Hisense

CIRELIUS

R32
Refrigerant

TECHNICAL & SERVICE MANUAL V5.0

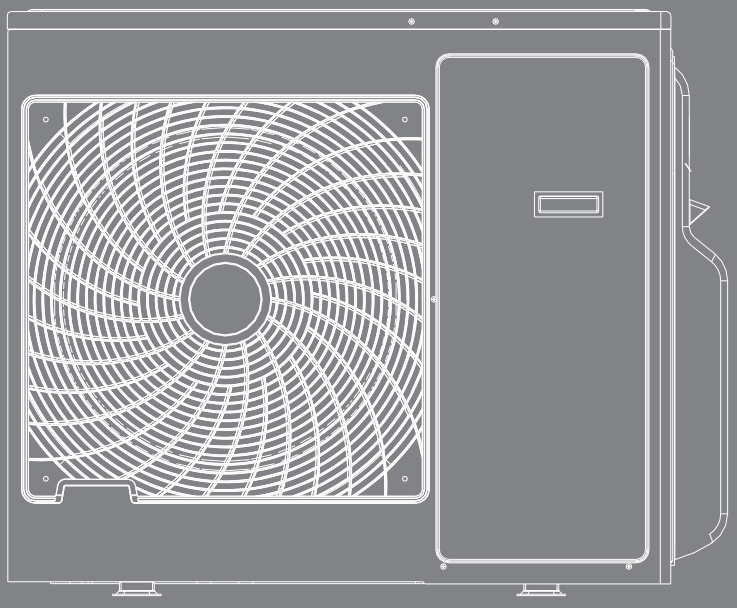
—MULTI-SPLIT TYPE AIR CONDITIONERS

Models:

<OutdoorUnit>

AMW2-12U4RRA
AMW2-14U4RRA
AMW2-18U4RXA
AMW3-21U4RFA
AMW3-24U4RFA
AMW3-24U4RAA
AMW4-27U4RAA
AMW4-36U4RAA
AMW5-42U4RTA

Category	Factory model	Customer model
Free Match Outdoor	AMW2-12U4RRA	2AMW35U4RRA
Free Match Outdoor	AMW2-14U4RRA	2AMW42U4RRA
Free Match Outdoor	AMW2-18U4RXA	2AMW50U4RXA
Free Match Outdoor	AMW3-21U4RFA	3AMW62U4RFA
Free Match Outdoor	AMW3-24U4RFA	3AMW72U4RFA
Free Match Outdoor	AMW4-27U4RAA	4AMW81U4RAA
Free Match Outdoor	AMW4-36U4RAA	4AMW105U4RAA
Free Match Outdoor	AMW5-42U4RTA	5AMW125U4RTA



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 another 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 a water leakage, electric shock or a fire.
- Use refrigerant R32 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.

• ***The figures in this manual are based on the external view of a standard model. Consequently, the shape may differ from that of the air conditioner you have selected.***

Multi-Split Type Air Conditioner Service Manual

Table of Contents

CIRELIUS

1. General

1.1 Features

- Twin Rotary DC Inverter Compressor

The twin rotary inverter compressor design reduces friction during operation for smoother rotation with less vibration, while also preventing leakage of refrigerant gas during compression. The result is a far quieter and more efficient air conditioner.

- 3-DC Inverter Technology

3-DC Inverter technology allows for extremely accurate control of compressor rotation speed, saving roughly 50% more energy than traditional air conditioners, Moreover, it guarantees and fan motor greatly reduce the loss owed to the typical owing dispersion of AC motors and more efficiently reaches the set temperature.

- Electronic Expansion Valve

Inside the outdoor unit is the electronic expansion valve, which regulates and optimizes the refrigerant quantity to all running indoor units.

- Self Recovery of Power Break

When the power supply is recovered after break, all preset are still effective and the air-conditioner can run according to the original setting.

1. GENERAL

➢ Comfortable temperature control

DC inverter power control uses its full capacity at startup to cool/warm quickly. As soon as the set temperature is reached, it carefully adjusts current frequency to prevent temperature fluctuation and energy loss.

➢ Long piping lengths for installation flexibility

The ample maximum piping length of 60 m permits more freedom in the placement of air conditioner units and enables you to optimise interior space.

➢ Variety Indoor & Outdoor Unit Type

The new line-up expands the range of layout options both indoors and outdoors.

More methods, more conveniently.

➢ Option Remote Controller

A variety of convenient controller systems permit individual control of settings such as temperature, airflow volume, and operation duration.

