AIRSTAGE

AIR CONDITIONER

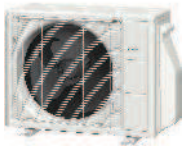
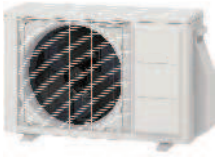
Wall-mounted type

FUJITSU

REFRIGERANT R32

INVERTER

SERVICE MANUAL

INDOOR			
	ASUH09KNAS ASUH12KNAS	ASUH18KNAS	ASUH24KNAS
OUTDOOR			
	AOUH09KNAS1 AOUH12KNAS1	AOUH18KNAS1	AOUH24KNAS1

FUJITSU GENERAL LIMITED

SR_AS159ES_02
2025.10.08

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

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CONTENTS

REFRIGERANT R32
INVERTER

1. GENERAL INFORMATION

CONTENTS

1. GENERAL INFORMATION

GENERAL INFORMATION

1. Specifications

1-1. Indoor unit

Type					Wall mounted	
					Inverter, Heat pump	
Model name					ASUH09KNAS	ASUH12KNAS
Power supply intake					Outdoor unit	
System power supply		Voltage		V	208/230	
		Frequency		Hz	60	
		Available voltage range		V	187—253	
Indoor unit power supply (from outdoor unit)				V	208/230	
Capacity	Cooling		Rated	kW	2.64	3.52
				Btu/h	9,000	12,000
			Min.—Max.	kW	0.90—3.08	0.90—3.67
				Btu/h	3,100—10,500	3,100—12,500
	Heating	47°FDB (Outdoor temp.)	Rated	kW	2.64	3.52
				Btu/h	9,000	12,000
			Min.—Max.	kW	0.90—3.63	0.90—4.07
				Btu/h	3,100—12,400	3,100—13,900
		17°FDB (Outdoor temp.)*1	Rated	kW	1.525	2.200
				Btu/h	5,200	7,500
			Max.	kW	2.505	2.960
				Btu/h	8,550	10,100
		5°FDB (Outdoor temp.)*2	Rated	kW	1.995	2.400
				Btu/h	6,800	8,200
			Max.	kW	2.05	2.58
				Btu/h	7,000	8,800
Input power	Cooling		Rated	kW	0.85	1.16
			Min.—Max.		0.24—1.44	0.23—1.44
	Heating	47°FDB (Outdoor temp.)	Rated		0.74	1.05
			Min.—Max.		0.20—1.38	0.21—1.66
		17°FDB (Outdoor temp.)*1	Rated		0.58	0.84
			Max.		1.08	1.24
		5°FDB (Outdoor temp.)*2	Rated		0.94	1.10
			Max.		0.96	1.12
	Fan		HIGH	W	20.1	20.2
			MED		11.3	11.5
			LOW		5.7	6.3
			QUIET		2.9	
Current		Cooling	Rated	A	4.2	5.4
		Heating			3.8	5.0
EER2		Cooling		Btu/hW	10.60	10.35
COP2		Heating		kW/kW	3.56	3.36
SEER2		Cooling		Btu/hW	18	
HSPF2		Heating			9	
Power factor		Cooling		%	88.0	93.4
		Heating			84.7	91.3
Moisture removal				pints/h (L/h)	1.9 (0.88)	3.3 (1.57)
Maximum operating current*3		Cooling		A	6.4	6.9
		Heating			7.9	
Fan	Airflow rate	Cooling	HIGH	CFM (m^3/h)	365 (620)	
			MED		288 (490)	
			LOW		212 (360)	218 (370)
			QUIET		141 (240)	
		Heating	HIGH		365 (620)	377 (640)
			MED		300 (510)	288 (490)
			LOW		241 (410)	235 (400)
			QUIET		153 (260)	
	Type × Qty				Crossflow fan × 1	
	Motor output			W	27	
Sound pressure level*4		Cooling	HIGH	dB (A)	41	
			MED		35	
			LOW		27	28
			QUIET		20	
		Heating	HIGH		41	
			MED		35	
			LOW		30	
			QUIET		22	
Heat exchanger type		Dimensions (H × W × D)		in (mm)	Main 1: 3-5/16 × 23-1/4 × 1/2 (84 × 590 × 13.3) Main 2: 3-5/16 × 23-1/4 × 1-1/16 (84 × 590 × 26.6) Main 3: 3-5/16 × 23-1/4 × 1/2 (84 × 590 × 13.3)	Main 1: 6-5/8 × 23-1/4 × 1-1/16 (168 × 590 × 26.6) Main 2: 3-5/16 × 23-1/4 × 1/2 (84 × 590 × 13.3)
		Fin pitch		FPI	Main 1: 21 Main 2: 20 Main 3: 21	Main 1: 20 Main 2: 21
		Rows × Stages			Main 1: 1 × 4 Main 2: 2 × 4 Main 3: 1 × 4	Main 1: 2 × 8 Main 2: 1 × 4
		Pipe type			Copper tube	
		Fin type			Aluminum	
Enclosure		Material			Polystyrene	
		Color			White Approximate color of Munsell 9PB 9.1/0.2	
Dimensions (H × W × D)	Net			in (mm)	9-13/16 × 30-5/16 × 8-9/16 (250 × 770 × 218)	
	Gross				10-13/16 × 33-1/16 × 12-3/16 (274 × 840 × 310)	

GENERAL INFORMATION

Type				Wall mounted	
				Inverter, Heat pump	
Model name				ASUH09KNAS	ASUH12KNAS
Weight	Net		lb (kg)	15 (7.0)	17 (7.5)
	Gross			21 (9.5)	22 (10.0)
Connection pipe	Size	Liquid	in (mm)	Ø1/4 (Ø6.35)	
		Gas		Ø3/8 (Ø9.52)	
	Method			Flare	
Drain hose	Material			Polypropylene + High-density polyethylene	
	Tip diameter		in (mm)	Ø17/32 (Ø13.8) (I.D.), Ø19/32 to Ø21/32 (Ø15.0 to Ø16.8) (O.D.)	
Operation range		Cooling	°F (°C)	64 to 90 (18 to 32)	
			%RH	80 or less	
		Heating	°F (°C)	60 to 86 (16 to 30)	
Remote controller type				Wireless (Option: Mobile app*5 [AIRSTAGE Mobile])	

NOTES:

- Specifications are based on the following conditions:
  - 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).
  - Heating: Indoor temperature of 70°FDB/60°FWB (21.11°CDB/15.56°CWB), and outdoor temperature of 47°FDB/43°FWB (8.33°CDB/6.11°CWB).
  - *1: Heating (17°F): Indoor temperature of 70°FDB/60°FWB (21.11°CDB/15.56°CWB), and outdoor temperature of 17°FDB/15°FWB (-8.33°CDB/-9.44°CWB).
  - *2: Heating (5°F): Indoor temperature of 70°FDB/60°FWB (21.11°CDB/15.56°CWB), and outdoor temperature of 5°FDB/4°FWB (-15.0°CDB/-15.56°CWB).
  - Test conditions are based on AHRI 210/240 2023.
  - Pipe length: 25 ft (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)
- Protective function might work when using it outside the operation range.
- *3: Maximum current:
  - The maximum value when operated within the operation range.
  - The total current of indoor unit and outdoor unit.
- *4: Sound pressure level:
  - Measured values in manufacturer's anechoic chamber.
  - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.
- *5: Available on Google Play™ store or on App Store®. Optional WLAN Adapter is also required. For details, refer to the setting manual.

GENERAL INFORMATION

Type					Wall mounted	
					Inverter, Heat pump	
Model name					ASUH18KNAS	ASUH24KNAS
Power supply intake					Outdoor unit	
System power supply		Voltage		V	208/230	
		Frequency		Hz	60	
		Available voltage range		V	187—253	
Indoor unit power supply (from outdoor unit)				V	208/230	
Capacity	Cooling		Rated	kW	5.28	6.45
				Btu/h	18,000	22,000
			Min.—Max.	kW	1.11—5.43	1.11—7.03
				Btu/h	3,800—18,500	3,800—24,000
	Heating	47°FDB (Outdoor temp.)	Rated	kW	5.28	7.03
				Btu/h	18,000	24,000
			Min.—Max.	kW	1.06—6.60	1.15—7.62
				Btu/h	3,600—22,500	3,900—26,000
		17°FDB (Outdoor temp.)*1	Rated	kW	3.63	4.34
				Btu/h	12,400	14,800
			Max.	kW	4.83	5.30
				Btu/h	16,500	18,200
		5°FDB (Outdoor temp.)*2	Rated	kW	4.25	4.69
				Btu/h	14,500	16,000
			Max.	kW	4.25	4.69
				Btu/h	14,500	16,000
Input power	Cooling		Rated	kW	1.64	2.10
			Min.—Max.		0.14—1.78	0.13—2.75
	Heating	47°FDB (Outdoor temp.)	Rated		1.66	2.07
			Min.—Max.		0.20—2.40	0.18—2.55
		17°FDB (Outdoor temp.)*1	Rated		1.32	1.50
			Max.		2.15	2.30
		5°FDB (Outdoor temp.)*2	Rated		2.10	2.13
			Max.		2.10	2.13
	Fan		HIGH	W	41	55
			MED		23	32
			LOW		15	21
			QUIET		10	14
Current		Cooling	Rated	A	7.3	9.3
		Heating			7.3	9.1
EER2		Cooling		Btu/hW	11.0	10.5
COP2		Heating		kW/kW	3.18	3.40
SEER2		Cooling		Btu/hW	20	
HSPF2		Heating			9	
Power factor		Cooling		%	97.7	98.2
		Heating			98.9	
Moisture removal				pints/h (L/h)	5.5 (2.6)	7.4 (3.5)
Maximum operating current*3		Cooling		A	9.9	14.4
		Heating			11.9	13.9
Fan	Airflow rate	Cooling	HIGH	CFM (m^3/h)	477 (810)	612 (1,040)
			MED		365 (620)	489 (830)
			LOW		277 (470)	394 (670)
			QUIET		212 (360)	306 (520)
		Heating	HIGH		477 (810)	606 (1,030)
			MED		377 (640)	489 (830)
			LOW		294 (500)	394 (670)
			QUIET		230 (390)	318 (540)
	Type × Qty				Crossflow fan × 1	
	Motor output			W	61	
Sound pressure level*4		Cooling	HIGH	dB (A)	48	49
			MED		41	43
			LOW		35	38
			QUIET		28	31
		Heating	HIGH		46	48
			MED		40	42
			LOW		35	38
			QUIET		30	32
Heat exchanger type		Dimensions (H × W × D)		in (mm)	Main 1: 8-1/4 × 26-5/16 × 1-1/16 (210 × 668 × 26.6) Main 2: 4-1/8 × 26-5/16 × 1-1/16 (105 × 668 × 26.6) Sub 1: 3-5/16 × 26-5/16 × 1/2 (84 × 668 × 13.3) Sub 2: 3-5/16 × 26-5/16 × 1/2 (84 × 668 × 13.3)	Main 1: 8-1/4 × 31-5/16 × 1-1/16 (210 × 796 × 26.6) Main 2: 5-5/16 × 31-5/16 × 13/16 (135 × 796 × 20.0) Sub 1: 3-5/16 × 31-5/16 × 1/2 (84 × 796 × 13.3) Sub 2: 3-5/16 × 31-5/16 × 1/2 (84 × 796 × 13.3)
		Fin pitch		FPI	Main 1: 21 Main 2: 21 Sub 1: 18 Sub 2: 18	Main 1: 21 Main 2: 23 Sub 1: 18 Sub 2: 18
		Rows × Stages			Main 1: 2 × 10 Main 2: 2 × 5 Sub 1: 1 × 4 Sub 2: 1 × 4	Main 1: 2 × 10 Main 2: 2 × 8 Sub 1: 1 × 4 Sub 2: 1 × 4
		Pipe type			Copper tube	
		Fin type			Aluminum	
Enclosure		Material			Polystyrene	
		Color			White Approximate color of Munsell 9PB 9.1/0.2	
Dimensions (H × W × D)	Net			in (mm)	10-5/8 × 32-13/16 × 9-7/16 (270 × 834 × 239)	11 × 38-9/16 × 9-7/16 (280 × 980 × 240)
	Gross				11-13/16 × 36 × 13-5/16 (300 × 914 × 338)	12-11/16 × 42-7/16 × 13-5/8 (322 × 1,078 × 346)
Weight	Net			lb (kg)	23 (10.5)	28 (12.5)
	Gross				31 (14.0)	37 (17.0)

GENERAL INFORMATION

Type				Wall mounted	
				Inverter, Heat pump	
Model name				ASUH18KNAS	ASUH24KNAS
Connection pipe	Size	Liquid	in (mm)	Ø1/4 (Ø6.35)	
		Gas		Ø1/2 (Ø12.70)	
	Method			Flare	
Drain hose	Material			Polypropylene + High-density polyethylene	
	Tip diameter		in (mm)	Ø17/32 (Ø13.8) (I.D.), Ø5/8 to Ø21/32 (Ø15.8 to Ø16.7) (O.D.)	
Operation range		Cooling	°F (°C)	64 to 90 (18 to 32)	
			%RH	80 or less	
		Heating	°F (°C)	60 to 86 (16 to 30)	
Remote controller type				Wireless (Option: Wired, Mobile app*5 [AIRSTAGE Mobile])	

NOTES:

- Specifications are based on the following conditions:
  - 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).
  - Heating: Indoor temperature of 70°FDB/60°FWB (21.11°CDB/15.56°CWB), and outdoor temperature of 47°FDB/43°FWB (8.33°CDB/6.11°CWB).
  - *1: Heating (17°F): Indoor temperature of 70°FDB/60°FWB (21.11°CDB/15.56°CWB), and outdoor temperature of 17°FDB/15°FWB (-8.33°CDB/-9.44°CWB).
  - *2: Heating (5°F): Indoor temperature of 70°FDB/60°FWB (21.11°CDB/15.56°CWB), and outdoor temperature of 5°FDB/4°FWB (-15.0°CDB/-15.56°CWB).
  - Test conditions are based on AHRI 210/240 2023.
  - Pipe length: 25 ft (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)
- Protective function might work when using it outside the operation range.
- *3: Maximum current:
  - The maximum value when operated within the operation range.
  - The total current of indoor unit and outdoor unit.
- *4: Sound pressure level:
  - Measured values in manufacturer's anechoic chamber.
  - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.
- *5: Available on Google Play™ store or on App Store®. Optional WLAN Adapter is also required. For details, refer to the setting manual.

GENERAL INFORMATION

1-2. Outdoor unit

Type				Inverter, Heat pump	
Model name				**AOUH09KNAS1**	**AOUH12KNAS1**
Power supply				208/230 V~ 60 Hz	
Power supply intake				Outdoor unit	
Available voltage range				187—253 V	
Starting current			A	4.2	5.4
Fan	Airflow rate	Cooling	CFM (m^3/h)	971 (1,650)	1,001 (1,700)
		Heating		853 (1,450)	865 (1,470)
	Type × Qty			Propeller fan × 1	
	Motor output		W	23	
Sound pressure level*		Cooling	dB (A)	45	48
		Heating		46	48
Heat exchanger type		Dimensions (H × W × D)	in (mm)	19-13/16 × 25-9/16 × 11/16 (504 × 650 × 18.19)	Main 1: 19-13/16 × 24-13/16 × 11/16 (504 × 630 × 18.19) Main 2: 19-13/16 × 24-13/16 × 11/16 (504 × 630 × 18.19)
		Fin pitch	FPI	20	Main 1: 20 Main 2: 20
		Rows × Stages		1 × 24	Main 1: 1 × 24 Main 2: 1 × 24
		Pipe type		Copper tube	
		Fin type	Type (Material)	Aluminum	
			Surface treatment	PC fin	
Compressor		Type		DC rotary	
		Motor output	W	550	
Refrigerant		Type		R32	
		Charge	lb oz	1 lb 3 oz	1 lb 7 oz
			g	530	650
Refrigerant oil		Type		RB74AF	
		Amount	in^3 (cm^3)	14.6 (240)	
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 × 26-1/8 × 11-7/16 (541 × 663 × 290)	
		Gross		23-11/16 × 31-5/8 × 14-3/4 (602 × 804 × 375)	
Weight		Net	lb (kg)	51 (23)	55 (25)
		Gross		60 (27)	64 (29)
Connection pipe	Size	Liquid	in (mm)	Ø1/4 (Ø6.35)	
		Gas		Ø3/8 (Ø9.52)	
	Method			Flare	
	Pre-charge length		ft (m)	49 (15)	
	Min. length			10 (3)	
	Max. length			65 (20)	
	Max. height difference			49 (15)	
Operation range		Cooling	°F (°C)	50 to 122 (10 to 50)	
		Heating		5 to 75 (-15 to 24)	
Drain hose		Material		Polypropylene	
		Tip diameter	in (mm)	Ø1/2 (Ø13.0) (I.D.), Ø5/8 to Ø11/16 (Ø16.0 to Ø16.8) (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: 25 ft (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)
- Protective function might work when using it outside the operation range.
- *: Sound pressure level
  - Measured values in manufacturer's semi-anechoic chamber.
  - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.

GENERAL INFORMATION

Type				Inverter, Heat pump	
Model name				**AOUH18KNAS1**	**AOUH24KNAS1**
Power supply				208/230 V~ 60 Hz	
Power supply intake				Outdoor unit	
Available voltage range				187—253 V	
Starting current			A	7.3	9.3
Fan	Airflow rate	Cooling	CFM (m^3/h)	1,183 (2,010)	1,660 (2,820)
		Heating		1,183 (2,010)	1,660 (2,820)
	Type × Qty			Propeller fan × 1	
	Motor output		W	23	45
Sound pressure level*		Cooling	dB (A)	51	55
		Heating		53	55
Heat exchanger type		Dimensions (H × W × D)	in (mm)	Main 1: 19-13/16 × 34-11/16 × 11/16 (504 × 881 × 18.19) Main 2: 19-13/16 × 33-1/2 × 11/16 (504 × 851 × 18.19)	Main 1: 23-1/8 × 34-11/16 × 11/16 (588 × 881 × 18.19) Main 2: 23-1/8 × 33-1/2 × 11/16 (588 × 851 × 18.19)
		Fin pitch	FPI	Main 1: 20 Main 2: 20	
		Rows × Stages		Main 1: 1 × 24 Main 2: 1 × 24	Main 1: 1 × 28 Main 2: 1 × 28
		Pipe type		Copper tube	
		Fin type	Type (Material)	Aluminum	
			Surface treatment	PC fin	
Compressor		Type		DC rotary	
		Motor output	W	1,000	
Refrigerant		Type		R32	
		Charge	lb oz	1 lb 15 oz	2 lb 10 oz
			g	890	1,200
Refrigerant oil		Type		RmM68AF	
		Amount	in^3 (cm^3)	21.4 (350)	
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)	73 (33)	79 (36)
		Gross		82 (37)	88 (40)
Connection pipe	Size	Liquid	in (mm)	Ø1/4 (Ø6.35)	
		Gas		Ø1/2 (Ø12.70)	
	Method			Flare	
	Pre-charge length		ft (m)	49 (15)	
	Min. length			10 (3)	
	Max. length			82 (25)	
	Max. height difference			66 (20)	
Operation range		Cooling	°F (°C)	50 to 122 (10 to 50)	
		Heating		5 to 75 (-15 to 24)	
Drain hose		Material		Polypropylene	
		Tip diameter	in (mm)	Ø1/2 (Ø13.0) (I.D.), Ø5/8 to Ø11/16 (Ø16.0 to Ø16.8) (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: 25 ft (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)
- Protective function might work when using it outside the operation range.
- *: Sound pressure level
  - Measured values in manufacturer's semi-anechoic chamber.
  - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.

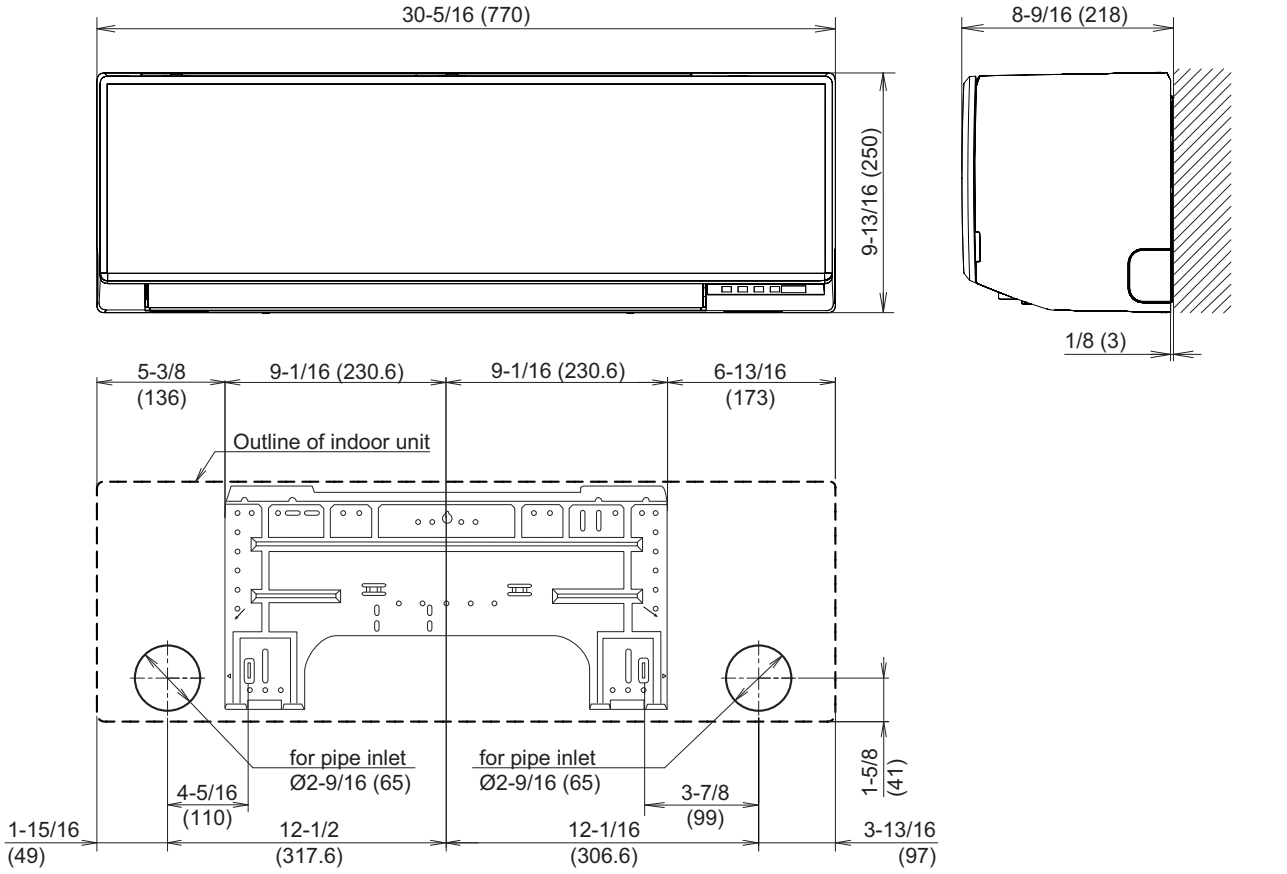
GENERAL INFORMATION

2. Dimensions

2-1. Indoor unit

■ Models: ASUH09KNAS and ASUH12KNAS

Unit: in (mm)

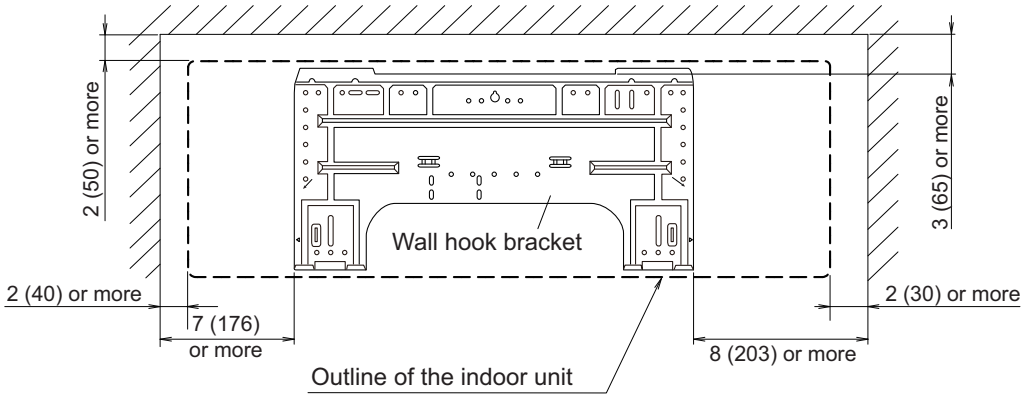


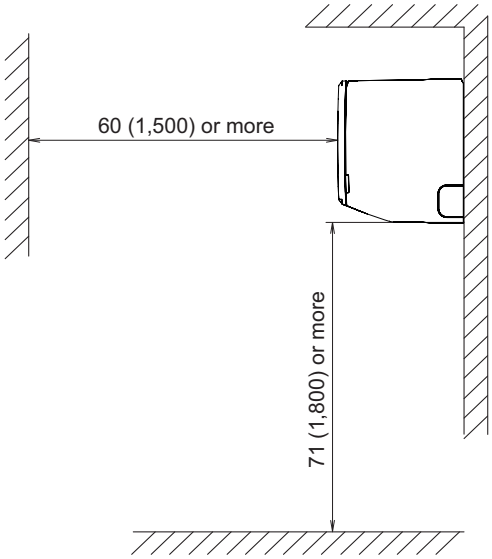
GENERAL INFORMATION

● Installation space requirement

Provide sufficient installation space for product safety.

Unit: in (mm)

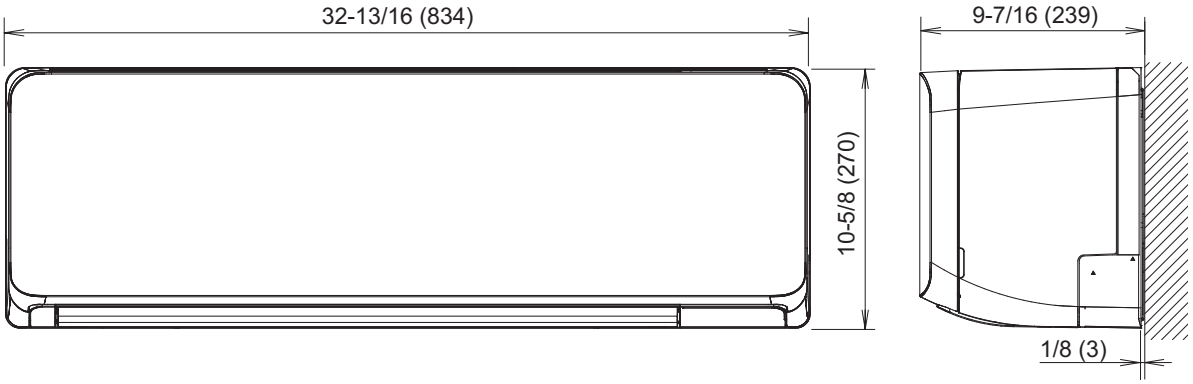


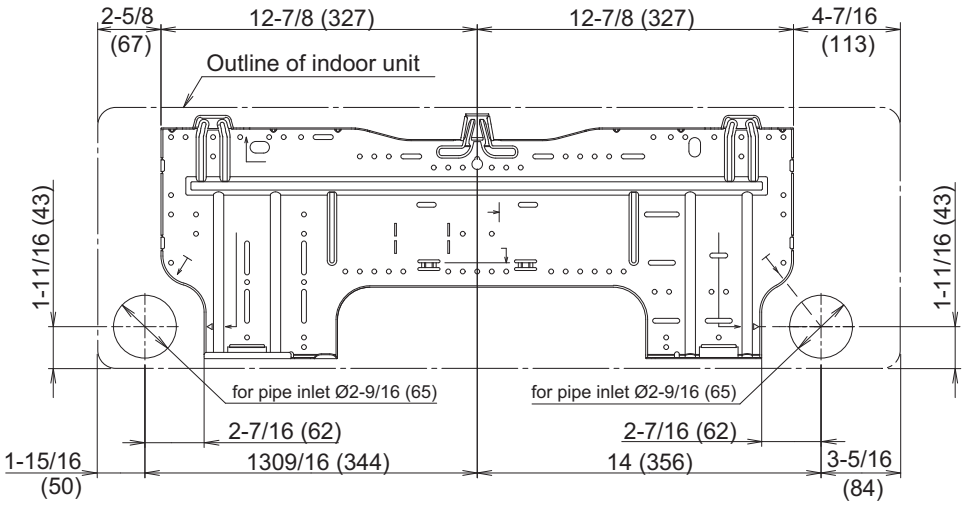


GENERAL INFORMATION

■ Model: ASUH18KNAS

Unit: in (mm)



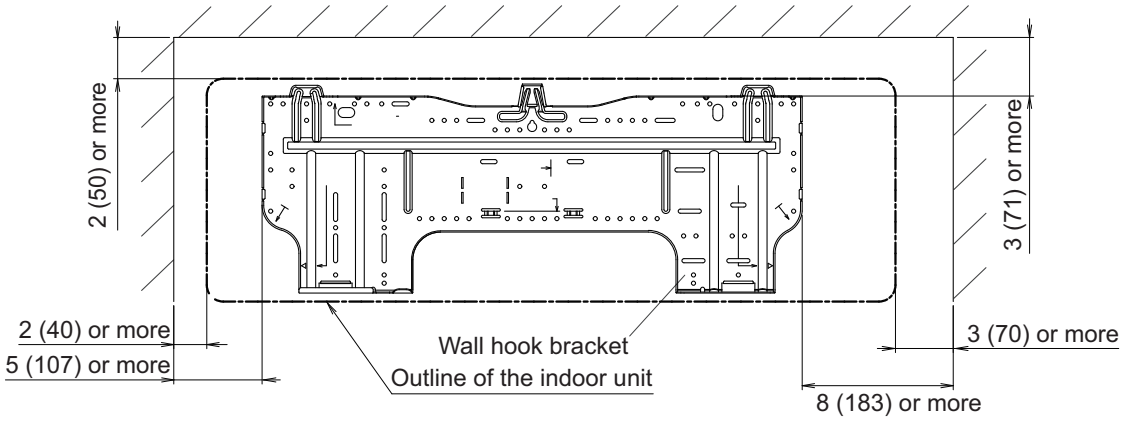


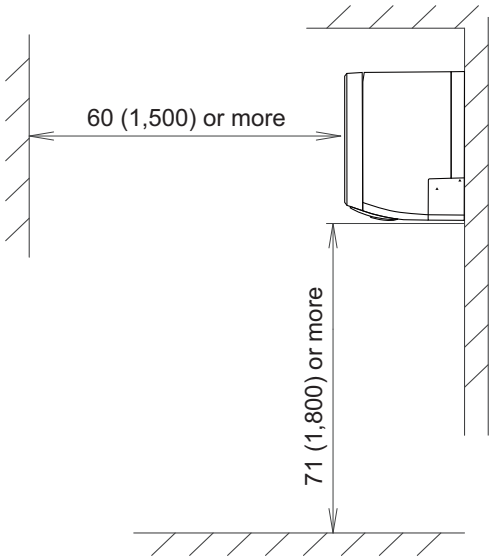
GENERAL INFORMATION

● Installation space requirement

Provide sufficient installation space for product safety.

Unit: in (mm)

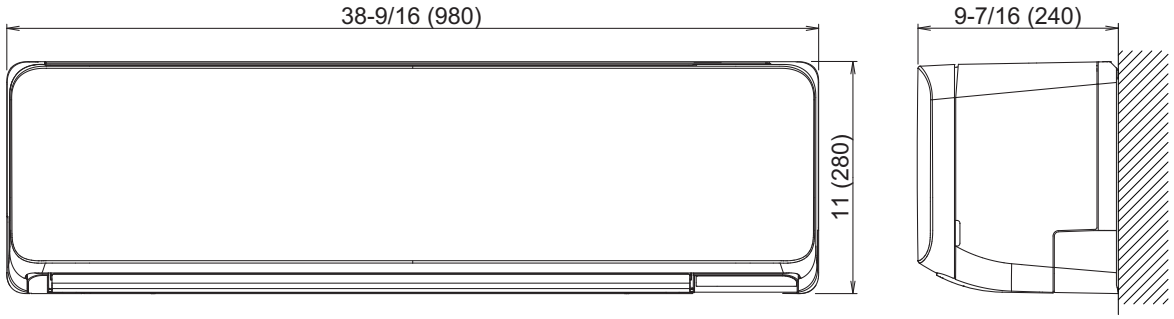


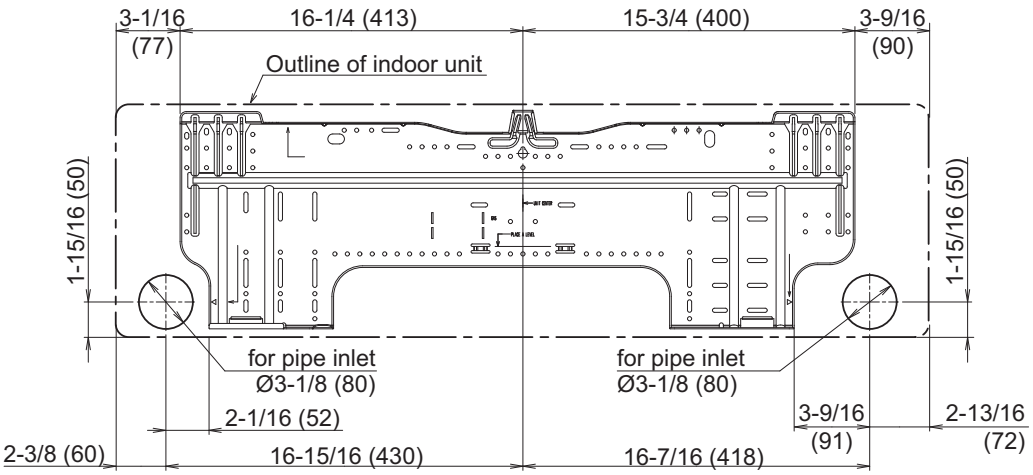


GENERAL INFORMATION

■ Model: ASUH24KNAS

Unit: in (mm)



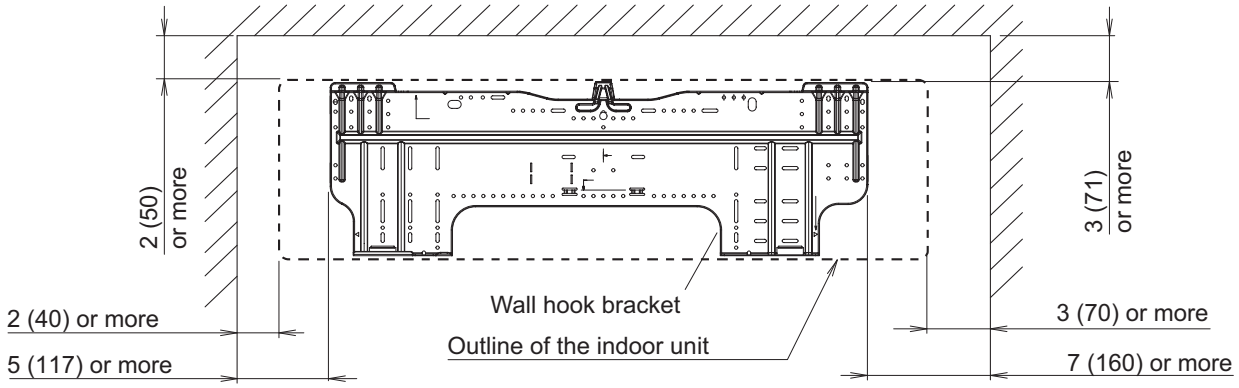


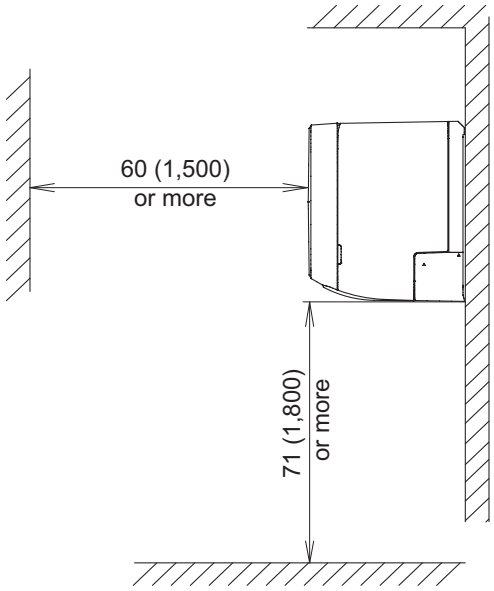
GENERAL INFORMATION

● Installation space requirement

Provide sufficient installation space for product safety.

Unit: in (mm)





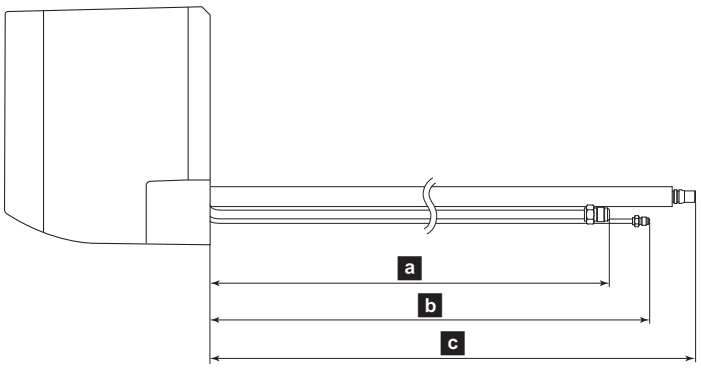
GENERAL INFORMATION

■ Pipe exit length from the rear

Design the system considering the length of the pipes or hose exiting from the rear of the indoor unit.

NOTE: Detailed shapes of the indoor unit and the tip of each pipe or hose may vary depending on the model.

