	Window panel sub assy	◆
10	9380589006	Fan guard (2-fan)	◆
11	9379897006	Air filter sub assy	◆
12	9379906012	Side panel R sub assy	◆
13	9379901161	Drain pan sub assy	◆

# ■ Fan and PC boards

TECHNICAL DATA  
AND PARTS LIST

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AND PARTS LIST



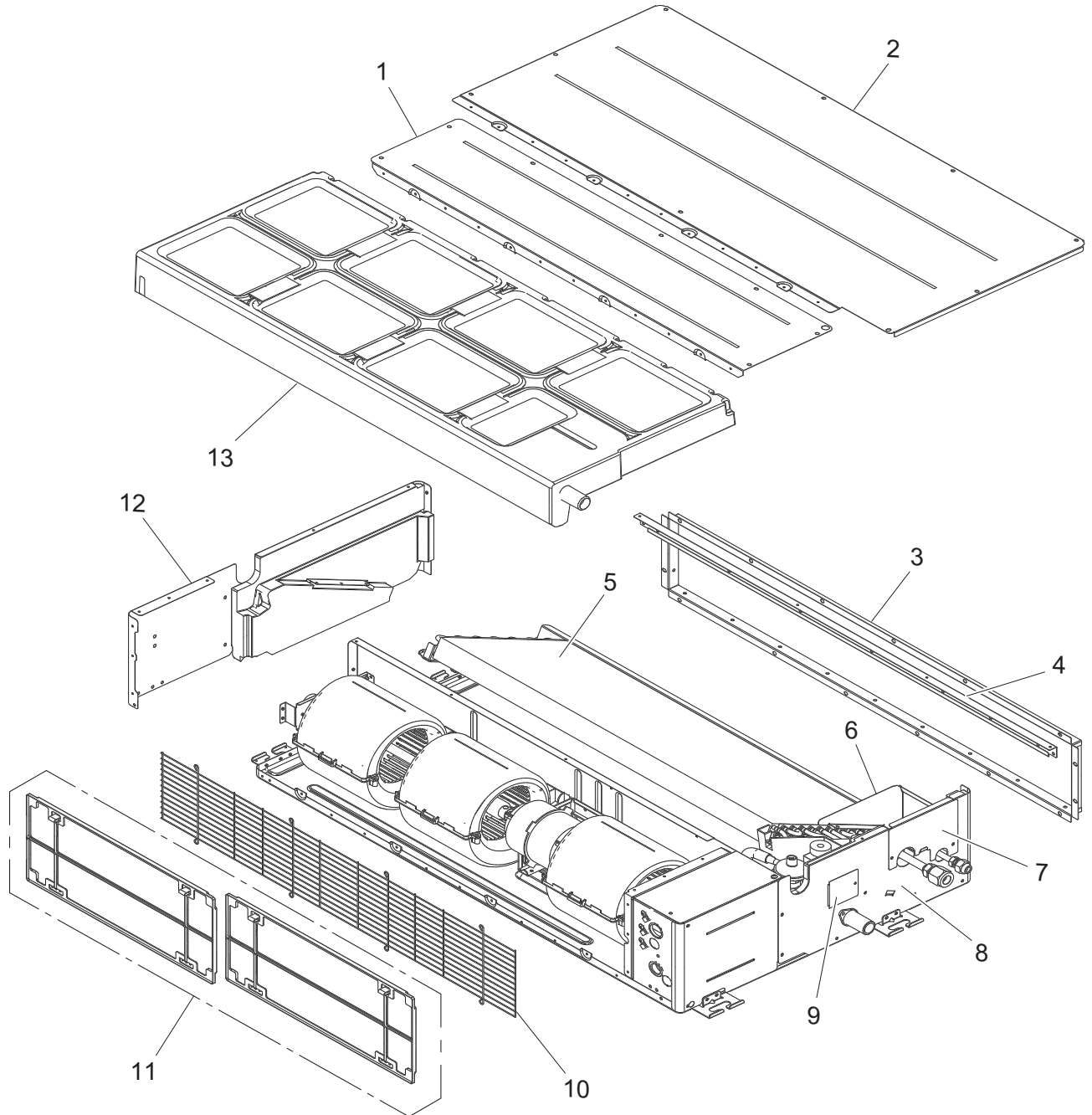
Item no.	Part no.	Part name	Service part
50	9379570015	Sirocco fan assy	◆
51	9379572019	Casing B	◆
52	9378593039	Float switch sub assy	◆
53	9379913003	Drain hose assy	◆
54	9378450141	Hose sub assy	◆
55	9379914062	Drain pump sub assy	◆
56	9711875068	Main PCB (09 model)	◆
	9711875075	Main PCB (12 model)	◆
57	9710019005	2-way remote PCB	◆
58	9900896027	Terminal 5P (Remote)	◆
59	9900568009	Terminal 3P	◆
60	9710661020	Power supply PCB	◆
61	9900653019	Thermistor (Room)	◆
62	9900349035	Thermistor (Pipe)	◆
63	9379908030	Top panel sub assy	◆
64	9379571012	Casing U	◆
65	9379644006	Vibration-proof rubber assy	◆
66	9379047159	Motor sub assy	◆
—	9710177057	Wire with connector (CN46 on Main PCB—Terminal 5P [External input])	◆
—	9710171055	Wire with connector (CN260 on Main PCB—CN262 on Power supply PCB)	◆
—	9710206047	Wire with connector (CN261 on Main PCB—CN263 on Power supply PCB)	◆
—	9710343094	Wire with connector (CN300 on Main PCB—Terminal 5P [Remote])	◆
—	9710703010	Wire with connector (CN205 on Power supply PCB—Terminal 3P)	◆

## 2-2. Model: ADUH18LUAS1

### External parts and chassis

TECHNICAL DATA  
AND PARTS LIST

TECHNICAL DATA  
AND PARTS LIST



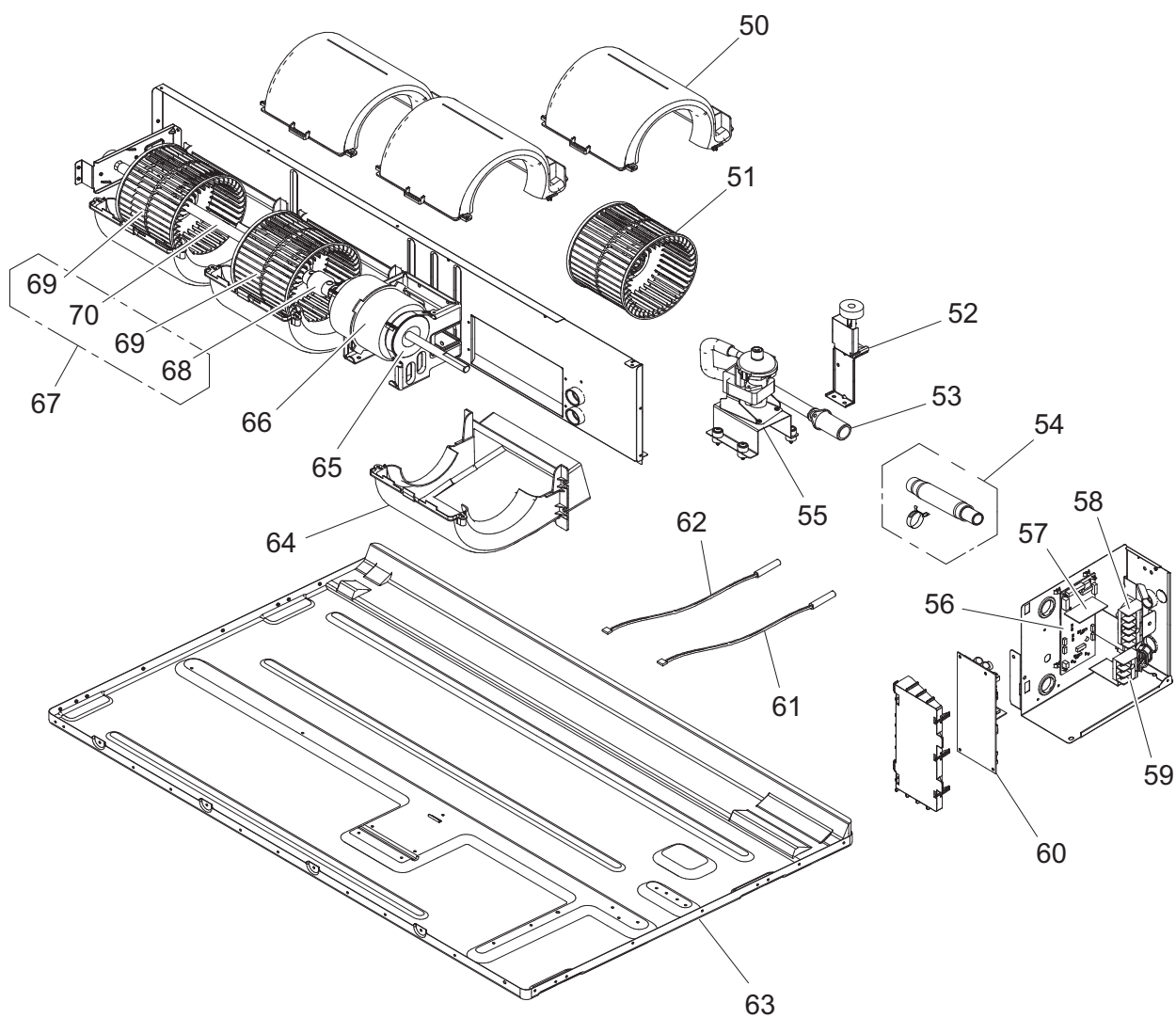


Item no.	Part no.	Part name	Service part
1	9380598008	Cabinet panel (3-fan)	◆
2	9380603016	Main panel (3-fan)	◆
3	9380042013	Outlet frame assy	◆
4	9380595007	Front panel (3-fan)	◆
5	9380682592	Evaporator total assy	◆
6	9379576017	Valve cover sub assy	◆
7	9379900003	Pipe panel sub assy	◆
8	9379907019	Side panel L sub assy	◆
9	9379915007	Window panel sub assy	◆
10	9380590002	Fan guard (3-fan)	◆
11	9379897013	Air filter sub assy	◆
12	9379906012	Side panel R sub assy	◆
13	9379901178	Drain pan sub assy	◆

# Fan and PC boards

TECHNICAL DATA  
AND PARTS LIST

TECHNICAL DATA  
AND PARTS LIST

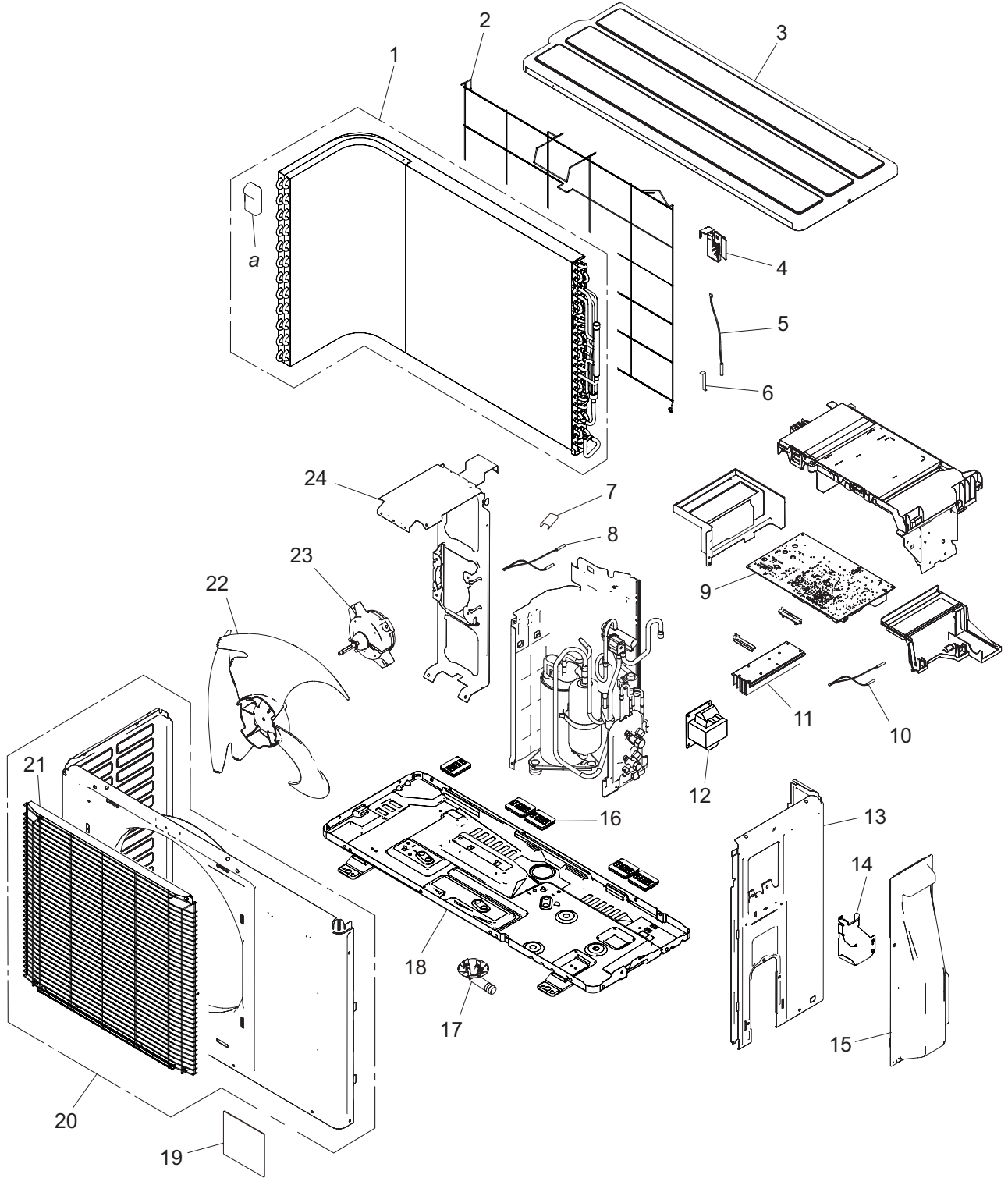


Item no.	Part no.	Part name	Service part
50	9379572019	Casing B	◆
51	9379570022	Sirocco fan assy	◆
52	9378593039	Float switch sub assy	◆
53	9379913003	Drain hose assy	◆
54	9378450141	Hose sub assy	◆
55	9379914062	Drain pump sub assy	◆
56	9711875082	Main PCB	◆
57	9710019005	2-way remote PCB	◆
58	9900896027	Terminal 5P (Remote)	◆
59	9900568009	Terminal 3P	◆
60	9710661020	Power supply PCB	◆
61	9900653019	Thermistor (Room)	◆
62	9900349035	Thermistor (Pipe)	◆
63	9379908047	Top panel sub assy	◆
64	9379571012	Casing U	◆
65	9379644006	Vibration-proof rubber assy	◆
66	9379047142	Motor sub assy	◆
67	9379971065	Sirocco fan sub assy	◆
68	9378038011	Joint assy	◆
69	9379570039	Sirocco fan assy	◆
70	9381052004	Shaft assy	◆
—	9710177057	Wire with connector (CN46 on Main PCB—Terminal 5P [External input])	◆
—	9710171055	Wire with connector (CN260 on Main PCB—CN262 on Power supply PCB)	◆
—	9710206047	Wire with connector (CN261 on Main PCB—CN263 on Power supply PCB)	◆
—	9710343094	Wire with connector (CN300 on Main PCB—Terminal 5P [Remote])	◆
—	9710703010	Wire with connector (CN205 on Power supply PCB—Terminal 3P)	◆

### 3. Outdoor unit parts list

#### 3-1. Model: AOUH09LUAS1

##### ■ Exterior parts and chassis



TECHNICAL DATA  
AND PARTS LIST

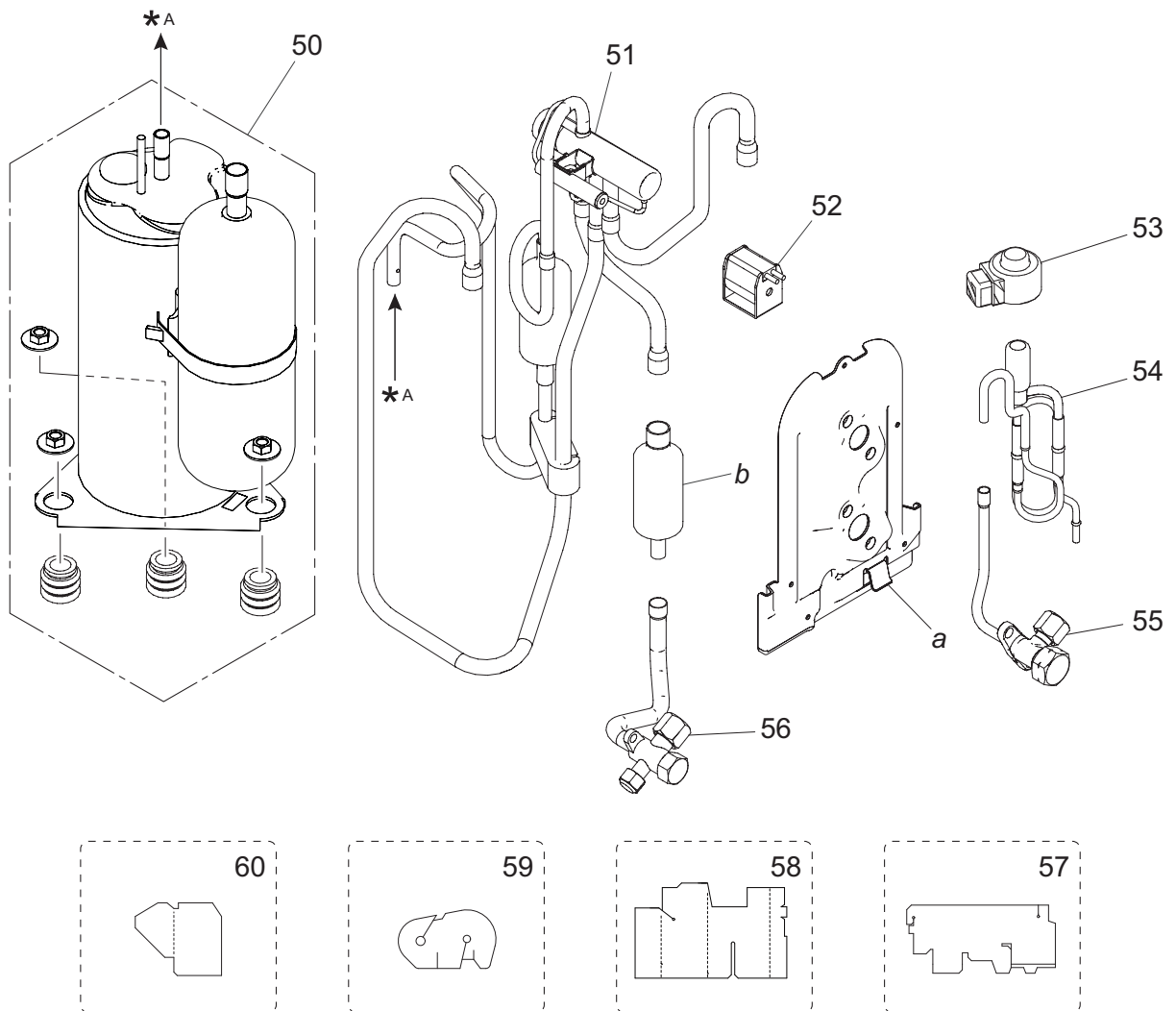
TECHNICAL DATA  
AND PARTS LIST

Item no.	Part no.	Part name	Service part
1	9323834132	Heat exchanger unit	◆
2	9377840004	Protective net	◆
3	9322556028	Top panel assy	◆
4	9322138002	Thermistor holder	◆
5	9900984014	Thermistor (Heat exchanger)	◆
6	313728262708	Thermistor spring A	◆
7	9300089012	Thermistor spring	◆
8	9900935047	Thermistor assy (Discharge temp.)	◆
9	9709686218	Main PCB	◆
10	9900565060	Thermistor (Outdoor temp.)	◆
11	9384912008	Heat sink	◆
12	9900583019	Reactor assy	◆
13	9322552259	Cabinet right assy	◆
14	9384268006	Conduit cover	◆
15	9322570055	Switch cover assy	◆
16	9383720000	Drain cap assy	◆
17	9322144003	Drain pipe	◆
18	9323550025	Base assy	◆
19	9317903011	Emblem	◆
20	9322555199	Front panel assy	◆
21	9384265005	Fan guard	◆
22	9322136008	Propeller fan	◆
23	9603553005	DC fan motor	◆
24	9322553010	Motor bracket assy	◆
—	9711555007	Wire with terminal (Terminal—Earth)	◆
a	—	Hair pin cushion	—