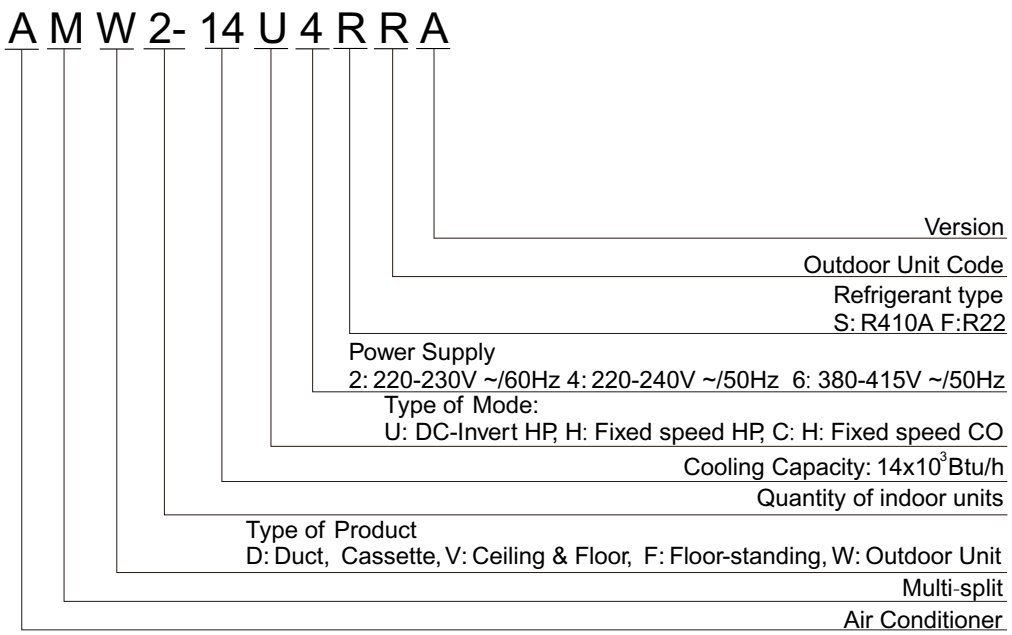
1.2 Product lineup

Outdoor Unit

Type \ Model(Btu/h)	12K	14K	18K	21K	24K	27K	36K	42K
Dual	●	●	●					
Trio				●	●			
Quattro						●	●	
Up to 5 indoor units								●

●--- available model

1.3 Nomenclature



1.4 Unit installation

With the DC inverter technology, one outdoor unit can be connected with 5 indoor units at most. The combination rate range is from 80% to 130%.

Model (Btu/h)	Max. Combined Quantity of Indoor Units
12K/14K/18K	2
21K/24K	3
27K/36K	4
42K	5

1.5 Working range

Power Supply

Working Voltage	176V ~ 253V
Voltage Imbalance	Within a 3% deviation from each voltage at the main terminal of outdoor unit
Starting Voltage	Higher than 85% of the Rated Voltage

Operating temperature range

This air conditioner is designed for the following outdoor operating temperatures.

Type	**Mode**	**Outdoor operating temperature (℃)**	
		maximum	**minimum**
Multi-Split Air Conditioner (Heat pump type)	Cooling Operation	48	-15
	Heating Operation	24	-15

Storage condition:

Temperature -25~60℃

Humidity 30%~80%

1.6 Product appearance

Outdoor Unit

Type	Capacity (Btu/h)	View
Dual	12K/14K	
	18K	
Trio	21K/ AMW3-24U4RFA	
	AMW3-24U4RAA	
Quattro	27K/36K	

1. GENERAL

Type	Capacity (Btu/h)	View
1 to 5 indoor units	42K	

2. SPECIFICATIONS

2. Specifications

Type (Free Match)			up to 2 indoor units	up to 2 indoor units	up to 2 indoor units	up to 3 indoor units	up to3indoor units	up to 3 indoor units	up to 4 indoor units	up to 4 indoor units	up to 5 indoor units
EU Model Name			2AMW35U4RRA	2AMW42U4RRA	2AMW50U4RXA	3AMW60U4RFA	3AMW72U4RFA	3AMW70U4RAA	4AMW81U4RAA	4AMW105U4RAA	5AMW125U4RTA
Model Name			AMW2-12U4RRA	AMW2-14U4RRA	AMW2-18U4RXA	AMW3-21U4RFA	AMW3-24U4RFA	AMW3-24U4RAA	AMW4-27U4RAA	AMW4-36U4RAA	AMW5-42U4RTA
Gas			R32	R32	R32	R32	R32	R32	R32	R32	R32
Performance											
Capacity	Pdesign Cooling	kW	3.5	4.1	5.2	6.3	7.2	7.0	8.0	10.0	12.5
	Pdesign Heating	kW	3.8	4.2	5.5	5.5	5.5	7.5	8.0	8.0	10.5
	Cooling	kW	3.5(1.0 ~ 4.1)	4.1(1.4 ~ 5.5)	5.2(1.8 ~ 6.6)	6.3(2.02~8.45)	7.2(2.09~9.65)	7.0(3.0 ~ 10.0)	8.0(2.6 ~ 11.5)	10.0(2.6 ~ 11.5)	12.5(3.8 ~ 15.3)
		Btu/h	11942 (3412~1398)	13990 (4780~18766)	17740 (6142~22519)	21495 (6892~28831)	24566 (7131~32925)	23890 (10240~34130)	27300 (8870~39250)	34130 (8870~39250)	4265 0(12960~52200)
	Heating	kW	3.85(1.25 ~ 4.75)	4.5(0.9 ~ 5.6)	6.0(1.4 ~ 7.2)	7.2(1.9~8.85)	7.92(2.0~10.0)	8.0(2.3 ~ 10.0)	9.0 (2.2 ~ 12.0)	11.0 (2.2 ~ 12.0)	13.5 (6.7 ~ 17.2)
		Btu/h	13136 (4265~16207)	15354 (3070~19100)	20472 (4777~24566)	24566 (6482~30196)	27023 (6875~34120)	27300 (7850~34130)	30720 (7510~40950)	37540 (7510~40950)	46060 (22860~58600)
Air flow		m3/h	1850	1850	2300	3150	3150	4000	4000	4000	5000
EER		W/W	4.14	4.10	3.77	4.28	3.85	3.89	3.56	3.23	3.46
COP		W/W	4.53	4.5	4.20	4.04	3.9	3.81	4.00	3.93	3.56
SEER			6.63	6.61	7.21	6.9	6.8	6.11	7.01	6.50	6.50
SCOP			4.12	4.1	4.1	4.01	4.01	4.01	4.05	4.01	3.72
EEL Rank		Cooling	A++	A++	A++	A++	A++	A++	A++	A++	A++
		Heating	A+	A+	A+	A+	A+	A+	A+	A+	A
Noise Level/ sound power		dB(A) (Max)	47/53 62	47/53 62	48/55 64	55 68	55 68	53/59 68	54/60 68	54/60 68	61 75
Guaranteed Operating Range	Cooling	℃	-15~48	-15~48	-15~48	-15~48	-15~48	-15~48	-15~48	-15~48	-15~48
	Heating	℃	-15~24	-15~24	-15~24	-15~24	-15~24	-15~24	-15~24	-15~24	-15~24
Compressor model	Model		GSD113RKRA8 JV6	GSD113RKRA8 JV6	KTN150D42 UFZ	KTM240D57 UMU	KTM240D57 UMU	KTF235D22UMT	KTF235D22UMT	KTF235D22UMT	KTF400D64UMT
	Brand		HITACHI	HITACHI	GMCC	GMCC	GMCC	GMCC	GMCC	GMCC	GMCC
Electrical Data											
Power		V/Hz/f	220~240/50/1	220~240/50/1	220~240/50/1	220~240/50/1	220~240/50/1	220~240/50/1	220~240/50/1	220~240/50/1	220~240/50/1
Power input	Cooling	W	850 (250~1560)	1000 (330~1900)	1380(390~2200)	1470 (525~2500)	1870 (600~2660)	1800 (650 ~ 3100)	2250 (580 ~ 4000)	3100 (580 ~ 4000)	3610 (810 ~ 7500)
	Heating	W	850 (200~1600)	1000 (200~1600)	1430(290~2300)	1780 (452~2741)	2030 (500~2967)	2100 (520 ~ 3100)	2250 (460 ~ 4000)	2800 (460 ~ 4000)	3790 (680 ~ 7500)
Rated current	Cooling	A	3.67	4.35	6.2	6.4	8.1	8.0	10.0	13.8	15.6
	Heating	A	3.67	4.35	6.4	7.8	8.8	9.3	10.0	12.4	16.7