Unit: in (mm)



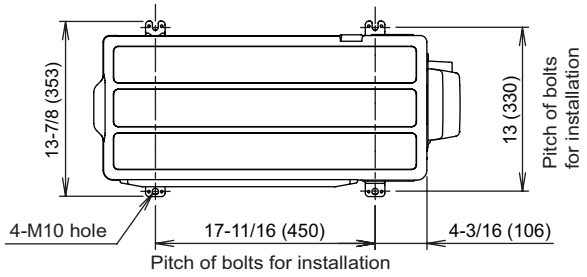
Model name	Approximate length		
	a Gas pipe	b Liquid pipe	c Drain hose
ASUH09-12KNAS	13 (330)	14-3/4 (375)	15-9/16 (395)
ASUH18KNAS	14-3/4 (375)	16-9/16 (420)	14-9/16 (370)
ASUH24KNAS	16-15/16 (430)	19-1/8 (485)	18-1/2 (470)

GENERAL INFORMATION

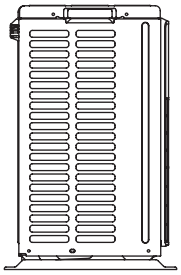
2-2. Outdoor unit

■ Models: AOUH09KNAS1 and AOUH12KNAS1

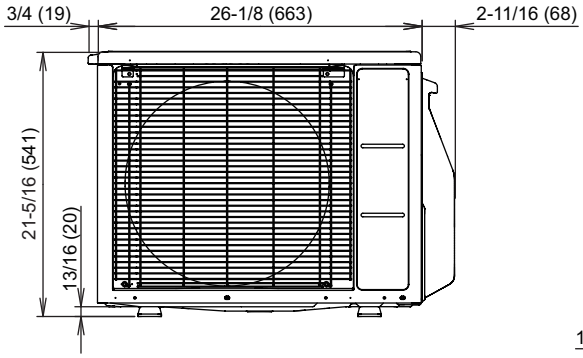
Unit: in (mm)



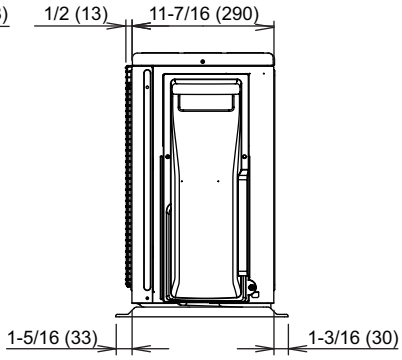
Top view



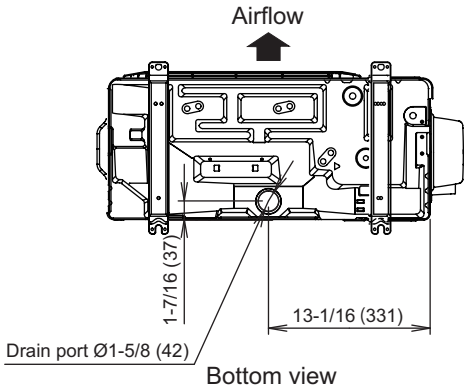
Side view



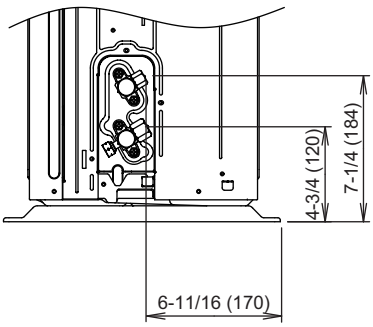
Front view



Side view



Bottom view

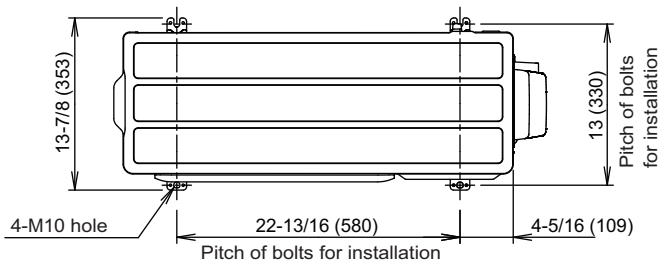


Side view (Valve part)

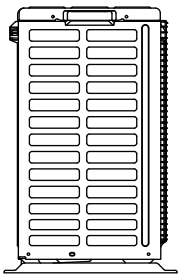
GENERAL INFORMATION

■ Model: AOUH18KNAS1

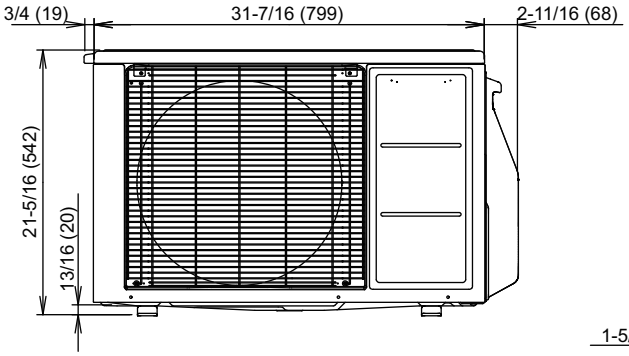
Unit: in (mm)



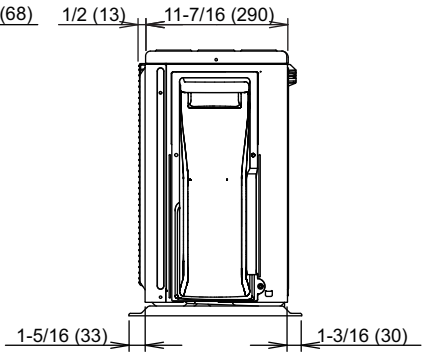
Top view



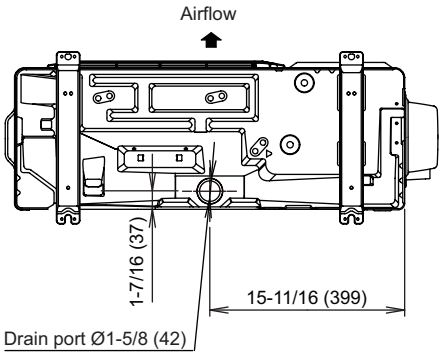
Side view



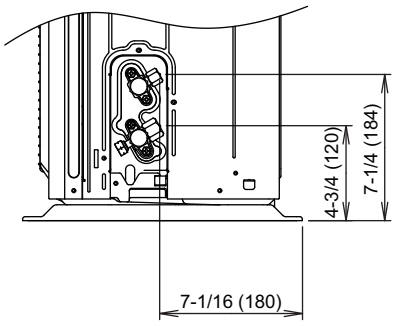
Front view



Side view



Bottom view

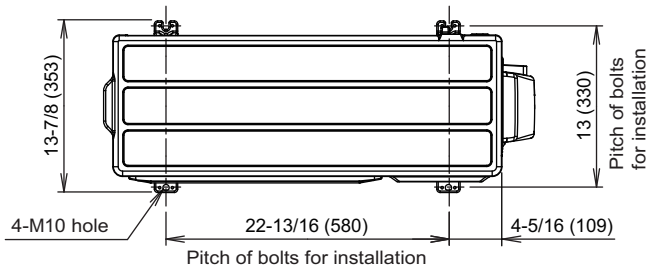


Side view (Valve part)

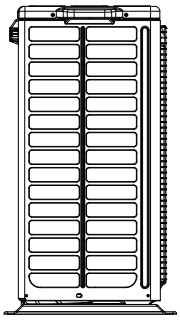
GENERAL INFORMATION

■ Model: AOUH24KNAS1

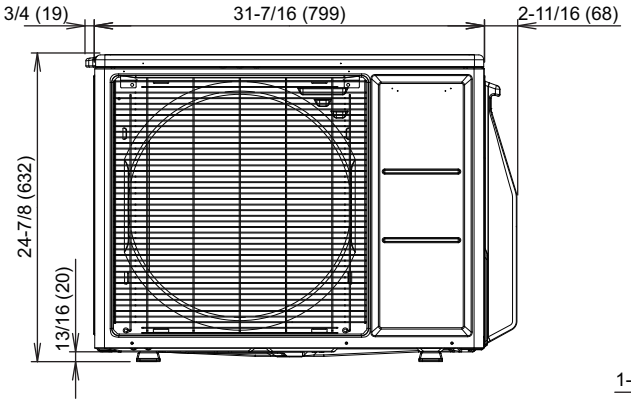
Unit: in (mm)



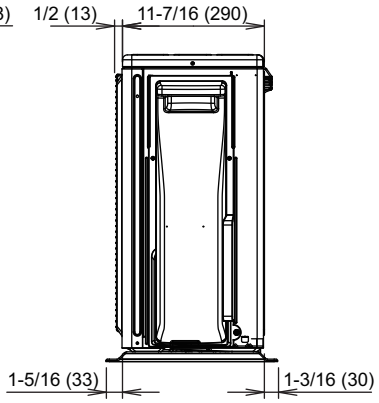
Top view



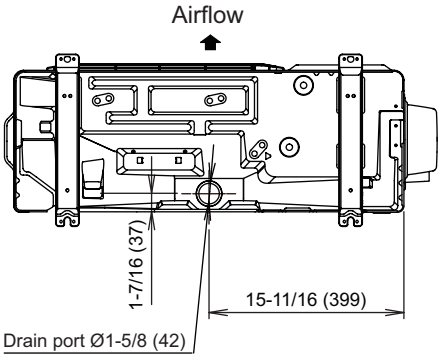
Side view



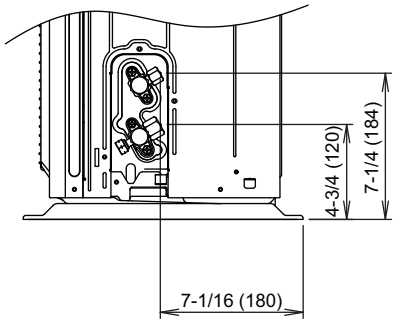
Front view



Side view



Bottom view



Side view (Valve part)

REFRIGERANT R32
INVERTER

2. TECHNICAL DATA AND PARTS LIST

2025.09.10
SR_CH02_AS159ES_01

CONTENTS

2. TECHNICAL DATA AND PARTS LIST

TECHNICAL DATA AND PARTS LIST

1. Precautions

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

⚠ CAUTION

- Service personnel
  - Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
  - Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
  - Servicing shall be performed only as recommended by the manufacturer.
- Work
  - Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. When repairing the refrigerant system, refer to the precautions written in the installation manual of the products before you start servicing.
  - Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
  - All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out.
  - Work in confined spaces shall be avoided.
  - The area around the workspace shall be sectioned off.
  - Ensure that the conditions within the area have been made safe by control of flammable material.
  - Electric shock may occur. After turning off the power, always wait 5 minutes before touching electrical components.
  - Do not touch the fins of the heat exchanger. Touching the heat exchanger fins could result in damage to the fins or personal injury such as skin rupture.
  - Do not place any other electrical products or household belongings under the product.
  - Condensation dripping from the product might get them wet, and may cause damage or malfunction to the property.
- Checking for presence of refrigerant
  - The area shall be checked with an appropriate refrigerant leak detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres.
  - Ensure that the leak detector being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

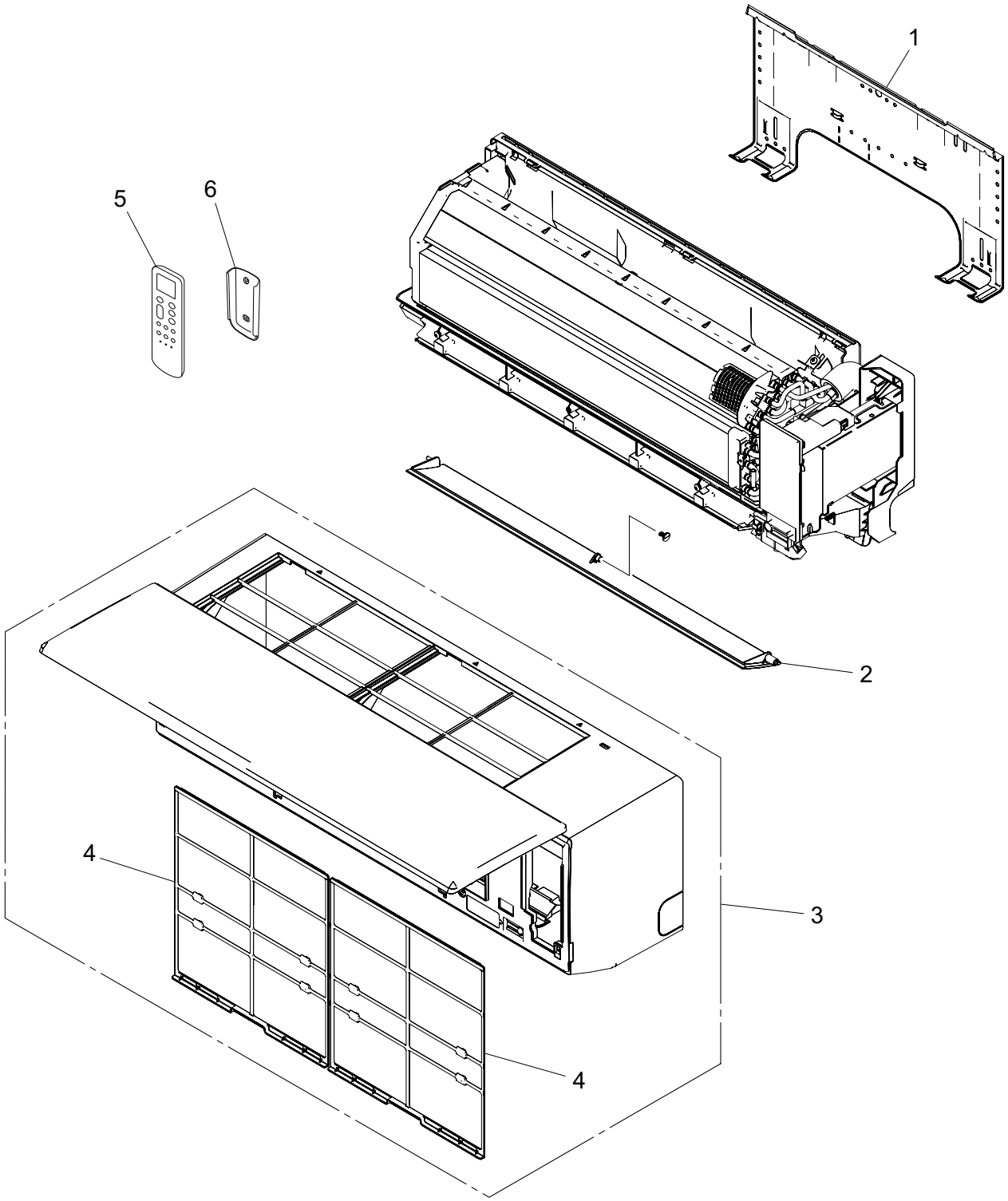
- Service parts information and design are subject to change without notice for product improvement.
- For the latest information of the service parts, refer to our Service Portal.
  https://fujitsu-general.force.com/portal/
- Precise figure of the service parts listed in this manual may differ from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

TECHNICAL DATA AND PARTS LIST

2. Indoor unit parts list

2-1. Models: ASUH09KNAS and ASUH12KNAS

■ Exterior parts

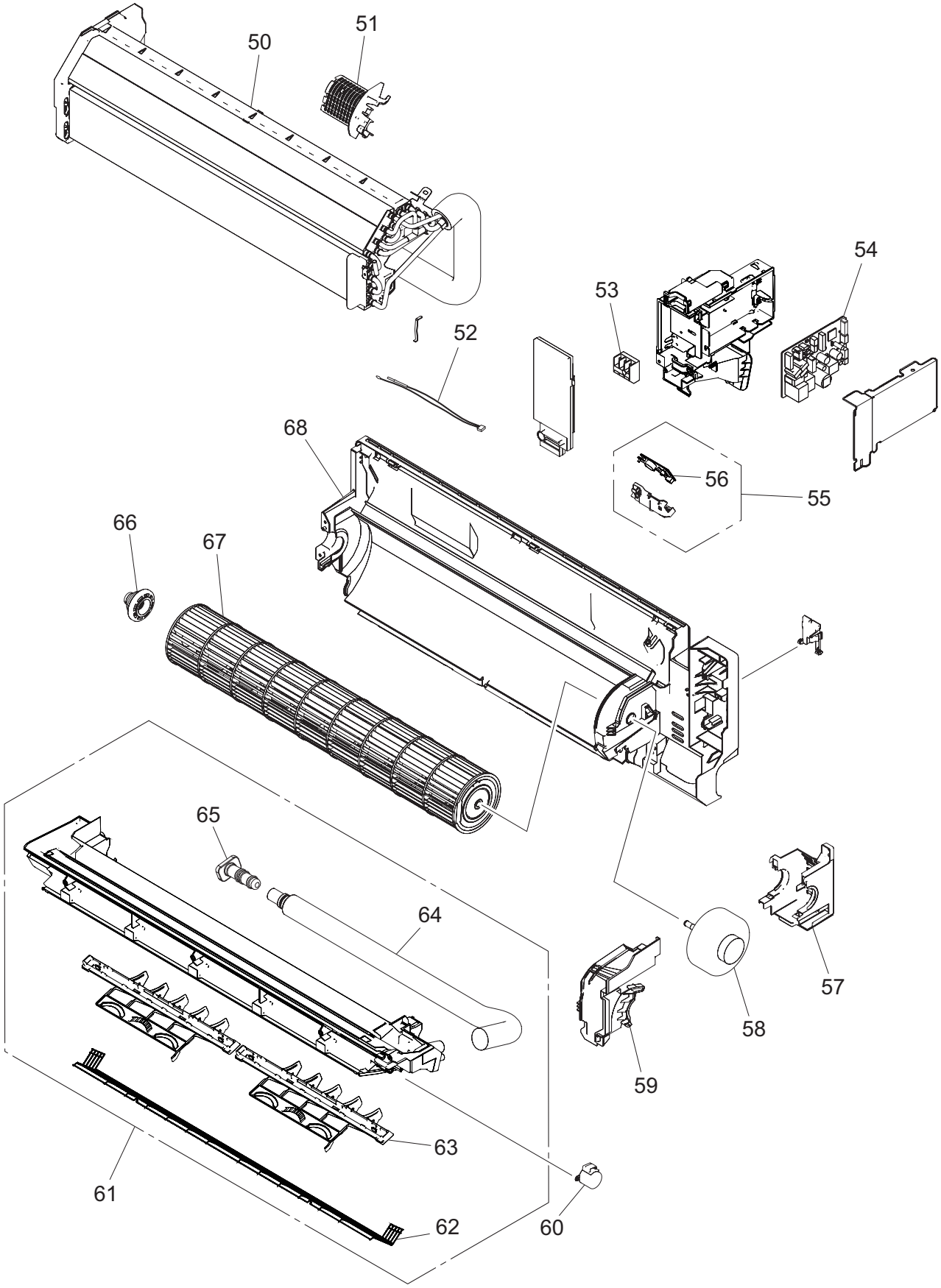


TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
1	9388959009	Bracket panel
2	9333888026	Horizontal louver
3	9333886312	Front panel total assy
4	9388953007	Air filter
5	9334141069	Remote controller total assy (Including No.6)
6	9334098004	Remote controller holder

TECHNICAL DATA AND PARTS LIST

■ Base, evaporator, and control unit



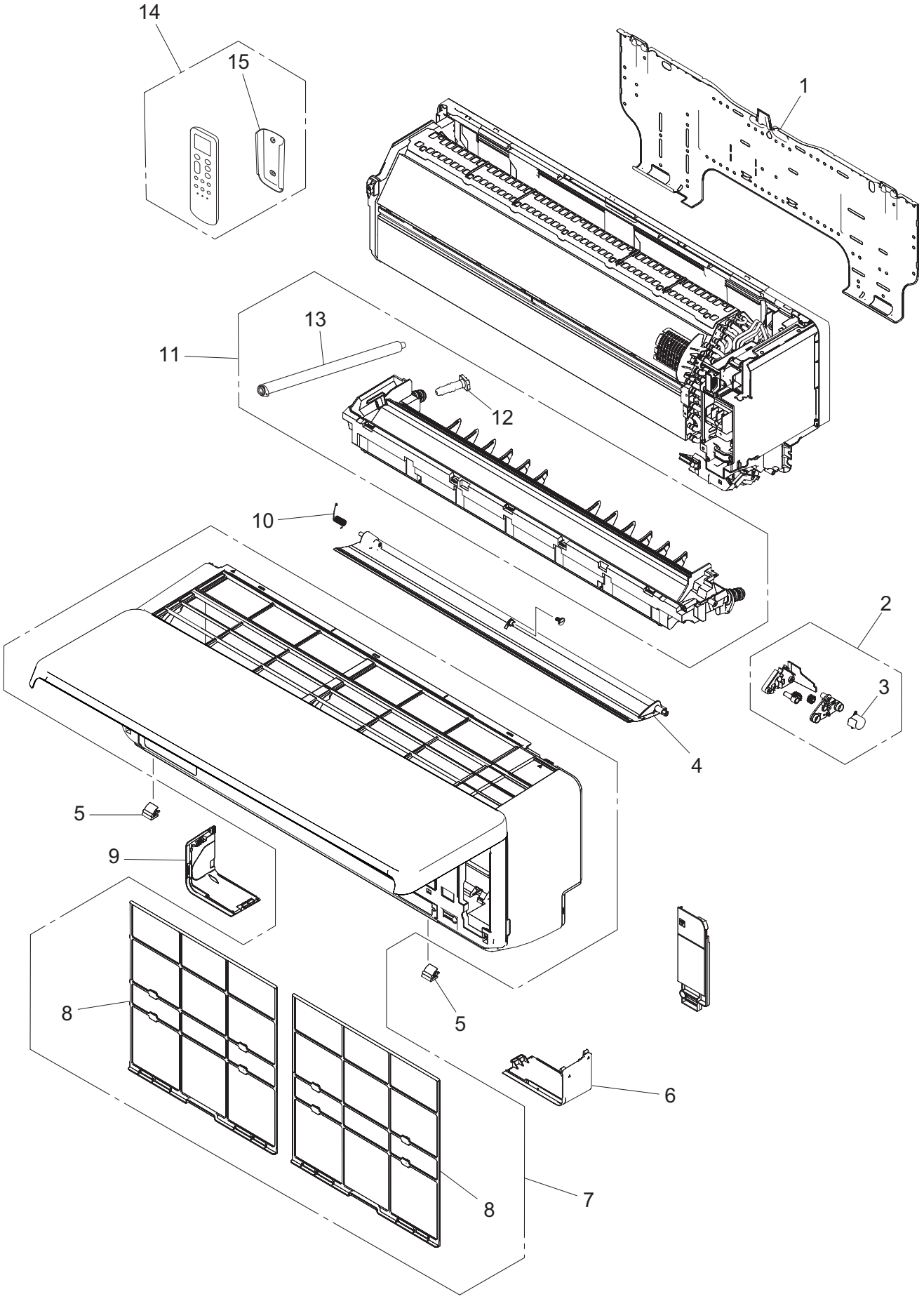
TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
50	9383735547	Evaporator total assy (09 model)
	9383735530	Evaporator total assy (12 model)
51	9388951003	Room thermistor holder
52	9901160066	Thermistor assy
53	9900369071	Terminal block 3P
54	9712493247	Main PCB (09 model)
	9712493254	Main PCB (12 model)
55	9711146137	Indicator assy
56	9711147028	Indicator PCB
57	9388977003	Motor case
58	9604163005	DC fan motor
59	9388946009	Motor cover
60	9901011139	Stepping motor
61	9333911045	Drain pan total assy
62	9388939001	Fan guard
63	9388935003	Vertical louver
64	9316904040	Drain hose assy
65	9316177017	Drain cap
66	9333628004	Bearing D assy
67	9388955001	Crossflow fan assy
68	9333882055	Base assy
—	9901010071	Wire with connector (CN75 on Main PCB—WLAN Adapter [option])
—	9709509081	Wire with terminal (E1 on Main PCB—Earth terminal)

TECHNICAL DATA AND PARTS LIST

2-2. Model: ASUH18KNAS

■ Exterior parts

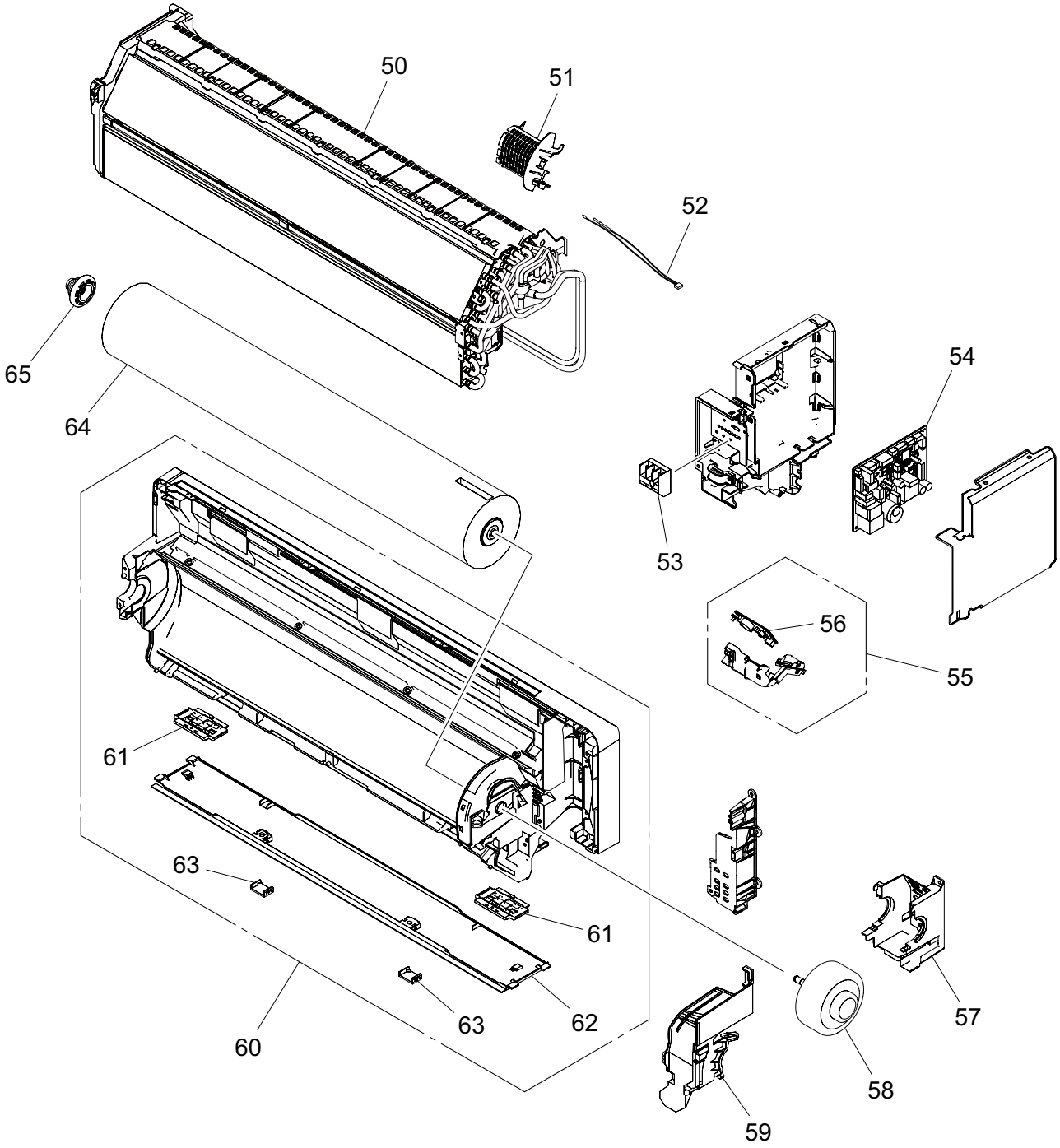


TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
1	9388142005	Bracket panel
2	9387714081	Gear case assy
3	9901011047	Stepping motor
4	9387479058	Horizontal louver assy
5	9387476002	Screw cover
6	9387966022	Under cover R
7	9384977618	Front panel total assy
8	9387473018	Air filter
9	9387967029	Under cover L
10	9387471007	Louver spring
11	9387590234	Drain pan total assy
12	9316177017	Drain cap
13	9316904040	Drain hose assy
14	9334141069	Remote controller total assy
15	9334098004	Remote controller holder

TECHNICAL DATA AND PARTS LIST

■ Base, evaporator, and control unit



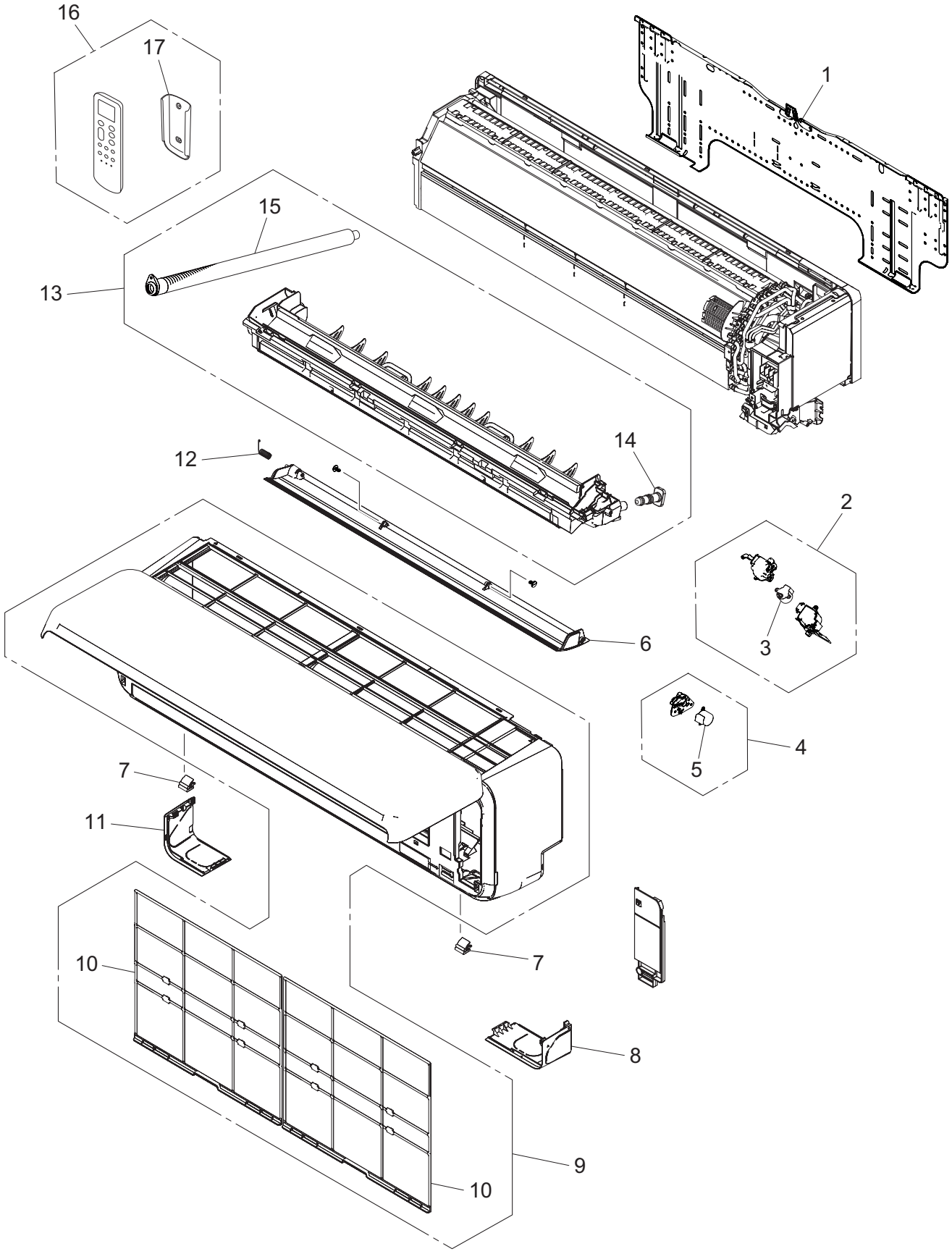
TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
50	9362077118	Evaporator total assy
51	9387467000	Room temp. thermistor holder
52	9901160035	Thermistor assy
53	9901013010	Terminal block 3P
54	9712493261	Main PCB
55	9711146199	Indicator assy
56	9711147073	Indicator PCB
57	9384500014	Motor case sub assy
58	9604281006	DC fan motor
59	9387713022	Motor cover assy
60	9387587302	Base assy
61	9388150000	Pipe bracket A
62	9388149004	Under cover C
63	9388182001	Screw cover
64	9387055047	Crossflow fan assy
65	9333628004	Bearing D assy
—	9901010071	Wire with connector (USB) (CN75 on Main PCB—WLAN Adapter)
—	9709509081	Wire with terminal (E1 on Main PCB—Earth terminal)

TECHNICAL DATA AND PARTS LIST

2-3. Model: ASUH24KNAS

■ Exterior parts

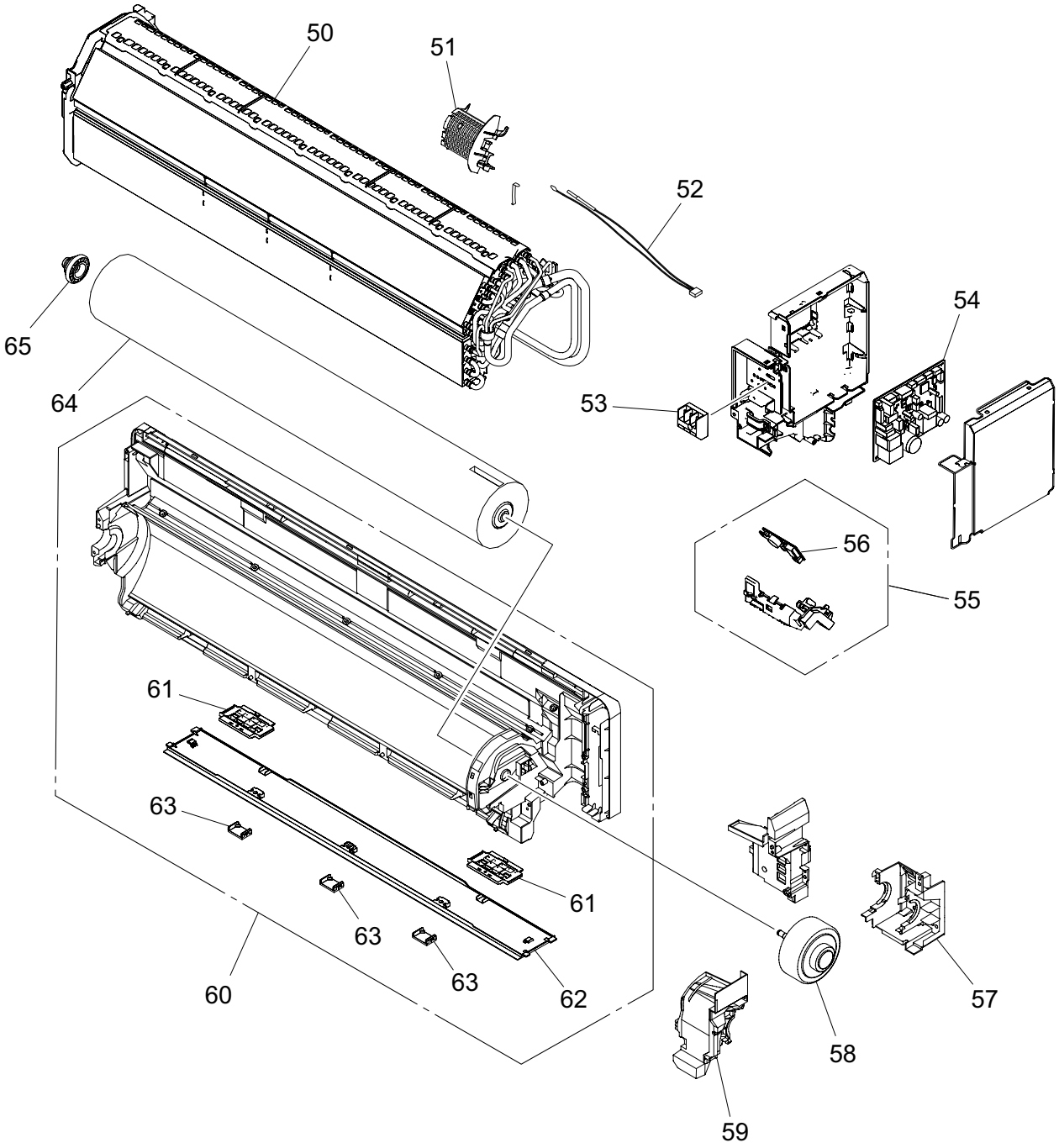


TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
1	9388158013	Bracket panel
2	9383728006	Vertical louver stepping motor assy
3	9901011023	Stepping motor
4	9387714012	Gear case assy
5	9901011016	Stepping motor
6	9387479010	Horizontal louver assy
7	9387476002	Screw cover
8	9323342033	Under cover R
9	9384977755	Front panel total assy
10	9323340015	Air filter
11	9323341036	Under cover L
12	9383730030	Louver spring
13	9387590142	Drain pan total assy
14	9316177017	Drain cap
15	9316904002	Drain hose assy
16	9334141076	Remote controller total assy
17	9334098004	Remote controller holder

TECHNICAL DATA AND PARTS LIST

■ Base, evaporator, and control unit



TECHNICAL DATA AND PARTS LIST

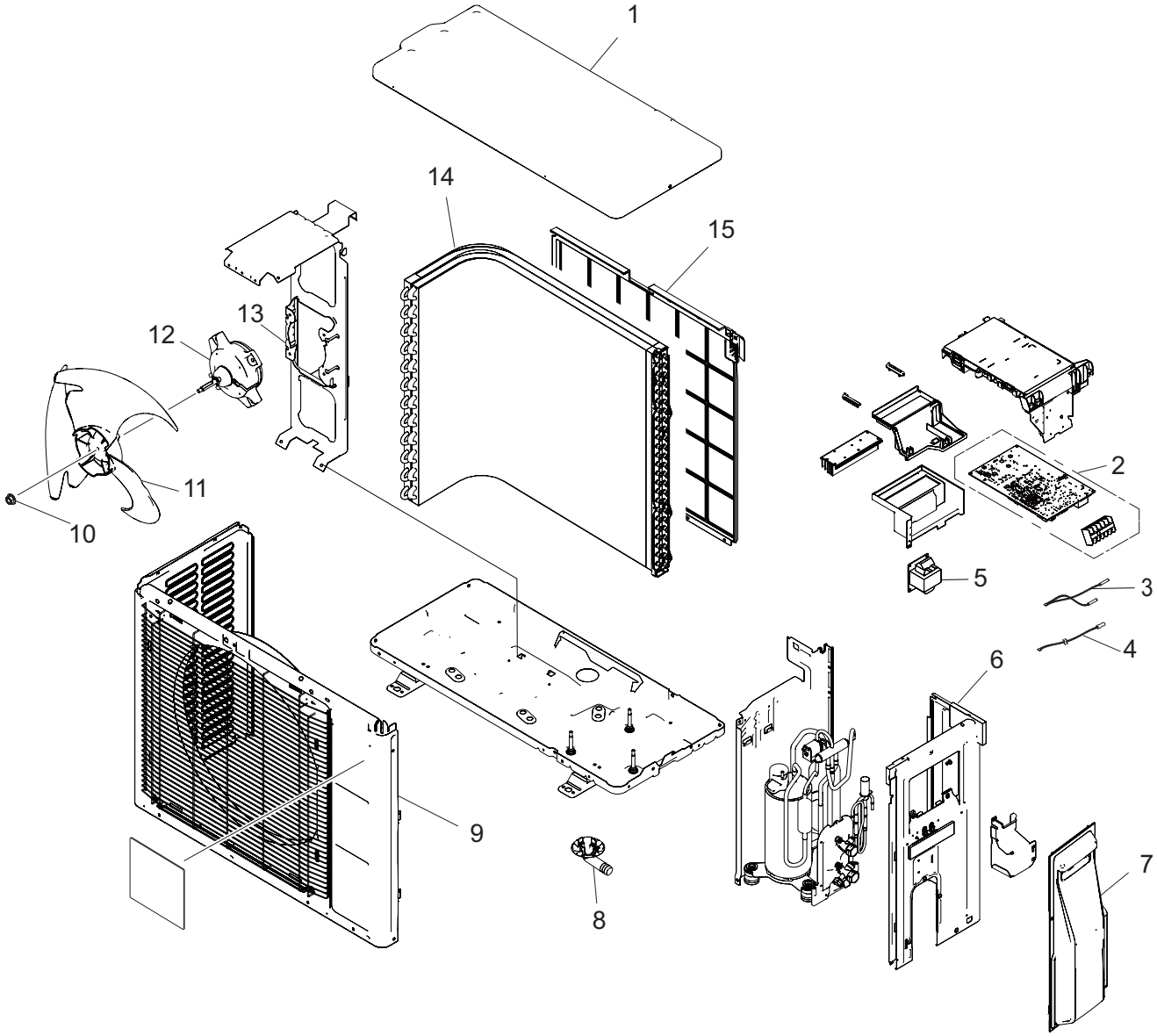
Item no.	Part no.	Part name
50	9383735400	Evaporator total assy
51	9387467000	Room thermistor holder
52	9901160035	Thermistor assy
53	9901013010	Terminal block 3P
54	9712493278	Main PCB
55	9711146304	Indicator assy
56	9711147073	Indicator PCB
57	9384500007	Motor case sub assy
58	9604281006	DC fan motor
59	9387713015	Motor cover assy
60	9387587272	Base assy
61	9388150000	Pipe bracket A
62	9388155005	Under cover C
63	9388182001	Screw cover
64	9387055054	Crossflow fan assy
65	9333628004	Bearing D assy
—	9901010071	Wire with connector (USB) (CN75 on Main PCB—WLAN Adapter)
—	9709509081	Wire with terminal (E1 on Main PCB—Earth terminal)

TECHNICAL DATA AND PARTS LIST

3. Outdoor unit parts list

3-1. Models: AOUH09KNAS1 and AOUH12KNAS1

■ Exterior parts and chassis

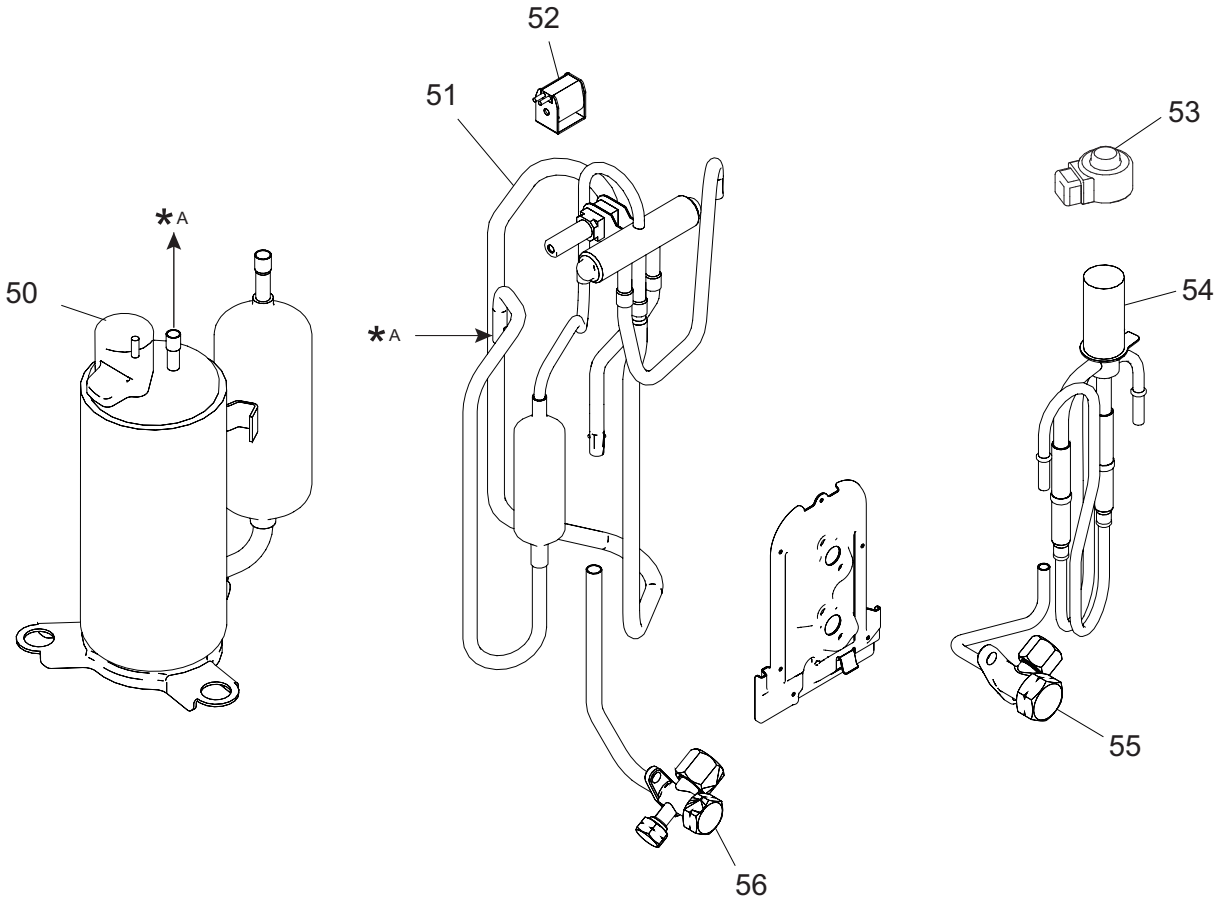


TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
1	9322556103	Top panel assy
2	9712996847	Main PCB (09 model)
	9712996854	Main PCB (12 model)
3	9900727062	Thermistor assy
4	9900565176	Thermistor (Outdoor temp.)
5	9900583019	Reactor assy
6	9322552310	Cabinet right assy
7	9322570185	Switch cover assy
8	9322144003	Drain pipe
9	9322555359	Front panel assy
10	0700103070	Nut
11	9322136008	Propeller fan
12	9604210006	DC fan motor
13	9322553089	Motor bracket assy (09 model)
	9322553096	Motor bracket assy (12 model)
14	9322272010	Condenser total assy (09 model)
	9322273000	Condenser total assy (12 model)
15	9322811004	Protective net assy

