Westinghouse

REFRIGERANT **R410A**

INVERTER

AIR CONDITIONER

Duct type

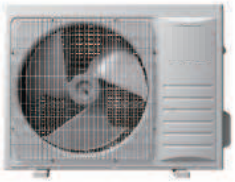
SERVICE MANUAL

INDOOR

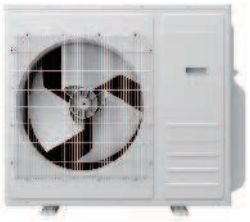
WHM24DMA21S
WHM36DMA21S

WHM48DMA21S
WHM60DMA21S

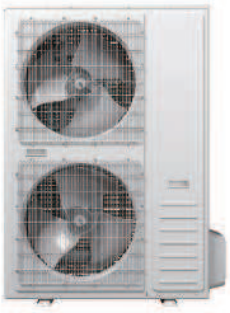
OUTDOOR



WHM24SZA21S



WHM36SZA21S



WHM48SZA21S
WHM60SZA21S

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2021.12.14

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

SAFETY SUMMARY

IMPORTANT NOTICE

- We pursue a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- We cannot anticipate every possible circumstance that might involve a potential hazard.
- This air conditioner is designed for standard air conditioning only. Do not use this air conditioner for other purposes such as drying clothes, refrigerating foods or for any other cooling or heating process. Do not let the air-out face animals or plants, it might have an adverse effect on them.
- The installer and system specialist shall secure safety against leakage according to local regulations or standards.
- Signal words (DANGER, WARNING and CAUTION) are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

⚠DANGER : Immediate hazards which WILL result in severe personal injury or death.

⚠WARNING : Hazards or unsafe practices which COULD result in severe personal injury or death.

⚠CAUTION : Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

NOTE : Useful information for operation and/or maintenance.

- Installation should be performed by the dealer or other professional personnel. Improper installation may cause water leakage, electrical shock, or fire.

⚠DANGER

- Do not perform installation work, refrigerant piping work, drain piping and electrical wiring connection without referring to our installation manual. If the instructions are not followed, it may result in water leakage, electric shock or fire.
- Use refrigerant R410A in the refrigerant cycle.
- Do not pour water into the indoor or outdoor unit. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply.
- Do not touch or adjust safety devices inside the indoor or outdoor units. If these devices are touched or readjusted, it may cause a serious accident.
- Refrigerant leakage can cause difficulty in breathing due to insufficient air. Turn OFF the main switch, extinguish any naked flames and contact your service contractor, if refrigerant leakage occurs.
- Do perform air-tight test. Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tight test. These types of gases are extremely dangerous and can cause an explosion. It is recommended that nitrogen be used for this test.
- The installer and system specialist shall secure safety against refrigerant leakage according to local regulations or standards.
- Use an ELB (Electric Leakage Breaker). In the event of a fault, there is danger of an electric shock or a fire if it is not used.

⚠WARNING

- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately one (1) meter from the system.
- If circuit breaker or fuse is often activated, stop the system and contact your service contractor.
- Check that the ground wire is securely connected. If the unit is not correctly grounded, it will lead to electric shock. Do not connect the ground wiring to gas piping, water piping, lightning conductor or ground wiring for telephone.
- Before performing any brazing work, check to ensure that there is no flammable material around when using refrigerant. Be sure to wear leather gloves to prevent cold injuries.
- Protect the wires, electrical parts, etc. from rats or other small animals.
  If not protected, rats may gnaw at unprotected parts, which may lead to fire.
- Fix the cables securely. External forces on the terminals could lead to a fire.
- Install the air conditioner on a solid base that can support the unit weight. An inadequate base or incomplete installation may cause injury in the event the unit falls off the base. Incomplete connections or clamping may cause terminal overheating or fire.
- Make sure that the outdoor unit is not covered with snow or ice, before operation.

⚠CAUTION

- Do not step or put any material on the product.
- Do not put any foreign material on the unit or inside the unit.

NOTE

- It is recommended that the room be ventilated every 3 to 4 hours.
- The air conditioner may not work properly under the following circumstances.
  The power transformer provides the same power with the air conditioner. The electrical equipment is too close to the power supply of the air conditioner. With the sharp change of power consumption and switching action, the power supply of the air conditioner will generate a large induction surge voltage.

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.
  The standard utilization of the unit shall be explained in these instructions.
  Therefore, the utilization of the unit other than those indicated in these instructions is not recommended.
  Please contact your local agent, as the occasion arises.

Specifications

Type					Duct			
					Inverter heat pump			
Model name					**WHM24DMA21S**	**WHM36DMA21S**	**WHM48DMA21S**	**WHM60DMA21S**
Power supply					208/230 V ~ 60 Hz			
Power supply intake					Outdoor unit			
Available voltage range					198—253 V			
Capacity		Cooling	Rated	kW	7.03	10.56	14.07	16.41
				Btu/h	24,000	36,000	48,000	56,000
			Min.—Max.	kW	2.23—7.33	2.81—10.70	5.36—15.24	5.36—17.41
				Btu/h	6,700—26,000	11,800—36,800	18,300—52,000	18,300—59,400
		Heating	Rated	kW	7.03	10.56	14.07	16.41
				Btu/h	24,000	36,000	48,000	56,000
			Min.—Max.	kW	2.23—7.33	2.61—11.20	5.16—15.24	5.16—16.85
				Btu/h	6,700—26,000	8,900—38,200	17,600—52,000	17,600—57,500
Input power		Cooling	Rated	kW	2.200	3.770	4.690	6.560
			Min.—Max.		0.560—2.900	1.122—3.981	1.423—5.708	1.490—7.569
		Heating	Rated		2.000	3.200	4.260	5.290
			Min.—Max.		0.725—3.960	0.725—3.960	1.228—5.080	1.323—6.019
Current		Cooling	Rated	A	9.6	16.5	21.0	26.8
		Heating			8.7	14.1	19.0	21.0
EER		Cooling		W/W	3.2	2.8	2.99	2.5
				Btu/hW	10.90	9.55	10.20	8.50
COP		Heating		W/W	3.5	3.3		3.1
				Btu/hW	11.95	11.26		10.58
SEER		Cooling		Btu/hW	18.0			17.5
HSPF		Heating		Btu/hW	10.0	11.0	10.0	
Power factor		Cooling		%	99			
		Heating			99			
Moisture removal				pints/h (L/h)	4.6 (2.2)	9.5 (4.5)	11.6 (5.5)	15.8 (7.5)
Maximum operating current*1		Cooling		A	25.0	35.0	50.0	
		Heating			25.0	35.0	50.0	
Fan	Airflow rate	Cooling		CFM (m^3/h)	800 (1,360)	1,120 (1,905)	1,588 (2,700)	1,706 (2,900)
		Heating			800 (1,360)	1,120 (1,905)	1,588 (2,700)	1,706 (2,900)
	Type × Q'ty				Sirocco × 1			
	Motor output			W	249	373	559	
Static pressure range				inWG (Pa)	0 to 0.8 (0 to 200)			
Sound pressure level*2		Cooling	HIGH	dB (A)	55	57	64	65
		Heating			55	57	64	65
Heat exchanger type		Dimensions (H × W × D)		in (mm)	17-1/2 × 16-1/2 × 1-1/16 (444 × 420 × 27.2) 17-1/2 × 16-1/2 × 1-1/16 (444 × 420 × 27.2)		20 × 21-1/2 × 1-5/16 (509 × 546 × 34) 20 × 21-1/2 × 1-5/16 (509 × 546 × 34)	
		Fin pitch		FPI	18		17	
		Rows × Stages			4 × 20		5 × 26	
		Pipe type			Copper			
		Fin type			Aluminum			
Dimensions (H × W × D)		Net		in (mm)	46-1/8 × 19-5/8 × 21-5/8 (1,170 × 500 × 550)		53-7/8 × 22 × 24 (1,370 × 560 × 610)	
		Gross			49-5/8 × 22-1/2 × 25-3/8 (1,260 × 570 × 645)		55-1/2 × 25-1/4 × 28 (1,410 × 640 × 710)	
Weight		Net		lb (kg)	135.5 (61.5)	140.0 (63.5)	187.2 (85)	
		Gross			158.6 (72)	163.1 (74)	214.0 (97)	
Connection pipe		Size	Liquid	in (mm)	Ø3/8 (Ø9.52)			
			Gas		Ø5/8 (Ø15.88)	Ø3/4 (Ø19.05)	Ø7/8 (Ø22.22)	
		Method			Flare			
Drain hose		Material			ABS			
		Tip diameter		in (mm)	Ø15/16 (Ø24.5) (I.D.), Ø1-1/16 (Ø26.5) (O.D.)			
Operation range		Cooling		°F (°C)	61 to 86 (16 to 30)			
				%RH	80 or less			
		Heating		°F (°C)	61 to 86 (16 to 30)			
Remote controller type					Wired [locally purchased]			
Option					Heater kit			

NOTES:

- Specifications are based on the following conditions:
  - Cooling: Indoor temperature of 80 °FDB (26.67 °CDB)/67 °FWB (19.44 °CWB), and outdoor temperature of 95 °FDB (35 °CDB)/75 °FWB (23.9 °CWB).
  - Heating: Indoor temperature of 70 °FDB (21.11 °CDB)/59 °FWB (15.56 °CWB), and outdoor temperature of 47 °FDB (8.33 °CDB)/43 °FWB (6.11 °CWB).
  - 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.
- *1: Maximum current is maximum value when operated within the operation range.
- *2: Sound pressure level:
  - Measured values in manufacturer's anechoic chamber.
  - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.

Type				Inverter heat pump			
Model name				**WHM24SZA21S**	**WHM36SZA21S**	**WHM48SZA21S**	**WHM60SZA21S**
Power supply				208/230 V ~ 60 Hz			
Available voltage range				198—253 V			
Fan	Airflow rate		CFM (m^3/h)	1,825 (3,150)	2,350 (3,995)	3,525 (6,000)	
	Type × Q'ty			Propeller fan × 1		Propeller fan × 2	
	Motor output		W	60	121		
Sound pressure level *1			dB (A)	54	57	59	60
Heat exchanger type		Dimensions (H × W × D)	in (mm)	35-5/8 × 25-1/4 × 7/8 (900 × 630 × 21.7) 34 × 25-1/4 × 7/8 (866 × 630 × 21.7)	38-3/16 × 31-3/8 × 1-11/16 (970 × 798 × 43.3)	38-3/16 × 53 × 1-7/16 (970 × 1,344 × 36.4)	38-3/16 × 53 × 1-11/16 (970 × 1,344 × 43.3)
		Fin pitch	FPI	18	19	17	18
		Rows × Stages		2 × 30	2 × 38	2 × 64	
		Pipe type		Copper			
		Fin type	Type (Material)	Aluminum			
			Surface treatment	Blue fin			
Compressor	Type			Rotary			
Refrigerant		Type		R410A			
		Charge	lb oz	4 lb 7 oz	6 lb 3 oz	8 lb 15 oz	
			g	2,000	2,800	4,050	
Refrigerant oil		Type		VG74			
Enclosure		Material		Steel sheet			
		Color		White			
Dimensions (H × W × D)	Net		in (mm)	26-3/8 × 33-7/8 × 12-1/4 (670 × 860 × 310)	33 × 37-3/8 × 13-3/8 (840 × 950 × 340)	54-5/8 × 37-3/8 × 13-3/8 (1,386 × 950 × 340)	
	Gross			28-3/4 × 39 × 1-3/4 (730 × 990 × 450)	36-1/4 × 43-3/4 × 18-1/8 (920 × 1,110 × 460)	60-1/4 × 43-3/4 × 18-1/8 (1,530 × 1,110 × 460)	
Weight	Net		lb (kg)	112.4 (51)	147.7 (67)	227.1 (103)	251.3 (114)
	Gross			121.3 (55)	158.7 (72)	253.5 (115)	277.5 (126)
Connection pipe	Size	Liquid	in (mm)	Ø3/8 (Ø9.52)			
		Gas		Ø5/8 (Ø15.88)	Ø3/4 (Ø19.05)	Ø7/8 (Ø22.22)	
	Method			Flare			
	Pre-charge length		ft (m)	24.6 (7.5)			
	Max. length			164 (50)	246 (75)		
	Max. height difference			Indoor unit higher than outdoor unit: 98 (30) Outdoor unit higher than indoor unit: 98 (30)			
Operation range		Cooling	°F (°C)	5 to 122 (-15 to 50)			
		Heating		-13 to 75 (-25 to 24)			

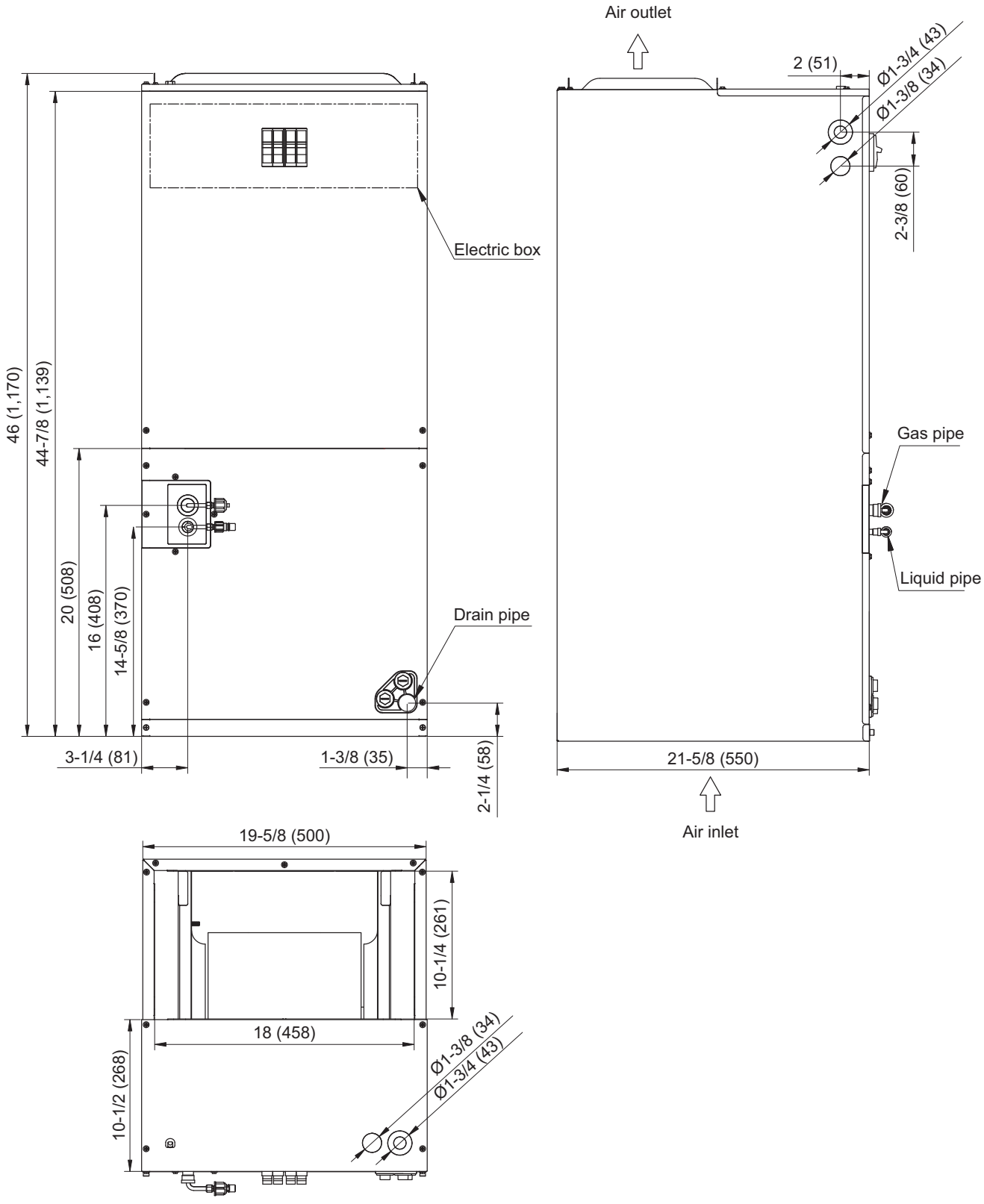
NOTES:

- Specifications are based on the following conditions:
  - Cooling: Indoor temperature of 80 °FDB (26.67 °CDB)/67 °FWB (19.44 °CWB), and outdoor temperature of 95 °FDB (35 °CDB)/75 °FWB (23.9 °CWB).
  - Heating: Indoor temperature of 70 °FDB (21.11 °CDB)/59 °FWB (15 °CWB), and outdoor temperature of 47 °FDB (8.33 °CDB)/43 °FWB (6.11 °CWB).
  - Pipe length: 24 ft 6 in (7.5 m), Height difference: 0 ft (0 m). (Between outdoor unit and indoor unit.)
- Protective function might work when using it outside the operation range.
- *1: Sound pressure level
  - Measured values in manufacturer's anechoic chamber.
  - Because of the surrounding sound environment, the sound levels measured in actual installation conditions might be higher than the specified values here.

Dimensions

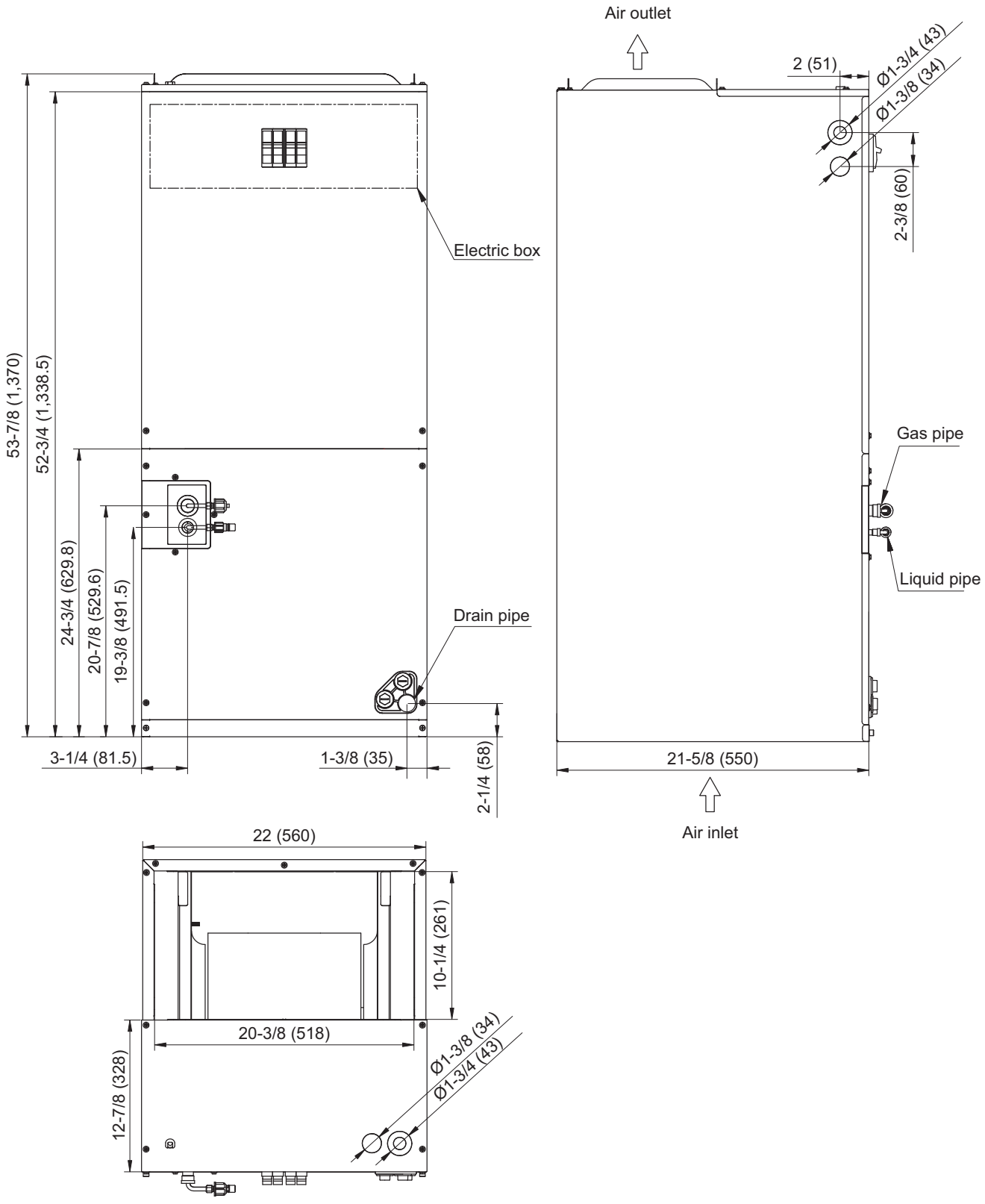
Models: WHM24DMA21S and WHM36DMA21S

Unit: in (mm)



Models: WHM48DMA21S and WHM60DMA21S

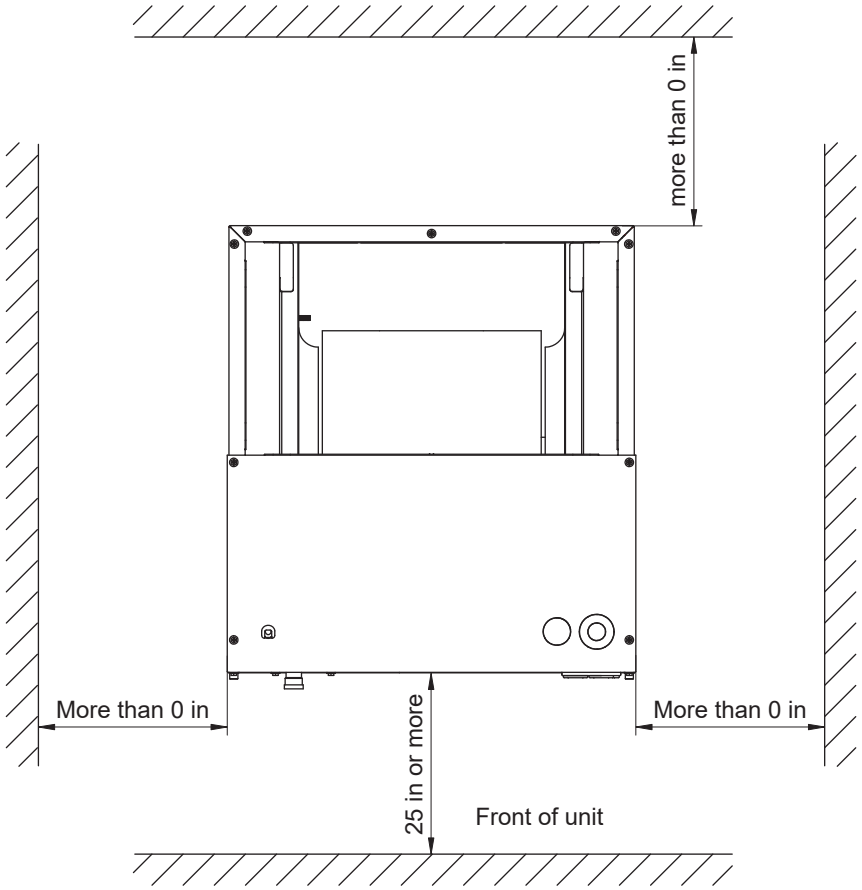
Unit: in (mm)



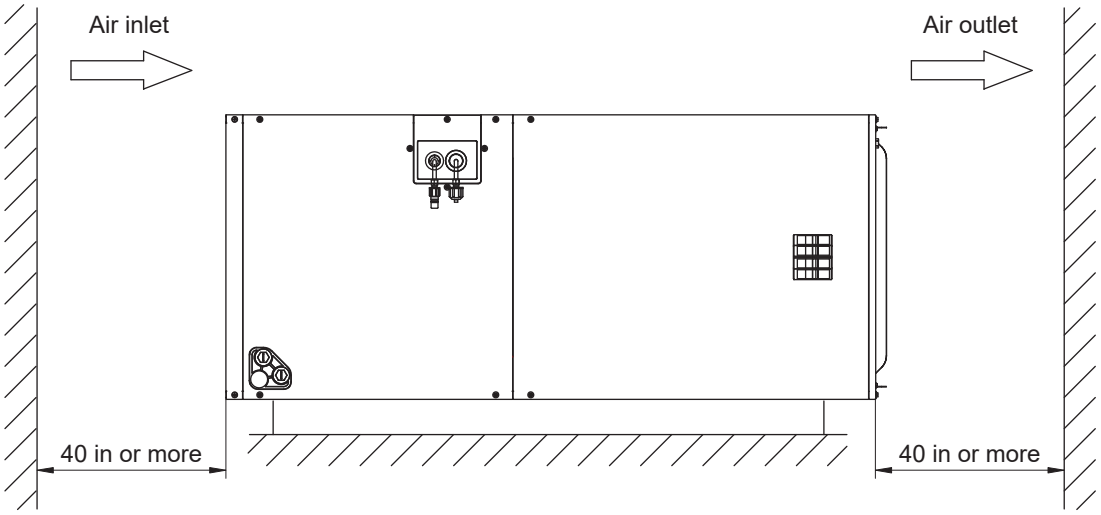
Installation space requirement

Provide sufficient installation space for product safety.