2. SPECIFICATIONS

Type (Free Match)			up to 2 indoor units	up to 2 indoor units	up to 2 indoor units	up to 3 indoor units	up to3indoor units	up to 3 indoor units	up to 4 indoor units	up to 4 indoor units	up to 5 indoor units
EU Model Name			2AMW35U4RRA	2AMW42U4RRA	2AMW50U4RXA	3AMW60U4RFA	3AMW72U4RFA	3AMW70U4RAA	4AMW81U4RAA	4AMW105U4RAA	5AMW125U4RTA
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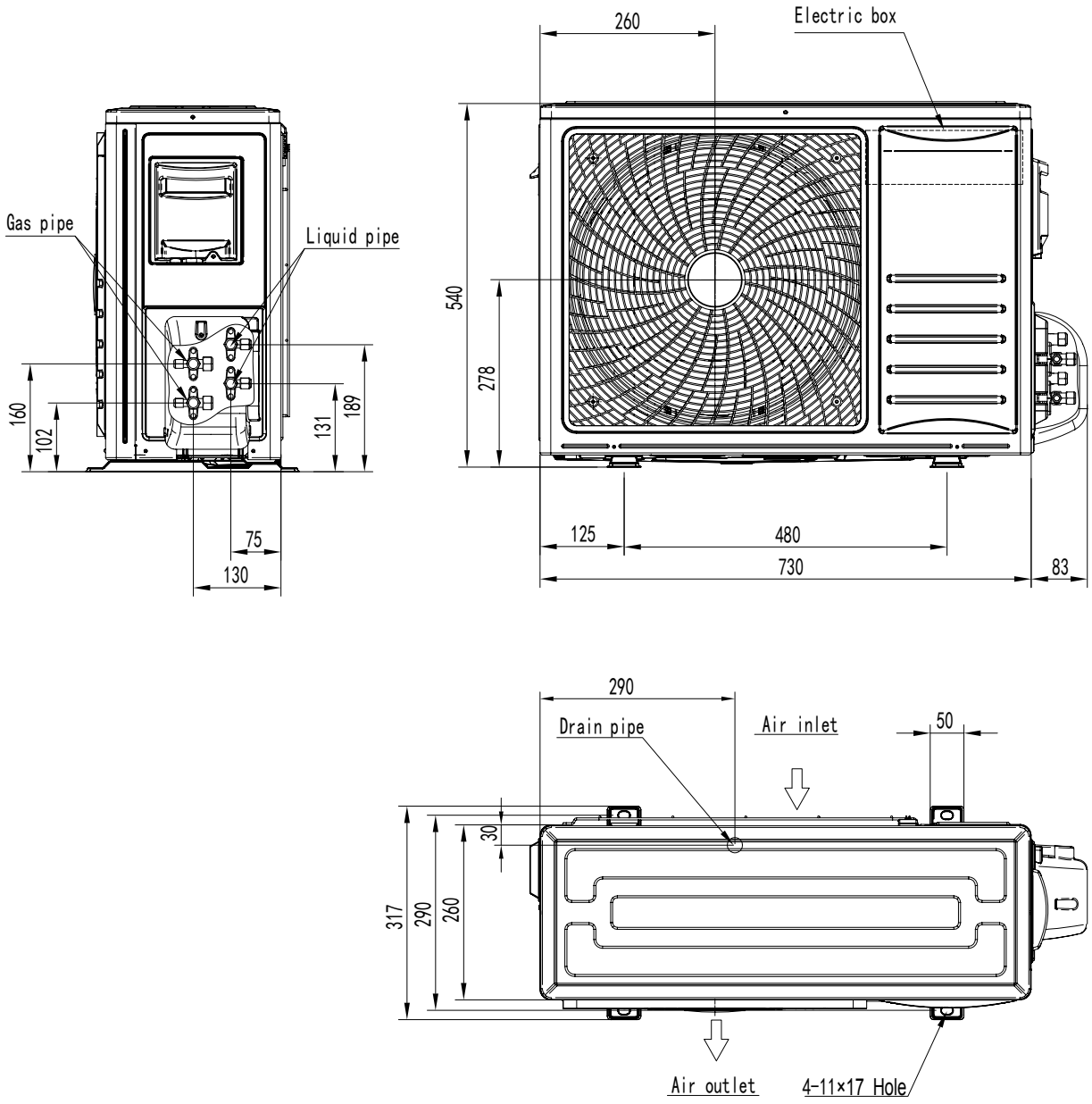
Anti electric shock			Class I	Class I	Class I	Class I	Class I	Class I	Class I	Class I	Class I
Degrees of protection			IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4
Dimension & Weight											
Net Dimension (WxHxD)		mm	730×540×260	730×540×260	810×280×580	860×670×310	860×670×310	950×840×340	950×840×340	950×840×340	950×1050×340
Net Weight		kg	34	34	37	49	49	72	73	73	95
Package Dimension (WxHxD)		mm	860×590×400	860×590×400	940×385×630	990×450×730	990×450×730	1110×460×920	1110×460×920	1110×460×920	1110×1200×460
Gross Weight		kg	36	36	39.5	54	54	77	78	78	102
Technical Information											
Piping	Diameter (Liquid)	mm	6.35×2	6.35×2	6.35×2	6.35×3	6.35×3	6.35×3	6.35×4	6.35×4	6.35×5
	Diameter (Gas)	mm	9.52×2	9.52×2	9.52×2	9.52×3	9.52×3	9.52×3	9.52×4	9.52×4	9.52×5
	Max Length (Each)	m	15	15	15	20	20	20	20	20	20
	Max Length (Total)	m	30	30	30	45	45	45	60	60	80
	Max Height	m	15	15	15	15	15	15	15	15	15
Upload refrigerant		g	950	950	1070	1450	1450	1800	2200	2200	3000
Upload additional refrigerant		g/m	12g/m over 15m	12g/m over 15m	12g/m over 15m	12g/m over 15m	12g/m over 15m	12g/m over 15m	12g/m over 20m	12g/m over 20m	12g/m over 25m