■ Compressor

TECHNICAL DATA AND PARTS LIST



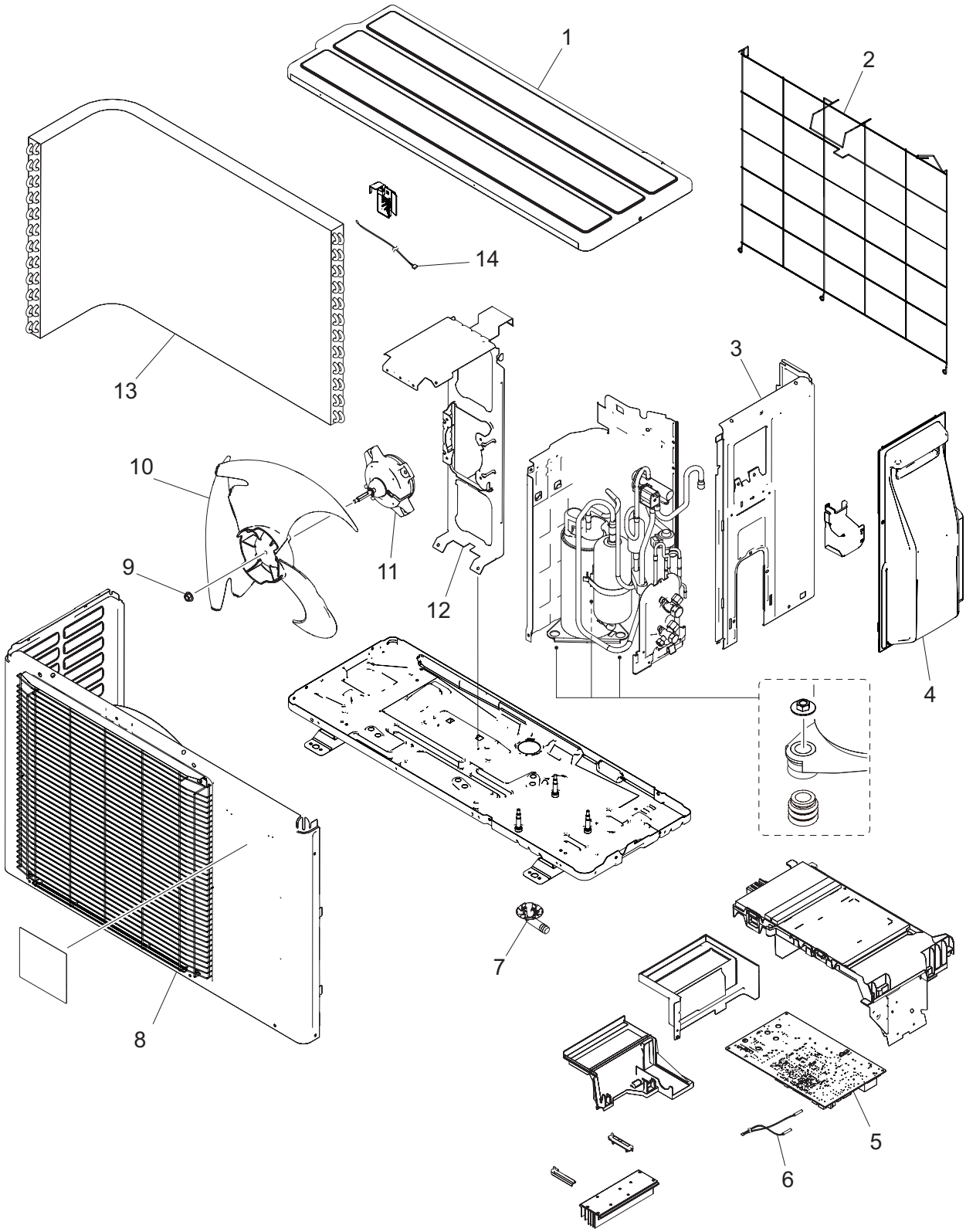
TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
50	9322423009	Compressor assy (09 model)
	9322425003	Compressor assy (12 model)
51	9322392008	4-way valve assy
52	9970110153	Solenoid
53	9970222009	Expansion valve coil
54	9322403001	Pulse motor valve
55	9322472007	2-way valve assy
56	9322473004	3-way valve assy

TECHNICAL DATA AND PARTS LIST

3-2. Model: AOUH18KNAS1

■ Exterior parts and chassis

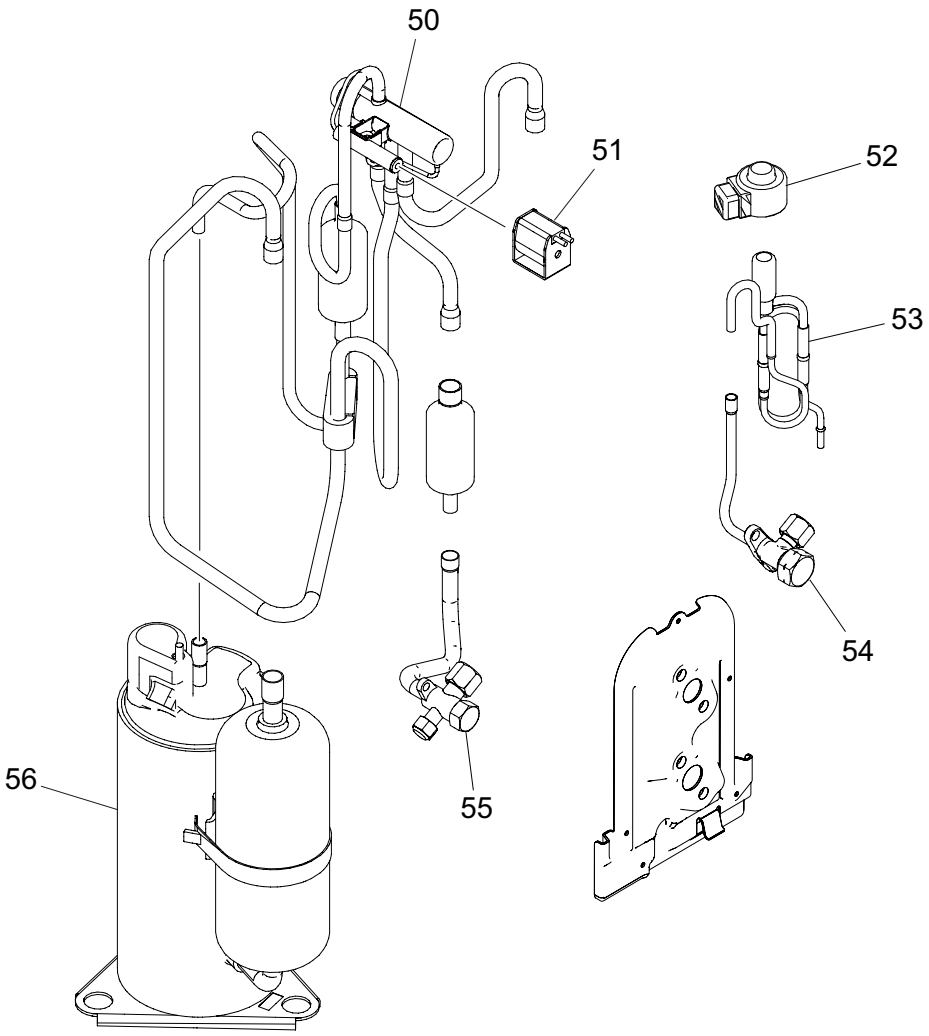


TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
1	9322556028	Top panel assy
2	9322811011	Protective net assy
3	9322552259	Cabinet right assy
4	9322570185	Switch cover assy
5	9712996861	Main PCB
6	9900727062	Thermistor assy
7	9322144003	Drain pipe
8	9322555199	Front panel assy
9	0700103070	Nut
10	9322136008	Propeller fan
11	9604210006	DC fan motor
12	9322553010	Motor bracket assy
13	9323834019	Heat exchanger unit
14	9900565145	Thermistor (Outdoor temp.)

■ Compressor

TECHNICAL DATA AND PARTS LIST



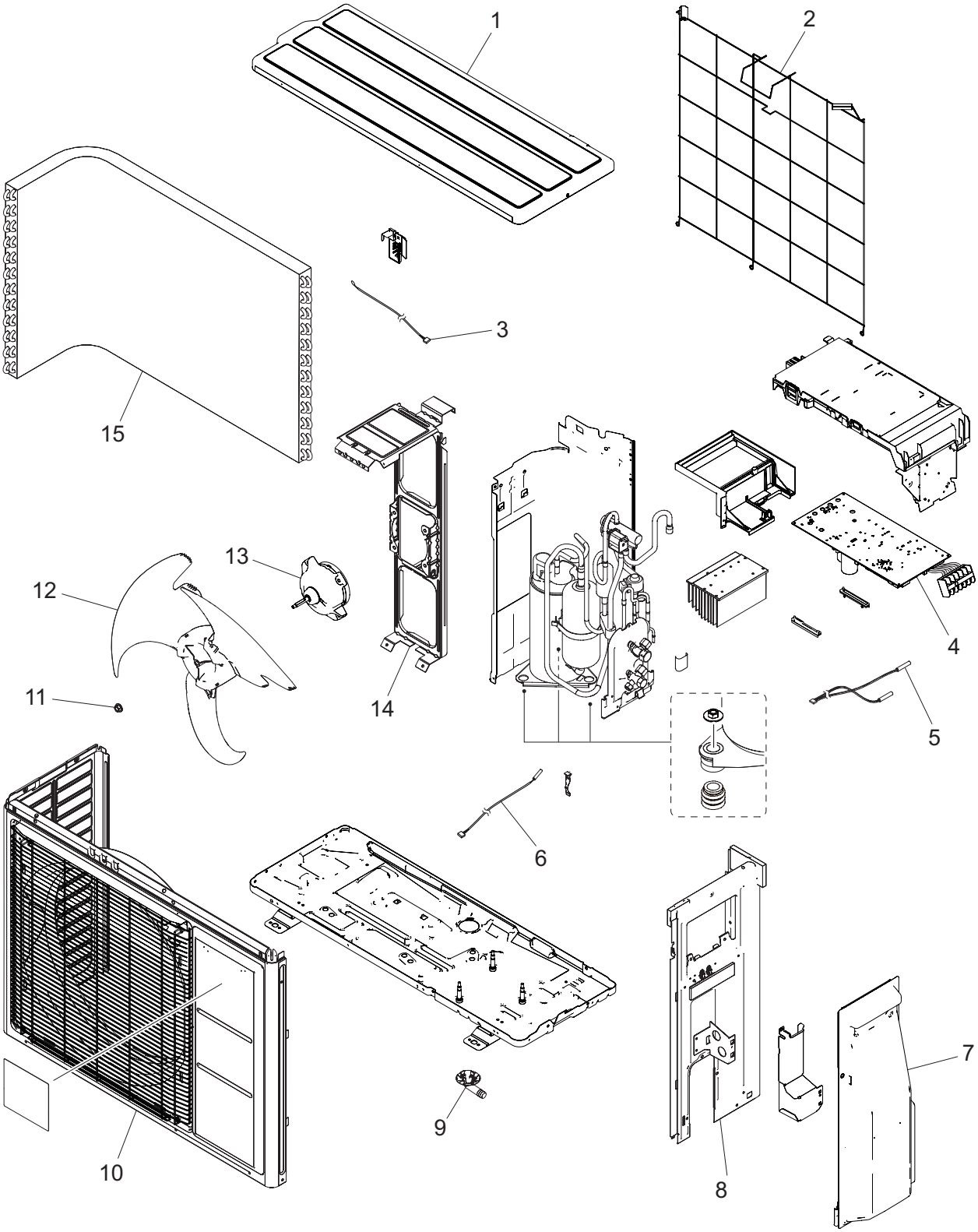
TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
50	9364463001	4-way valve assy
51	9970110160	Solenoid
52	9970222016	Expansion valve coil
53	9322463050	Pulse motor valve assy
54	9322481016	2-way valve assy
55	9322477002	3-way valve assy
56	9811079007	Compressor assy

TECHNICAL DATA AND PARTS LIST

3-3. Model: AOUH24KNAS1

■ Exterior parts and chassis

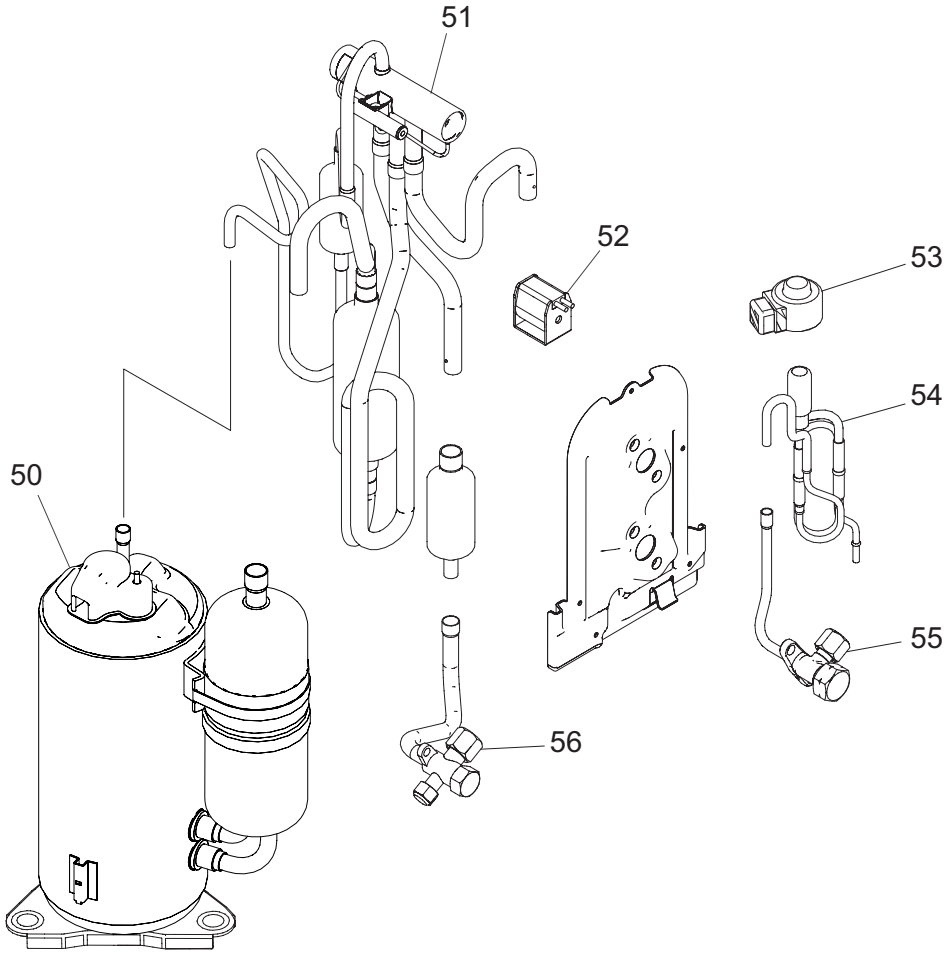


TECHNICAL DATA AND PARTS LIST

Item no.	Part no.	Part name
1	9322556028	Top panel assy
2	9322811028	Protective net assy
3	9900565145	Thermistor (Outdoor temp.)
4	9712996878	Main PCB
5	9900727079	Thermistor assy
6	9900985011	Thermistor (Compressor temp.)
7	9322570178	Switch cover assy
8	9322552365	Cabinet right assy
9	9322144003	Drain pipe
10	9322555182	Front panel assy
11	0700103070	Nut
12	9322150004	Propeller fan
13	9604217005	DC fan motor
14	9322553027	Motor bracket assy
15	9323834217	Heat exchanger unit

TECHNICAL DATA AND PARTS LIST

■ Compressor



Item no.	Part no.	Part name
50	9811079007	Compressor
51	9364474007	4-way valve assy
52	9970110160	Solenoid
53	9970222016	Expansion valve coil
54	9322463050	Pulse motor valve assy
55	9322481016	2-way valve assy
56	9322477002	3-way valve assy

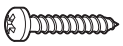
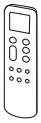
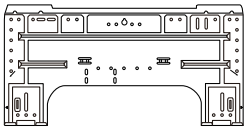
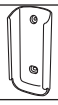
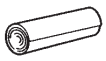
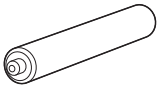
TECHNICAL DATA AND PARTS LIST

TECHNICAL DATA AND PARTS LIST

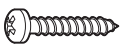
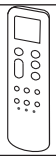
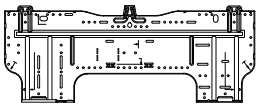
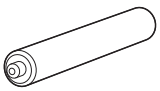
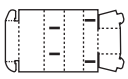
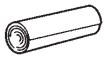
4. Accessories

4-1. Indoor unit

■ Models: ASUH09KNAS and ASUH12KNAS

Part name	Exterior	Qty	Part name	Exterior	Qty
Operation manual		1	Self-tapping screw (Large)		5
Installation manual		1	Self-tapping screw (Small)		2
Remote controller		1	Wall hook bracket		1
Remote controller holder		1	Cloth tape		1
Battery		2			

■ Models: ASUH18KNAS and ASUH24KNAS

Part name	Exterior	Qty	Part name	Exterior	Qty
Operation manual		1	Self-tapping screw (Large)		5
Installation manual		1	Self-tapping screw (Small)		2
Remote controller		1	Wall hook bracket		1
Battery		2	Remote controller holder		1
Installation spacer		1	Cloth tape		1

TECHNICAL DATA AND PARTS LIST

4-2. Outdoor unit

■ Models: AOUH09KNAS1, AOUH12KNAS1, AOUH18KNAS1, and AOUH24KNAS1

Part name	Exterior	Qty	Part name	Exterior	Qty
Protection label		1	Cable tie		2
Drain pipe		1			

TECHNICAL DATA AND PARTS LIST

5. Optional parts

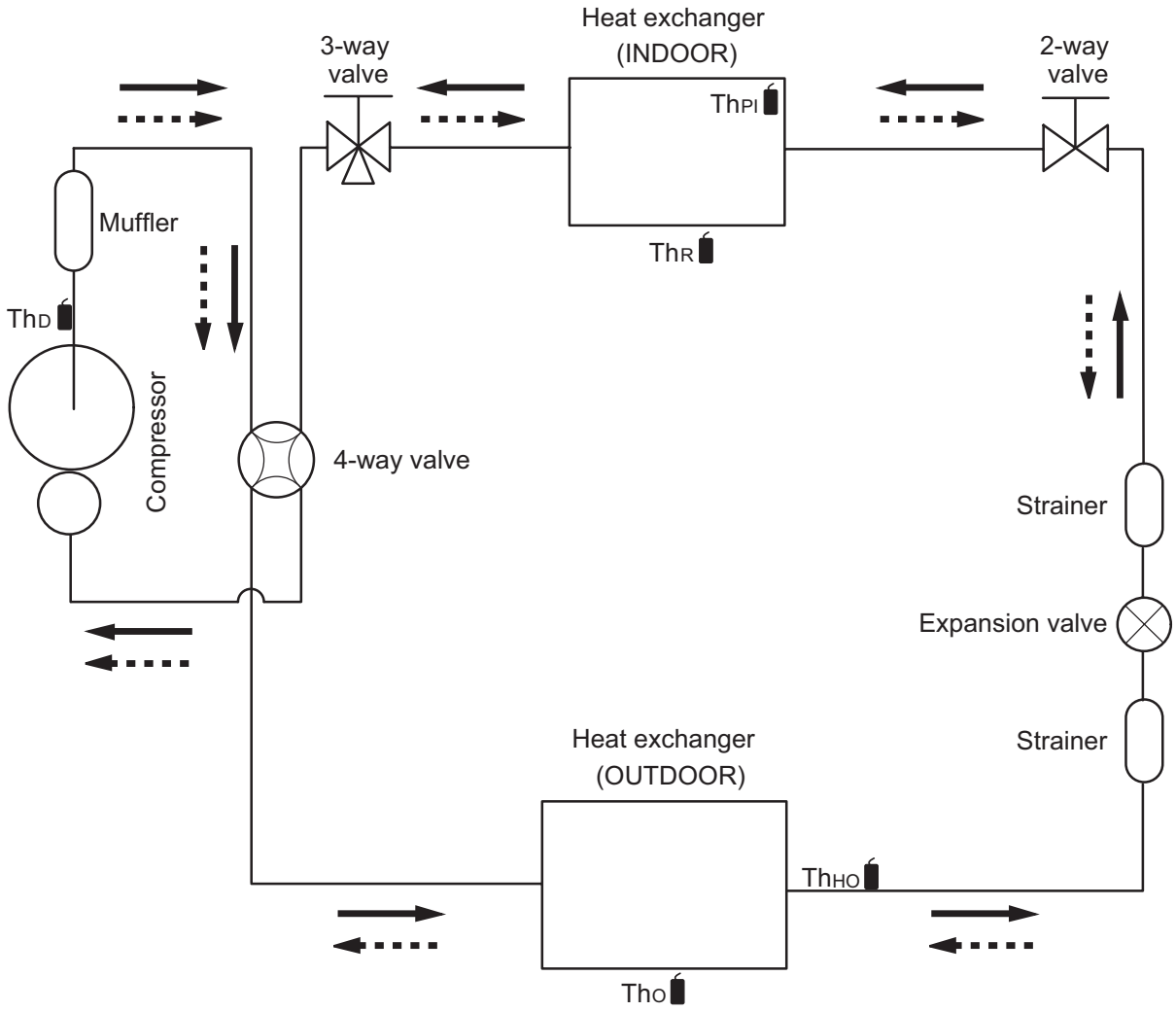
5-1. Indoor unit

Exterior	Part name	Model name	Summary
	WLAN Adapter	UTY-TFSXH4	Remotely manage an air conditioning system using mobile devices such as smartphones and tablets. Appropriate application for each region is required to use this option. For details, contact FGL sales company. Connecting point: USB connector

TECHNICAL DATA AND PARTS LIST

6. Refrigerant system diagrams

6-1. Models: AOUH09KNAS1 and AOUH12KNAS1



ThD : Thermistor (Discharge temperature)

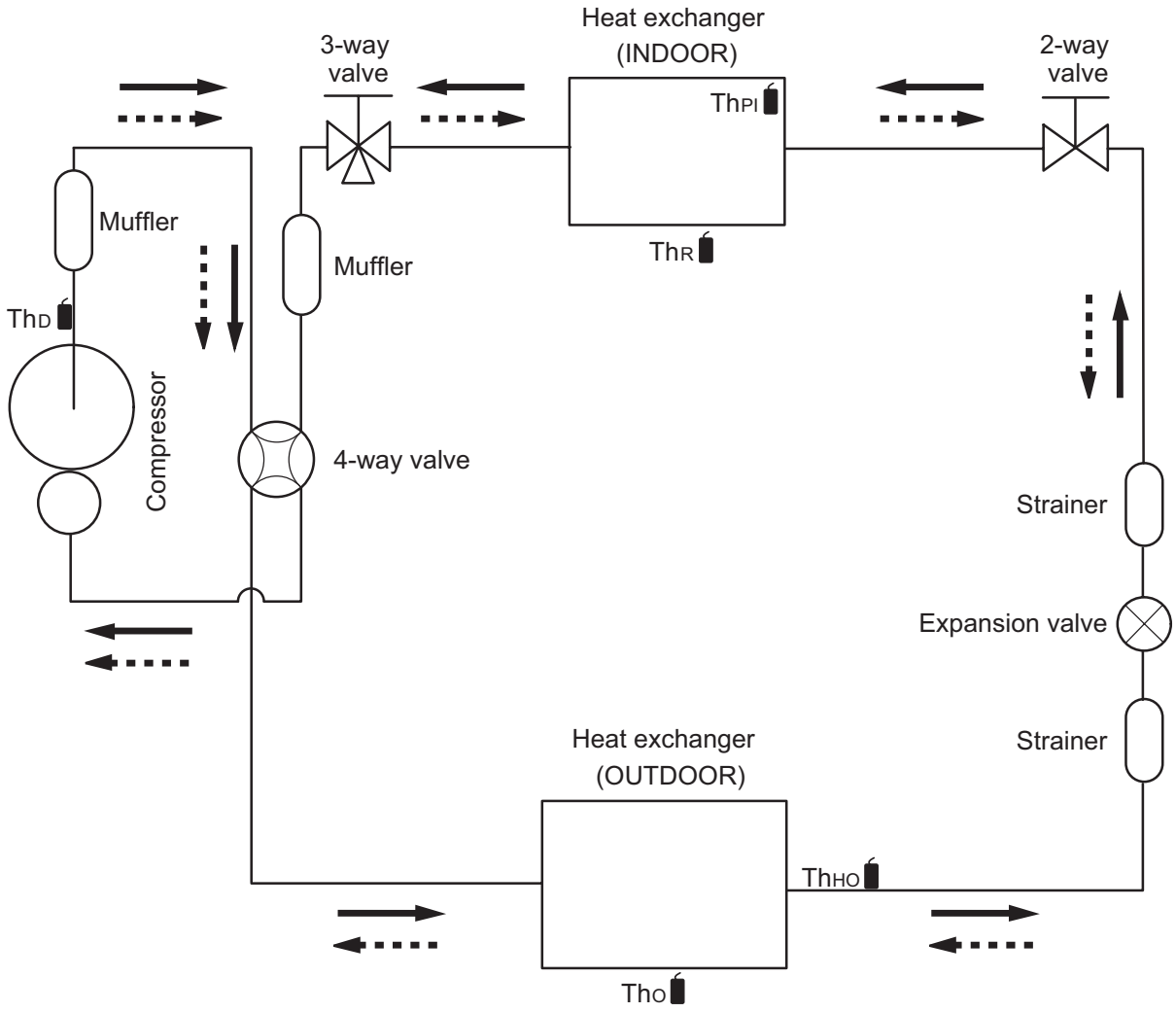
ThO : Thermistor (Outdoor temperature)

ThHO: Thermistor (Heat exchanger out temperature)

ThPI : Thermistor (Pipe temperature)

ThR : Thermistor (Room temperature)

6-2. Model: AOUH18KNAS1



ThD : Thermistor (Discharge temperature)

ThO : Thermistor (Outdoor temperature)

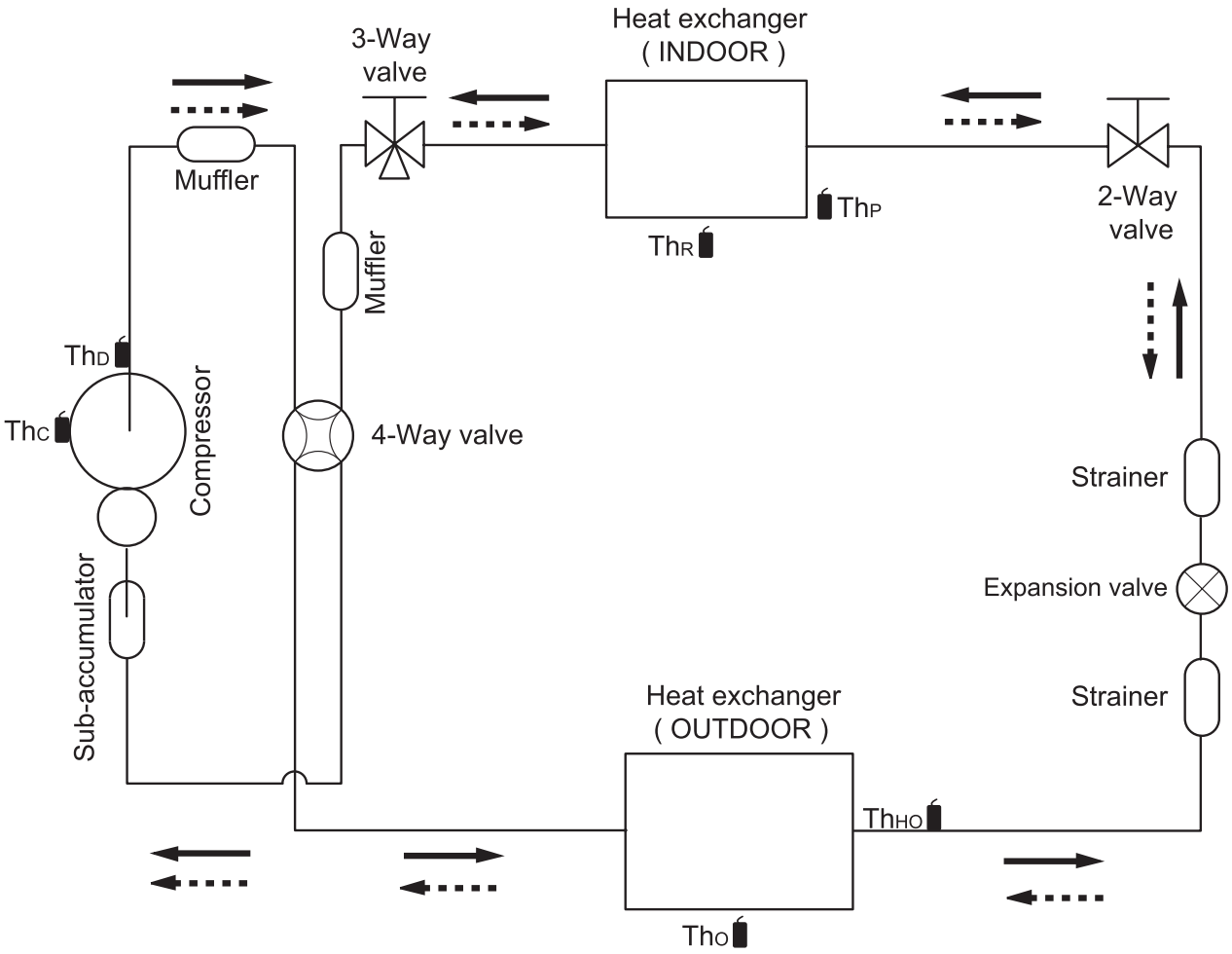
ThHO: Thermistor (Heat exchanger out temperature)

ThPI : Thermistor (Pipe temperature)

ThR : Thermistor (Room temperature)

TECHNICAL DATA AND PARTS LIST

6-3. Model: AOUH24KNAS1



Cooling

Heating

ThC : Thermistor (Compressor temperature)

ThD : Thermistor (Discharge temperature)

ThO : Thermistor (Outdoor temperature)

ThHO : Thermistor (Heat exchanger out temperature)

ThP : Thermistor (Pipe temperature)

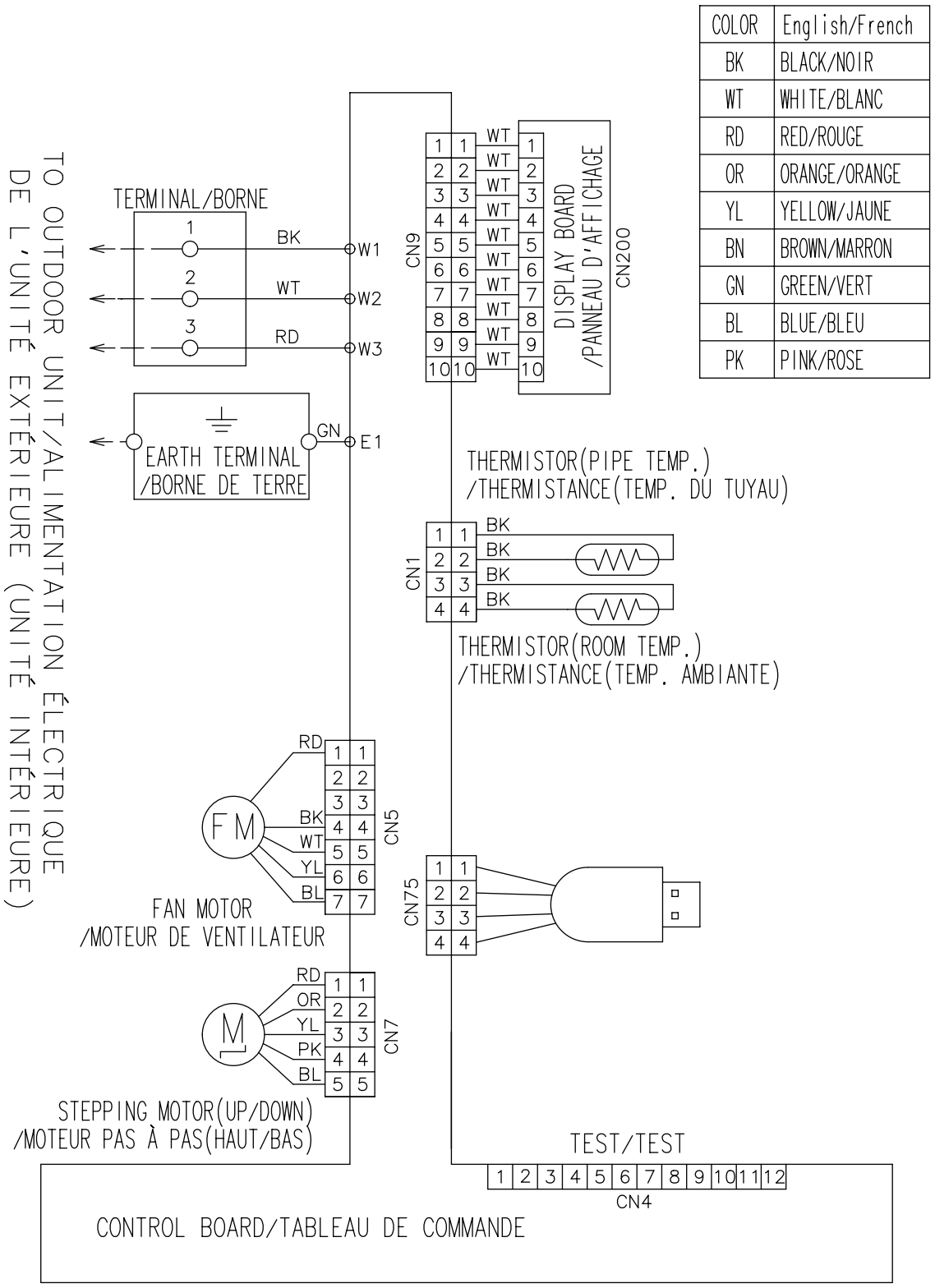
ThR : Thermistor (Room temperature)

7. Wiring diagrams

7-1. Indoor unit

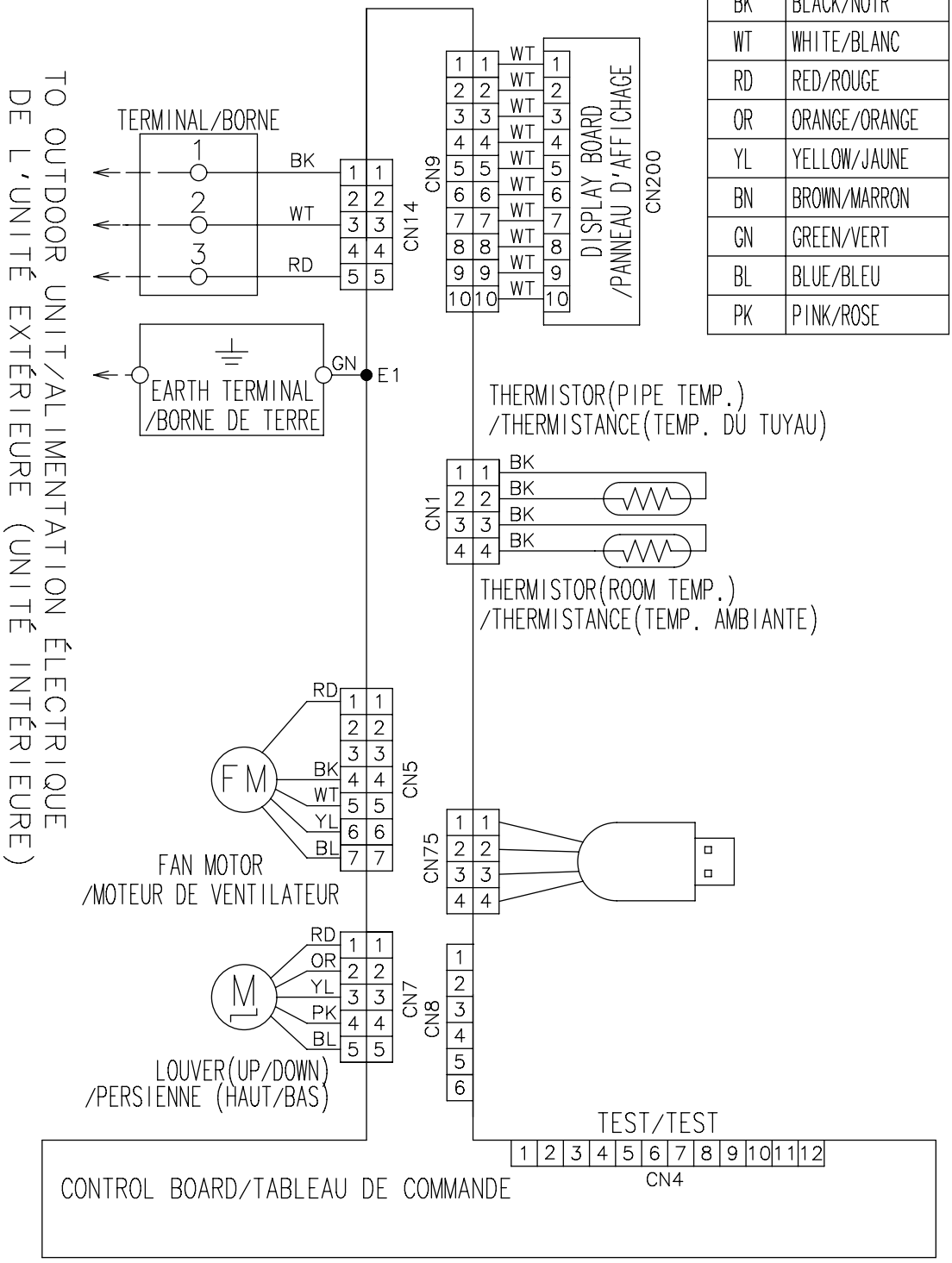
■ Models: ASUH09KNAS and ASUH12KNAS

COLOR	English/French
BK	BLACK/NOIR
WT	WHITE/BLANC
RD	RED/ROUGE
OR	ORANGE/ORANGE
YL	YELLOW/JAUNE
BN	BROWN/MARRON
GN	GREEN/VERT
BL	BLUE/BLEU
PK	PINK/ROSE



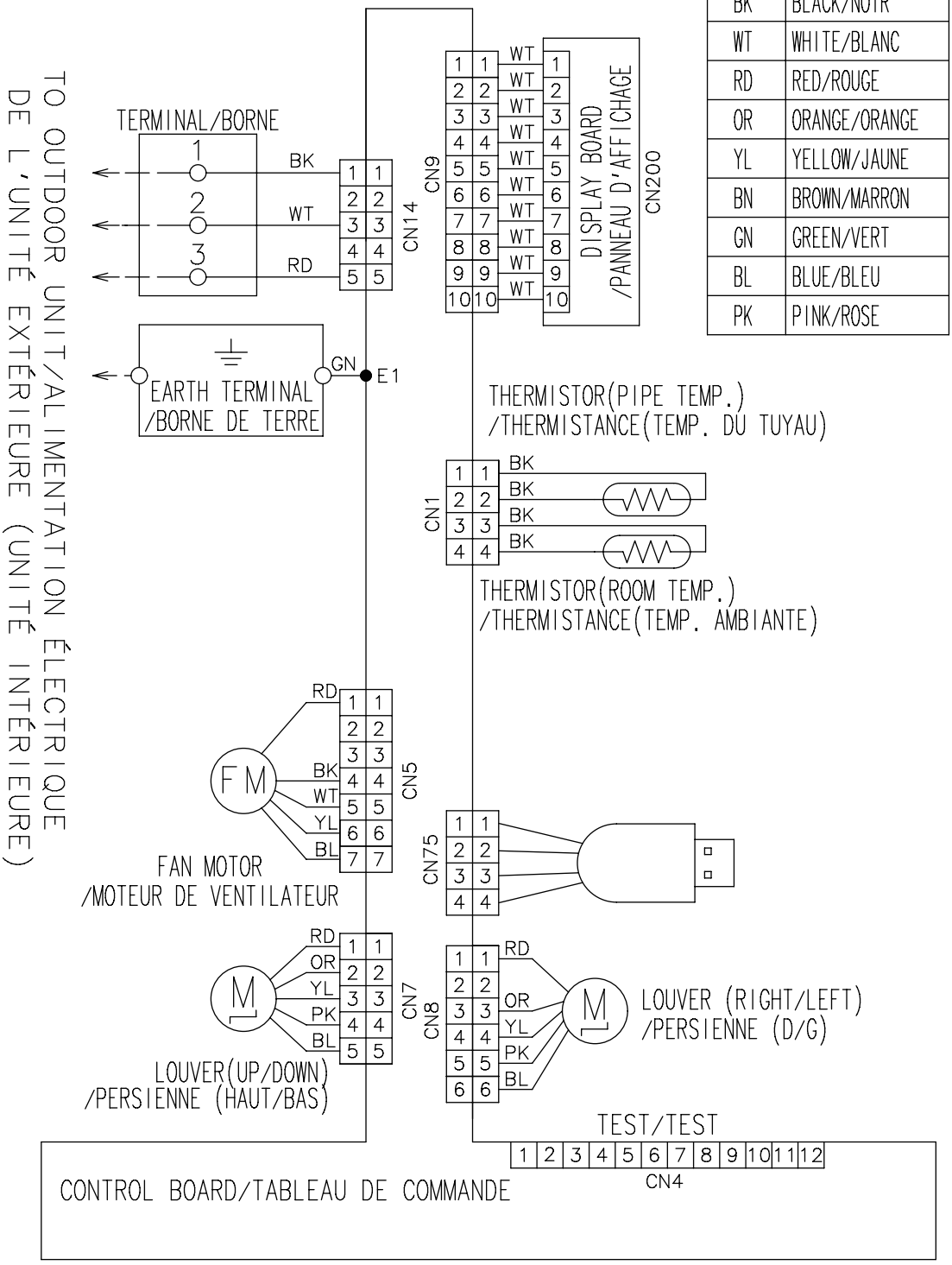
■ Model: ASUH18KNAS

COLOR	English/French
BK	BLACK/NOIR
WT	WHITE/BLANC
RD	RED/ROUGE
OR	ORANGE/ORANGE
YL	YELLOW/JAUNE
BN	BROWN/MARRON
GN	GREEN/VERT
BL	BLUE/BLEU
PK	PINK/ROSE