- Clearance in the vertical position

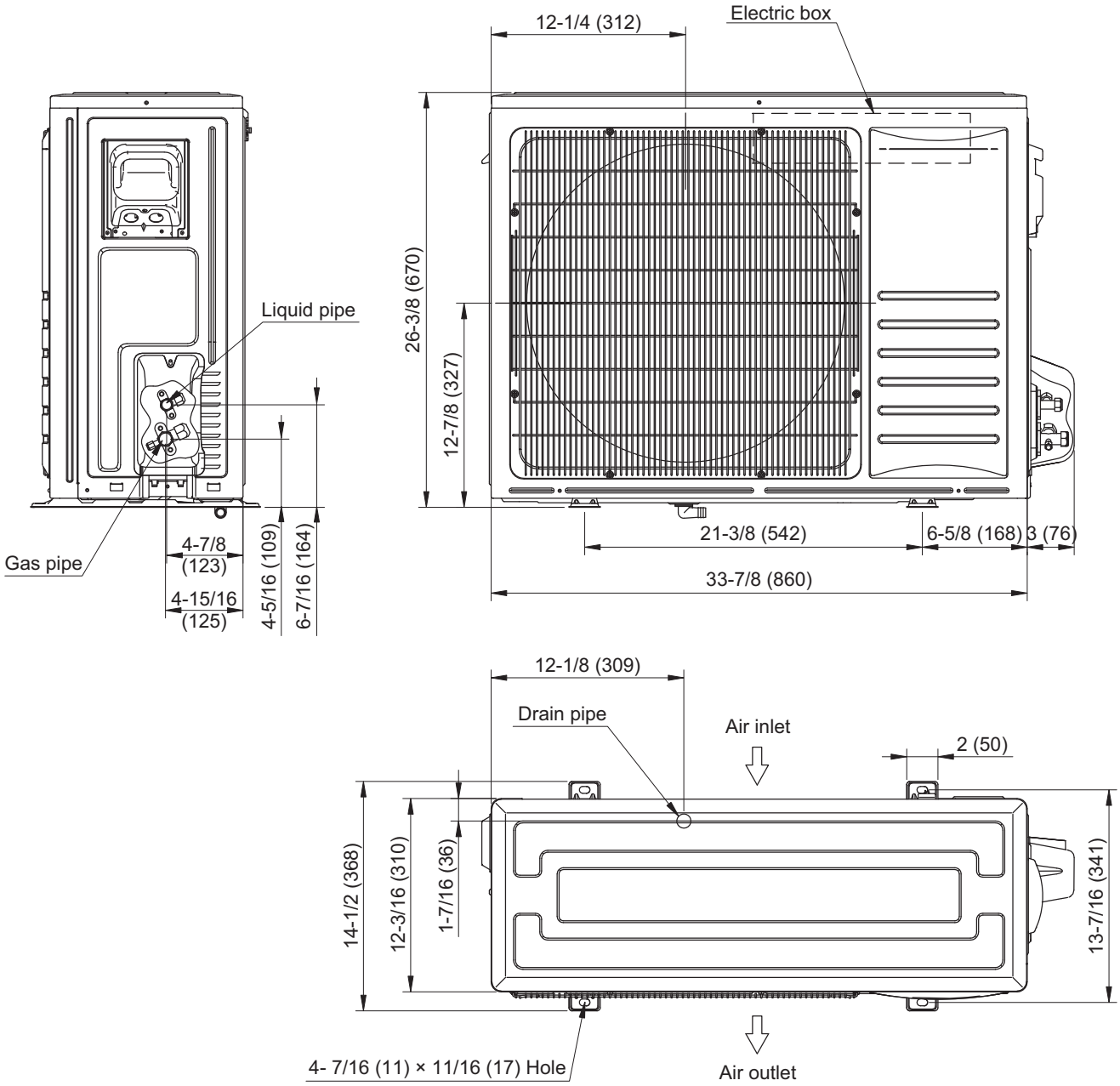


- Clearance in the horizontal position



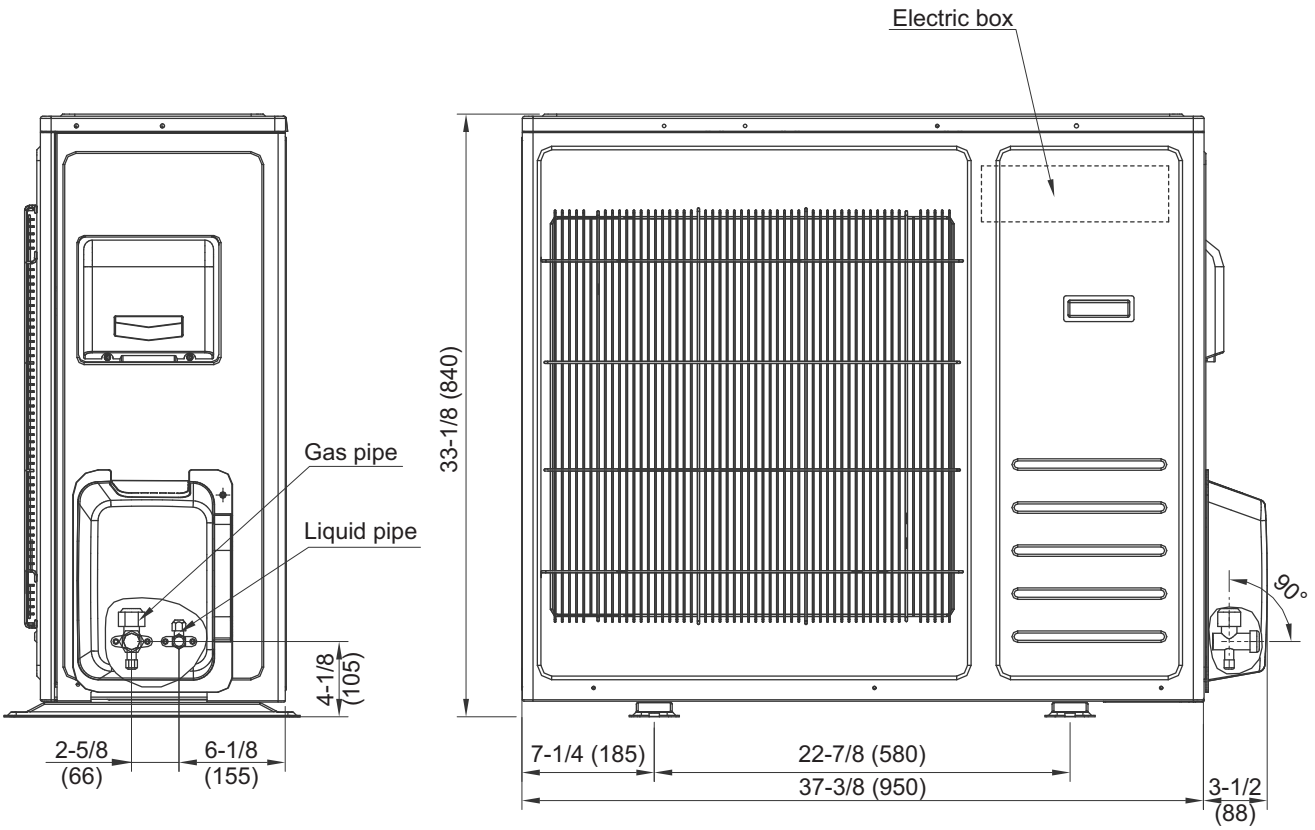
Model: WHM24SZA21S

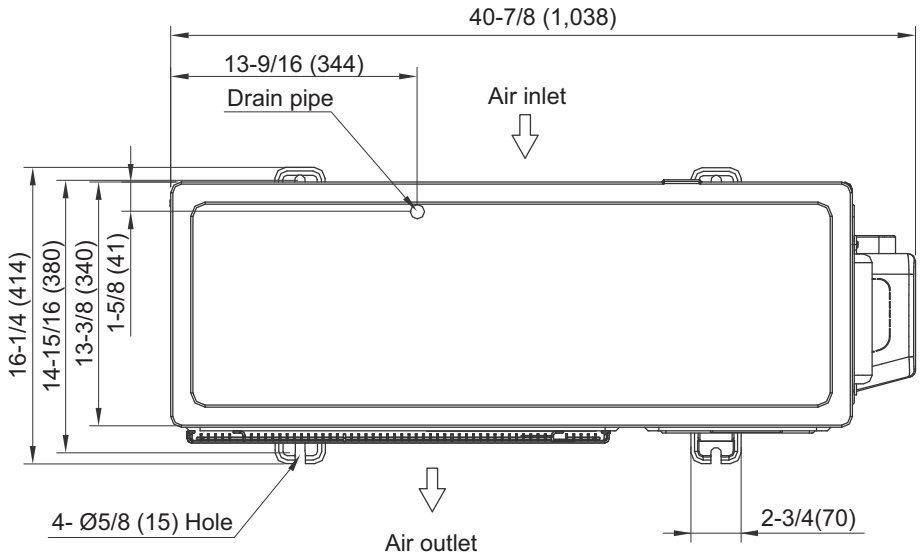
Unit: in (mm)



Model: WHM36SZA21S

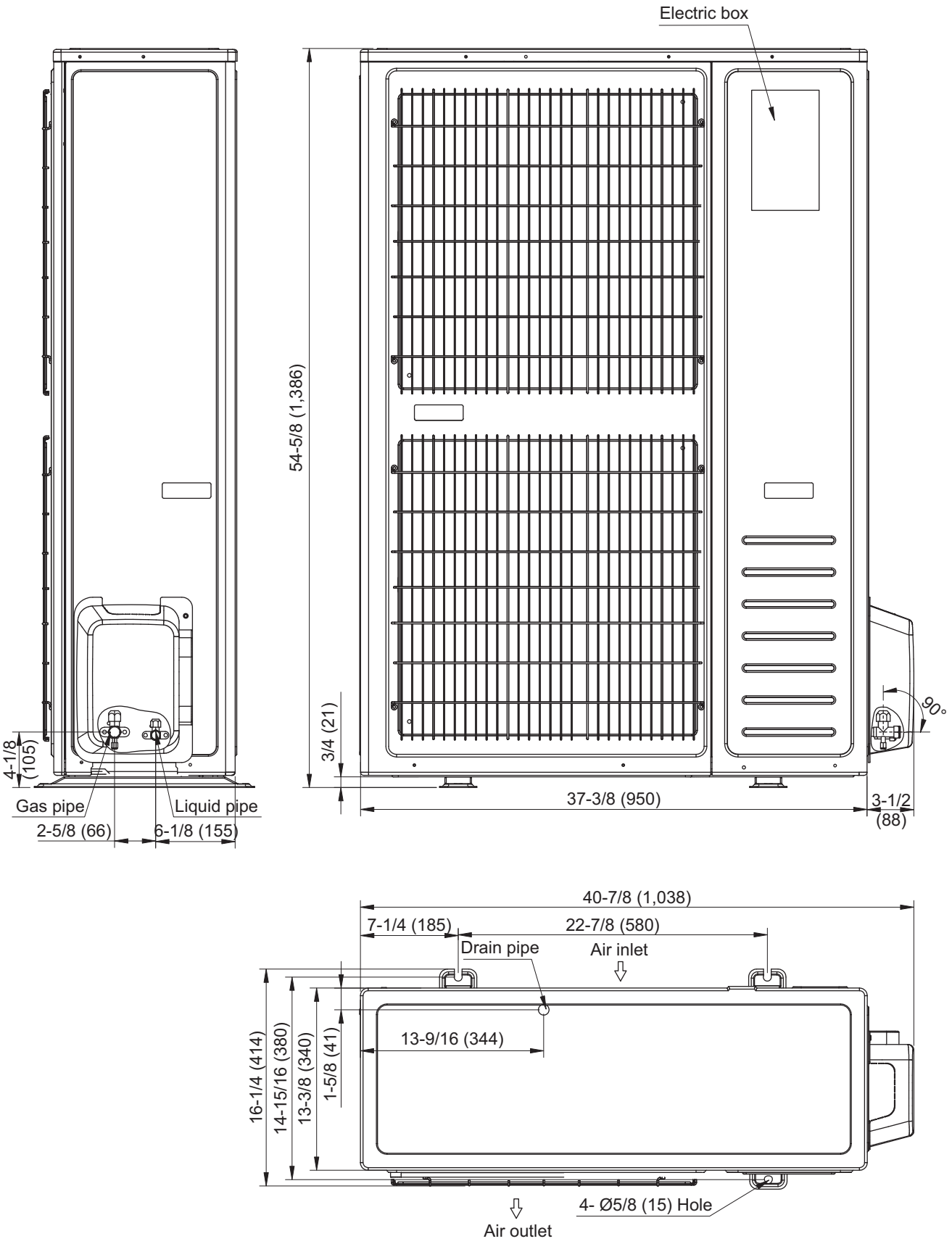
Unit: in (mm)





Models: WHM48SZA21S and WHM60SZA21S

Unit: in (mm)



Installation space

Models: WHM24SZA21S, WHM36SZA21S, WHM48SZA21S, and WHM60SZA21S

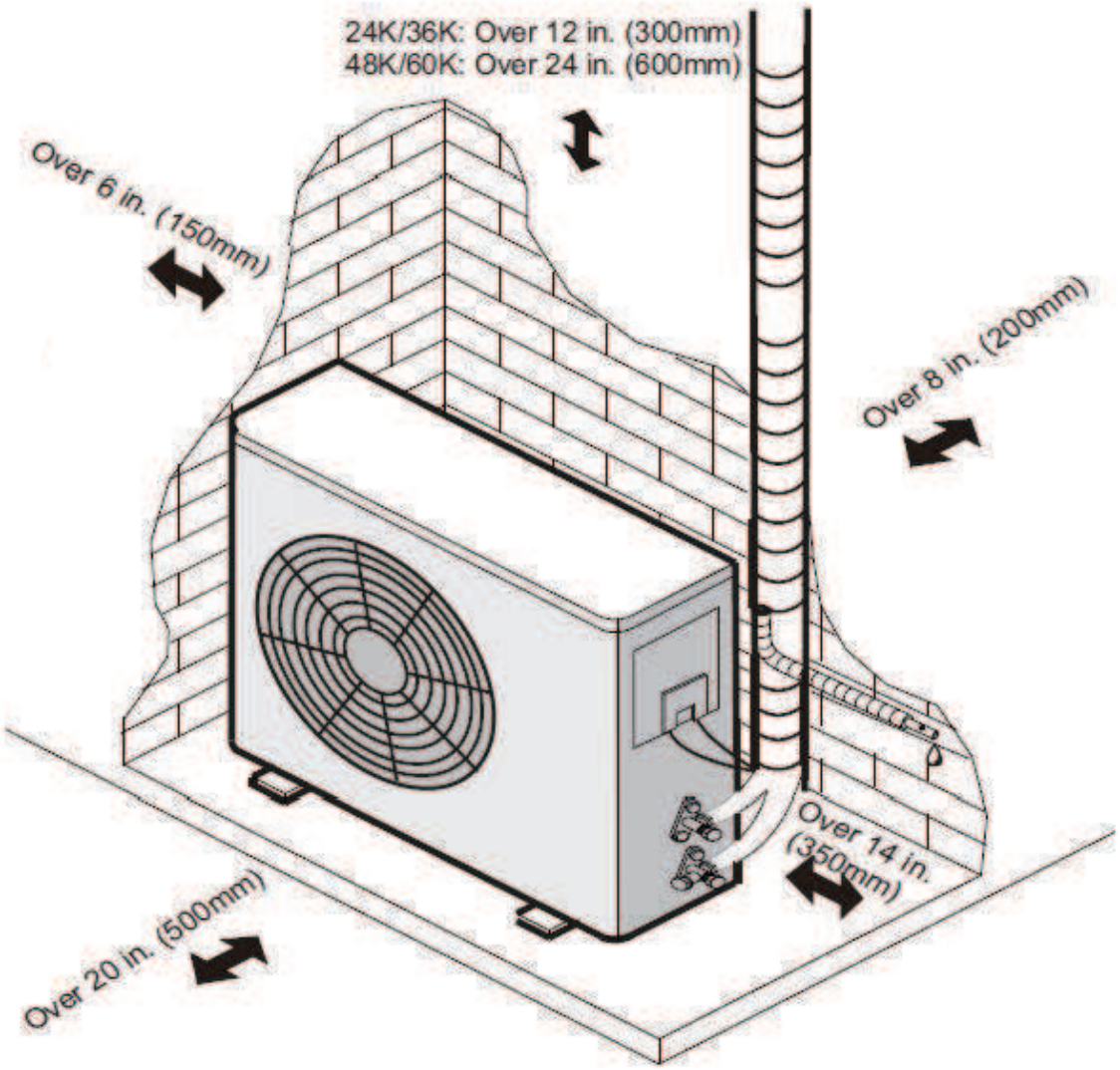
■ Space requirement

Provide sufficient installation space for product safety.

⚠ CAUTION

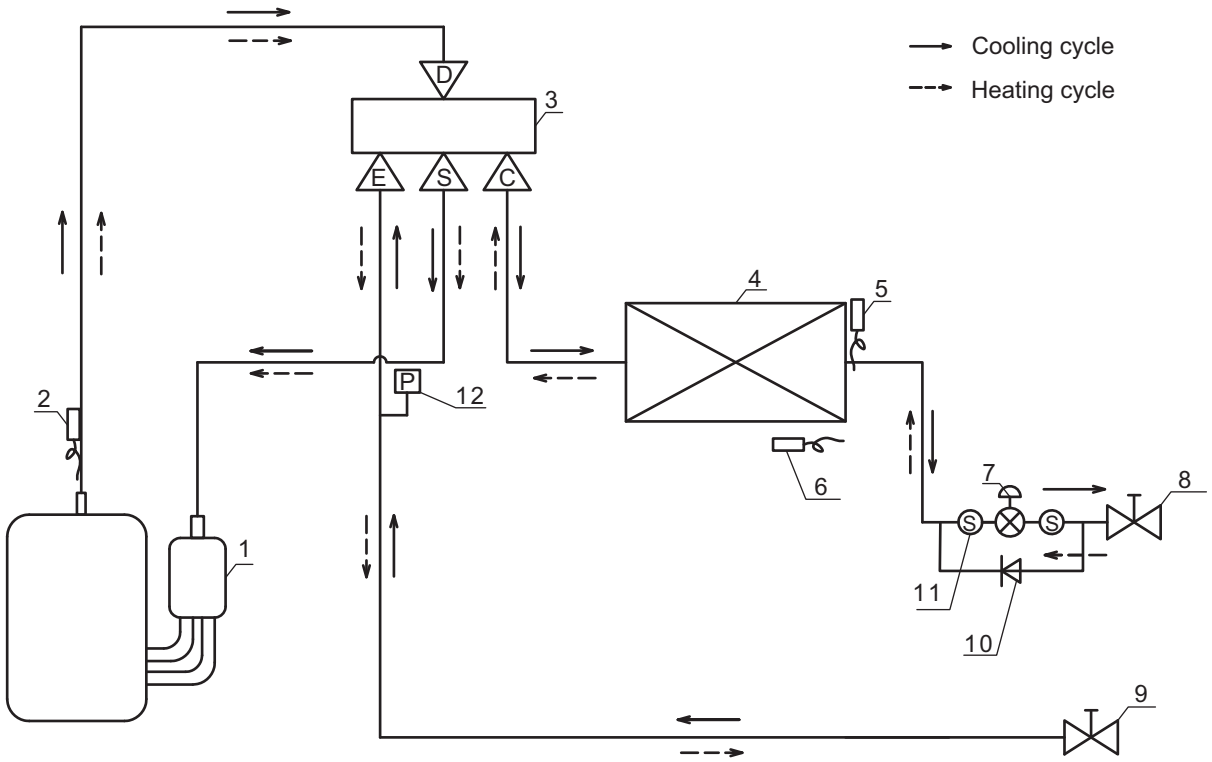
Keep the space shown in the installation examples.

If the installation is not performed accordingly, it could cause a short circuit and result in a lack of operating performance.



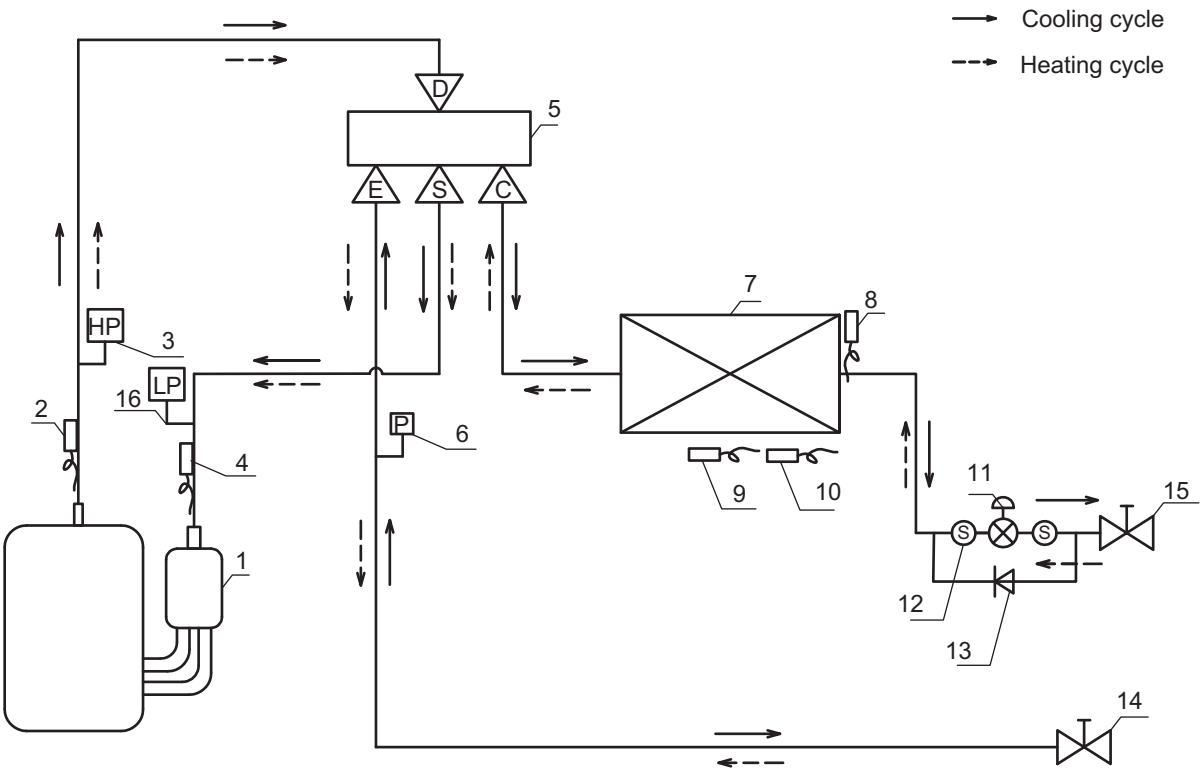
Refrigerant circuit

Models: WHM24SZA21S and WHM36SZA21S



List of components	
1	Compressor
2	Discharge temperature sensor
3	4-way valve
4	Outdoor heat exchanger
5	Coil temperature sensor
6	Ambient temperature sensor
7	Electronic expansion valve
8	Stop valve (Liquid)
9	Stop valve (Gas)
10	One-way valve
11	Strainer
12	Pressure sensor

Models: WHM48SZA21S and WHM60SZA21S

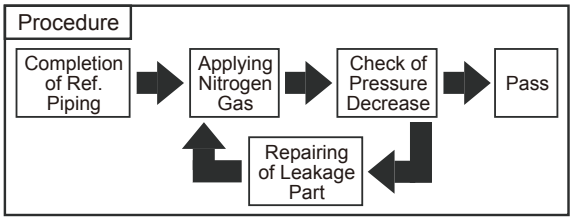


List of components	
1	Compressor
2	Discharge temperature sensor
3	High pressure switch
4	Suction temperature sensor
5	4-Way valve
6	Pressure sensor
7	Outdoor heat exchanger
8	Ambient temperature sensor
9	Coil temperature sensor
10	Defrost temperature sensor
11	Electronic expansion valve
12	Strainer
13	One-way valve
14	Stop valve (Gas)
15	Stop valve (Liquid)
16	Low pressure switch

Piping work and refrigerant charge

Air tight test

Do use nitrogen when performing air-tight test.
Connect the gauge manifold using charging hoses with a nitrogen cylinder to the check joints of the liquid line and the gas line stop valves. Perform the air-tight test. Don't open the gas line stop valves. Apply nitrogen gas pressure of 550 psig (3.8MPa). Check for any gas leakage at the flare nut connections, or brazed parts by gas leak detector or foaming agent. It is OK if gas pressure does not decrease. After the air tight test, release nitrogen gas.



Air tight procedure

Additional refrigerant charge

Although refrigerant has been charged into this unit, additional refrigerant charge is required according to the piping length.

- The additional refrigerant precharge quantity should be determined and charged into the system according to the following procedure.
- Record the additional refrigerant quantity in order to facilitate maintenance and servicing activities.

Refrigerant charge before shipment (W0 (oz.))

W0 is the outdoor unit refrigerant charge before shipment;

Xg is additional refrigerant outdoor unit needed to charge according to piping length during installation.

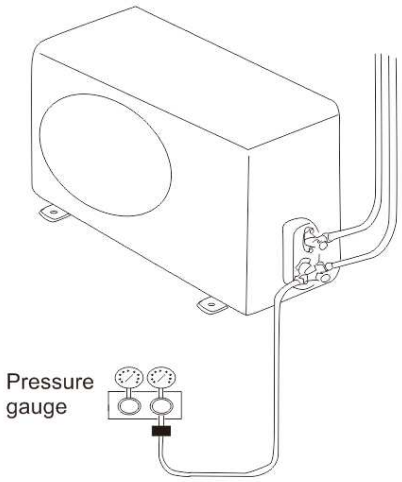
Model	Refrigerant precharged before shipment (oz.)	Total refrigerant pipe length	
		0ft.～24.6ft. (0m～7.5m)	Longer than 24.6ft. (7.5m)
24K	70.5	0	Xg = 0.38oz/ft ×(Total pipe length(ft.) -24.6)
36K	98.7	0	Xg = 0.38oz/ft ×(Total pipe length(ft.) -24.6)
48K/60K	142.9	0	Xg = 0.60oz/ft ×(Total pipe length(ft.) -24.6)

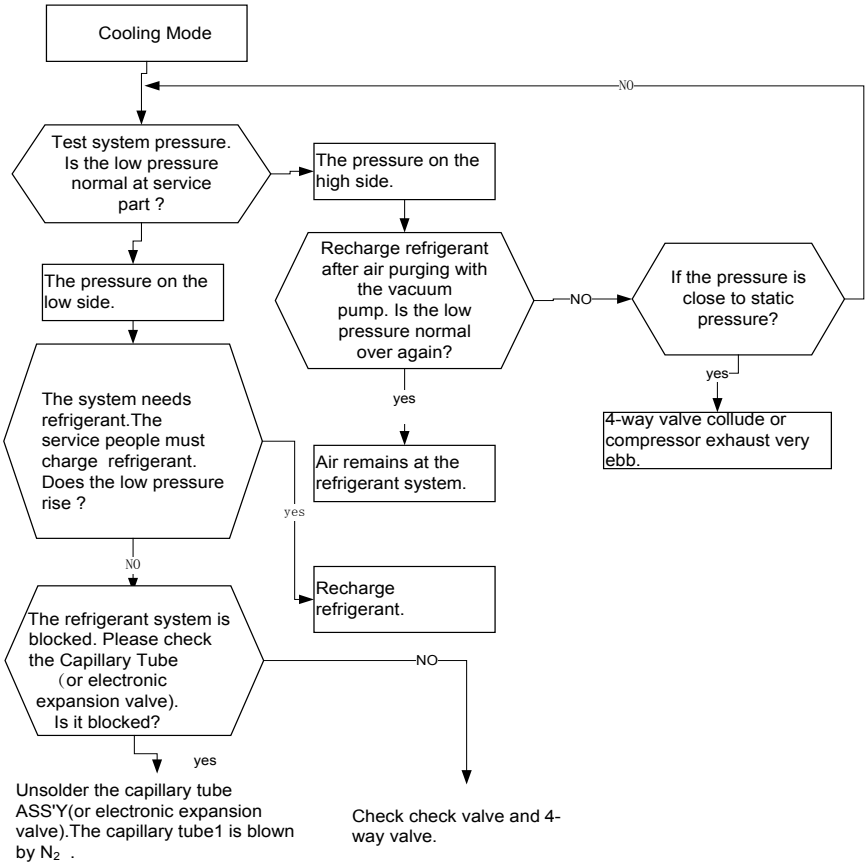
Checking Components

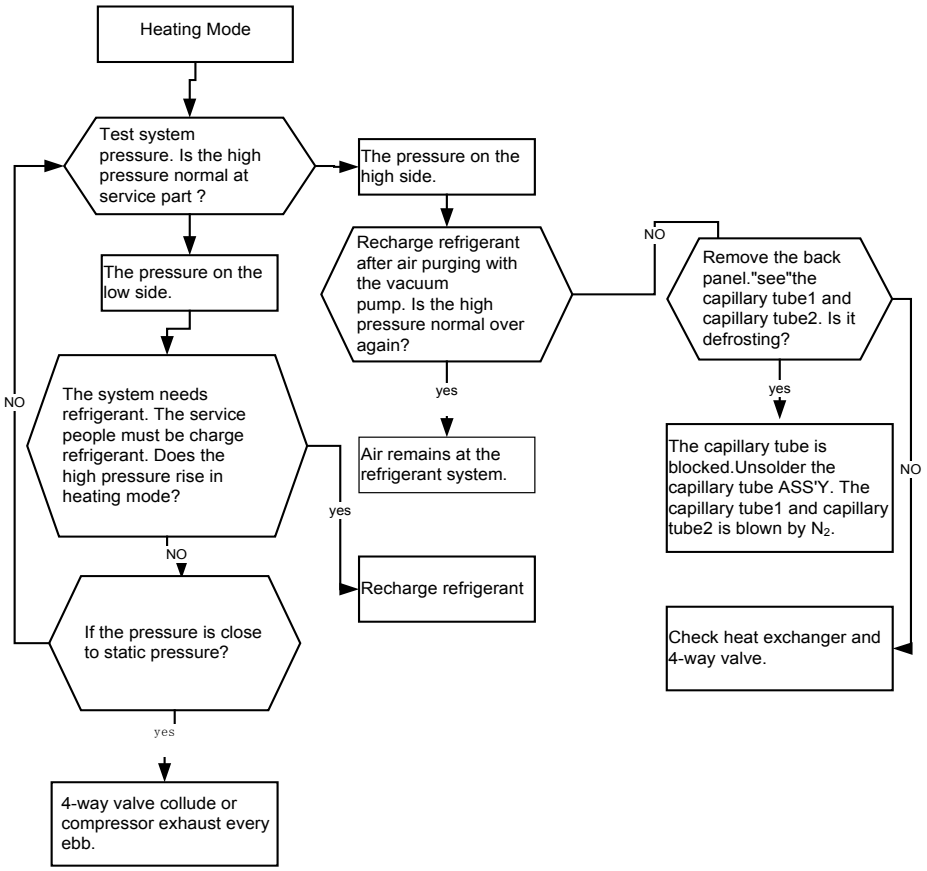
Check Refrigerant System

TEST SYSTEM FLOW:

Conditions: ① Compressor is running.
The air condition should be installed in good ventilation.
Tool: Pressure Gauge Technique: ① see ② feel ③ test
See ----- Tube Defrost.
Feel ----- The Difference between Tube's Temperature.
Test ----- Test Pressure.






Heating Mode
Test system pressure. Is the high pressure normal at service part ?
The pressure on the high side.
The pressure on the low side.
Recharge refrigerant after air purging with the vacuum pump. Is the high pressure normal over again?
NO
Remove the back panel."see"the capillary tube1 and capillary tube2. Is it defrosting?
yes
The capillary tube is blocked.Unsolder the capillary tube ASS'Y. The capillary tube1 and capillary tube2 is blown by N_2.
NO
Check heat exchanger and 4-way valve.
yes
Air remains at the refrigerant system.
The system needs refrigerant. The service people must be charge refrigerant. Does the high pressure rise in heating mode?
NO
yes
Recharge refrigerant
NO
If the pressure is close to static pressure?
yes
4-way valve collude or compressor exhaust every ebb.