# Compressor

TECHNICAL DATA  
AND PARTS LIST

TECHNICAL DATA  
AND PARTS LIST



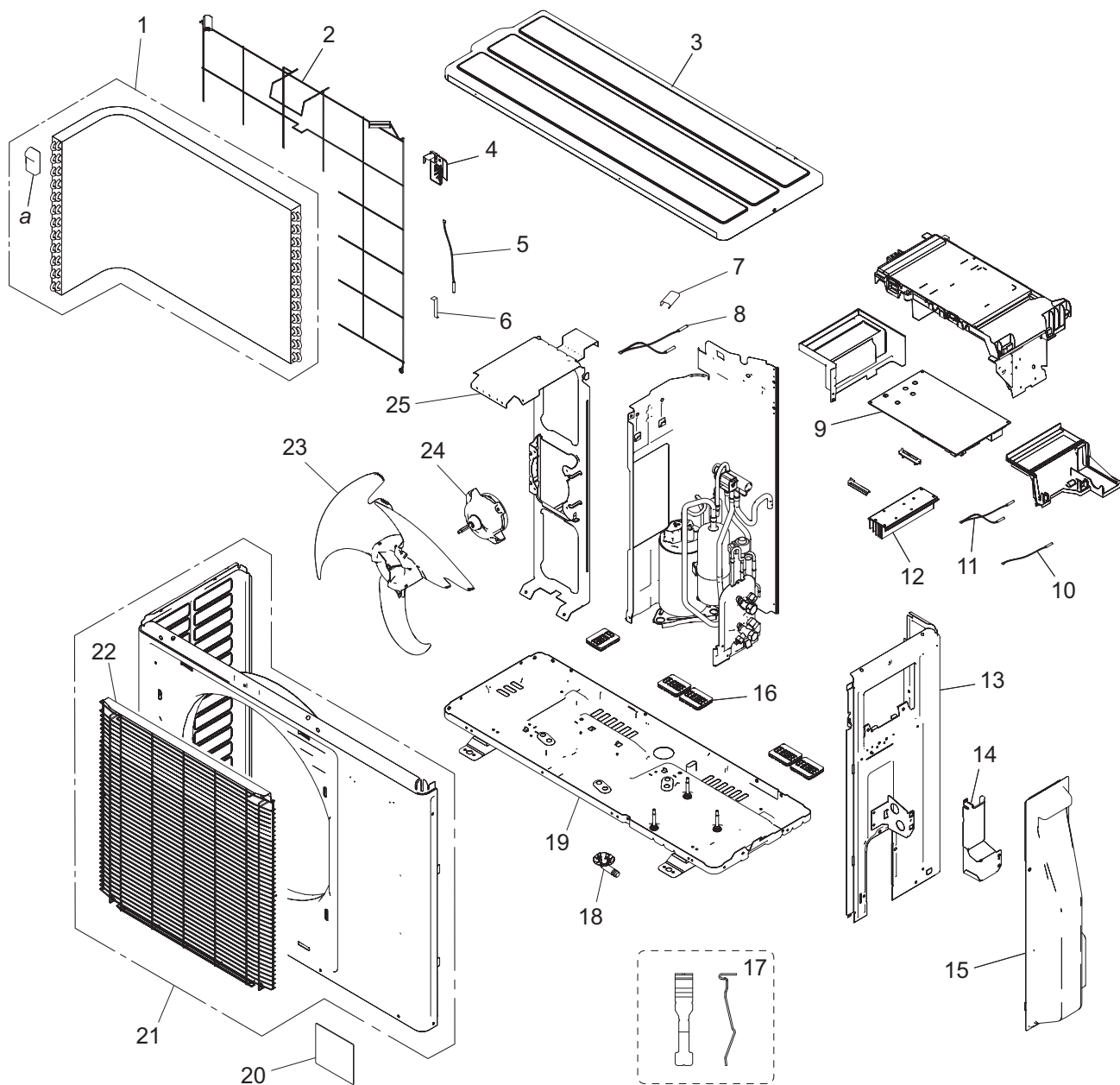
Item no.	Part no.	Part name	Service part
50	9323825192	Compressor unit	◆
51	9322444011	4-way valve assy	◆
52	9970110160	Solenoid	◆
53	9970173028	Expansion valve coil	◆
54	9322463029	Pulse motor valve assy	◆
55	9322474001	2-way valve assy	◆
56	9322475008	3-way valve assy	◆
57	9324024006	S-insulator B	◆
58	9322536020	S-insulator F	◆
59	9322537003	S-insulator H	◆
60	9323045002	S-insulator V	◆
<i>a</i>	—	Valve bracket	—
<i>b</i>	—	Muffler	—

### 3-2. Models: AOUH12LUAS1 and AOUH18LUAS1

#### ■ Exterior parts and chassis

TECHNICAL DATA  
AND PARTS LIST

TECHNICAL DATA  
AND PARTS LIST



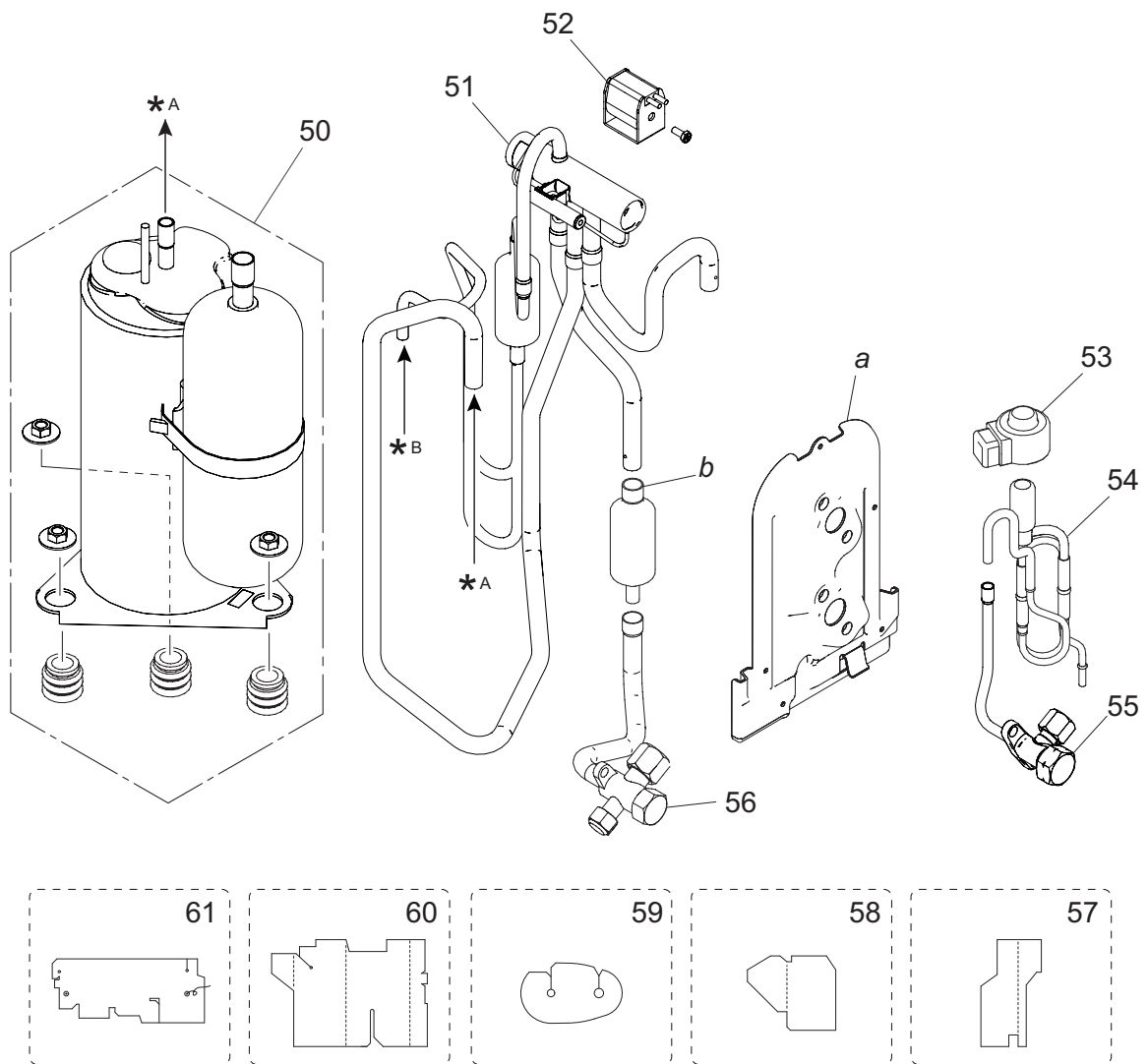


Item no.	Part no.	Part name	Service part
1	9323834194	Heat exchanger unit (12 model)	◆
	9323834330	Heat exchanger unit (18 model)	◆
2	9377854001	Protective net assy	◆
3	9322556028	Top panel assy	◆
4	9322327000	Thermistor holder	◆
5	9900984014	Thermistor (Heat exchanger)	◆
6	313728262708	Thermistor spring A	◆
7	9300089012	Thermistor spring	◆
8	9900935054	Thermistor assy (Discharge temp.)	◆
9	9709686225	Main PCB (12 model)	◆
	9709686232	Main PCB (18 model)	◆
10	9900985011	Thermistor assy (Compressor temp.)	◆
11	9900565060	Thermistor assy (Outdoor temp.)	◆
12	9322420046	Heat sink	◆
13	9322552242	Cabinet right assy	◆
14	9384276001	Conduit cover	◆
15	9322570062	Switch cover assy	◆
16	9810028006	Thermistor stopper	◆
17	9383720000	Drain cap assy	◆
18	9322144003	Drain pipe	◆
19	9323550025	Base assy	◆
20	9317903011	Emblem	◆
21	9322555182	Front panel assy	◆
22	9384273000	Fan Guard	◆
23	9322150004	Propeller fan	◆
24	9603601003	DC fan motor	◆
25	9322553027	Motor bracket assy	◆
—	9709488027	Wire with terminal (Terminal—Earth)	◆
<i>a</i>	—	Hair pin cushion	—

# Compressor

TECHNICAL DATA  
AND PARTS LIST

TECHNICAL DATA  
AND PARTS LIST





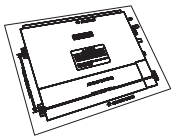
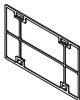


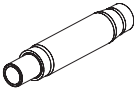
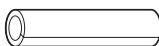

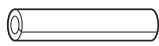



Item no.	Part no.	Part name	Service part
50	9323825208	Compressor unit (12 model)	◆
	9323825215	Compressor unit (18 model)	◆
51	9322446015	4-way valve assy	◆
52	9970194023	Solenoid	◆
53	9970173028	Expansion valve coil	◆
54	9322463029	Pulse motor valve assy	◆
55	9322474001	2-way valve assy	◆
56	9322850010	3-way valve assy (12 model)	◆
	9387831016	3-way valve assy (18 model)	◆
57	9322824004	S-insulator K	◆
58	9323045002	S-insulator V	◆
59	9322501004	S-insulator H	◆
60	9322847003	S-insulator F	◆
61	9324014014	S-insulator B	◆
<i>a</i>	—	Valve bracket	—
<i>b</i>	—	Muffler	—

## 4. Accessories




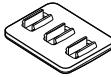
### 4-1. Indoor unit

#### ■ Models: ADUH09LUAS1, ADUH12LUAS1, and ADUH18LUAS1

Part name	Exterior	Q'ty	Part name	Exterior	Q'ty
Operating manual		1	Cable tie (large)		4
Installation manual		1	Cable tie (medium)		3
Installation template		1	Filter (small) [For 09/12 models]		2
Washer		8	Filter (large) [For 18 models]		2
Drain hose ( $\varnothing$ 3/4 in [I.D.], $\varnothing$ 1-1/16 in [O.D.])		1	Coupler heat insulation (large)		1
Hose band		1	Coupler heat insulation (small)		1
Drain hose insulation B		1			

### 4-2. Outdoor unit



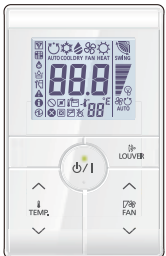
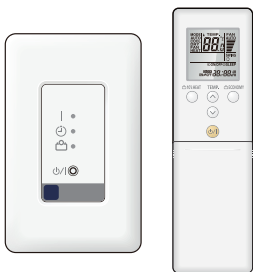
#### ■ Models: AOUH09LUAS1, AOUH12LUAS1, and AOUH18LUAS1

Part name	Exterior	Q'ty	Part name	Exterior	Q'ty
Installation manual		1	Cable tie		2
Drain pipe		1	Drain cap		5

## 5. Optional parts





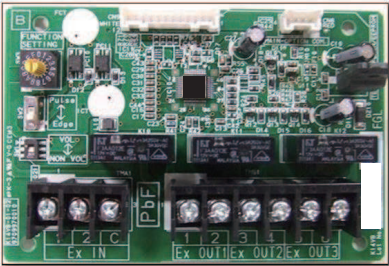
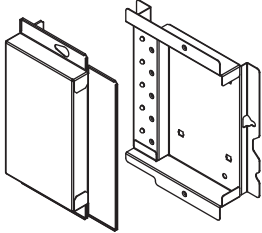


### 5-1. Indoor unit


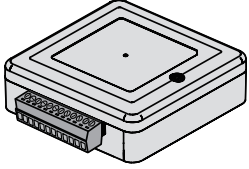

#### ■ Controllers

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
	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
	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
	IR receiver kit with wireless remote controller	UTY-LBTUM	Unit control is performed by wireless remote controller.

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

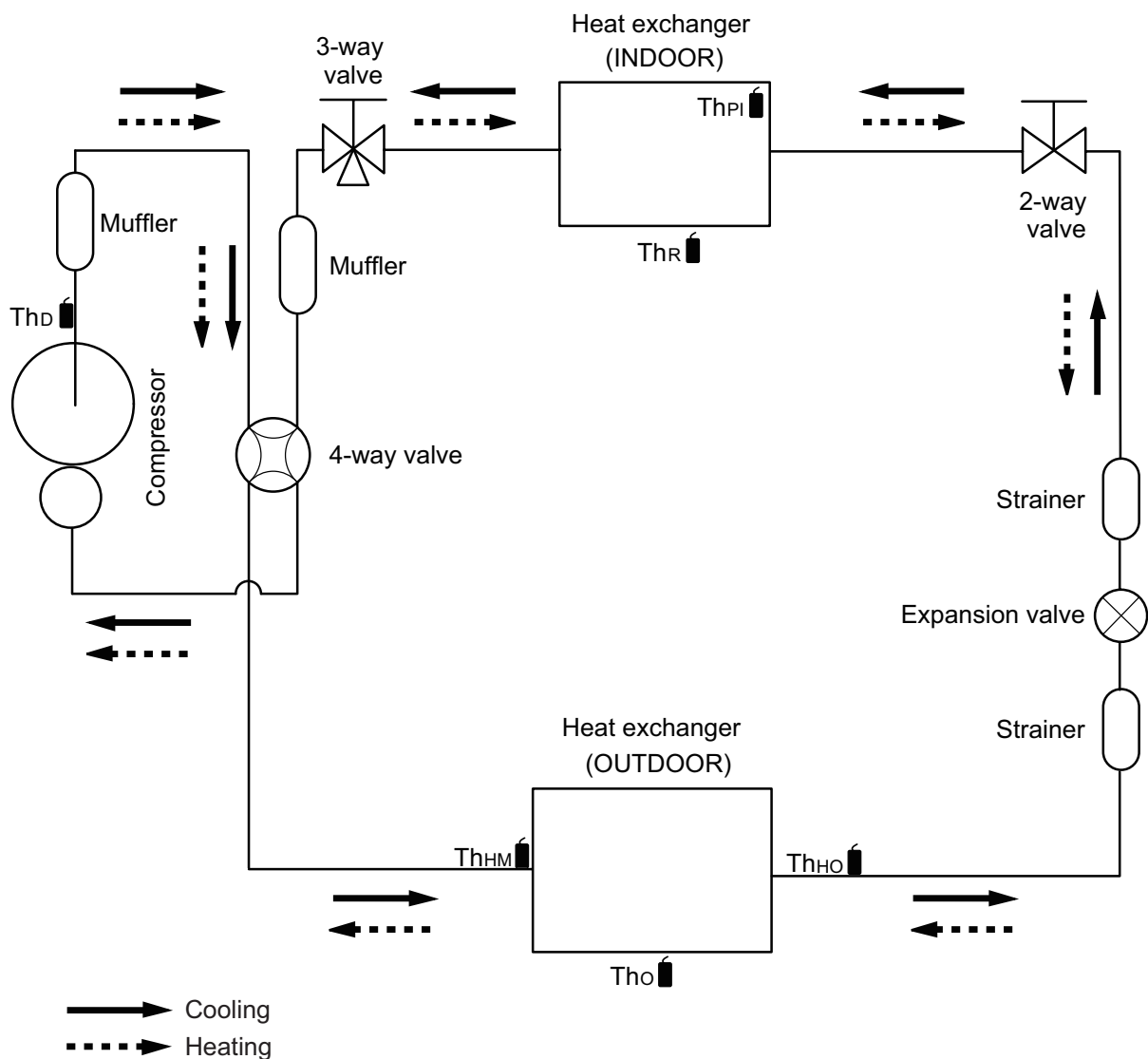
## Others

Exterior	Part name	Model name	Summary
	Remote sensor unit	UTY-XSZX	Thermo-sensor for sensing the temperature of arbitrary place in the room.
	Auto louver grille kit	UTD-GXTA-W	Width: 683 mm For 09 and 12 model
	Auto louver grille kit	UTD-GXTB-W	Width: 883 mm For 18 model
	External connect kit	UTY-XWZXZG	Use to connect with various peripheral devices and air conditioner PCB. For control output port.
	External input and output PCB	UTY-XCSX	Use to connect with external devices and air conditioner PCB.
	External input and output PCB box	UTZ-GXEA	For installing the External input and output PCB.
	Wireless LAN adapter	UTY-TFSXZ2	Remotely manage an air conditioning system using mobile devices such as smartphones and tablets. For connection indoor unit with UART interface.
	Modbus converter	UTY-VMSX	For connection between indoor unit with UART interface and a Modbus open network.

Exterior	Part name	Model name	Summary
	KNX converter	UTY-VKSX	For connection between indoor unit with UART interface and a KNX open network.
	Thermostat converter	UTY-TTRX	This converter can control Fujitsu General products using a third-party thermostat controller.
	External switch controller	UTY-TERX	Air conditioner switching can be controlled by connecting other external sensor switches.

## 6. Refrigerant system diagrams

### 6-1. Models: AOUH09LUAS1



ThD : Thermistor (Discharge temperature)

Tho : Thermistor (Outdoor temperature)

ThHO : Thermistor (Heat exchanger out temperature)

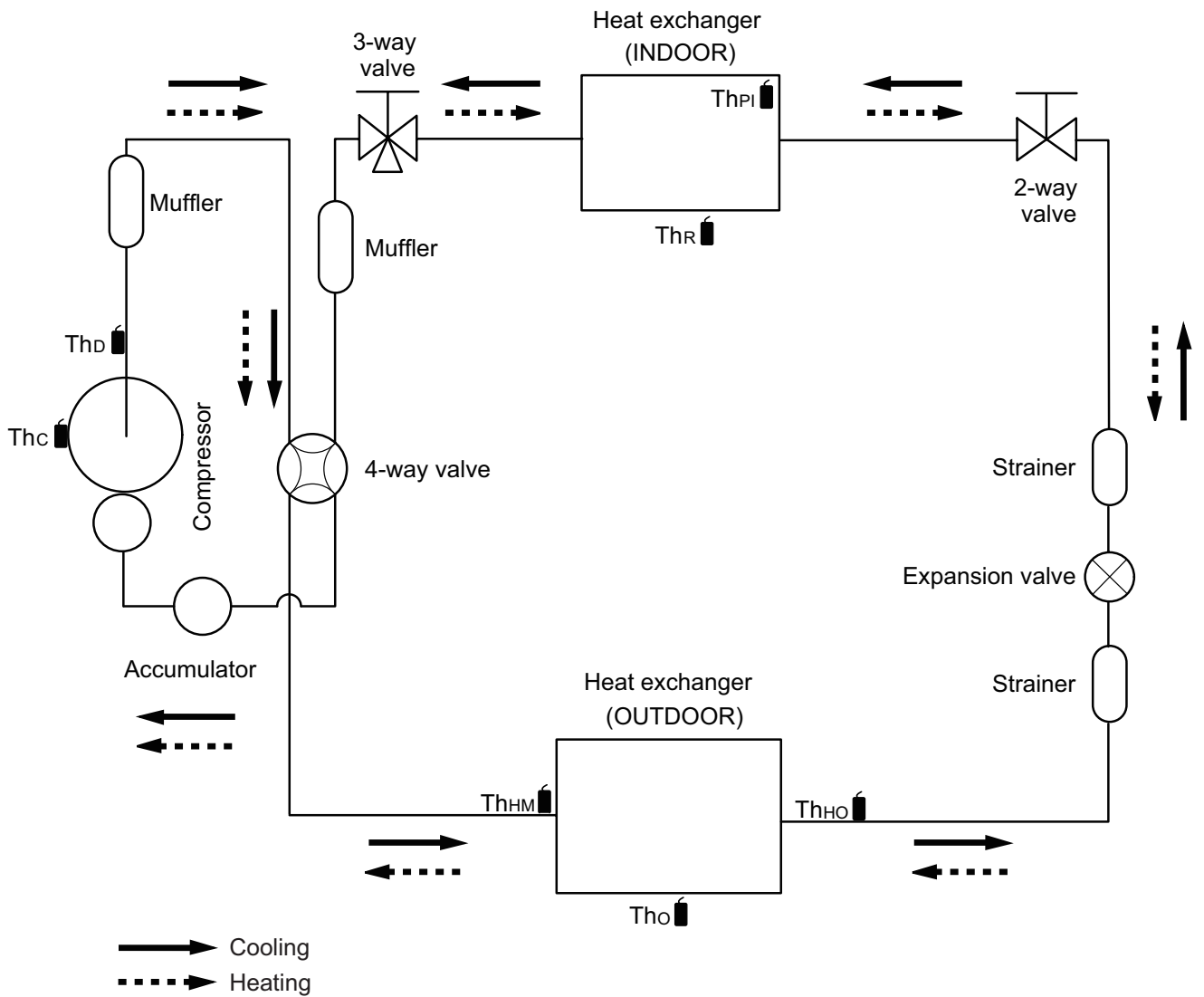
ThHM : Thermistor (Heat exchanger middle temperature)

ThR : Thermistor (Room temperature)

ThPI : Thermistor (Pipe temperature)



## 6-2. Models: AOUH12LUAS1 and AOUH18LUAS1



Thc : Thermistor (Compressor temperature)

Thd : Thermistor (Discharge temperature)

Tho : Thermistor (Outdoor temperature)

Thm : Thermistor (Heat exchanger middle temperature)

Tho : Thermistor (Heat exchanger out temperature)