■ Model: ASUH24KNAS

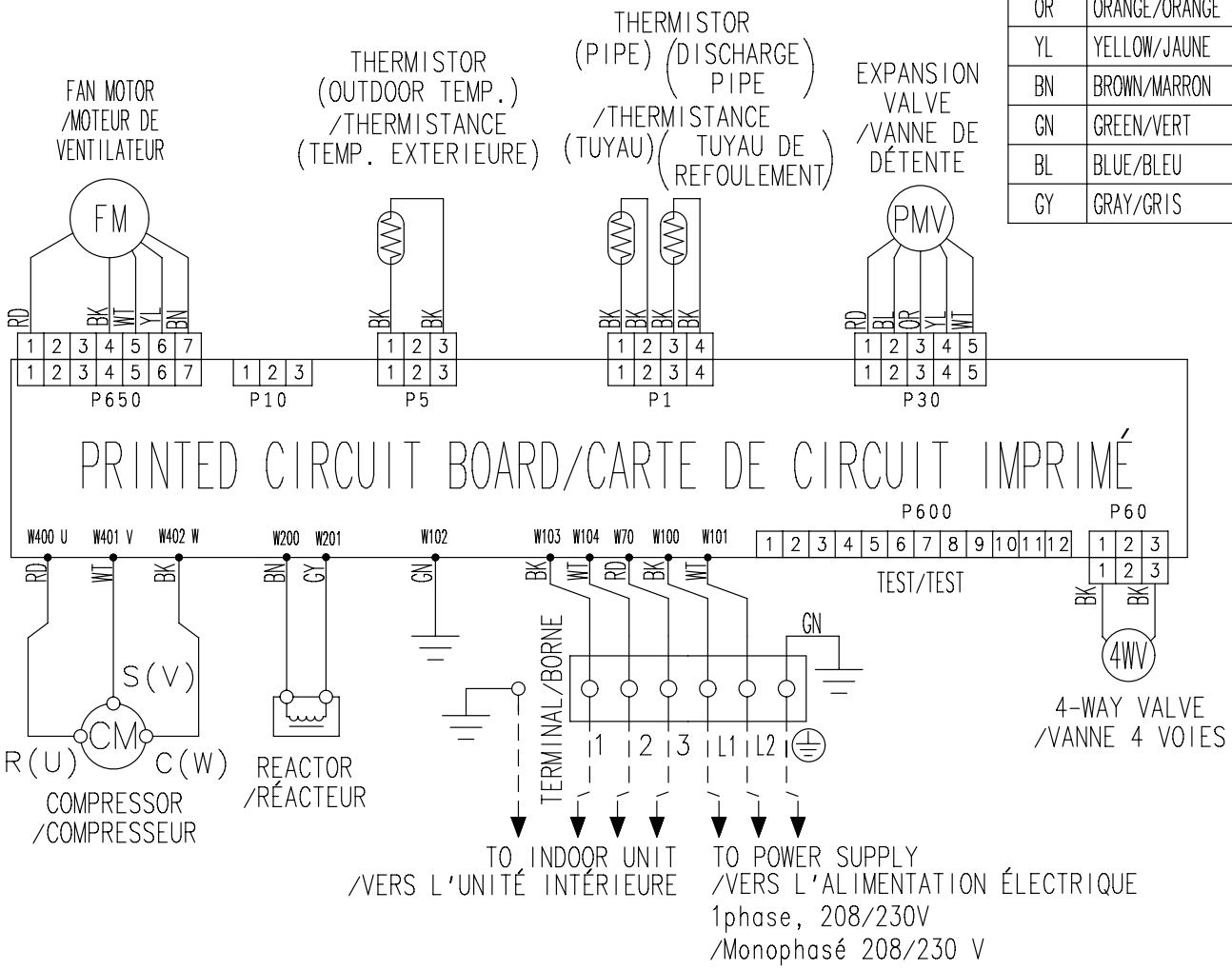
COLOR	English/French
BK	BLACK/NOIR
WT	WHITE/BLANC
RD	RED/ROUGE
OR	ORANGE/ORANGE
YL	YELLOW/JAUNE
BN	BROWN/MARRON
GN	GREEN/VERT
BL	BLUE/BLEU
PK	PINK/ROSE



7-2. Outdoor unit

■ Models: AOUH09KNAS1 and AOUH12KNAS1

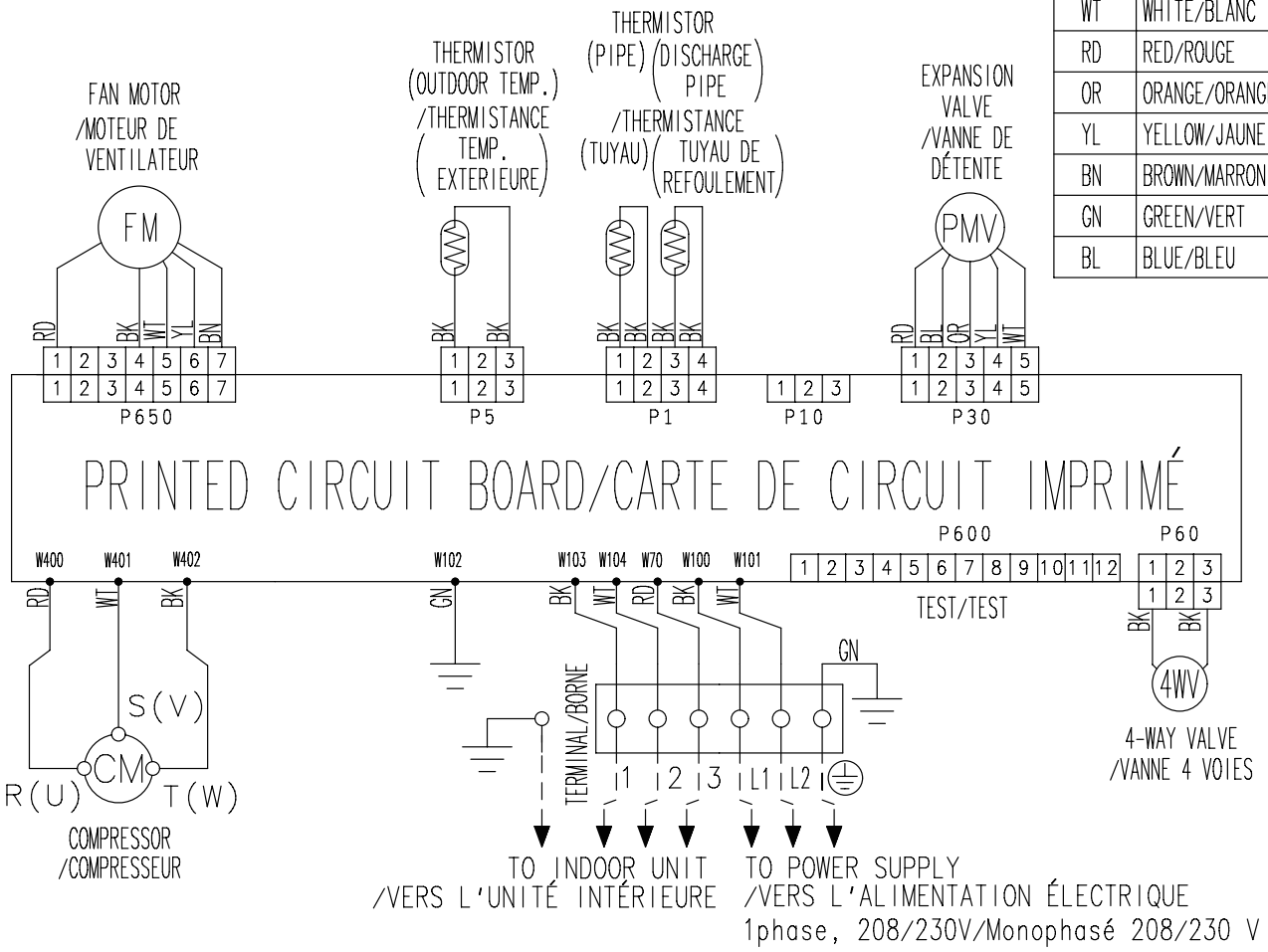
COLOR	English/French
BK	BLACK/NOIR
WT	WHITE/BLANC
RD	RED/ROUGE
OR	ORANGE/ORANGE
YL	YELLOW/JAUNE
BN	BROWN/MARRON
GN	GREEN/VERT
BL	BLUE/BLEU
GY	GRAY/GRIS



■ Model: AOUH18KNAS1

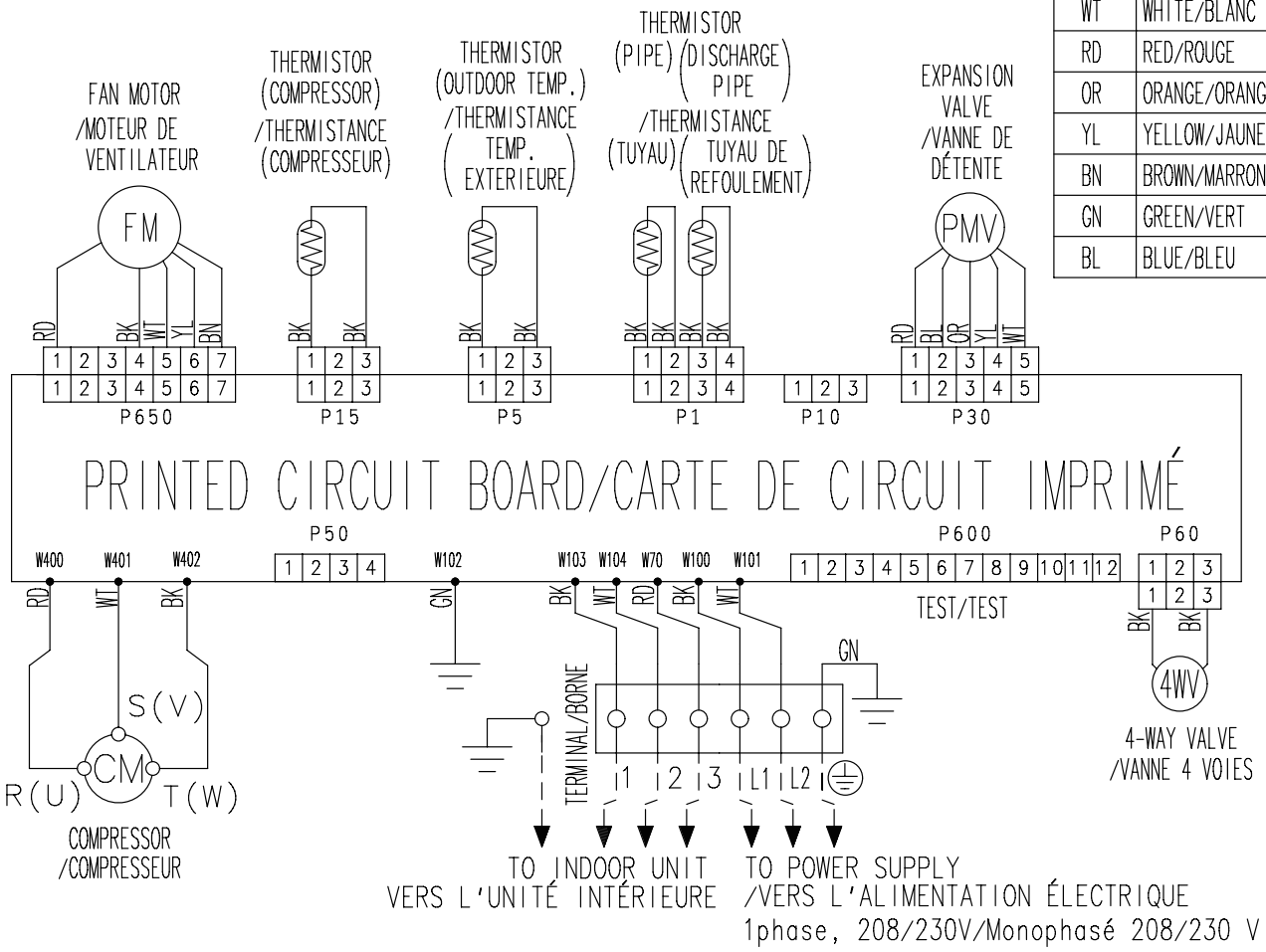
TECHNICAL DATA AND PARTS LIST

COLOR	English/French
BK	BLACK/NOIR
WT	WHITE/BLANC
RD	RED/ROUGE
OR	ORANGE/ORANGE
YL	YELLOW/JAUNE
BN	BROWN/MARRON
GN	GREEN/VERT
BL	BLUE/BLEU



■ Model: AOUH24KNAS1

COLOR	English/French
BK	BLACK/NOIR
WT	WHITE/BLANC
RD	RED/ROUGE
OR	ORANGE/ORANGE
YL	YELLOW/JAUNE
BN	BROWN/MARRON
GN	GREEN/VERT
BL	BLUE/BLEU

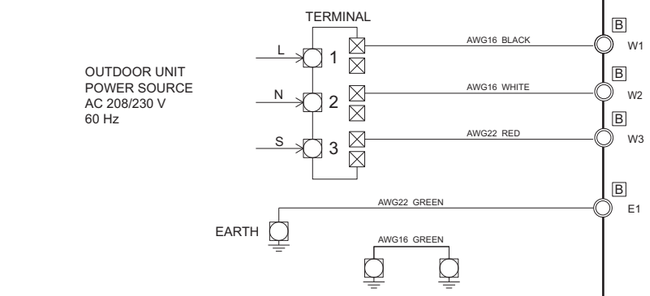


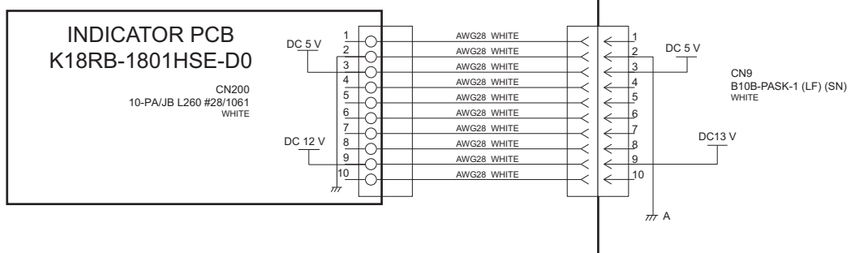
8. PC board diagrams

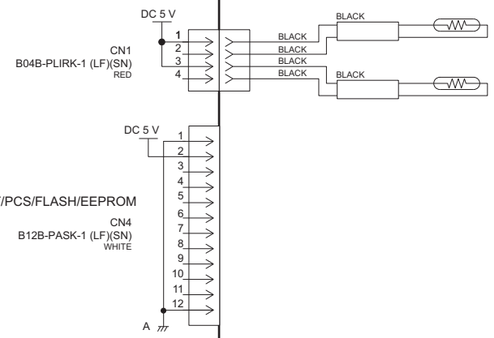
8-1. Models: ASUH09KNAS and ASUH12KNAS

CONTROL UNIT
ASVH09: EZ-0249HSE
ASVH12: EZ-024AHSE
ASUH09: EZ-0251HSE
ASUH12: EZ-0252HSE

MAIN PCB
ASVH09: K23AL-2400HSE-C1
ASVH12: K23AL-2401HSE-C1
ASUH09: K23AL-240BHSE-C1
ASUH12: K23AL-240CHSE-C1





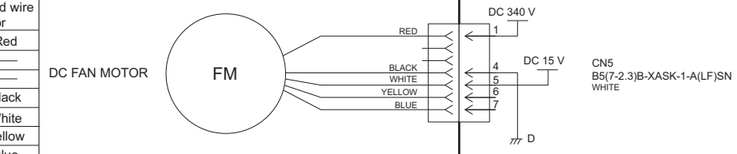


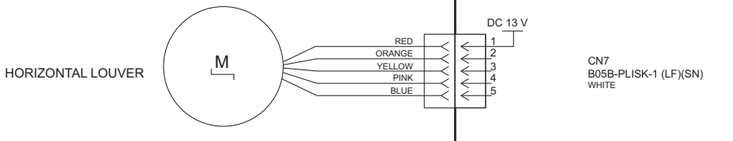
Thermistor Characteristics

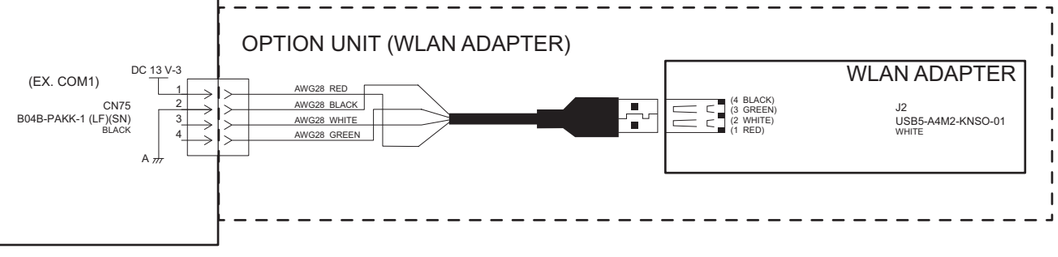
Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Pipe temp.)	176.03 kΩ 1.10 V	62.91 kΩ 2.21 V	39.57 kΩ 2.79 V
Thermistor (Room temp.)	33.62 kΩ 1.15 V	12.54 kΩ 2.22 V	8.04 kΩ 2.77 V

CN5 DC Fan motor

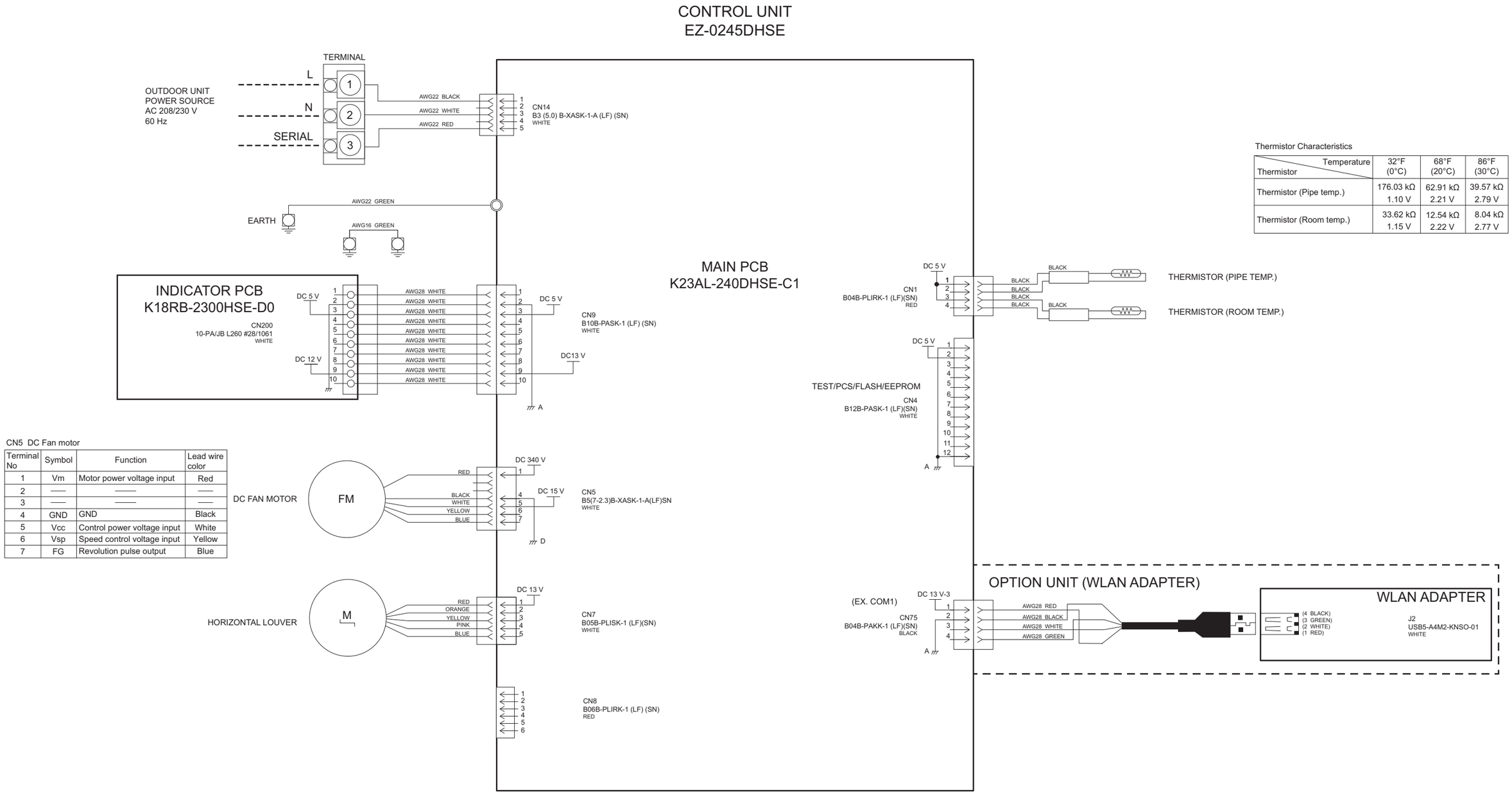
Terminal No	Symbol	Function	Lead wire color
1	Vm	Motor power voltage input	Red
2	——	——	——
3	——	——	——
4	GND	GND	Black
5	Vcc	Control power voltage input	White
6	Vsp	Speed control voltage input	Yellow
7	FG	Revolution pulse output	Blue







8-2. Model: ASUH18KNAS



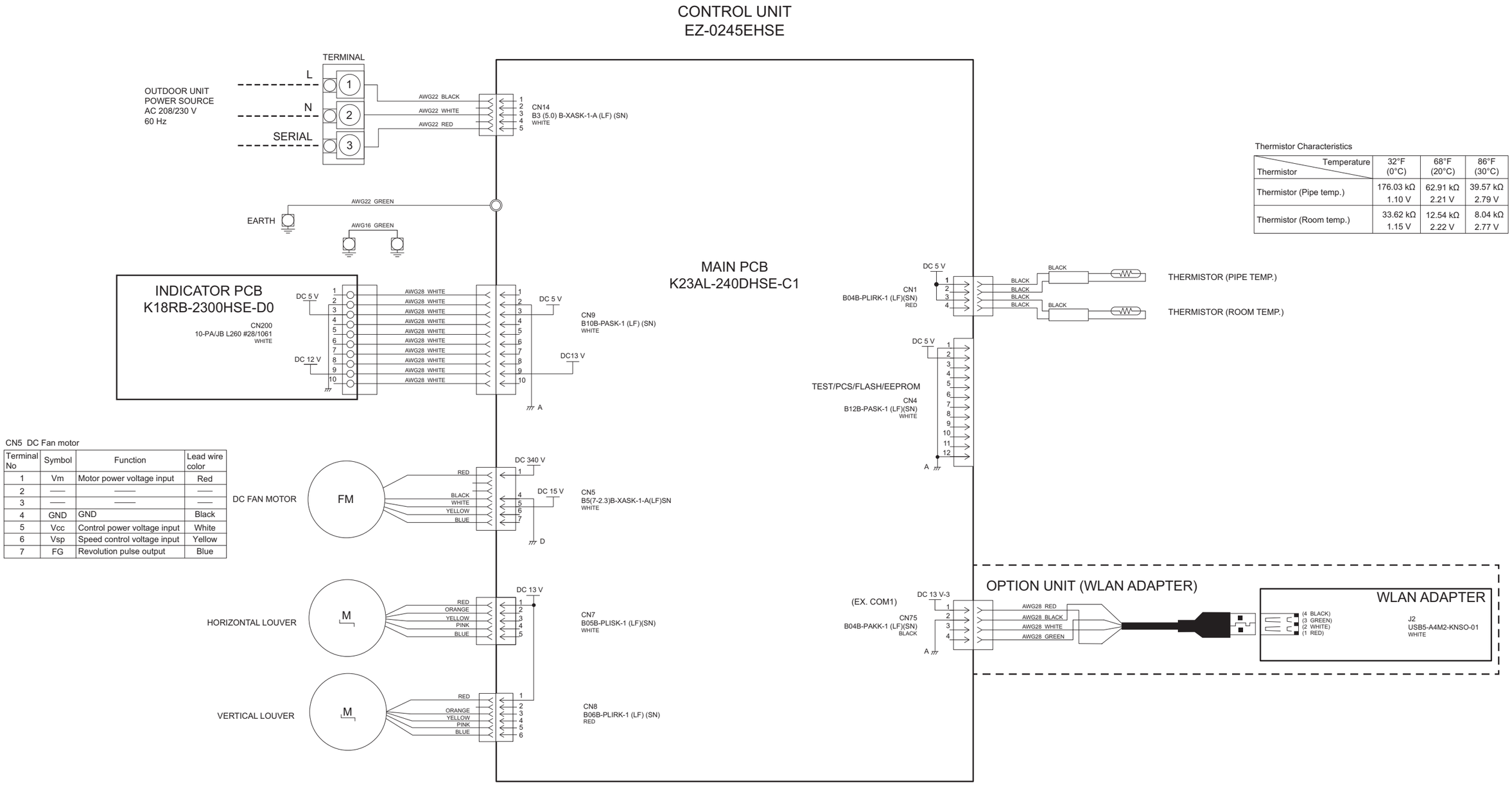
Terminal No	Symbol	Function	Lead wire color
1	Vm	Motor power voltage input	Red
2	——	——	——
3	——	——	——
4	GND	GND	Black
5	Vcc	Control power voltage input	White
6	Vsp	Speed control voltage input	Yellow
7	FG	Revolution pulse output	Blue

Thermistor Characteristics

Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Pipe temp.)	176.03 kΩ 1.10 V	62.91 kΩ 2.21 V	39.57 kΩ 2.79 V
Thermistor (Room temp.)	33.62 kΩ 1.15 V	12.54 kΩ 2.22 V	8.04 kΩ 2.77 V

8-3. Model: ASUH24KNAS

TECHNICAL DATA AND PARTS LIST



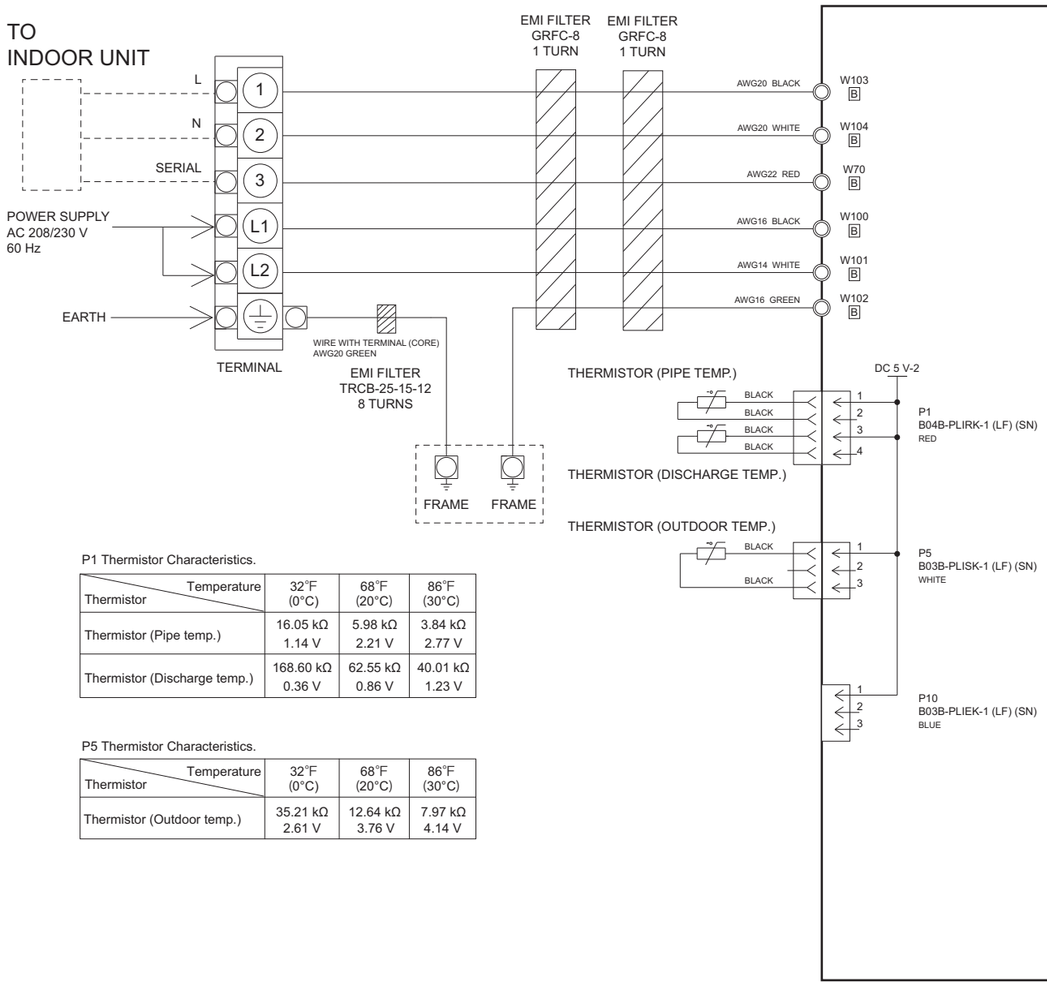
Terminal No	Symbol	Function	Lead wire color
1	Vm	Motor power voltage input	Red
2	——	——	——
3	——	——	——
4	GND	GND	Black
5	Vcc	Control power voltage input	White
6	Vsp	Speed control voltage input	Yellow
7	FG	Revolution pulse output	Blue

Thermistor Characteristics

Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Pipe temp.)	176.03 kΩ 1.10 V	62.91 kΩ 2.21 V	39.57 kΩ 2.79 V
Thermistor (Room temp.)	33.62 kΩ 1.15 V	12.54 kΩ 2.22 V	8.04 kΩ 2.77 V

8-4. Models: AOUH09KNAS1 and AOUH12KNAS1

CONTROL UNIT
KPTA: EZ-024BHUE
KLTA: EZ-0257HUE

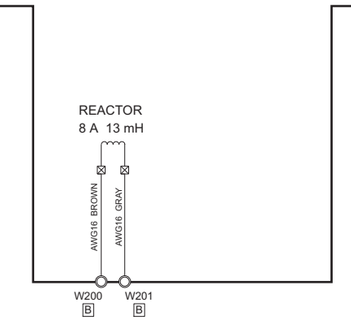


P1 Thermistor Characteristics.

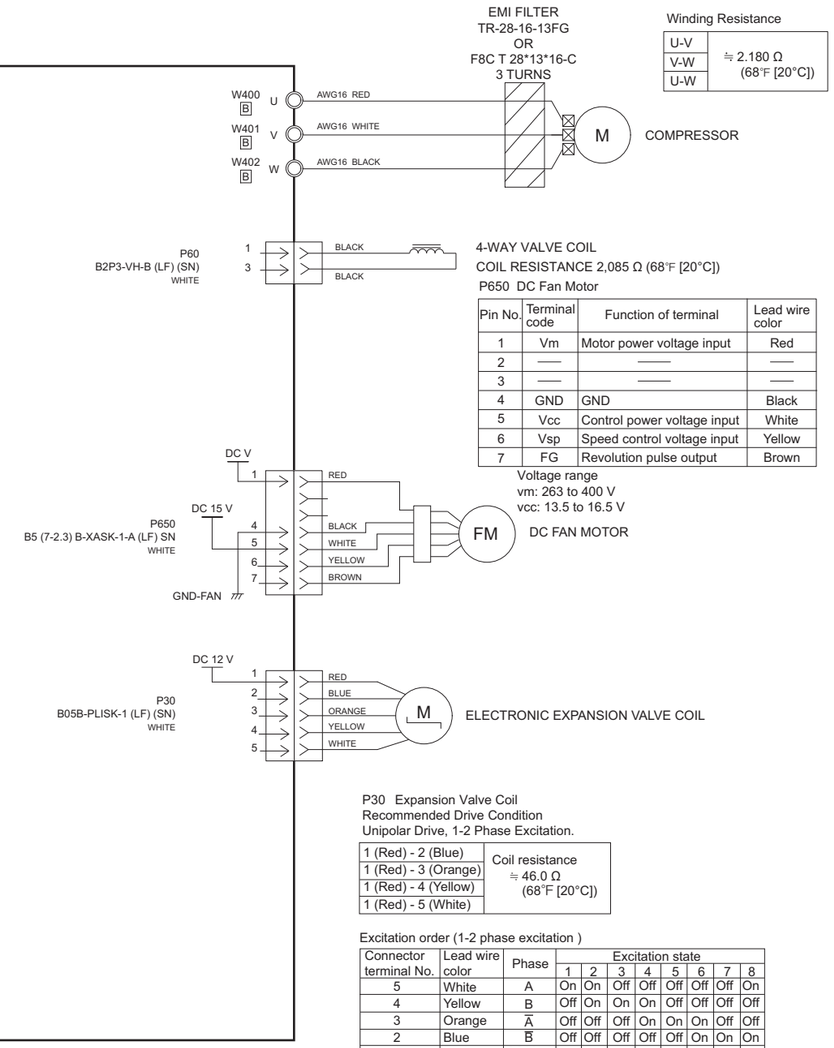
Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Pipe temp.)	16.05 kΩ 1.14 V	5.98 kΩ 2.21 V	3.84 kΩ 2.77 V
Thermistor (Discharge temp.)	168.60 kΩ 0.36 V	62.55 kΩ 0.86 V	40.01 kΩ 1.23 V

P5 Thermistor Characteristics.

Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Outdoor temp.)	35.21 kΩ 2.61 V	12.64 kΩ 3.76 V	7.97 kΩ 4.14 V



MAIN PCB
09model: H09KPTA(U)-A01-00-SV
12model: H12KPTA(V)-A01-00-SV
09model: H09KLTA(V)-A01-00-SV
12model: H12KLTA(V)-A01-00-SV



Winding Resistance

U-V V-W U-W	≒ 2.180 Ω (68°F [20°C])

4-WAY VALVE COIL
COIL RESISTANCE 2,085 Ω (68°F [20°C])

P650 DC Fan Motor

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

Voltage range
vm: 263 to 400 V
vcc: 13.5 to 16.5 V

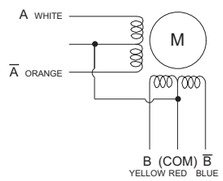
P30 Expansion Valve Coil
Recommended Drive Condition
Unipolar Drive, 1-2 Phase Excitation.

1 (Red) - 2 (Blue) 1 (Red) - 3 (Orange) 1 (Red) - 4 (Yellow) 1 (Red) - 5 (White)	Coil resistance ≒ 46.0 Ω (68°F [20°C])

Excitation order (1-2 phase excitation)

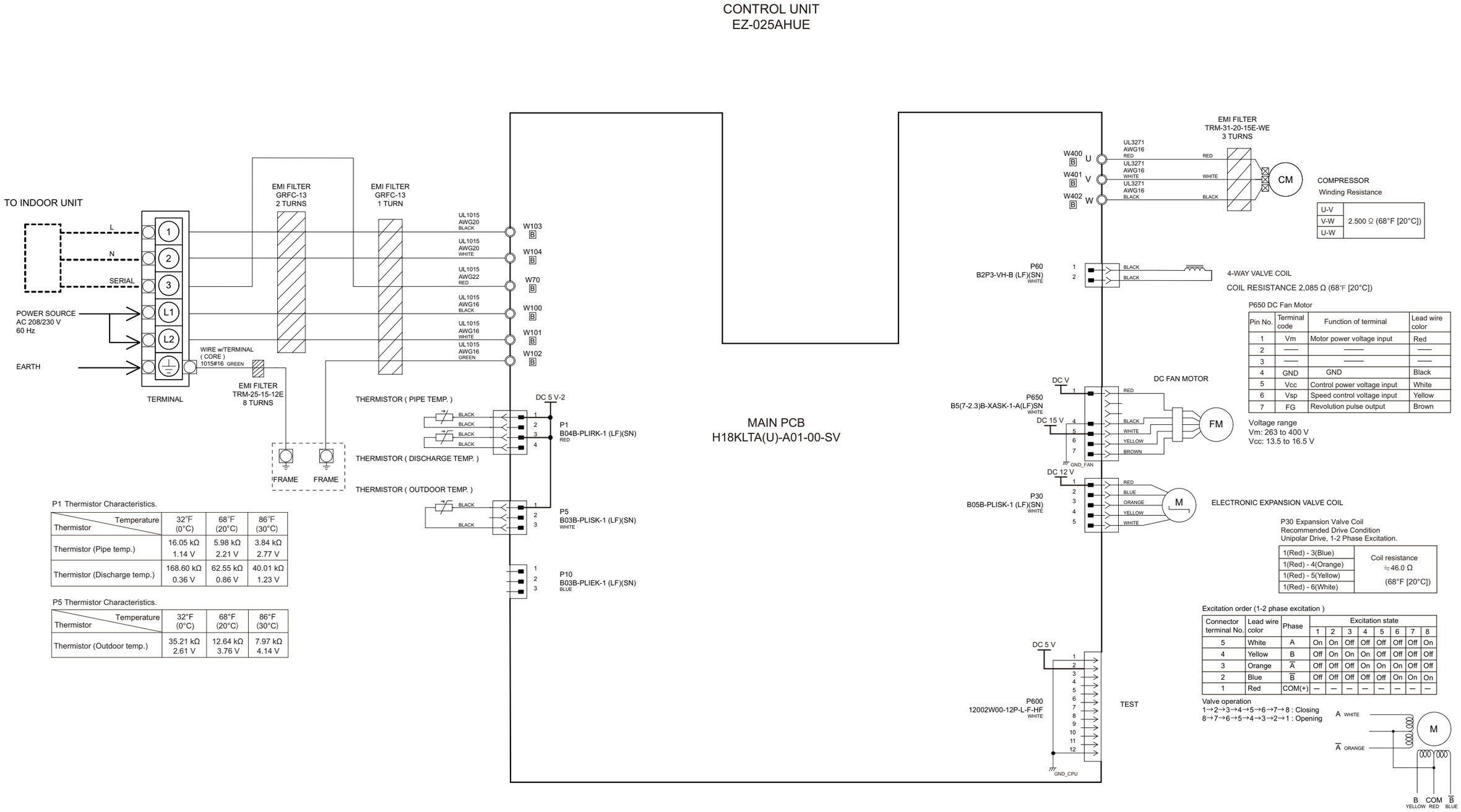
Connector terminal No.	Lead wire color	Phase	Excitation state							
			1	2	3	4	5	6	7	8
5	White	A	On	On	Off	Off	Off	Off	Off	On
4	Yellow	B	Off	On	On	On	Off	Off	Off	Off
3	Orange	$\overline{A}$	Off	Off	Off	On	On	On	Off	Off
2	Blue	$\overline{B}$	Off	Off	Off	Off	Off	On	On	On
1	Red	COM(+)	—	—	—	—	—	—	—	—

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



8-5. Model: AOUH18KNAS1

TECHNICAL DATA AND PARTS LIST



P1 Thermistor Characteristics.

Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Pipe temp.)	16.05 kΩ 1.14 V	5.98 kΩ 2.21 V	3.84 kΩ 2.77 V
Thermistor (Discharge temp.)	168.60 kΩ 0.36 V	62.55 kΩ 0.86 V	40.01 kΩ 1.23 V

P5 Thermistor Characteristics.

Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Outdoor temp.)	35.21 kΩ 2.61 V	12.64 kΩ 3.76 V	7.97 kΩ 4.14 V

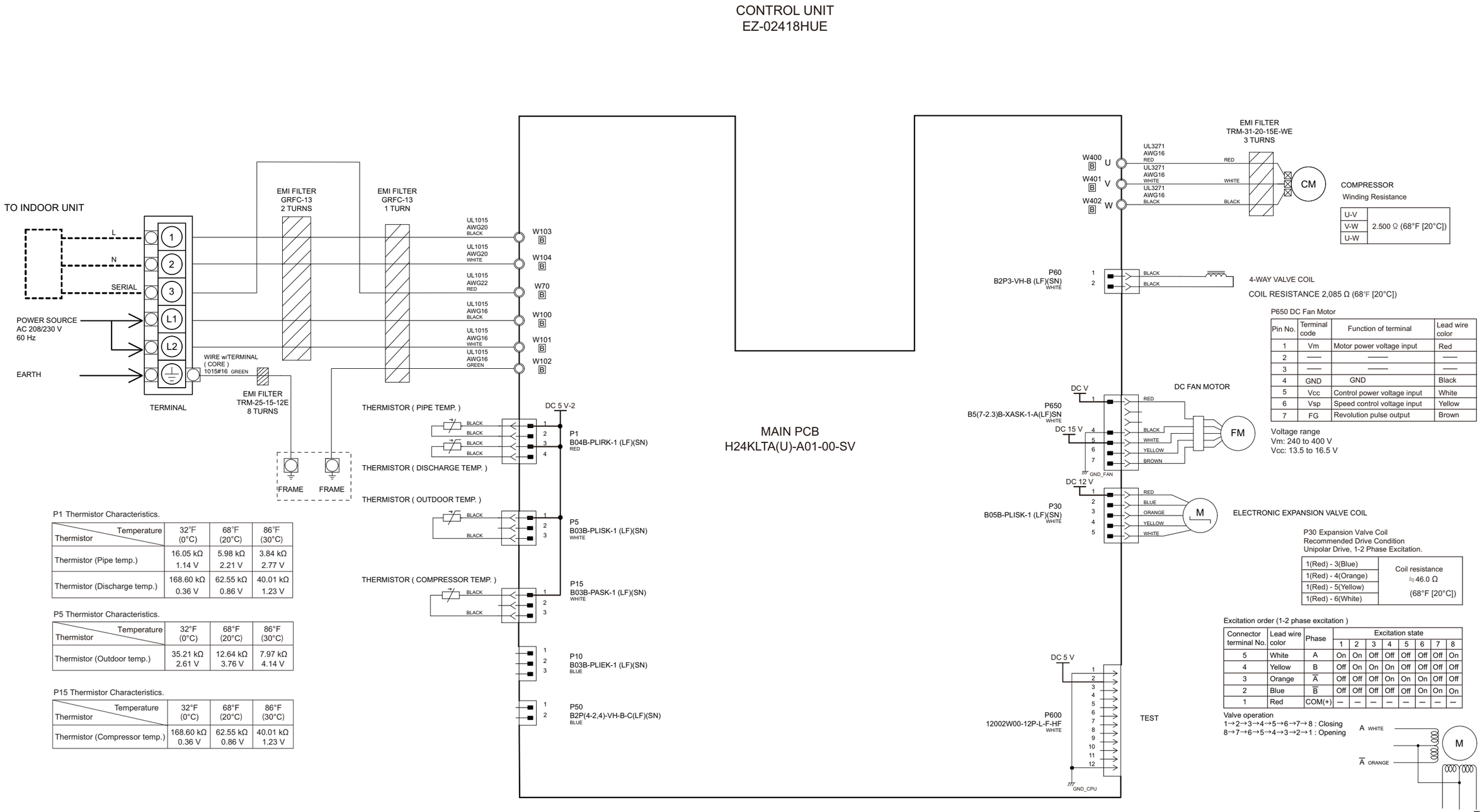
P650 DC Fan Motor

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

Excitation order (1-2 phase excitation)

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

8-6. Model: AOUH24KNAS1



P650 DC Fan Motor

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

Voltage range
Vm: 240 to 400 V
Vcc: 13.5 to 16.5 V

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

1(Red) - 3(Blue)	Coil resistance ≒46.0 Ω (68°F [20°C])
1(Red) - 4(Orange)	
1(Red) - 5(Yellow)	
1(Red) - 6(White)	

Excitation order (1-2 phase excitation)

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

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

P1 Thermistor Characteristics.

Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Pipe temp.)	16.05 kΩ 1.14 V	5.98 kΩ 2.21 V	3.84 kΩ 2.77 V
Thermistor (Discharge temp.)	168.60 kΩ 0.36 V	62.55 kΩ 0.86 V	40.01 kΩ 1.23 V

P5 Thermistor Characteristics.

Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Outdoor temp.)	35.21 kΩ 2.61 V	12.64 kΩ 3.76 V	7.97 kΩ 4.14 V

P15 Thermistor Characteristics.

Thermistor \ Temperature	32°F (0°C)	68°F (20°C)	86°F (30°C)
Thermistor (Compressor temp.)	168.60 kΩ 0.36 V	62.55 kΩ 0.86 V	40.01 kΩ 1.23 V

TECHNICAL DATA
AND PARTS LIST

REFRIGERANT R32
INVERTER

3. TROUBLESHOOTING

CONTENTS

3. TROUBLESHOOTING

TROUBLESHOOTING

1. Error code

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

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

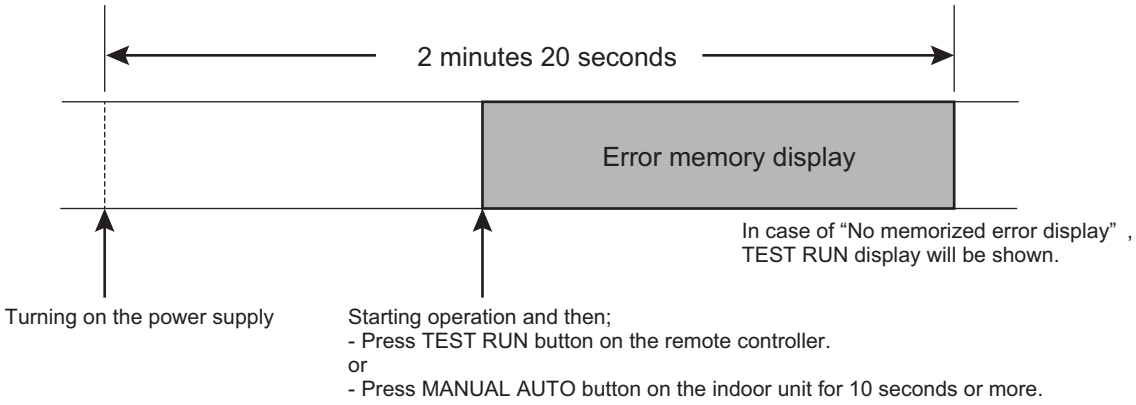
Errors, once displayed, will be automatically stored in the PC board of the indoor unit. Even if the power is disconnected, the memory containing the error history will not be erased.

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

1-1. How to check the error memory

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

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



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

1-2. How to erase the error memory

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

- Manual erase: Pressing the MANUAL AUTO button on the indoor unit while the “Error memory display” is being shown. (Short beep emits for about 3 seconds.)

- Automatic erase: After continuing the normal operation of the air conditioner without error for 2 hours or longer after displaying the error memory as described in How to check the error memory. (Except FAN operation mode.)

1-3. Error codes and indicators

When the system detects an error, the indicator lamps on the indoor unit, outdoor unit, or IR Receiver Unit flash in a specific pattern to indicate the type of the error. If there is a remote controller connected to the system, it shows the corresponding error code on its display.

● Indoor unit or IR Receiver Unit indicator lamps and displayed code on the Wired Remote Controller (if connected)

The operation, timer, and economy indicator lamps inform you of the error with the associated blinking pattern.

The blinks described in a number in the following table are on for 0.5 seconds and off for 0.5 seconds. Fast blinks repeat blinks 0.1 seconds on and 0.1 seconds off.

Error	Number or speed or blinks of the indicator lamp			Error code
	Operation	Timer	Economy	
	Green	Orange	Green	
E: 11.X. Serial communication error (Serial reverse transfer error)	1	1	Fast blinks	11
E: 11.X. Serial communication error (Serial forward transfer error)	1	1	Fast blinks	11
E: 15.X. Automatic airflow adjustment error	1	5	Fast blinks	15
E: 18.X. External communication error	1	8	Fast blinks	18
E: 22.X. Indoor unit capacity error	2	2	Fast blinks	22
E: 23.X. Refrigerant combination error	2	3	Fast blinks	23
E: 29.X. Connected unit number error	2	9	Fast blinks	29
E: 32.X. Indoor unit Main PCB error	3	2	Fast blinks	32
E: 33.X. Indoor unit motor electricity consumption detection error	3	3	Fast blinks	33
E: 35.X. MANUAL AUTO button error	3	5	Fast blinks	35
E: 39.X. Power supply error of indoor unit fan motor	3	9	Fast blinks	39
E: 3A.X. Indoor unit communication circuit error	3	10	Fast blinks	3A
E: 41 / 42.X. Indoor unit thermistor error	4	1	Fast blinks	41
E: 41 / 42.X. Indoor unit thermistor error	4	2	Fast blinks	42
E: 51.X. Indoor unit fan motor error	5	1	Fast blinks	51
E: 62.X. Outdoor unit Main PCB communication error	6	2	Fast blinks	62
E: 63.X. Inverter error	6	3	Fast blinks	63
E: 64.X. PFC circuit error	6	4	Fast blinks	64
E: 65.X. IPM error	6	5	Fast blinks	65

TROUBLESHOOTING

Error	Number or speed or blinks of the indicator lamp			Error code
	Operation	Timer	Economy	
	Green	Orange	Green	
E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error	7	1	Fast blinks	71
E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error	7	2	Fast blinks	72
E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error	7	3	Fast blinks	73
E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error	7	4	Fast blinks	74
E: 84.X. Current sensor error	8	4	Fast blinks	84
E: 94.X. Trip detection	9	4	Fast blinks	94
E: 95.X. Compressor motor control error	9	5	Fast blinks	95
E: 97 / 98.X. Outdoor unit fan motor error	9	7	Fast blinks	97
E: 99.X. 4-way valve error	9	9	Fast blinks	99
E: A1.X. Discharge temperature error	10	1	Fast blinks	A1
E: A3.X. Compressor temperature error	10	3	Fast blinks	A3

TROUBLESHOOTING

● Outdoor unit indicator lamps and displayed code

The ERROR indicator lamp blinks at a high speed when an error occurs. To enter the error display mode to check the individual error, press the ENTER button once.

Then, the ERROR indicator lamp lights on, and other indicator lamps inform you of the operation status and the error with the associated blinking pattern.

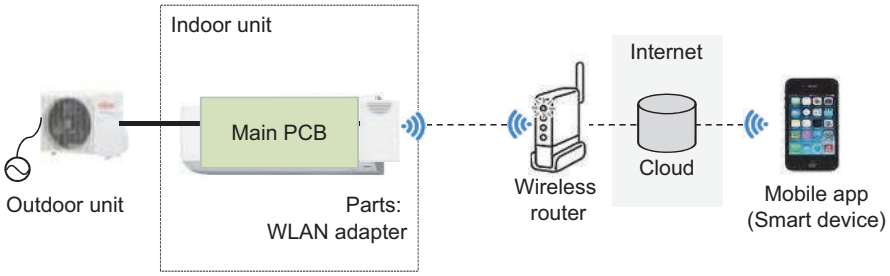
Error	Lighting on/off or number of blinks								Error code
	POWER MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT			
	Green	Red	L1 Orange	L2 Orange	L3 Orange	L4 Orange	L5 Orange	L6 Orange	
E: 11.X. Serial communication error (Serial reverse transfer error)	2	On	5	15	Off	Off	Off	On	11
E: 11.X. Serial communication error (Serial forward transfer error) (Occurs immediately after starting operation)	2	On	1	1	Off	Off	On	On	11
E: 11.X. Serial communication error (Serial forward transfer error) (Occurs during operation)	2	On	1	1	Off	On	Off	Off	11
E: 15.X. Automatic airflow adjustment error	2	On	5	15	Off	Off	Off	On	15
E: 18.X. External communication error	2	On	5	15	Off	Off	Off	On	18
E: 22.X. Indoor unit capacity error	2	On	2	2	Off	Off	Off	On	22
E: 23.X. Refrigerant combination error	2	On	2	3	Off	Off	Off	On	23
E: 29.X. Connected unit number error	2	On	5	15	Off	Off	Off	On	29
E: 32.X. Indoor unit Main PCB error	2	On	5	15	Off	Off	Off	On	32
E: 33.X. Indoor unit motor electricity consumption detection error	2	On	5	15	Off	Off	Off	On	33
E: 35.X. MANUAL AUTO button error	2	On	5	15	Off	Off	Off	On	35
E: 39.X. Power supply error of indoor unit fan motor	2	On	5	15	Off	Off	Off	On	39
E: 3A.X. Indoor unit communication circuit error	2	On	5	15	Off	Off	Off	On	3A
E: 41 / 42.X. Indoor unit thermistor error	2	On	5	15	Off	Off	Off	On	41
E: 41 / 42.X. Indoor unit thermistor error	2	On	5	15	Off	Off	Off	On	42
E: 51.X. Indoor unit fan motor error	2	On	5	15	Off	Off	Off	On	51
E: 62.X. Outdoor unit Main PCB communication error	2	On	6	2	Off	Off	Off	On	62
E: 63.X. Inverter error	2	On	6	3	Off	Off	Off	On	63

Error	Lighting on/off or number of blinks								Error code
	POWER / MODE	ERROR	PUMP DOWN	LOW NOISE		PEAK CUT			
	Green	Red	L1 Orange	L2 Orange	L3 Orange	L4 Orange	L5 Orange	L6 Orange	
E: 65.X. IPM error	2	On	6	5	Off	Off	Off / On	On	65
E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error	2	On	7	1	Off	Off	Off	On	71
E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error	2	On	7	2	Off	Off	Off	On	72
E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error	2	On	7	3	Off	Off	On	Off / On	73
E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error	2	On	7	4	Off	Off	Off	On	74
E: 84.X. Current sensor error	2	On	8	4	Off	Off	Off	On	84
E: 94.X. Trip detection	2	On	9	4	Off	Off	Off	On	94
E: 95.X. Compressor motor control error	2	On	9	5	Off	Off	Off	On	95
E: 97 / 98.X. Outdoor unit fan motor error	2	On	9	7	Off	Off	On	Off	97
E: 99.X. 4-way valve error	2	On	9	9	Off	Off	Off	On	99
E: A1.X. Discharge temperature error	2	On	10	1	Off	Off	Off	On	A1
E: A3.X. Compressor temperature error	2	On	10	3	Off	Off	Off	On	A3

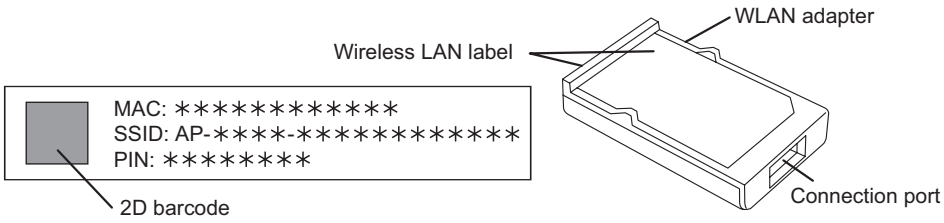
1-4. Error code table (Wireless LAN indicator)

TROUBLESHOOTING

- Wireless LAN control system diagram example



- Name of parts



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

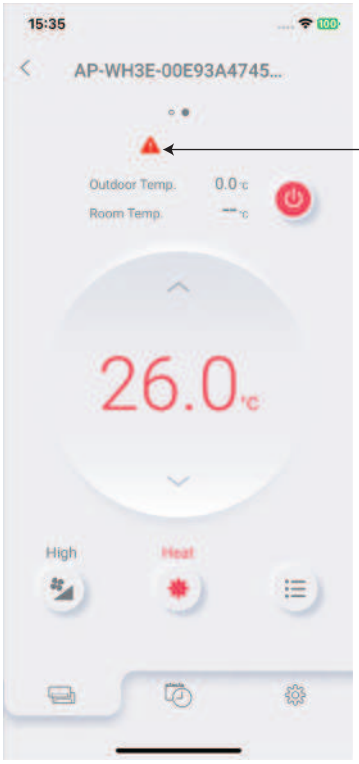
Error contents	Wireless LAN indicator lamp (orange)	Error code
E: 18.X. External communication error between indoor unit and wireless LAN adapter	Flashing slowly	18
Network communication error between wireless LAN router and wireless LAN adapter	Flashing slowly	No error
E: 18.X. Communication error	Flashing slowly	18
E: 18.X. Wireless LAN adapter non-energized	Off	18

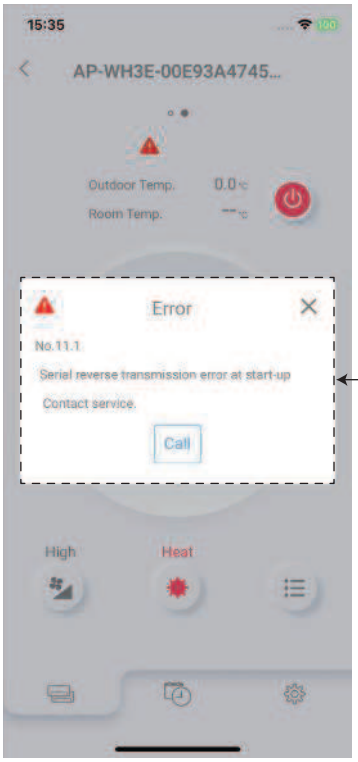
Flashing slowly: Repeating 7 seconds on/2 seconds off

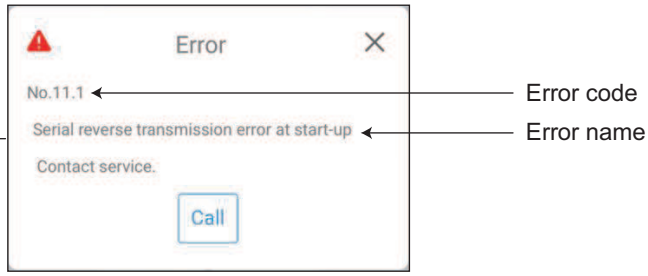
1-5. How to check the error code on Mobile app

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

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







TROUBLESHOOTING

1-6. Error code table (Mobile app)

Error code	Error message	Error contents
11.1	Serial reverse transmission error at start-up	E: 11.X. Serial communication error (Serial reverse transfer error)
11.2	Serial reverse transmission error during operation	
11.3	Serial forward transmission error at start-up	E: 11.X. Serial communication error (Serial forward transfer error)
11.4	Serial forward transmission error during operation	
15.1	Scan error of initial setting data	E: 15.X. Automatic airflow adjustment error
15.2	Number of indoor units excessive (400 exceeded)	
15.3	Number of outdoor units excessive (100 exceeded)	
15.4	Configuration data acquisition error during scan	
15.5	Scan setting range error	
15.6	Check run unfinished	
18.1	External communication 1 error	E: 18.X. External communication error
22.1	Indoor unit capacity error	E: 22.X. Indoor unit capacity error
23.1	Connection forbidden (series error)	E: 23.X. Refrigerant combination error
23.2	Unit combination error	
29.1	Connection unit number error (indoor unit in wired remote controller system)	E: 29.X. Connected unit number error
29.2	Connection unit number error (Remote controller)	
32.1	Indoor unit PCB model information error	E: 32.X. Indoor unit Main PCB error
32.2	Microcomputers communication error	
32.3	Indoor unit EEPROM access error	
32.4	Indoor unit main PCB EEPROM erase error	
32.5	Watchdog operation (indoor unit)	
32.6	Constant correction control error	
32.7	Indoor unit microcomputer self-check error	
33.1	Indoor unit display microcomputers error	E: 33.X. Indoor unit motor electricity consumption detection error
33.2	Indoor unit motor electricity consumption detection microcomputers error	
33.3	Indoor unit actuator extensions microcomputers error	
35.1	Indoor unit manual auto switch error	E: 35.X. MANUAL AUTO button error
39.1	Indoor unit power supply error for fan motor 1	E: 39.X. Power supply error of indoor unit fan motor
39.2	Indoor unit power supply error for fan motor 2	
39.3	Indoor unit power supply error of AC24V system	
3A.1	Indoor unit communication circuit (wired remote controller) microcomputers communication error	E: 3A.X. Indoor unit communication circuit error
41.1	Indoor unit suction air temp. thermistor error	E: 41 / 42.X. Indoor unit thermistor error
41.2	Indoor unit discharge air temp. thermistor error	
42.1	Indoor unit heat ex. inlet temp. thermistor error	
42.2	Indoor unit heat ex. middle temp. thermistor error	
42.3	Indoor unit heat ex. outlet temp. thermistor error	
51.1	Indoor unit fan motor 1 lock error	E: 51.X. Indoor unit fan motor error
51.2	Indoor unit fan motor 1 rotation speed error	
51.3	Indoor unit sub fan motor lock error	
51.4	Indoor unit sub fan motor rotation speed error	
51.5	Indoor unit fan motor 1 communication error	
51.6	Indoor unit fan motor 1 self judgment error	
51.7	Indoor unit fan motor 1 model error	

TROUBLESHOOTING

TROUBLESHOOTING

Error code	Error message	Error contents
62.1	Outdoor unit PCB model information error	E: 62.X. Outdoor unit Main PCB communication error
62.2	Outdoor unit PCB microcomputer communication error	
62.3	Outdoor unit EEPROM access error	
62.4	Outdoor unit main PCB EEPROM erase error	
62.5	Watchdog operation (outdoor unit)	
62.6	Outdoor unit inverters communication error	
62.7	PFC communication error	
62.8	Outdoor unit EEPROM data corruption error	
62.9	Outdoor unit microcomputer self-check error	
62.A	Outdoor unit inverters 2 communication error	
63.1	Outdoor unit inverter error	E: 63.X. Inverter error
63.2	Electrolytic capacitor error	
63.3	Outdoor unit inverter 2 error	
64.1	Outdoor unit abnormal voltage error (permanent stop)	E: 64.X. PFC circuit error
64.2	Module error	
64.3	Outdoor unit abnormal voltage error (automatic restore)	
64.4	Outdoor unit over current error (permanent stop)	
64.5	PFC power supply interrupted error	
64.6	Over current protection (restartable)	
64.7	PFC AD detection error	
64.8	Outdoor unit PFC hardware error	
65.1	Temperature abnormal	E: 65.X. IPM error
65.2	Current abnormal	
65.3	Outdoor unit trip terminal L error	
71.1	Outdoor unit discharge temp. thermistor 1 error	E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error
71.2	Outdoor unit discharge temp. thermistor 2 error	
72.1	Outdoor unit compressor temp. thermistor 1 error	
72.2	Outdoor unit compressor temp. thermistor 2 error	
73.1	Outdoor unit heat ex. inlet temp. thermistor error	
73.2	Outdoor unit heat ex. middle temp. thermistor error	
73.3	Outdoor unit heat ex. liquid temp. thermistor error	
73.4	Outdoor unit heat ex. 1 gas temp. thermistor error	
73.5	Outdoor unit heat ex. 1 liquid temp. thermistor error	
73.6	Outdoor unit heat ex. 2 gas temp. thermistor error	
73.7	Outdoor unit heat ex. 2 liquid temp. thermistor error	
74.1	Outside air temp. thermistor error	
76.1	Outdoor unit 2-way valve temp. thermistor error	
76.2	Outdoor unit 3-way valve temp. thermistor error	
77.1	Outdoor unit heat sink temp. thermistor error	
77.2	Outdoor unit PFC heat sink temp. thermistor error	
77.3	Outdoor unit heat sink temp. thermistor 1 error	
84.1	Outdoor unit current sensor 1 error (permanent stop)	E: 84.X. Current sensor error
84.2	Outdoor unit current sensor 1 error (automatic restore)	
84.3	Outdoor unit current sensor 2 error (permanent stop)	
84.4	Outdoor unit current sensor 2 error (automatic restore)	
84.5	U phase current sensor error	
84.6	V phase current sensor error	
94.1	Outdoor unit trip detection	E: 94.X. Trip detection
94.2	Reverse current trip (restore)	
94.3	Outdoor unit trip detection 2	

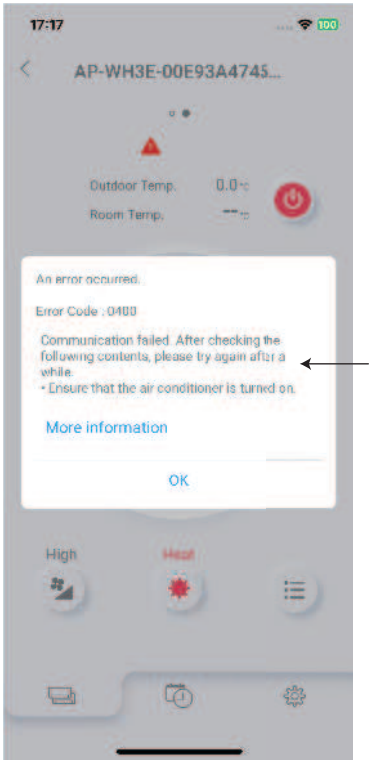
TROUBLESHOOTING

Error code	Error message	Error contents
95.1	Outdoor unit compressor rotor position detection error (permanent stop)	E: 95.X. Compressor motor control error
95.2	Outdoor unit compressor rotor position detection error (automatic restore)	
95.3	Outdoor unit compressor speed error	
95.4	Compressor reverse phase, open phase error	
95.5	Outdoor unit compressor motor loss of synchronization	
95.6	Outdoor unit compressor 2 motor loss of synchronization	
97.1	Outdoor unit fan motor 1 lock error	E: 97 / 98.X. Outdoor unit fan motor error
97.2	Outdoor unit DC fan motor 1 error (permanent stop)	
97.3	Outdoor unit fan motor 1 power source duty error	
97.4	Outdoor unit fan motor 1 under-voltage error	
97.5	Outdoor unit fan motor 1 temperature error (protective action)	
97.6	Rotation speed protected operation	
97.7	Strong wind running protected operation	
97.8	Fan motor HIC temperature sensor error	
97.9	Outdoor unit fan motor 1 driver error	
99.1	Outdoor unit 4-way valve error	E: 99.X. 4-way valve error
99.2	Retry protected operation	
A1.1	Outdoor unit discharge temperature 1 error (permanent stop)	E: A1.X. Discharge temperature error
A1.2	Outdoor unit discharge temperature 1 error (automatic restore)	
A1.3	Discharge temperature 1 release stoppage	
A3.1	Outdoor unit compressor 1 temperature error	E: A3.X. Compressor temperature error
A3.2	Outdoor unit compressor 2 temperature error	

1-7. Error message for wireless LAN control (Mobile app)

■ Error display

If there is an abnormality on the wireless control system, refer to error messages as follows.



Error message

TROUBLESHOOTING

■ Error message list

- **Registration error**

Error code	Error message	Cause Solution
2400	Communication failed. After checking the following contents, please try again after a while. • Ensure that the air conditioner is turned on.	Communication with the air conditioner failed. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the indicator lamp lights and then operate again. If the indicator lamp is still blinking after waiting for a while, check that the wireless router is turned on.
2930	Cannot connect to your air conditioner. Check if the WiFi setting of the mobile device is turned on. When problems are not resolved, there may be other causes. Tap the link below to check other solutions.	Failed because the smartphone could not connect to the air conditioner. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** 1. Check that the 2D barcode is for the air conditioner to be registered. 2. Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. 3. Check that the power plug of the air conditioner main unit is plugged in. 4. Retry the connection step procedure for the air conditioner registration displayed in the application to set the lamp to the blinking state. • **When lighting or blinking** 1. Check that the 2D barcode is for the air conditioner to be registered. 2. Check that the wireless LAN setting of smartphone is set to ON.

TROUBLESHOOTING

TROUBLESHOOTING

Error code	Error message	Cause Solution
2931	WLAN adapter password is wrong. Enter it again. When problems are not resolved, there may be other causes. Tap the link below to check other solutions.	Failed because the smartphone could not connect to the air conditioner.
		Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** 1. Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. 2. Check that the power plug of the air conditioner main unit is plugged in. 3. Retry the connection step procedure for the air conditioner registration displayed in the application to set the lamp to the blinking state. • **When lighting or blinking** 1. Check that the entered SSID and PIN numbers of WLAN Adapter are correct. 2. Check that the wireless LAN setting of smartphone is set to ON.
2932 2933	Failed to connect to wireless router. Check if the WiFi setting of the mobile device is turned on. When problems are not resolved, there may be other causes. Tap the link below to check other solutions.	• Registration failed because the smartphone cannot connect to the network. • Connection to the WLAN Adapter was disconnected during processing.
		1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet.
2934	Wi-Fi router password is wrong. Tap “From the beginning” to enter it again. When problems are not resolved, there may be other causes. Tap the link below to check other solutions.	• The wireless router password is not correct. • The air conditioner is not connected to the same wireless router as the smartphone.
		Check the following contents and operate again. 1. Check that the wireless router password is correct. 2. Check that the smartphone and the air conditioner are connected to the same wireless router. 3. The wireless router encryption method WPA3 is not supported. Check if SSID other than WPA3 is selected. 4. Check that the local network setting of the smartphone is “Enabled”. (Only for smartphones with iOS14 or later)
2935 2937 2939 2941	Failed to register the air conditioner. Make sure the wireless router is connected to the Internet, and then tap “Re-register” to perform the registration process again. When problems are not resolved, there may be other causes. Tap the link below to check other solutions.	Registration failed because the air conditioner cannot connect to the Internet.
		Check the following contents and operate again. 1. Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. 2. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. 3. Check that the MAC address filter and privacy separator settings are not “enabled” on the wireless router.

TROUBLESHOOTING

Error code	Error message	Cause Solution
2936 2940	Air conditioner registration failed. Tap “Re-register” and conduct the registration processing again. If not successful after multiple attempts, tap “From the beginning” and then initialize the WLAN and start over from the beginning.	• The air conditioner you are trying to register is already registered to another account. • Registration failed because the air conditioner cannot connect to the Internet. • Immediately after turning on the power of the air conditioner, wait for about 5 minutes before registering it. Check the following contents and operate again. 1. Tap “Re-register” and conduct the registration processing again. 2. Delete from another account or initialize the WLAN Adapter. 3. Check that the wireless router is turned on. 4. Check that wireless router is connected to the Internet. If not connected, reboot the wireless router. When rebooting does not solve the problem, contact the manufacturer of the wireless router. 5. Check that the MAC address filter and privacy separator settings are not “enabled” on the wireless router.
2938	Registration failed because the air conditioner could not connect to the Internet. Perform the WPS connection procedure again and confirm that the WLAN lamp on the indoor unit or LED2 on the WLAN adapter is lit before registering. When problems are not resolved, there may be other causes. Tap the link below to check other solutions.	• Registration failed because the air conditioner cannot connect to the Internet. • Registration failed because the air conditioner is not connected to the same wireless router as the smartphone. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** 1. Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. 2. Check that the power plug of the air conditioner main unit is plugged in. 3. Check that the wireless router is turned on. 4. Retry the connection step procedure for the air conditioner registration displayed in the application and complete WPS connection with wireless router to set the lamp to the blinking state. • **When lighting** 1. Check that the air conditioner and the smartphone are connected to the same wireless router. 2. Check that the local network setting of the smartphone is “Enabled”. (Only for smartphones with iOS14 or later)
2942	Your mobile device is not connected to WiFi. Connect to the target wireless router through the OS WiFI setting and restart the procedure. 1. Open the Wi-Fi setting screen of your device. 2. Connect your mobile device to the {ssid}. 3. Return to the application screen and tap “Re-register”. When problems are not resolved, there may be other causes. Tap the link below to check other solutions.	Registration failed because the air conditioner cannot connect to the Internet. Check the following contents and operate again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Set the connection setting with the wireless router to Auto Connection in the smartphone settings. 4. Check that the wireless router is turned on.

TROUBLESHOOTING

Error code	Error message	Cause Solution
2944	Communication failed.	Registration may have failed because a problem occurred in communication with the server (cloud). Wait for a while and then operate again.
2946	The connected air conditioner cannot use the Direct control.	Your air conditioner does not support Direct Control. Operate the air conditioner with Cloud Control.
2947	Already reached the max number of air conditioners per user.	The number of air conditioners that can be registered on AIRSTAGE Mobile has reached the maximum limit. Check the number of air conditioners registered on AIRSTAGE Mobile. (Maximum number of registered units: 50 units for Cloud Control, 50 units for Direct Control) Delete the unused air conditioners on the “Air conditioner editing” screen before registration.
2949	The number of air conditioners registered by the entered user has reached the upper limit, so registration is not possible.	The number of sub users that can be registered has reached the maximum limit. Check the number of registered sub users. (Maximum number of registered sub users: 4 sub users) Delete the unused sub users on the “Sub User Registration” screen.
2953	The specified air conditioner is already registered. To Reregister, delete the air conditioner information on the air conditioner edit screen and initialize the wireless LAN adapter with the remote control.	The specified air conditioner was already registered. Check that the specified air conditioner is displayed on the air conditioner list screen. To register again, delete the air conditioner on the air conditioner editing screen.
2954	The wireless router to which the mobile device and the wireless LAN adapter are connected must be the same. Follow the steps below. 1. Please open the Wi-Fi setting screen of the mobile device. 2. Connect your mobile device to the wireless router that you pressed the automatic connection button. 3. Return to the app screen and tap “OK”.	The air conditioner and the smartphone are not connected to the same wireless router network. Check the following contents and operate again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on. 4. Check that the air conditioner and the smartphone are connected to the same wireless router.

TROUBLESHOOTING

- **Sign in error**

Error code	Error message	Cause / Solution
4010 4410 4610 4810 4910	Communication failed. After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Various settings could not be completed because communication with the server (cloud) failed.
		Check the following contents and operate again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on.
4100	The account you are currently signed in to may have been deleted. If necessary, please create the account again.	Token has been disabled because the signed-in account has been deleted or certain amount of time has elapsed.
		Restart the application and check that you can sign in.If you cannot sign in, create the account again.
4101	The session has expired. Please sign in again to continue.	Token has been disabled because the signed-in account has been deleted or certain amount of time has elapsed.
		Restart the application and check that you can sign in. If you cannot sign in, create the account again.
4102	Your session has expired. Please sign in again. *If you cannot sign in, your account may have been deleted. If necessary, please create an account again.	Token has been disabled because the signed-in account has been deleted or certain amount of time has elapsed.
		Restart the application and check that you can sign in. If you cannot sign in, create the account again.
4110	Failed to connect to the server. Some functions can be used with Direct Control. Do you want to switch to direct control?	• Communication with the server (cloud) failed at sign in. • Registration process of Account registration procedure verification email has not been completed.
		Check the following contents and sign in again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on. 4. Tap the link of Account registration procedure verification email and check that registration process has completed.
4111	Failed to read the device. Since some functions are available in Direct control, switch to Direct control.	Air conditioner information could not be obtained because communication with the server (cloud) failed after sign in.
		Check the following contents and sign in again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on.
4112	Failed to connect to the server. Some functions are limited.	• Communication with the server (cloud) failed at sign in. • Registration process of Account registration procedure verification email has not been completed.
		Check the following contents and sign in again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on. 4. Tap the link of Account registration procedure verification email and check that registration process has completed.
4113	Failed to connect to the server. Would you like to sign in again? Yes: Sign in again No: Return to the sign-in screen	Air conditioner information could not be obtained because communication with the server (cloud) failed after sign in.
		Check the following contents and sign in again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on.

TROUBLESHOOTING

Error code	Error message	Cause Solution
4420	Loading of user information failed. Check the following contents. • Check that your mobile device is connected to the internet.	User information or temperature unit information could not be obtained because communication with the server (cloud) failed. Check the following contents and operate again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on.
4530	Password update failed. Please check if the entered current password is correct.	Password update failed because the entered password was not correct. Check that the entered “Current password” is correct and operate again.
4920	Loading of time zone failed. Check the following contents. • Check that your mobile device is connected to the internet.	Time zone information could not be obtained because communication with server (cloud) failed. Check the following contents and operate again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on.

TROUBLESHOOTING

- **General error**

Error code	Error message	Cause Solution
0100		Communication with the air conditioner failed.
0200 0300 0400 0500 0501 0600 0601 0800 0900 1000 1200 1400 1500 3200 5500 5700 5900 6200	Communication failed. After checking the following contents, please try again after a while. • Ensure that the air conditioner is turned on.	Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router.
0810 0811 0812 1510		• Various settings could not be completed because communication with the server (cloud) failed. • Air conditioner information could not be obtained because communication with server (cloud) failed.
1511 1512 3010 5510 5520 5530 6001 6002 6003 6010 6011 6012 6013 6310	Communication failed. After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Check the following contents and operate again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on.

TROUBLESHOOTING

Error code	Error message	Cause Solution
0820	Loading of outdoor low noise timer failed. Check the following contents. • Ensure that your mobile device is connected to the internet.	The outdoor unit low noise timer information could not be obtained because communication with the server (cloud) failed.
		Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the indicator lamp lights and then operate again. If the indicator lamp is still blinking after waiting for a while, check that the wireless router is turned on.
1520	Loading of weekly timer failed. Check the following contents. • Ensure that your mobile device is connected to the internet.	The weekly timer setting information could not be obtained because communication with the server (cloud) failed.
		Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the lamp lights and then operate again. If the lamp is still blinking after waiting for a while, check that the wireless router is turned on.

TROUBLESHOOTING

Error code	Error message	Cause Solution
1720	Loading of error history failed. Check the following contents. • Ensure that your mobile device is connected to the internet.	The error history information could not be obtained because communication with the server (cloud) failed. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Or check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the indicator lamp lights and then operate again. If the indicator lamp is still blinking after waiting for a while, check that the wireless router is turned on.
3110	Communication failure prevented the group movement processing from being conducted. After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Air conditioner group setting has not been completed because communication with air conditioner failed. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the indicator lamp lights and then operate again. If the indicator lamp is still blinking after waiting for a while, check that the wireless router is turned on.

TROUBLESHOOTING

Error code	Error message	Cause Solution
3111	Communication failure prevented the group creation processing from being conducted. After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Air conditioner group setting has not been completed because communication with air conditioner failed. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the indicator lamp lights and then operate again. If the indicator lamp is still blinking after waiting for a while, check that the wireless router is turned on.
3112	Communication failure prevented the group name change processing from being conducted. After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Air conditioner group setting has not been completed because communication with air conditioner failed. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the indicator lamp lights and then operate again. If the indicator lamp is still blinking after waiting for a while, check that the wireless router is turned on.

TROUBLESHOOTING

Error code	Error message	Cause Solution
3113	Communication failure prevented the group deletion processing from being conducted. After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Air conditioner group setting has not been completed because communication with air conditioner failed. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the indicator lamp lights and then operate again. If the indicator lamp is still blinking after waiting for a while, check that the wireless router is turned on.
3114	The room temperature display indoor unit setting could not be made due to a communication failure. After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Air conditioner group setting has not been completed because communication with air conditioner failed. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the indicator lamp lights and then operate again. If the indicator lamp is still blinking after waiting for a while, check that the wireless router is turned on.

TROUBLESHOOTING

Error code	Error message	Cause Solution
3115	Some device group move processing could not be conducted due to communication failure. After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Air conditioner group setting has not been completed because communication with air conditioner failed. Check the following contents depending on the status of indoor unit wireless LAN indicator lamp or WLAN Adapter LED 2 and operate again. • **When not lighting** – Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. – Check that the power plug of the air conditioner main unit is plugged in. • **When lighting** Use a smartphone to check that the wireless router to which the air conditioner is connected is connected to the Internet. If the smartphone cannot connect to the Internet, reboot the wireless router. When rebooting the wireless router does not solve the problem, contact the manufacturer of the wireless router. • **When blinking** Wait for a while until the indicator lamp lights and then operate again. If the indicator lamp is still blinking after waiting for a while, check that the wireless router is turned on.
5320	Loading of air conditioner information failed. Check the following contents. • Ensure that your mobile device is connected to the internet.	Air conditioner information could not be obtained because communication with server (cloud) failed. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on.
5531 5540	New firmware update failed.	Firmware update failed. Check the following contents and operate again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on. 4. Refer to the operation manual of air conditioner and check the indicator lamp state of air conditioner indoor unit.
5601	Failed to get the air conditioner information.	Failed to obtain air conditioner information by Direct Control. Sign in again.
5602	Failed to add the air conditioner.	Failed to add air conditioner by Direct Control. Check the following contents and operate again. 1. When 2D barcode label is used, scan 2D barcode label again. 2. When 2D barcode label is not used, check that the entered SSID or PIN code is correct.
5630	Device disconnection failed.After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Failed to disconnect the connection with air conditioner by Direct Control. Check the following contents and operate again. 1. Check that the smartphone is connected with the air conditioner. 2. Check that the Electrical panel (Switch breaker) to the air conditioner is turned on. 3. Check that the power plug of the air conditioner main unit is plugged in.

Error code	Error message	Cause Solution
6201	Failed to update the screen. After checking the following contents, please try again after a while. • Ensure that your mobile device is connected to the internet.	Various settings could not be completed because communication with the server (cloud) failed. Check the following contents and operate again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on.
7610	Communication failed. Check the following contents. • Ensure that your mobile device is connected to the internet.	Various settings could not be completed because communication with the server (cloud) failed. Check the following contents and operate again. 1. Check that the wireless LAN setting of smartphone is set to ON. 2. Check that the smartphone is connected to the Internet. 3. Check that the wireless router is turned on.

TROUBLESHOOTING

2. Troubleshooting

NOTE: Some troubleshooting procedures mention non-equipped components, depending on the model. If the component described in the troubleshooting procedure is not present in the model, skip the procedure for that component.