Check Parts Unit

1. Indoor Unit Fan Motor

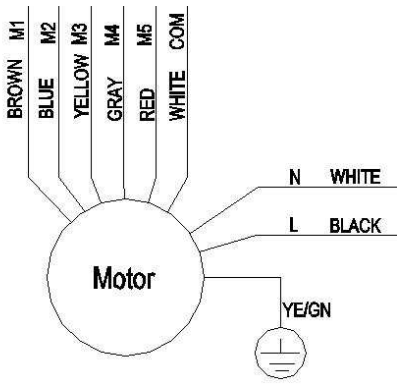
Duct motor model

24K: ZWK702B006073

36K: ZWK702B500026

48K: ZKSD-560-8-50-14

60K: ZKSD-560-8-58



Test in resistance.

TOOL: Multimeter.

Test the resistance of the main winding. The indoor fan motor fails if the resistance of main winding is 0(short circuit)or∞（open circuit）.

Test in voltage

TOOL: Multimeter.

Insert screwdriver to rotate indoor fan motor slowly for 1 revolution or over, and measure voltage "YELLOW" and "GND" on motor. The voltage repeat 0V DC and 5V DC.

NOTES:

Please don't hold motor by lead wires.

Please don't plug IN/OUT the motor connector while power is ON.

Please don't drop hurl or dump motor against hard material. Malfunction may not be observed at early stage after such shock. But it may be found later, this type of mishandling void our warranty.

Filed Setting

Static Pressure Setting of indoor unit:

DIP Switch S2 Setting	Blower Speed Tap	Fan Speed Select	Static Pressure (W.C.[kPa]) 24K	Static Pressure (W.C.[kPa]) 36K	Static Pressure (W.C.[kPa]) 48K/60K
	2	Medium Low (Default setting)	0.18[0.045]	0.24[0.057]	0.28[0.07]
	3	Medium	0.25[0.08]	0.4[0.1]	0.4[0.1]
	4	Medium High	0.58[0.145]	0.58[0.145]	0.58[0.145]
	5	High	0.8[0.2]	0.8[0.2]	0.8[0.2]

NOTE: Symbol " ■ " indicates the position of the DIP switch.
Symbol " ▯ " indicates any position of ON or OFF.

Blower data

Airflow performance data is based on cooling performance with a coil and no filter in place. Check the performance table for appropriate unit size selection. External static pressure should stay within the minimum and maximum limits shown in the table below to ensure proper cooling, heating, and electric heating operation.

NOTES:

- Required 350-450 CFM/Ton range.
- When there is an electric heater, set the fan speed based on the air volume that the electric heater needs (not less than 350 CFM/Ton).
- Airflow based upon air handler unit operates at 230 V with no electric heater kit and no filter. Airflow at 208 V is approximately the same as 230 V.

■ Model: WHM24DMA21S

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	815	792	752	709	—	—	—	—	—
	W	94	102	110	123	—	—	—	—	—
Tap (3)	CFM	862	828	792	735	705	—	—	—	—
	W	106	114	125	137	145	—	—	—	—
Tap (4)	CFM	—	—	—	859	853	803	769	735	—
	W	—	—	—	178	185	193	203	213	—
Tap (5)	CFM	—	—	—	—	—	895	864	825	779
	W	—	—	—	—	—	241	251	258	267

■ Model: WHM36DMA21S

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,264	1,216	1,172	1,135	1,096	—	—	—	—
	W	215	222	233	238	244	—	—	—	—
Tap (3)	CFM	1,350	1,314	1,269	1,206	1,116	1,082	1,050	—	—
	W	257	264	274	282	292	297	302	—	—
Tap (4)	CFM	—	—	—	1,323	1,266	1,192	1,122	1,060	—
	W	—	—	—	304	313	323	333	340	—
Tap (5)	CFM	—	—	—	—	1,350	1,292	1,221	1,148	1,088
	W	—	—	—	—	371	381	394	401	406

■ Model: WHM48DMA21S

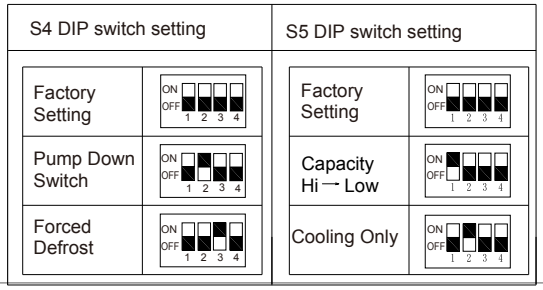
Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,756	1,701	1,626	1,579	1,520	1,468	1,425	—	—
	W	348	357	369	378	387	395	407	—	—
Tap (3)	CFM	1,799	1,746	1,678	1,634	1,571	1,522	1,449	1,402	—
	W	366	377	388	398	410	419	428	444	—
Tap (4)	CFM	—	1,794	1,749	1,719	1,670	1,633	1,589	1,553	1,510
	W	—	387	401	413	428	437	452	465	482
Tap (5)	CFM	—	—	—	1,782	1,735	1,701	1,665	1,626	1,585
	W	—	—	—	456	469	481	495	510	525

■ Model: WHM60DMA21S

Fan speed		External static pressure in.H2O [KPa]								
		0 (0)	0.1 (0.02)	0.18 (0.045)	0.3 (0.07)	0.4 (0.1)	0.5 (0.12)	0.6 (0.15)	0.7 (0.17)	0.8 (0.20)
Tap (2) Default setting	CFM	1,838	1,810	1,770	1,760	—	—	—	—	—
	W	376	387	401	413	—	—	—	—	—
Tap (3)	CFM	1,888	1,855	1,813	1,782	1,751	—	—	—	—
	W	415	428	445	456	469	—	—	—	—
Tap (4)	CFM	1,971	1,941	1,893	1,864	1,820	1,786	1,755	—	—
	W	472	485	501	513	530	540	558	—	—
Tap (5)	CFM	2,056	2,022	1,978	1,950	1,907	1,878	1,826	1,801	1,750
	W	533	545	562	575	592	603	619	631	638

DIP Switch Setting of Outdoor Unit (Optional setting)

1. Turn on all power sources before setting. Without turning on, the switches settings are not refreshed and might be invalid. (24K/36K)
2. Turn off all power sources before setting. Without turning off, the switches settings are not refreshed and might be invalid.(48K/60K)
3. Mark of "■" indicates the position of DIP switches.



Forced defrost mode

Operation:

Dial the switch from OFF to ON before turning on the appliance, and set it in heating mode, then it will run with manual defrosting mode at once.

Cooling only set

Operation:

Heating mode will be invalid after the DIP has been dialed.

Capacity set

Dial it when the indoor units matched are in the following conditions.

Outdoor unit model	Indoor unit connect
24K	18K
36K	30K
48K	42K
60K	48K

Pump down mode

Actions:

The compressor runs with the target frequency, and without any protection when frequency rises; The EEV runs with setting opening; Outdoor unit fan will run with the set fan speed.

Operation procedures:

Step 1:

Press the ON/OFF button to power off the appliance.

Step 2:

Disconnect the machine power.

Step 3:

Close the shut-off valve of the liquid piping with an Allen wrench in a clockwise direction.

Step 4:

Open the maintenance panel.

Step 5:

Switch the dial code (referring to outdoor wiring diagram) ON position on the main control board.

Step 6:

Switch on the machine power.

Step 7:

Check if “40” is displayed on the LED digital tube of the main control board.

Step 8:

When the numerals on the LED digital tube of outdoor unit count down to 0 (40 → 39 → 38 ... 0), and “0” begins to blink, close the shut-off valve of the gas piping with an Allen wrench in a clockwise direction.

Step 9:

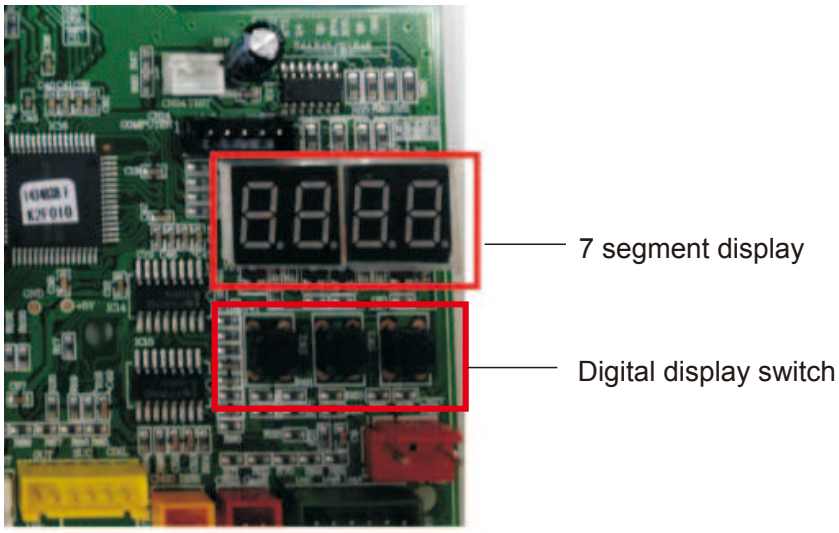
Cut off machine power and the procedure for recovering refrigerant is finished.

NOTE:

Be sure to switch back the dial after refrigerant recovery operation. If not, it will enter refrigerant recovery mode again after power ON. But if the power is not off, it will not enter refrigerant recovery mode and will run normally.

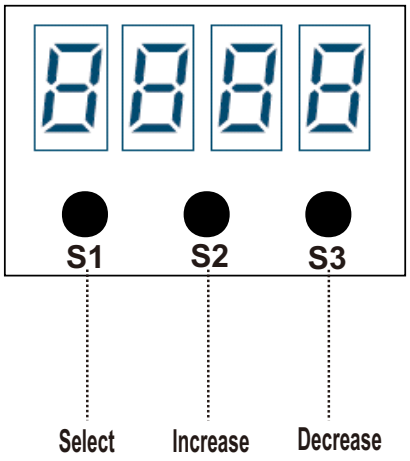
Running parameter query

Query by 7 segment display



7-segment display Introduction

24K/36K



There are 3 buttons on the digital display board：
1) Select button: Select to display outdoor/indoor unit parameter.

"P." -- Parameter of outdoor unit

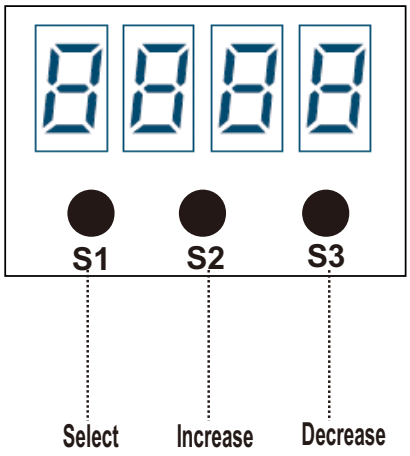
2) INCREASE button：Each time it is pressed, the number rises by 1.
3) DECREASE button：Each time it is pressed, the number lowers by 1.
The parameter content will be automatically displayed after the parameter code is selected for 3s.

Parameters can be checked in the following table below.

Parameter code	Descriptions
P.0	Fault codes
P.1	Compressor actual frequency
P.2	Compressor driving frequency
P.4	Compressor target frequency
P.5	Compressor exhaust temperature
P.6	Outdoor suction temperature
P.7	Outdoor ambient temperature
P.8	Outdoor coil temperature
P.9	Outdoor defrosting temperature
P.10	IPM module temperature
P.11	Outdoor capacity requirement
P.13	Outdoor DC Motor target speed
P.14	AC input current
P.15	AC input voltage
P.16	DC bus voltage
P.17	Compressor phase current
P.18	Frequency limit code
P.20	Target suction overheating
P.21	Target exhaust overheating
P.22	Actual suction overheating (heating)
P.23	Actual exhaust overheating (heating)

NOTE: The right is therefore reserved to EE changing without notice.

48K/60K



There are 3 buttons on the digital display board：

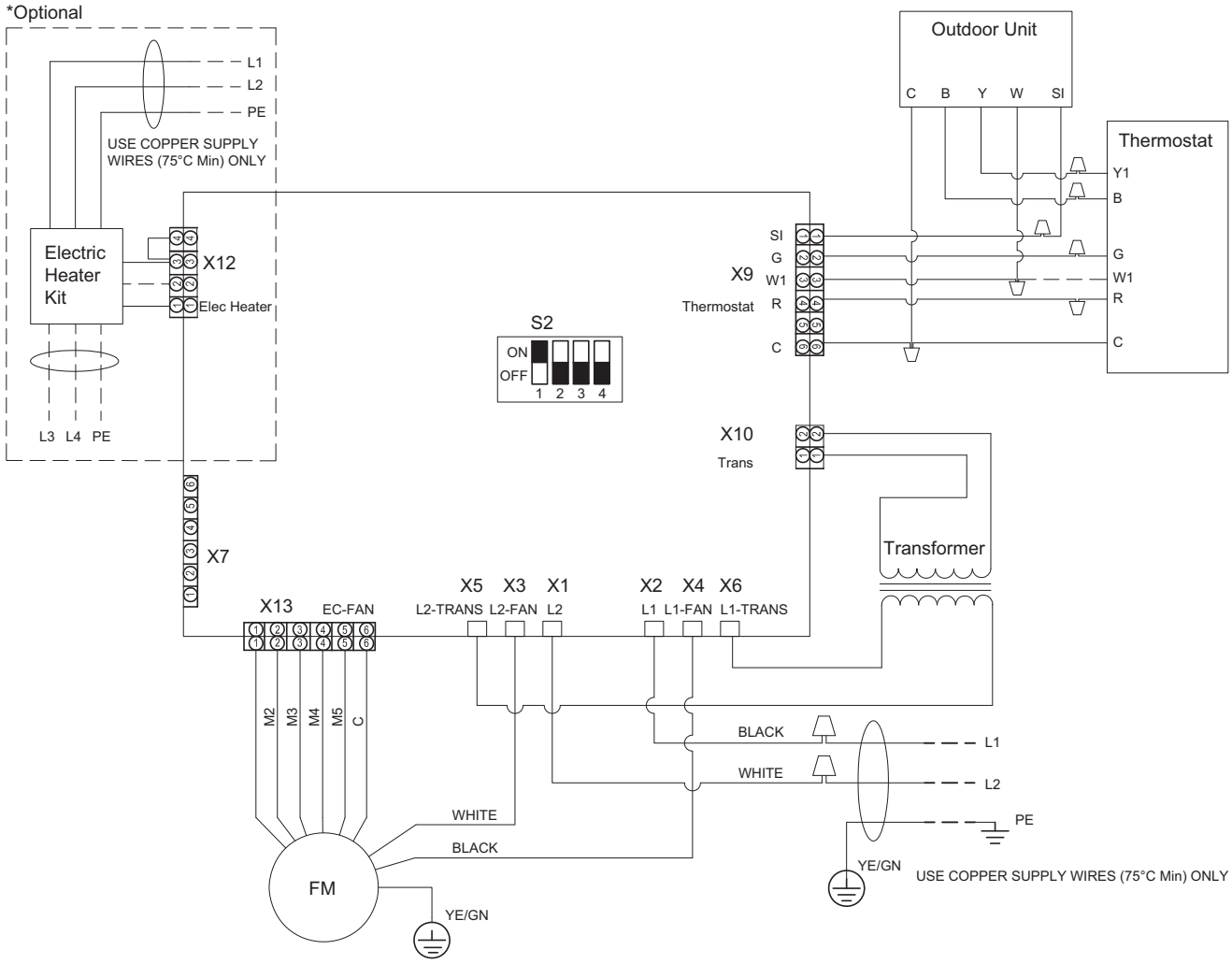
1) SWITCH button:
Indoor parameters and outdoor parameters can be selected in turn by pressing it.
"P."/"H."-outdoor unit parameter
2) INCREASE button:
Each time it is pressed, the number rises by 1, hold down it, the number will be rapidly increased;
3) DECREASE button：
Each time it is pressed, the number lowers by 1, hold down it, the number will be rapidly decreased.

Parameters can be checked in the following table below.

Parameter code	Descriptions
0	Protection code or fault code
P.1	Target frequency
P.2	Driving frequency
P.4	Outdoor EEV opening
P.5	Outdoor EEV target opening
P.6	Upper DC motor revolving speed
P.8	AC Input voltage
P.9	Current
P.10	Modular temperature
P.11	Capacity needed
P.12	Modular fault
P.20	Outdoor ambient temperature
P.21	Outdoor coil temperature
P.22	Outdoor defrost temperature
P.23	Suction temperature
P.24	Discharge temperature
H.1	DSH actual value
H.2	DSH target value
H.3	Target pressure in cooling mode (Actual pressure= the displayed value/100)
H.4	Target pressure in heating mode (Actual pressure= the displayed value/100)
H.5	Actual pressure (Actual pressure=the displayed value/100)

Wiring diagrams

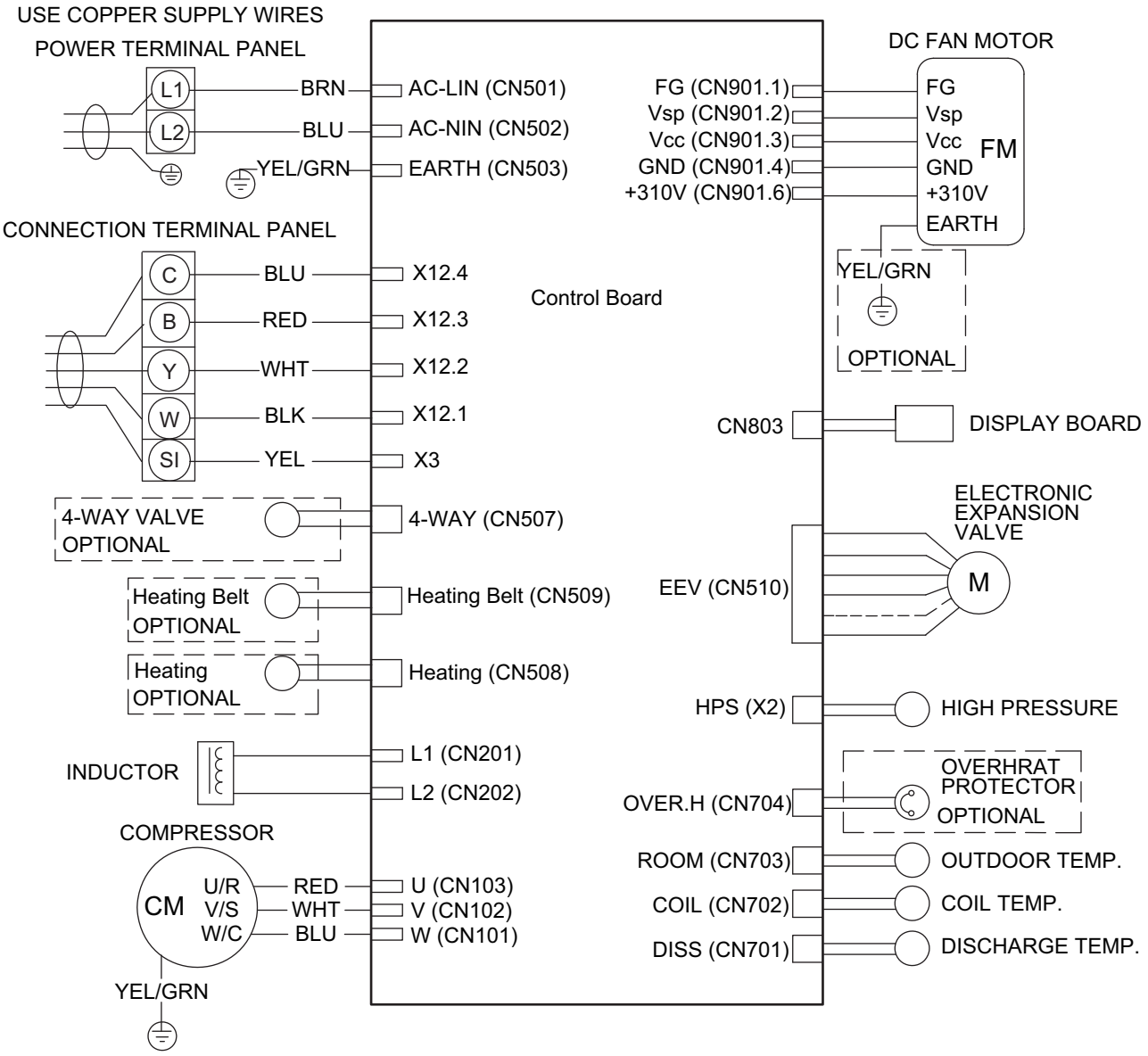
Models: WHM24DMA21S, WHM36DMA21S, WHM48DMA21S, and WHM60DMA21S



Fan motor

Pin No.	Terminal code	Function of terminal	Lead wire color
1	M1	Fan speed	Brown
2	M2	Fan speed	Blue
3	M3	Fan speed	Yellow
4	M4	Fan speed	Gray
5	M5	Fan speed	Red
6	C	Common	White
7	N	Fan input neutral	White
8	L	Fan input live	Black
9	YE/GN	GND	——

Models: WHM24SZA21S and WHM36SZA21S



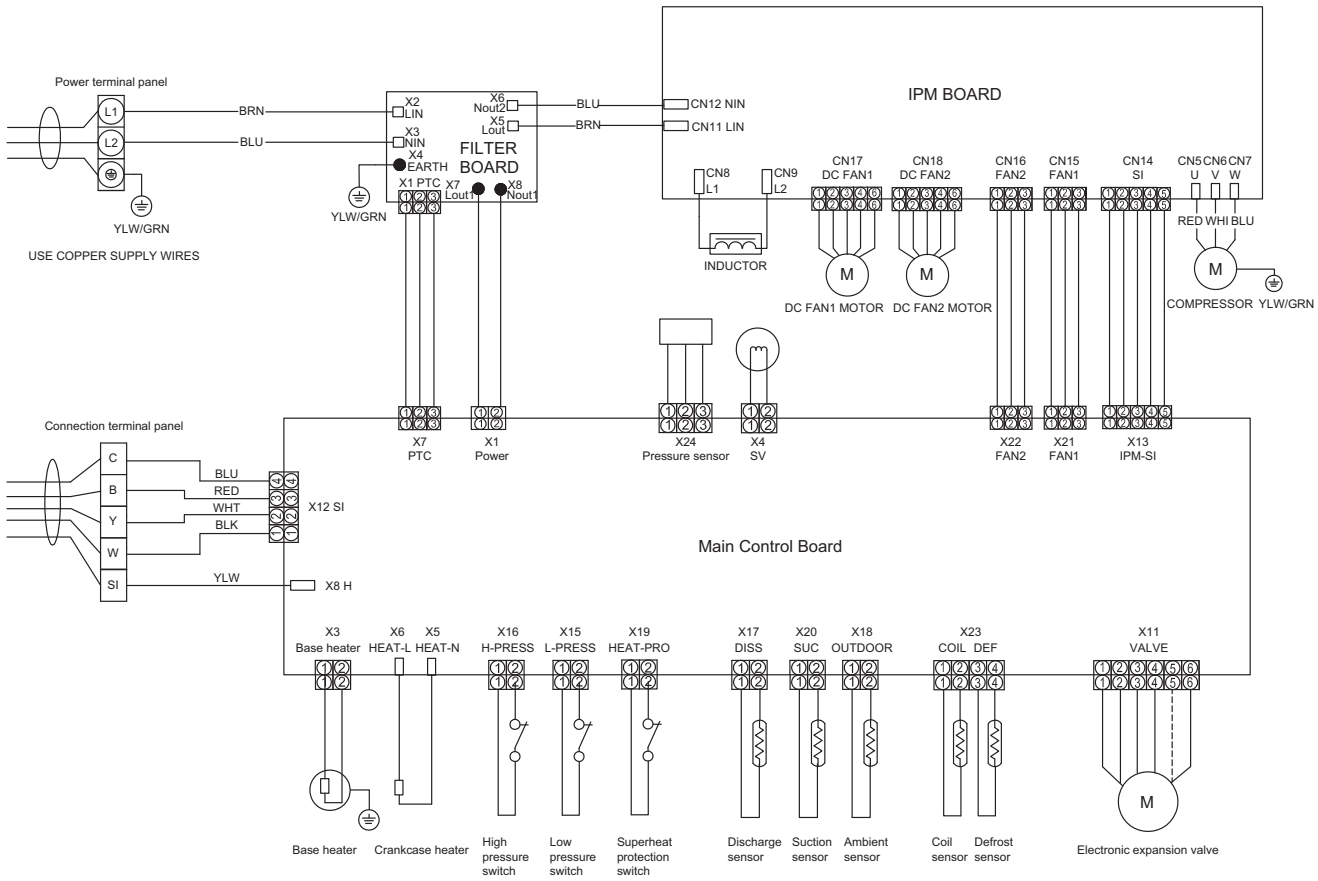
Fan motor

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

Compressor
24 model: 0.75 Ω
36 model: 0.75 Ω
(20℃ 68°F)

Temperature	0℃ 32°F	20℃ 68°F	30℃ 86°F
Thermistor (Outdoor temp.)	15 kΩ 1.3 V	6.5 kΩ 2.2 V	4.5 kΩ 2.7 V
Thermistor (Coil & Defrost temp.)	15 kΩ 1.3 V	6.5 kΩ 2.2 V	4.5 kΩ 2.7 V
Thermistor (Discharge temp.)	187 kΩ 0.18 V	72.1 kΩ 0.43 V	46.5 kΩ 0.64 V

Models: WHM48SZA21S and WHM60SZA21S



Fan motor

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

Compressor

48 model: 0.63 Ω
60 model: 0.63 Ω
(20℃ 68°F)

Temperature	0℃ 32°F	20℃ 68°F	30℃ 86°F
Thermistor (Outdoor temp.)	15 kΩ 1.3 V	6.5 kΩ 2.2 V	4.5 kΩ 2.7 V
Thermistor (Coil & Defrost temp.)	15 kΩ 1.3 V	6.5 kΩ 2.2 V	4.5 kΩ 2.7 V
Thermistor (Discharge temp.)	187 kΩ 0.18 V	72.1 kΩ 0.43 V	46.5 kΩ 0.64 V
Thermistor (Suction temp.)	15 kΩ 1.3 V	6.5 kΩ 2.2 V	4.5 kΩ 2.7 V

Troubleshooting

Trouble guide

Troubleshooting for normal malfunction

Troubleshooting	Possible Reasons of Abnormality	How to Deal With
Air conditioner can not start up	1. Power supply failure; 2. Trip of breaker or blow of fuse; 3. Power voltage is too low; 4. Improper setting of remote controller ; 5. Remote controller is short of power.	1. Check power supply circuit; 2. Measure insulation resistance to ground to see if there is any leakage; 3. Check if there is a defective contact or leak current in the power supply circuit; 4. Check and set remote controller again; 5. Change batteries.
The compressor starts or stops frequently	The airinlet and outlet have been blocked.	Remove obstacles.
Poor cooling/heating	1. The outdoor heat exchanger is dirty, such as condenser; 2. There are heating devices indoors; 3. The airtightness is not enough, and people come in and out too frequently; 4. Block of outdoor heate xchanger; 5. Improper setting of temperature.	1. Clean the heat exchanger of the outdoor unit, such as condenser; 2. Remove heating devices; 3. Keep certain air tightness indoors; 4. Remove block obstacles; 5. Check and try to set temperature again.
Sound from deforming parts	During system starting or stopping, a sound might be heard.However, this is due to the normal deformation of plastic parts.	It is not abnormal, and the sound will disappear soon.
Waterleakage	1. Drainage pipe is blocked or broken; 2. Wrap of refrigerant pipe joint is not closed completely.	1. Change drainage pipe; 2. Re-wrap and make it tight.

Outdoor unit

24K/36K

DC-Inverter unitary (Main control board upside-down)

1) Fault code displayed by LED lamps on outdoor main control board.

There are 3 LED lamps on control board, LED1, LED2 and LED3.

LED1 indicates the ten's place of the fault code, LED2 indicates the unit's place of the fault code and LED3 indicates outdoor drive control fault.

When LED3 is off, LED1 and LED 2 indicate main control fault code.