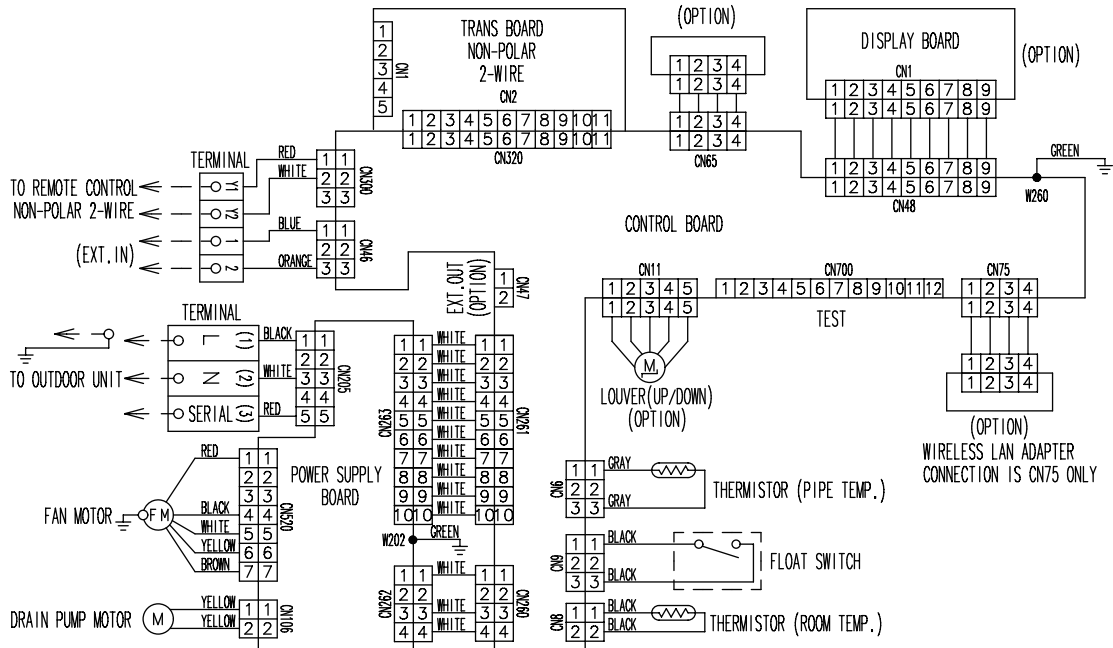
Thr : Thermistor (Room temperature)

Thpi : Thermistor (Pipe temperature)

# 7. Wiring diagrams

## 7-1. Indoor unit

### Models: ADUH09LUAS1, ADUH12LUAS1, and ADUH18LUAS1



TECHNICAL DATA AND PARTS LIST

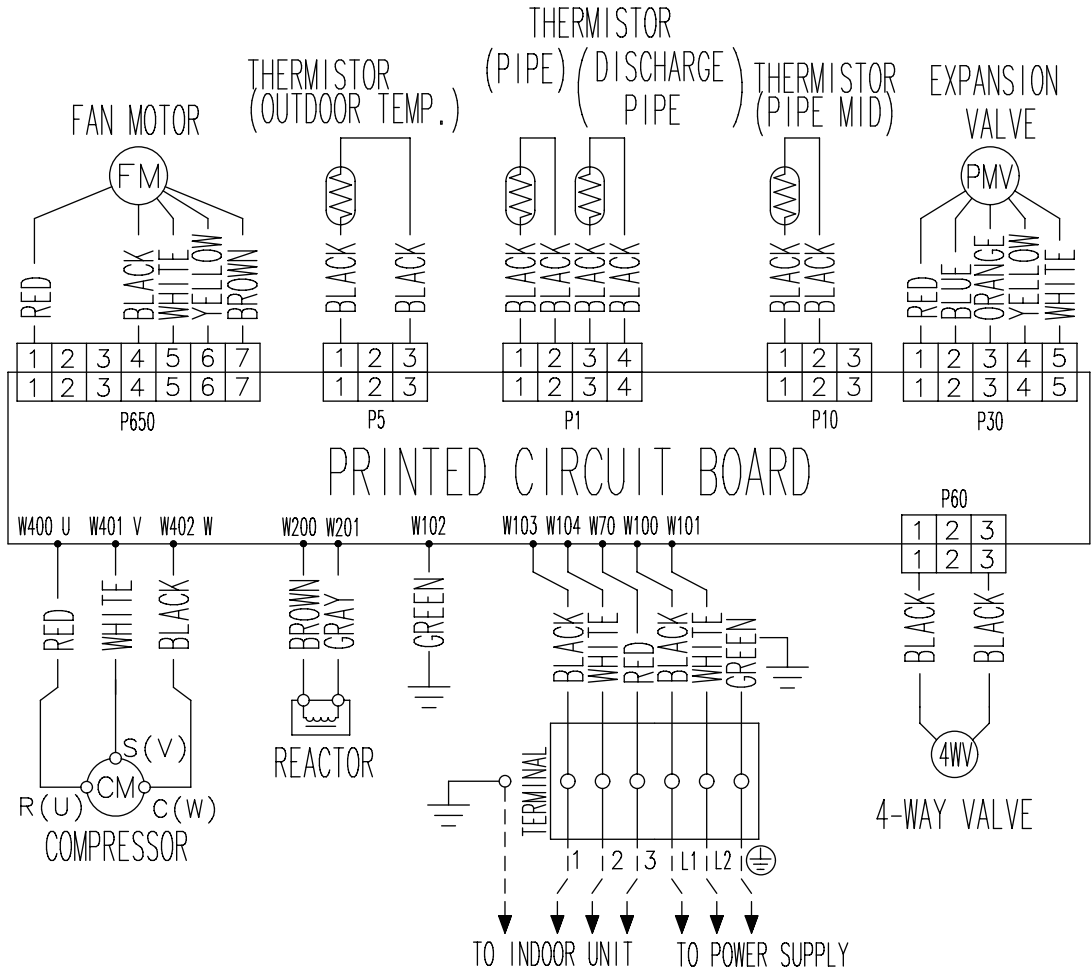
TECHNICAL DATA AND PARTS LIST

# 7-2. Outdoor unit

## Model: AOUH09LUAS1

TECHNICAL DATA AND PARTS LIST

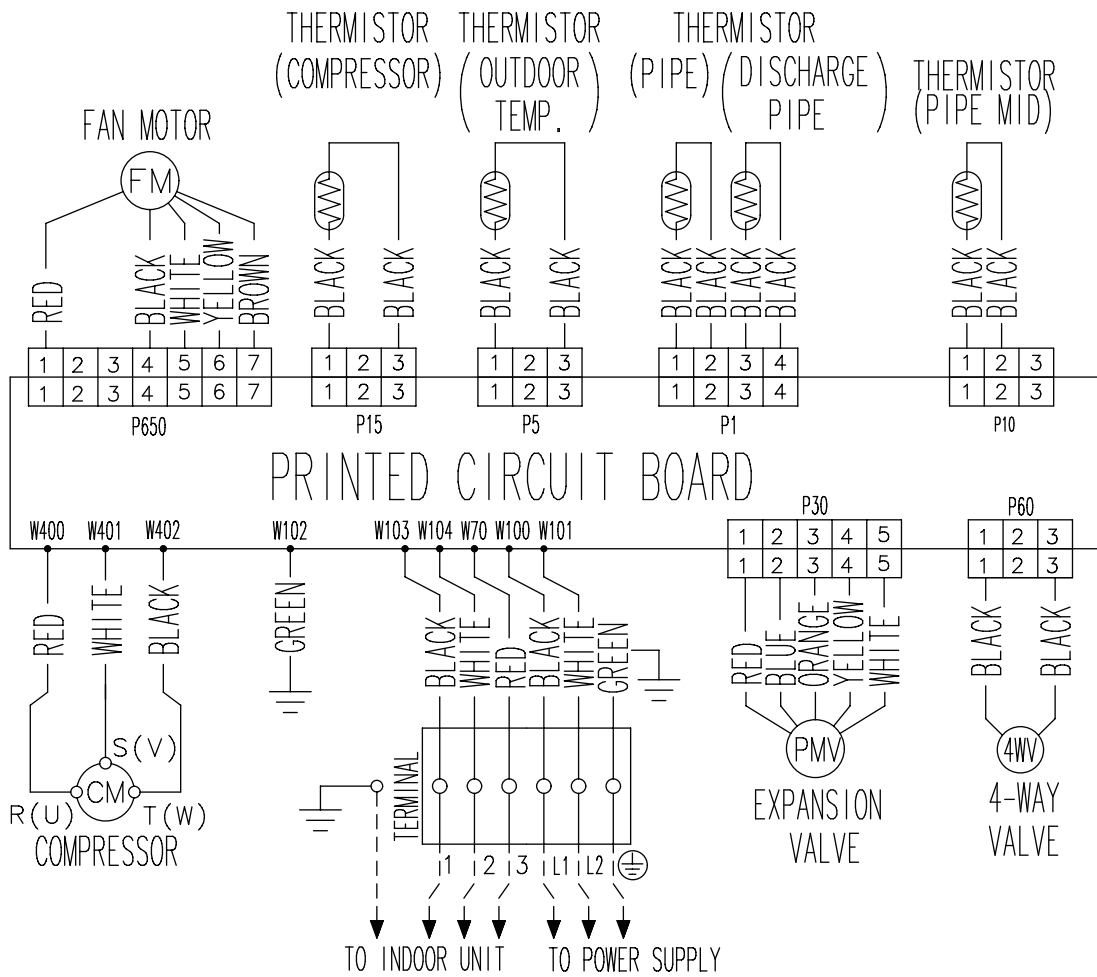
TECHNICAL DATA AND PARTS LIST



Models: AOUH12LUAS1 and AOUH18LUAS1

TECHNICAL DATA  
AND PARTS LIST

TECHNICAL DATA  
AND PARTS LIST



# 8. PC board diagrams

## 8-1. Models: ADUH09LUAS1, ADUH12LUAS1, and ADUH18LUAS1

TECHNICAL DATA AND PARTS LIST

TECHNICAL DATA AND PARTS LIST

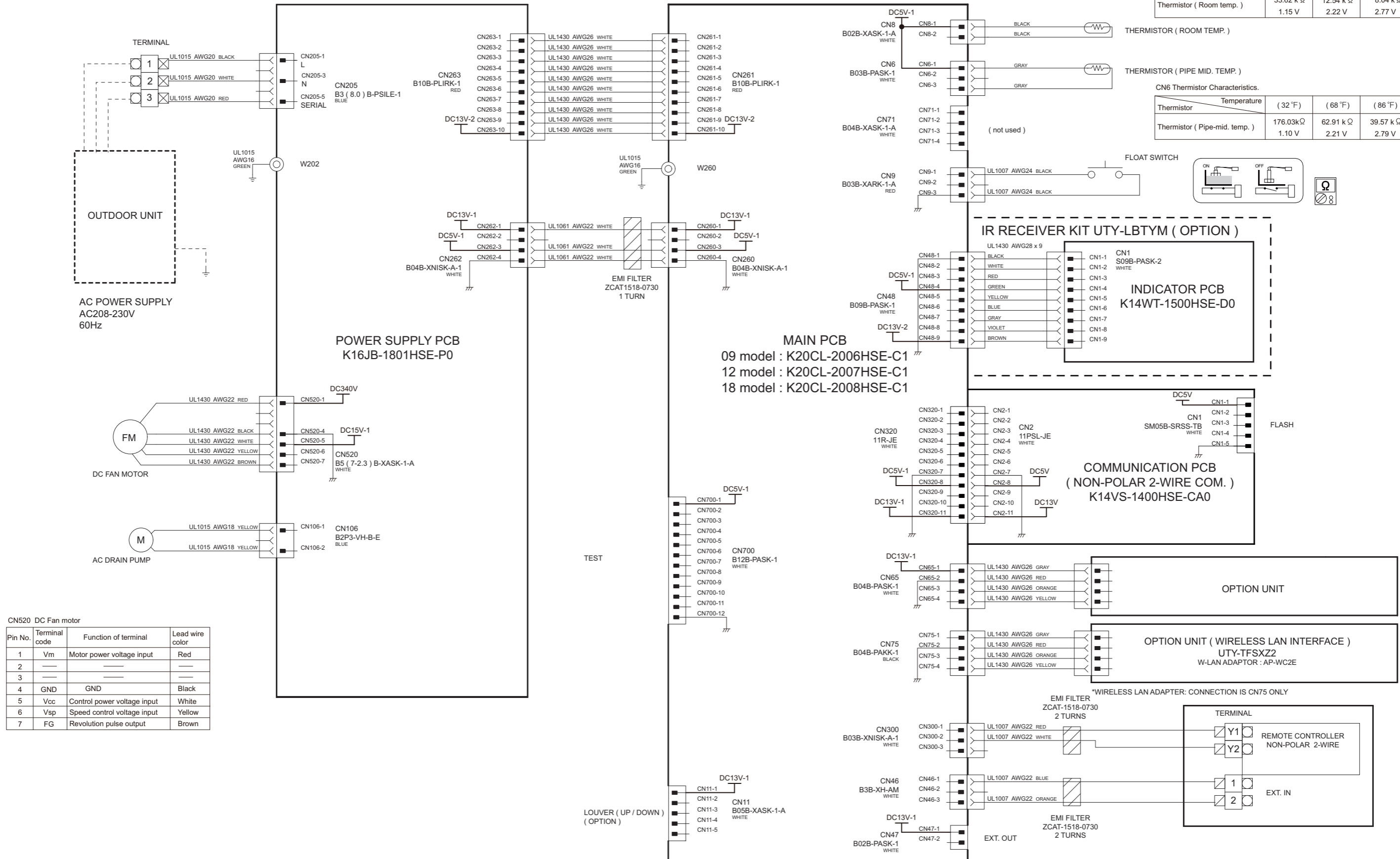
**CONTROL UNIT**  
 09 model : EZ-02016HSE  
 12 model : EZ-02017HSE  
 18 model : EZ-02018HSE

CN8 Thermistor Characteristics.

Thermistor	Temperature	(32 °F)	(68 °F)	(86 °F)
Thermistor ( Room temp. )		33.62 kΩ	12.54 kΩ	8.04 kΩ
		1.15 V	2.22 V	2.77 V

CN6 Thermistor Characteristics.

Thermistor	Temperature	(32 °F)	(68 °F)	(86 °F)
Thermistor ( Pipe-mid. temp. )		176.03kΩ	62.91 kΩ	39.57 kΩ
		1.10 V	2.21 V	2.79 V

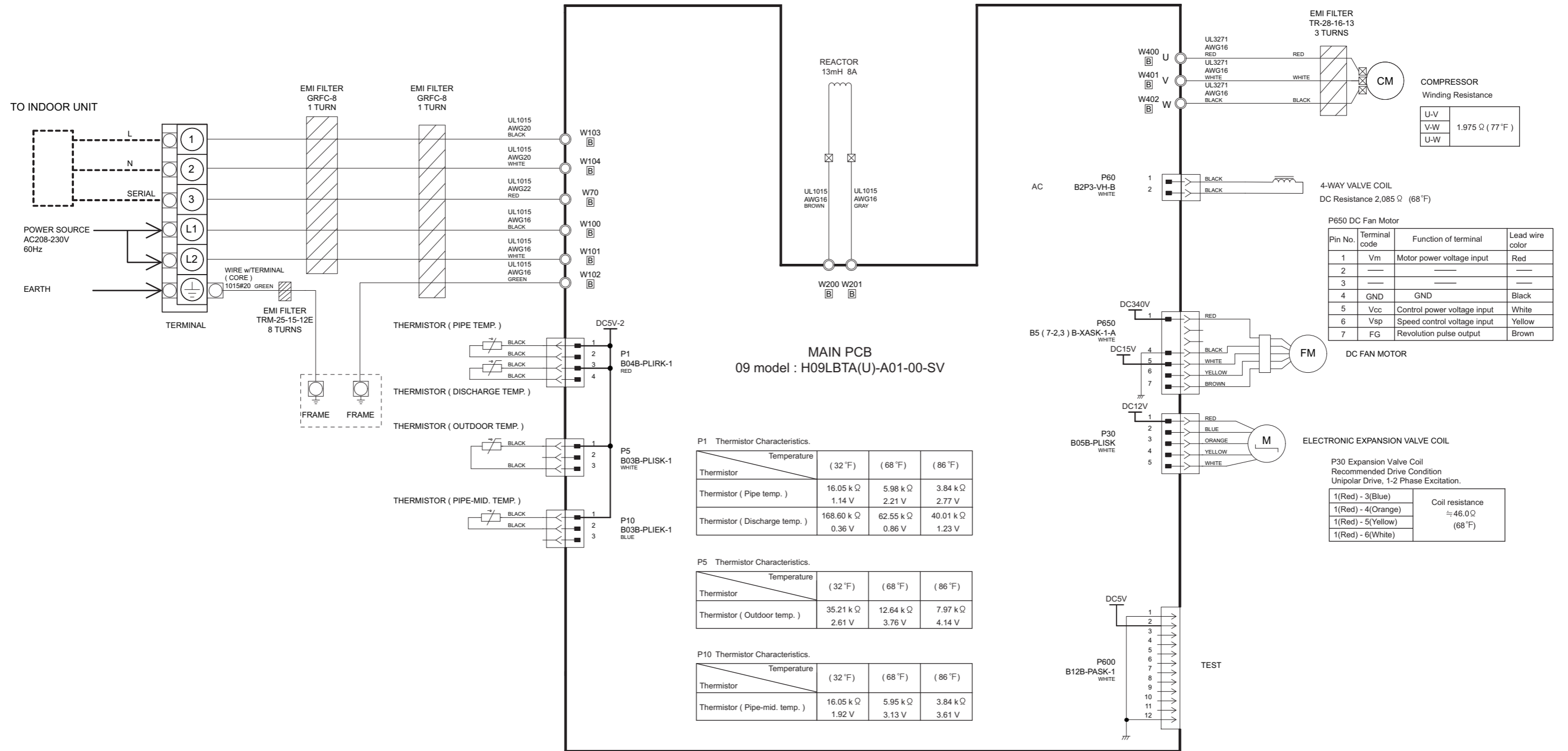


CN520 DC Fan motor

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

8-2. Models: AOUH09LUAS1

INVERTER ASSEMBLY  
09 model : EZ-0200WHUE



P1 Thermistor Characteristics.

Temperature	(32 °F)	(68 °F)	(86 °F)
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.

Temperature	(32 °F)	(68 °F)	(86 °F)
Thermistor ( Outdoor temp. )	35.21 k Ω 2.61 V	12.64 k Ω 3.76 V	7.97 k Ω 4.14 V

P10 Thermistor Characteristics.

Temperature	(32 °F)	(68 °F)	(86 °F)
Thermistor ( Pipe-mid. temp. )	16.05 k Ω 1.92 V	5.95 k Ω 3.13 V	3.84 k Ω 3.61 V

TECHNICAL DATA  
AND PARTS LIST

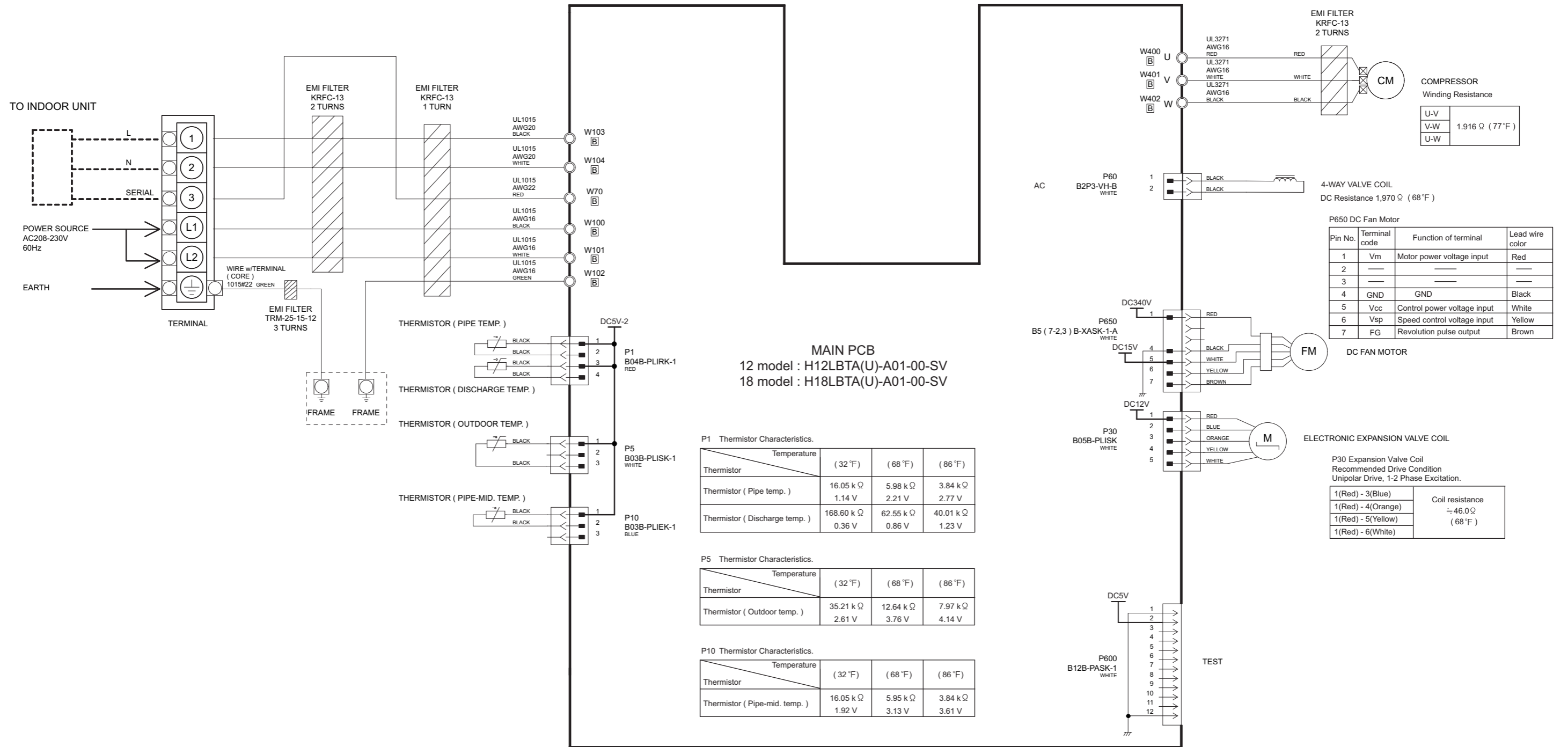
TECHNICAL DATA  
AND PARTS LIST

### 8-3. Models: AOUH12LUAS1 and AOUH18LUAS1

INVERTER ASSEMBLY  
 12 model : EZ-0200HHUE  
 18 model : EZ-0200YHUE

TECHNICAL DATA  
AND PARTS LIST

TECHNICAL DATA  
AND PARTS LIST







## 3. TROUBLESHOOTING

# CONTENTS

## 3. TROUBLESHOOTING

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## 1. Error code

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

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

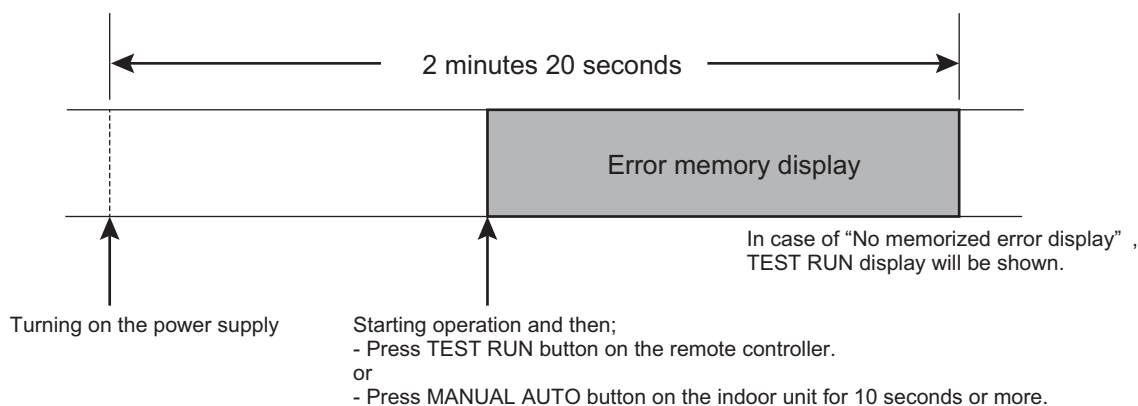
Errors, once displayed, will be automatically stored in the PC board of the indoor unit. Even if the power is disconnected, the memory containing the error history will not be erased.