NOTE:

1. Test conditions：
   Cooling： Indoor: DB27℃/ WB19℃ Outdoor: DB35℃/ WB24℃
   Heating: Indoor: DB20℃/ WB15℃ Outdoor: DB7℃/ WB 6℃
2. The Sound Pressure Level is based on the following conditions:
   Outdoor unit：
   Measure the noise value of 3 points，the points are1 meter in front of the three sides of the unit surface (front/left/right)and height =1/2(unit height +1) meter from floor level, and calculate the weighted average of the noise.
3. The above data was measured in an anechoic chamber. Please take into consideration reflected sound of your specific application environment.
4. All specifications are subjected to change by the manufacturer without prior notice.

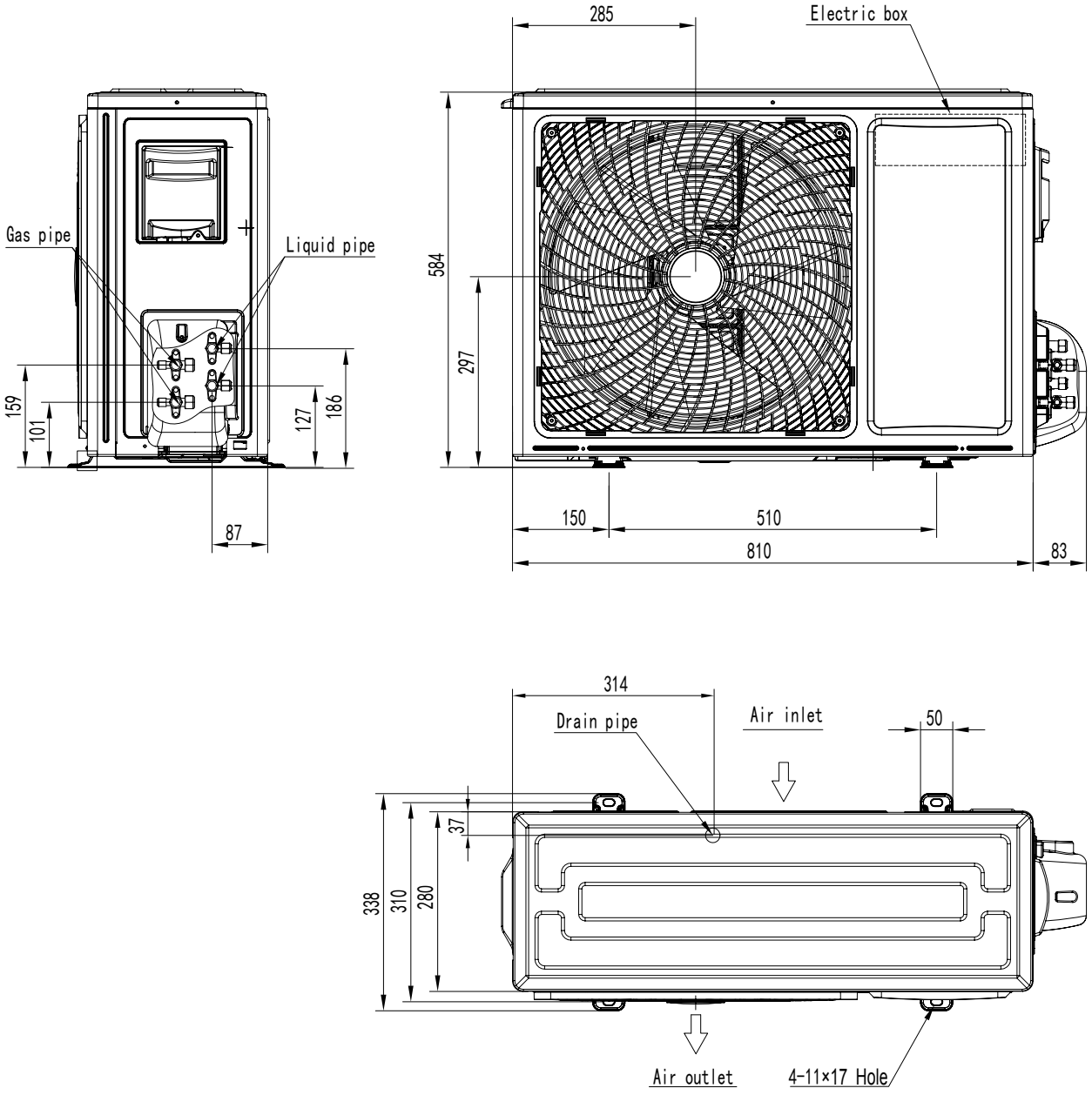
3. Outlines and dimensions

12K/14K (Unit:mm)