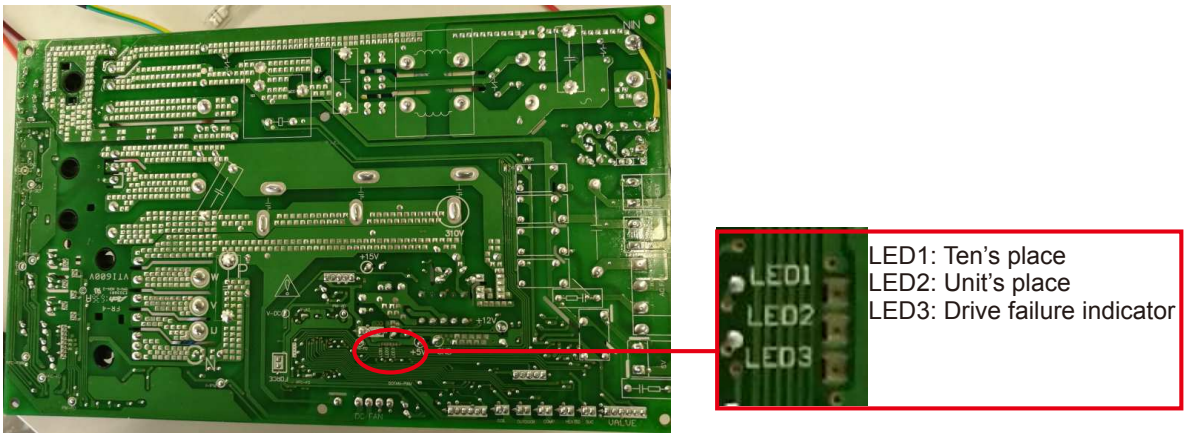
When LED3 is on, LED1 and LED 2 indicate drive control fault code.

When LED3 is flickering and LED1, LED 2 are all off, it indicates the compressor is preheating.

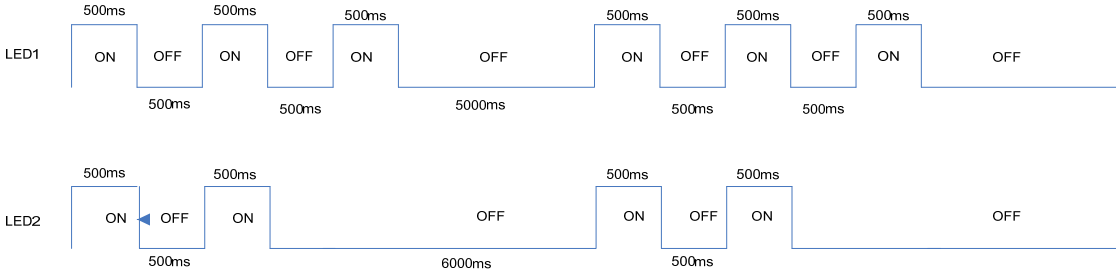
Failures display with 5s interval. It means LED will be off for 5s to report the next fault code.

System protection codes display method is the same with main control fault code.

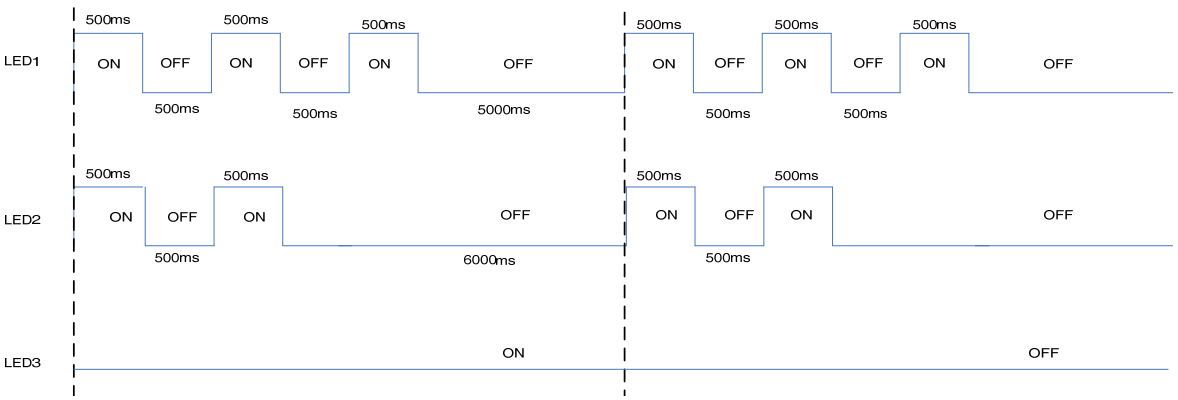
LED lamps will be off when there is no failure, protection or preheating.



For example, outdoor main control fault 32:



For example, outdoor drive fault 32:



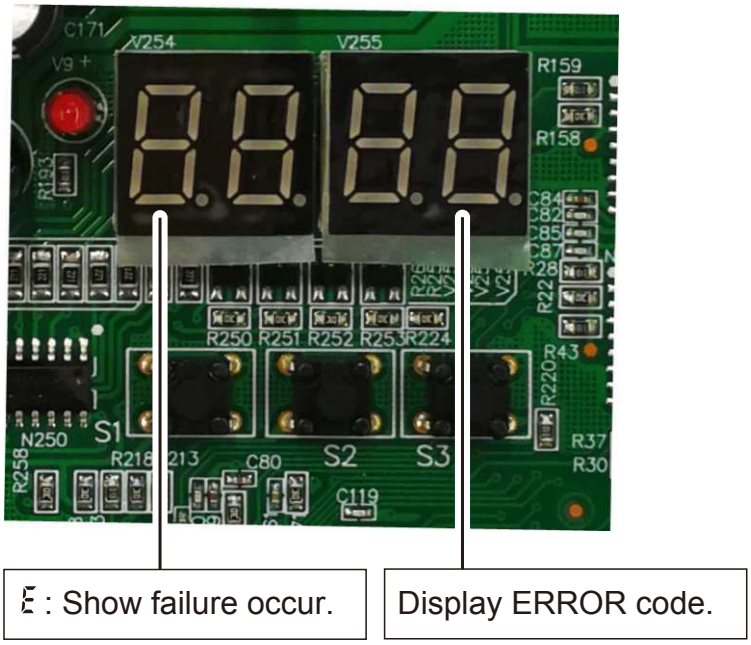
2) Display by 7 segment display board.

Fault code will be displayed directly on 7 segment display board.

48K/60K

Main control fault display

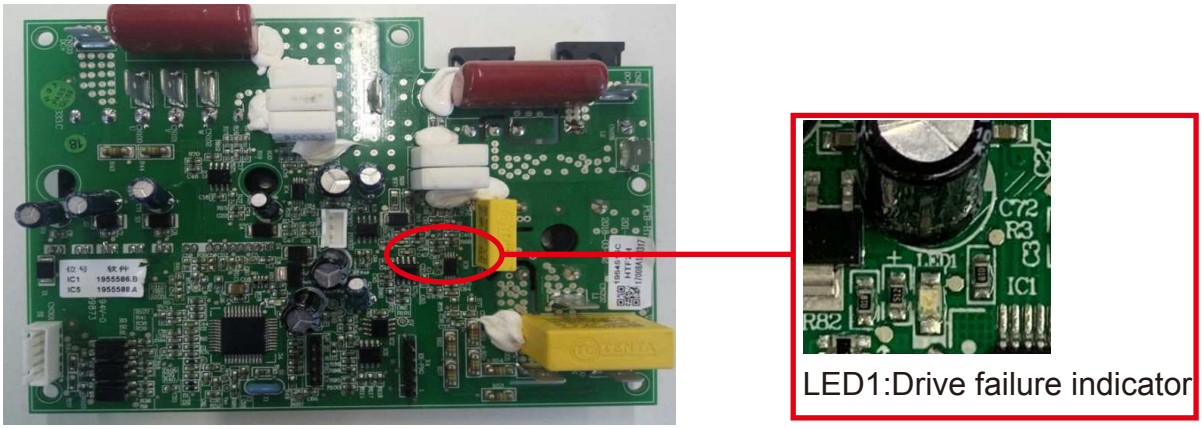
Fault code will be displayed by 7 segment display on main control board.



Drive fault code display

The lamp of drive board flashing shows failure occurs.

How many times the drive failure lamp flicker will show the failure code.



Fault codes

The following is the fault code table of outdoor units.

Table 1 Outdoor fault code

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
1	Outdoor ambient temperature sensor fault	1.The outdoor ambient temperature sensor is connected loosely; 2.The outdoor ambient temperature sensor fails to work; 3.The sampling circuit fails.	1.Reconnect the outdoor ambient temperature sensor; 2.Replace the outdoor ambient temperature sensor components; 3.Replace the outdoor control board components.	
2	Outdoor coil temperature sensor fault	1.The outdoor coil temperature sensor is connected loosely; 2.The outdoor coil temperature sensor fails to work; 3.The sampling circuit fails.	1.Reconnect the outdoor coil temperature sensor; 2.Replace the outdoor coil temperature sensor components; 3.Replace the outdoor control board components.	
3	The unit over-current turn off fault	1. Control board current sampling circuit fails; 2. The current is over high because the supply voltage is too low; 3. The compressor is blocked; 4. Overload in cooling mode; 5. Overload in heating mode.	1. Replace the electrical control board components; 2. Normal protection; 3. Replace the compressor; 4. Please see NOTE 3; 5. Please see NOTE 4.	
4	EEprom Data error	1.EE components fails; 2.EE components control circuit fails; 3.EE components are inserted incorrectly.	1.Replace the EE components; 2.Replace the outdoor control board components; 3.Reassemble the EE components.	
5	Cooling freezing protection (the indoor coil temperature is too low) or heating overload (indoor coil temperature is too high)	1.The indoor unit can not blow air normally; 2.The room temperature is too low in cooling mode or the room temperature is too high in heating; 3.The filter is dirty; 4.The duct resistance is too high to resulting in low air flow; 5.The setting fan speed is too low; 6.The indoor unit is not installed in accordance with the installation standards, and the air inlet is too close to the air outlet .	1.Check whether the indoor fan, indoor fan motor and evaporator work normally; 2.Normal protection; 3.Clean the filter; 4.Check the volume control valve, duct length etc.; 5.Set the speed with high speed; 6.Reinstall the indoor unit referring to the user manual to change the distance between the indoor unit and the wall or ceiling.	
7	The communication fault between the indoor unit and outdoor unit	1.The connection cable is connected improperly between the indoor unit and outdoor unit; 2.The communication cable is connected loosely; 3.The communication cable fails; 4.The indoor control board fails; 5.The outdoor control board fails; 6.Communication circuit fuse open; 7.The specification of communication cable is incorrect.	1.Reconnect the connection cable referring to the wiring diagram; 2.Reconnect the communication cable; 3.Replace the communication cable; 4.Replace the indoor control board; 5.Replace the outdoor control board; 6.Check the communication circuit, adjust the DIP switch and the short-circuit fuse; 7.Choose suitable communication cable referring to the user manual.	

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
13	Compressor overheat protector device	1. The wiring of the overload protector is connected loosely. 2. The overload protector fails . 3. The refrigerant is not enough; 4. The installation pipe is much longer than the normal one, but extra refrigerant is not added ; 5. The expansion valve fails; 6. The outdoor control board fails.	1. Reconnect the wiring of the overload protector; 2. Replace the overload protector; 3. Check the welding point of the unit to confirm whether it is leakage, and then recharge the refrigerant; 4. Add the refrigerant; 5. Replace expansion valve; 6. Replace the outdoor control board.	
14	The high pressure switch operation or the unit is turned off for high pressure protection	1.The wiring of the high pressure protector is connected loosely; 2.The high pressure protector fails; 3.The outdoor control board is abnormal; 4. Overload in cooling; 5. Overload in heating.	1. Reconnect the wiring of the high pressure protector; 2. Replace the high pressure protector; 3. Replace the outdoor control board; 4. Please refer to NOTE 3; 5. Please refer to NOTE 4.	Applied to models with high pressure switch or pressure sensor
15	The low pressure switch protection or the unit is turned off for low pressure protection	1. The wiring of the low pressure switch is connected loosely; 2. The low pressure switch fails; 3. The refrigerant is not enough; 4. The expansion valve fails in heating mode; 5. The outdoor control board is abnormal.	1. Reconnect the wiring of the low pressure switch; 2. Replace the low pressure switch; 3. Check the welding point to confirm whether the unit leaks, and add some refrigerant; 4. Replace the expansion valve; 5. Replace the outdoor control board.	Applied to models with low pressure switch or pressure sensor
16	Overload protection in cooling mode	System overload	Please refer to NOTE 3.	
17	Discharge temperature sensor fault	1.The wiring of the discharge tempe-rature sensor is connected loosely; 2. The discharge temperature sensor fails; 3.The sampling circuit is abnormal.	1. Reconnect the wiring of the discharge temperature sensor; 2. Replace the discharge temperature sensor; 3. Replace the outdoor control board.	
18	AC voltage is abnormal	1.The AC voltage>275V or <160V; 2.The AC voltage of sampling circuit on the driver board is abnormal.	1. Normal protection, please check the supply power; 2. Replace the driver board.	
19	Suction temperature sensor fault	1.The wiring of the suction tempe-rature sensor is connected loosely; 2.The suction temperature sensor fails; 3.The sampling circuit is abnormal.	1.Reconnect the wiring of the suction temperature sensor; 2.Replace the suction temperature sensor; 3.Replace the outdoor control board.	
22	The defrosting sensor fault	1.The wiring of the defrosting sensor is connected loosely; 2.The defrosting sensor fails; 3.The sampling circuit is abnormal.	1. Reconnect the wiring of the defrosting sensor; 2. Replace the defrosting sensor; 3. Replace the outdoor control board.	
43	High Pressure sensor fault	1. The wiring of the high-pressure pressure sensor connect is loose; 2. The high-pressure pressure sensor fails; 3. The sampling circuit of the high-pressure pressure sensor fails.	1. Reconnect the wiring of the high-pressure pressure sensor; 2. Replace the high-pressure pressure sensor; 3. Replace the outdoor control board.	

Fault code	Fault description	Possible reasons for abnormality	How to deal with	Remarks
45	IPM fault	There are many reasons for this failure. You can check the driver board fault LED to further analyze the fault code of the drive board and to learn about what leads to the fault and how to operate it. Specific information can be seen in table 2, table 3.	See attached "analysis of the driving board fault".	
46	IPM and control board communication fault	1.The cable between the control board and the driver board is connected loosely; 2.The cable between the control board and the driver board fails; 3.The driver board fails ; 4.The control board fails.	1.Reconnect the cable between the control board and the driver board; 2.Replace the communication cable between the control board and the driver board; 3.Replace the driver board; 4.Replace the control board.	
47	Too high discharge temperature fault	1. The refrigerant of the unit is not enough; 2.The refrigerant of the unit is not enough due to that the installation pipe is longer; 3.Throttling service fails; 4.The outdoor ambient temperature is too high.	1.Check the welding point to confirm whether the unit has leakage point, and then add some refrigerant; 2.Add some refrigerant referring to the installation user manual; 3.Replace the throttling service (such as capillary, expansion valve); 4.Normal protection.	
48	The outdoor DC fan motor fault (upper fan motor)	1.The connecting wiring of the up DC fan motor is loose; 2.The cord of the upper DC fan motor fails; 3.The upper DC fan motor fails; 4.The drive circuit of the upper DC fan motor fails; 5.The outdoor fan has been blocked.	1.Reconnect the wiring of the up DC fan motor; 2.Replace the upper DC fan motor; 3.Replace the upper DC fan motor; 4.Replace the driver board of the fan motor; 5.Check the outdoor fan and ensure the outdoor fan can run normally.	
49	The outdoor DC fan motor fault (down fan motor)	1.The connecting wiring of the down DC fan motor is loose; 2.The cord of the down DC fan motor fails; 3. The down DC fan motor fails; 4. The drive circuit of the down DC fan motor fails; 5. The outdoor fan has been blocked.	1. Reconnect the wiring of the down DC fan motor; 2. Replace the down DC fan motor; 3. Replace the down DC fan motor; 4. Replace the driver board of the fan motor; 5. Check the outdoor fan and ensure the outdoor fan can run normally.	
91	The unit turn off due to the IPM board over heating fault	1. The outdoor ambient temp. is too high; 2. The speed of the out fan motor is too low if the fan motor is AC fan motor; 3. The outdoor unit is not installed in accordance with the standard; 4.The supply power is too low.	1. Normal protection; 2. Check the fan capacitor, and replace the fan capacitor if it is a failure; 3. Reinstalled the outdoor unit referring to the installation user manual; 4. Normal protection.	
96	Lacking of refrigerant	The refrigerant of the unit is not enough.	Discharge the refrigerant and charge the refrigerant referring to the rating label.	
97	4-way valve commutation failure fault	1.The connecting wiring of the 4-way valve coil is loose; 2.The 4-way valve coil fails; 3.The 4-way valve fails; 4.The driver board of the 4-way valve fails.	1. Reconnect the wiring of the 4-way valve; 2. Replace the 4-way valve coil; 3. Replace the 4-way valve; 4. Replace the driver board of the way valve.	

NOTE 1:

If the indoor unit can not start or the indoor unit stops itself after 30s, at the same time the unit does not display the fault code, please check the fire and the socket of the control board.

NOTE 2:

If the indoor unit displays the 75,76,77,78 fault code after you turn on the unit, please check the TEST seat of the indoor control board or the TEST detection circuit to see whether short circuit occurs.

NOTE 3: Overload in cooling mode

	Overload in cooling mode	
sr.	**The root cause**	**Corrective measure**
1	The refrigerant is excessive.	Discharge the refrigerant, and recharge the refrigerant referring to the rating label.
2	The outdoor ambient temperature is too high.	Please use it within allowable temperature range
3	Short-circuit occurs in the air outlet and air inlet of the outdoor unit.	Adjust the installation of the outdoor unit referring to the user manual.
4	The outdoor heat exchanger is dirty, such as condenser.	Clean the heat exchanger of the outdoor unit, such as condenser.
5	The speed of the outdoor fan motor is too low.	Check the outdoor fan motor and fan capacitor.
6	The outdoor fan is broken or the outdoor fan is blocked.	Check the outdoor fan.
7	The air inlet and outlet have been blocked.	Remove the obstructions.
8	The expansion valve or the capillary fails.	Replace the expansion valve or the capillary.

NOTE 4: Over load in heating mode

	Overload in heating mode	
sr.	**The root cause**	**Corrective measures**
1	The refrigerant is excessive.	Discharge the refrigerant, and recharge the refrigerant referring to the rating label.
2	The indoor ambient temperature is too high.	Please use it within allowable temperature range.
3	Short-circuit occurs in the air outlet and air inlet of the indoor unit.	Adjust the installation of the indoor unit referring to the user manual.
4	The indoor filter is dirty.	Clean the indoor filter.
5	The speed of the indoor fan motor is too low.	Check the indoor fan motor and fan capacitor.
6	The indoor fan is broken or the outdoor fan is blocked.	Check the indoor fan.
7	The air inlet and outlet have been blocked.	Remove the obstructions.
8	The expansion valve or the capillary fails.	Replace the expansion valve or the capillary.

Table 2 Drive fault code (24K/36K)

Fault code	Fault description	Possible reasons for abnormality	How to deal with
1	Inverter DC voltage overload fault	1. Power supply input is too high or too low; 2. Driver board fault.	1. Check power supply; 2. Change driver board.
2	Inverter DC low voltage fault		
3	Inverter AC current overload fault		
4	Out-of-step detection	1. Compressor phase lost ; 2. Bad driver board components ; 3. The compressor insulation fault.	1. Check compressor wire connection; 2. Change the driver board; 3. Change compressor.
5	Loss phase detection fault (speed pulsation)		
6	Loss phase detection fault (current imbalance)		
7	Inverter IPM fault (edge)	1. System overload or current overload; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft ; 4. The compressor insulation fault.	1. Check the system. 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
8	Inverter IPM fault (level)		
9	PFC_IPM IPM fault (edge)		
10	PFC_IPM IPM fault (level)		
11	PFC power detection of failure	1. The power supply is not stable; 2. Instantaneous power off; 3. Driver board failure.	1. Check the power supply. 2. No need to deal with. 3. Change the driver board.
12	PFC overload current detection of failure.	1. System overload, current is too high; 2. Driver board fails; 3. PFC fails.	1.Check the system; 2.Change the driver board; 3.Change the PFC.
13	DC voltage detected abnormal .	1. Input voltage is too high or too low; 2. Driver board fails.	1. Check the power supply; 2. Change the driver board.
14	PFC LOW voltage detected failure.		
15	AD offset abnormal detected failure.	Driver board fails.	Change the driver board.
16	Inverter PWM logic set fault.		
17	Inverter PWM initialization failure		
18	PFC_PWM logic set fault.		
19	PFC_PWM initialization fault.		
20	Temperature abnormal.		
21	Shunt resistance unbalance adjustment fault		
22	Communication failure.	1. Communication wire connection is not proper; 2. Driver board fails; 3. Control board fails.	1. Check the wiring; 2. Change the driver board; 3. Change the control board.
23	Motor parameters setting of failure	Initialization is abnormal.	Reset the power supply.
26	DC voltage mutation error	1. Power input changes suddenly 2. Driver board fails.	1.Check power supply, to provide stable power supply; 2.Change driver board.
27	D axis current control error	1. System overload, phase current is too high; 2. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
28	Q axis current control error	1. System overloads, phase current is too high ; 2. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
29	Saturation error of d axis current control integral	1. System overload suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
30	Saturation error of q axis current control integral	1. System overload suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check system to see if it works normally. 2. Check stop valve to see if it is open; 3. Change the driver board.
35	EE data abnormal	Driver board EEPROM is abnormal	1. Change EEPROM ; 2. Change the driver board.

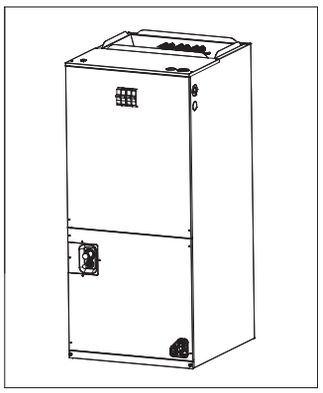
Table 3 Drive fault code (48K/60K)

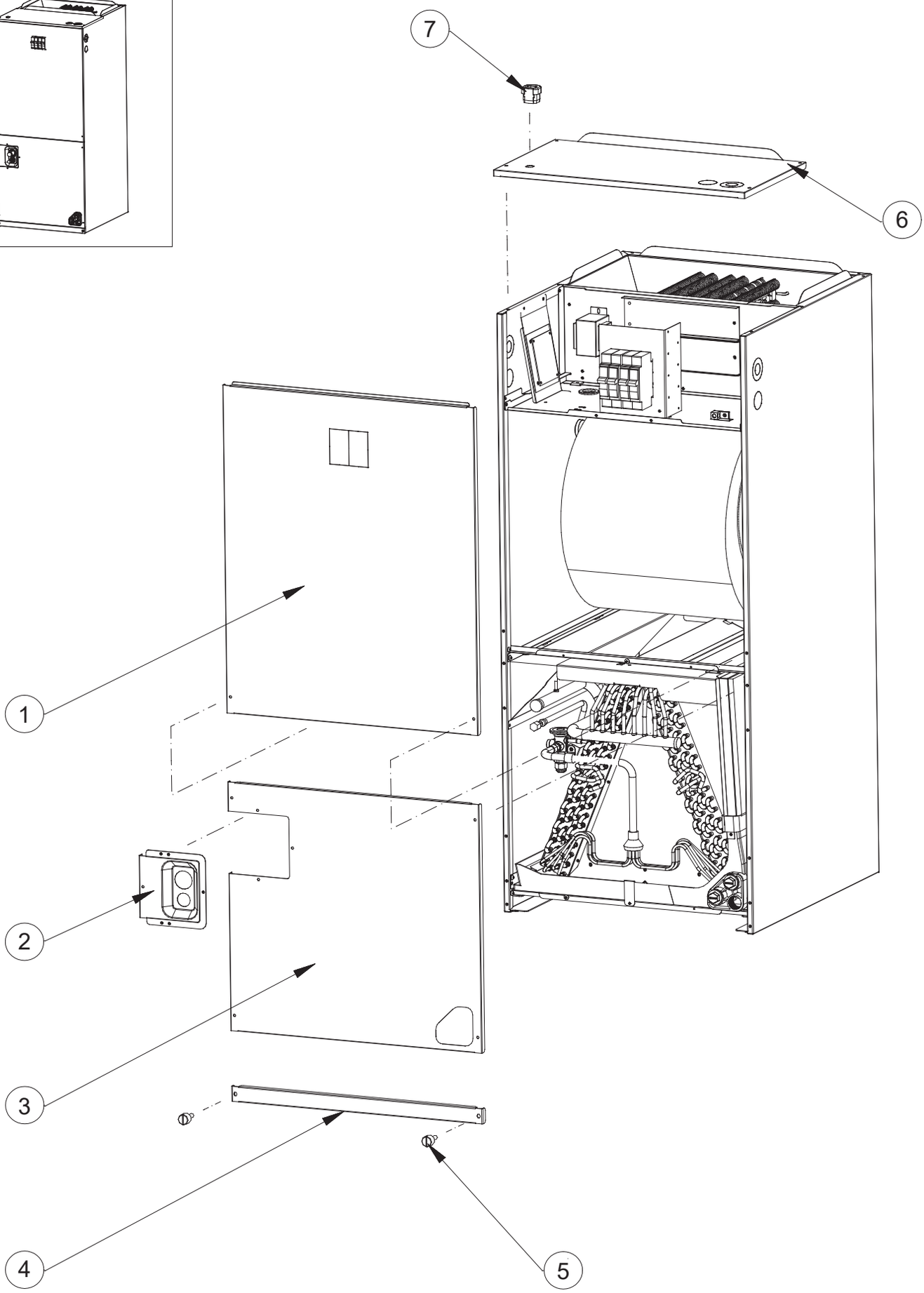
Fault code	Fault description	Possible reasons for abnormality	How to deal with
1	Q axis current detection, failure in drive control	1. Compressor wire is not connected properly; 2. Bad driver board components; 3. Compressor start load is too large; 4. Compressor demagnetization; 5. Compress or oil shortage serious wear of crankshaft; 6. The compressor insulation fails.	1. Check the wire of the compressor; 2. Change the driver board ; 3. Turn on the machine after the pressure is balanced again; 4. Change the compressor; 5. Change the compressor; 6. Change the compressor.
2	Phase current detection, failure in drive control	1.Compressor voltage default phase; 2.Bad driver board components; 3.The compressor insulation fault.	1.Check compressor wire connection; 2.Change the driver board; 3.Change the compressor.
3	Initialization, phase current imbalance	Bad driver board components.	Change the driver board .
4	Speed estimation, failure in drive control	1.Bad driver board components; 2.Compressor shaft clamping; 3.The compressor insulation fails.	1.Change the driver board ; 2.Change the compressor ; 3.Change the compressor .
5	IPM FO output fault	1. System overload or current overload. 2. Driver board fails; 3. Compressor oil shortage,serious wear of crankshaft; 4. The compressor insulation fault.	1.Check the air conditioner system; 2.Change the driver board; 3.Change the compressor; 4. Change the compressor.
6	Communication between driver board and control board fault	1.Communication wire is not connected well; 2. Driver board fault; 3. Control board fault;	1. Check compressor wire connection. 2. Change the driver board; 3. Change the control board ;
7	AC voltage,overload voltage	1. Supply voltage input is too high or too low; 2. Driver board fails;	1.Check power supply; 2.Change the driver board;
8	DC voltage,overload voltage	1. Supply voltage input is too high ; 2. Driver board fault;	1. Check power supply; 2. Change the driver board;
9	AC voltage imbalance	Driver board fails;	Change the driver board;
10	The PFC current detection circuit fault before compressor is ON	Bad driver board components;	Change the driver board
11	AC voltage supply in outrange	1.Power supply abnormal, power frequency out of range; 2.Driver board fails;	1. Check the system; 2. Change the driver board;
12	Products of single-phase PFC over-current, FO output low level	1. System overload, current is too large 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Inverter over current (3-phase power supply air conditioners)	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage, serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
13	Inverter over current	1. System overload, current is too large; 2. Driver board fault; 3. Compressor oil shortage,serious wear of crankshaft; 4. The compressor insulation fault.	1. Check the system; 2. Change the driver board; 3. Change the compressor; 4. Change the compressor.
14	PFC over current(single-phase air-conditioner)	1. System overload, current is too large; 2. Driver board fault; 3. PFC fault.	1. Check the system; 2. Change the driver board; 3. Change PFC.
	Phase imbalance or phase lacks or the instantaneous power failure (only for 3-phase power supply air conditioners)	1.3-Phase voltage imbalance; 2.The 3-phase power supply phase lost; 3. Power supply wiring is wrong; 4. Driver board fault.	1, Check the power supply; 2. Check the power supply; 3. Check the power supply wiring connection; 4. Change the driver board.
15	The instantaneous power off detection	1.The power supply is not stable ; 2.The instantaneous power failure ; 3.Driver board fault;	1. Check the power supply; 2. Not fault; 3. Change the driver board.