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

### 1-1. How to check the error memory

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

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



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

### 1-2. How to erase the error memory

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

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

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

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

Error contents	Wired remote controller display
E: 11. Serial communication error (Serial reverse transfer error) (Outdoor unit)	11
E: 11. Serial communication error (Serial forward transfer error) (Indoor unit)	11
E: 12. Wired remote controller communication error (Indoor unit)	12
E: 18. External communication error (Indoor unit)	18
E: 23. Combination error (Outdoor unit)	23
E: 26. Address setting error in wired remote controller (Indoor unit)	26
E: 29. Connected unit number error (Indoor unit)	29
E: 32. Indoor unit main PCB error (Indoor unit)	32
E: 33. Indoor unit motor electricity consumption detection error (Indoor unit)	33
E: 39. Indoor unit power supply error for fan motor (Indoor unit)	39
E: 3A. Indoor unit communication circuit (wired remote controller) error	3A
E: 41. Room temperature sensor error (Indoor unit)	41
E: 42. Indoor unit heat exchanger sensor error (Indoor unit)	42
E: 51. Indoor unit fan motor error (Indoor unit)	51
E: 53. Drain pump error (Indoor unit)	53
E: 62. Outdoor unit main PCB error (Outdoor unit)	62
E: 63. Inverter error (Outdoor unit)	63
E: 64. PFC circuit error (Outdoor unit)	64
E: 65. IPM error (Outdoor unit)	65
E: 71. Discharge thermistor error (Outdoor unit)	71
E: 73. Outdoor unit heat exchanger thermistor error (Outdoor unit)	73
E: 74. Outdoor temperature thermistor error (Outdoor unit)	74
E: 84. Current sensor error (Outdoor unit)	84
E: 94. Trip detection (Outdoor unit)	94
E: 95. Compressor motor control error (Outdoor unit)	95
E: 97. Outdoor unit fan motor error (Outdoor unit)	97
E: 99. 4-way valve error (Outdoor unit)	99
E: A1. Discharge temperature error (Outdoor unit)	A1

## 2. Troubleshooting with error code

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

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

Check point 1. Reset the power and operate

Does error indication show again?

→ If no, go to "Check point 1-2".



Check point 2. Check connection

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

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

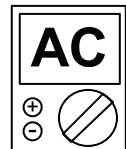
→ If there is an abnormal condition, correct it by referring to the installation manual or the "DESIGN & TECHNICAL MANUAL".



Check point 3. Check the voltage of power supply

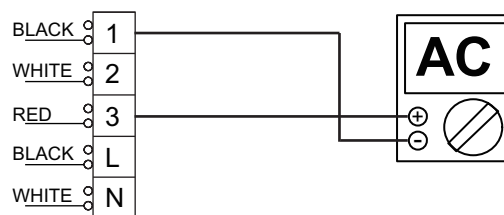
Check the voltage of power supply

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



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

## Check serial signal (Reverse transfer signal)



- Check if indicated value swings between AC 90 V and AC 270 V at the outdoor unit terminal 1—3.
- If it is abnormal, check the parts below.
  - Outdoor unit fan motor in "[Service parts information](#)" on page 03-43
- If outdoor fan motor is abnormal, replace outdoor unit fan motor and main PCB.
- If the checked parts are normal, replace the main PCB.



**End**

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

- Check the complete insulation of the grounding.
- Check if there is any equipment that causes harmonic wave near the power cable (Neon light bulb or any electronic equipment which causes harmonic wave).



**End**



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

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

Check point 1. Reset the power and operate

Does error indication show again?

→ If no, go to "Check point 1-2".



Check point 2. Check connection

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

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

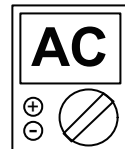
Check connection condition is control unit. (If there is loose connector, open cable or mis-wiring.)



Check point 3. Check the voltage of power supply

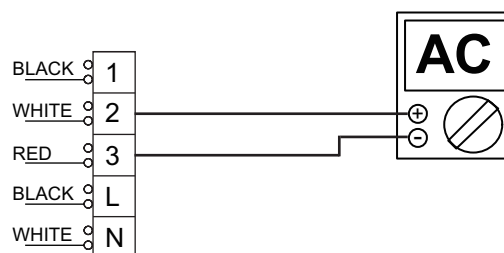
Check the voltage of power supply

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



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

Check serial signal (Forward transfer signal)



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



**End**

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

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



**End**

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

Indicator	Wired remote controller	Error code	E: 12
Detective actuator	Indoor unit	Main PCB	When the indoor unit cannot receive the signal from wired remote controller more than following time during normal operation. <ul style="list-style-type: none"> <li>• 3-wire type: 1 minute</li> <li>• 2-wire type: 2.5 minutes</li> </ul>
	Wired remote control		
Forecast of cause			Terminal connection abnormal
			Wired remote control failure
			Main PCB failure

### Check point 1. Check the connection of terminal

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

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



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

Check voltage at CN300 (terminal 1-3, terminal 1-2) of main PCB. (Power supply to the remote controller)

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



- If it is DC 13 V, remote controller is failure. (Main PCB is normal)
  - Replace remote control
- If it is DC 0 V, main PCB is failure. (Check remote controller once again)
  - Replace main PCB



**End**

### Check Point 2 : Wire installation wrong remote controller group setting

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



### Check Point 2-1 : Check Indoor unit main PCB

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



**End**

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

Indicator	Wired remote controller	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
			External input and output PCB failure
			Main PCB

### Check point 1. Check the connection

- Check any loose or removed connection between the main PCB to the external input and output PCB.  
-> 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 external input and output PCB and the main PCB (If there is loose connector, open cable or mis-wiring.)



### Check point 2. Replace the external input and output PCB

If check point 1 do not improve the symptom, change external input and output PCB.



### Check point 3. Replace main PCB

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



**End**

## 2-5. E: 23. Combination error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 23
Detective actuator	Indoor unit		<ul style="list-style-type: none"> <li>The outdoor unit receives the serial signal of applied refrigerant information from indoor unit. (When the refrigerant type is R410A)</li> <li>When the outdoor unit type is multi type</li> </ul>
Forecast of cause			Incorrect indoor unit is selected.

### Check point 1. Check the type of indoor unit

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



### Check point 2. Replace main PCB

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



**End**

## 2-6. E: 26. Address setting error in wired remote controller (Indoor unit)

Indicator	Wired remote controller	Error code	E: 26
Detective actuator	Wired remote controller (2-wire)	Indoor unit controller PCB	<ul style="list-style-type: none"> <li>When the address number set by auto setting and manual setting are mixed in one remote controller group</li> <li>When the duplicated address number exists in one remote controller group</li> </ul>
Forecast of cause			Wrong wiring of remote controller group
			Wrong remote controller address setting
			Indoor unit main PCB failure
			Remote controller failure

### Check point 1. Wire installation

- Check the wire connection in the remote controller group (For installation method, refer to installation manual)  
-> If there is an abnormal condition, correct it by refer to the installation manual or the "DESIGN & TECHNICAL MANUAL".



### Check point 2. Wrong remote controller group setting

- The given address number by auto setting (00) and the manual set number (except 00) are not existing in one remote controller group.
- The remote controller address setting by UI is not existing same address.
- The duplicate address number is not existing in one remote controller group.



### Check point 3. Check indoor unit main PCB

- Check if main PCB is damaged.
- Change main PCB and check the error after setting remote controller address.



**End**

## 2-7. E: 29. Connected unit number error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 29
Detective actuator	Wired remote controller (2-wire)	When the number of the connected indoor unit exceeds the limitation.	
	Indoor unit main PCB		
Forecast of cause	Wrong wiring of indoor unit or remote controller		
	Number of indoor unit or remote controller in remote controller group		
	Indoor unit main PCB failure		

### Check point 1. Wire installation

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



### Check point 2. Check indoor unit main PCB

- Check if main PCB is damaged.
- Change main PCB and check the error after setting remote controller address.



**End**

## 2-8. E: 32. Indoor unit main PCB error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 32
Detective actuator	Indoor unit	main PCB	When power is on and there is some below case. 1. When model information of EEPROM is incorrect. 2. When the access to EEPROM failed.
Forecast of cause			External cause
			Defective connection of electric components
			Main PCB failure

Check point 1. Reset power supply and operate

Does error indication show again?

→ If no, go to "Check point 1-2".



Check point 2. Check Indoor unit electric components

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



Check point 3. Replace 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 (Electrically Erasable and Programmable Read Only Memory) is a non-volatile memory which keeps memorized information even if the power is turned off. It can change the contents electronically. To change the contents, it uses higher voltage than normal, and it cannot change a partial contents. (Rewriting shall be done upon erasing the all contents.) There is a limit in a number of rewriting.



## 2-9. E: 33. Indoor unit motor electricity consumption detection error (Indoor unit)

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

Check point 1. Check the rotation of fan

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



Check point 2. Check ambient temperature around the motor

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



Check point 3. Check indoor unit fan motor

Check indoor unit fan motor. (Refer to indoor unit fan motor in "[Service parts information](#)" on page 03-43.)  
→ If indoor unit fan motor is abnormal, replace it.



Check point 4. Replace main PCB

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



**End**

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

Indicator	Wired remote controller	Error code	E: 39
Detective actuator	Indoor unit main PCB		<ul style="list-style-type: none"> <li>When a momentary power cut off</li> <li>When do not start fan motor</li> </ul>
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**

## 2-11. E: 3A. Indoor unit communication circuit (wired remote controller) error

Indicator	Wired remote controller	Error code	E: 3A
Detective actuator	Wired remote controller (2-wire)	Indoor unit controller PCB circuit	Detect the communication error of microcomputer and communication PCB.
	Indoor unit controller PCB circuit		
Forecast of cause			Communication PCB defective
			Indoor unit main PCB defective

Check point 1. Check the connection of terminal

- After turning off the power supply, check and correct the followings  
Indoor unit - Check the connection the communication PCB and the main PCB



Check Point 2 : Replace the communication PCB

If the Check point 1 is ok, replace the communication PCB



Check Point 3 : Replace the main PCB

If condition is doesn't change, replace the main PCB



**End**

## 2-12. E: 41. Room temperature sensor error (Indoor unit)

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

### Check point 1. Check connection of connector

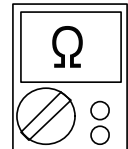
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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



### Check point 2. Remove connector and check thermistor resistance value

- For the room thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-54.
- 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 02-24.

If the voltage does not appear, replace main PCB.



**End**

## 2-13. E: 42. Indoor unit heat exchanger sensor error (Indoor unit)

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

### Check point 1. Check connection of connector

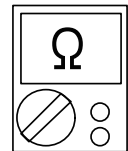
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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



### Check point 2. Remove connector and check thermistor resistance value

- For the heat exchanger thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-54.
- If thermistor is either open or shorted, replace it and reset the power.

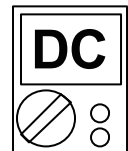


### Check point 3. Check voltage of main PCB

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 02-24.

If the voltage does not appear, replace main PCB.



**End**

## 2-14. E: 51. Indoor unit fan motor error (Indoor unit)

Indicator	Wired remote controller	Error code	E: 51
Detective actuator	Indoor unit	main PCB	When the 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

### 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 03-43.)  
→ 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.



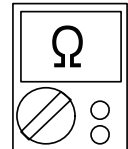
**End**

## 2-15. E: 53. Drain pump error (Indoor unit)

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

### Check point 1. Check float switch

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



-> If float switch is abnormal, replace it.



### Check point 2. Check connector and wire

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



### Check point 3. Check drain hose

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



### Check point 4. Replace drain pump

If check point 1 to 3 do not improve the symptom, replace drain pump.



### Check point 5. Replace main PCB

If check point 4 do not improve the symptom, replace main PCB.



**End**

## 2-16. E: 62. Outdoor unit main PCB error (Outdoor unit)

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

Check point 1. Reset power supply and operate

Does error indication show again?

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



Check point 2. Replace 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**



## 2-17. E: 63. Inverter error (Outdoor unit)

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

Check point 1. Turn the power on again?

Error displayed again?

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



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

- Connector and wiring connection state check
- Cable open check



Check point 3. Replace inverter PCB

Replace inverter PCB



**End**

Check point 1-2. Check external cause

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



**End**

## 2-18. E: 64. PFC circuit error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 64
Detective actuator	Outdoor unit	Main PCB	<ul style="list-style-type: none"> <li>When inverter input DC voltage is higher than 415 V for over 3 seconds, the compressor stops.</li> <li>If the same operation is repeated 5 times, the compressor stops permanently.</li> </ul>
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**

## 2-19. E: 65. IPM error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 65
Detective actuator	Outdoor unit	Main PCB	<ol style="list-style-type: none"> <li>1. When more than normal operating current to IPM in main PCB flows, the compressor stops.</li> <li>2. After the compressor restarts, if the same operation is repeated within 40 seconds, the compressor stops again.</li> <li>3. If 1. and 2. repeats 5 times, the compressor stops permanently.</li> </ol>
		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 03-31.)

→ 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**

## 2-20. E: 71. Discharge thermistor error (Outdoor unit)

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

### Check point 1. Check connection of connector

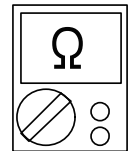
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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



### Check point 2. Remove connector and check thermistor resistance value

- For the discharge temperature thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-54.
- If thermistor is either open or shorted, replace it and reset the power.

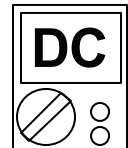


### Check point 3. Check voltage of main PCB

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 02-24.

If the voltage does not appear, replace main PCB.



**End**

## 2-21. E: 73. Outdoor unit heat exchanger thermistor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 73
Detective actuator	Outdoor unit main PCB	Heat exchanger temperature thermistor	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

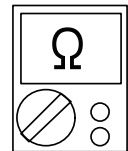
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

→ 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 03-54.
- 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 02-24.

If the voltage does not appear, replace main PCB.



**End**

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

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

### Check point 1. Check connection of connector

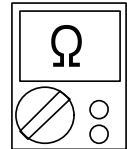
- Check if connector is loose or removed.
- Check erroneous connection.
- Check if thermistor cable is open

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



### Check point 2. Remove connector and check thermistor resistance value

- For the outdoor temperature thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-54.
- If thermistor is either open or shorted, replace it and reset the power.

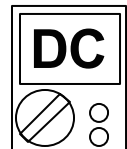


### Check point 3. Check voltage of main PCB

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 02-24.

If the voltage does not appear, replace main PCB.



**End**

## 2-23. E: 84. Current sensor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 84
Detective actuator	Outdoor unit	main PCB	When input current sensor has detected 0 A, while inverter compressor is operating at higher than 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**



## 2-24. E: 94. Trip detection (Outdoor unit)

Indicator	Wired remote controller	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. <b>NOTE:</b> 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**

## 2-25. E: 95. Compressor motor control error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 95
Detective actuator	Outdoor unit	Main PCB	<ol style="list-style-type: none"> <li>When running the compressor, if the detected rotor location is out of phase with actual rotor location more than 90°, the compressor stops.</li> <li>After the compressor restarts, if the same operation is repeated within 40 seconds, the compressor stops again.</li> <li>If 1. and 2. repeats 5 times, the compressor stops permanently.</li> </ol>
		Compressor	
Forecast of cause			Defective connection of electric components
			Main PCB failure
			Compressor failure

### Check point 1. Check Noise from Compressor

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



### Check point 2. Check connection of around the compressor components

For compressor terminal, main PCB

- Check if connector is removed.
- Check erroneous connection.
- Check if cable is open. (Refer to inverter compressor in "[Service parts information](#)" on page 03-43.)

→ 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**

## 2-26. E: 97. Outdoor unit fan motor error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 97
Detective actuator	Outdoor unit	Main PCB	<ol style="list-style-type: none"> <li>When outdoor fan rotation speed is less than 100 rpm in 20 seconds after fan motor starts, fan motor stops.</li> <li>After fan motor restarts, if the same operation within 60 seconds is repeated 3 times in a row, compressor and fan motor stops.</li> <li>If 1. and 2. repeats 5 times in a row, compressor and fan motor stops permanently.</li> </ol>
		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 03-43.)  
→ 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 02-24.



Read wire	DC voltage
Red—Black	280 V ±10 % (for 09 model), 140 V — 280 V ±10 % (for 12/18 models)
White—Black	15 ±1.5 V

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



**End**

## 2-27. E: 99. 4-way valve error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: 99
Detective actuator	Indoor unit	main PCB	<p>When the indoor heat exchanger temperature is compared with the room temperature, and either following condition is detected continuously two times, the compressor stops.</p> <p>Indoor heat exchanger temp. - Room temp. &gt; 20 °F (10 °C) (Cooling or Dry operation)</p> <p>Indoor heat exchanger temp. - Room temp. &lt; -20 °F (-10 °C) (Heating operation)</p> <p>If the same operation is repeated 5 times, the compressor stops permanently.</p>
	Heat exchanger temperature thermistor		
	Room temperature thermistor		
	4-way valve		
Forecast of cause			Connector connection failure
			Thermistor failure
			Coil failure
			4-way valve failure
			Main PCB failure

### Check point 1. Check connection of connector

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

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



### Check point 2. Check each thermistor

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

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

For the thermistor resistance value, refer to "[Thermistor resistance values](#)" on page 03-54.

→ If defective, replace the thermistor.



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

- **Solenoid coil**  
Remove P60 from PCB and check the resistance value of coil. Resistance value is about 2.085 k $\Omega$  (for 09 model) or 1.97 k $\Omega$  (for 12/18 models) (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 P60 of Main PCB.

→ Check if AC 198 V (AC 220 V -10%) to AC 264 V (AC 240 V +10%) appears at P60 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**

## 2-28. E: A1. Discharge temperature error (Outdoor unit)

Indicator	Wired remote controller	Error code	E: A1
Detective actuator	Outdoor unit main PCB		Protection stop by discharge temperature $\geq 230$ °F (110 °C) during compressor operation generated 2 times within 24 hours.
	Discharge temperature thermistor		
Forecast of cause			3-way valve not opened
			EEV 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 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 03-43.
- 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 03-43.)



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 03-54.



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**

## 3. Troubleshooting without error code

### 3-1. Indoor unit—No power

Forecast of cause	Power supply failure
	External cause
	Electrical components defective

#### Check point 1. Check installation condition

- Isn't the breaker down?
- Check loose or removed connection cable.

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



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

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



#### Check point 3. Check electrical components

Check the voltage of power supply.

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

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



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



**End**



## 3-2. Outdoor unit—No power

Forecast of cause	Power supply failure
	External cause
	Electrical components defective

### Check point 1. Check installation condition

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

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



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

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

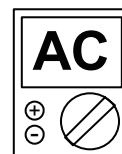


### Check point 3. Check electrical components

Check the voltage of power supply.

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

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



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



### Check point 4. Replace 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

#### Check point 1. Check indoor and outdoor installation condition

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



Turn off the power and check correct followings.

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



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

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



#### Check point 3. Check wired remote controller and controller PCB

Check voltage at CN300 of main PCB. (terminal 1-3, terminal 1-2).  
(Power supply to remote controller)

- If it is DC 13 V, remote controller is failure. (The controller PCB is normal)  
-> Replace remote controller.
- If it is DC 0 V, controller PCB is failure. (Check the remote controller once again)  
-> Replace controller PCB.



#### Check point 4. Replace main PCB

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



**End**

## 3-4. No cooling/No heating

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

### Check point 1. Check Indoor unit

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



### Check point 2. Check outdoor unit operation

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



### Check point 3. Check site condition

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



### Check point 4. Check Indoor/ Outdoor installation condition

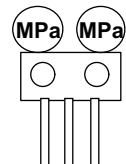
- Check connection pipe (specified pipe length and pipe diameter?)
- Check any loose or removed communication line.