2-1. Troubleshooting with error code

■ E: 11.X. Serial communication error (Serial reverse transfer error)

TROUBLESHOOTING

A serial reverse transfer error occurs when the indoor unit cannot receive the serial signal from the outdoor unit for more than 2 minutes after power is on or for more than 15 seconds during regular operation.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- Connection failure
- External cause
- Power supply failure
- Outdoor unit fan motor failure
- Active filter module* failure
- Inverter PCB (IPM)* failure
- Filter PCB* failure
- Outdoor unit Main PCB failure

*: Some models may not have these components or the modules.

TROUBLESHOOTING STEPS

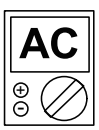
1. **Turn the power off and on again.**
   If the error indication still repeats, go to step 2. If not, go to step 3.

2. **Check if any external cause exists.**
   If you find any of the following problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   - Close installation of neon light bulbs or other electronic equipment that generates harmonic waves near the power supply cable
   - Cable miswiring or connector disconnections on the control unit of the indoor unit or the outdoor unit
   - Grounding failure caused by an incomplete insulation

   If none of these external cause exist, go to step 3.

3. **Verify the power supply voltage.**

   Check if the outdoor unit's power supply terminal block L—N voltage is in the available voltage range specified in the product specifications.
   For the available voltage range, refer to "Specifications" in Chapter 1. GENERAL INFORMATION on page 01-1.



4. **Verify the serial signal (reverse transfer signal).**
   Check that indicated value swings between AC 90 V and AC 270 V at the outdoor unit's power supply terminal block 1—3.
   If the indicated value is in the range, go to step 5. If not, go to step 6.

5. **Verify individual component failure.**
   Check whether the following components work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   - Outdoor unit fan motor
   - Active filter module (if any)
   - Inverter PCB (if any)
   - Filter PCB (EMI filter wire) (if any)

   If these parts replacements do not correct the symptom, go to step 6.

6. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

TROUBLESHOOTING

■ E: 11.X. Serial communication error (Serial forward transfer error)

A serial forward transfer error occurs when the outdoor unit cannot receive the serial signal from the indoor unit for more than 10 seconds.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

TROUBLESHOOTING

POSSIBLE CAUSE

The following are possible causes of this error.

- Connection failure
- External cause
- Power supply failure
- Indoor unit fan motor failure
- Indoor unit Main PCB failure
- Outdoor unit Main PCB failure

TROUBLESHOOTING STEPS

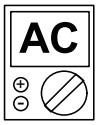
1. **Turn the power off and on again.**
   If the error indication still repeats, go to step 2. If not, go to step 3.

2. **Check if any external cause exists.**
   If you find any of the following problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   - Close installation of neon light bulbs or other electronic equipment that generates harmonic waves near the power supply cable
   - Cable miswiring or connector disconnections on the control unit of the indoor unit or the outdoor unit
   - Grounding failure caused by an incomplete insulation

   If none of these external cause exist, go to step 3.

3. **Verify the power supply voltage.**

   Check if the outdoor unit's terminal block L—N voltage is in the available voltage range specified in the product specifications.
   For the available voltage range, refer to "Specifications" in Chapter 1. GENERAL INFORMATION on page 01-1.



4. **Verify the serial signal (forward transfer signal).**
   Check that indicated value swings between AC 30 V and AC 130 V at the outdoor unit's terminal block 2—3.
   If the indicated value is in the range, go to step 5. If not, go to step 6.

5. **Verify individual component failure.**
   Check whether the following components work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   - Indoor unit fan motor
   - Indoor unit Main PCB

   If these parts replacements do not correct the symptom, go to step 6.

6. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

TROUBLESHOOTING

■ E: 15.X. Automatic airflow adjustment error

An automatic airflow adjustment error occurs when the fan speed is not appropriately controlled in the automatic airflow adjustment operation.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Indoor unit fan rotation error
  - Indoor unit fan failure
  - Indoor unit fan motor failure
  - Bearing failure
- Indoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Check if any external cause exists.**
   Excessive heat around the fan motor may cause the motor to malfunction.
   If any surrounding equipment causes heat, stop the operation and wait until the temperature around the motor cools down. After you make sure that the temperature comes down, restart the operation.
   If the error indication still repeats, go to step 2.

2. **Verify the fan rotation.**
   After turning off the power, rotate the fan by hand. If the fan is caught, dropped off, or has a locked motor, replace the following components.
   - Indoor unit fan
   - Bearing

   If these parts replacements do not correct the symptom, go to step 3.

3. **Replace the indoor unit fan motor.**
   Check whether the indoor unit fan work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 4.

4. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

END

■ E: 18.X. External communication error

An external communication error occurs when the indoor unit does not receive the same signal from the External Input and Output PCB 15 seconds after the indoor unit last received a signal from the External Input and Output PCB.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- Connection failure
- External Input and Output PCB failure
- WLAN Adapter failure
- Indoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Verify the cable connection.**
   After turning off the power, check the cable connection between the indoor unit and the following devices:
   - External Input and Output PCB
   - WLAN Adapter

   If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 2.

2. **Verify individual component failure.**
   If the previous steps do not solve the problem, replace the following components.
   - External Input and Output PCB
   - WLAN Adapter

   If these parts replacements do not correct the symptom, go to step 3.

3. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

END

■ E: 22.X. Indoor unit capacity error

An indoor unit capacity error occurs when the indoor unit(s)'s total capacity does not match the outdoor unit's capacity after 3 minutes of power-on.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- Incorrect indoor unit selection
- Outdoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Check the total capacity of the indoor unit.**
   If you find any problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   If the total capacity of the indoor unit(s) is correct, go to step 2.

2. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

■ E: 23.X. Refrigerant combination error

A refrigerant combination error occurs when the outdoor unit receives a serial signal with different refrigerant type information from the indoor unit.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- Incorrect indoor unit selection
- Outdoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Check if the refrigerant type of the outdoor unit and the indoor unit(s) match.**
   If you find any problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   If the refrigerant type of the outdoor unit and the indoor unit(s) match, go to step 2.

2. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

■ E: 29.X. Connected unit number error

A connected unit number error occurs when the number of indoor units connected within one remote controller group exceeds the limit.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- Connection failure in a remote controller group
  - Wiring error of the indoor unit or the remote controller
  - The connectable unit number in one remote controller group exceeded
- Indoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Check the connected unit(s) number in one remote controller group.**
   Ensure the total unit numbers of the indoor unit(s) and the remote controller(s) in one remote controller group are less than 16 units.
   If you find a problem, correct them by referring to the *Installation Manual*.
   If there is no remote controller group setting error, go to step 2.

2. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

   NOTE: After replacing the Main PCB, set the remote controller address appropriately.

END

■ E: 32.X. Indoor unit Main PCB error

An indoor unit Main PCB error occurs when the EEPROM* information of the indoor unit is not accessible or is incorrect.
*: Electronically Erasable and Programmable Read Only Memory.

A non-volatile memory that keeps memorized information even if you turn off the device. You can change the contents of EEPROM electronically. To change the contents, you use a higher voltage than usual. To rewrite, you must erase all contents so you cannot partially alter contents. You can only rewrite the contents of EEPROM a limited number of times.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Connection failure
- Indoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Turn the power off and on again.**
   If the error indication still repeats, go to step 2.

2. **Check if any external cause exists.**
   If you find any of the following problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   - Close installation of neon light bulbs or other electronic equipment that generates harmonic waves near the power supply cable
   - Cable miswiring or connector disconnections on the control unit of the indoor unit or the outdoor unit
   - Grounding failure caused by an incomplete insulation

   If none of these external cause exist, go to step 3.

3. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

END

■ E: 33.X. Indoor unit motor electricity consumption detection error

An indoor unit motor electricity consumption detection error occurs when the voltage or the current value of the indoor unit fan motor exceeds the limit.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Indoor unit fan rotation error
  - Indoor unit fan failure
  - Indoor unit fan motor failure
  - Bearing failure
- Indoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Check if any external cause exists.**
   Excessive heat around the fan motor may cause the motor to malfunction.
   If any surrounding equipment causes heat, stop the operation and wait until the temperature around the motor cools down. After you make sure that the temperature comes down, restart the operation.
   If the error indication still repeats, go to step 2.

2. **Verify the fan rotation.**
   After turning off the power, rotate the fan by hand. If the fan is caught, dropped off, or has a locked motor, replace the following components.
   - Indoor unit fan
   - Bearing

   If these parts replacements do not correct the symptom, go to step 3.

3. **Replace the indoor unit fan motor.**
   Check whether the indoor unit fan work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 4.

4. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

END

■ E: 35.X. MANUAL AUTO button error

A MANUAL AUTO button error occurs when the MANUAL AUTO button is on continuously for over 60 seconds.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

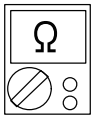
- MANUAL AUTO button remains pressed
- MANUAL AUTO button failure
- Indoor unit Indicator PCB failure
- Indoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Check whether the MANUAL AUTO button works appropriately.**

   Check whether there are any of the following problems.

   - The MANUAL AUTO button remains pressed.
   - The on/off switching does not work. To verify whether the switching operation works properly, use a resistance meter.

   If you find any of problems above, replace the MANUAL AUTO button.
   If this part replacement does not correct the symptom, go to step 2.

2. **Replace the indoor unit Indicator PCB.**
   If you find a short circuit or corrosion on the Indicator PCB or none of the previous steps correct the symptom, replace the indoor unit Indicator PCB.
   If this part replacement does not correct the symptom, go to step 3.

3. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

END

■ E: 39.X. Power supply error of indoor unit fan motor

A power supply error of indoor unit fan motor occurs when the fan motor does not receive the necessary voltage values to operate.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- Voltage drop
- External cause
- Connection failure
- Indoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Check if a voltage drop occurs in the same electrical circuit.**
   Large electrical loads in the same circuit may cause a voltage drop and cause insufficient voltage supply to the indoor unit fan motor. Redesign the circuit if any apparatus causes large electrical loads.
   If no large electrical loads exist in the same circuit, go to step 2.

2. **Check if any external cause exists.**
   If you find any of the following problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   - Close installation of neon light bulbs or other electronic equipment that generates harmonic waves near the power supply cable
   - Cable miswiring or connector disconnections on the control unit of the indoor unit or the outdoor unit
   - Grounding failure caused by an incomplete insulation

   If none of these external cause exist, go to step 3.

3. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

END

■ E: 3A.X. Indoor unit communication circuit error

An indoor unit communication circuit error occurs when the Main PCB cannot communicate with the parts to be connected.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

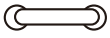
POSSIBLE CAUSE

The following are possible causes of this error.

- Connection failure
- Indoor unit Communication PCB failure
- Wired Remote Controller failure
- Indoor unit Main PCB failure

TROUBLESHOOTING STEPS

PREREQUISITE:
The settings of the components on the indoor unit Main PCB depend on the parts connected to the PCB. Before starting this troubleshooting, check whether the settings of components on the Main PCB are correct.

Connected parts to the Main PCB		Components setting on the Main PCB	
Wired Remote Controller	**Communication PCB**	**DIP switch**	**Jumper (JM9)**
2-wire type	Not connected	 2WIRE/3WIRE Factory setting: 2WIRE	 JM9 Disconnected
3-wire type	Not connected	 2WIRE/3WIRE Factory setting: 3WIRE	 JM9 Connected (Factory setting)

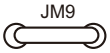
TROUBLESHOOTING

If the settings of components on the Main PCB are not correct, the following symptoms appear.

- Each device indicates the error 3A.

Connected parts to the Main PCB		Components setting on the Main PCB	
Wired Remote Controller	**Communication PCB**	**DIP switch**	**Jumper (JM9)**
2-wire type	Not connected	–	 Disconnected

- Wired Remote Controller does not work.

Connected parts to the Main PCB		Components setting on the Main PCB	
Wired Remote Controller	**Communication PCB**	**DIP switch**	**Jumper (JM9)**
2-wire type	Connected	–	 Connected (Factory setting)
	Not connected	 2WIRE/3WIRE Factory setting: 3WIRE	–
3-wire type	Not connected	 2WIRE/3WIRE Factory setting: 2WIRE	–

1. **Verify the cable connection.**
   After turning off the power, check the connection of the terminal block between the indoor unit and the Wired Remote Controller. Some models may have the Communication Kit between the indoor unit and the Wired Remote Controller.
   If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 2.

2. **Replace the Communication PCB.**
   If you find a short circuit or corrosion on the Communication PCB or none of the previous steps correct the symptom, replace the indoor unit Communication PCB.
   Turn the power on again. If the error indication still repeats, go to step 3.

3. **Verify the power supply voltage.**

   Check if the power supply voltage to the remote controller is correct.

   - If the indicated value is the same as those shown in the PC board diagram, it suggests the remote controller failure.
     Replace the Wired Remote Controller.
   - If the indicated value is DC 0 V, it suggests the indoor unit Main PCB failure.
     Go to step 4.

   For the remote controller power supply terminal block location and the voltage, refer to "PC board diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-38.

4. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

   NOTE: After replacing the Main PCB, set the remote controller address appropriately.

END

■ E: 41 / 42.X. Indoor unit thermistor error

An indoor unit thermistor error occurs when the indoor unit detects that the following thermistor is open or short-circuited.

- Room temperature thermistor (E: 41.X)
- Heat exchanger temperature thermistor (E: 42.X)

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

TROUBLESHOOTING

POSSIBLE CAUSE

The following are possible causes of this error.

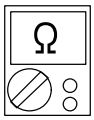
- Connection failure
- External cause
- Thermistor failure
- Indoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Verify the cable connection.**
   After turning off the power, check the connection of the terminal between the indoor unit and the thermistor.
   If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 2.

2. **Verify the thermistor failure.**

   Check whether the thermistor works appropriately by referring to "Thermistor resistance values" on page 03-87. For the thermistor terminal location, refer to "PC board diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-38.

   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 3.

3. **Verify the power supply voltage.**

   Check if the power supply voltage to the thermistor is correct.
   - If the indicated value is the same as those shown in the PC board diagram, it suggests the thermistor failure. Replace the thermistor.
   - If the indicated value is DC 0 V, it suggests the indoor unit Main PCB failure. Go to step 4.

   For the thermistor terminal location and the voltage, refer to "PC board diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-38.

4. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

END

■ E: 51.X. Indoor unit fan motor error

An indoor unit fan motor error occurs when the rotation number does not reach the target number after 56 seconds have passed since the fan motor started the rotation.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Indoor unit fan rotation error
  - Indoor unit fan failure
  - Indoor unit fan motor failure
  - Bearing failure
- Capacitor* failure
- Power supply PCB* failure
- Indoor unit Main PCB failure

*: Some models may not have this component or the module.

TROUBLESHOOTING STEPS

1. **Verify the fan rotation.**
   After turning off the power, rotate the fan by hand. If the fan is caught, dropped off, or has a locked motor, replace the following components.
   - Indoor unit fan
   - Bearing

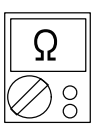
   If these parts replacements do not correct the symptom, go to step 2.

2. **Check if any external cause exists.**
   Excessive heat around the fan motor may cause the motor to malfunction.
   If any surrounding equipment causes heat, stop the operation and wait until the temperature around the motor cools down. After you make sure that the temperature comes down, restart the operation.
   If the error indication still repeats, go to step 3.

3. **Replace the indoor unit fan motor.**
   Check whether the indoor unit fan work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 4.

4. **Verify the capacitor failure (if any).**

   Check whether the capacitor work appropriately by using a resistance meter. If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 5.



5. **Replace the Power supply PCB (if any).**
   If you find a short circuit or corrosion on the Power supply PCB or none of the previous steps correct the symptom, replace the Power supply PCB.
   If this part replacement does not correct the symptom, go to step 6.

6. **Replace the indoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the indoor unit Main PCB.

END

TROUBLESHOOTING

■ E: 62.X. Outdoor unit Main PCB communication error

An outdoor unit Main PCB communication error occurs when the EEPROM* information of the outdoor unit is not accessible or is incorrect.
*: Electronically Erasable and Programmable Read Only Memory.

A non-volatile memory that keeps memorized information even if you turn off the device. You can change the contents of EEPROM electronically. To change the contents, you use a higher voltage than usual. To rewrite, you must erase all contents so you cannot partially alter contents. You can only rewrite the contents of EEPROM a limited number of times.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Connection failure
- Outdoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Turn the power off and on again.**
   If the error indication still repeats, go to step 3. If not, go to step 2.

2. **Check if any external cause exists.**
   If you find any of the following problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   - Close installation of neon light bulbs or other electronic equipment that generates harmonic waves near the power supply cable
   - Cable miswiring or connector disconnections on the control unit of the indoor unit or the outdoor unit
   - Grounding failure caused by an incomplete insulation

   If none of these external cause exist, go to step 3.

3. **Verify the cable connection.**
   After turning off the power, check all the terminal connections for the indoor unit. If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 4.

4. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

■ E: 63.X. Inverter error

An inverter error occurs when the outdoor unit receives error information from the Inverter PCB.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Connection failure
- Inverter PCB failure
- Outdoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Turn the power off and on again.**
   If the error indication still repeats, go to step 3. If not, go to step 2.

2. **Check if any external cause exists.**
   If you find any of the following problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   - Close installation of neon light bulbs or other electronic equipment that generates harmonic waves near the power supply cable
   - Cable miswiring or connector disconnections on the control unit of the indoor unit or the outdoor unit
   - Grounding failure caused by an incomplete insulation

   If none of these external cause exist, go to step 3.

3. **Verify the cable connection.**
   After turning off the power, check the cable connection between the outdoor unit Main PCB and following devices:
   - Power supply
   - Inverter PCB

   If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 4.

4. **Replace the Inverter PCB.**
   If you find a short circuit or corrosion on the Inverter PCB or none of the previous steps correct the symptom, replace the Inverter PCB.
   Turn the power on again. If the error indication still repeats, go to step 5.

5. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

■ E: 64.X. PFC circuit error

A PFC circuit error occurs when the voltage value of the inverter input DC exceeds the limit.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Connection failure
- Active filter module failure
- Outdoor unit Main PCB failure

TROUBLESHOOTING STEPS

1. **Check if a voltage drop occurs in the same electrical circuit.**
   Large electrical loads in the same circuit may cause overvoltage and cause damage to the converter. Redesign the circuit if any apparatus causes large electrical loads.
   If no large electrical loads exist in the same circuit, go to step 2.

2. **Check if any external cause exists.**
   If you find any of the following problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   - Close installation of neon light bulbs or other electronic equipment that generates harmonic waves near the power supply cable
   - Cable miswiring or connector disconnections on the control unit of the outdoor unit or the outdoor unit
   - Grounding failure caused by an incomplete insulation

   If none of these external cause exist, go to step 3.

3. **Verify individual component failure.**
   Check whether the following components work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   - Active filter module (if any)

   If these parts replacements do not correct the symptom, go to step 4.

4. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

■ E: 65.X. IPM error

An IPM error occurs when an overcurrent flows to the IPM.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Connection failure
- Outdoor unit fan motor failure
- Compressor failure
- Inverter PCB* failure
- Outdoor unit Main PCB failure

*: Some models may not have these components or the modules.

TROUBLESHOOTING STEPS

1. **Verify the cable connection.**
   After turning off the power, check all the terminal connections for the outdoor unit. If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 2.

2. **Check if any external cause exists.**
   If you find any of the following problems, remove the possible factors.
   - Obstruction is in the air distribution circuit.
   - The outdoor heat exchanger is clogged by dust or debris.
   - There is excessive heat around the fan motor.

   If none of these external cause exist or removing these factor does not correct the symptom, go to step 3.

3. **Verify the fan rotation.**
   After turning off the power, rotate the fan by hand.
   If the fan is caught, dropped off, or has a locked motor, replace the outdoor unit fan motor.
   If this part replacement does not correct the symptom, go to step 4.

4. **Verify the fan motor failure.**
   Check whether the fan motor work appropriately by referring "Service parts information" on page 03-78.
   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 5.

5. **Verify the compressor failure.**
   Check whether the compressor work appropriately by referring "Service parts information" on page 03-78.
   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 6.

6. **Replace the Inverter PCB.**
   If you find a short circuit or corrosion on the Inverter PCB or none of the previous steps correct the symptom, replace the Inverter PCB.
   Turn the power on again. If the error indication still repeats, go to step 7.

7. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

TROUBLESHOOTING

■ E: 71 / 72 / 73 / 74 / 76 / 77.X. Outdoor unit thermistor error

An outdoor unit thermistor error occurs when the outdoor unit detects that the following thermistor is open or short.

- E: 71.X. Thermistor (Discharge temperature) error
- E: 72.X. Thermistor (Compressor temperature) error
- E: 73.X. Thermistor (Heat exchanger Middle/Outlet temperature) error
- E: 74.X. Thermistor (Outdoor temperature) error
- E: 76.X. Thermistor (2-way/3-way valve temperature) error
- E: 77.X. Thermistor (Heat sink temperature) error

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- Connection failure
- External cause
- Thermistor failure
- Inverter PCB* failure
- Outdoor unit Main PCB failure

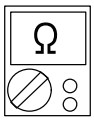
*: Some models may not have these components or the modules.

TROUBLESHOOTING STEPS

1. **Verify the cable connection.**
   After turning off the power, check the connection of the terminal between the outdoor unit and the thermistor.
   If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 2.

2. **Verify the thermistor failure.**

   Check whether the thermistor works appropriately by referring to "Thermistor resistance values" on page 03-87. For the thermistor terminal location, refer to "PC board diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-38.

   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 3.

3. **Verify the power supply voltage.**

   Check if the power supply voltage to the thermistor is correct.

   - If the indicated value is the same as those shown in the PC board diagram, it suggests the thermistor failure. Replace the thermistor.
   - If the indicated value is DC 0 V, it suggests the outdoor unit Main PCB failure. Go to step 4.

   For the thermistor terminal location and the voltage, refer to "PC board diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-38.

4. **Replace the Inverter PCB. (if any)**
   If you find a short circuit or corrosion on the Inverter PCB or none of the previous steps correct the symptom, replace the Inverter PCB.
   Turn the power on again. If the error indication still repeats, go to step 5.

5. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the Outdoor unit Main PCB.

END

TROUBLESHOOTING

■ E: 84.X. Current sensor error

A current sensor error occurs when the input current sensor detects a current value lower than a certain value after the compressor starts operation.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Connection failure
- Inverter PCB* failure
- Outdoor unit Main PCB failure

*: Some models may not have these components or the modules.

TROUBLESHOOTING STEPS

1. **Turn the power off and on again.**
   If the error indication still repeats, go to step 3. If not, go to step 2.

2. **Check if a voltage drop occurs in the same electrical circuit.**
   Large electrical loads in the same circuit may cause a voltage drop and cause insufficient voltage supply to the indoor unit and outdoor unit. Redesign the circuit if any apparatus causes large electrical loads.
   If no large electrical loads exist in the same circuit, go to step 3.

3. **Check if any external cause exists.**
   If you find any of the following problems, correct them by referring to the *Installation Manual* or the *DESIGN & TECHNICAL MANUAL*.
   - Close installation of neon light bulbs or other electronic equipment that generates harmonic waves near the power supply cable
   - Cable miswiring or connector disconnections on the control unit of the indoor unit or the outdoor unit
   - Grounding failure caused by an incomplete insulation

   If none of these external cause exist, go to step 4.

4. **Verify the cable connection.**
   After turning off the power, check all the terminal connections for the outdoor unit. If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 5.

5. **Replace the Inverter PCB. (if any)**
   If you find a short circuit or corrosion on the Inverter PCB or none of the previous steps correct the symptom, replace the Inverter PCB.
   Turn the power on again. If the error indication still repeats, go to step 6.

6. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

■ E: 94.X. Trip detection

A trip detection occurs when multiple consecutive protection stops due to overcurrent occurring after the inverter compressor completes the startup process.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Connection failure
- Outdoor unit fan motor failure
- Compressor failure
- Inverter PCB* failure
- Outdoor unit Main PCB failure

*: Some models may not have these components or the modules.

TROUBLESHOOTING STEPS

1. **Verify the cable connection.**
   After turning off the power, check all the terminal connections for the outdoor unit. If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 2.

2. **Check if any external cause exists.**
   If you find any of the following problems, remove the possible factors.
   - Obstruction is in the air distribution circuit.
   - The outdoor heat exchanger is clogged by dust or debris.
   - There is excessive heat around the fan motor.

   If none of these external cause exist or removing these factor does not correct the symptom, go to step 3.

3. **Verify the fan rotation.**
   After turning off the power, rotate the fan by hand.
   If the fan is caught, dropped off, or has a locked motor, replace the outdoor unit fan motor.
   If this part replacement does not correct the symptom, go to step 4.

4. **Verify the fan motor failure.**
   Check whether the fan motor work appropriately by referring "Service parts information" on page 03-78.
   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 5.

5. **Verify the compressor failure.**
   Check whether the compressor work appropriately by referring "Service parts information" on page 03-78.
   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 6.

6. **Replace the Inverter PCB.**
   If you find a short circuit or corrosion on the Inverter PCB or none of the previous steps correct the symptom, replace the Inverter PCB.
   Turn the power on again. If the error indication still repeats, go to step 7.

7. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

TROUBLESHOOTING

■ E: 95.X. Compressor motor control error

A compressor motor control error occurs when the compressor cannot start after several restarts.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- Connection failure
- Compressor failure
- Inverter PCB* failure
- Outdoor unit Main PCB failure

*: Some models may not have these components or the modules.

TROUBLESHOOTING STEPS

1. **Check the compressor operation noise.**
   If you hear abnormal noise from the compressor after turning on the power, stop the operation immediately and replace the compressor.
   If this part replacement does not correct the symptom, go to step 2.

2. **Verify the cable connection.**
   After turning off the power, check the connection of the terminal between the compressor and the power supply. If you find a cable disconnection, reconnect the cable appropriately.
   For the compressor connector location and resistance value, refer to "Service parts information" on page 03-78.
   Turn the power on again. If the error indication still repeats, go to step 3.

3. **Replace the Inverter PCB. (if any)**
   If you find a short circuit or corrosion on the Inverter PCB or none of the previous steps correct the symptom, replace the Inverter PCB.
   Turn the power on again. If the error indication still repeats, go to step 4.

4. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

TROUBLESHOOTING

■ E: 97 / 98.X. Outdoor unit fan motor error

An outdoor unit fan motor error occurs when the rotation number of the outdoor unit fan motor does not reach 100 rpm after repeated restarts.

- Outdoor unit fan motor 1 (E: 97.X)
- Outdoor unit fan motor 2 (E: 98.X)

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

TROUBLESHOOTING

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Outdoor unit fan rotation error
  - Outdoor unit fan failure
  - Outdoor unit fan motor failure
  - Bearing failure
- Inverter PCB* failure
- Outdoor unit Main PCB failure

*: Some models may not have this component or the module.

TROUBLESHOOTING STEPS

1. **Verify the fan rotation.**
   After turning off the power, rotate the fan by hand.
   If the fan is caught, dropped off, or has a locked motor, replace the outdoor unit fan motor.
   If this part replacement does not correct the symptom, go to step 2.

2. **Check if any external cause exists.**
   Excessive heat around the fan motor may cause the motor to malfunction.
   If any surrounding equipment causes heat, stop the operation and wait until the temperature around the motor cools down. After you make sure that the temperature comes down, restart the operation.
   If the error indication still repeats, go to step 3.

3. **Replace the outdoor unit fan motor.**
   Check whether the outdoor unit fan work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 4.

4. **Verify the power supply voltage.**

   If the indicated value is not the same as those shown in the PC board diagram, it suggests the connected PCB failure. Replace the Inverter PCB (if any).
   If there is no Inverter PCB or this part replacement does not correct the symptom, go to step 5.

   For the outdoor unit fan motor power supply terminal location and the voltage, refer to "PC board diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-38.

5. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

TROUBLESHOOTING

■ E: 99.X. 4-way valve error

A 4-way valve error occurs when the temperature difference between the indoor unit heat exchanger and the room temperature is 10 degrees or more.

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- Connection failure
- Thermistor failure
- Solenoid coil failure
- 4-way valve failure
- Outdoor unit Main PCB failure

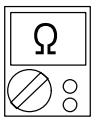
TROUBLESHOOTING STEPS

1. **Check if the air filter is clogged.**
   Remove any dust or debris that may be clogged in the air filter.
   If the error indication still repeats, go to step 2.

2. **Verify the cable connection.**
   After turning off the power, check all the terminal connections for the indoor unit. If you find a cable disconnection, reconnect the cable appropriately.
   Turn the power on again. If the error indication still repeats, go to step 3.

3. **Verify the thermistor failure.**

   Check whether the thermistor works appropriately by referring to "Thermistor resistance values" on page 03-87. For the thermistor terminal location, refer to "PC board diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-38.

   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 4.

4. **Verify individual component failure.**
   Check whether the following components work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   - Solenoid coil
   - 4-way valve

   If these parts replacements do not correct the symptom, go to step 5.

5. **Verify the compressor failure.**
   Check whether the compressor work appropriately by referring "Service parts information" on page 03-78.
   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 6.

6. **Verify the power supply voltage.**

   Check if the power supply voltage to the 4-way valve is in the available voltage range specified in the product specifications.

   For the available voltage range, refer to "Specifications" in Chapter 1. GENERAL INFORMATION on page 01-1.

   Replace the outdoor unit Main PCB if the following measurement value is indicated during each operation mode.

   - Cooling operation: Within the available voltage range.
   - Heating operation: Out of the available voltage range.

7. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

TROUBLESHOOTING

■ E: A1.X. Discharge temperature error

A discharge temperature error occurs when the compressor repeatedly stops by the discharge gas temperature over-rise prevention.

For details on the over-rise prevention control of the discharge gas temperature, refer to "Various protections" in Chapter 4. CONTROL AND FUNCTIONS on page 04-29

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

TROUBLESHOOTING

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- 2-way valve* is shut off
- 3-way valve is shut off
- Electronic expansion valve* failure
- Capillary tube* failure
- Strainer* failure
- Outdoor unit fan motor failure
- Thermistor (Discharge temperature) failure
- Refrigerant charge shortage
- Refrigerant leakage
- Outdoor unit Main PCB failure

*: Some models may not have this component or the module.

TROUBLESHOOTING STEPS

1. **Verify the open/close status of the 2-way valve or 3-way valve.**
   The valve to check differs depending on the operation mode.
   - In cooling operation, check the valve connecting to the gas pipe.
   - In heating operation, check the valve connecting to the liquid pipe.

   If you find the valve shutoff, open the valve.
   If the error indication still repeats, go to step 2.

2. **Verify individual component failure.**
   Check whether the following components work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   - Electronic expansion valve (if any)
   - Capillary tube (if any)

   If these parts replacements do not correct the symptom, go to step 3.

3. **Check the individual component for dust or debris.**
   Check if the following components are clogged with dust. If you find clogging, remove the dust from component.
   - Strainer
   - Outdoor heat exchanger

   If the error indication still repeats, go to step 4.

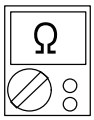
TROUBLESHOOTING

4. **Verify the fan rotation.**
   After turning off the power, rotate the fan by hand.
   If the fan is caught, dropped off, or has a locked motor, replace the outdoor unit fan motor.
   If this part replacement does not correct the symptom, go to step 5.

5. **Verify the fan motor failure.**
   Check whether the fan motor work appropriately by referring "Service parts information" on page 03-78.
   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 6.

6. **Verify the thermistor failure.**

   Check whether the thermistor works appropriately by referring to "Thermistor resistance values" on page 03-87. For the thermistor terminal location, refer to "PC board diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-38.



   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 7.

7. **Check if the refrigerant leak occurs.**
   Check if refrigerant leakage occurs with your leak detector. If there is a leakage, repair the refrigerant leak.
   If refrigerant does not leak or this repair does not correct the symptom, go to step 8.

8. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

■ E: A3.X. Compressor temperature error

A compressor temperature error occurs when the compressor repeatedly stops by the compressor temperature prevention.

For details on compressor temperature prevention control, refer to "Various protections" in Chapter 4. CONTROL AND FUNCTIONS on page 04-29

INDICATOR

For a list of errors and associated error indicators, refer to "Error codes and indicators" on page 03-2.

TROUBLESHOOTING

POSSIBLE CAUSE

The following are possible causes of this error.

- External cause
- 2-way valve* is shut off
- 3-way valve is shut off
- Electronic expansion valve* failure
- Capillary tube* failure
- Strainer* failure
- Outdoor unit fan motor failure
- Thermistor (Compressor temperature) failure
- Refrigerant charge shortage
- Refrigerant leakage
- Outdoor unit Main PCB failure

*: Some models may not have this component or the module.

TROUBLESHOOTING STEPS

1. **Verify the open/close status of the 2-way valve or 3-way valve.**
   The valve to check differs depending on the operation mode.
   - In cooling operation, check the valve connecting to the gas pipe.
   - In heating operation, check the valve connecting to the liquid pipe.

   If you find the valve shutoff, open the valve.
   If the error indication still repeats, go to step 2.

2. **Verify individual component failure.**
   Check whether the following components work appropriately by referring to "Service parts information" on page 03-78. If there is a failure, replace the component.
   - Electronic expansion valve (if any)
   - Capillary tube (if any)

   If these parts replacements do not correct the symptom, go to step 3.

3. **Check the individual component for dust or debris.**
   Check if the following components are clogged with dust. If you find clogging, remove the dust from component.
   - Strainer
   - Outdoor heat exchanger

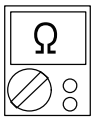
   If the error indication still repeats, go to step 4.

4. **Verify the fan rotation.**
   After turning off the power, rotate the fan by hand.
   If the fan is caught, dropped off, or has a locked motor, replace the outdoor unit fan motor.
   If this part replacement does not correct the symptom, go to step 5.

5. **Verify the fan motor failure.**
   Check whether the fan motor work appropriately by referring "Service parts information" on page 03-78.
   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 6.

6. **Verify the thermistor failure.**

   Check whether the thermistor works appropriately by referring to "Thermistor resistance values" on page 03-87. For the thermistor terminal location, refer to "PC board diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-38.

   If there is a failure, replace the component.
   If this part replacement does not correct the symptom, go to step 7.

7. **Check if the refrigerant leak occurs.**
   Check if refrigerant leakage occurs with your leak detector. If there is a leakage, repair the refrigerant leak.
   If refrigerant does not leak or this repair does not correct the symptom, go to step 8.

8. **Replace the outdoor unit Main PCB.**
   If you find a short circuit or corrosion on the Main PCB or none of the previous steps correct the symptom, replace the outdoor unit Main PCB.

END

2-2. Troubleshooting without error code

■ Indoor unit—No power

Forecast of cause	Power supply failure
	External cause
	Electrical components defective

TROUBLESHOOTING

Check point 1. Check installation condition

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

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

↓

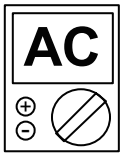
Check point 2. Check external cause at indoor and outdoor (voltage drop or noise)

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

↓

Check point 3. Check electrical components

Check the voltage of power supply.
Check if AC 103.5 to 126.5 V appears at outdoor unit terminal L—N.
-> If no, go to "Check point 1" and "Check point 2".



↓

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

↓

End

■ Outdoor unit—No power

Forecast of cause	Power supply failure
	External cause
	Electrical components defective

TROUBLESHOOTING

Check point 1. Check installation condition

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

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

↓

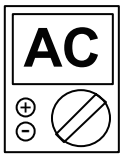
Check point 2. Check external cause at indoor and outdoor (voltage drop or noise)

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

↓

Check point 3. Check electrical components

Check the voltage of power supply.
Check if AC 103.5 to 126.5 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 the Main PCB.
- Check varistor in the Main PCB.
  If varistor is defective, there is a possibility of an abnormal power supply. Check the correct power supply and replace the Main PCB.
  → Upon checking the normal power supply, replace the Main PCB.

↓

Check point 4. Replace the main PCB

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

↓

End

■ No operation (Power is on)

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

TROUBLESHOOTING

Check point 1. Check indoor and outdoor installation condition

Are these indoor unit, outdoor unit, and remote controller suitable model names to connect?
-> If there is some abnormal condition, correct it by referring to the installation manual and “DESIGN & TECHNICAL MANUAL”.

↓

Turn off the power and check correct followings.

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

↓

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

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

↓

Check point 3. Replace main PCB

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

↓

End

■ No cooling/No heating

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

TROUBLESHOOTING

Check point 1. Check Indoor unit

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

↓

Check point 2. Check outdoor unit operation

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

↓

Check point 3. Check site condition

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

↓

Check point 4. Check indoor/outdoor installation condition

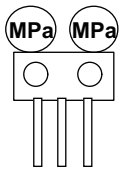
- Check connection pipe (specified pipe length and pipe diameter?)
- Check any loose or removed communication line.

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

↓

Check point 5. Check Refrigeration cycle

- Check if strainer is clogged (Refer to the figure below).
- Measure gas pressure, and if there is a leakage, correct it.
- Check if EEV open or there is a capillary tube defect.
  Refer to outdoor unit Electronic Expansion Valve (EEV) or Capillary tube in "Service parts information" on page 03-78.
- Check compressor.
  Refer to compressor in "Service parts information" on page 03-78.
  Refer to inverter compressor in "Service parts information" on page 03-78.



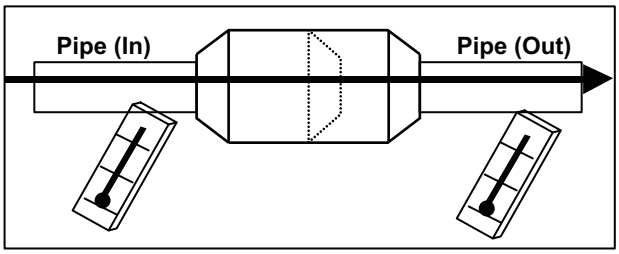
NOTE: When recharging the refrigerant, make sure to perform vacuuming, and recharge the specified amount.

↓

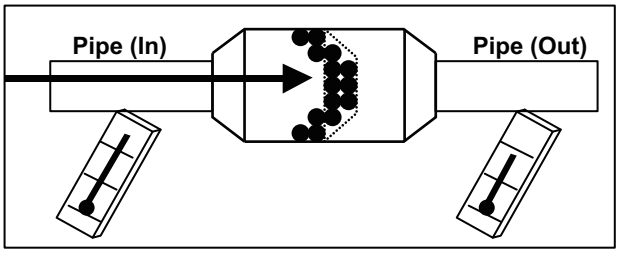
End

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.



TROUBLESHOOTING

■ 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 03-78.

↓

End

TROUBLESHOOTING

■ Water leaking

Forecast of cause	Erroneous installation
	Drain hose failure

TROUBLESHOOTING

Diagnosis method when water leak occurs

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

↓

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

↓

Is fan rotating?

↓

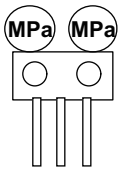
End

Diagnosis method when water is spitting out

Is the filter clogged?

↓

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



↓

End

■ Intake grille closing failure

Forecast of cause	Intake grille is not tightly closed
	Intake grille assy failure

Check point 1. Check the Intake grille is closed securely.
• If the Intake grille is not tightly closed, close it. • After closing, restart the operation and check for errors.

↓

Check point 2. Check the condition of the Intake grille.
Check if the projection on the back of the Intake grille, which presses the limit switch, is not broken. If the projection is broken, replace the Intake grille assy. **NOTE:** If the projection is not broken and the limit switch is pressed correctly, you will hear a slight click when closing the grille.

↓

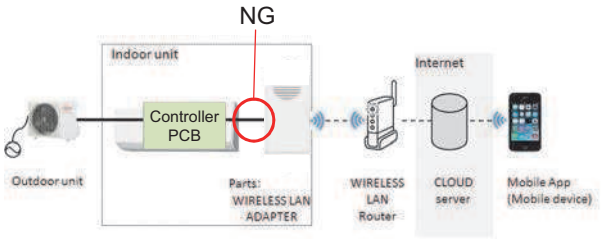
End

TROUBLESHOOTING

2-3. Troubleshooting with error code (For wireless LAN adapter)

■ E: 18.X. External communication error between indoor unit and wireless LAN adapter

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	8 time flash
		Economy indicator	Continuous flash
		Wireless LAN indicator	Flashing slowly
		Error code	E: 18
	Mobile app		E: 18.1
Detective actuator	Wireless LAN adapter PCB		After receiving a signal from the wireless LAN adapter, the same signal has not been received for 15 seconds. 
	Controller PCB		
Forecast of cause			Connection between indoor unit and wireless LAN adapter failure
			Wireless LAN adapter PCB failure
			Controller PCB failure

Check point 1. Check the connection

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

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

↓

Check point 2. Replace wireless LAN adapter.

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

For the method of the Mobile app, refer to "Mobile app setting method" on page 03-76.

↓

Check point 3. Replace controller PCB

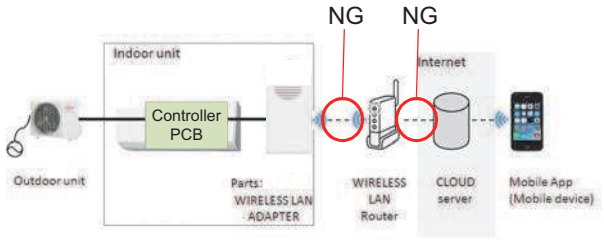
If check point 1 to 2 do not improve the symptom, replace the controller PCB.

↓

End

■ Network communication error between wireless LAN router and wireless LAN adapter

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	No indication
		Timer indicator	No indication
		Economy indicator	No indication
		Wireless LAN indicator	Flashing slowly
		Error code	—
	Mobile app		No indication
Detective actuator	Wireless LAN router		When the not connection between wireless LAN adapter and wireless LAN router. 
	Wireless LAN adapter PCB		
Forecast of cause			Connection cable failure of wireless LAN router
			Connection between wireless LAN adapter and wireless LAN router failure
			Wireless LAN router failure
			Wireless LAN adapter PCB failure

Check point 1. Check the connection cable

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

↓

Check point 2. Check the connection status.