Fault code	Fault description	Possible reasons for abnormality	How to deal with
16	Low DC voltage 200V	1. Voltage input is too low; 2. Drive board fault.	1. Check the power supply. 2. Change the driver board.
18	Driver board read EE data error	1. EEPROM has no data or data error; 2. EEPROM circuit fault.	1. Change EEPROM component; 2. Change the driver board.
19	PFC chip receives data fault	Abnormal communication loop.	Change the drive board.
20	PFC soft start abnormally	Abnormal PFC drive loop.	Change the drive board.
21	The compressor drive chip could not receive data from PFC chip.	Communication loop fault.	Change the drive board.

Parts list

Indoor unit
WHM24DMA21S





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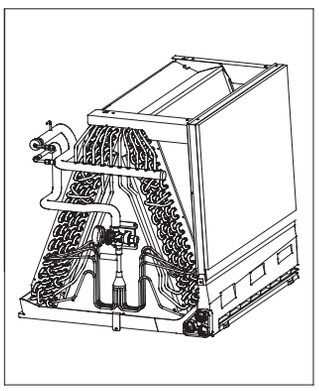

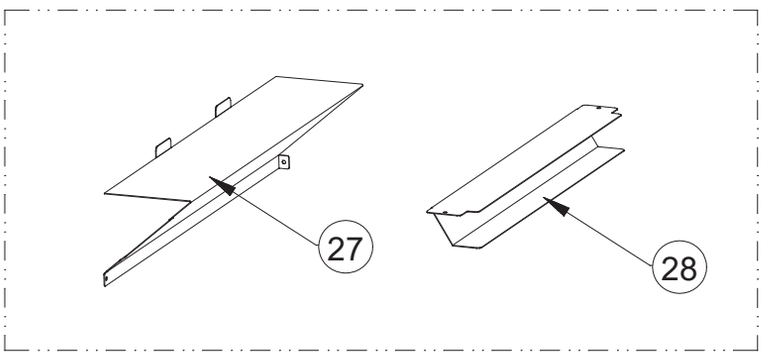

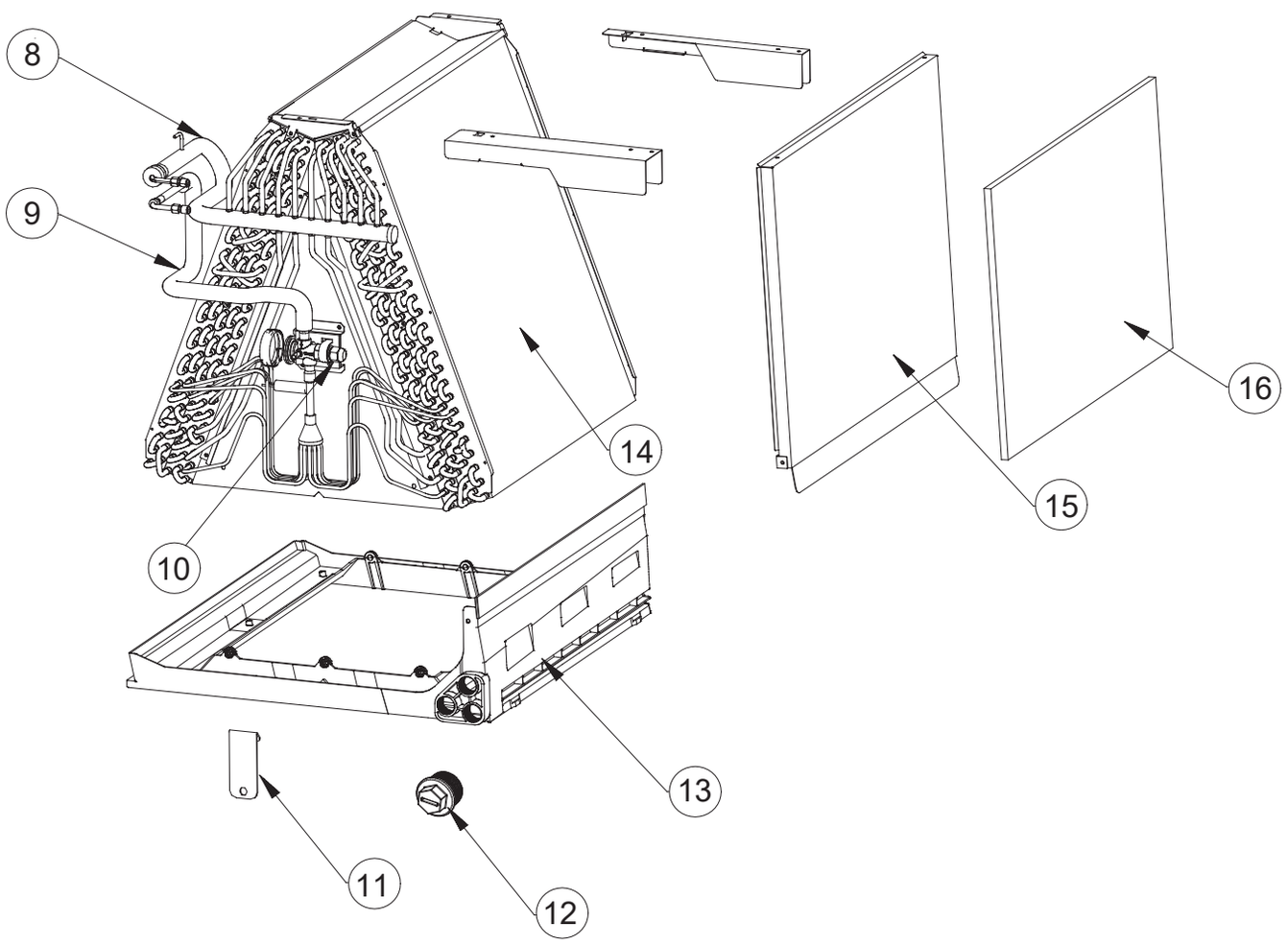

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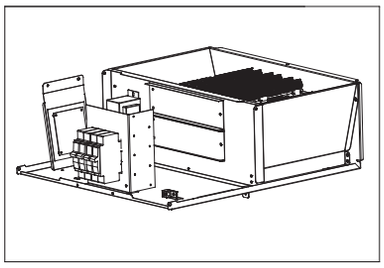
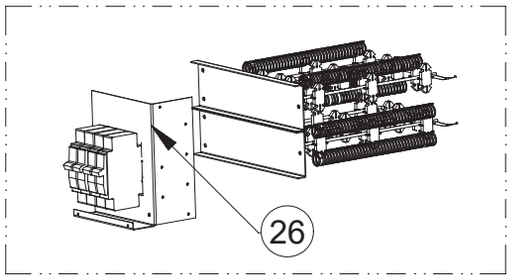
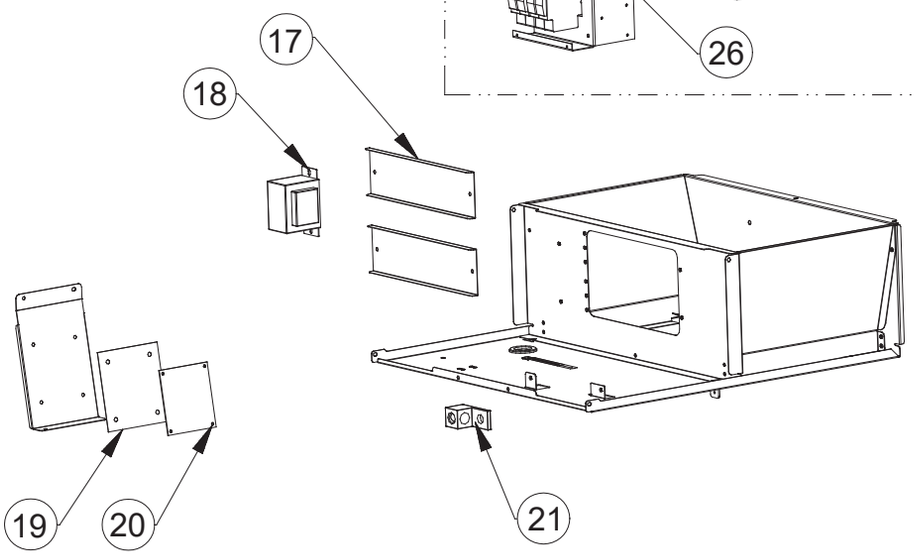
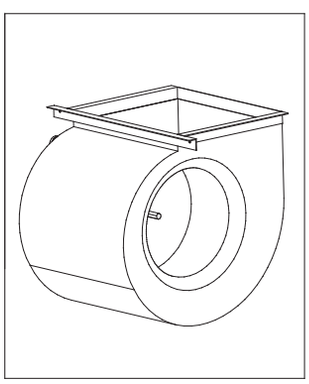
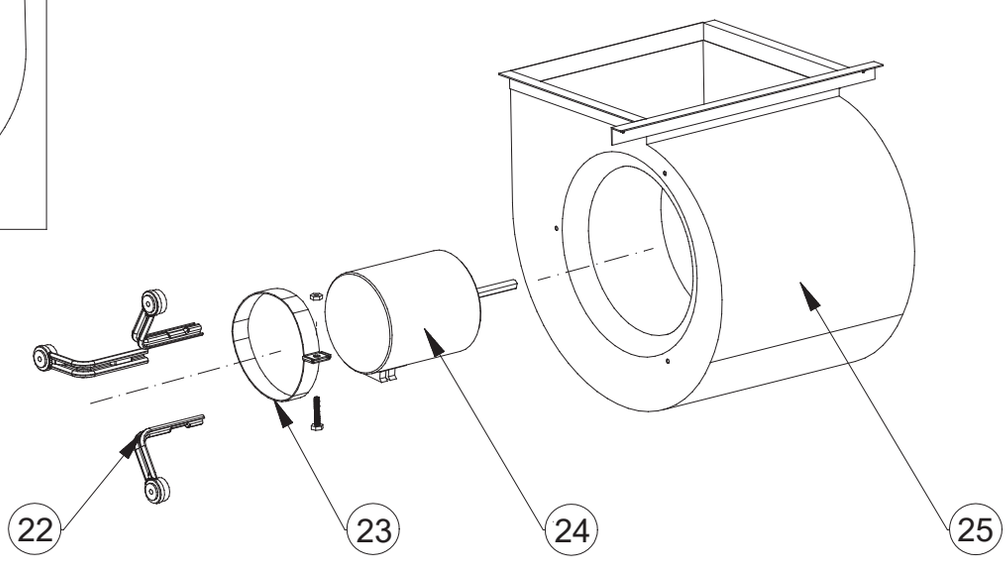








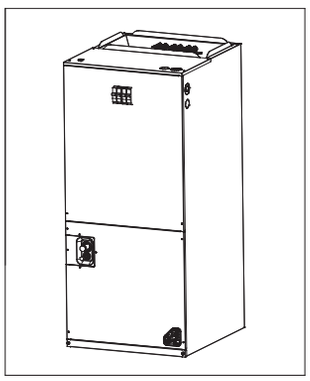


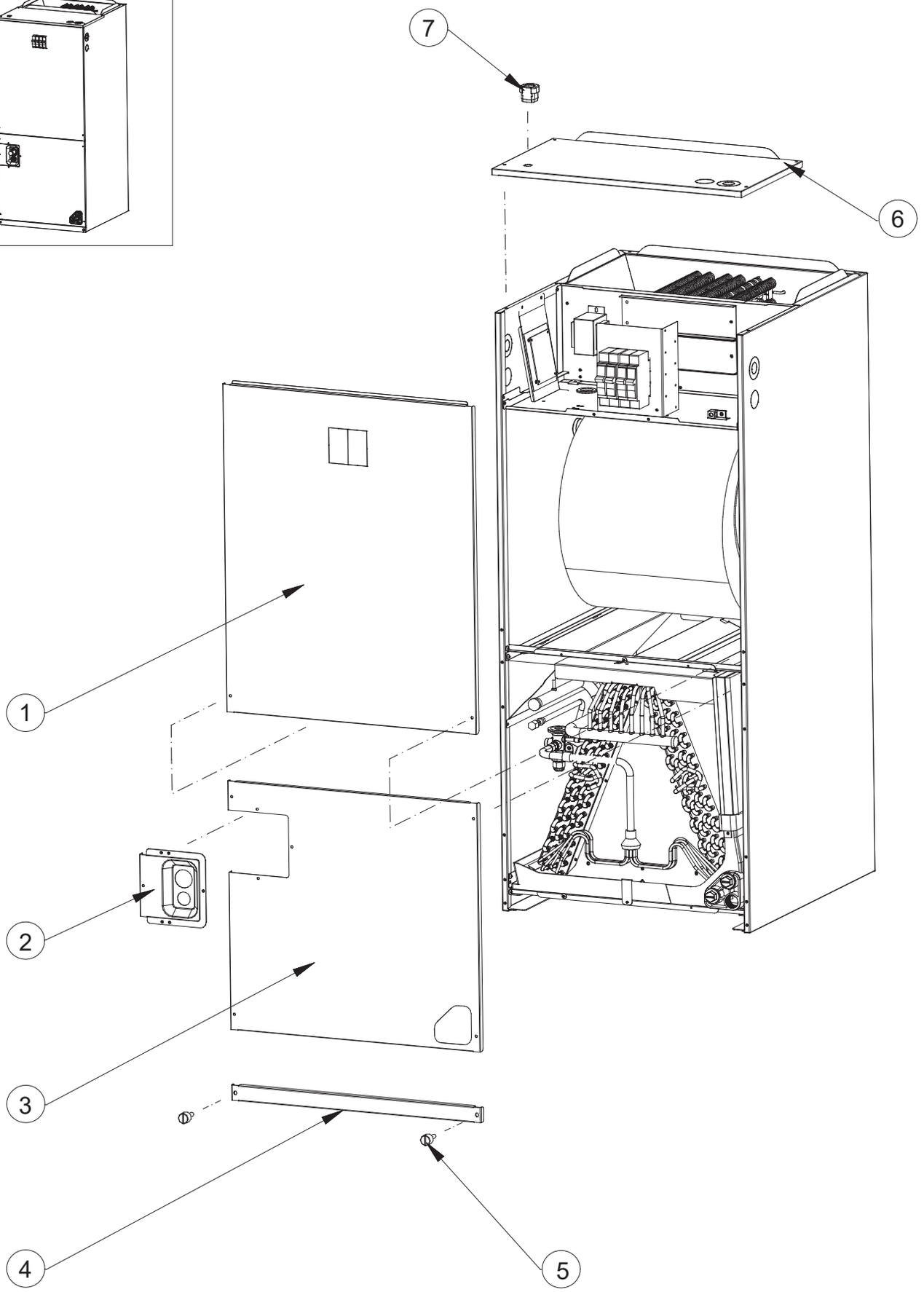
Indoor unit
WHM24DMA21S

No.	Part number	Description
1	2082476	Upper front panel AS
2	2093922	Seal plate parts
3	2082481	Down front panel AS
4	2082496	Mounting plate
5	2110453	Wing screw
6	2082470	Upper cover
7	2108011	Over the wire clip
8	2115463	Outlet tube assembly
9	2081573	Inlet tube assembly
10	2036833	Thermal EV body
11	2093962	Plate cover
12	2108088	Protecting plug
13	2082567	Water tray
14	2115464	Evaporator assembly
15	2082568	Water tray
16	2091112	Cotton
17	2082522	Mounting plate
18	2035135	Linear transformer
19	2082507	Insulative spacer
20	2150390	Controller PCB
21	2108027	Clamp
22	2108142	Plate cover
23	2108139	Hooking
24	2085227	Fan motor
25	2091218	Fan assembly
26	2105340	Electric heater kit (5 kW)
	2105342	Electric heater kit (7.5 kW)
	2105343	Electric heater kit (10 kW)

AS: assembly

Indoor unit
WHM36DMA21S





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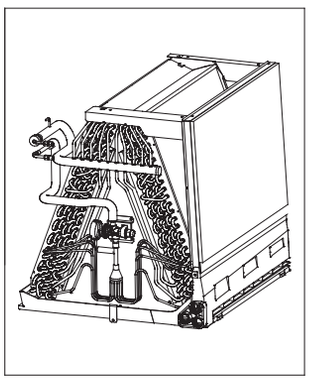

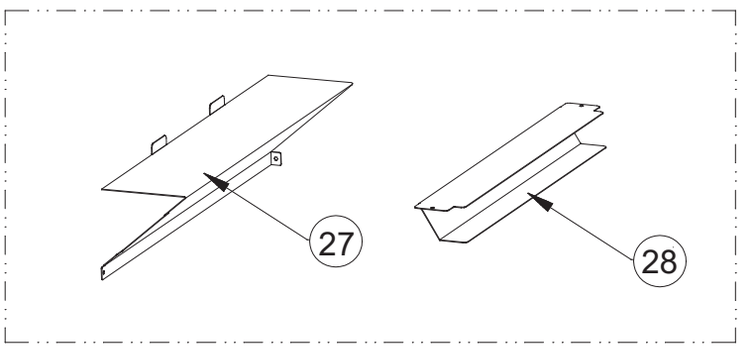

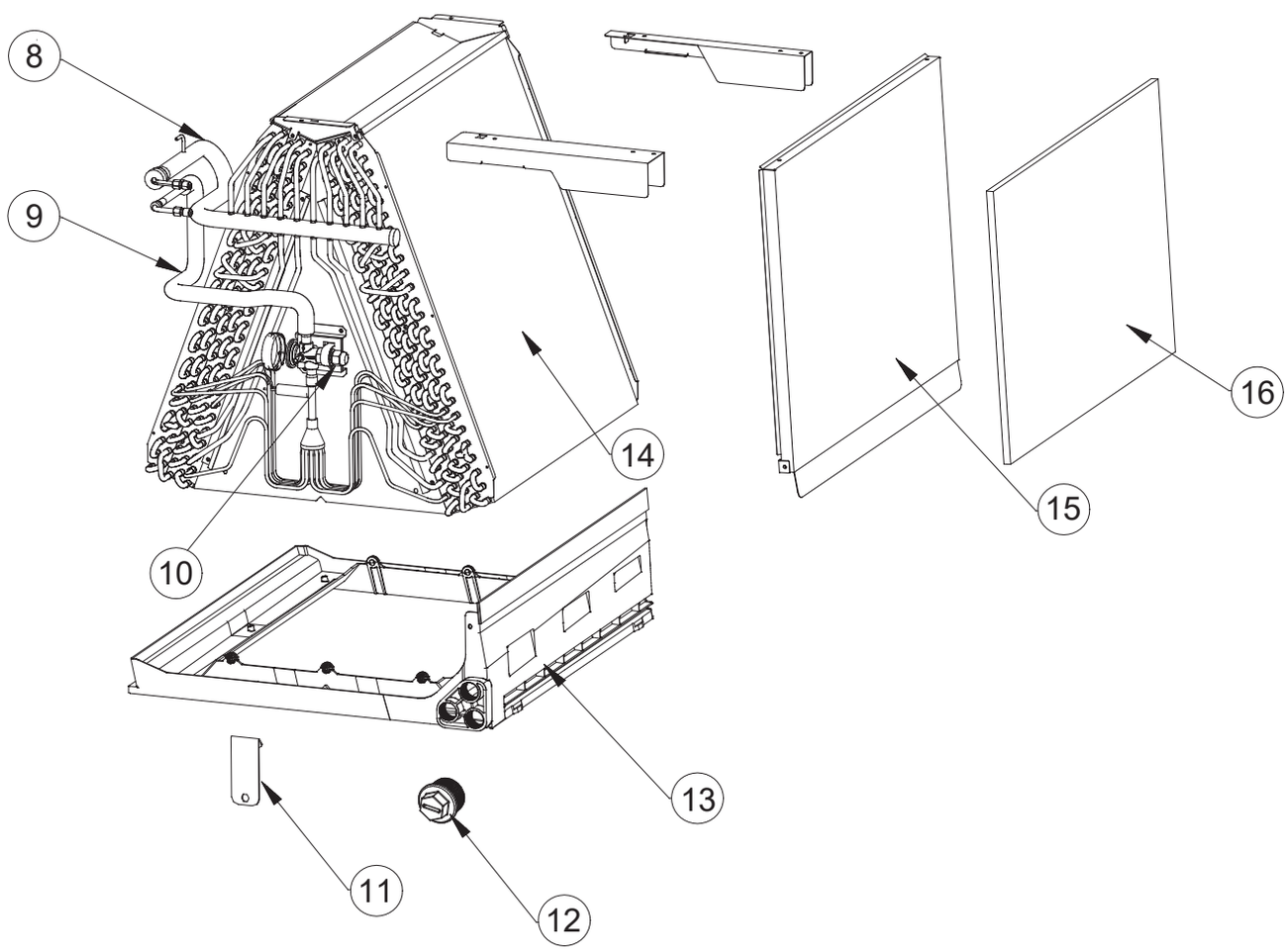

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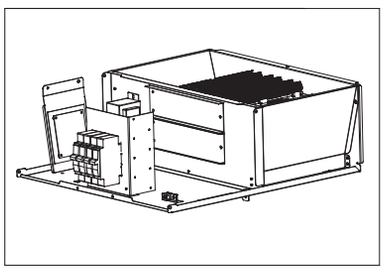
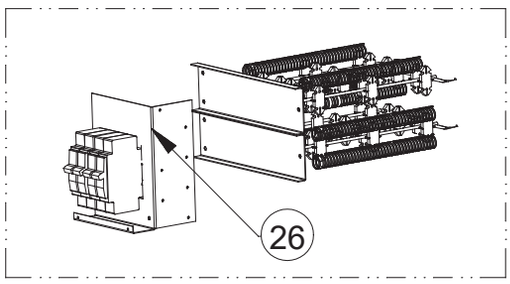
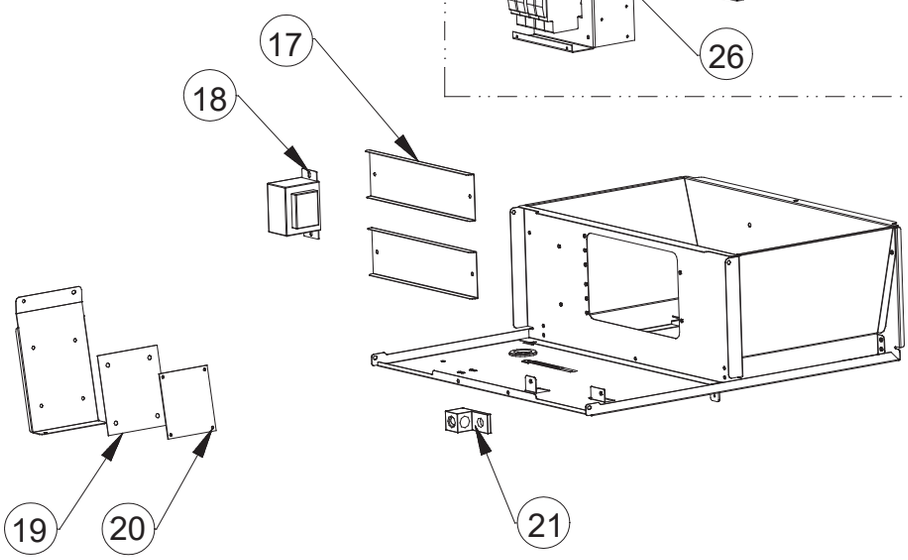
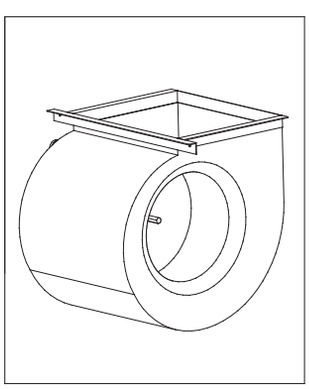
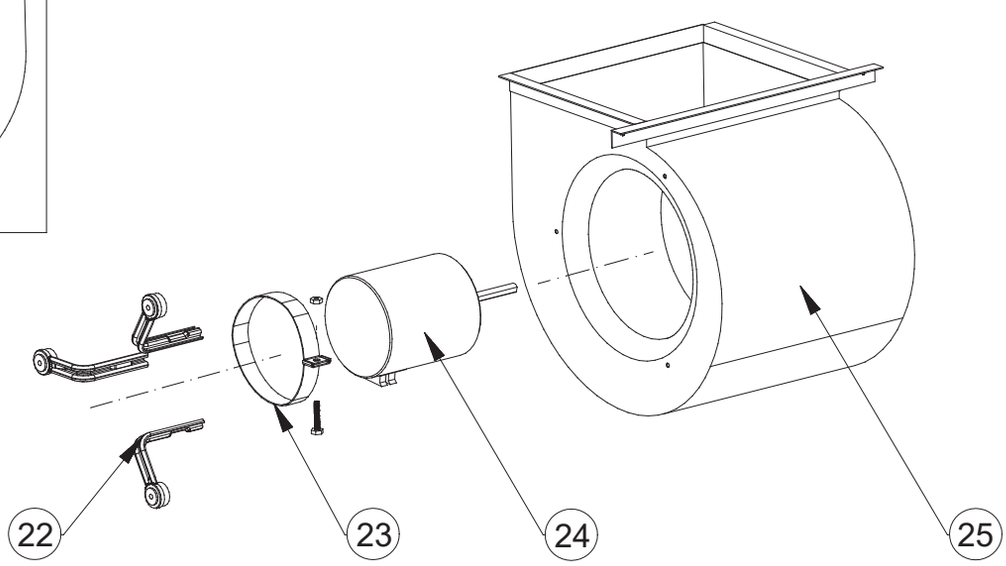








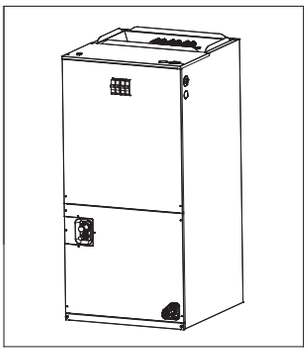


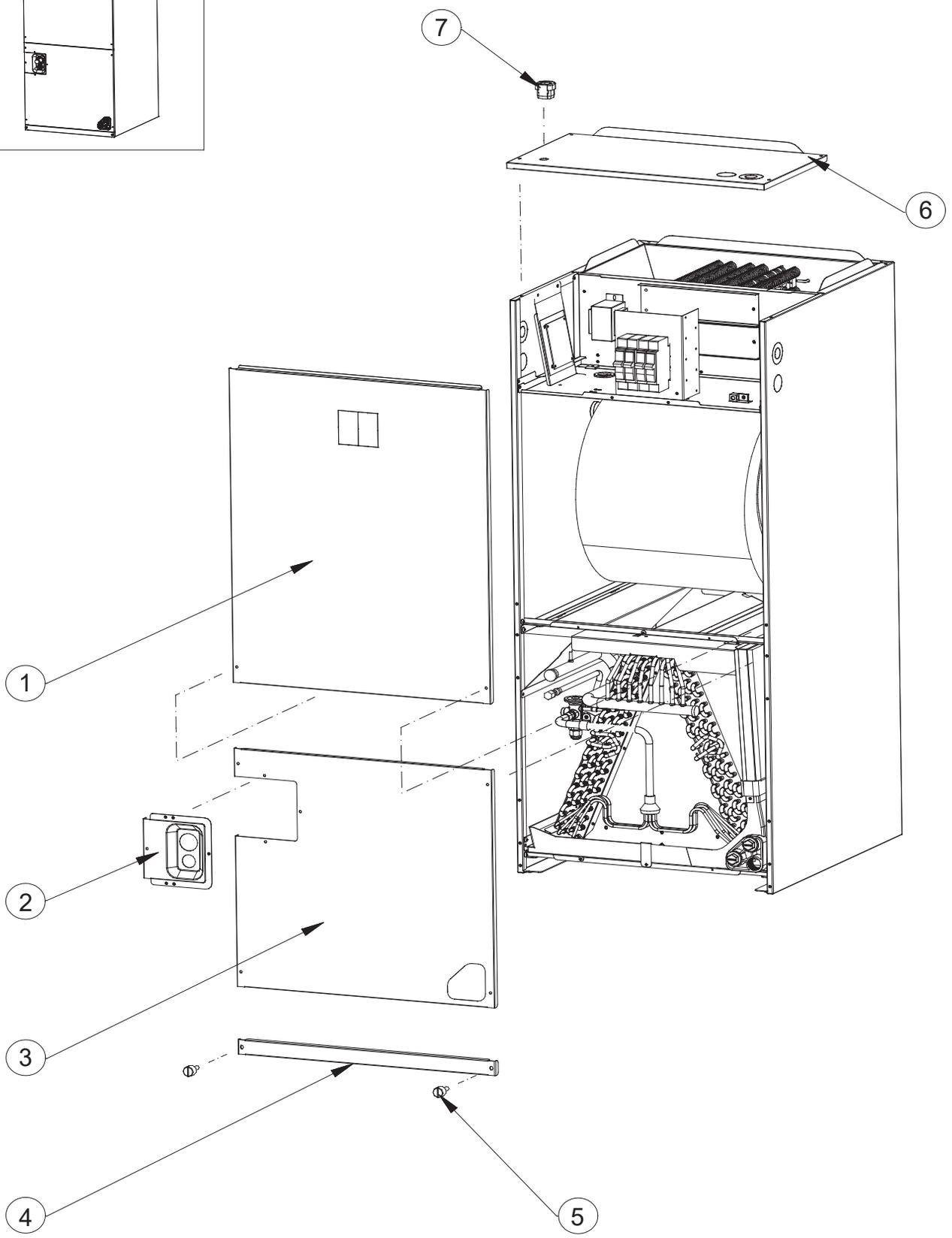
Indoor unit
WHM36DMA21S

No.	Part number	Description
1	2082476	Upper front panel AS
2	2093922	Seal plate parts
3	2082481	Down front panel AS
4	2082496	Mounting plate
5	2110453	Wing screw
6	2082470	Upper cover
7	2108011	Over the wire clip
8	2081574	Outlet tube assembly
9	2081573	Inlet tube assembly
10	2036833	Thermal EV body
11	2093962	Plate cover
12	2108088	Protecting plug
13	2082567	Water tray
14	2035912	Evaporator assembly
15	2082568	Water tray
16	2091112	Cotton
17	2082522	Mounting plate
18	2035135	Linear transformer
19	2082507	Insulative spacer
20	2150390	Controller PCB
21	2108027	Clamp
22	2108142	Plate cover
23	2108139	Hooking
24	2034691	Fan motor
25	2082523	Fan assembly
26	2105340	Electric heater kit (5 kW)
	2105342	Electric heater kit (7.5 kW)
	2105343	Electric heater kit (10 kW)
	2105344	Electric heater kit (15 kW)