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



### Check point 5. Check Refrigeration cycle

- Check if strainer is clogged (Refer to the figure below).
- Measure gas pressure, and if there is a leakage, correct it.
- Check the electronic expansion valve.  
Refer to outdoor unit Electronic Expansion Valve (EEV) in "[Service parts information](#)" on page 03-43.
- Check compressor.  
Refer to compressor in "[Service parts information](#)" on page 03-43.  
Refer to inverter compressor in "[Service parts information](#)" on page 03-43.



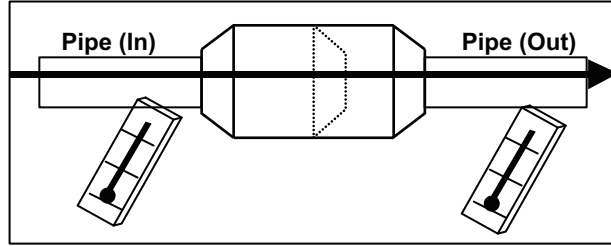
**NOTE:** When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.



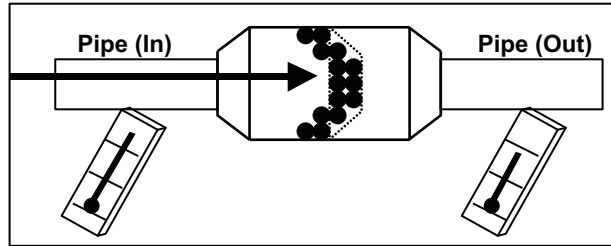
**End**

**NOTES:**

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



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



## 3-5. Abnormal noise

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

### Diagnosis method when abnormal noise is occurred

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 03-43.



**End**

## 3-6. Water leaking

Forecast of cause

Erroneous installation

Drain hose failure

Diagnosis method when water leak occurs

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



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



Is fan rotating?



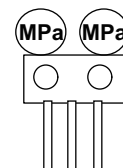
**End**

Diagnosis method when water is spitting out

Is the filter clogged?



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

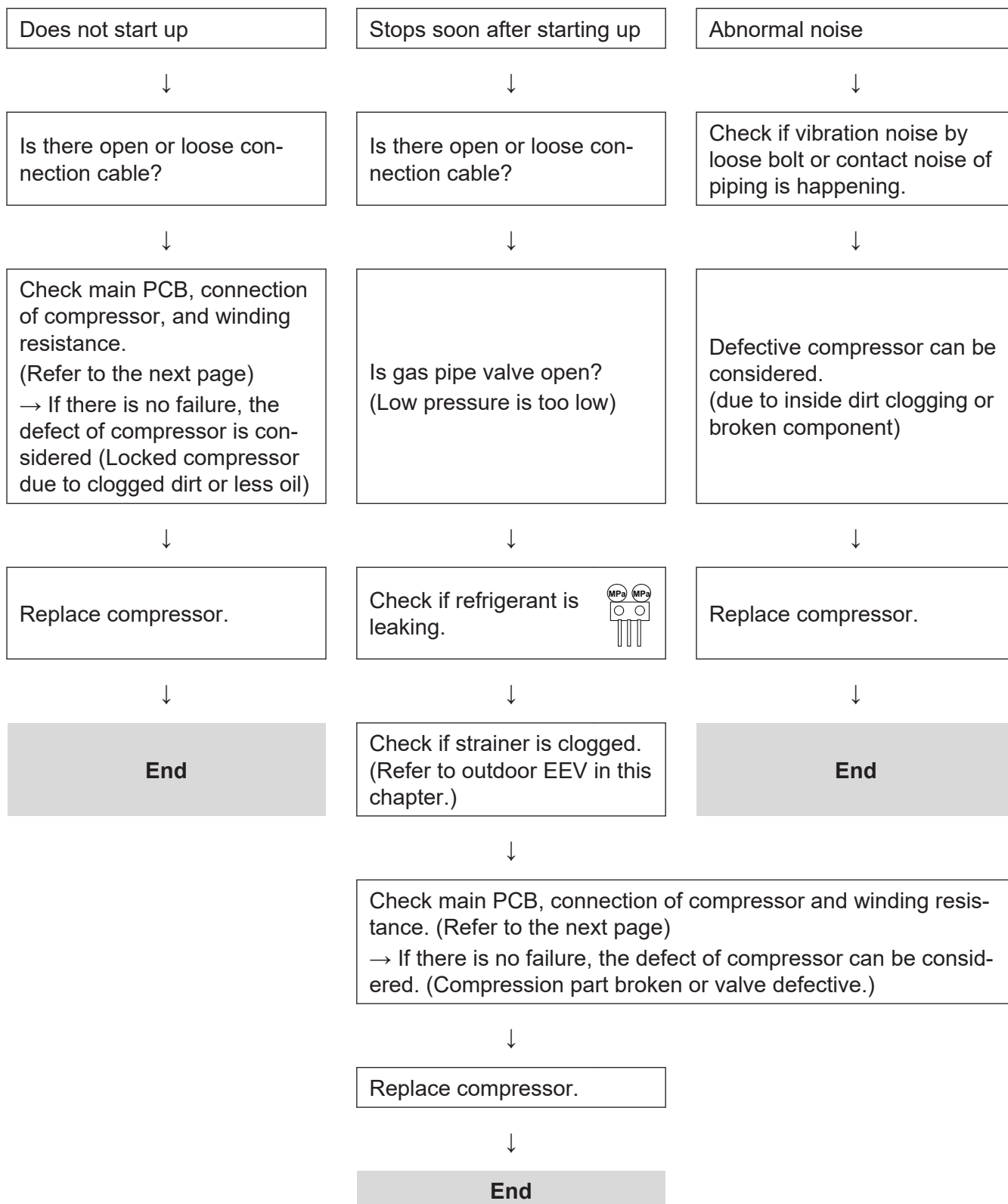


**End**

## 4. Service parts information

### 4-1. Compressor

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

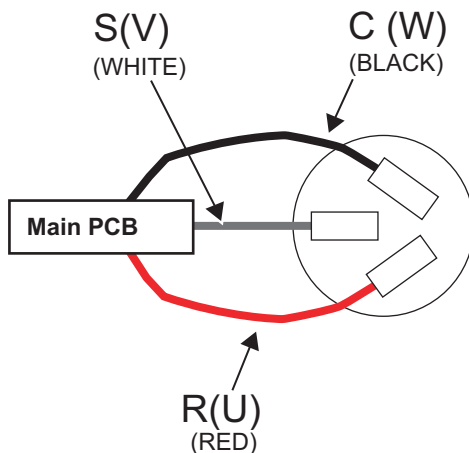


## 4-2. Inverter compressor

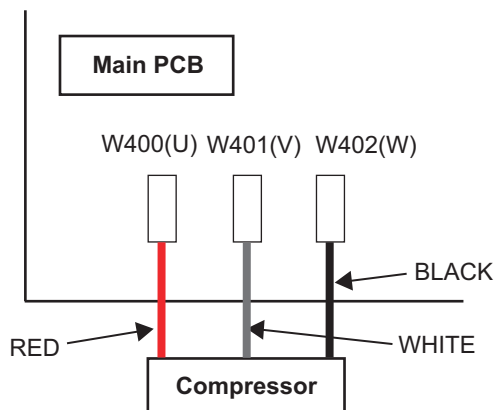
### ■ Model: AOUH09LUAS1

#### Check point 1. Check connection

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



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

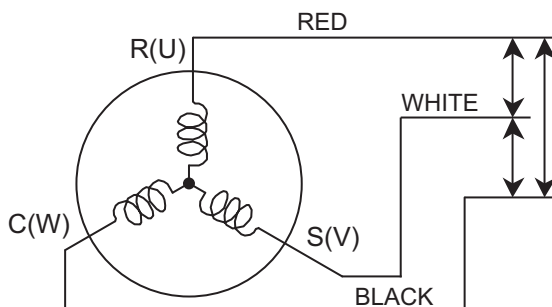
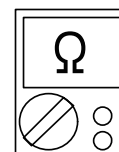


↓

#### Check point 2. Check winding resistance

Check winding resistance of each terminal.

Resistance value:  $1.975 \pm 7\% \Omega$  at 77 °F (25 °C)



→ If the resistance value is 0  $\Omega$  or infinite, replace compressor.

↓



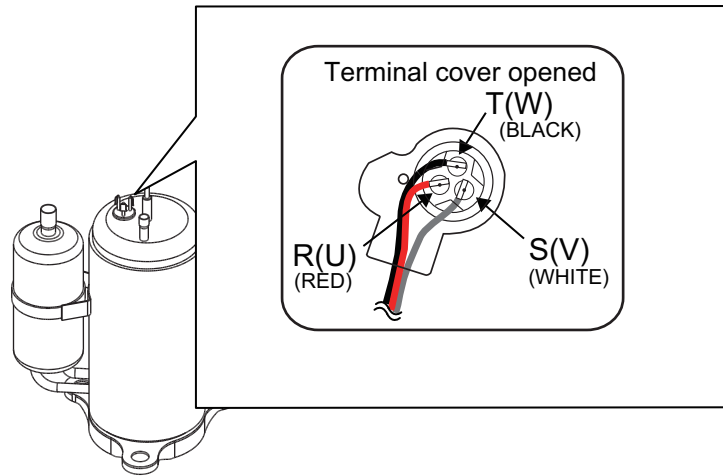
Check point 3. Replace inverter PCB

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

## Models: AOUH12LUAS1 and AOUH18LUAS1

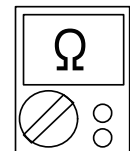
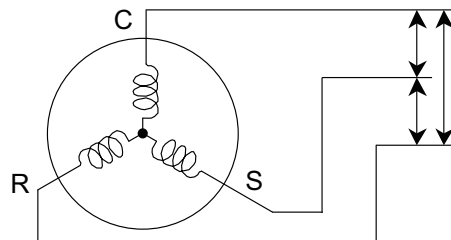
### Check point 1. Check connection

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



### Check point 2. Check winding resistance

Check winding resistance of each terminal.  
Resistance value:  $1.916 \pm 8\% \Omega$  at 68 °F (20 °C)



→ If the resistance value is 0  $\Omega$  or infinite, replace compressor.



### Check point 3. Replace inverter PCB

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

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

### ■ Models: AOUH09LUAS1, AOUH12LUAS1, and AOUH18LUAS1

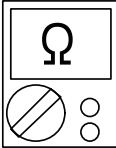
#### Check point 1. Check connections

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 02-24.

#### Check point 2. Check coil of EEV

Remove connector, check each winding resistance of coil.

Read wire	Resistance value
White - Red	$46 \Omega \pm 4 \Omega$ at 68 °F (20 °C) 
Yellow - Red	
Orange - Red	
Blue - Red	

→ If Resistance value is abnormal, replace EEV.

#### Check point 3. Check voltage from main PCB

Remove connector and check voltage (DC 12 V)

→ If it does not appear, replace main PCB.



#### Check point 4. Check noise at start up

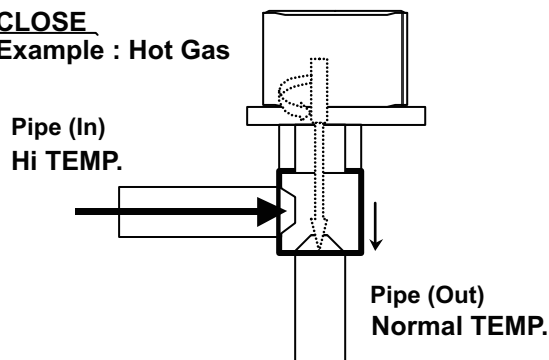
Turn on the power and check the operation noise.

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

#### Check point 5. Check opening and closing operation of valve

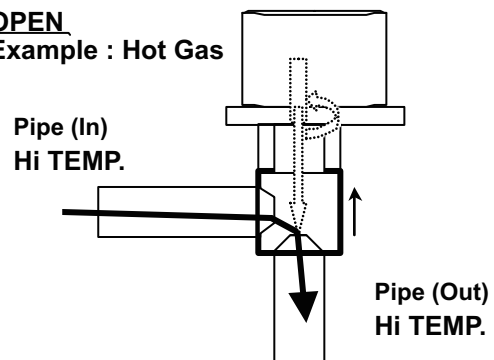
When valve is closed, it has a temp. difference between inlet and outlet

**CLOSE**  
Example : Hot Gas



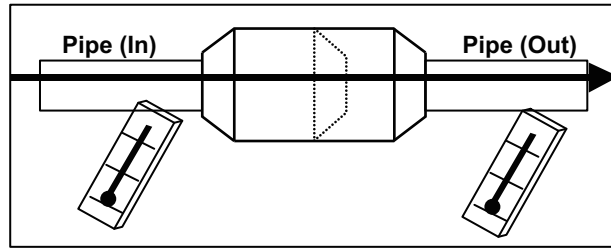
If it is open, it has no temp. difference between inlet and outlet

**OPEN**  
Example : Hot Gas

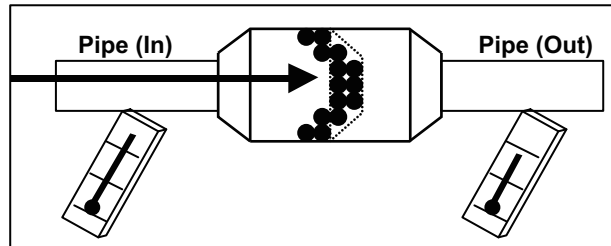


## Check point 6. Check strainer

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



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



## 4-4. Indoor unit fan motor

### ■ Models: ADUH09LUAS1, ADUH12LUAS1, and ADUH18LUAS1

#### 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.

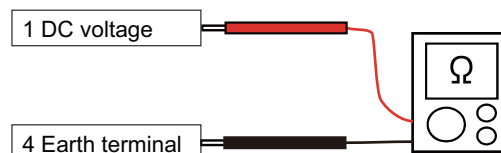
#### Check point 2. Check resistance of indoor fan motor

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)	Ground terminal (GND)
5 (White)	Control voltage (Vcc)
6 (Yellow)	Speed command (Vsp)
7 (Brown)	Feed back (FG)



## 4-5. Outdoor unit fan motor

### ■ Model: AOUH09LUAS1

#### Check point 1. Check rotation of fan

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

#### Check point 2. Check resistance of outdoor fan motor

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

**NOTE:** Vm: DC voltage, GND: Earth terminal

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

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

## ■ Models: AOUH12LUAS1 and AOUH18LUAS1

### Check point 1. Check rotation of fan

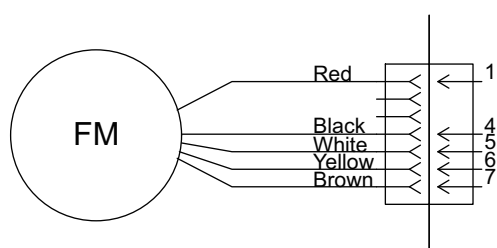
Rotate the fan by hand when operation is off.  
 (Check if fan is caught, dropped off or locked motor)  
 → If fan or bearing is abnormal, replace it.

### 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

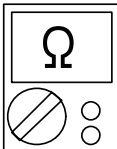
→ If they are short-circuited (below 300 kΩ), replace outdoor fan motor and main PCB.



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)

## 4-6. IPM on transistor PCB

### Check point 1

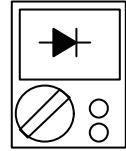
- 1 Disconnect the connection wires between the transistor PCB—capacitor PCB and transistor PCB—inverter PCB. 
- 2 Set the tester to the resistance mode, and measure the resistance between the following terminals.  
 TM301 (P)—TM305 (U)/TM304 (V)/TM303 (W)  
 TM302 (N)—TM305 (U)/TM304 (V)/TM303 (W)
- 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	Over 2 kΩ (Including ∞ Ω)
N	W	
U	N	
V	N	Over 2 kΩ (Including ∞ Ω)
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	

## 5. Thermistor resistance values

### 5-1. 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)	25.92	1.39
50.0 (10.0)	20.17	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	3.48

#### ■ 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	4.05
149.0 (65.0)	9.69	4.19

## 5-2. 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)	8.69	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

## ■ 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

## ■ 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



## 4. CONTROL AND FUNCTIONS

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## 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 frequency of the compressor.

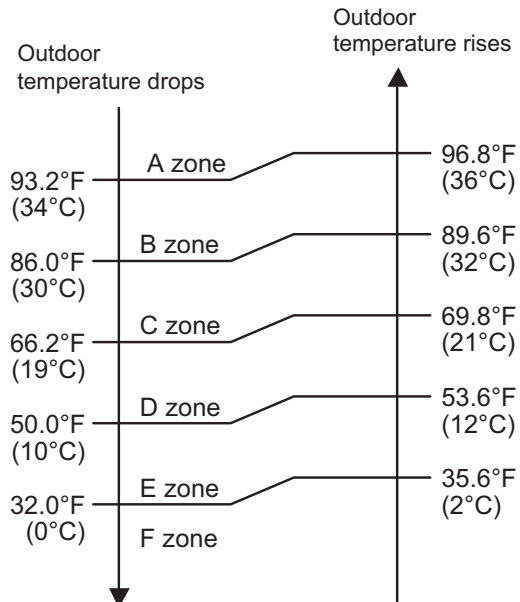
- If the room temperature is 11 °F (6.0 °C) higher than a set temperature, the compressor operation frequency will attain to maximum performance.
- If the room temperature is 2 °F (1.0 °C) lower than a set temperature, the compressor will be stopped.
- When the room temperature is within the range of +11 °F (6.0 °C) to -2 °F (1.0 °C) of the setting temperature, the compressor frequency is controlled within the range shown in the table below. However, the maximum frequency is limited in the range shown in the figure below based on the indoor fan mode and the outdoor temperature.

- **Compressor frequency range**

Unit: rps

Model name	Minimum frequency	Maximum frequency
ADUH09LUAS1	12	72
ADUH12LUAS1 ADUH18LUAS1	8	102

• Limit of maximum speed based on outdoor temperature



Unit: rps

Model name	Outdoor temperature zone	Indoor unit fan mode			
		HIGH	MED	LOW	QUIET
ADUH09LUAS1	A zone	72	44	38	28
	B zone	72	44	38	28
	C zone	54	44	38	28
	D zone	40	34	32	22
	E zone	40	34	32	22
	F zone	40	34	32	22
ADUH12LUAS1	A zone	102	46	36	26
	B zone	102	46	36	26
	C zone	58	46	36	26
	D zone	39	32	30	20
	E zone	39	32	30	20
	F zone	39	32	30	20
ADUH18LUAS1	A zone	102	46	36	26
	B zone	102	46	36	26
	C zone	58	36	32	26
	D zone	39	32	30	20
	E zone	39	32	30	20
	F zone	39	32	30	20

CONTROL AND FUNCTIONS

CONTROL AND FUNCTIONS

## 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 11 °F (6.0 °C) lower than a set temperature, the compressor operation frequency will attain to maximum performance.
- If the room temperature is 2 °F (1.0 °C) higher than a set temperature, the compressor will be stopped.
- When the room temperature is within the range of +2 °F (1.0°C) to -11 °F (6.0°C) of the setting temperature, the compressor frequency is controlled within the range shown below.

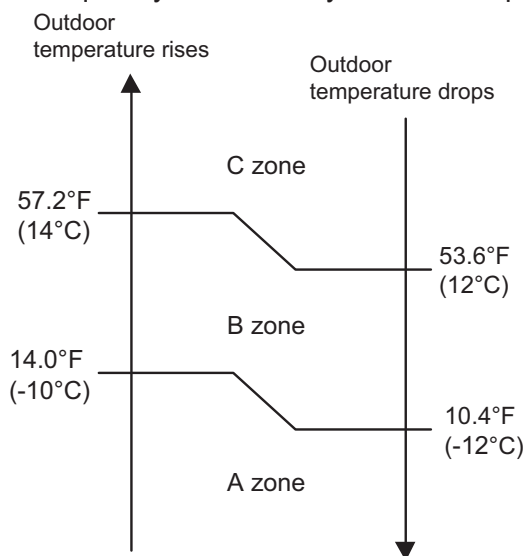
- **Compressor frequency range**

Unit: rps

Model name	Minimum frequency	Maximum frequency
ADUH09LUAS1	12	110
ADUH12LUAS1 ADUH18LUAS1	8	130

- **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
ADUH09LUAS1	A zone	110	89	77	67
	B zone	110	89	77	67
	C zone	110	89	77	36
ADUH12LUAS1	A zone	130	130	58	46
	B zone	130	130	58	46
	C zone	130	130	58	46
ADUH18LUAS1	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.

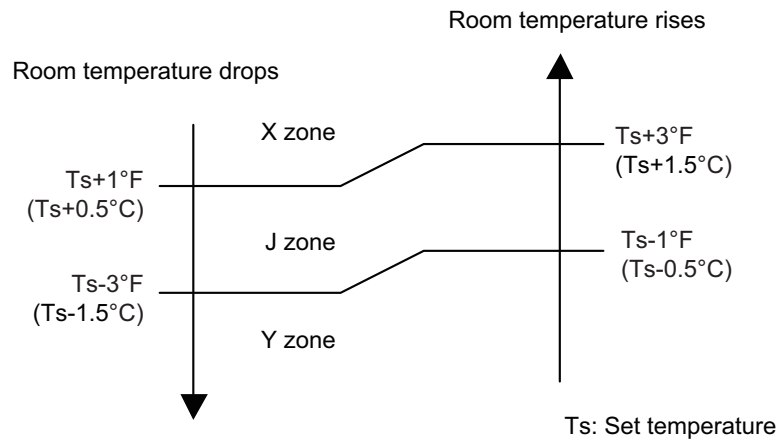
Zone is defined by set temperature and room temperature.