3.OUTLINES AND DIMENSIONS

18K (Unit:mm)



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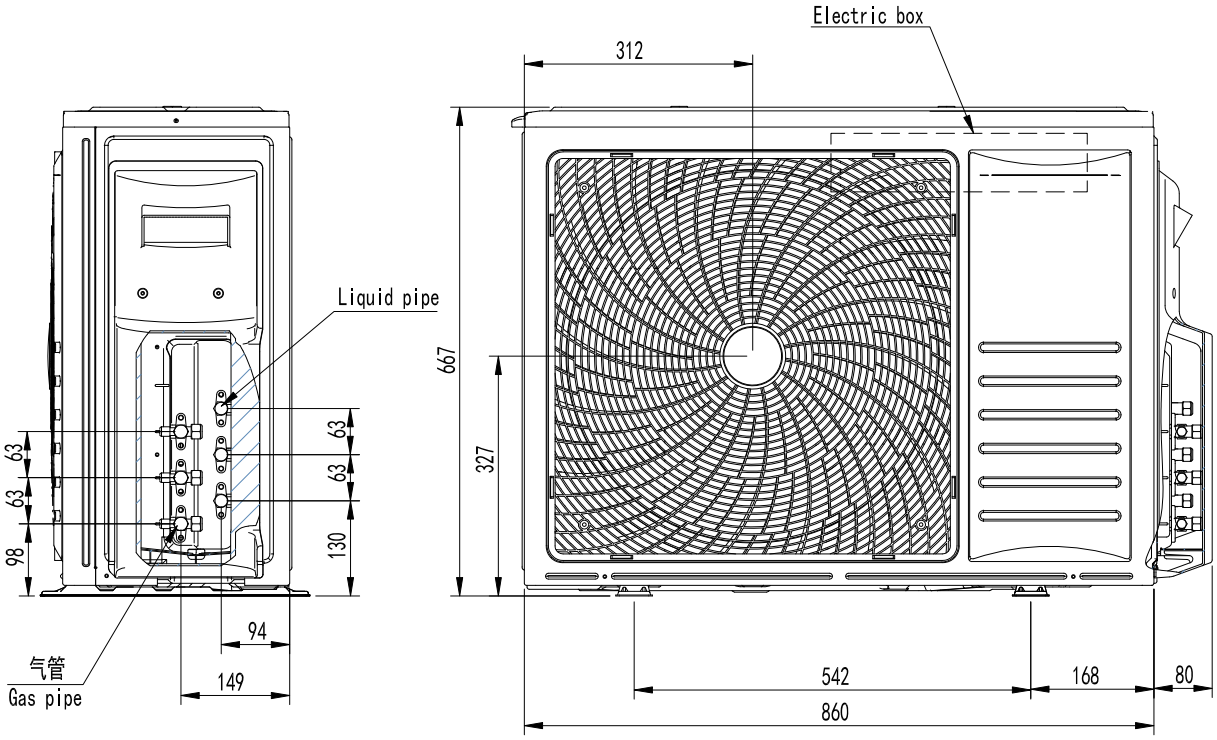
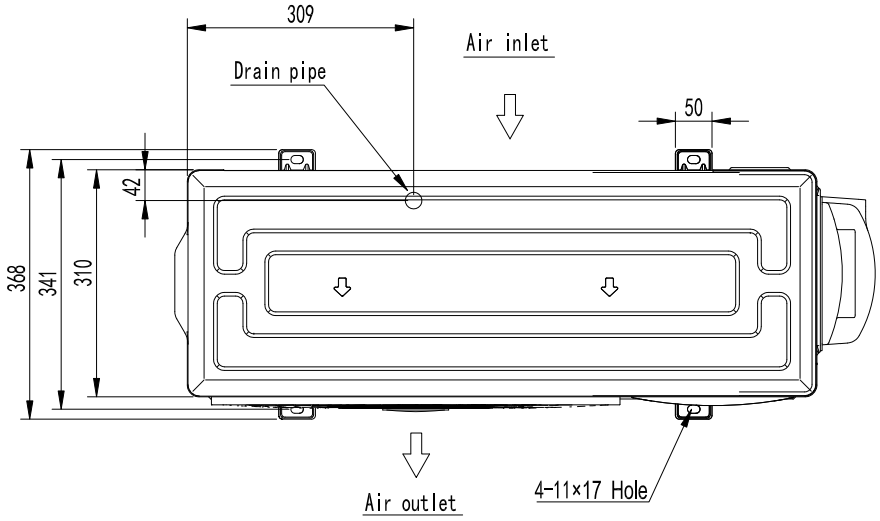
3.OUTLINES AND DIMENSIONS

21K/AMW3-24U4RFA (Unit:mm)