AS: assembly

Indoor unit
WHM48DMA21S





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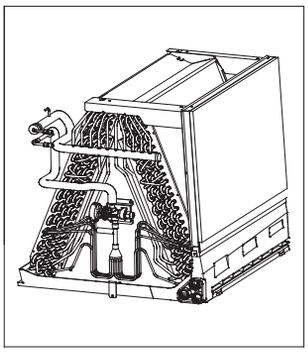

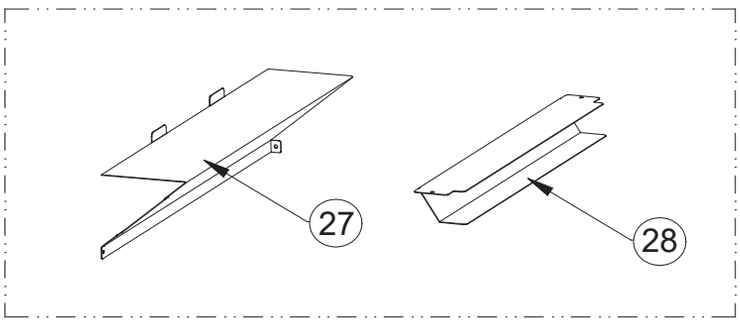

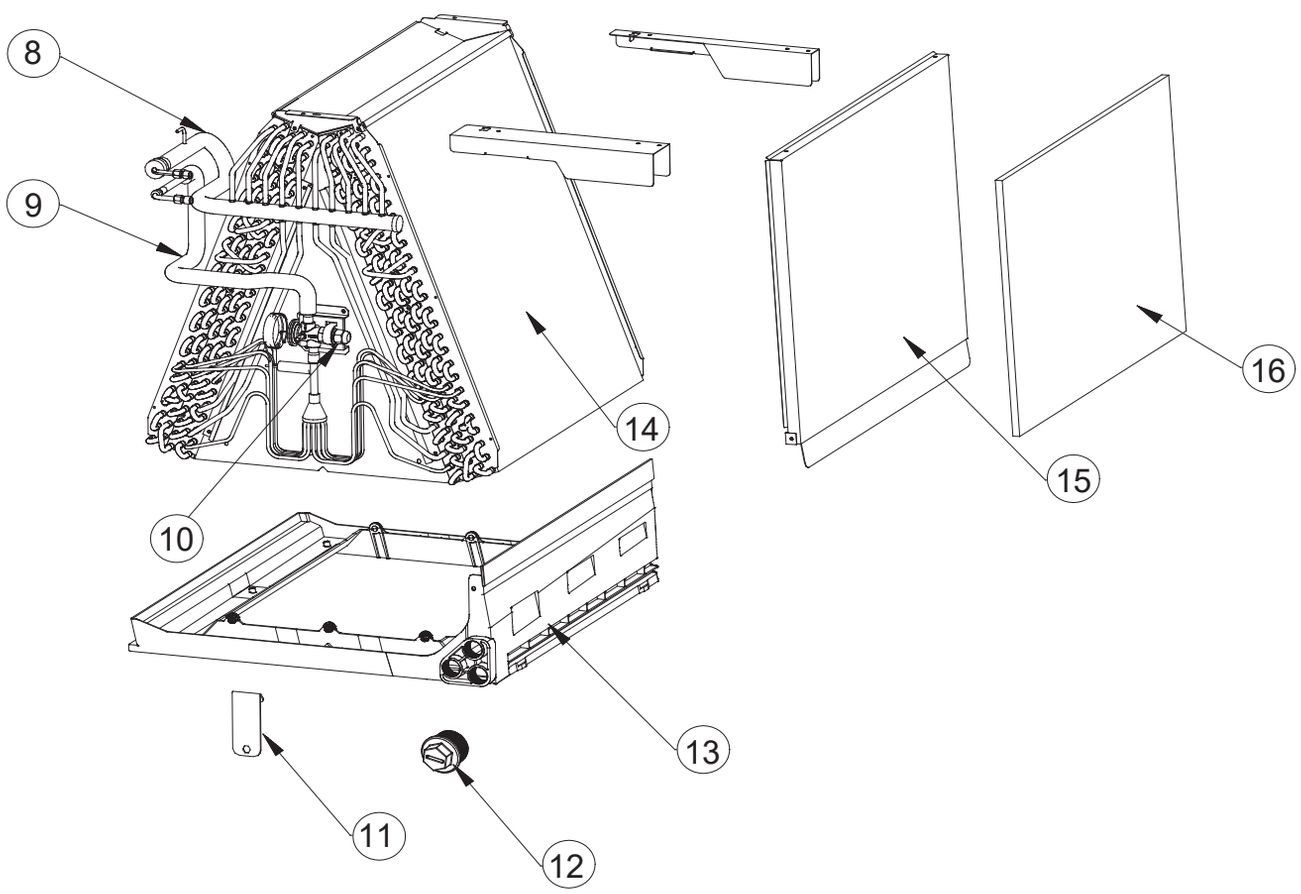

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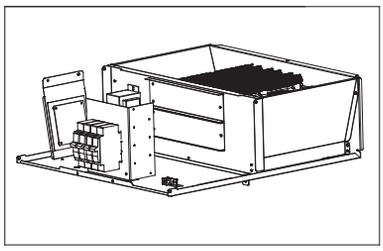
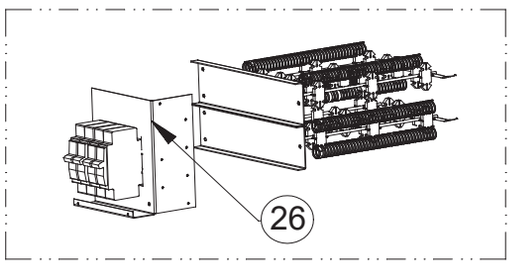
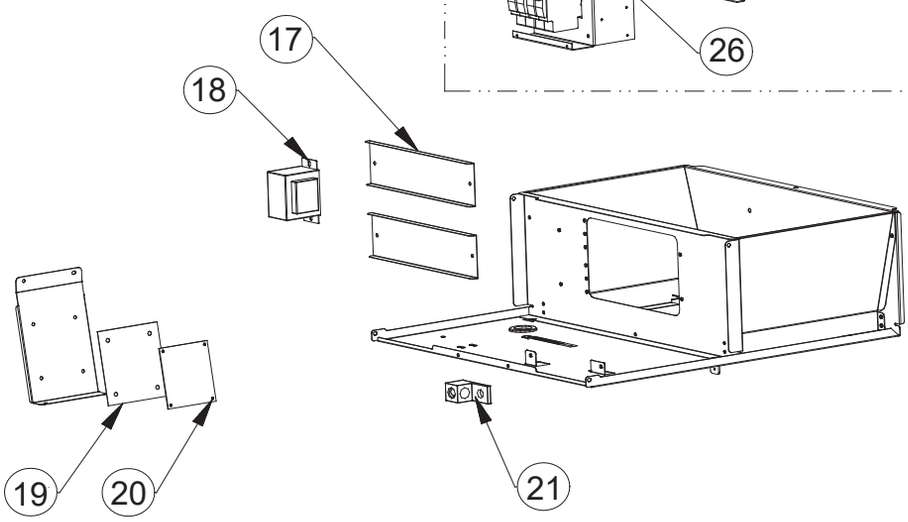
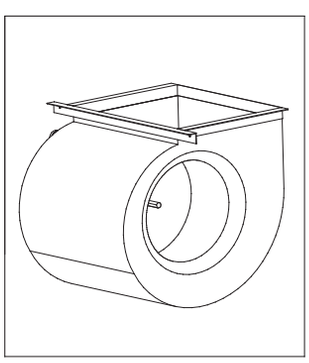
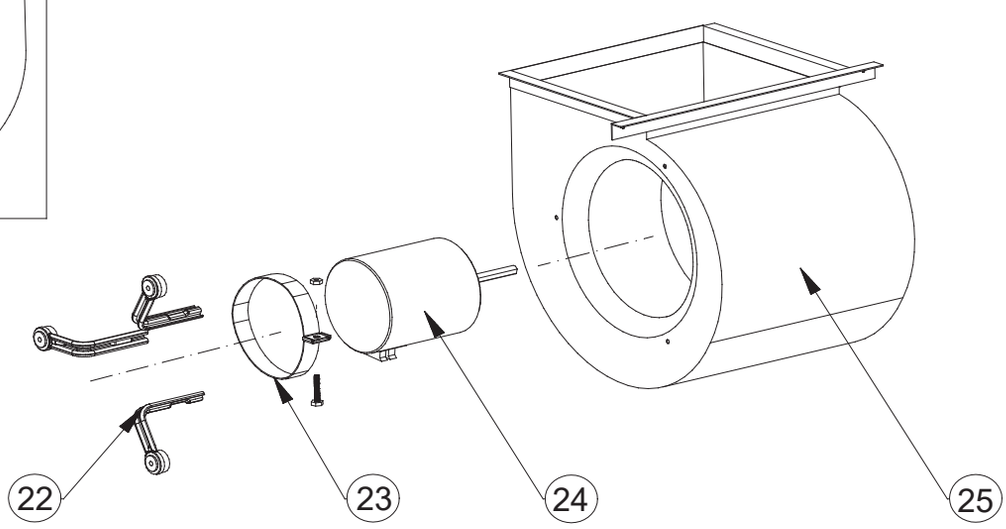








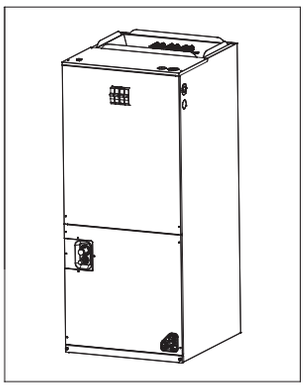


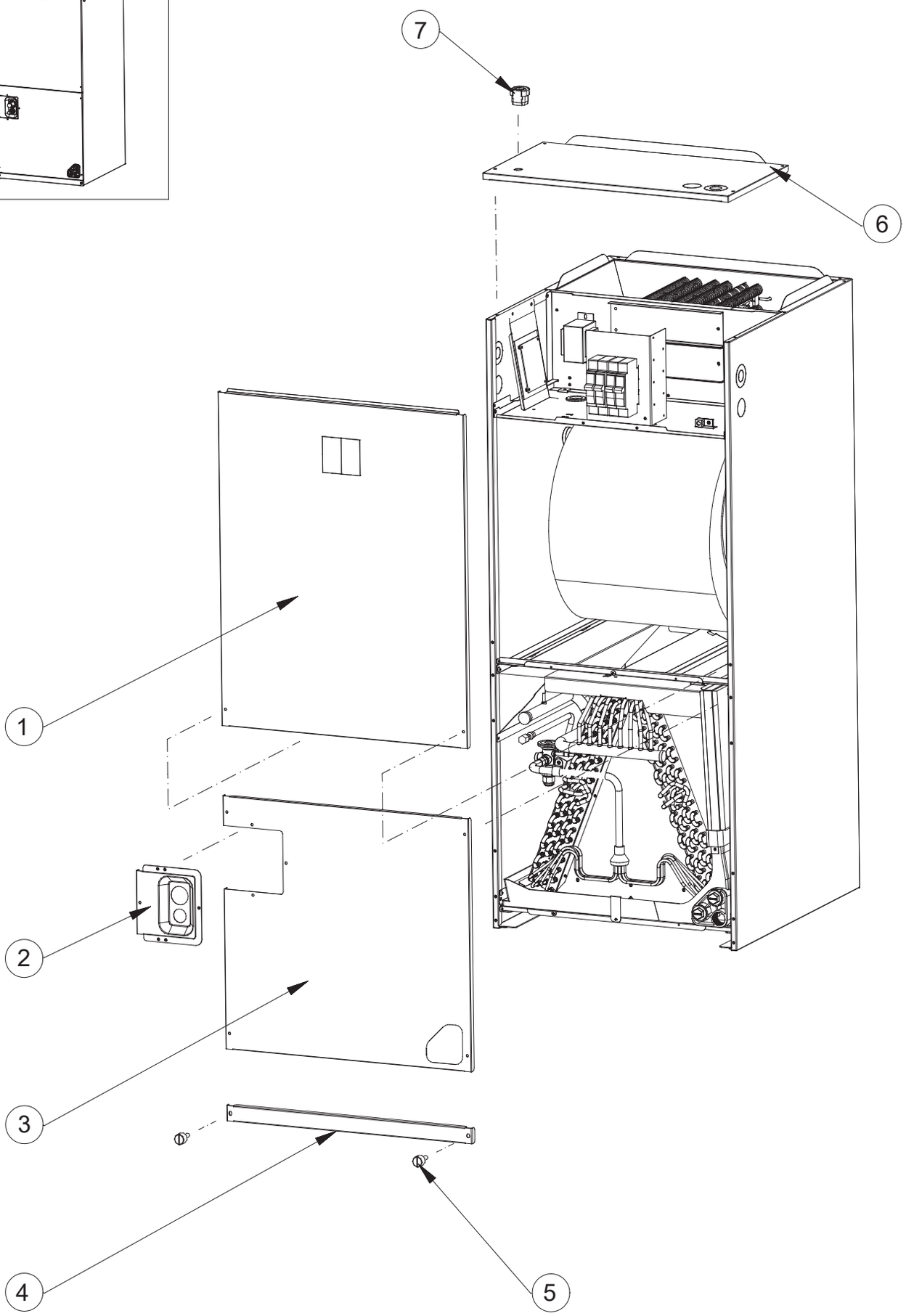
Indoor unit
WHM48DMA21S

No.	Part number	Description
1	2098536	Upper front panel AS
2	2093922	Seal plate parts
3	2098540	Down front panel AS
4	2098605	Mounting plate
5	2110453	Wing screw
6	2098533	Upper cover
7	2108011	Over the wire clip
8	2112692	Outlet tube assembly
9	2152785	Inlet tube assembly
10	2157986	Thermal EV body
11	2093962	Plate cover
12	2108088	Protecting plug
13	2098583	Water tray
14	2152788	Evaporator assembly
15	2098586	Water tray
16	2098600	Cotton
17	2082522	Mounting plate
18	2035135	Linear transformer
19	2082507	Insulative spacer
20	2150390	Controller PCB
21	2108027	Clamp
22	2108142	Plate cover
23	2108139	Hooking
24	2150373	Fan motor
25	2082523	Fan assembly
26	2105340	Electric heater kit (5 kW)
	2105342	Electric heater kit (7.5 kW)
	2105343	Electric heater kit (10 kW)
	2105344	Electric heater kit (15 kW)
	2105345	Electric heater kit (20 kW)

AS: assembly

Indoor unit
WHM60DMA21S





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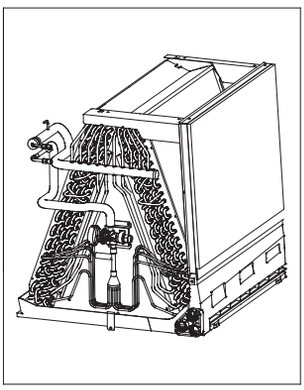

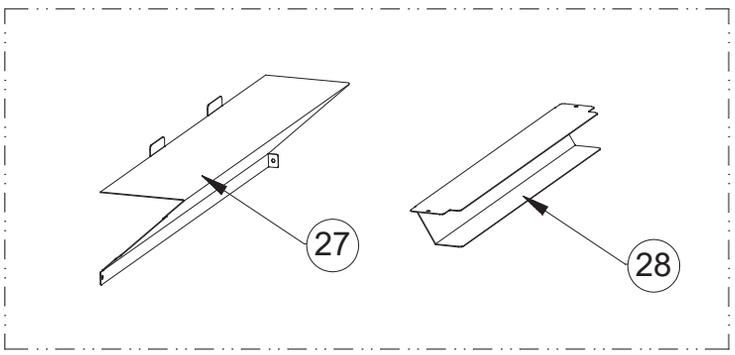

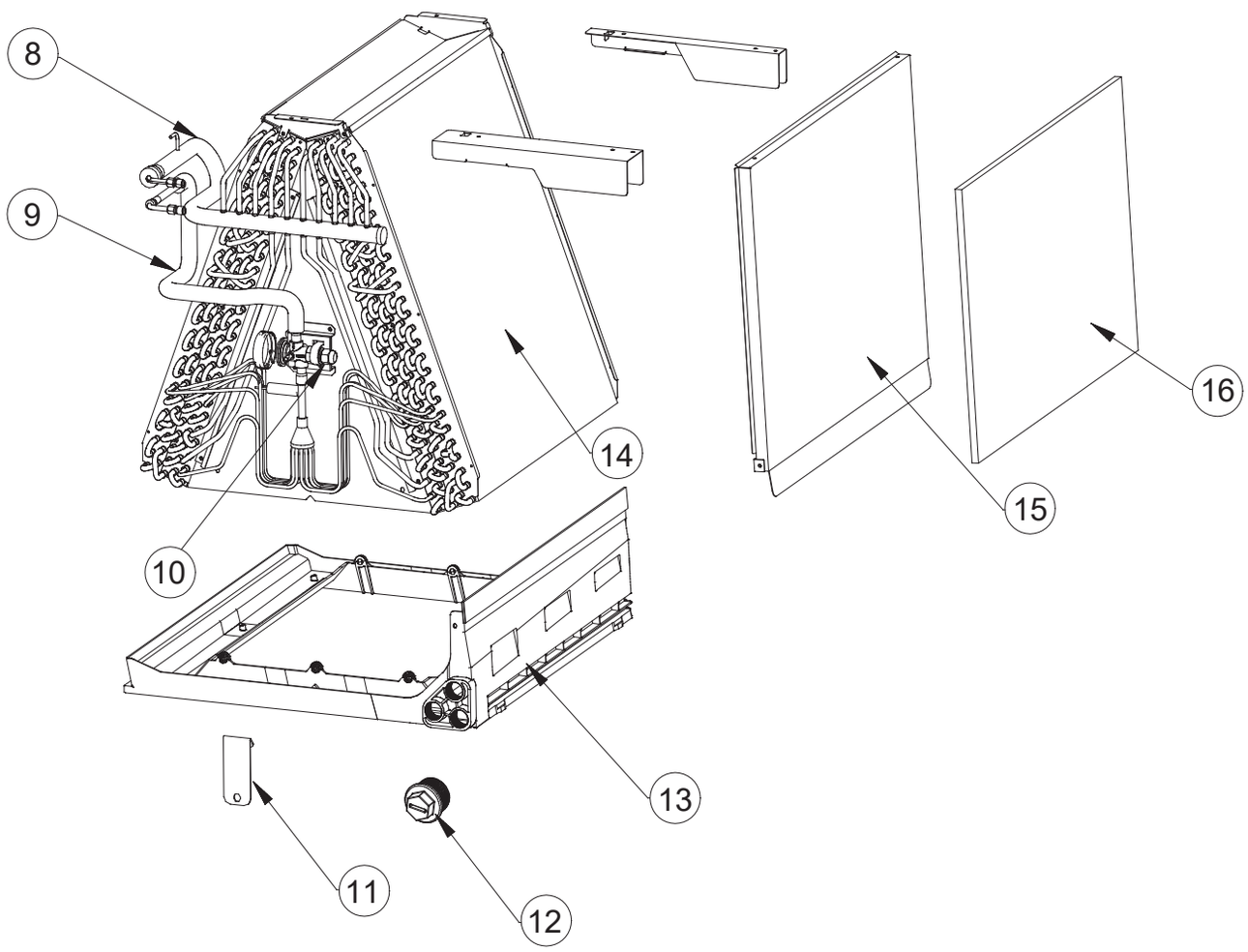

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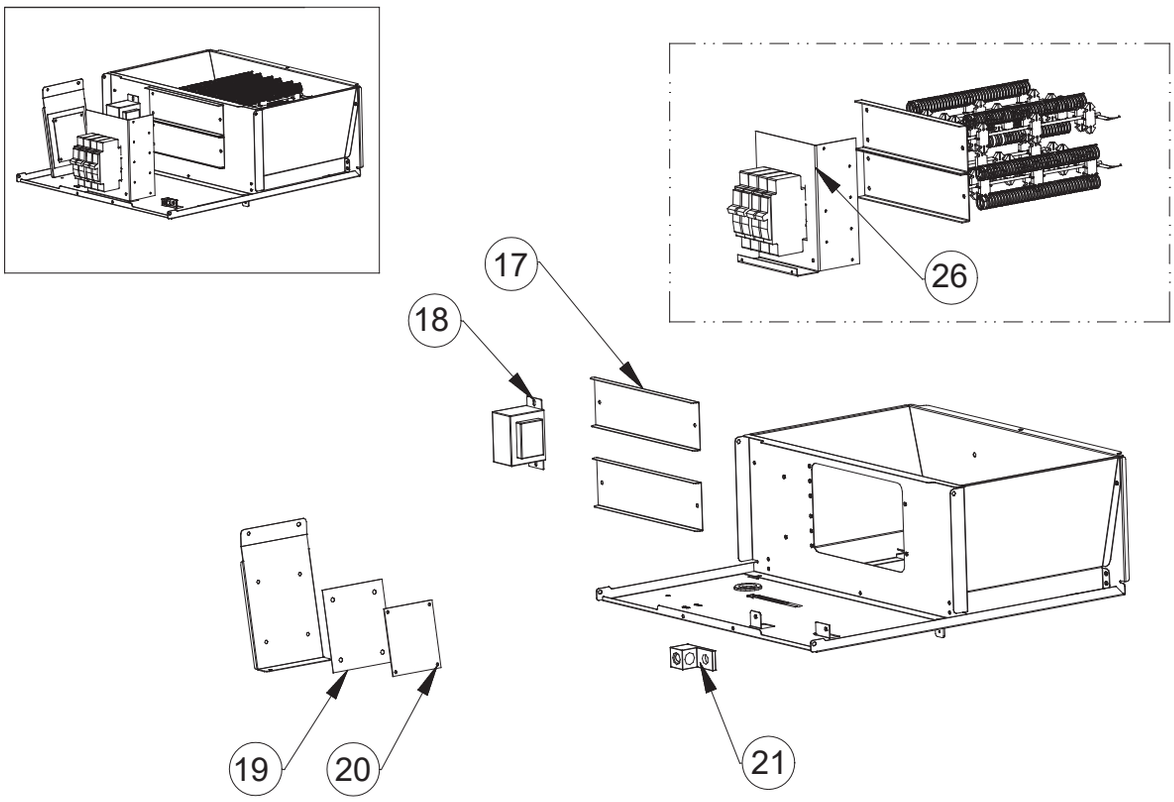
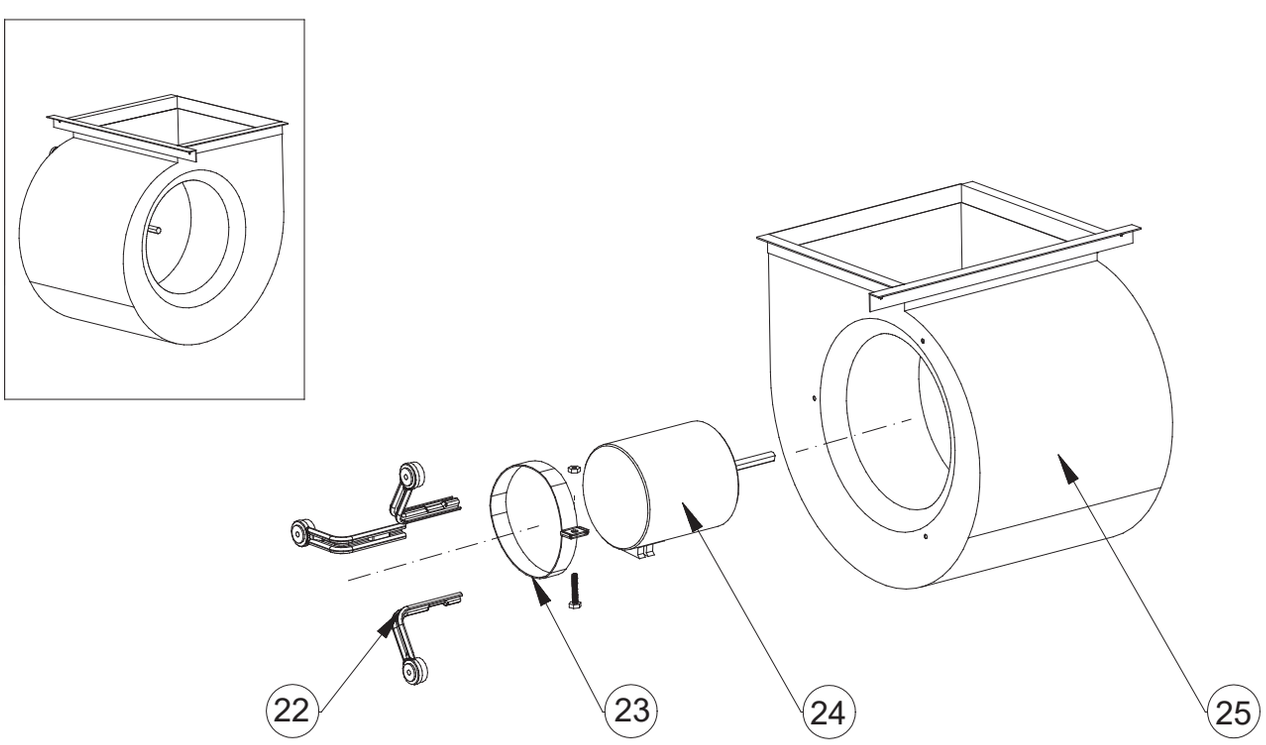