- **Compressor frequency range**

Unit: rps

Model name	Outdoor temperature zone	Operating frequency
ADUH09LUAS1	X zone	28
	J zone	28
	Y zone	0
ADUH12LUAS1 ADUH18LUAS1	X zone	26
	J zone	26
	Y zone	0

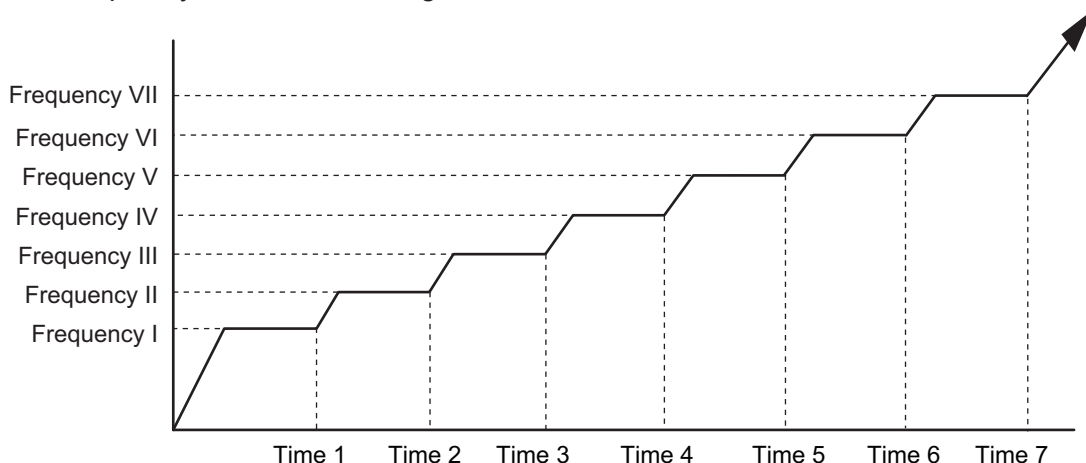
- **Compressor control based on room temperature**



# 1-4. Compressor frequency at normal start-up

## ■ Model: AOUH09LUAS1

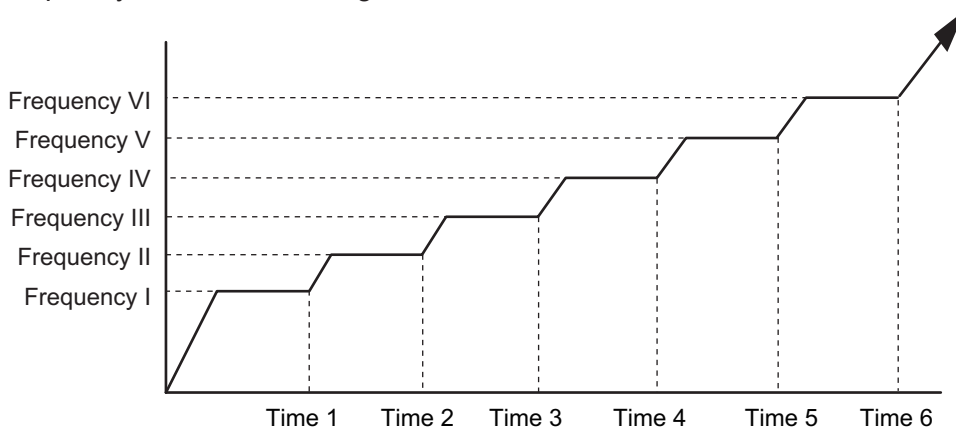
Compressor frequency soon after starting is controlled as below.



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

## ■ Models: AOUH12LUAS1 and AOUH18LUAS1

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

CONTROL AND FUNCTIONS

CONTROL AND FUNCTIONS

## 1-5. Compressor frequency limitation by outdoor temperature

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

- **Cooling/Dry mode**

100.4°F (38°C)	F zone
66.2°F (19°C)	E zone
50.0°F (10°C)	D zone
32.0°F (0°C)	C zone
14.0°F (-10°C)	B zone
	A zone

Model name	Outdoor temperature zone	Limitation of compressor frequency
AOUH09LUAS1	A zone	35 rps
	B zone	35 rps
	C zone	35 rps
	D zone	15 rps
	E zone	15 rps
	F zone	36 rps
AOUH12LUAS1	A zone	37 rps
	B zone	37 rps
	C zone	37 rps
	D zone	28 rps
	E zone	1 rps
	F zone	22 rps
AOUH18LUAS1	A zone	33 rps
	B zone	33 rps
	C zone	33 rps
	D zone	25 rps
	E zone	10 rps
	F zone	20 rps

- Heating mode

66.2°F (19°C)	F zone
41.0°F (5°C)	E zone
32.0°F (0°C)	D zone
5.0°F (-15°C)	C zone
-13.0°F (-25°C)	B zone
	A zone

Model name	Outdoor temperature zone	Limitation of compressor frequency
AOUH09LUAS1	A zone	37 rps
	B zone	37 rps
	C zone	36 rps
	D zone	15 rps
	E zone	15 rps
	F zone	1 rps
AOUH12LUAS1	A zone	34 rps
	B zone	34 rps
	C zone	34 rps
	D zone	15 rps
	E zone	14 rps
	F zone	14 rps
AOUH18LUAS1	A zone	30 rps
	B zone	30 rps
	C zone	30 rps
	D zone	13 rps
	E zone	10 rps
	F zone	10 rps

## 2. Auto changeover operation

When the air conditioner is set to AUTO mode by remote controller, operation starts in the optimum mode from among heating, cooling, dry and monitoring modes. During operation, the optimum mode is automatically switched in accordance with temperature changes. The temperature can be set between 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
$Tr > Ts + 3.6^{\circ}\text{F} (2^{\circ}\text{C})$	Cooling
$Ts + 3.6^{\circ}\text{F} (2^{\circ}\text{C}) \geq Tr \geq Ts - 3.6^{\circ}\text{F} (2^{\circ}\text{C})$	Middle zone
$Tr < Ts - 3.6^{\circ}\text{F} (2^{\circ}\text{C})$	Heating

Tr: Room temperature

Ts: Setting temperature

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

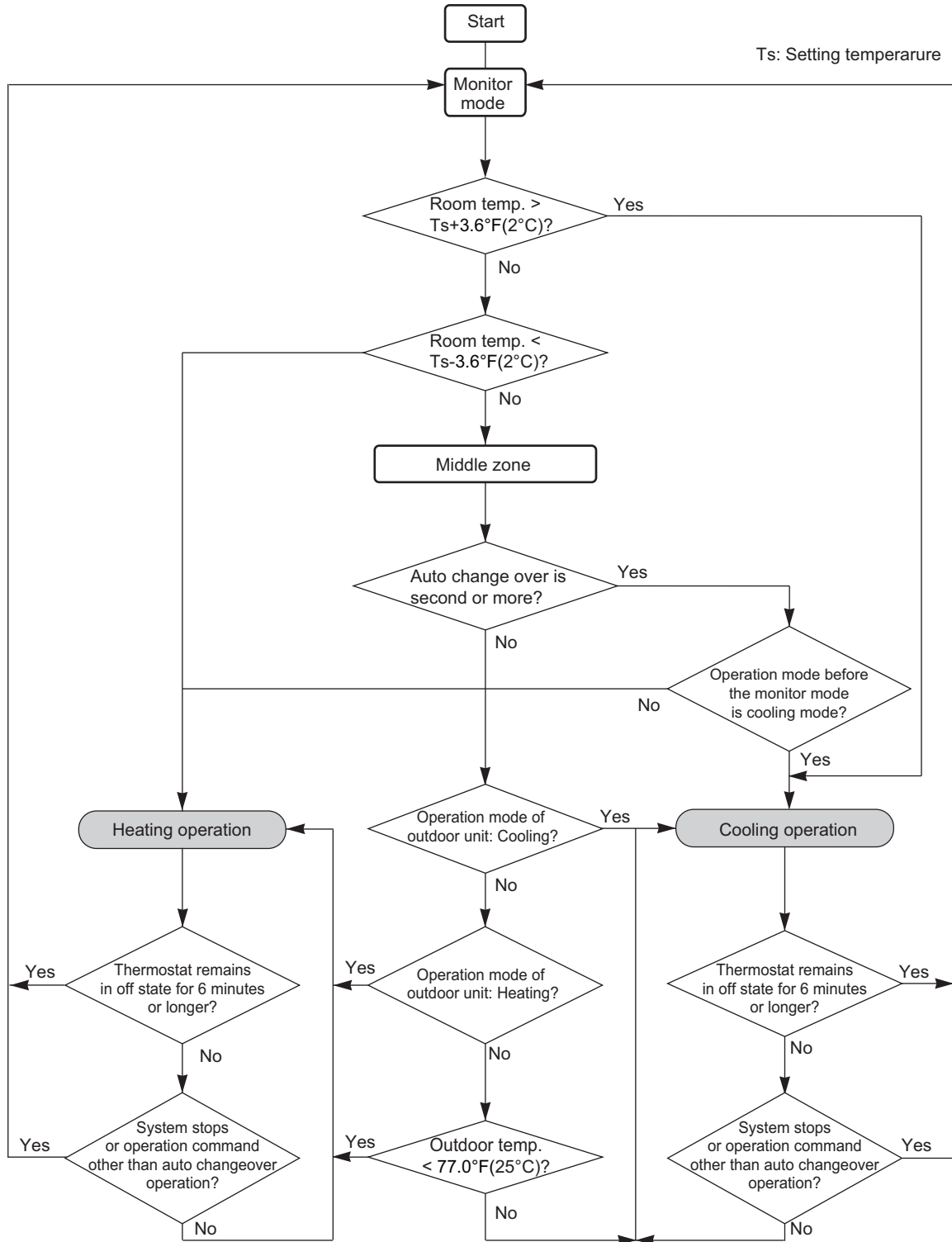
- Same operation mode is selected as outdoor unit.  
If outdoor unit is operating in cooling and heating mode, indoor unit will be operated by the same operation mode.
- Selected by outdoor temperature.  
If outdoor unit is operating in other than cooling and heating mode, indoor unit will be operated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

Outdoor temp.	Operation mode
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.



Operation flow chart



CONTROL AND FUNCTIONS

CONTROL AND FUNCTIONS

## 3. Fan control

Tr: Room temperature

Ts: Setting temperature

### 3-1. Indoor fan control

#### ■ Fan speed

Indoor fan speed is defined as below.

Operation mode	Fan mode	Speed (rpm)		
		ADUH09LUAS1	ADUH12LUAS1	ADUH18LUAS1
Heating	HIGH	1,260	1,340	1,380
	MED	1,160	1,240	1,300
	LOW	1,060	1,140	1,220
	QUIET	960	1,030	1,140
	S-LOW	500	500	600
Cooling/Fan	HIGH	1,260	1,340	1,380
	MED	1,160	1,240	1,300
	LOW	1,060	1,140	1,220
	QUIET	960	1,030	1,140
	Soft quiet	500*1	500*1	600*1
	S-LOW	500*2	500*2	600*2
Dry		X zone: 960 J zone: 960	X zone: 1,030 J zone: 1,030	X zone: 1,140 J zone: 1,140

\*1: Fan mode only

\*2: Cooling mode only

#### ■ Fan operation

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

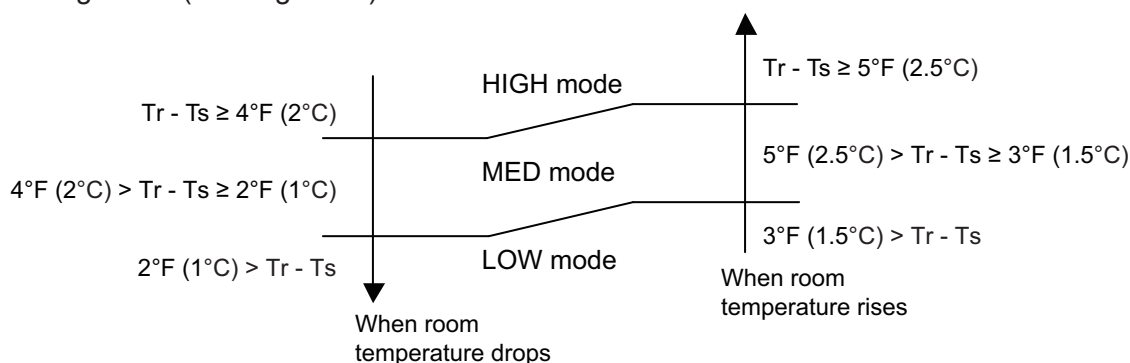
When fan mode is set at AUTO, it operates on MED fan speed.

#### ■ Cooling operation

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

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

Airflow change over (Cooling: Auto)



## ■ Dry operation

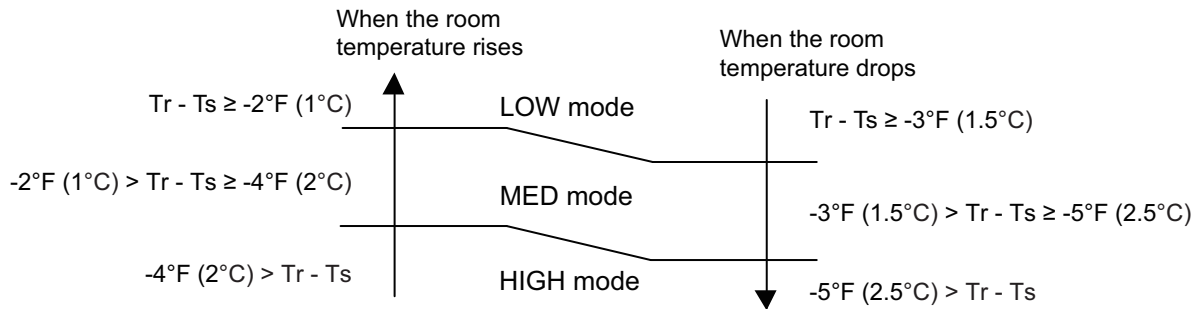
During dry operation, fan speed setting can not be changed as shown in “Fan speed” above.

## ■ Heating operation

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

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

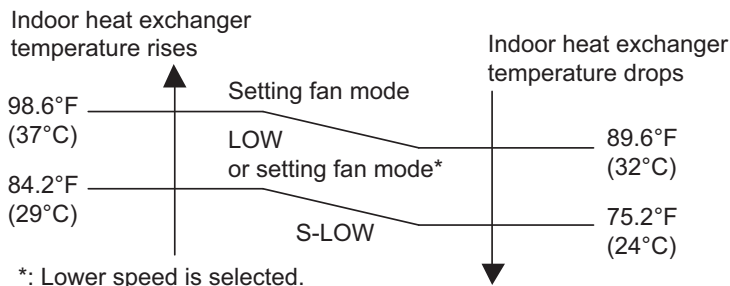
Airflow change over (Heating: Auto)



## ■ Cool air prevention control (heating mode)

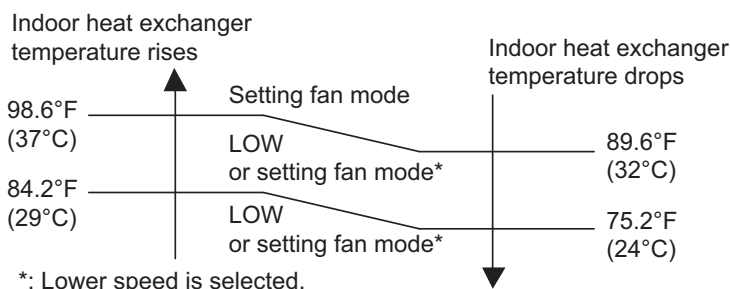
The maximum value of the indoor fan speed is set as shown below, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

### • Normal operation



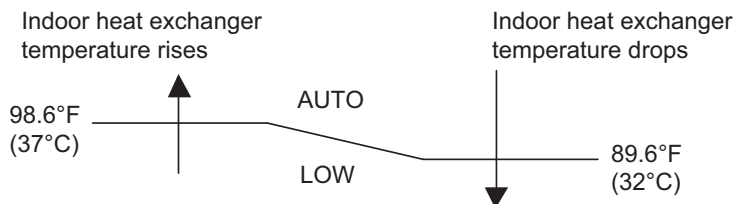
\*: Lower speed is selected.

13 minutes later:



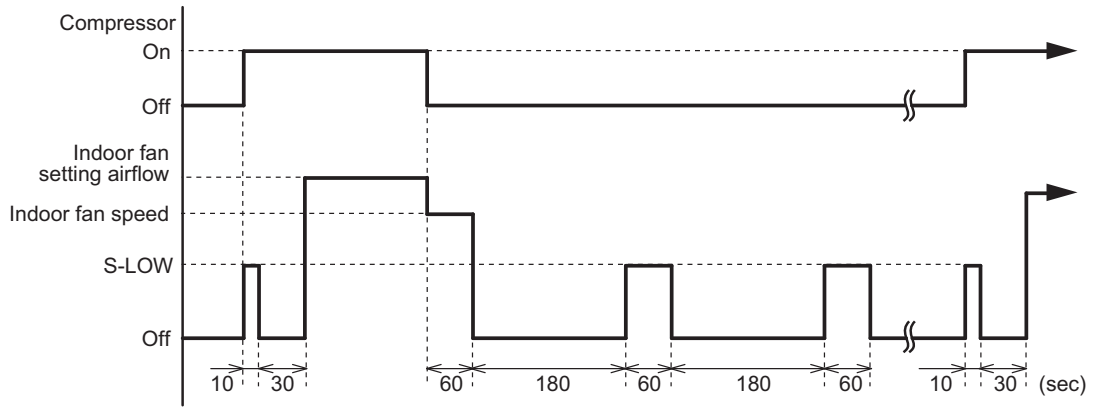
\*: Lower speed is selected.

### • 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.



CONTROL AND FUNCTIONS

CONTROL AND FUNCTIONS

## 3-2. Outdoor fan control

### ■ Outdoor fan motor

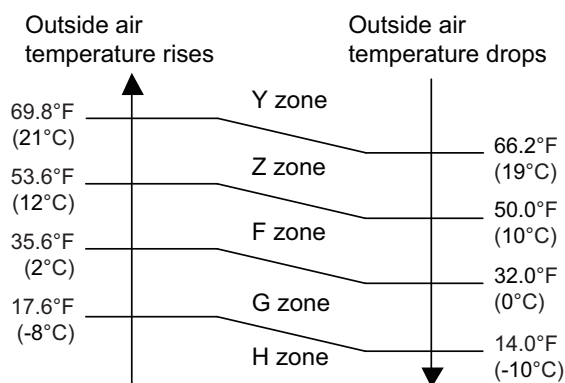
This outdoor unit has a DC fan motor. (Control method is different between AC and DC motors.)

### ■ Fan speed

#### ● Model: AOUH09LUAS1

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	H zone	
S-HIGH2	—	1,120	—	—	—	—	—	—
S-HIGH1	990	1,120	—	—	—	—	—	—
HIGH	990	1,120	—	—	—	—	—	—
10	—	1,120	—	—	—	—	—	—
9	990	1,120	990	390	320	240	240	240
8	940	1,120	940	390	320	240	240	240
7	810	940	810	390	320	240	240	240
6	810	810	810	300	240	200	200	200
5	810	690	810	250	240	200	200	200
4	790	630	790	250	240	200	200	200
3	710	570	710	250	240	200	200	200
2	660	570	660	250	240	200	200	200
1	620	570	620	250	240	200	200	200

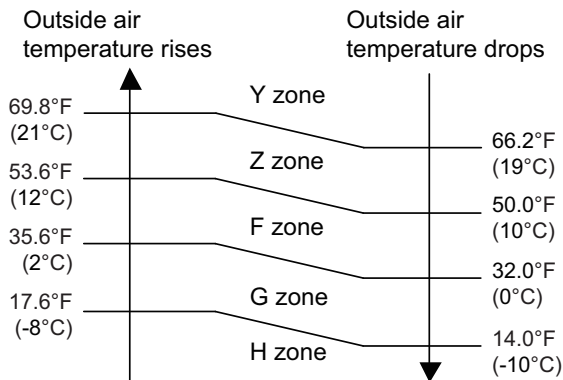
**NOTE:** After defrost control on the heating mode, the fan speed is kept higher regardless of the compressor frequency.

Fan speed after defrost control: 1,120 rpm

## ● Model: AOUH12LUAS1

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	H 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	270	270
8	810	870	810	850	320	270	270	270
7	810	760	810	770	320	270	270	270
6	560	760	560	630	270	230	230	230
5	560	680	560	440	270	230	230	230
4	440	530	440	320	270	230	230	230
3	440	500	440	320	270	230	230	230
2	440	420	440	320	270	230	230	230
1	440	420	440	320	270	230	230	230

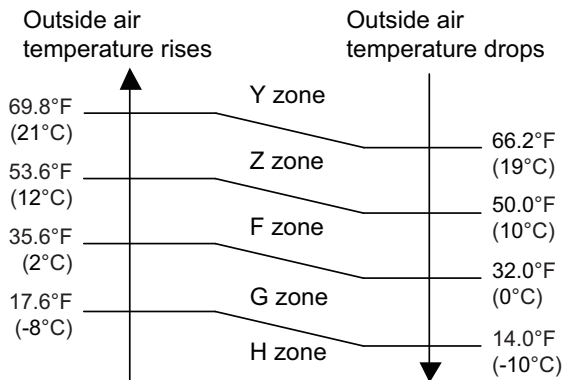
**NOTE:** After defrost control on the heating mode, the fan speed is kept higher regardless of the compressor frequency.

Fan speed after defrost control: 1,100 rpm

## ● Model: AOUH18LUAS1

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	H 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	270	
8	950	990	950	850	320	270	270	
7	850	920	850	770	320	270	270	
6	690	710	690	630	270	230	230	
5	560	620	560	440	270	230	230	
4	440	560	440	320	270	230	230	
3	440	500	440	320	270	230	230	
2	440	440	440	320	270	230	230	
1	440	440	440	320	270	230	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

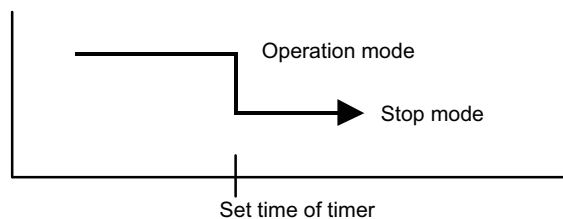
## 4. Timer operation control

### 4-1. Wireless remote control

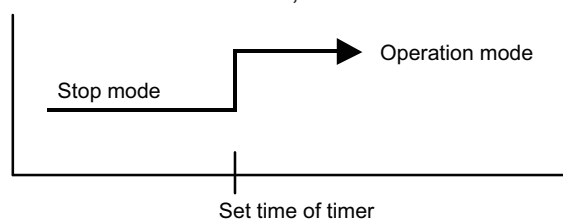
On/Off timer	Program timer	Sleep timer	Weekly timer
○	○	○	—

#### ■ On/Off timer

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

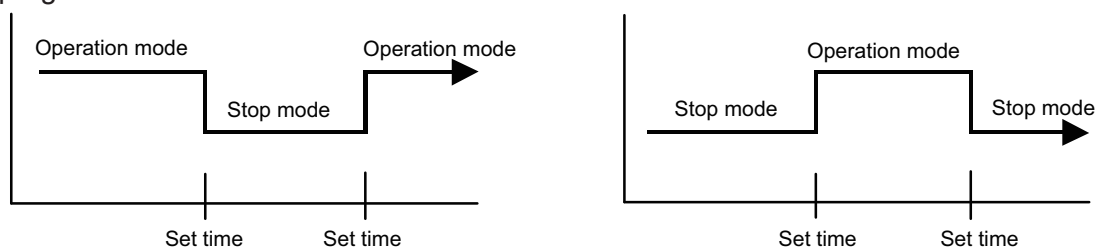


- On timer: When the clock reaches the set timer, the air conditioner will be turned on.