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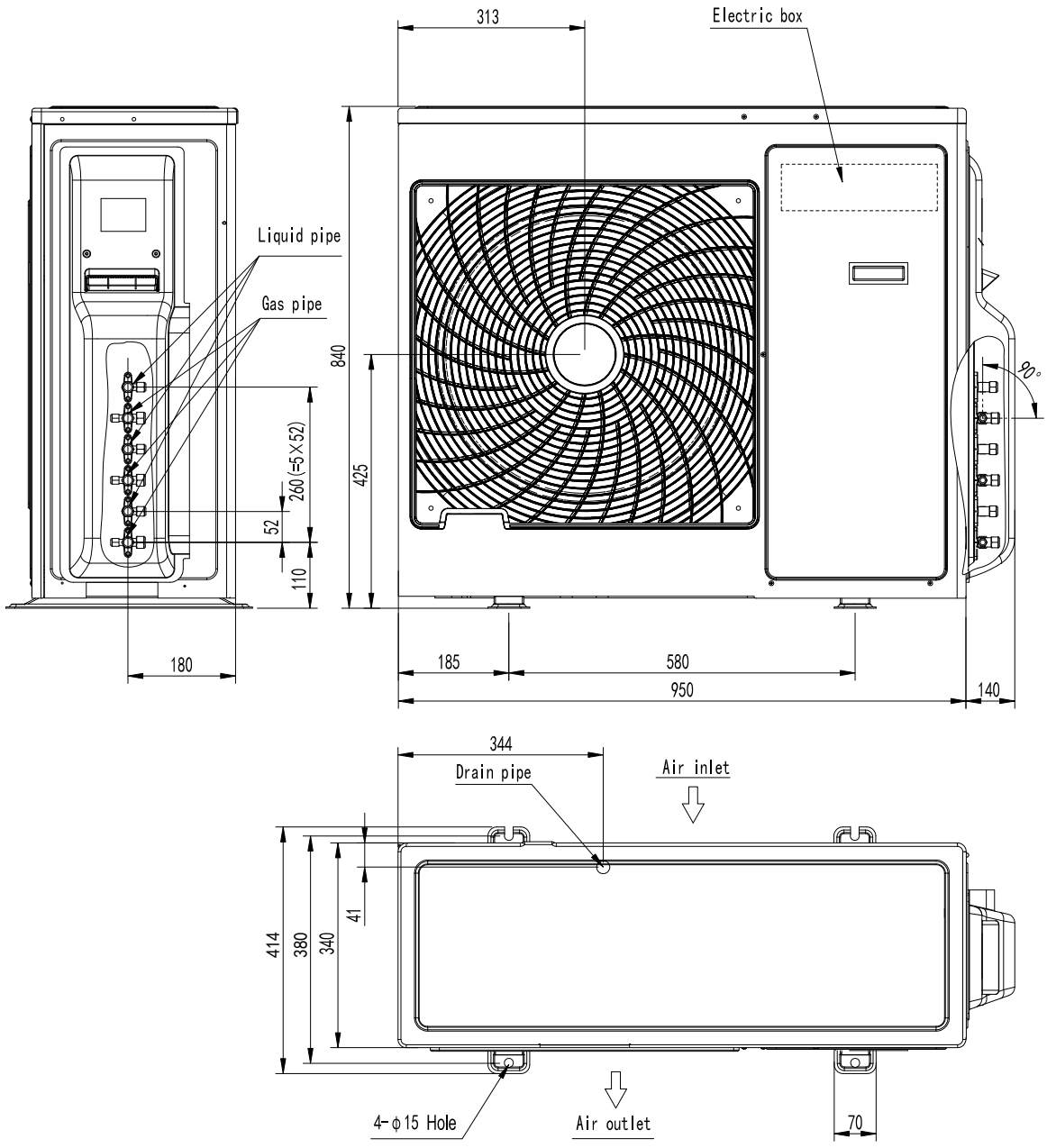
3.OUTLINES AND DIMENSIONS

AMW3-24U4RAA (Unit:mm)



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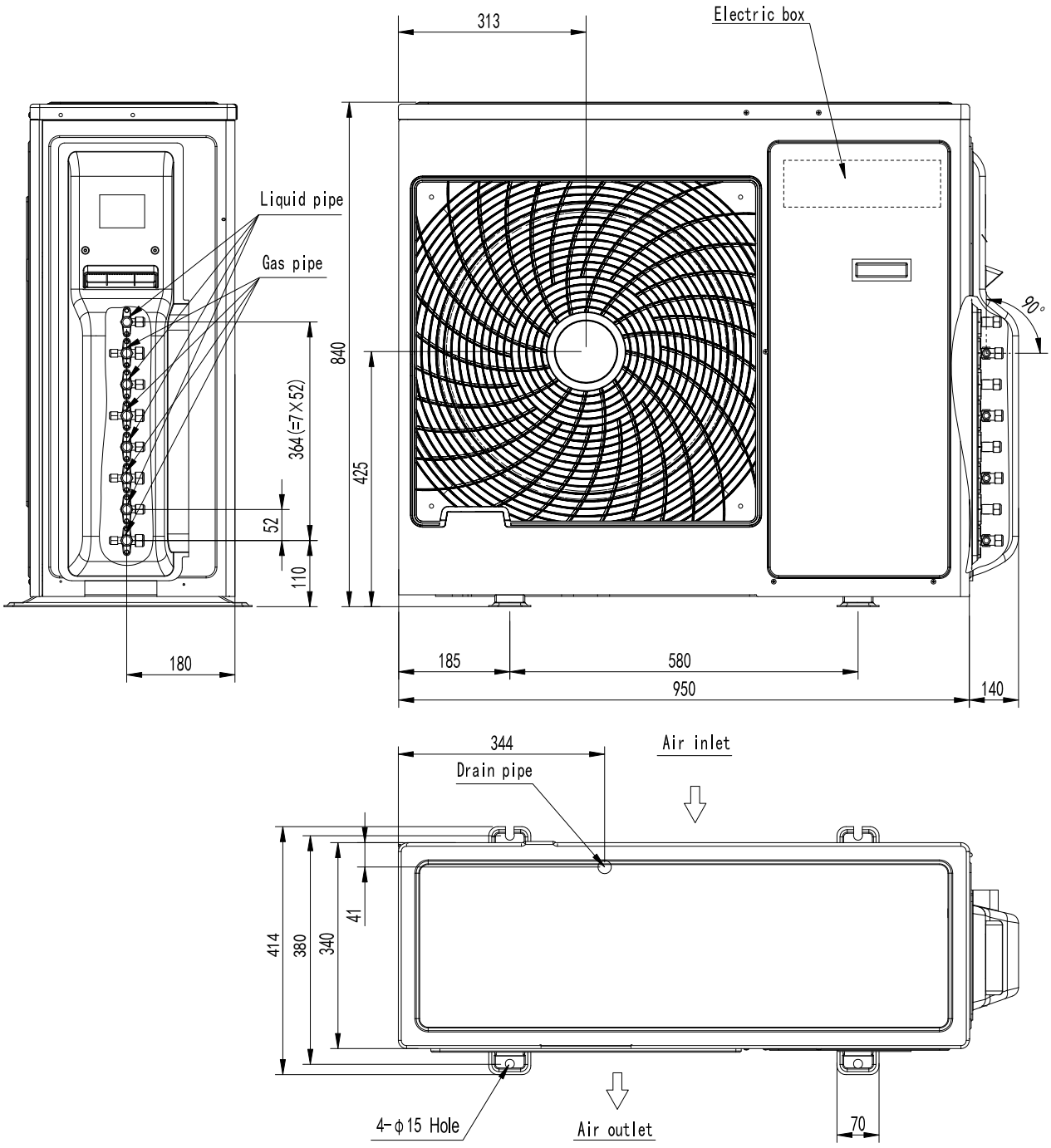
3.OUTLINES AND DIMENSIONS