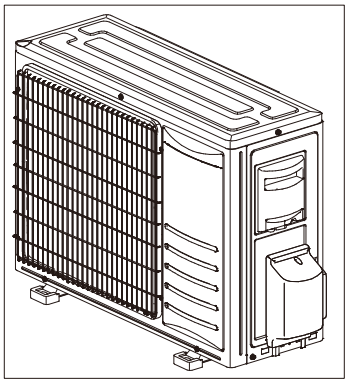


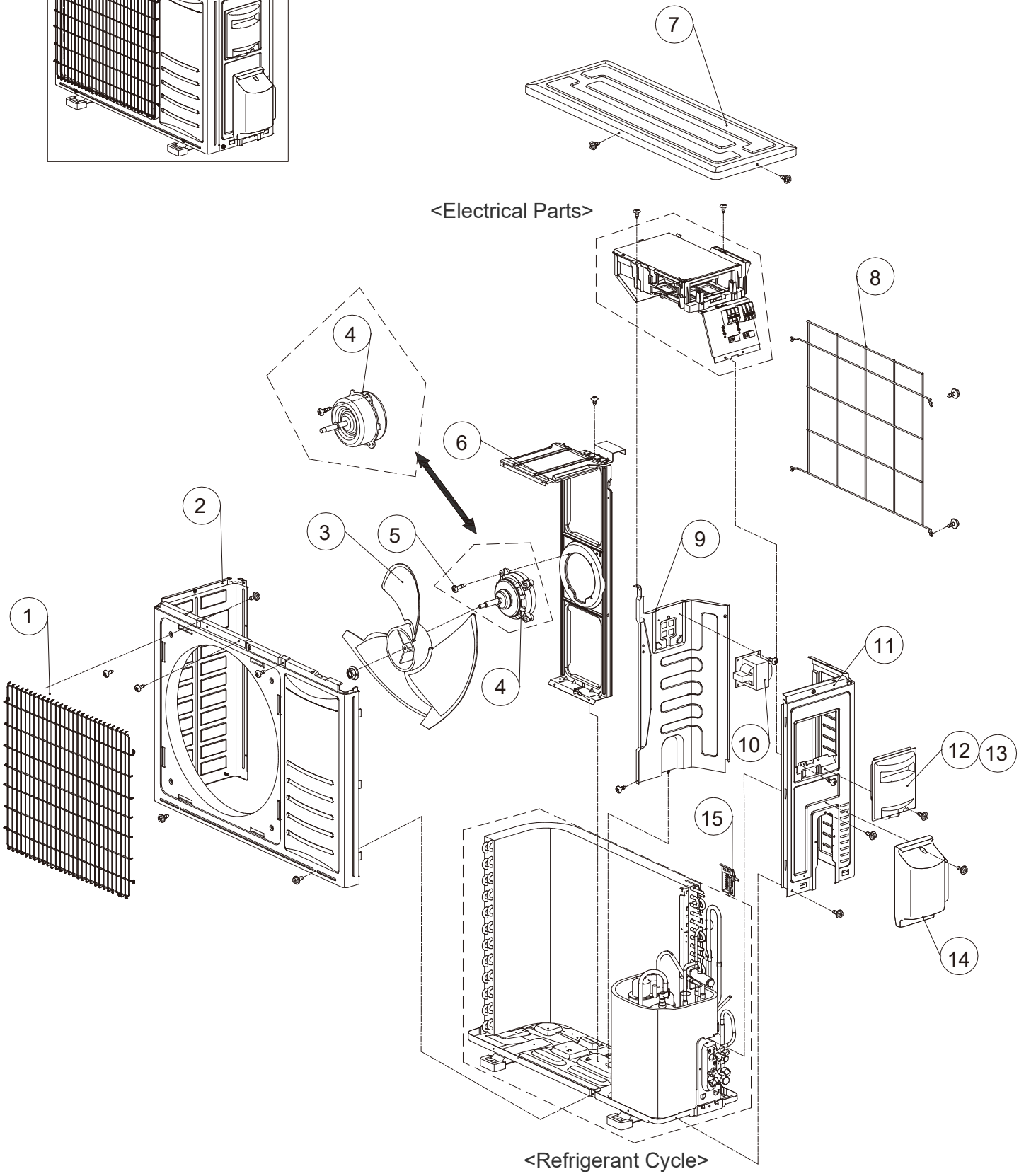
Indoor unit
WHM60DMA21S

No.	Part number	Description
1	2098536	Upper front panel AS
2	2093922	Seal plate parts
3	2098540	Down front panel AS
4	2098605	Mounting plate
5	2110453	Wing screw
6	2098533	Upper cover
7	2108011	Over the wire clip
8	2112692	Outlet tube assembly
9	2112613	Inlet tube assembly
10	2113143	Thermal EV body
11	2093962	Plate cover
12	2108088	Protecting plug
13	2098583	Water tray
14	2114254	Evaporator assembly
15	2098586	Water tray
16	2098600	Cotton
17	2082522	Mounting plate
18	2035135	Linear transformer
19	2082507	Insulative spacer
20	2150390	Controller PCB
21	2108027	Clamp
22	2108142	Plate cover
23	2108139	Hooking
24	2085233	Fan motor
25	2082523	Fan assembly
26	2105340	Electric heater kit (5 kW)
	2105342	Electric heater kit (7.5 kW)
	2105343	Electric heater kit (10 kW)
	2105344	Electric heater kit (15 kW)
	2105345	Electric heater kit (20 kW)

AS: assembly

Outdoor unit
WHM24SZA21S





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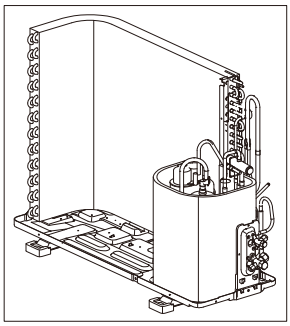

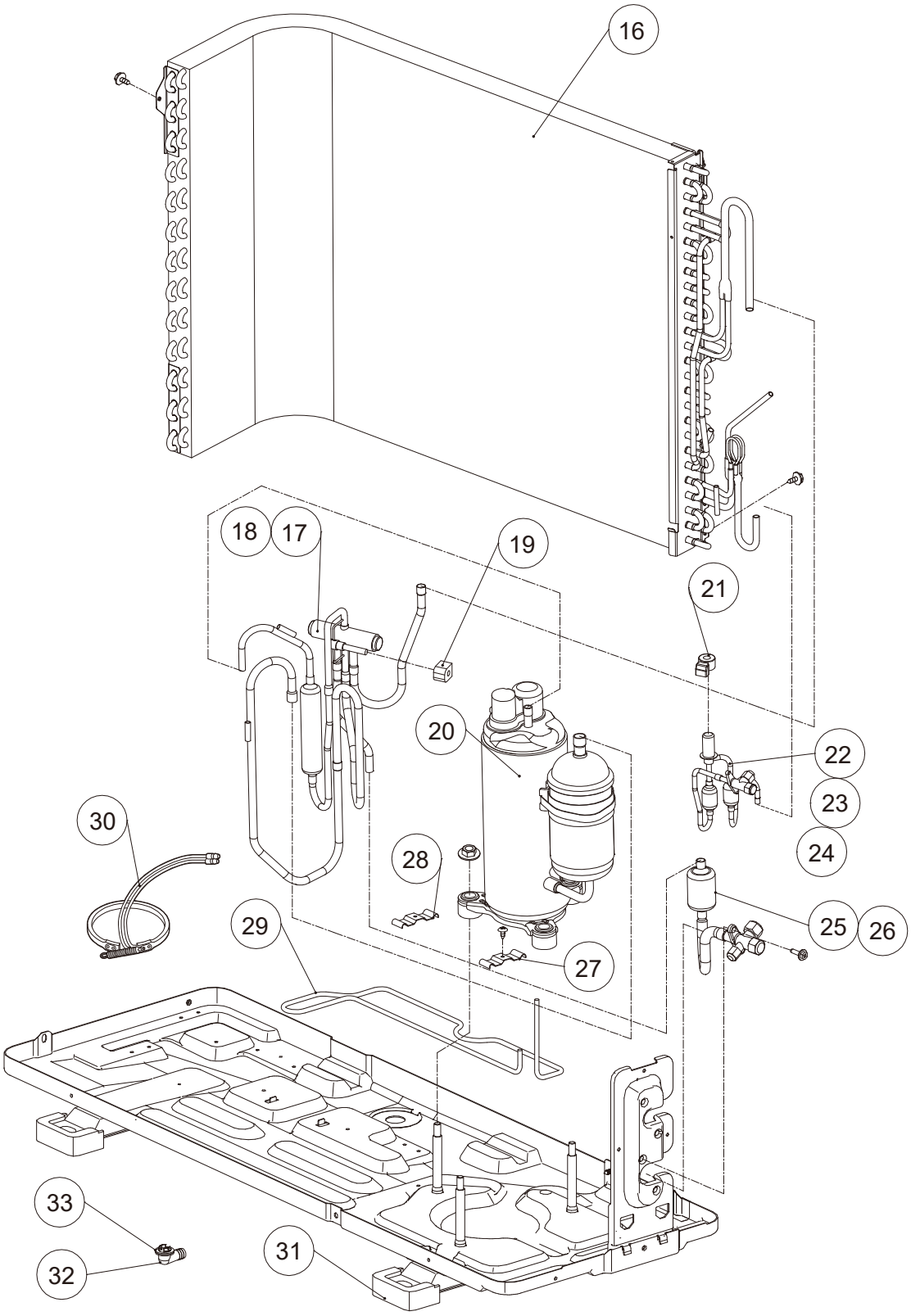

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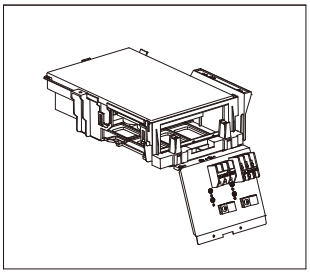
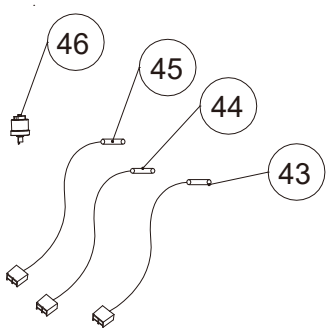
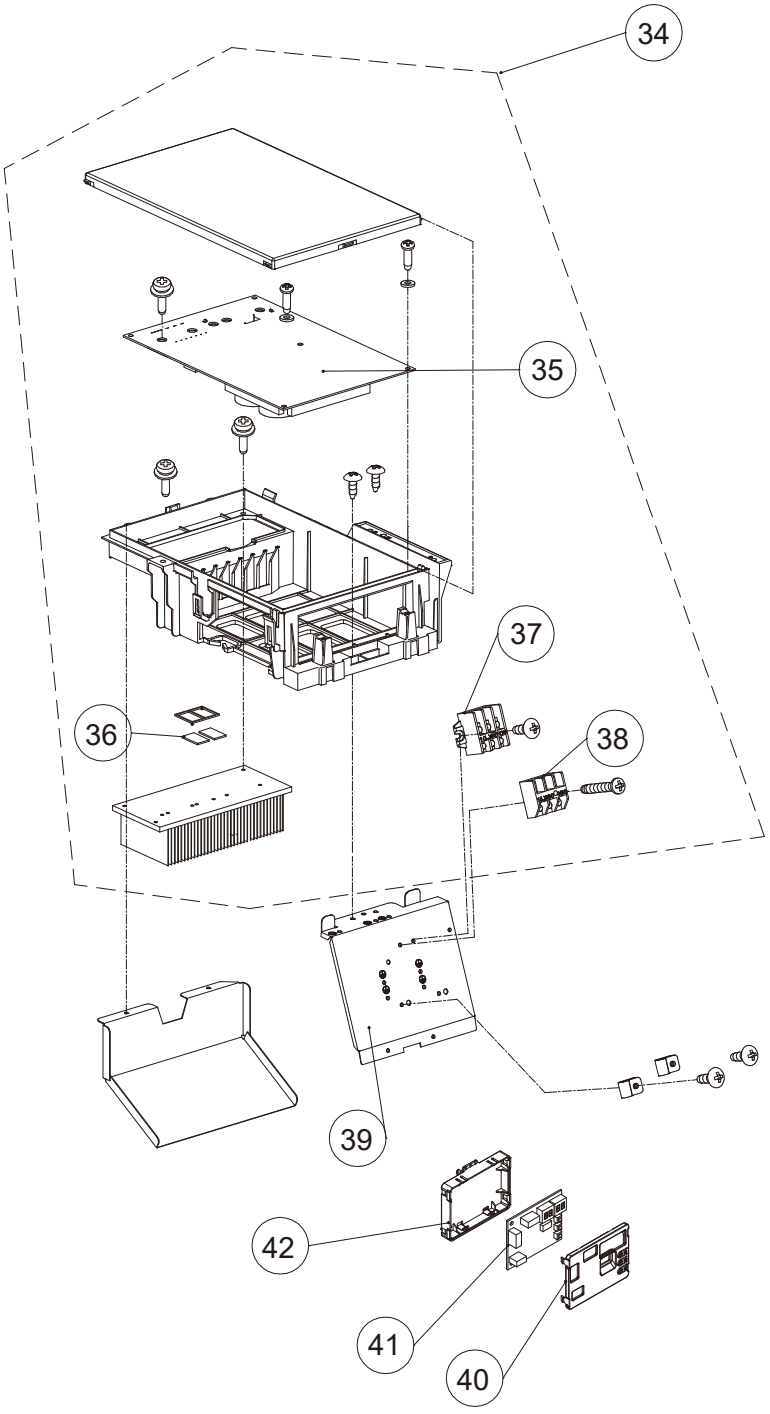




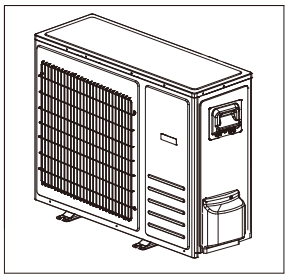


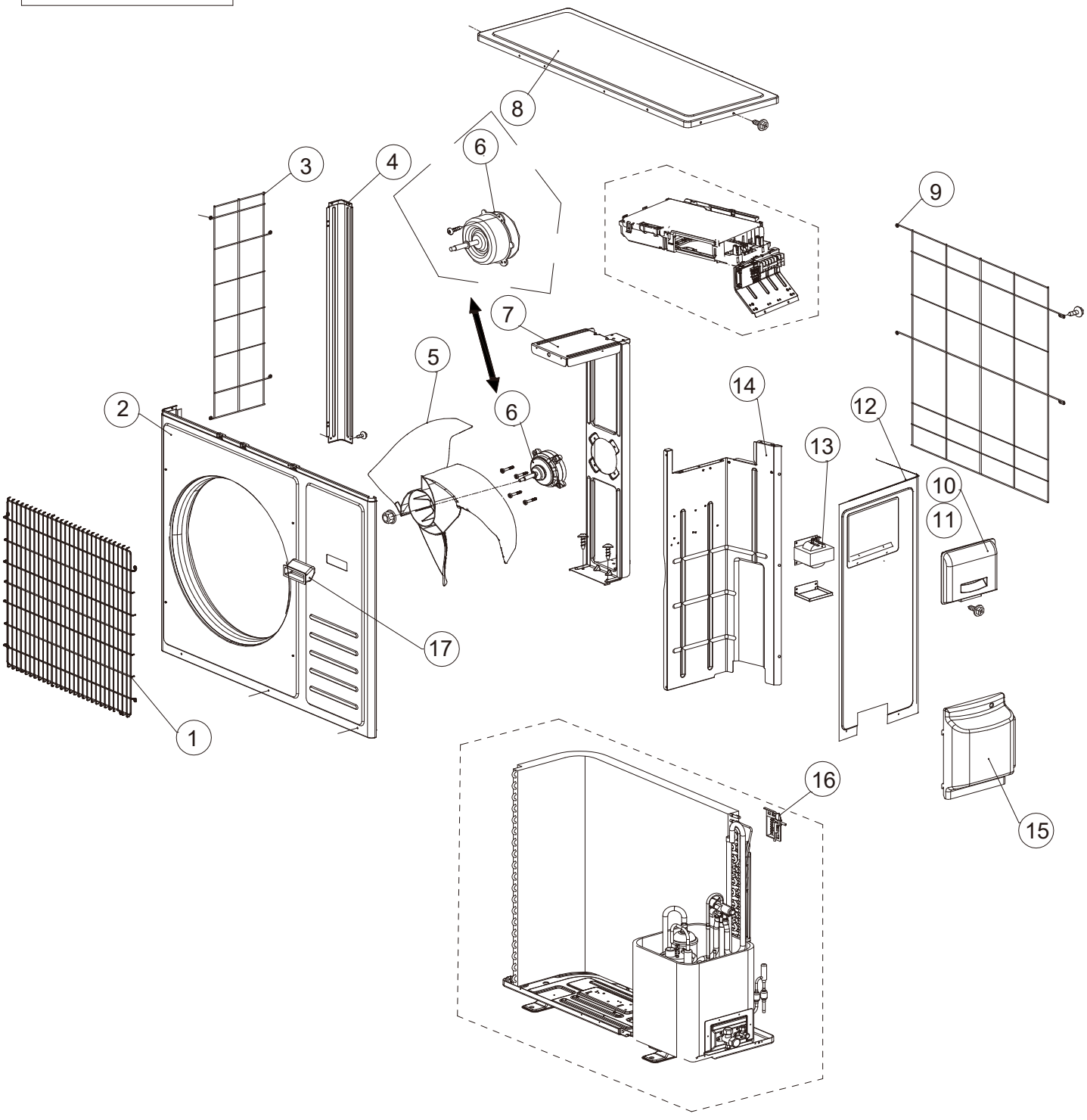
Outdoor unit
WHM24SZA21S

No.	Part number	Description
1	2006879	Fan guard
2	2091948	Intake grille
3	1559520	Propeller fan blade
4	1859837	DC motor
5	2119437	Tapping screw
6	1963835	Motor bracket
7	1972357	Top panel
8	1929744	Protective net back
9	1972622	Clapboard part
10	1302261	Choke coil
11	1971724	Cabinet right
12	1863156	Bracket conduit SA
13	1854040	Bracket conduit
14	1825563	Valve cover
15	1546721	Sensor mount plate
16	1993892	Condenser assembly
17	2157953	Valve 4 way assembly
18	1258444	Valve 4 way
19	1511783	Solenoid
20	1993782	Compressor
21	1848625	EEV coil
22	2090524	EEV assembly
23	1463769	EEV
24	1466345	Valve 3 way 3/8
25	2091366	Valve assembly
26	1999913	Valve 3 way 5/8
27	1854042	Fixing clip
28	1807108	Mounting plate
29	1854710	Tube electric heater
30	1928912	Crankcase heater
31	1453803	Rubber cushion
32	1227300	Drainage rostra
33	1227366	Rubber cushion
34	2150394	Control box unit
35	2150395	Inverter control PCB
36	1440764	Insulative spacer
37	2150399	Wire terminal board
38	2150410	Wire terminal board
39	2090869	Connecting board
40	2150185	Electric box cover
41	2150396	Display board
42	2090874	Electric box
43	1822633	Thermistor pipe
44	1837502	Temperature sensor
45	1831029	Thermistor outdoor
46	2004319	Pressure sensor

AS: assembly
SA: sub assembly

Outdoor unit
WHM36SZA21S





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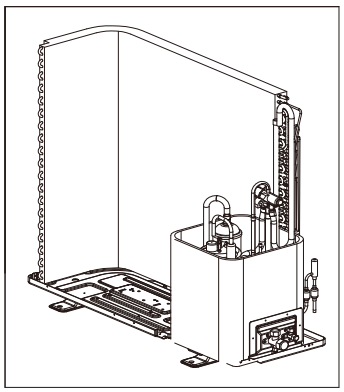

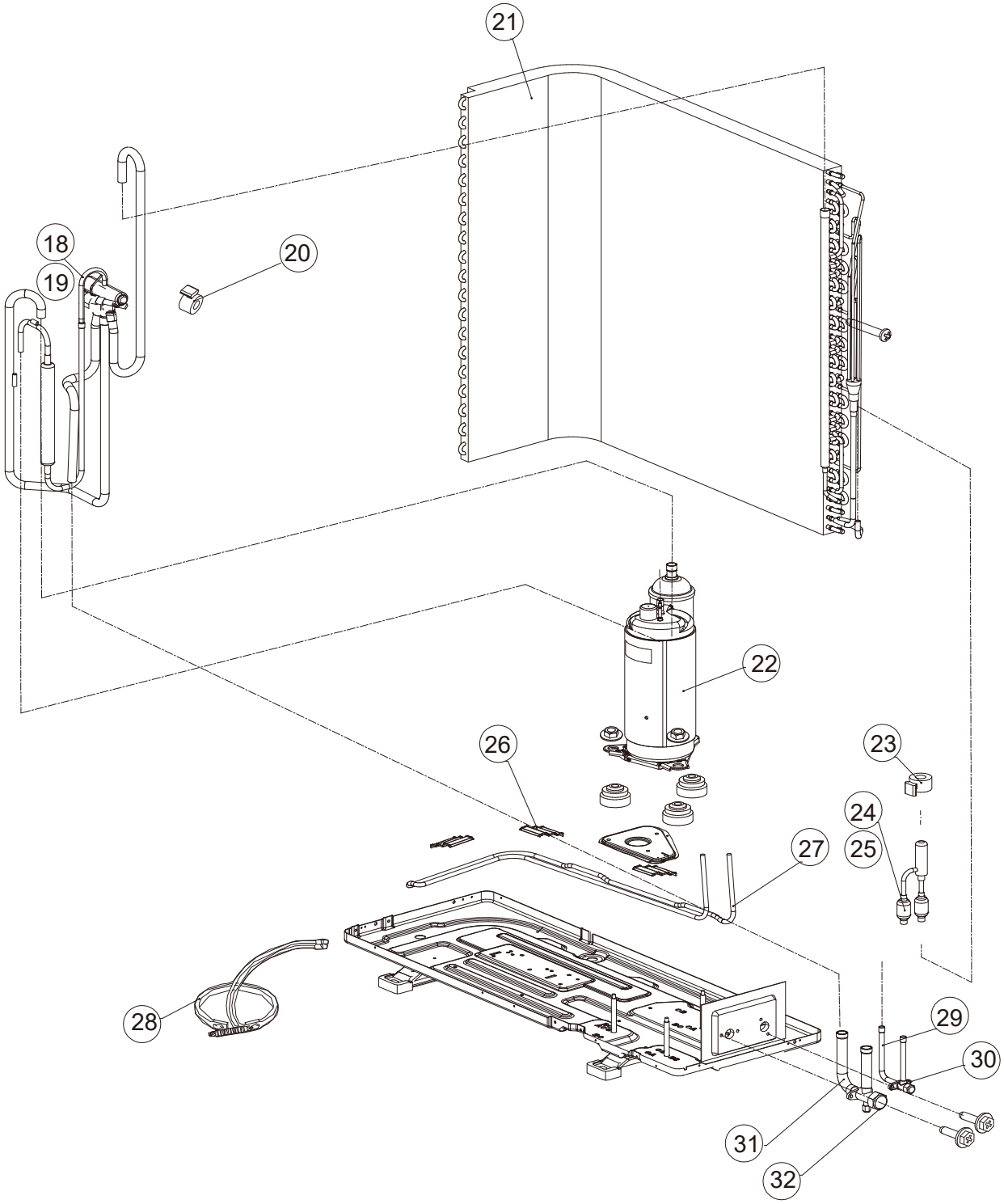

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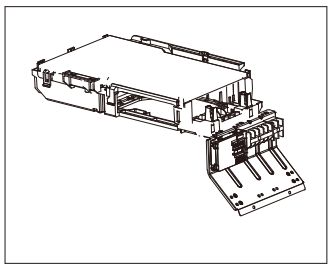
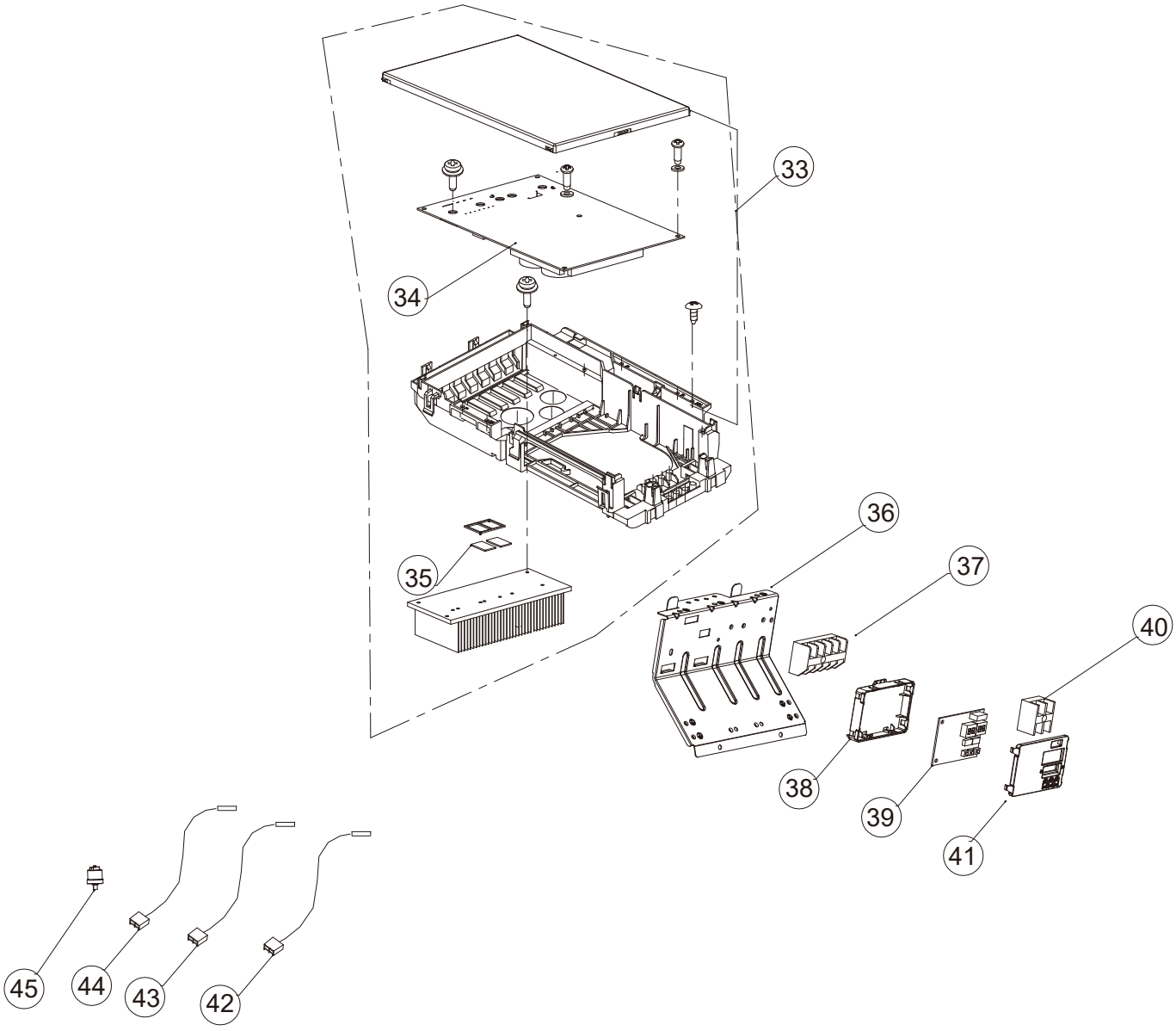