#### ■ Program timer

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



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

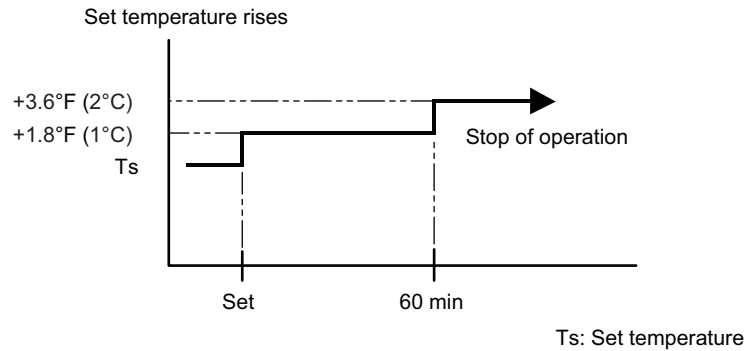


## ■ Sleep timer

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

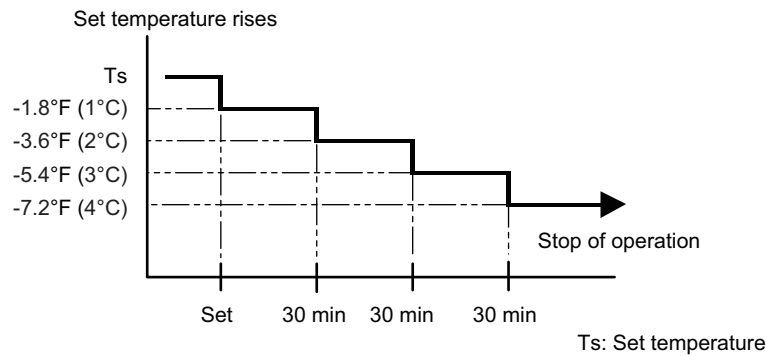
- In the cooling operation mode

When the sleep timer is set, the setting temperature is increased  $1.8^{\circ}\text{F}$  ( $1^{\circ}\text{C}$ ). It increases the setting temperature another  $1.8^{\circ}\text{F}$  ( $1^{\circ}\text{C}$ ) 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  $1.8^{\circ}\text{F}$  ( $1^{\circ}\text{C}$ ). It decreases the setting temperature another  $1.8^{\circ}\text{F}$  ( $1^{\circ}\text{C}$ ) every 30 minutes. Upon lowering  $7.2^{\circ}\text{F}$  ( $4^{\circ}\text{C}$ ), the setting temperature is not changed and the operation is stopped at the setting time.

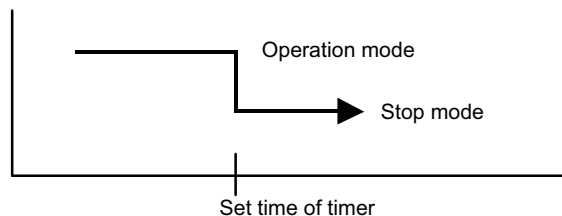


## 4-2. Wired remote control

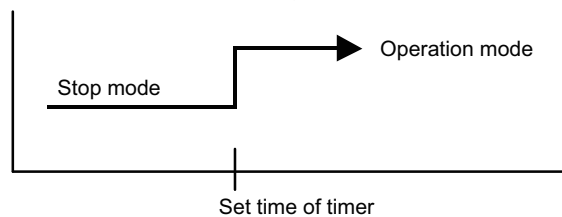
On/Off timer	Program timer	Sleep timer	Weekly timer	Temperature set back timer
○	○	○	○	○

### ■ On/Off timer

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

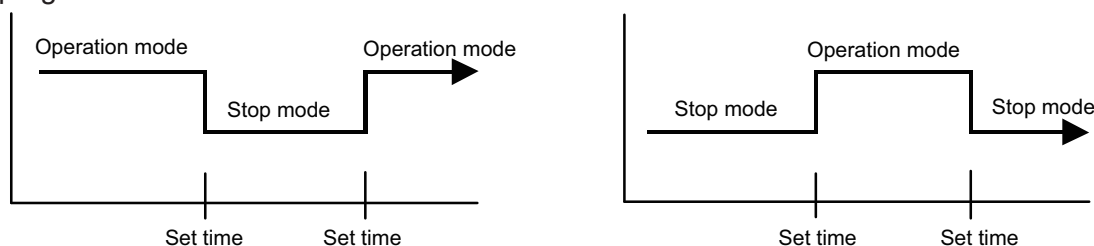


- On timer: When the clock reaches the set timer, the air conditioner will be turned on.



### ■ Program timer

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



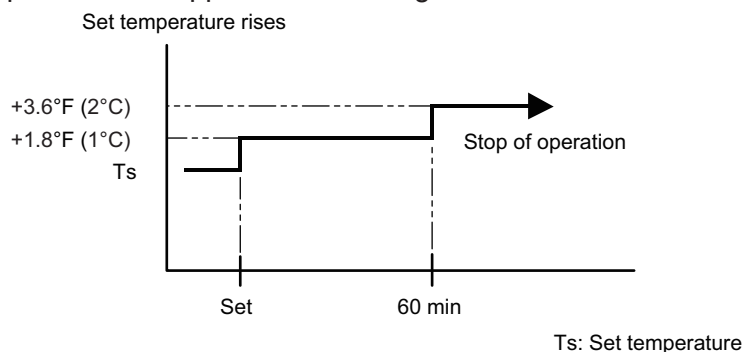
- Operation will start from the timer setting (either off timer and on timer) whichever is closest to the clock current timer setting. The order of operations is indicated by the allow in the remote controller screen.
- Sleep timer operation cannot be combined with on timer operation.

## ■ Sleep timer

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

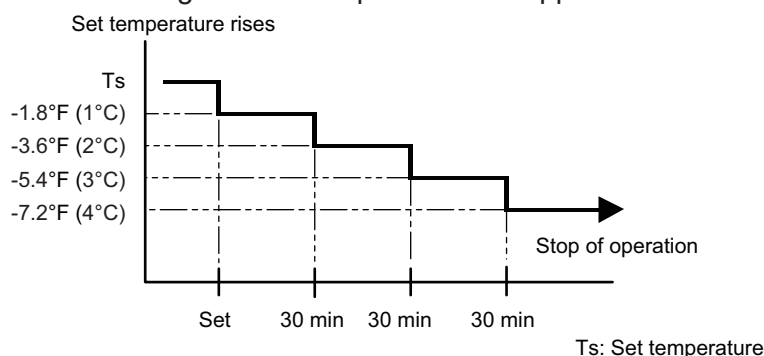
- In the cooling operation mode

When the sleep timer is set, the setting temperature is increased  $1.8^{\circ}\text{F}$  ( $1^{\circ}\text{C}$ ). It increases the setting temperature another  $1.8^{\circ}\text{F}$  ( $1^{\circ}\text{C}$ ) 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  $1.8^{\circ}\text{F}$  ( $1^{\circ}\text{C}$ ). It decreases the setting temperature another  $1.8^{\circ}\text{F}$  ( $1^{\circ}\text{C}$ ) every 30 minutes. Upon lowering  $7.2^{\circ}\text{F}$  ( $4^{\circ}\text{C}$ ), the setting temperature is not changed and the operation is stopped at the setting time.



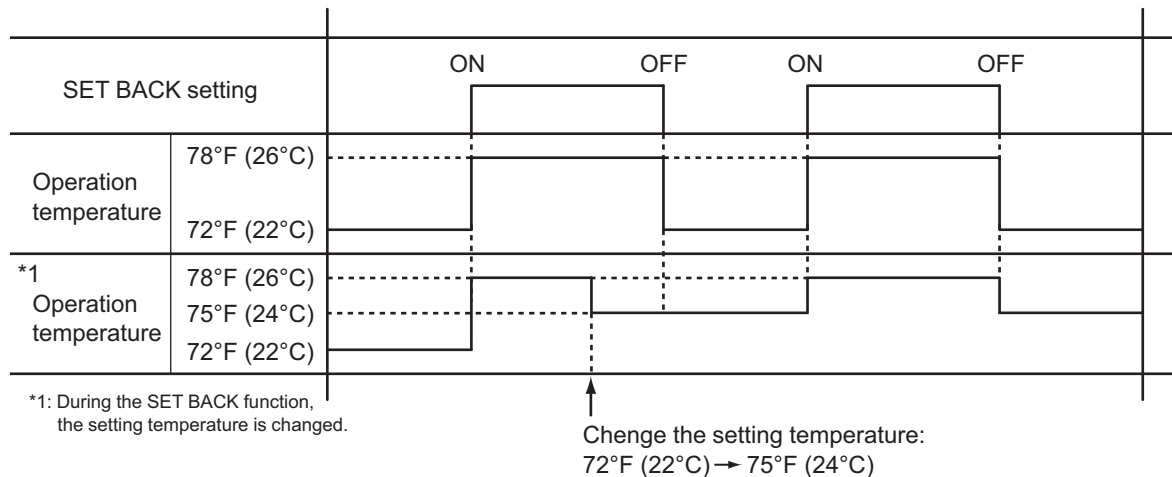
## ■ Weekly timer

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

## ■ Temperature set back timer

- The SET BACK timer only changes the set temperature for 7 days, it cannot be used to start or stop air conditioner operation.
- The SET BACK timer can be set to operate up to two times per day but only one temperature setting can be used.
- During COOLING/DRY mode, the air conditioner will operate at a minimum of 64°F (18°C) even if the SET BACK temperature is set to 63°F (17°C) or lower.

Case of SET BACK timer on the Cooling operation. (Setting temperature :72°F [22°C], SET BACK temperature :78°F [26°C])



## 5. 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.

#### – Model: AOUH09LUAS1

##### • 1st time defrosting after starting operation

Compressor integrating operation time	Less than 17 min.	17 to 57 min.	More than 57 min.
Condition	Does not operate	$T_n \leq 15.8^\circ\text{F} (-9^\circ\text{C})$ and $T_n - T_a \geq 9.0^\circ\text{F} (5^\circ\text{C})$	$T_n \leq 23.0^\circ\text{F} (-5^\circ\text{C})$

##### • 2nd time and after

Compressor integrating operation time	Less than 40 min.	More than 40 min.
Condition	Does not operate	$T_n - T_{n10} < -9.0^\circ\text{F} (-5^\circ\text{C})$ ( $T_n \leq 21.2^\circ\text{F} [-6^\circ\text{C}]$ ) $T_n - T_{nb} < -3.6^\circ\text{F} (-2^\circ\text{C})$ ( $T_n \leq 21.2^\circ\text{F} [-6^\circ\text{C}]$ ) $T_n \leq 1.4^\circ\text{F} (-17^\circ\text{C})$ ( $T_a \geq 14.0^\circ\text{F} [-10^\circ\text{C}]$ ) $T_n \leq 19.4^\circ\text{F} (-7^\circ\text{C})$ or $T_n \leq -13.0^\circ\text{F} (-25^\circ\text{C})$ ( $T_a < 14.0^\circ\text{F} [-10^\circ\text{C}]$ )

##### • 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	$T_n \leq 26.6^\circ\text{F} (-3^\circ\text{C})$	$T_n \leq 23.0^\circ\text{F} (-5^\circ\text{C})$	Count of the compressor off: 40 times

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

– **Models: AOUH12LUAS1 and AOUH18LUAS1**

• **1st time defrosting after starting operation**

Compressor integrating operation time	Less than 17 min.	17 to 57 min.	More than 57 min.
Condition	Does not operate	$T_n \leq 15.8^\circ\text{F} (-9^\circ\text{C})$ and $T_n - T_a \geq 9.0^\circ\text{F} (5^\circ\text{C})$	$T_n \leq 23.0^\circ\text{F} (-5^\circ\text{C})$

• **2nd time and after**

Compressor integrating operation time	Less than 40 min.	More than 40 min.
Condition	Does not operate	$T_n - T_{n10} < -9.0^\circ\text{F} (-5^\circ\text{C})$ ( $T_n \leq 21.2^\circ\text{F} [-6^\circ\text{C}]$ ) $T_n - T_{nb} < -3.6^\circ\text{F} (-2^\circ\text{C})$ ( $T_n \leq 21.2^\circ\text{F} [-6^\circ\text{C}]$ ) $T_n \leq -4.0^\circ\text{F} (-20^\circ\text{C})$ ( $T_a \geq 14.0^\circ\text{F} [-10^\circ\text{C}]$ ) $T_n \leq 19.4^\circ\text{F} (-7^\circ\text{C})$ or $T_n \leq -13.0^\circ\text{F} (-25^\circ\text{C})$ ( $T_a < 14.0^\circ\text{F} [-10^\circ\text{C}]$ )

• **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	$T_n \leq 26.6^\circ\text{F} (-3^\circ\text{C})$	$T_n \leq 23.0^\circ\text{F} (-5^\circ\text{C})$	Count of the compressor off: 40 times

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

• **Release condition**

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

Outdoor unit heat exchanger temperature (after 1 minute or later since compressor start)	09 model	60.8°F (16°C) or more
	12/18 model	55.4°F (13°C) or more
Compressor operation time	15 minutes	

## 5-1. 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)	09 model	60.8°F (16°C) or more
	12/18 model	55.4°F (13°C) or more
Compressor operation time	15 minutes	

## 6. Various control

### 6-1. 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	
ECONOMY operation	
MIN. HEAT operation	

### 6-2. 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

### 6-3. ECONOMY operation

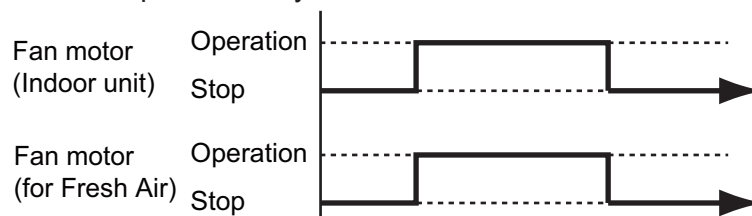
The ECONOMY operation starts by pressing ECONOMY button on the remote controller.

The ECONOMY operation is almost the same operation as below settings.

Mode	Cooling/Dry	Heating
Target temperature	Setting temperature +2°F (1°C)	Setting temperature -2°F (1°C)

### 6-4. Fresh air control

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

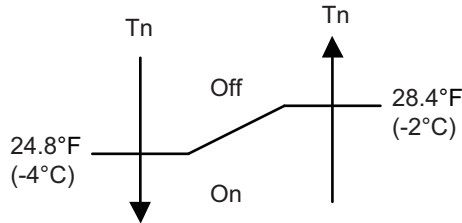


## 6-5. Compressor preheating

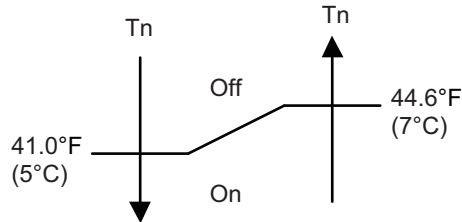
By preheating the compressor, warm airflow is quickly discharged when the operation is started.

• **Triggering condition**

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

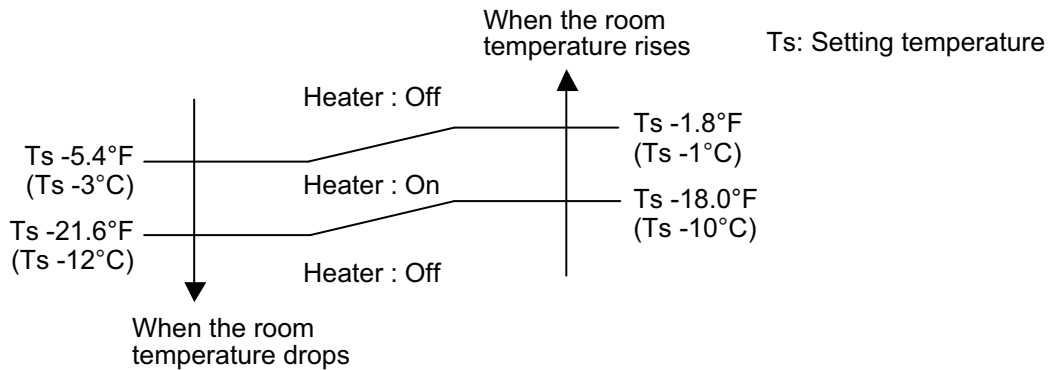


When the jumper wire (JM2) is disconnected:



## 6-6. External electrical heater control

The external electrical heater is operated as below.



**NOTES:**

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

## 6-7. 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).

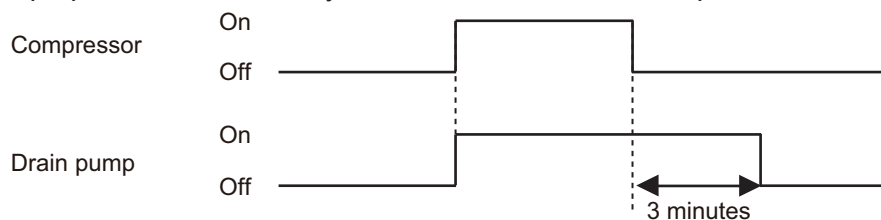


## 6-8. Drain pump control

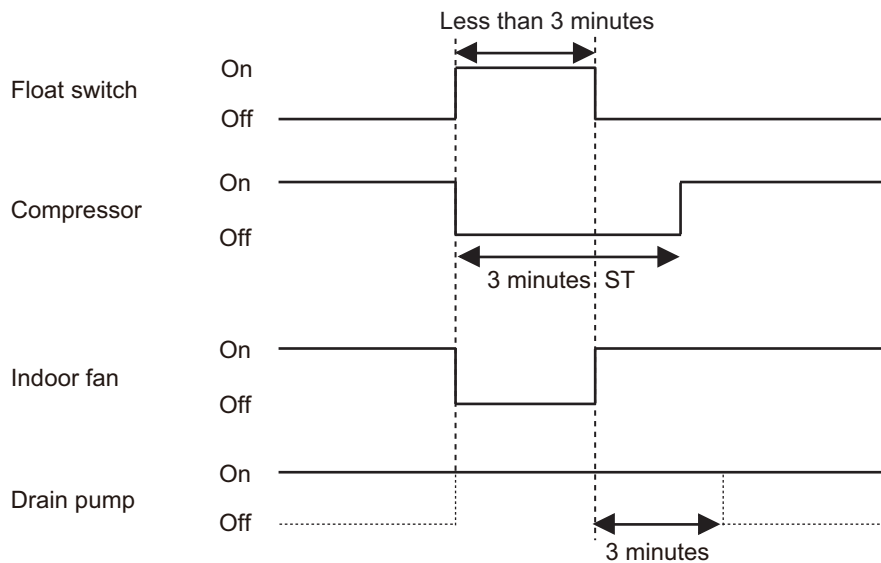
### ■ Drain control for dehumidification operation

#### ● During cooling or dry mode

- When the compressor starts, the drain pump starts simultaneously.
- The drain pump operates continuously for 3 minutes after the compressor is turned off.



- When the compressor stops by the "Anti-freezing control (cooling and dry mode)" on page 04-29, the drain pump is turned off in 1 hour after the compressor stops.
- When the float switch is on, the compressor, indoor and outdoor fan motor operation are stopped.
- Drain pump operates continuously for 3 minutes after the float switch is turned off and then drain pump is turned off.
- When the float switch turns on continuously for 3 minutes, "failure indication" operates. (It is necessary to turn off power for release it.)
- When the float switch turns off less than 3 minutes, the unit starts cooling operation. Indoor fan motor starts after the float switch is turned off and the compressor starts after 3 minutes st.



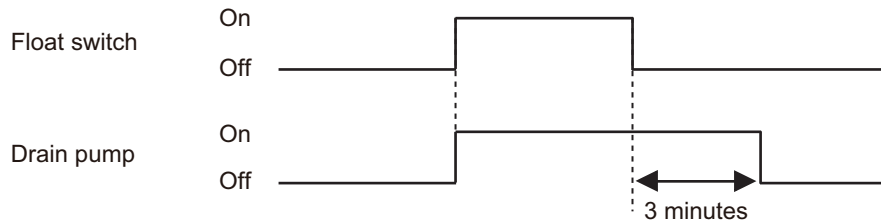
## ● During heating mode or fan mode and when operation is stopped

- **Triggering condition**

Drain pump is turned on at the same time that the float switch is turned on.

- **Operation details**

When the float switch turns on continuously for 3 minutes, "failure indication" operates. Thereafter, even if the float switch turns off, the "failure indication" is not released. (It is necessary to turn off power for release it.)



- **Release condition**

Drain pump operates continuously for 3 minutes after the float switch is turned off and then drain pump is turned off.

## 6-9. 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.

## 6-10. 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.

## 6-11. Unit status monitoring and the detected value indication

The wired remote controller can monitor the indoor and outdoor units' status and display the detected result as a relevant ID.

For details of the display method, refer to the Chapter of "Display Sensor Values" in the *Installation Manual* of Wired remote controller (Touch panel).