27K (Unit:mm)



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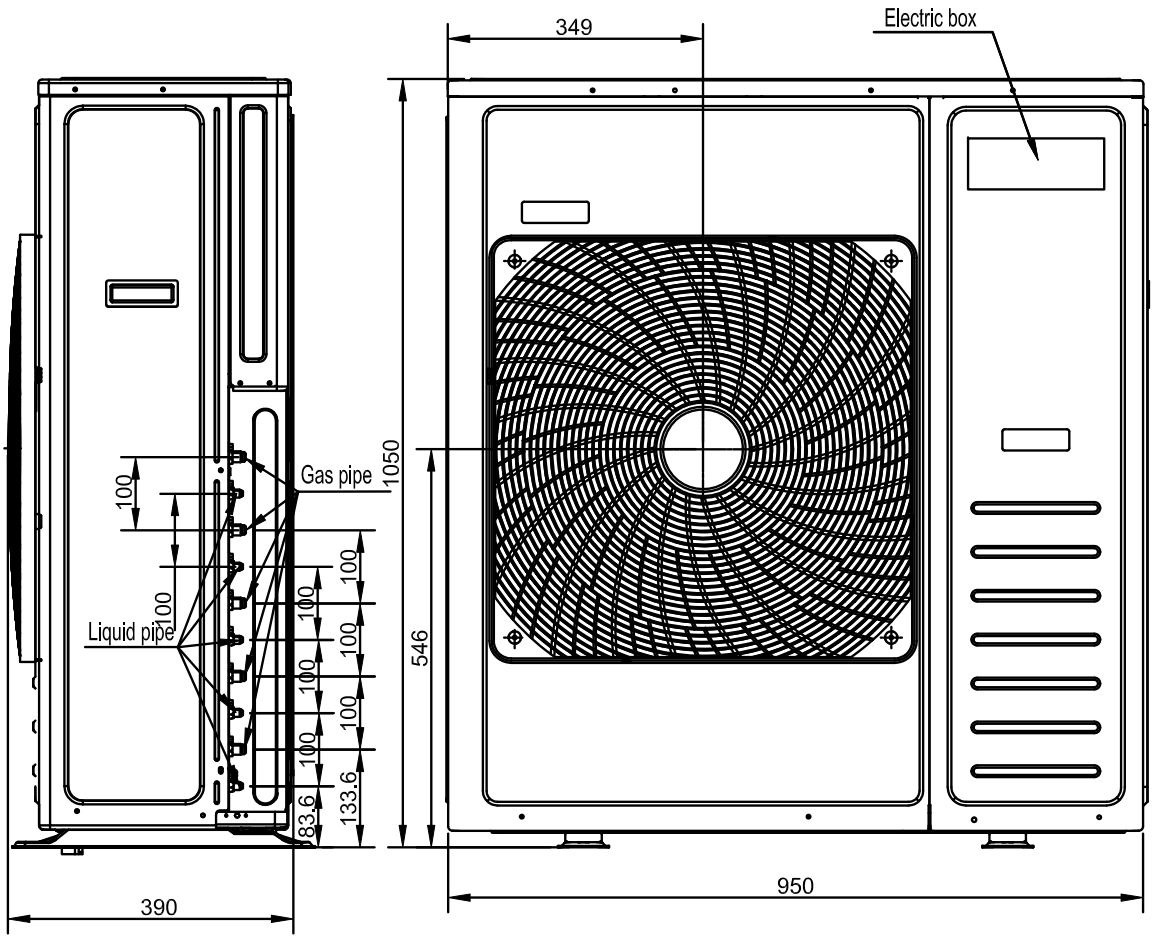
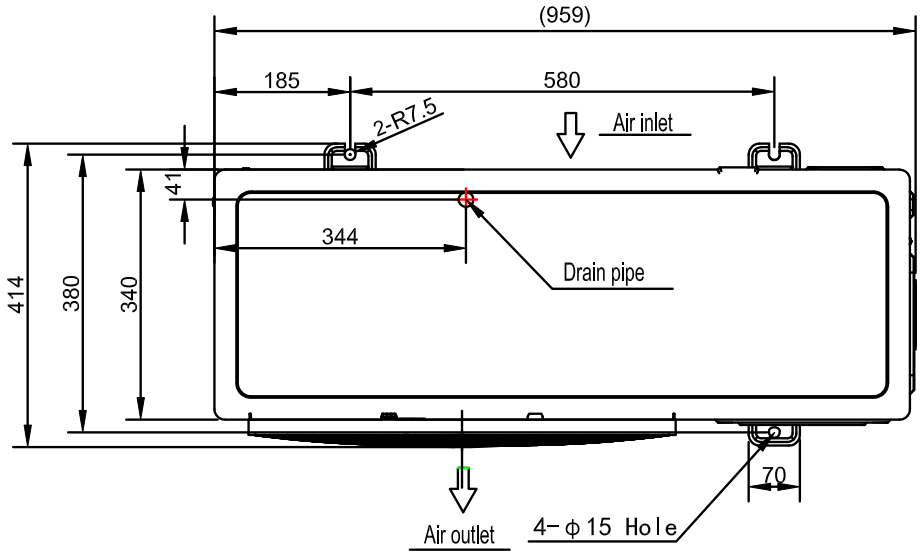
3. OUTLINES AND DIMENSIONS