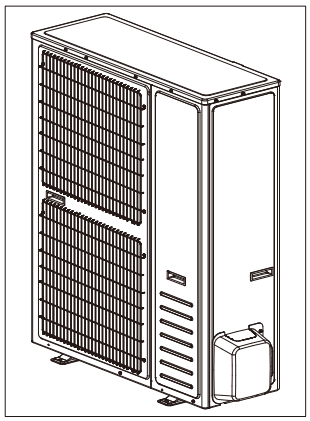


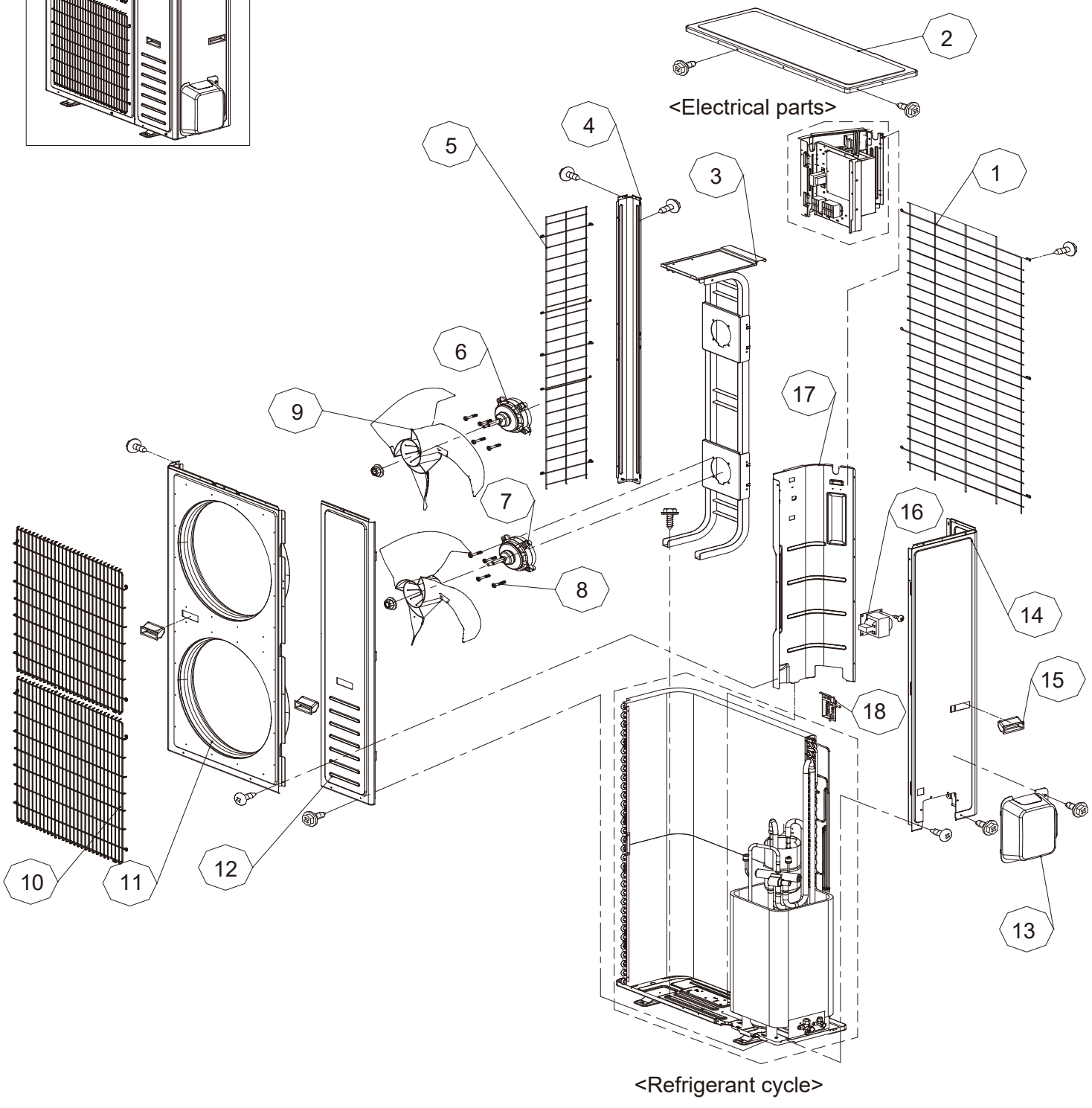
Outdoor unit
WHM36SZA21S

No.	Part number	Description
1	2118361	Fan guard
2	2118319	Front panel
3	1469450	Left guard filter
4	1382782	Mounting plate
5	1405350	Propeller fan blade
6	1421124	Fan motor
7	1880172	Motor bracket
8	1908421	Upper cover
9	1469447	Back guard filter
10	2023540	Bracket conduit SA
11	2017891	Bracket conduit
12	1493224	Side plate
13	1302261	Choke coil
14	2147392	Clapboard part
15	1472878	Valve cover
16	1546721	Senser mount plate
17	1202703	Handle
18	2157080	Valve 4 way assembly
19	1225658	Valve 4 way
20	1511783	Solenoid
21	2191577	Condenser assembly
22	1993782	Compressor
23	1511786	EEV coil
24	2095772	EEV assembly
25	1301273	EEV
26	1993788	Plate cover
27	1993517	Tube electric heater
28	1928912	Crankcase heater
29	2031010	Stop valve AS (High)
30	2030993	Valve 3 way 3/4
31	2031011	Stop valve AS (Low)
32	1466345	Valve 3 way 3/8
33	2150414	Control box unit
34	2150413	Inverter control PCB
35	1440764	Insulative spacer
36	2147395	Mounting plate
37	2150410	Wire terminal board
38	2090874	Electric box
39	2150396	Display board
40	2150185	Electric box cover
41	2150399	Wire terminal board
42	1822633	Thermistor pipe
43	1831029	Thermistor outdoor
44	1837502	Temperature sensor
45	2004319	Pressure sensor

AS: assembly
SA: sub assembly

Outdoor unit
WHM48SZA21S





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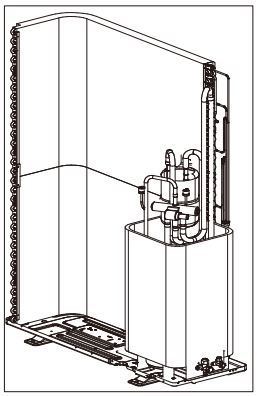

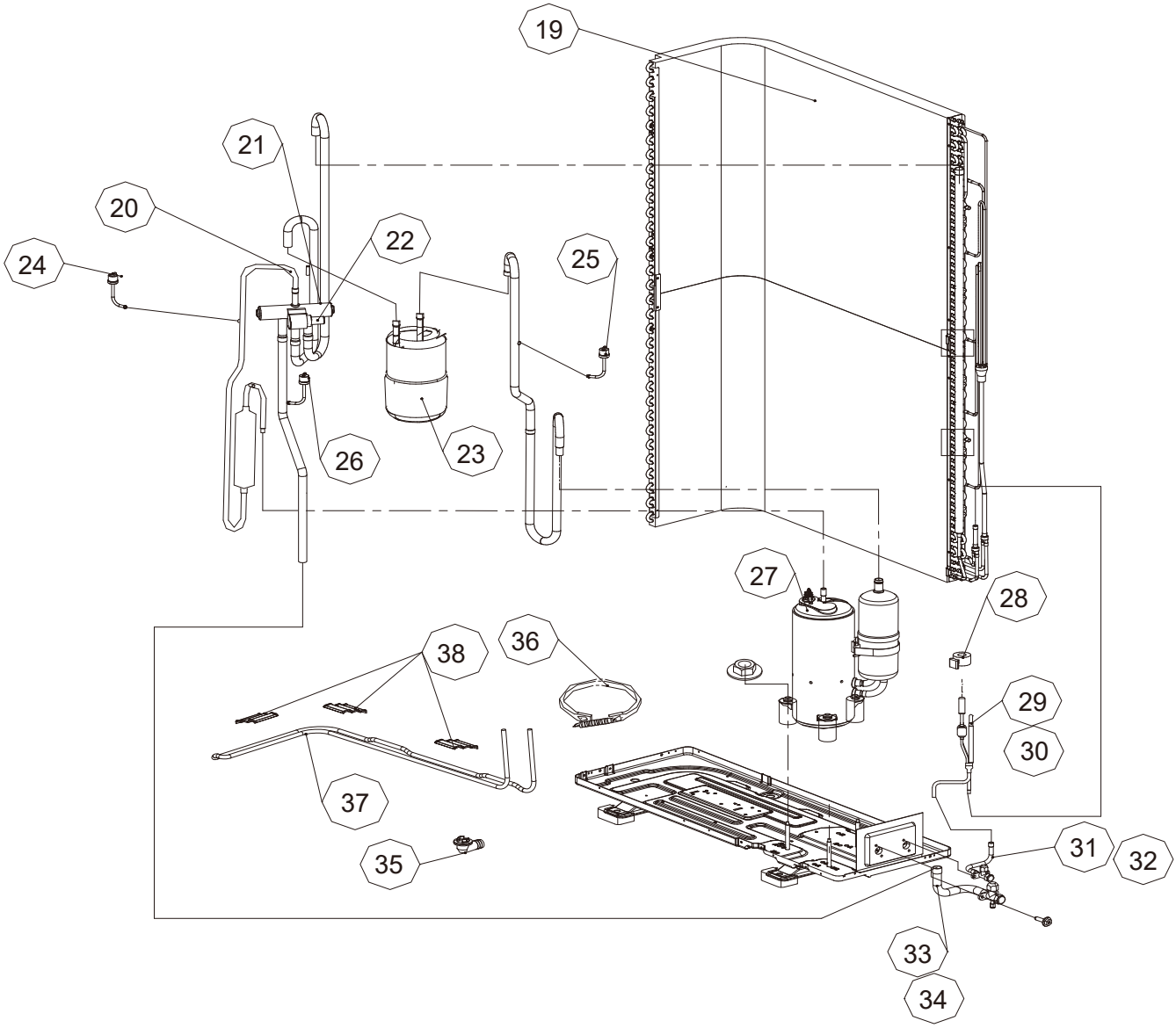

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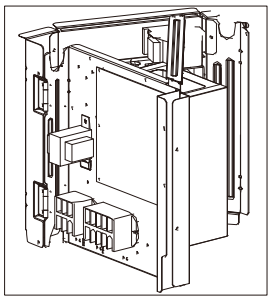
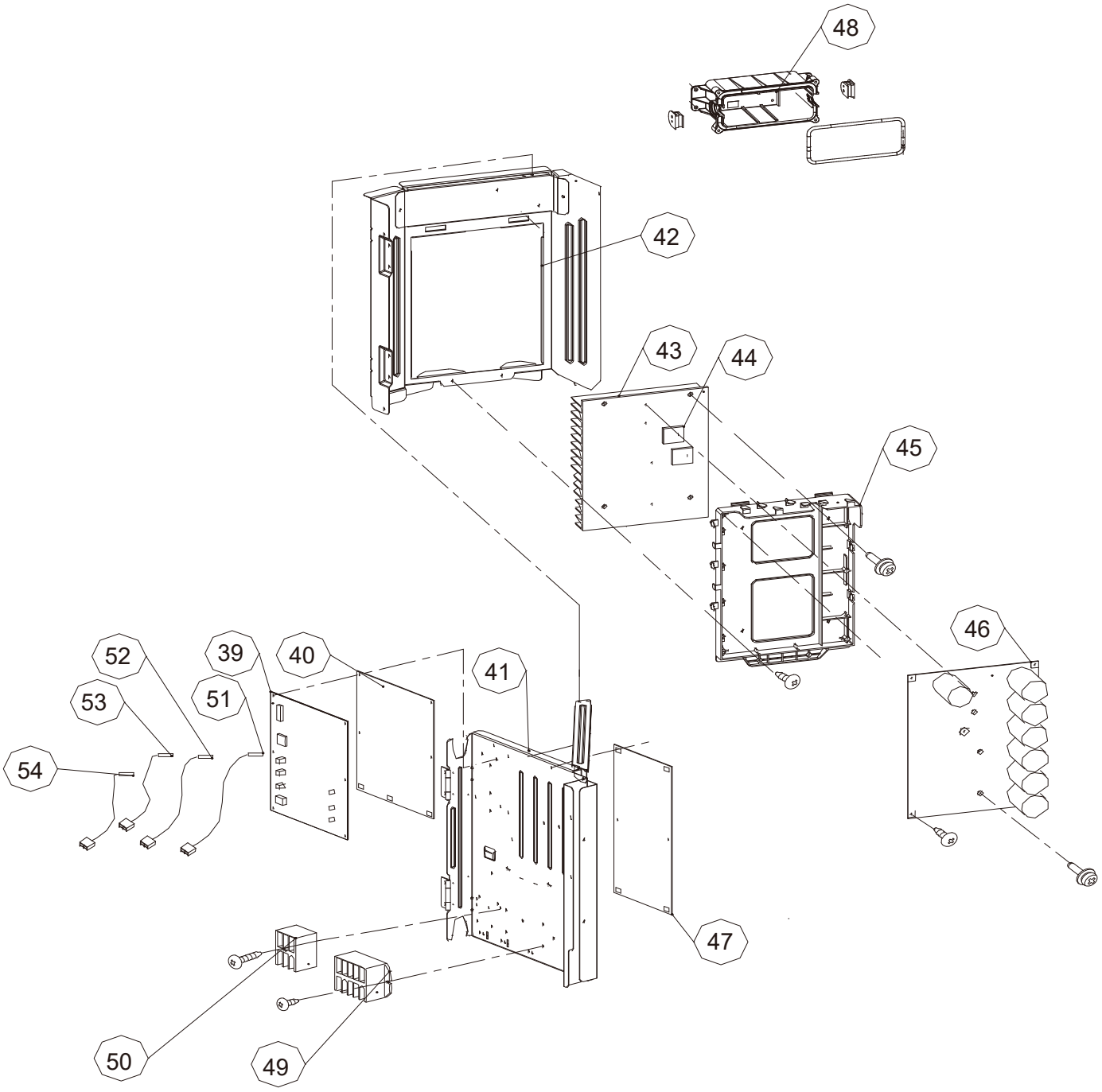




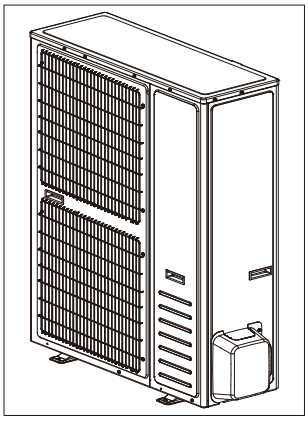
Outdoor unit
WHM48SZA21S

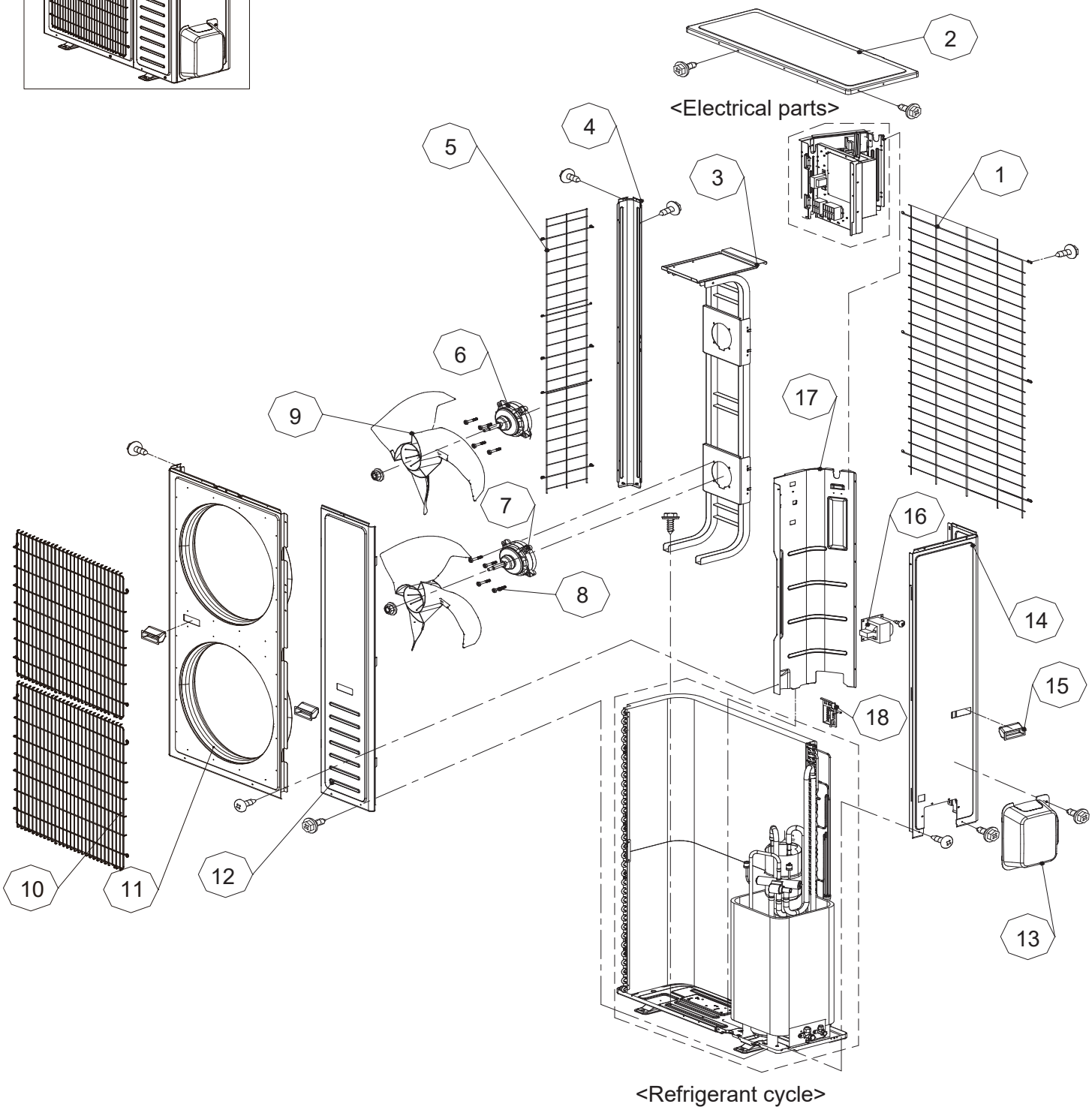
No.	Part number	Description
1	1470773	Back guard filter
2	1942918	Upper cover
3	1889227	Motor bracket
4	1424843	Mounting plate
5	1470782	Left guard filter
6	1421124	Fan motor
7	1464268	Fan motor
8	1971180	Bolt and washer AS
9	1899961	Propeller fan
10	2118361	Fan guard
11	1424731	Front panel
12	1424733	Service plate
13	1472878	Valve cover
14	2114432	Side plate
15	1202703	Handle
16	1400760	Choke coil
17	1460536	Clapboard part
18	1546721	Senser mount plate
19	1492139	Condenser assembly
20	2108767	Valve 4 way assembly
21	1225534	Valve 4 way
22	1302932	Solenoid
23	1325923	Gas-liquid separator
24	1918068	High pressure switch
25	1820199	Low pressure switch
26	1464759	Pressure sensor
27	2000141	Compressor

No.	Part number	Description
28	1465154	EEV coil
29	2105689	EEV assembly
30	1465131	EEV
31	2031010	Stop valve AS (High)
32	1466345	Valve 3 way 3/8
33	2108768	Stop valve AS (Low)
34	2110442	Valve 2 way 7/8
35	1204014	Drainage rostra
36	1391303	Crankcase heater
37	2110247	Tube electric heater
38	1993788	Plate cover
39	2157217	Inverter control PCB
40	2096599	Insulative spacer
41	1464292	Electric box
42	1464281	Mounting plate
43	1916769	Radiator
44	1440764	Insulative spacer
45	1519508	Mounting plate
46	2002099	Driver board
47	2095101	Filter board
48	1421352	Insulative spacer
49	1993161	Wire terminal board
50	2150410	Wire terminal board
51	1395042	Temperature sensor
52	1421856	Temperature sensor
53	1464346	Temperature sensor
54	1902722	Temperature sensor

AS: assembly

Outdoor unit
WHM60SZA21S





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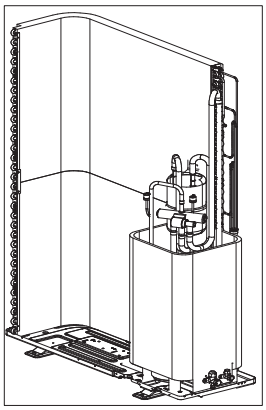

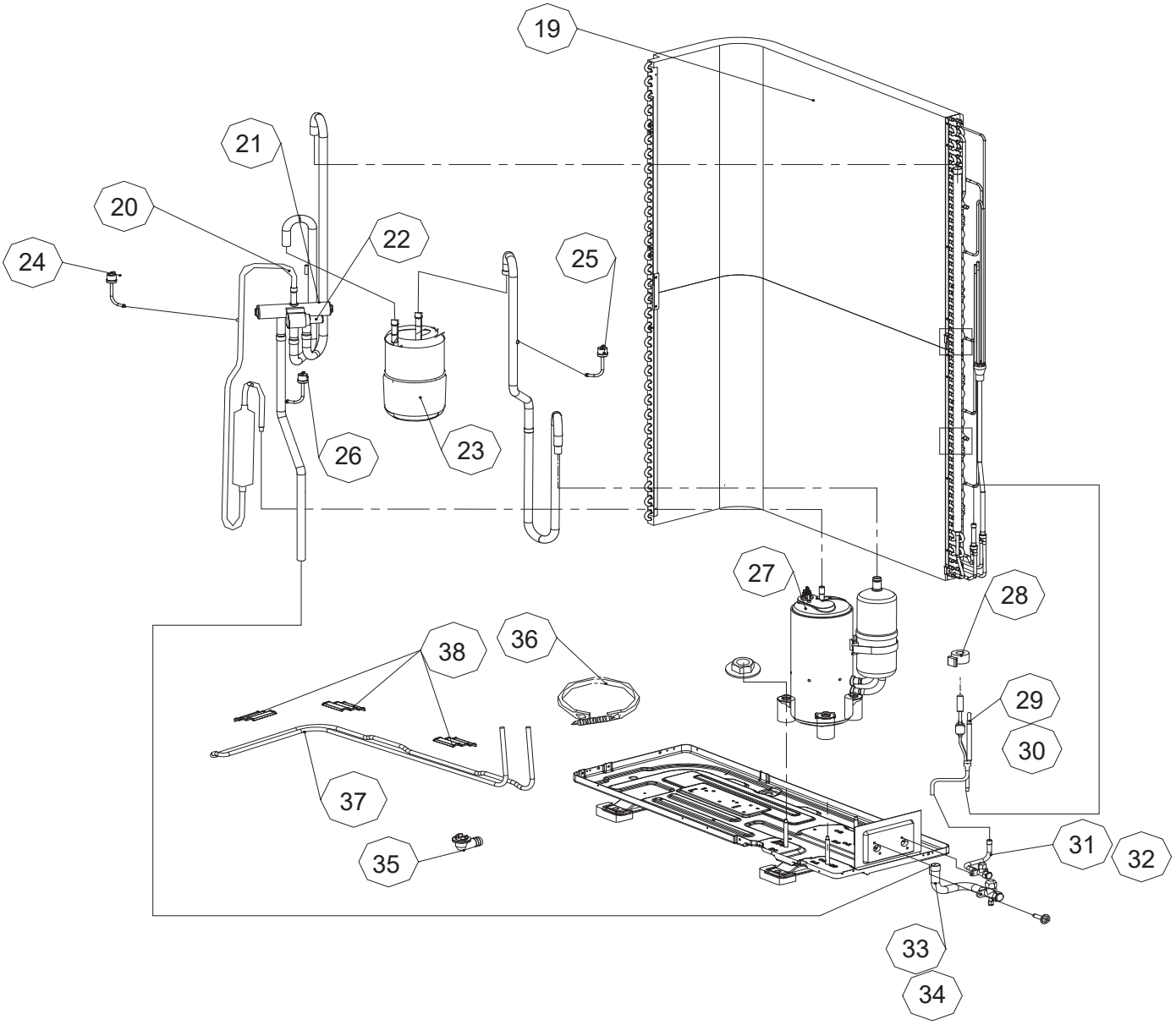

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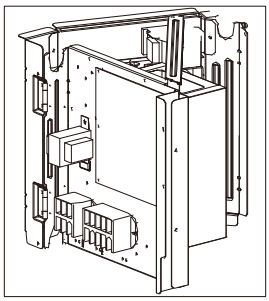

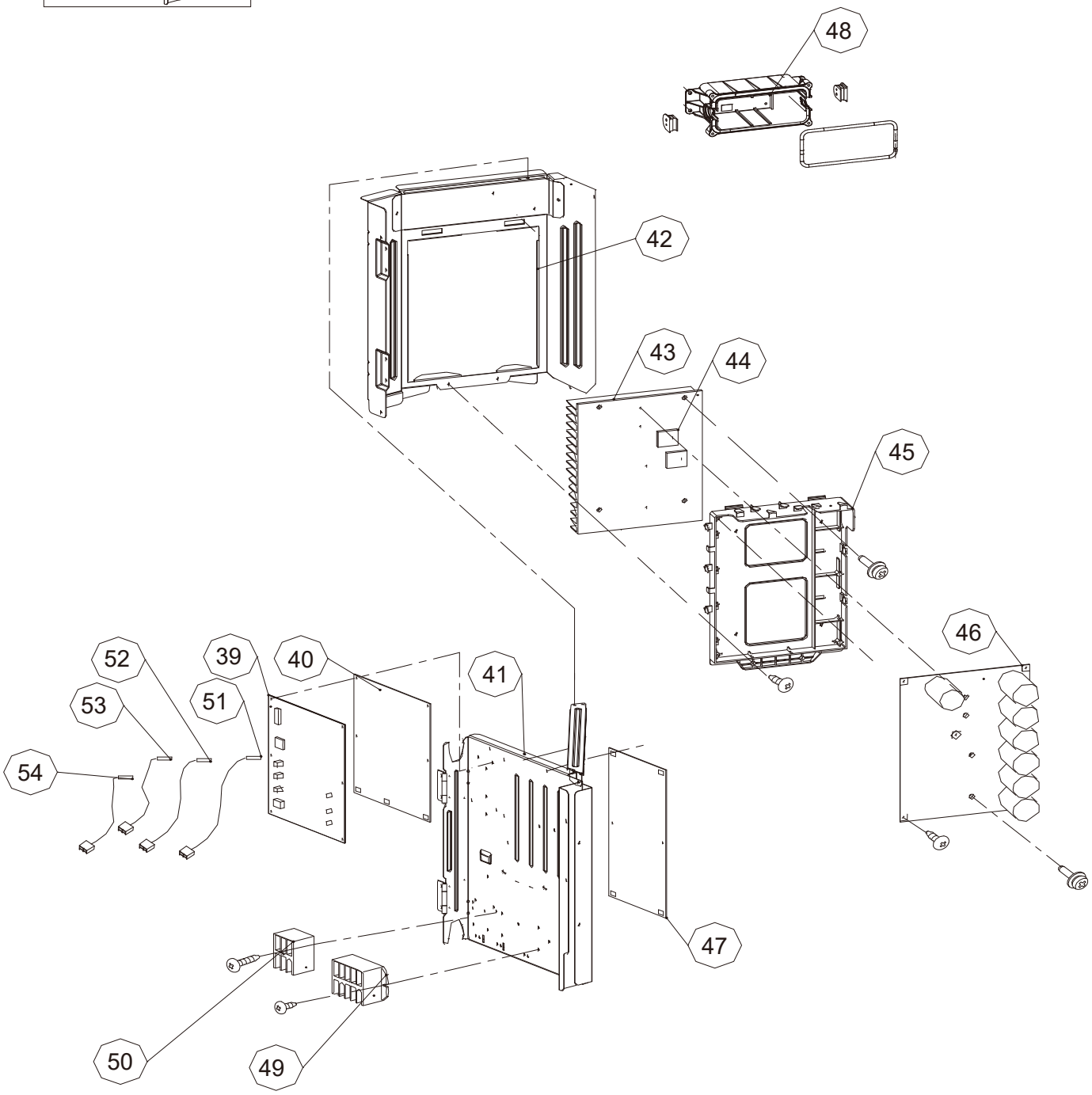

Outdoor unit
WHM60SZA21S

No.	Part number	Description
1	1470773	Back guard filter
2	1942918	Upper cover
3	1889224	Motor bracket
4	1424843	Mounting plate
5	1470782	Left guard filter
6	1421124	Fan motor
7	1464268	Fan motor
8	1971180	Bolt and washer AS
9	1899961	Propeller fan
10	2118361	Fan guard
11	1424731	Front panel
12	1424733	Service plate
13	1472878	Valve cover
14	2114432	Side plate
15	1202703	Handle
16	1400760	Choke coil
17	1460536	Clapboard part
18	1546721	Senser mount plate
19	1994036	Condenser assembly
20	2184163	Valve 4 way assembly
21	1225534	Valve 4 way
22	1302932	Solenoid
23	1325923	Gas-liquid separator
24	1918068	High pressure switch
25	1820199	Low pressure switch
26	1464759	Pressure sensor
27	2000141	Compressor

No.	Part number	Description
28	1465154	EEV coil
29	2105689	EEV assembly
30	1465131	EEV
31	2031010	Stop valve AS (High)
32	1466345	Valve 3 way 3/8
33	2108768	Stop valve AS (Low)
34	2110442	Valve 2 way 7/8
35	1204014	Drainage rostra
36	1391303	Crankcase heater
37	2110247	Tube electric heater
38	1993788	Plate cover
39	2152596	Inverter control PCB
40	2096599	Insulative spacer
41	1464292	Electric box
42	1464281	Mounting plate
43	1916769	Radiator
44	1440764	Insulative spacer
45	1519508	Mounting plate
46	2002099	Driver board
47	2095101	Filter board
48	1421352	Insulative spacer
49	1993161	Wire terminal board
50	2150410	Wire terminal board
51	1395042	Temperature sensor
52	1421856	Temperature sensor
53	1464346	Temperature sensor
54	1902722	Temperature sensor

AS: assembly

Accessories

Indoor unit

Part name	Q'ty	Part name	Q'ty
Use and installation instructions	1	Warranty card	1

Outdoor unit

Part name	Q'ty	Part name	Q'ty
Installation and operation manual	1	Drain hose	1
Rubber cushion	1		