The status can be monitored and displayed on the wired remote controller by assigning an arbitrary ID. For available ID list, refer to the table below.

**NOTE:** Operating time for each part cannot be reset when the part is replaced. Take notes of the operating time before replacing to count the operating time of the replaced part.

Available Sensor ID				
Sensor ID	Item	Unit	Remarks	
<b>00: Indoor unit</b>				
00	000	Suction temp.	01: °F or °C	
00	001	Room temp.	01: °F or °C	When the wired remote controller thermistor is enabled, temperature of the wired remote controller thermistor is displayed.
00	002	Wired remote controller detected temp.	01: °F or °C	
00	006	Heat exchanger middle temp.	01: °F or °C	
00	020	Fan rotation number	03: rpm	
00	051	Float switch On/Off	08: On/Off	0: Off, 1: On (When the water level rises)
00	052	Drain pump On/Off	08: On/Off	0: Off, 1: On
00	080	Indoor unit total energized hours	11: h	
00	081	Total filtering hours	11: h	
00	082	Indoor unit fan total operation hours	11: h	
00	140	Operation or Stop (External input)	00: —	0: Off, 1: On —: When the function setting 46 is not set <b>NOTE:</b> Available only for external input port of the indoor unit
00	142	Forced stop (External input)	00: —	0: Off, 1: On —: When the function setting 46 is not set <b>NOTE:</b> Available only for external input port of the indoor unit
00	143	Operation or Stop 2 (External input)	00: —	0: Off, 1: On —: When the function setting 46 is not set <b>NOTE:</b> Available only for external input port of the indoor unit
00	155	Operation or Stop On/Off (External output)	00: —	0: Off, 1: On <b>NOTE:</b> The value is output even if the function setting or rotary switch is not set.
00	156	Error On/Off (External output)	00: —	0: Off, 1: On <b>NOTE:</b> The value is output even if the function setting or rotary switch is not set.
00	157	Indoor unit fan interlocking On/Off (External output)	00: —	0: Off, 1: On <b>NOTE:</b> The value is output even if the function setting or rotary switch is not set.

Available Sensor ID				
Sensor ID		Item	Unit	Remarks
00	158	Cooling thermostat On/Off (External output)	00: —	0: Off, 1: On <b>NOTE:</b> The value is output even if the function setting or rotary switch is not set.
00	159	Requested cooling strength On/Off (External output)	00: —	0: Off, 1: On <b>NOTE:</b> The value is output even if the function setting or rotary switch is not set.
00	160	External heater On/Off (External output)	00: —	0: Off, 1: On <b>NOTE:</b> The value is output even if the function setting or rotary switch is not set.
00	161	Heating operation status (External output)	00: —	0: Off, 1: On <b>NOTE:</b> The value is output even if the function setting or rotary switch is not set.
00	162	External output command by remote controller (External output)	00: —	0: Off, 1: On <b>NOTE:</b> The value is output even if the function setting or rotary switch is not set.
<b>01: Outdoor unit</b>				
01	000	Outdoor temp.	01: °F or °C	
01	001	Discharge temp.	01: °F or °C	
01	003	Heat exchanger middle temp.	01: °F or °C	
01	004	Heat exchanger outlet temp.	01: °F or °C	
01	007	Compressor temp.	01: °F or °C	
01	050	Fan 1 rotation number	03: rpm	
01	055	Compressor rotation number	04: rps	
01	060	Expansion valve (Upstream during heating)	05: pls	
01	080	4-way valve output status	07: Cooling/ Heating	0: Cooling, 1: Heating
01	100	Operating current	09: A	
01	110	Outdoor unit total power-on hours	11: h	
01	111	Compressor total heating operation hours	11: h	
01	112	Compressor total cooling operation hours	11: h	
01	113	Compressor total operation hours	11: h	
01	114	Outdoor unit fan 1 total operation hours	11: h	

## 7. Various protections

### 7-1. 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	219.2°F (104°C)
Compressor frequency	-20 rps/120 seconds
Release condition	213.8°F (101°C)
Compressor protection temperature	230.0°F (110°C)

### 7-2. 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. $\geq$ 50°F (10°C)*1	44.6°F (7°C)
	Outdoor temp. $\geq$ 53.6°F (12°C)*2	
	Outdoor temp. $<$ 50°F (10°C)*1	55.4°F (13°C)
	Outdoor temp. $<$ 53.6°F (12°C)*2	

\*1: During the outdoor temperature dropping

\*2: During the outdoor temperature rising

## 7-3. 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.

### ■ Model: AOUH09LUAS1

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	$122.0^{\circ}\text{F} (50^{\circ}\text{C}) \leq \text{Ta}$	4.0 A	3.5 A
	$114.8^{\circ}\text{F} (46^{\circ}\text{C}) \leq \text{Ta} < 122.0^{\circ}\text{F} (50^{\circ}\text{C})$	4.0 A	3.5 A
	$104.0^{\circ}\text{F} (40^{\circ}\text{C}) \leq \text{Ta} < 114.8^{\circ}\text{F} (46^{\circ}\text{C})$	5.0 A	4.5 A
	$53.6^{\circ}\text{F} (12^{\circ}\text{C}) \leq \text{Ta} < 104.0^{\circ}\text{F} (40^{\circ}\text{C})$	6.0 A	5.5 A
	$35.6^{\circ}\text{F} (2^{\circ}\text{C}) \leq \text{Ta} < 53.6^{\circ}\text{F} (12^{\circ}\text{C})$	6.0 A	5.5 A
	$\text{Ta} < 35.6^{\circ}\text{F} (2^{\circ}\text{C})$	6.0 A	5.5 A
Heating	$62.6^{\circ}\text{F} (17^{\circ}\text{C}) \leq \text{Ta}$	5.5 A	5.0 A
	$53.6^{\circ}\text{F} (12^{\circ}\text{C}) \leq \text{Ta} < 62.6^{\circ}\text{F} (17^{\circ}\text{C})$	7.0 A	6.5 A
	$41.0^{\circ}\text{F} (5^{\circ}\text{C}) \leq \text{Ta} < 53.6^{\circ}\text{F} (12^{\circ}\text{C})$	7.5 A	7.0 A
	$\text{Ta} < 41.0^{\circ}\text{F} (5^{\circ}\text{C})$	8.5 A	8.0 A

### ■ Model: AOUH12LUAS1

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

### ■ Model: AOUH18LUAS1

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	$122.0^{\circ}\text{F} (50^{\circ}\text{C}) \leq \text{Ta}$	4.5 A	4.0 A
	$114.8^{\circ}\text{F} (46^{\circ}\text{C}) \leq \text{Ta} < 122.0^{\circ}\text{F} (50^{\circ}\text{C})$	4.5 A	4.0 A
	$104.0^{\circ}\text{F} (40^{\circ}\text{C}) \leq \text{Ta} < 114.8^{\circ}\text{F} (46^{\circ}\text{C})$	6.0 A	5.5 A
	$53.6^{\circ}\text{F} (12^{\circ}\text{C}) \leq \text{Ta} < 104.0^{\circ}\text{F} (40^{\circ}\text{C})$	10.0 A	9.5 A
	$35.6^{\circ}\text{F} (2^{\circ}\text{C}) \leq \text{Ta} < 53.6^{\circ}\text{F} (12^{\circ}\text{C})$	10.0 A	9.5 A
	$\text{Ta} < 35.6^{\circ}\text{F} (2^{\circ}\text{C})$	10.0 A	9.5 A
Heating	$62.6^{\circ}\text{F} (17^{\circ}\text{C}) \leq \text{Ta}$	7.0 A	6.5 A
	$53.6^{\circ}\text{F} (12^{\circ}\text{C}) \leq \text{Ta} < 62.6^{\circ}\text{F} (17^{\circ}\text{C})$	9.0 A	8.5 A
	$41.0^{\circ}\text{F} (5^{\circ}\text{C}) \leq \text{Ta} < 53.6^{\circ}\text{F} (12^{\circ}\text{C})$	12.5 A	12.0 A
	$\text{Ta} < 41.0^{\circ}\text{F} (5^{\circ}\text{C})$	12.5 A	12.0 A

## 7-4. Indoor unit fan motor over temperature protection

When satisfy the following conditions, the protection works.

- After the 90 seconds from the fan operation, detect less than 300 rpm for 10 seconds.
- IPM trip protection works.
- Current overload protection works.

When detecting the above condition, recheck the condition after 6 minutes. When count the twice, the protection works.

- **Protection contents**

Reduce the static pressure 20 Pa. When it does not dissolve even the minimum static pressure condition, work the following operation.

- Fan motor error displayed when less than 300 rpm for 10 seconds is detected after the 90 seconds from the fan operation.
- Fan stop 40 seconds when IPM trip protection works.
- Fan stop 50 seconds when current overload protection works.

## 7-5. Compressor temperature protection (For 12/18 model)

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

Trigger condition	226.4°F (108°C)
Release condition	176.0°F (80°C) (3 minutes after compressor stop)

## 7-6. Low outdoor temperature protection

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

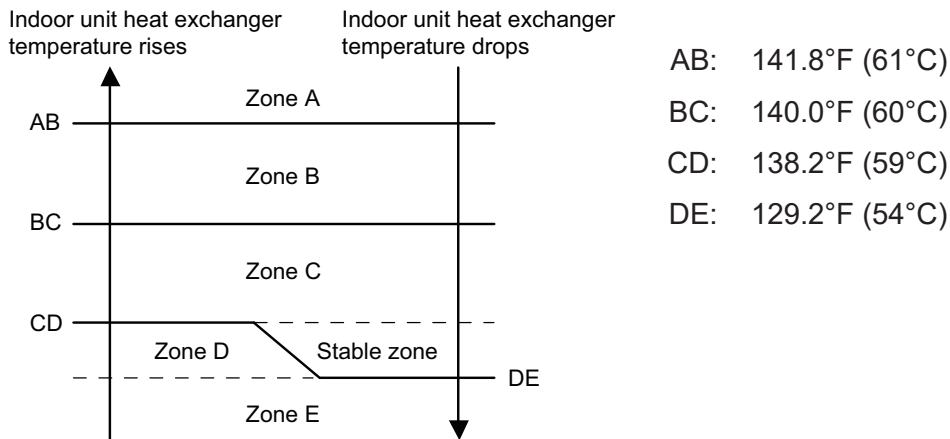
Operation mode	Cooling/Dry
Trigger condition	5°F (-15°C)
Release condition	14°F (-10°C)

## 7-7. High temperature and high pressure release control

The compressor is controlled as follows.

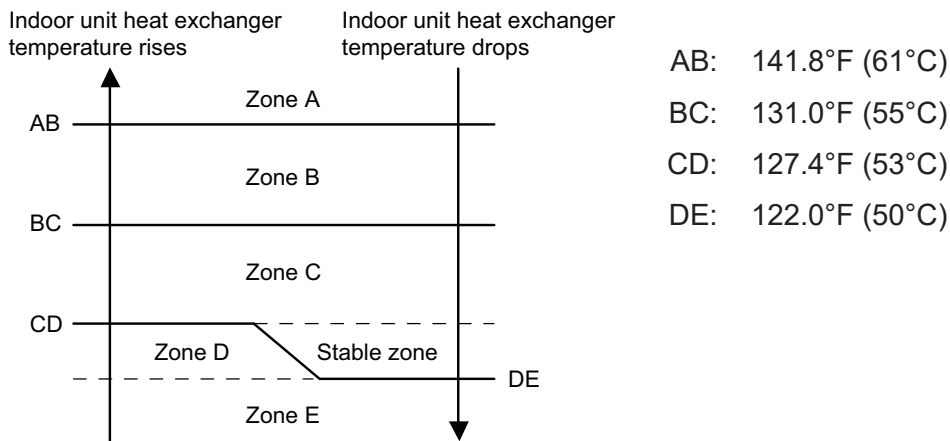
### ■ Models: AOUH09LUAS1, AOUH12LUAS1 and AOUH18LUAS1

#### • Cooling mode



Zone	Operation	
Zone A	Compressor is stopped.	
Zone B	The compressor frequency is decreased.	-30 rps/30 sec.
Zone C		-5 rps/60 sec.
Zone D	The protection is released and the operation is returned to normal mode.	
Zone E		

#### • Heating mode



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		



## 5. FILED WORKING

# CONTENTS

## 5. FILED WORKING

<b>1. Function settings</b> .....	<b>05-1</b>
1-1. Function settings on indoor unit.....	05-1
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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 on indoor unit

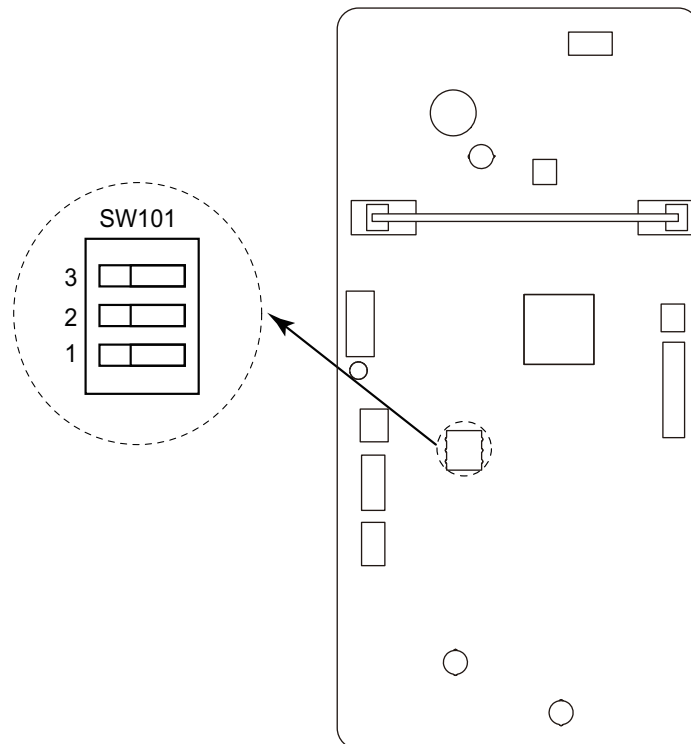
By using some components on the PCB, you can change the function settings.

**Related components on the PCB and the applicable settings:**

Component		Setting content	
DIP switch	SW101	1	Drainage function setting
		2	Auto louver grille setting
		3	Fan delay setting

### ■ Component location

Components on the indoor unit main PCB used for the function settings are located as shown in the following figure.



## ■ DIP switch setting

- **SW101-Switch 1: Drainage function setting**

Switch 1	Drainage function	Factory setting
ON	Disabled	
OFF	Enabled	◆

- **SW101-Switch 2: Auto louver grille setting**

When Auto louver grille kit (optional parts) is attached, set to “Enabled”.

Switch 2	Auto louver grille setting	Factory setting
ON	Enabled	
OFF	Disabled	◆

- **SW101-Switch 3: Fan delay setting**

When the indoor unit is stopped while operating in conjunction with auxiliary heater, the indoor unit fan operation will continue for 1 minute.

Switch 3	Fan delay	Factory setting
ON	Enabled	
OFF	Disabled	◆

## 1-2. Function settings by using remote controller

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

### ■ Setting procedure by using remote controller

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

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

### ■ Contents of function setting

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

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

### ● Function setting list

	Function no.	Functions
1)	11	Filter sign
2)	26	Static pressure
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)	60	Switching functions for external output terminal
12)	61	Control switching of external heaters
13)	62	Operating temperature switching of external heaters
14)	66	Outdoor temperature zone boundary temperature A
15)	67	Outdoor temperature zone boundary temperature B
16)	71	Standby time for auxiliary equipment operation
17)	72	Heat pump backup setting
18)	73	Emergency heat
19)	74	Fan delay time
20)	75	External heater use in defrosting

#### 1) Filter sign

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

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

Function number	Setting value	Setting description	Factory setting
11	00	Standard (400 hours)	
	01	Long interval (1,000 hours)	
	02	Short interval (200 hours)	
	03	No indication	◆

## 2) Static pressure

Select the appropriate static pressure according to the installation conditions.

Function number	Setting value	Setting description	Factory setting
26	00	0 in.WG (0 Pa)	
	01	0.04 in.WG (10 Pa)	
	02	0.08 in.WG (20 Pa)	
	03	0.12 in.WG (30 Pa)	
	04	0.16 in.WG (40 Pa)	
	05	0.20 in.WG (50 Pa)	
	06	0.24 in.WG (60 Pa)	
	07	0.28 in.WG (70 Pa)	
	08	0.32 in.WG (80 Pa)	
	09	0.36 in.WG (90 Pa)	
	31	Standard (0.10 in.WG [25 Pa])	◆

## 3) Room temperature control for indoor unit sensor

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

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

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

Example of correction:

When the temperature of the room temp. sensor is 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).

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

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

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

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

Function number		Setting value	Setting description	Factory setting	
35 (For cooling)	36 (For heating)	00	Standard setting	◆	
		01	No correction 0.0 °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	◆
	01	(Setting prohibited)	
	02	Forced stop mode	
	03	Operation/Stop mode 2	

**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.



## 11) Switching functions for external output terminal

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

Function number	Setting value	Setting description	Factory setting
60	00	Operation status	◆
	01—04	Cooling thermostat On	
	05	Heating operation	
	06	Operation/Stop	
	07—08	Cooling thermostat On	
	09	Error status	
	10	Fresh air control	
	11	External heater	

## 12) Control switching of external heaters

Sets the control method for external heater to be used.

For details, refer to “External heater output” in Chapter 0-1. "Details of function" on page 1.

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	
	05	Auxiliary heater control by outdoor temperature 3	
	06	Auxiliary heat pump control	
	08	Auxiliary heat pump control by outdoor temperature 2	
	09	Auxiliary heat pump control by outdoor temperature 3	

### 13) 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 0-1. "Details of function" on page 1.

Function number	Setting value	Setting description				Factory setting
		Setting value of function 61:				
		00		01 to 09		
		Heater: On	Heater: Off	Heater: On	Heater: Off	
62	00	-5.4 °F (-3 °C)	-1.8 °F (-1 °C)	-0.9 °F (-0.5 °C)	0.9 °F (0.5 °C)	◆
	01	-3.6 °F (-2 °C)	-1.8 °F (-1 °C)	-1.8 °F (-1 °C)	0.9 °F (0.5 °C)	
	02	-3.6 °F (-2 °C)	-1.8 °F (-1 °C)	-3.6 °F (-2 °C)	0.9 °F (0.5 °C)	
	03	-5.4 °F (-3 °C)	-1.8 °F (-1 °C)	-5.4 °F (-3 °C)	0.9 °F (0.5 °C)	
	04	-7.2 °F (-4 °C)	-1.8 °F (-1 °C)	-7.2 °F (-4 °C)	0.9 °F (0.5 °C)	
	05	-9.0 °F (-5 °C)	-1.8 °F (-1 °C)	-9.0 °F (-5 °C)	0.9 °F (0.5 °C)	
	06	-5.4 °F (-3 °C)	-0.9 °F (-0.5 °C)	-0.9 °F (-0.5 °C)	0 °F (0 °C)	
	07	-3.6 °F (-2 °C)	-0.9 °F (-0.5 °C)	-1.8 °F (-1 °C)	0 °F (0 °C)	
	08	-3.6 °F (-2 °C)	-0.9 °F (-0.5 °C)	-3.6 °F (-2 °C)	0 °F (0 °C)	
	09	-5.4 °F (-3 °C)	-0.9 °F (-0.5 °C)	-5.4 °F (-3 °C)	0 °F (0 °C)	
	10	-7.2 °F (-4 °C)	-0.9 °F (-0.5 °C)	-7.2 °F (-4 °C)	0 °F (0 °C)	
	11	-9.0 °F (-5 °C)	-0.9 °F (-0.5 °C)	-9.0 °F (-5 °C)	0 °F (0 °C)	
	12	-5.4 °F (-3 °C)	0 °F (0 °C)	-0.9 °F (-0.5 °C)	-0.9 °F (-0.5 °C)	
	13	-3.6 °F (-2 °C)	0 °F (0 °C)	-1.8 °F (-1 °C)	-0.9 °F (-0.5 °C)	
	14	-3.6 °F (-2 °C)	0 °F (0 °C)	-3.6 °F (-2 °C)	-0.9 °F (-0.5 °C)	
	15	-5.4 °F (-3 °C)	0 °F (0 °C)	-5.4 °F (-3 °C)	-0.9 °F (-0.5 °C)	
	16	-7.2 °F (-4 °C)	0 °F (0 °C)	-7.2 °F (-4 °C)	-0.9 °F (-0.5 °C)	
17	-9.0 °F (-5 °C)	0 °F (0 °C)	-9.0 °F (-5 °C)	-0.9 °F (-0.5 °C)		

### 14) 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 0-1. "Details of function" on page 1.

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)	
	08	24.8 °F (-4 °C)	

### 15) 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 0-1. "Details of function" on page 1.

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)		

### 16) Standby time for auxiliary equipment operation

Sets the standby time until the auxiliary equipment operation starts during primary equipment operation.

For details, refer to Chapter 0-1. "Details of function" on page 1.

Function number	Setting value	Setting description	Factory setting
71	00	Disable	◆
	01	1 minute	
	02	2 minutes	
	•	•	
	•	•	
	•	•	
	98	98 minutes	
	99	99 minutes	

### 17) Heat pump backup setting

Enables or disables the heat pump backup instruction from the outdoor unit.

This function will be usable provided that the corresponding outdoor unit is connected.

Function number	Setting value	Setting description	Factory setting
72	00	Disable	◆
	01	Enable	

### 18) Emergency heat

Enables or disables emergency heat input.

Function number	Setting value	Setting description	Factory setting
73	00	Disable	◆
	01	Enable	

**NOTE:** When this function is used, IR receiver unit is necessary.

**19) Fan delay time**

Sets the fan delay time when the heater is turned off.

Function number	Setting value	Setting description	Factory setting
74	00	1 minute	◆
	01	50 seconds	
	02	40 seconds	
	03	30 seconds	

**20) External heater use in defrosting**

Enables or disables external heater use in defrosting.

**NOTE:** Inappropriate heater selection may cause cold air in defrosting.

Function number	Setting value	Setting description	Factory setting
75	00	Disable	◆
	01	Enable	