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

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

↓

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

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

↓

Check point 4. Replace wireless LAN adapter.
If check point 3 do not improve the symptom, replace the wireless LAN adapter and cancel the registration of air conditioner on the Mobile app. After replacing the adapter, perform the pairing on the Mobile app. For the method of the Mobile app, refer to "Mobile app setting method" on page 03-76.

↓

End

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

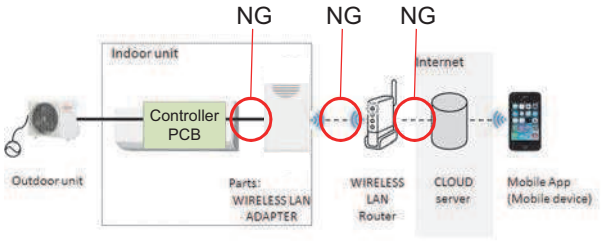
↓

End

TROUBLESHOOTING

■ E: 18.X. Communication error

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	8 time flash
		Economy indicator	Continuous flash
		Wireless LAN indicator	Flashing slowly
		Error code	E: 18
	Mobile app		E: 18.1
Detective actuator	Wireless LAN router		When the external communication error between indoor unit and wireless LAN adapter and network communication error between wireless LAN router and wireless LAN adapter has occurred simultaneously. 
	Wireless LAN adapter PCB		
	Indoor unit controller PCB		
Forecast of cause			Connection cable failure of wireless LAN router
			Wireless LAN router failure
			Connection between indoor unit and wireless LAN adapter failure
			Connection between wireless LAN adapter and wireless LAN router failure
			Wireless LAN adapter PCB failure
			Controller PCB failure

Check point 1. Check the connection

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

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

↓

Check point 2. Replace wireless LAN adapter.

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

For the method of the Mobile app, refer to "Mobile app setting method" on page 03-76.

↓

Check point 3. Replace controller PCB

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

↓

TROUBLESHOOTING

Check point 4. Check the connection cable
Check the connection cable on the wireless LAN router. -> If there is loose connector, open cable or mis-wiring, correct it.

↓

Check point 5. Check the connection status.
Check the connection status to the Internet and wireless LAN router. -> If the wireless LAN router is not connected to the Internet, check the transmission between wireless LAN products (ex. PC or game console, etc.) other than air conditioner and wireless LAN router. If no, go to "Check point 5-2".

↓

Check point 6. Turn on the power again of air conditioner.
If check point 1 to 2 do not improve the symptom, turn on the power of the air conditioner again and wait for 60 seconds.

↓

Check point 7. Replace wireless LAN adapter.
If check point 3 do not improve the symptom, replace the wireless LAN adapter and cancel the registration of air conditioner on the Mobile app. After replacing the adapter, perform the pairing on the Mobile app. For the method of the Mobile app, refer to "Mobile app setting method" on page 03-76.

↓

End

Check point 5-2. Check the transmission state
Check the wireless transmission state pf the wireless LAN router (indicator lamp status). -> If the wireless transmission from the wireless LAN router has not been outgoing, inquire to the wireless LAN router maker.

↓

End

■ E: 18.X. Wireless LAN adapter non-energized

TROUBLESHOOTING

Indicator	Indoor unit	Operation indicator	1 time flash
		Timer indicator	8 time flash
		Economy indicator	Continuous flash
		Wireless LAN indicator	No indication
		Error code	E: 18
	Mobile app		No indication
Detective actuator	Indoor unit controller PCB		When the voltage (DC 12 V) does not output from the controller PCB.
	Wireless LAN adapter PCB		
Forecast of cause			Indoor unit controller PCB failure
			Wireless LAN adapter PCB failure
			Wiring connection failure

Check point 1. Check the connection.

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

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

↓

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

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

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

  For the method of the Mobile app, refer to "Mobile app setting method" on page 03-76.

↓

End

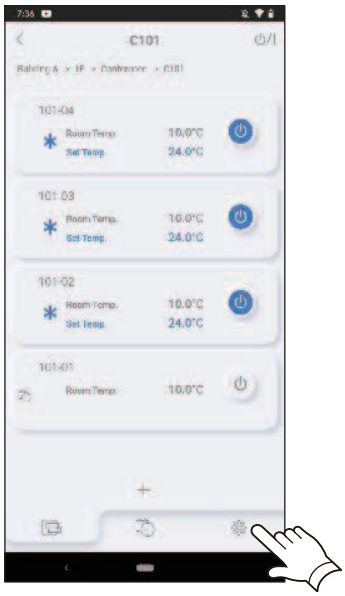
■ Mobile app setting method

● Air conditioner delete method

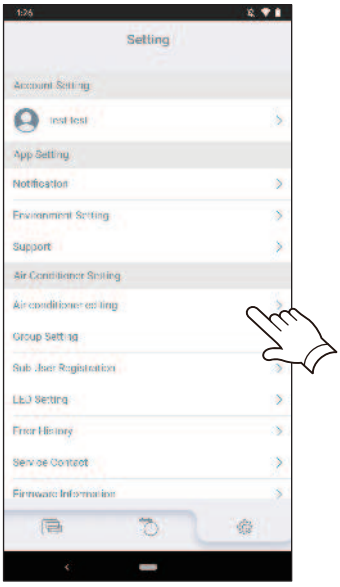
When the wireless LAN adapter is replaced, delete of all air conditioner is necessary on the mobile app.

1. Launch the mobile app.

2. Tap the  icon to display the Setting screen.

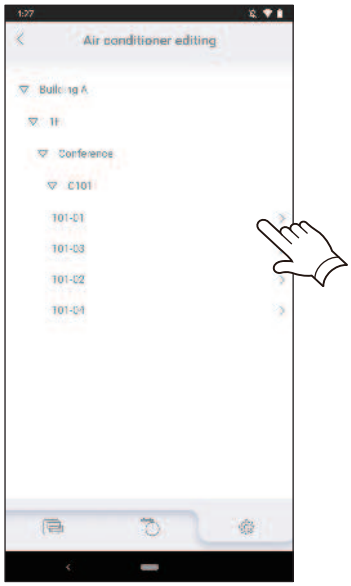


3. Tap the “Air conditioner editing”.

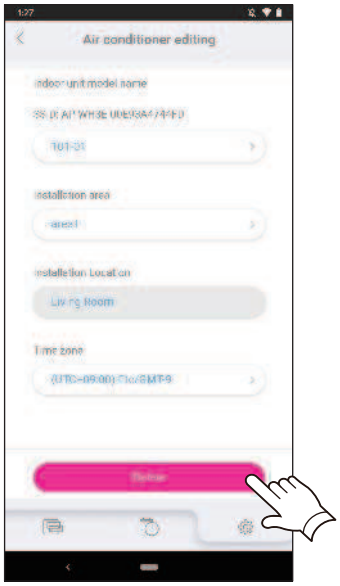


TROUBLESHOOTING

4. Tap the air conditioner to be deleted.



5. Tap the Delete button.



6. Tap the OK button.

7. Deletion of the air conditioner registered in the mobile app is completed.

3. Service parts information

3-1. Compressor

TROUBLESHOOTING

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

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

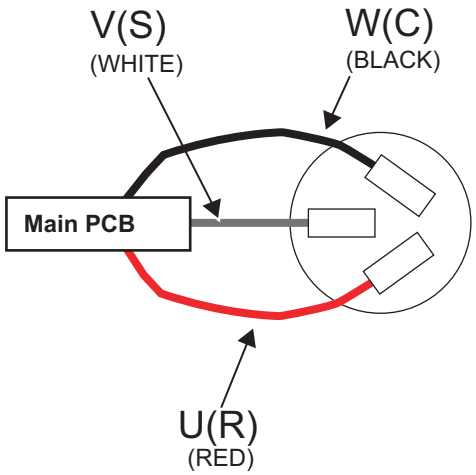
TROUBLESHOOTING

3-2. Inverter compressor

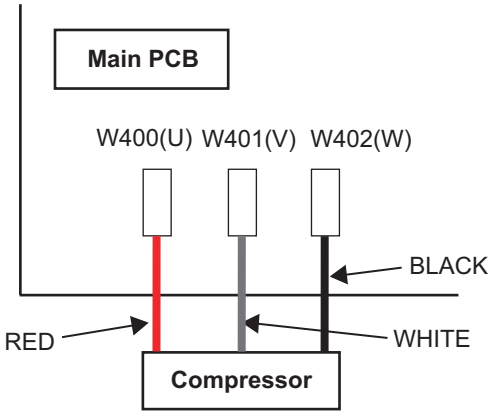
■ Models: ASUH09KNAS, ASUH12KNAS, and ASUH18KNAS

Check point 1. Check connection

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



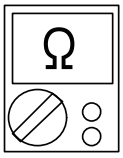
- Check terminal connection of main PCB (loose or incorrect wiring)

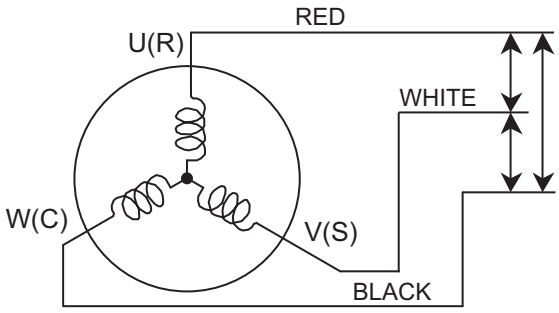


↓

Check point 2. Check winding resistance

Check winding resistance of each terminal.
Resistance value: 2.18 Ω ±7% at 68°F (20°C)





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

↓

Check point 3. Replace inverter PCB

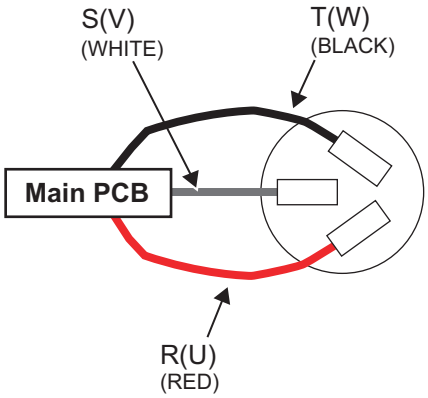
If check point 1 to 2 do not improve the symptom, replace main PCB.

■ Model: ASUH24KNAS

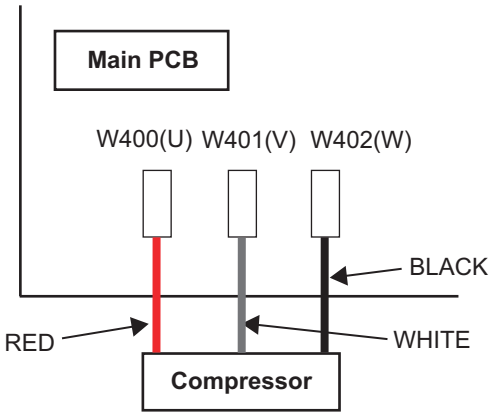
TROUBLESHOOTING

Check point 1. Check connection

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



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

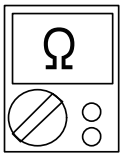


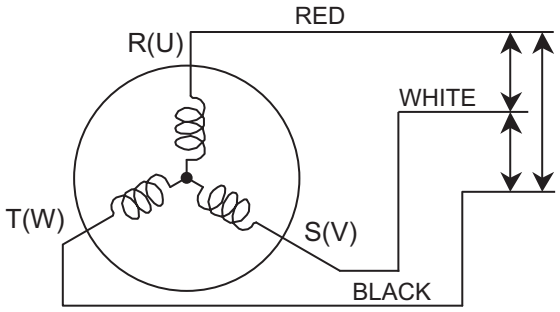
↓

Check point 2. Check winding resistance

Check winding resistance of each terminal.

Resistance value: 2.50 Ω ±8% at 68°F (20°C)





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

↓

Check point 3. Replace inverter PCB

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

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

TROUBLESHOOTING

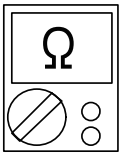
Check point 1. Check connections

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

NOTE: For details of wiring diagram, refer to "Wiring diagrams" in Chapter 2. TECHNICAL DATA AND PARTS LIST on page 02-32.

Check point 2. Check coil of EEV

Remove connector, check each winding resistance of coil.

Read wire	Resistance value
1 (Red)—2 (Blue)	46 Ω ±3.7 Ω at 68°F (20°C) 
1 (Red)—3 (Orange)	
1 (Red)—4 (Yellow)	
1 (Red)—5 (White)	

→ If Resistance value is abnormal, replace EEV.

Check point 3. Check Voltage from main PCB

Remove connector and check voltage (DC 12 V)

→ If it does not appear, replace main PCB.

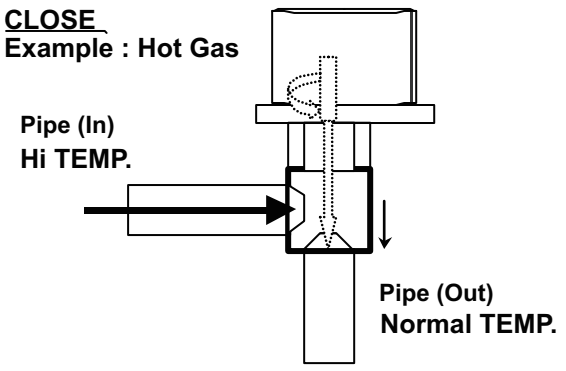
Check point 4. Check noise at start up

Turn on the power and check the operation noise.

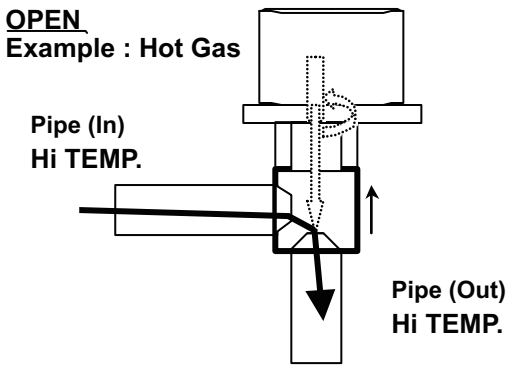
→ If an abnormal noise does not show, replace main PCB.

Check point 5. Check Opening and Closing Operation of Valve

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



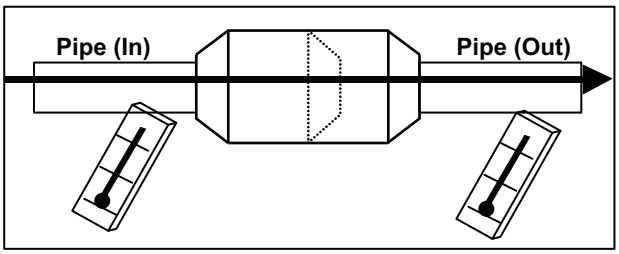
If it is open, it has no temp. difference between inlet and outlet



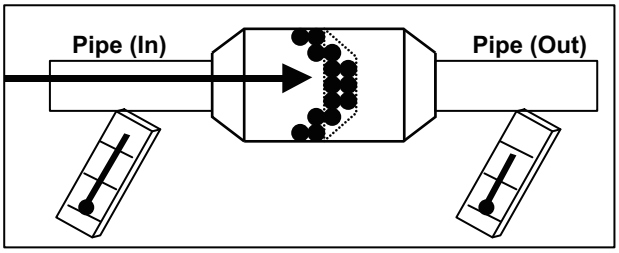
TROUBLESHOOTING

Check point 6. Check strainer

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



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



3-4. Indoor unit fan motor

TROUBLESHOOTING

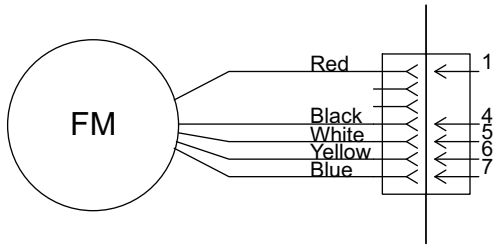
Check point 1. Check rotation of fan

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

Check point 2. Check resistance of indoor fan motor

Refer to below. Circuit-test “Vm” and “GND” terminal
NOTE: Vm: DC voltage, GND: Earth terminal

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



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

3-5. Outdoor unit fan motor

TROUBLESHOOTING

Check point 1. Check rotation of fan
Rotate the fan by hand when operation is off. (Check if fan is caught, dropped off or locked motor) → If fan or bearing is abnormal, replace it.

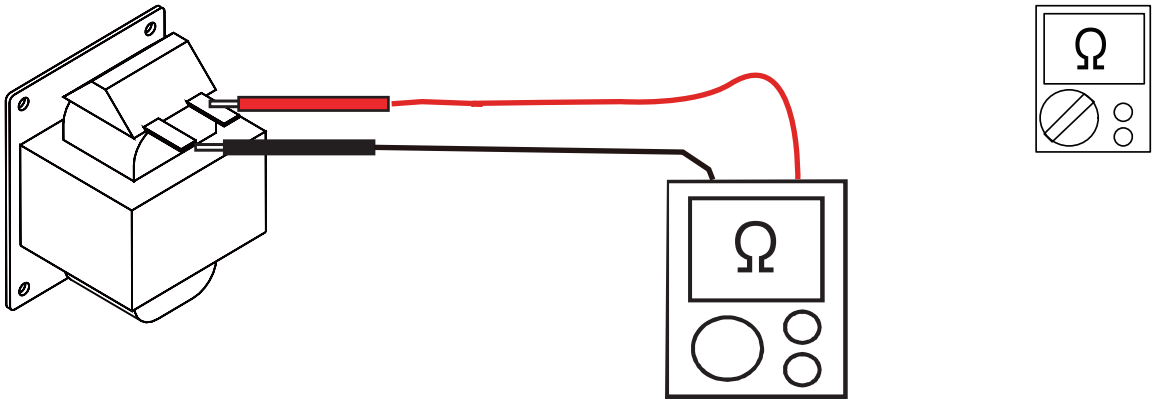
Check point 2. Check resistance of outdoor fan motor
Refer to below. Circuit-test “Vm” and “GND” terminal **NOTE:** Vm: DC voltage, GND: Ground terminal → If they are short-circuited (below 300 kΩ), replace outdoor fan motor and controller PCB.

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)

3-6. Reactor assy

Check point 1. Appearance check
No fissures, breaks, damage, etc. at the body and winding section, terminals section?

Check point 2. Electric check



- Set the tester to the "Resistance" mode, and check for open/short between both ends of the reactor wire (or connector).
- Judge the result of 1. as follows:

Short	Normal
Open	Abnormal (open)

NOTE: Reference value of DC resistance of reactor used:
415.9 mΩ (at 77°F [25°C])

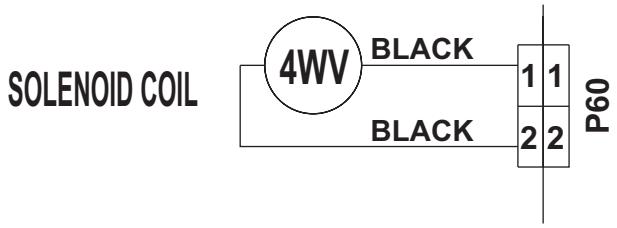
TROUBLESHOOTING

3-7. 4-way valve coil (solenoid coil)/4-way valve

TROUBLESHOOTING

Check point 1. Check connection

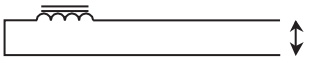
- Check the connection of connector P60.

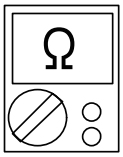


↓

Check Point 2. Check Solenoid Coil

Remove P60 from PCB and check the resistance value of coil.
Resistance Value ≈ 2085 Ω ±10%



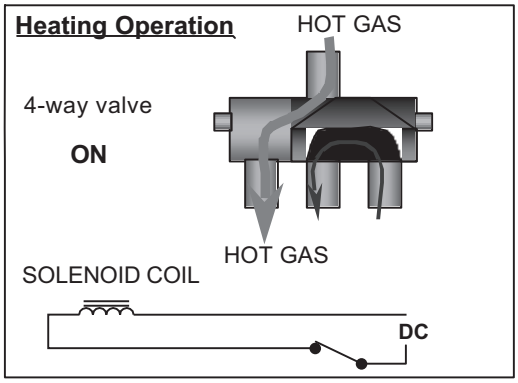


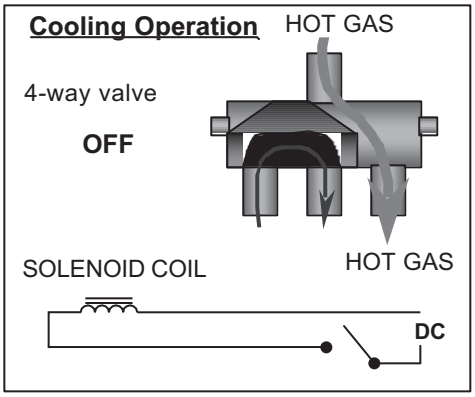
→ If it is Open or abnormal resistance value, replace Solenoid Coil.

↓

Check Point 3. Check Operation of 4 Way Valve

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





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

↓

Check Point 4. Replace Main PCB

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

4. Thermistor resistance values

4-1. Indoor unit

■ Room temperature thermistor

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

■ Heat exchanger temperature thermistor

Temperature °F (°C)	Resistance (kΩ)	Voltage (V)
-22.0 (-30.0)	1,131.91	0.21
-13.0 (-25.0)	804.52	0.29
-4.0 (-20.0)	579.59	0.40
5.0 (-15.0)	422.89	0.53
14.0 (-10.0)	312.27	0.69
23.0 (-5.0)	233.21	0.88
32.0 (0.0)	176.03	1.10
41.0 (5.0)	134.23	1.36
50.0 (10.0)	103.34	1.63
59.0 (15.0)	80.28	1.92
68.0 (20.0)	62.91	2.21
77.0 (25.0)	49.70	2.51
86.0 (30.0)	39.57	2.79
95.0 (35.0)	31.74	3.06
104.0 (40.0)	25.64	3.30
113.0 (45.0)	20.85	3.53
122.0 (50.0)	17.06	3.73
131.0 (55.0)	14.05	3.90
140.0 (60.0)	11.64	4.05
149.0 (65.0)	9.69	4.19

TROUBLESHOOTING

4-2. 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

TROUBLESHOOTING

■ Heat exchanger temperature thermistor

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

TROUBLESHOOTING

TROUBLESHOOTING

■ 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

■ Compressor temperature thermistor (for 24 model)

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

REFRIGERANT R32
INVERTER

4. CONTROL AND FUNCTIONS

CONTENTS

4. CONTROL AND FUNCTIONS

1. Rotation number control of compressor

1-1. Cooling operation

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

- If the room temperature is 11°F (6.0°C) higher than a set temperature, the operation rotation number of compressor 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 rotation number of compressor is controlled within the range shown in the table below. However, the maximum rotation number is limited in the range shown in the figure below based on the indoor fan mode and the outdoor temperature.

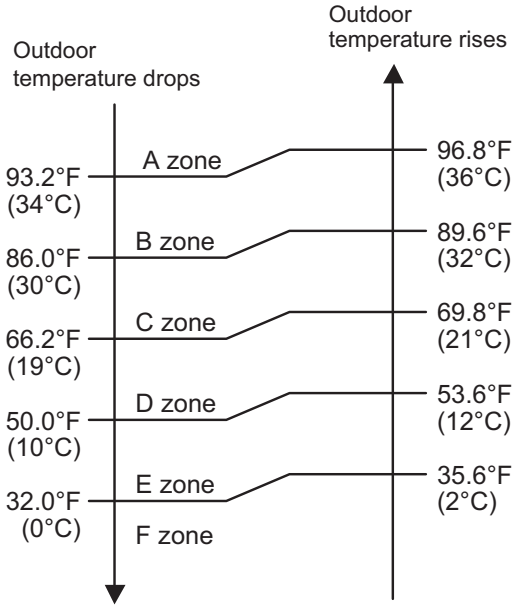
CONTROL AND FUNCTIONS

- **Rotation number range of compressor**

Unit: rps

Model name	Minimum rotation number	Maximum rotation number
ASUH09KNAS ASUH12KNAS	14	103
ASUH18KNAS	8	80
ASUH24KNAS	8	111

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



CONTROL AND FUNCTIONS

Unit: rps

Model name	Outdoor temperature zone	Indoor unit fan mode			
		HIGH	MED	LOW	QUIET
ASUH09KNAS	A zone	103	68	52	24
	B zone	90	68	52	24
	C zone	84	64	49	24
	D zone	64	49	32	24
	E zone	64	49	32	24
	F zone	64	49	32	24
ASUH12KNAS	A zone	103	78	68	30
	B zone	96	73	64	30
	C zone	90	73	60	30
	D zone	68	60	52	26
	E zone	60	46	34	26
	F zone	60	46	34	26
ASUH18KNAS	A zone	80	46	32	24
	B zone	80	46	32	24
	C zone	80	46	32	24
	D zone	54	36	28	24
	E zone	54	36	28	24
	F zone	54	36	28	24
ASUH24KNAS	A zone	111	54	42	30
	B zone	111	54	42	30
	C zone	111	54	42	30
	D zone	74	46	36	28
	E zone	74	46	36	28
	F zone	74	46	36	28

1-2. Heating operation

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

- If the room temperature is 11°F (6.0°C) lower than a set temperature, the operation rotation number of compressor 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 rotation number of compressor is controlled within the range shown below.

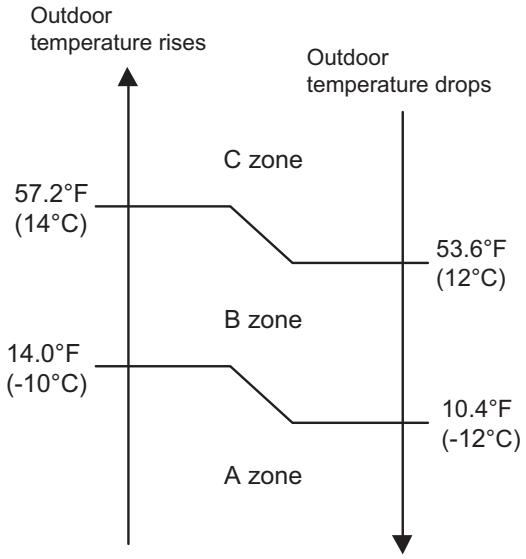
- **Rotation number range of compressor**

Unit: rps

Model name	Minimum rotation number	Maximum rotation number
ASUH09KNAS ASUH12KNAS	14	110
ASUH18KNAS ASUH24KNAS	8	120

CONTROL AND FUNCTIONS

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



Unit: rps

Model name	Outdoor temperature zone	Indoor unit fan mode			
		HIGH	MED	LOW	QUIET
ASUH09KNAS	A zone	110	103	103	96
	B zone	110	103	96	52
	C zone	110	103	84	52
ASUH12KNAS	A zone	110	103	78	78
	B zone	110	103	78	73
	C zone	110	103	73	46
ASUH18KNAS	A zone	120	120	87	87
	B zone	102	102	87	63
	C zone	94	74	63	39
ASUH24KNAS	A zone	120	120	87	87
	B zone	120	120	87	68
	C zone	120	94	68	39

1-3. Dry operation

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

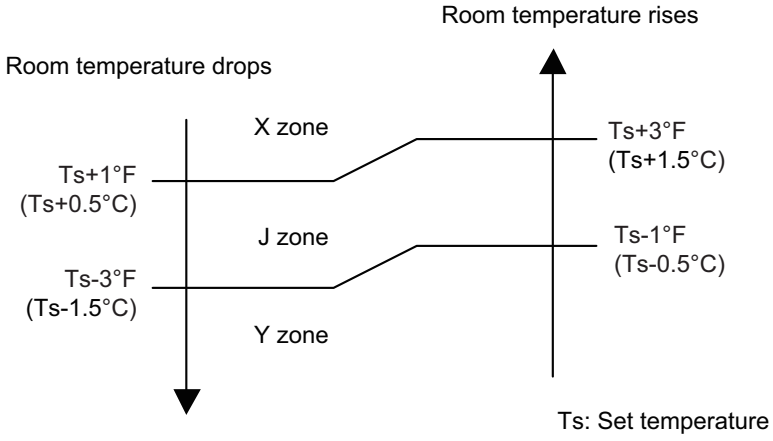
Zone is defined by set temperature and room temperature.

- **Rotation number range of compressor**

Unit: rps

Model name	Outdoor temperature zone	Operating rotation number
ASUH09KNAS ASUH12KNAS	X zone	24
	J zone	20
	Y zone	0
ASUH18KNAS	X zone	24
	J zone	12
	Y zone	0
ASUH24KNAS	X zone	30
	J zone	16
	Y zone	0

- **Compressor control based on room temperature**

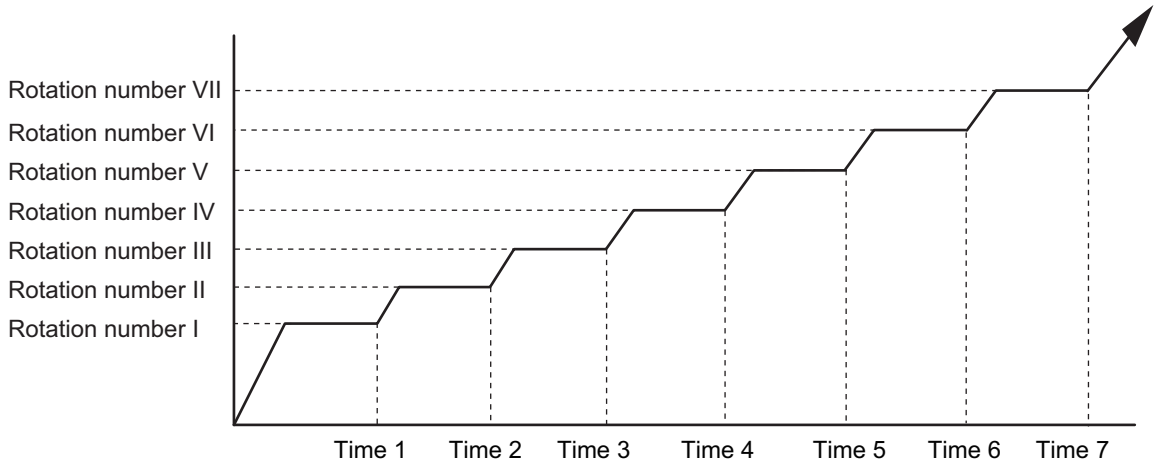


CONTROL AND FUNCTIONS

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

■ Models: AOUH09KNAS1 and AOUH12KNAS1

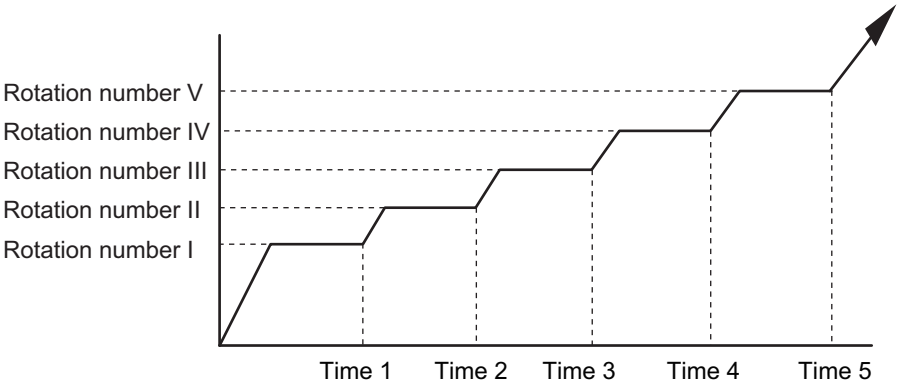
Rotation number of compressor soon after starting is controlled as below.



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

■ Models: AOUH18KNAS1 and AOUH24KNAS1

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



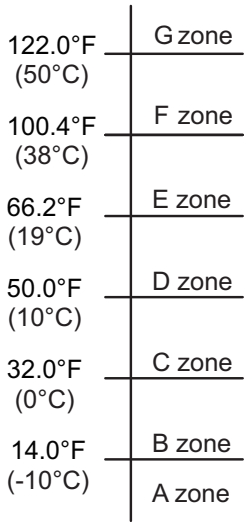
Rotation number (rps)	I	II	III	IV	V
	32	56	77	90	99
Time (sec)	1	2	3	4	5
	60	240	280	360	400

CONTROL AND FUNCTIONS

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

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

- **Cooling/Dry mode**

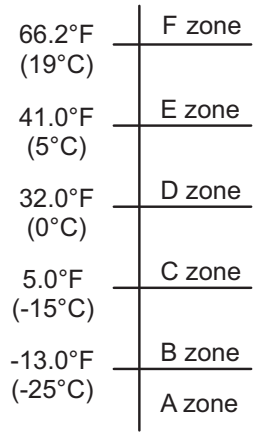


Unit: rps

Model name	Outdoor temperature zone	Limitation of compressor rotation number
AOUH09KNAS1	A zone	42
	B zone	42
	C zone	33
	D zone	24
	E zone	16
	F zone	21
	G zone	21
AOUH12KNAS1	A zone	42
	B zone	42
	C zone	33
	D zone	26
	E zone	16
	F zone	21
	G zone	21
AOUH18KNAS1 AOUH24KNAS1	A zone	34
	B zone	34
	C zone	34
	D zone	24
	E zone	10
	F zone	24
	G zone	24

CONTROL AND FUNCTIONS

- **Heating mode**



Unit: rps

Model name	Outdoor temperature zone	Limitation of compressor rotation number
AOUH09KNAS1	A zone	43
	B zone	43
	C zone	30
	D zone	18
	E zone	20
	F zone	16
AOUH12KNAS1	A zone	43
	B zone	43
	C zone	30
	D zone	18
	E zone	16
	F zone	16
AOUH18KNAS1 AOUH24KNAS1	A zone	60
	B zone	39
	C zone	34
	D zone	18
	E zone	14
	F zone	14

CONTROL AND FUNCTIONS

2. Auto changeover operation

When the air conditioner is set to AUTO mode by remote controller, operation starts in the optimum mode from among heating, cooling, and monitoring modes. During operation, the optimum mode is automatically switched in accordance with temperature changes. The temperature can be set between 64.4°F (18°C) and 86.0°F (30°C) in 1.8°F (1.0°C) steps.

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

Room temperature	Operation mode
Tr > Ts + 3.6°F (2°C)	Cooling
Ts + 3.6°F (2°C) ≥ Tr ≥ Ts - 3.6°F (2°C)	Middle zone
Tr < Ts - 3.6°F (2°C)	Heating

Tr: Room temperature

Ts: Setting temperature

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

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

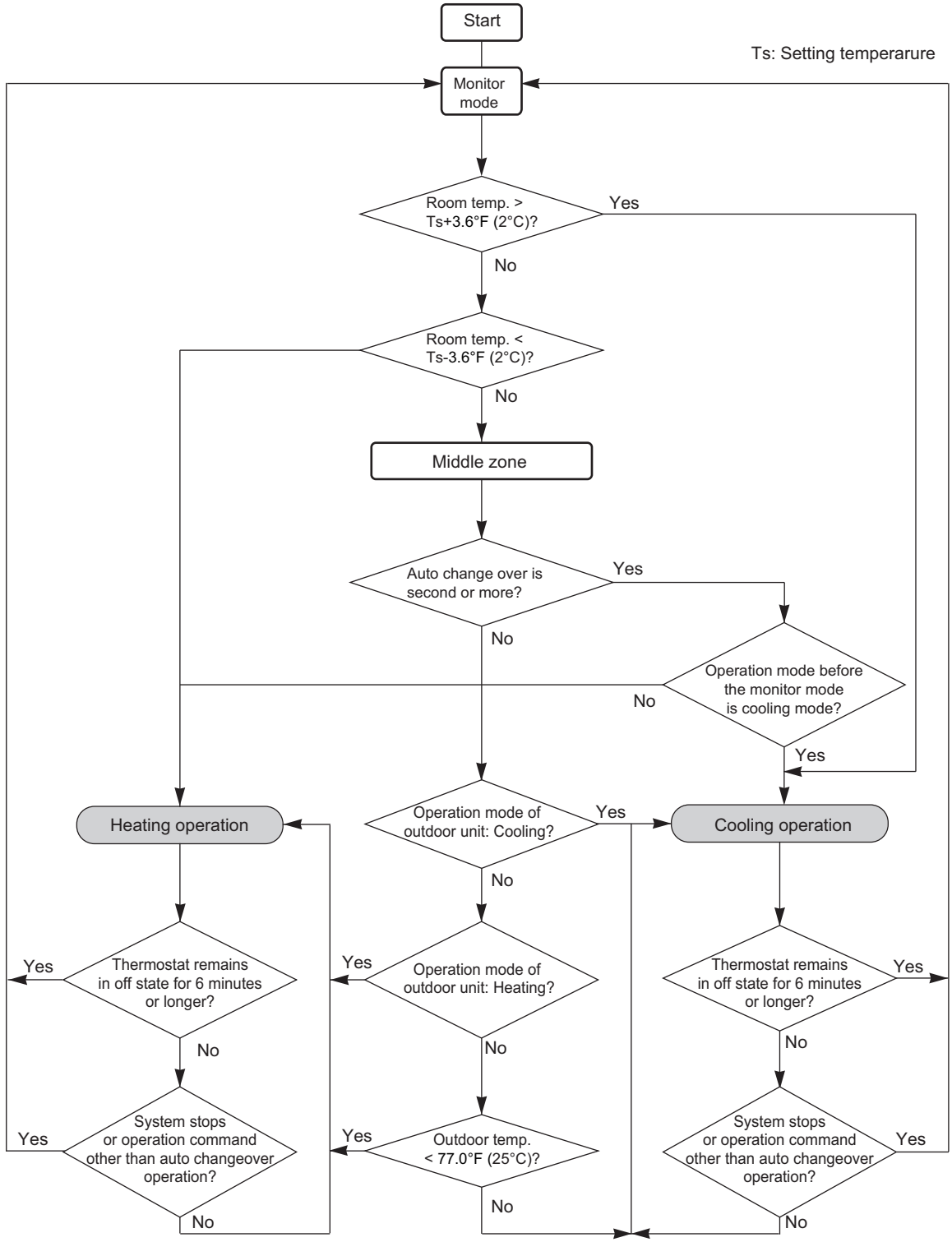
Outdoor temp.	Operation mode
77.0°F (25°C) or more	Cooling
Less than 77.0°F (25°C)	Heating

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

- When the middle zone is selected on the predetermining of the operation mode, the operation mode before the changing to the monitoring mode is selected.

CONTROL AND FUNCTIONS

Operation flow chart



CONTROL AND FUNCTIONS

3. Fan control

Tr: Room temperature
Ts: Setting temperature

3-1. Indoor fan control

■ Fan speed

Indoor fan speed is defined as below.

Operation mode	Fan mode	Speed (rpm)			
		ASUH09KNAS	ASUH12KNAS	ASUH18KNAS	ASUH24KNAS
Heating	POWERFUL	1,360	1,380	1,540	1,490
	HIGH	1,260	1,310	1,440	1,390
	MED+	1,160	1,170	1,300	1,300
	MED	1,070	1,050	1,180	1,160
	LOW	890	890	970	980
	QUIET	640	650	810	830
	Cool air prevention	600	600	730	650
	S-LOW	550	550	550	520
Cooling/Fan	POWERFUL	1,360	1,380	1,540	1,490
	HIGH	1,260	1,280	1,440	1,410
	MED	1,040	1,050	1,150	1,160
	LOW	810	840	930	980
	QUIET	610	620	760	810
	Soft quiet	550*1	550*1	640*1	650*1
	S-LOW	550*2	550*2	550*2	520*2
Dry		X zone:620 J zone: 620	X zone: 620 J zone: 620	X zone: 760 J zone: 760	X zone: 810 J zone: 810

*1: Fan mode only

*2: Cooling mode only

■ Fan operation

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

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

CONTROL AND FUNCTIONS

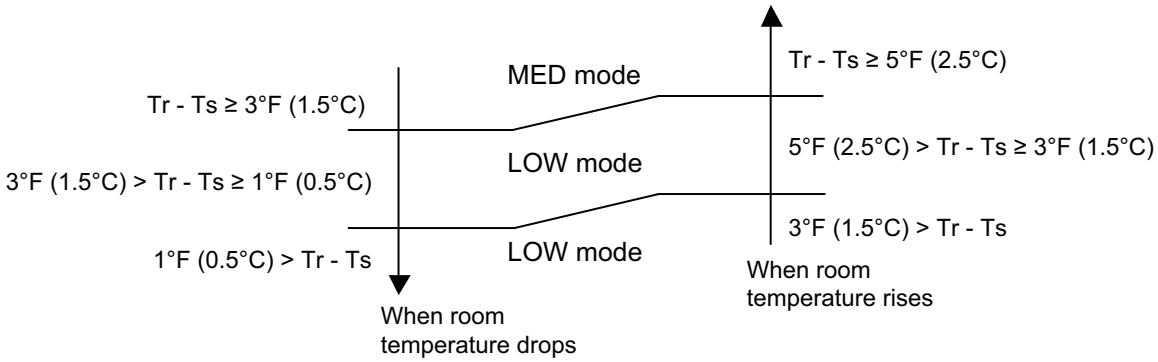
CONTROL AND FUNCTIONS

■ Cooling operation

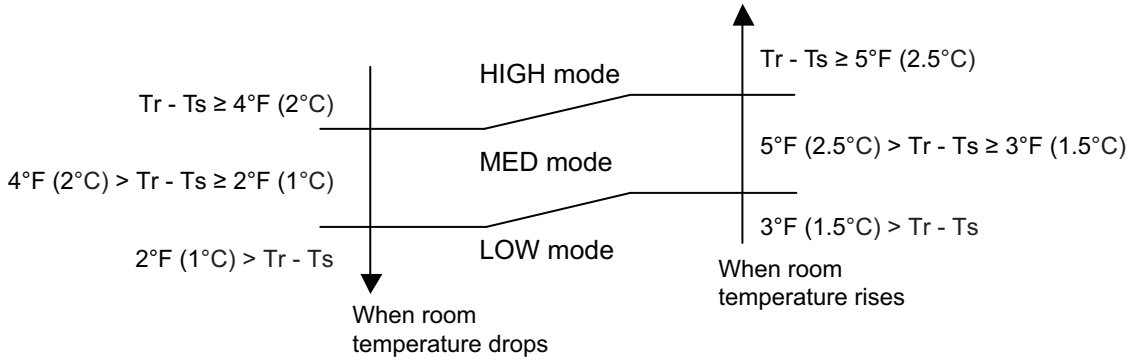
Switch the airflow AUTO, and indoor fan motor will run according to room temperature, as below.
On the other hand, if switched in HIGH—QUIET, indoor motor will run at a constant airflow of COOL operation modes QUIET, LOW, MED, HIGH as shown in “Fan speed” above.

Airflow change over (Cooling: Auto)

- Models: ASUH09KNAS and ASUH12KNAS



- Models: ASUH18KNAS and ASUH24KNAS



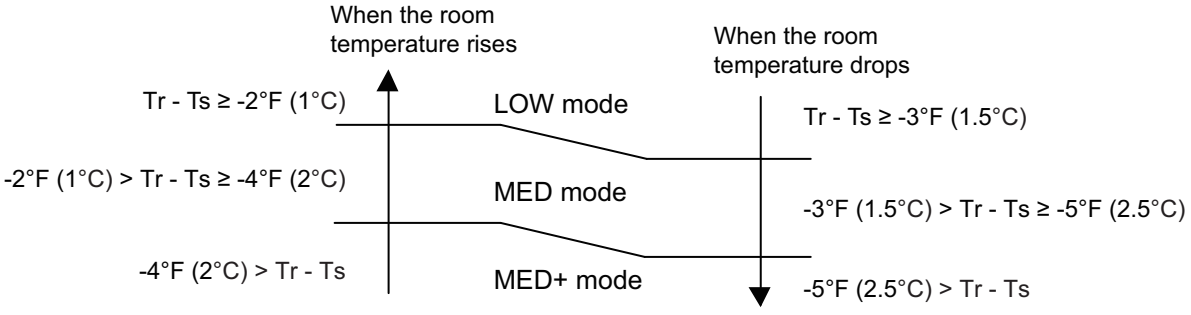
■ Dry operation

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

■ Heating operation

Switch the airflow AUTO, and the indoor fan motor will run according to a room temperature, as below.
On the other hand, if switched in HIGH—QUIET, the indoor motor will run at a constant airflow of HEAT operation modes QUIET, LOW, MED, HIGH as shown in “Fan speed” above.

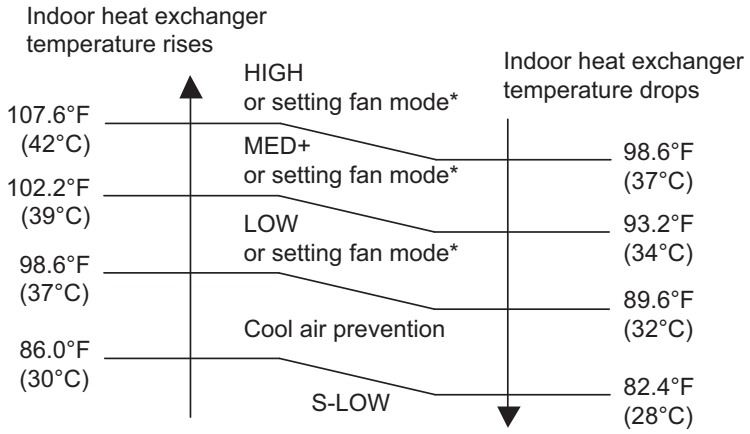
Airflow change over (Heating: Auto)



■ Cool air prevention control (heating mode)

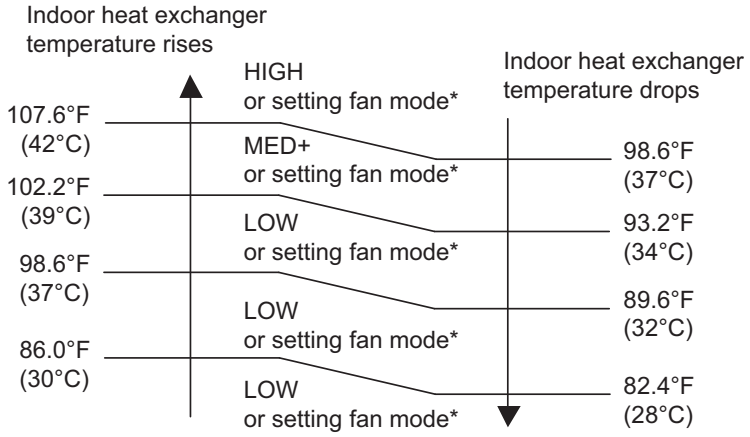
The maximum value of the indoor fan speed is set as shown below, based on the detected temperature by the indoor heat exchanger sensor on heating mode.

- **Normal operation**



*: Lower speed is selected.

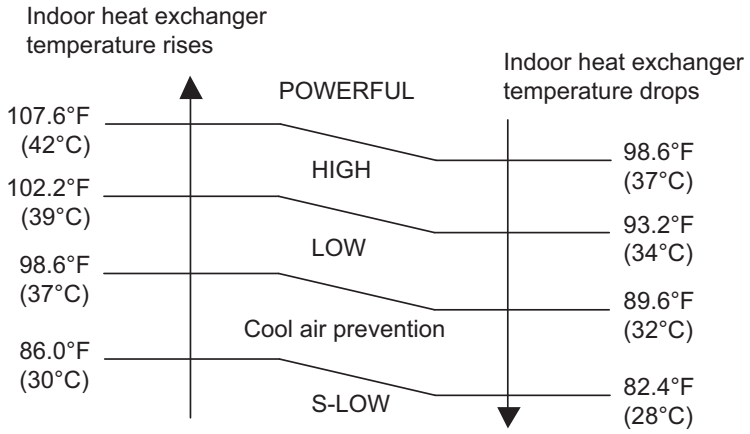
7 minutes later:



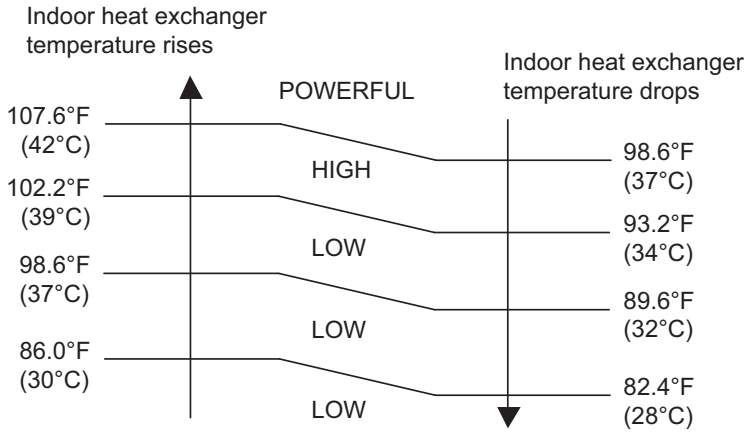
*: Lower speed is selected.

CONTROL AND FUNCTIONS

- **Powerful operation**

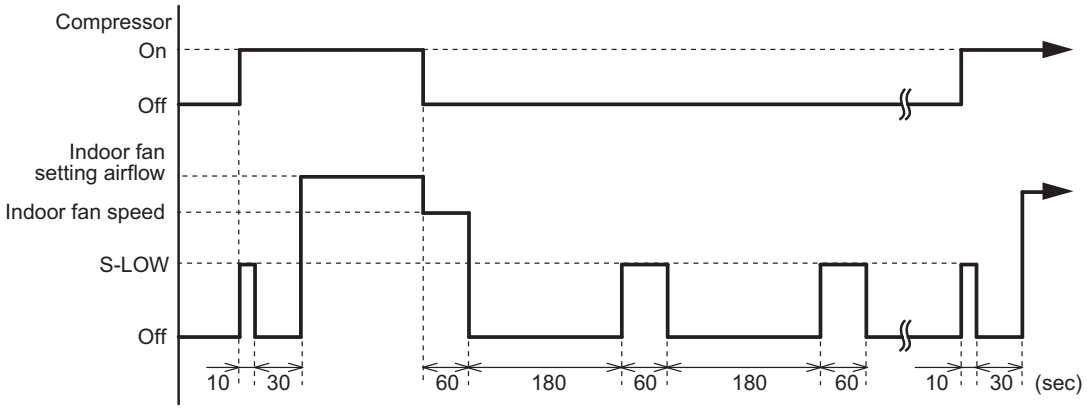


7 minutes later:



■ Moisture return prevention control (cooling and dry mode)

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



3-2. Outdoor fan control

■ Outdoor fan motor

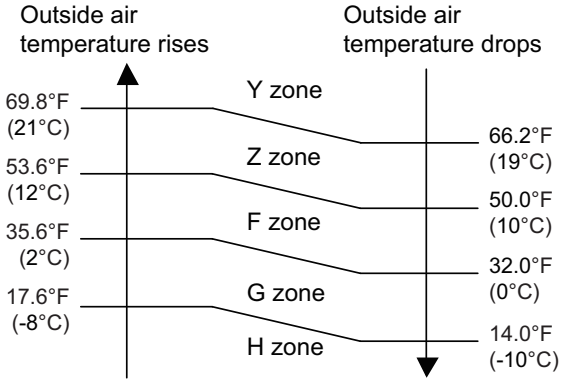
This outdoor unit has a DC fan motor. (Control method is different between AC and DC motors.)

■ Fan speed

● Model: AOUH09KNAS1

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

- **Outside air temperature zone selection**



Unit: rpm

Fan step	Cooling	Heating	Dry	Cooling or dry at low outdoor temp.			
	Y zone		Y zone	Z zone	F zone	G zone	H zone
S-HIGH2	—	930	—	—	—	—	—
S-HIGH1	950	930	—	—	—	—	—
HIGH	950	930	—	—	—	—	—
10	—	690	—	—	—	—	—
9	950	690	950	950	950	950	950
8	780	690	780	780	270	250	250
7	780	690	780	780	270	250	250
6	780	690	780	540	270	250	250
5	780	690	780	360	240	220	220
4	780	550	780	270	210	190	190
3	680	510	680	270	190	170	170
2	610	480	610	270	190	170	170
1	580	480	580	270	170	170	170

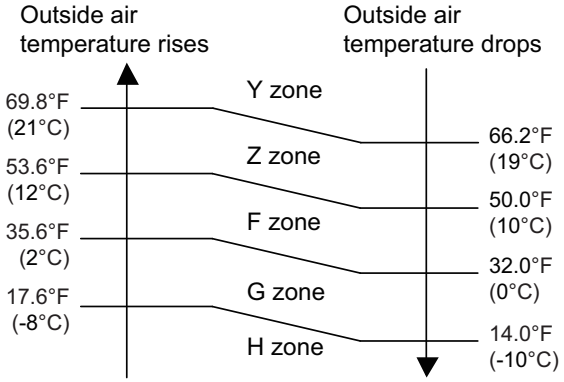
NOTE: After defrost control on the heating mode, the fan speed is kept higher regardless of the compressor frequency.
Fan speed after defrost control: 930 rpm

CONTROL AND FUNCTIONS

● Model: AOUH12KNAS1

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	—	1,020	—	—	—	—	—
S-HIGH1	950	1,020	—	—	—	—	—
HIGH	950	1,020	—	—	—	—	—
10	—	790	—	—	—	—	—
9	950	790	950	950	950	950	950
8	900	790	900	900	350	330	330
7	900	790	900	900	350	330	330
6	900	790	900	560	350	330	330
5	900	730	900	420	320	300	300
4	800	630	800	350	290	270	270
3	680	530	680	350	270	250	250
2	580	470	580	350	270	250	250
1	540	470	540	350	250	250	250

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

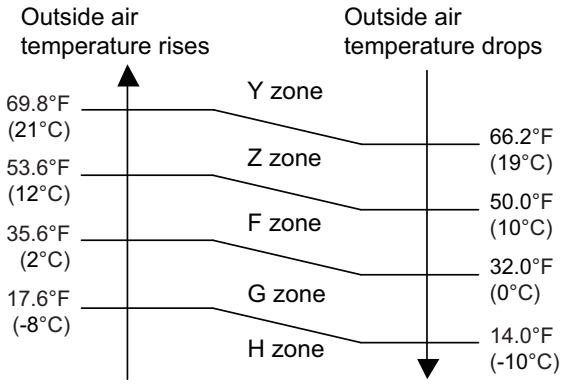
Fan speed after defrost control: 1,020 rpm

CONTROL AND FUNCTIONS

● Model: AOUH18KNAS1

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	1,020	1,120	—	—	—	—	—
HIGH	1,020	1,120	—	—	—	—	—
10	—	1,020	—	—	—	—	—
9	1,020	1,020	1,020	630	320	270	270
8	1,020	1,020	1,020	630	320	270	270
7	1,020	920	1,020	630	320	270	270
6	920	850	920	610	290	240	240
5	920	850	920	520	250	210	210
4	810	660	810	440	250	210	210
3	670	500	670	440	250	210	210
2	570	500	570	440	250	210	210
1	520	500	520	440	250	210	210

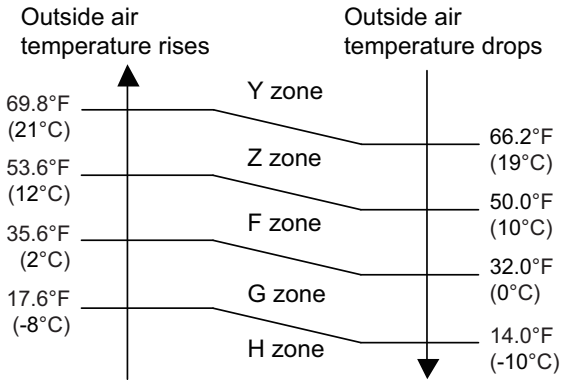
NOTE: After defrost control on the heating mode, the fan speed is kept higher regardless of the compressor frequency.
Fan speed after defrost control: 1,120 rpm

CONTROL AND FUNCTIONS

● Model: AOUH24KNAS1

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	—	1,050	—	—	—	—	—
9	1,050	1,050	1,050	850	320	270	270
8	1,050	1,050	1,050	850	320	270	270
7	1,050	920	1,050	770	270	270	270
6	990	710	990	630	230	210	210
5	840	620	840	440	200	200	200
4	680	560	680	320	200	200	200
3	560	420	560	320	200	200	200
2	440	420	440	320	200	200	200
1	440	420	440	320	200	200	200

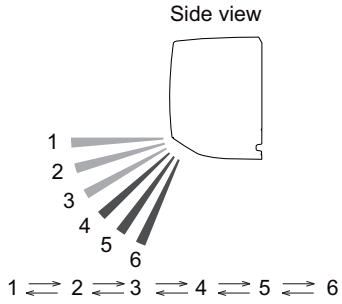
NOTE: After defrost control on the heating mode, the fan speed is kept higher regardless of the compressor frequency.
Fan speed after defrost control: 1,100 rpm

CONTROL AND FUNCTIONS

4. Louver control

4-1. Horizontal louver control

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



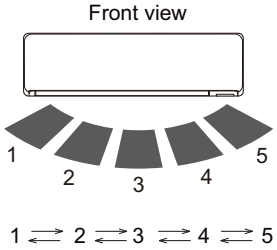
- Remote controller display is not changed.
- Up/down airflow direction is set automatically as shown, in accordance with the type of operation selected.

  Cooling / Dry mode : Horizontal flow 1

  Heating mode : Downward flow 6
- During AUTO operation, for the first a few minutes after beginning operation, airflow will be horizontal 1; the air direction cannot be adjusted during this period.
  The airflow direction setting will temporarily become 1 when the temperature of the airflow is low at the start of the Heating mode.
- After beginning of AUTO/HEAT mode operated and automatic defrosting operation, the airflow will be horizontal 1. However, the airflow direction cannot be adjusted at beginning AUTO operation mode.

4-2. Vertical louver control (for 24 model)

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



Remote controller display is not changed.

CONTROL AND FUNCTIONS

4-3. Swing operation

- To select up/down airflow swing operation
  When the swing signal is received, the horizontal louver starts to swing.
  - Swinging range
    - Cooling mode/dry mode/fan mode (1 to 3): 1 ↔ 4
    - Heating mode/fan mode (4 to 6): 3 ↔ 6
  - When the indoor fan is S-LOW or stop mode, the swing operation is interrupted and it stops at either upper end or bottom end.

- To select left/right airflow swing operation (24 model only)
  When the swing signal is received, the vertical louver starts to swing.
  - Swinging range
    - All mode: 1 ↔ 5
  - When the indoor fan is S-LOW or stop mode, the swing operation is interrupted and it stops at either left end or right end.

- To select up/down and left/right airflow swing operation (24 model only)
  When the swing signal is received, both of the vertical and the horizontal louvers start to swing.

CONTROL AND FUNCTIONS

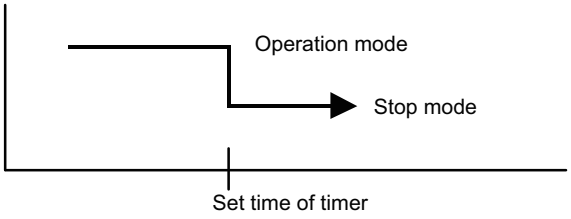
5. Timer operation control

5-1. Wireless remote control

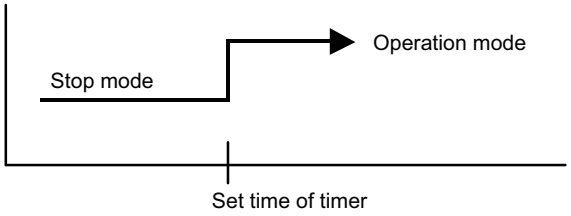
On/Off timer	Program timer	Sleep timer	Weekly timer
○	○	○	—

■ On/Off timer

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

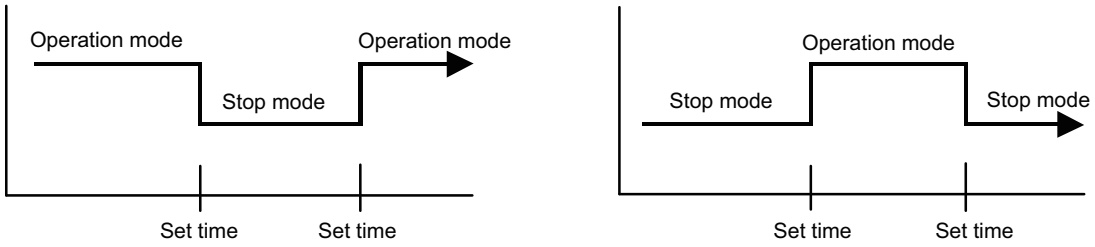


- On timer: When the clock reaches the set timer, the air conditioner will be turned on.



■ Program timer

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



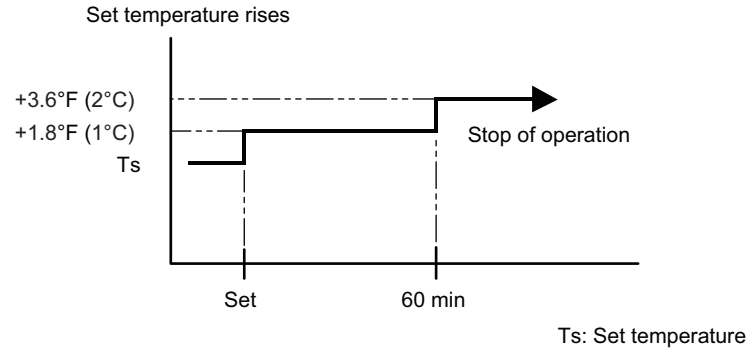
- Operation will start from the timer setting (either off timer and on timer) whichever is closest to the clock current timer setting. The order of operations is indicated by the allow in the remote controller screen.
- Sleep timer operation cannot be combined with on timer operation.

CONTROL AND FUNCTIONS

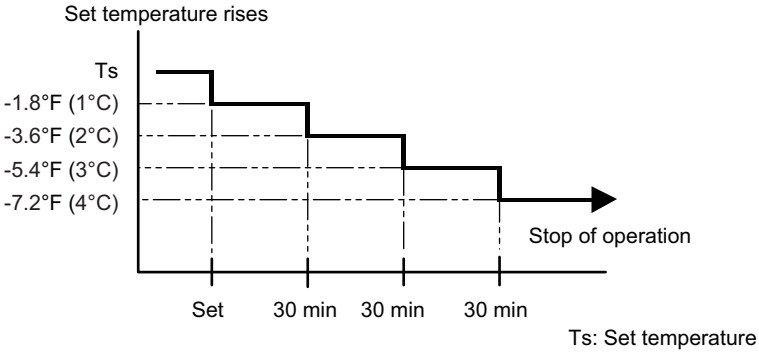
■ Sleep timer

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

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



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



CONTROL AND FUNCTIONS

6. Defrost operation control

Tn: Outdoor unit heat exchanger temperature
Ta: Outdoor temperature
Tn10: Temperature at 10 minutes after compressor start
Tnb: Temperature before 5 minutes

• Triggering condition

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

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

Compressor integrating operation time	Less than 17 min.	17 to 57 min.	More than 57 min.
Condition	Does not operate	Tn ≤ 15.8°F (-9°C) and Tn-Ta ≥ 9.0°F (5°C)	Tn ≤ 23.0°F (-5°C)

– **2nd time and after**

Compressor integrating operation time	Less than 40 min.	More than 40 min.
Condition	Does not operate	Tn-Tn10 < -9.0°F (-5°C) (Tn ≤ 21.2°F [-6°C]) Tn-Tnb < -3.6°F (-2°C) (Tn ≤ 21.2°F [-6°C]) Tn ≤ 1.4°F (-17°C) (Ta ≥ 14.0°F [-10°C]) Tn ≤ 19.4°F (-7°C) or Tn ≤ -4.0°F (-20°C) (Ta < 14.0°F [-10°C])

– **Integrating defrost (Constant monitoring)**

Compressor integrating operation time	More than 240 min. (For long continuous operation)	More than 215 min. (For long continuous operation	Less than 10 min.* (For intermittent operation)
Condition	Tn ≤ 26.6°F (-3°C)	Tn ≤ 23.0°F (-5°C)	Count of the compressor off: 40 times

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

• Release condition

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

Outdoor unit heat exchanger temperature (after 1 minute or later since compressor start)	09/12 model	60.8°F (16°C) or more
	18/24 model	55.4°F (13°C) or more
Compressor operation time		15 minutes

CONTROL AND FUNCTIONS

6-1. Defrost operation in heating operation stopped

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

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

• Triggering condition

When all of the following conditions are satisfied in heating operation

– Compressor operation integrating time: 30 minutes or more
– Compressor continuous operation time: 10 minutes or more
– Outdoor unit heat exchanger temperature: 24.8°F (-4°C) or less

• Release condition

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

Outdoor unit heat exchanger temperature (after 1 minute or later since compressor start)	09/12 model	60.8°F (16°C) or more
	18/24 model	55.4°F (13°C) or more
Compressor operation time		15 minutes

CONTROL AND FUNCTIONS

7. Various control

7-1. Auto restart

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

Operation contents memorized when the power is interrupted
Operation mode
Setting temperature
Fan mode setting
Timer mode and set time (set by wireless remote controller)
Airflow direction setting
Swing
ECONOMY operation
Remote control setting
WLAN LED setting

CONTROL AND FUNCTIONS

7-2. MANUAL AUTO operation

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

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

Operation mode	Auto changeover
Fan mode	AUTO
Timer mode	Continuous (no timer setting available)
Setting temperature	75.2°F (24°C)
Horizontal louver setting	Standard
Vertical louver setting(24 model only)	According to memory position
SWING	Off
ECONOMY	Off

7-3. Forced cooling operation

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

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

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

CONTROL AND FUNCTIONS

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

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

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

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

7-4. ECONOMY operation

The ECONOMY operation can start via the remote controller. The starting operation may vary between the remote controller models.

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)

7-5. POWERFUL operation

The POWERFUL operation can start via the remote controller. The starting operation may vary between the remote controller models.

The indoor unit and outdoor unit operate at maximum power as shown in the table below.

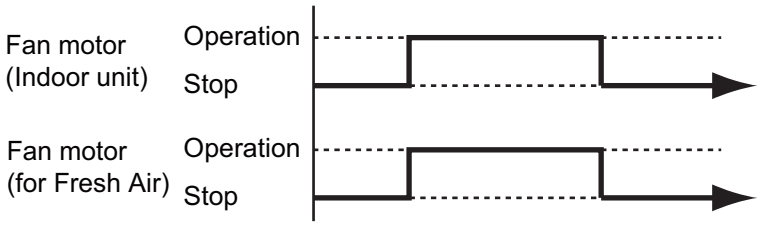
Rotation number of compressor		Maximum
Fan mode		POWERFUL
Vertical airflow direction louver setting	Cooling	3
	Dry	
	Heating	6

Release condition:

- Cooling/Dry
  Room temperature ≤ Setting temperature -1°F (-0.5°C) or Operation time has passed 20 minutes.
- Heating
  Room temperature ≥ Setting temperature +1°F (+0.5°C) or Operation time has passed 20 minutes.

7-6. Fresh air control

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



7-7. Compressor preheating operation

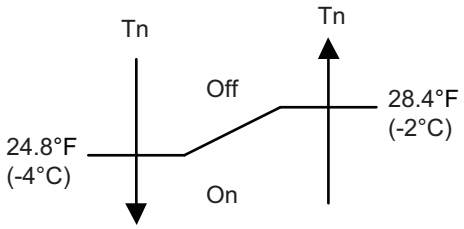
⚠ CAUTION

To perform the preheat operation, turn on the power for the outdoor unit at least 12 hours before the operation. Especially in cold climate regions, the compressor may fail if the outdoor unit is on for less than 12 hours.

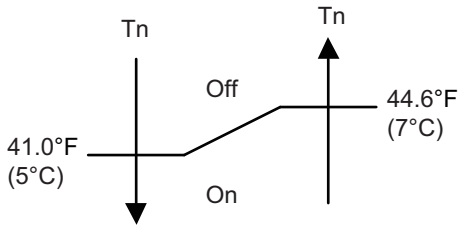
CONTROL AND FUNCTIONS

Compressor preheating operation prevents the damage caused by the refrigerant in the compressor from soaking into the oil. 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)

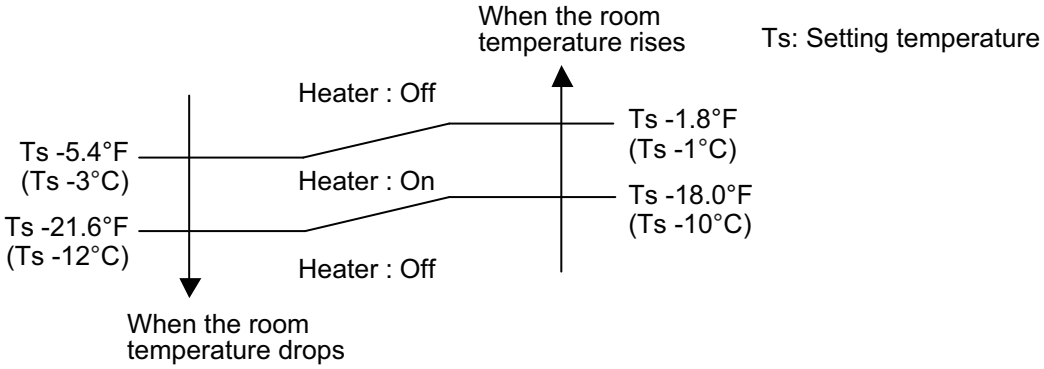


When the jumper wire (J600) is disconnected:



7-8. 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.)

CONTROL AND FUNCTIONS

7-9. Electronic expansion valve control

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

Operation mode	Pulse range
Cooling/dry mode	Between 52 and 480 pulses
Heating mode	

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

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

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

- **Models: AOUH09KNAS1 and AOUH12KNAS1**

Retry number	10
Retry set number	10

- **Models: AOUH18KNAS1 and AOUH24KNAS1**

Retry number	5
Retry set number	3

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

7-11. 4-way valve control

- If heating mode is selected at the compressor start, 4-way valve is energized for heating.
- When the air conditioner is switched between cooling and heating mode, compressor is stopped, and the 4-way valve is switched when the 140 seconds passes and the compressor is started.

7-12. Outdoor unit low noise operation

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

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

- **Model: AOUH09KNAS1**

Operation mode	Current	
	Trigger condition	Release condition
Cooling/Dry mode	25.5 A	25.5 A
Heating mode	25.5 A	25.5 A

- **Model: AOUH12KNAS1**

Operation mode	Current	
	Trigger condition	Release condition
Cooling/Dry mode	1.9 A	1.4 A
Heating mode	1.9 A	1.4 A

- **Models: AOUH18KNAS1 and AOUH24KNAS1**

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

CONTROL AND FUNCTIONS

8. Various protections

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

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

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

Trigger condition	219.2°F (104°C)
Rotation number of compressor	-20 rps/120 seconds
Release condition	213.8°F (101°C)
Compressor protection temperature	230.0°F (110°C)

CONTROL AND FUNCTIONS

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

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

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

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

*1: During the outdoor temperature dropping

*2: During the outdoor temperature rising

8-3. Current release control

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

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

■ Model: AOUH09KNAS1

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	122.0°F (50°C) ≤ Ta	3.5 A	3.0 A
	114.8°F (46°C) ≤ Ta < 122.0°F (50°C)	3.5 A	3.0 A
	104.0°F (40°C) ≤ Ta < 114.8°F (46°C)	4.0 A	3.5 A
	53.6°F (12°C) ≤ Ta < 104.0°F (40°C)	5.5 A	5.0 A
	35.6°F (2°C) ≤ Ta < 53.6°F (12°C)	5.5 A	5.0 A
	Ta < 35.6°F (2°C)	5.5 A	5.0 A
Heating	62.6°F (17°C) ≤ Ta	5.5 A	5.0 A
	53.6°F (12°C) ≤ Ta < 62.6°F (17°C)	7.0 A	6.5 A
	41.0°F (5°C) ≤ Ta < 53.6°F (12°C)	7.0 A	6.5 A
	Ta < 41.0°F (5°C)	7.0 A	6.5 A

■ Model: AOUH12KNAS1

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	122.0°F (50°C) ≤ Ta	4.0 A	3.5 A
	114.8°F (46°C) ≤ Ta < 122.0°F (50°C)	4.0 A	3.5 A
	104.0°F (40°C) ≤ Ta < 114.8°F (46°C)	5.0 A	4.5 A
	53.6°F (12°C) ≤ Ta < 104.0°F (40°C)	6.0 A	5.5 A
	35.6°F (2°C) ≤ Ta < 53.6°F (12°C)	6.0 A	5.5 A
	Ta < 35.6°F (2°C)	6.0 A	5.5 A
Heating	62.6°F (17°C) ≤ Ta	5.5 A	5.0 A
	53.6°F (12°C) ≤ Ta < 62.6°F (17°C)	6.0 A	5.5 A
	41.0°F (5°C) ≤ Ta < 53.6°F (12°C)	7.0 A	6.5 A
	Ta < 41.0°F (5°C)	7.0 A	6.5 A

CONTROL AND FUNCTIONS

■ Model: AOUH18KNAS1

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	122.0°F (50°C) ≤ Ta	4.5 A	4.0 A
	114.8°F (46°C) ≤ Ta < 122.0°F (50°C)	4.5 A	4.0 A
	104.0°F (40°C) ≤ Ta < 114.8°F (46°C)	6.0 A	5.5 A
	53.6°F (12°C) ≤ Ta < 104.0°F (40°C)	9.0 A	8.5 A
	35.6°F (2°C) ≤ Ta < 53.6°F (12°C)	9.0 A	8.5 A
	Ta < 35.6°F (2°C)	9.0 A	8.5 A
Heating	62.6°F (17°C) ≤ Ta	7.0 A	6.5 A
	53.6°F (12°C) ≤ Ta < 62.6°F (17°C)	9.0 A	8.5 A
	41.0°F (5°C) ≤ Ta < 53.6°F (12°C)	11.0 A	10.5 A
	Ta < 41.0°F (5°C)	11.0 A	10.5 A

■ Model: AOUH24KNAS1

Operation mode	Outdoor temp. (Ta)	Trigger condition	Release condition
Cooling	122.0°F (50°C) ≤ Ta	7.0 A	6.5 A
	114.8°F (46°C) ≤ Ta < 122.0°F (50°C)	7.0 A	6.5 A
	104.0°F (40°C) ≤ Ta < 114.8°F (46°C)	9.5 A	9.0 A
	53.6°F (12°C) ≤ Ta < 104.0°F (40°C)	13.5 A	13.0 A
	35.6°F (2°C) ≤ Ta < 53.6°F (12°C)	13.5 A	13.0 A
	Ta < 35.6°F (2°C)	13.5 A	13.0 A
Heating	62.6°F (17°C) ≤ Ta	7.0 A	6.5 A
	53.6°F (12°C) ≤ Ta < 62.6°F (17°C)	9.0 A	8.5 A
	41.0°F (5°C) ≤ Ta < 53.6°F (12°C)	11.0 A	10.5 A
	Ta < 41.0°F (5°C)	13.0 A	12.5 A

CONTROL AND FUNCTIONS

8-4. Cooling pressure over-rise protection

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

Trigger condition	149.0°F (65°C)

8-5. Compressor temperature protection (for 24 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)

CONTROL AND FUNCTIONS

8-6. 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)

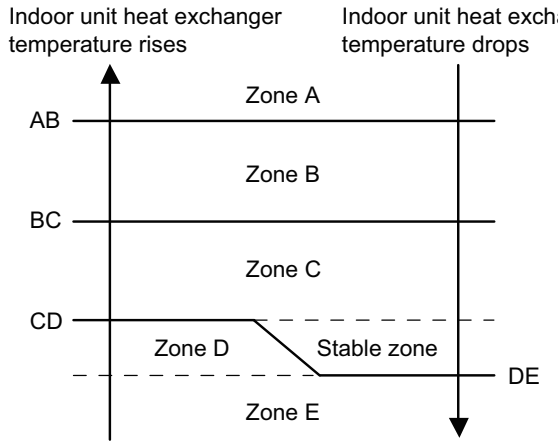
8-7. High temperature and high pressure release control

The compressor is controlled as follows.

■ Models: AOUH09KNAS1 and AOUH12KNAS1

The compressor is controlled as follows.

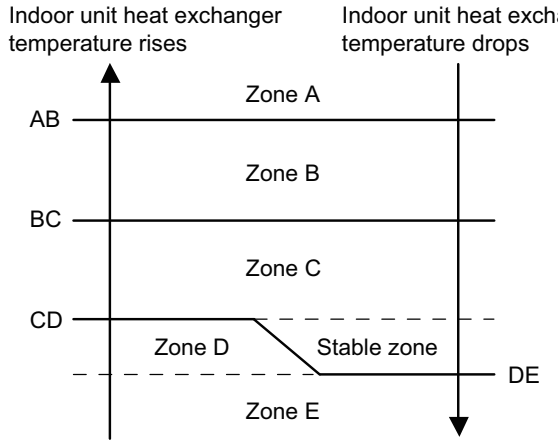
- **Cooling mode**



AB: 141.8°F (61°C)
BC: 140.0°F (60°C)
CD: 138.2°F (59°C)
DE: 129.2°F (54°C)

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**



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

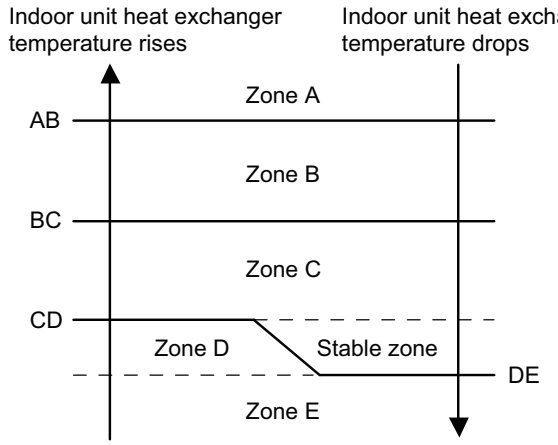
Zone	Operation	
Zone A	Compressor is stopped.	
Zone B	The compressor frequency is decreased.	-25 rps/120 sec.
Zone C		-3 rps/60 sec.
Zone D	The protection is released and the operation is returned to normal mode.	
Zone E		

CONTROL AND FUNCTIONS

■ Models: AOUH18KNAS1 and AOUH24KNAS1

The compressor is controlled as follows.

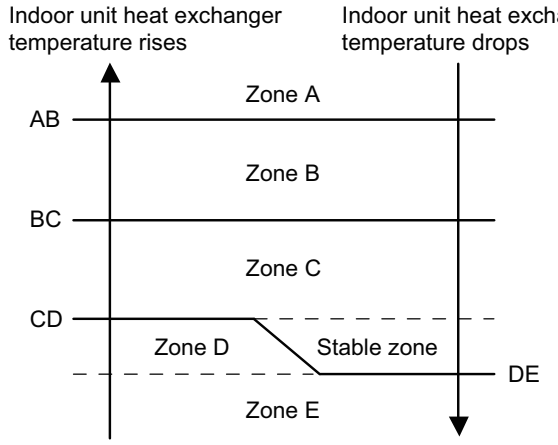
- **Cooling mode**



AB: 141.8°F (61°C)
BC: 140.0°F (60°C)
CD: 138.2°F (59°C)
DE: 129.2°F (54°C)

Zone	Operation	
Zone A	Compressor is stopped.	
Zone B	The rotation number of compressor 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**



AB: 145.4°F (63°C)
BC: 133.7°F (56.5°C)
CD: 130.1°F (54.5°C)
DE: 124.7°F (51.5°C)

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

CONTROL AND FUNCTIONS

REFRIGERANT R32
INVERTER

5. FIELD WORKING

CONTENTS

5. FIELD WORKING

1. Function settings

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

NOTE: Incorrect settings can cause a product malfunction.

1-1. Function settings by using remote controller

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

■ Setting procedure by using wireless remote controller

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

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

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

Then, connect the power supply of the indoor unit.

Entering function setting mode:

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

STEP 1: Setting the remote controller custom code

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

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

For details on how to set the custom codes through the normal process, refer to "Custom code setting for wireless remote controller" on page 05-5.

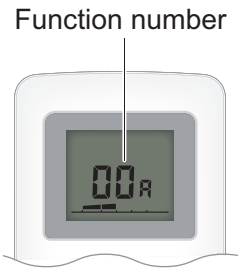
1. Press the TEMP./SELECT (∧) (∨) buttons to change the custom code between A →b →C →d. Match the code on the display to the air conditioner custom code. (Initially set to A.) If the custom code does not need to be selected, press the MODE button, and proceed to **STEP 2**.
2. Press the MODE button to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

NOTES:

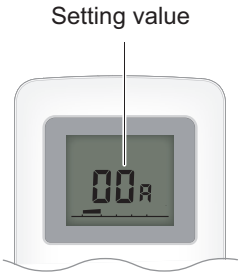
- The air conditioner custom code is set to A prior to shipment.
- The remote controller resets to custom code A when the batteries on the remote controller are replaced. If you use a custom code other than code A, reset the custom code after replacing the batteries.
- If you do not know the air conditioner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

STEP 2: Selecting the function number and setting value

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



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



⚠ CAUTION

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

FIELD WORKING

■ Contents of function setting

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

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

● Function setting list

	Function no.	Functions
1)	11	Filter sign
2)	30/31	Room temperature control for indoor unit sensor
3)	40	Auto restart
4)	44	Remote controller custom code
5)	49	Indoor unit fan control for energy saving for cooling
6)	94	Fixed operation mode switching
7)	95	Heat insulation condition (building insulation)

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) Room temperature control for indoor unit sensor

Before performing this setting, refer to Function 95.

Depending on the installed environment, correction of the room temperature sensor may be required. Select the appropriate control setting according to the installed environment.
The temperature of the room temperature sensor is corrected as follows:

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

Example of correction:

When the temperature of the room temp. sensor is 78°F and the setting value is “03” (-2°F), the corrected temp. will be 80°F (78°F - [-2°F]).

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

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)		

3) Auto restart

Enables or disables automatic restart after a power interruption.

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

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

4) Remote controller custom code

(Only for wireless remote controller)

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

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

5) Indoor unit fan control for energy saving for cooling

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

Function number	Setting value	Setting description	Factory setting
49	00	Disable	
	01	Enable	
	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.

FIELD WORKING

6) Fixed operation mode switching

Sets the operation mode to heat pump, heating only, or cooling only.

Function number	Setting value	Setting description	Factory setting
94	00	Heat pump	♦
	01	Heating only	
	02	Cooling only	

7) Heat insulation condition (building insulation)

Heat insulation conditions differ according to the installed environment.

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

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

When “High insulation” (01) is selected:

- Overheating (overcooling) is prevented at the start-up.

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

1-2. Custom code setting for wireless remote controller

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

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

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

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

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

NOTES:

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

FIELD WORKING