42K

Unit: mm





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4. Electrical data

	Power supply			Applicable voltage		ELB	
Outdoor unit	Voltage(V)	PH	Frequency (Hz)	Umin(V)	Umax(V)	Nominal Current(A)	Nominal Sensitive Current(mA)
12K/14K/18K	220-240	1	50	176	253	25	30
21K/24K/ 27K/36K	220-240	1	50	176	253	32	30
42K	220-240	1	50	176	253	63	30

NOTE:

1. The above compressor data is based on 100% capacity combination of indoor units at the rated operating frequency.
2. This data is based on the same conditions as the nominal heating and cooling capacities.
3. The compressor is started by an inverter, resulting in extremely low starting current.

5. Capacities and selection data

5.1 Capacity characteristic charts

The following charts show the characteristics of outdoor unit capacity, which corresponds with the operating ambient temperature of outdoor unit.

Conditions:

① Pipe length / height difference : 5m / 0m

② Compressor at rated inverter frequency

③ Indoor fan speed at high fan speed

④ Capacity loss due to white frost and defrost operation is not included.

12K

COOLING CAPACITY (W)

Indoor temperature		Outdoor temperature (℃ DB)						
(℃ DB)	(℃ WB)	15	20	25	30	35	40	45
22	16	2870	2975	3010	3115	3150	2800	2345
27	19	3710	3675	3640	3570	3500	3150	2555
30	22	3675	3780	3815	3850	3920	3500	2800

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

HEATING CAPACITY (W)

Indoor temperature	Outdoor temperature (℃ DB)						
(℃ DB)	-10	-5	0	5	10	15	20
16	2695	3003	3388	3427	3465	3504	3542
20	2772	3119	3465	3773	3966	4235	4158
24	2888	3465	3850	4235	4428	4736	3773

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

14K

COOLING CAPACITY (W)

Indoor temperature		Outdoor temperature (℃ DB)						
(℃ DB)	(℃ WB)	15	20	25	30	35	40	45
22	16	3362	3485	3526	3649	3690	3280	2747
27	19	4346	4305	4264	4182	4100	3690	2993
30	22	4305	4510	4469	4510	4592	4100	3280

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

HEATING CAPACITY (W)

Indoor temperature	Outdoor temperature (℃ DB)						
(℃ DB)	-10	-5	0	5	10	15	20
16	3150	3510	3960	4050	4050	4095	4140
20	3240	3645	4050	4410	4635	4950	4860
24	3375	4050	4500	4950	5175	5535	4410

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

5. CAPACITIES AND SELECTION DATA

18K

COOLING CAPACITY (W)

Indoor temperature		Outdoor temperature (℃ DB)						
(℃ DB)	(℃ WB)	15	20	25	30	35	40	45
22	16	4264	4420	4472	4628	4680	4160	3484
27	19	5512	5460	5408	5304	5200	4680	3796
30	22	5460	5720	5668	5720	5824	5200	4160

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

HEATING CAPACITY (W)

Indoor temperature	Outdoor temperature (℃ DB)						
(℃ DB)	-10	-5	0	5	10	15	20
16	4200	4680	5280	5400	5400	5460	5520
20	4320	4860	5400	5880	6180	6600	6480
24	4500	5400	6000	6600	6900	7380	5880

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

21K

COOLING CAPACITY (W)

Indoor temperature		Outdoor temperature (℃ DB)						
(℃ DB)	(℃ WB)	15	20	25	30	35	40	45
22	16	5166	5355	5418	5607	5670	5040	4221
27	19	6678	6615	6552	6426	6300	5670	4599
30	22	6615	6930	6867	6930	7056	6300	5040

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

HEATING CAPACITY (W)

Indoor temperature	Outdoor temperature (℃ DB)						
(℃ DB)	-10	-5	0	5	10	15	20
16	5040	5616	6336	6480	6480	6552	6624
20	5184	5832	6480	7056	7416	7920	7776
24	5400	6480	7200	7920	8280	8856	7056

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

AMW3-24U4RFA

COOLING CAPACITY (W)

Indoor temperature		Outdoor temperature (℃ DB)						
(℃ DB)	(℃ WB)	15	20	25	30	35	40	45
22	16	5904	6120	6192	6408	6480	5760	4824
27	19	7632	7560	7488	7344	7200	6480	5256
30	22	7560	7920	7848	7920	8064	7200	5760

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

5. CAPACITIES AND SELECTION DATA

HEATING CAPACITY (W)

Indoor temperature	Outdoor temperature (℃ DB)						
(℃ DB)	-10	-5	0	5	10	15	20
16	5544	6178	6970	7128	7128	7207	7286
20	5702	6415	7128	7762	8158	8712	8554
24	5940	7128	7920	8712	9108	9742	7762

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

AMW3-24U4RAA

COOLING CAPACITY (W)

Indoor temperature		Outdoor temperature (℃ DB)						
(℃ DB)	(℃ WB)	15	20	25	30	35	40	45
22	16	5740	5950	6020	6230	6300	5600	4690
27	19	7420	7350	7280	7140	7000	6300	5110
30	22	7350	7700	7630	7700	7840	7000	5600

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

HEATING CAPACITY (W)

Indoor temperature	Outdoor temperature (℃ DB)						
(℃ DB)	-10	-5	0	5	10	15	20
16	5600	6240	7040	7200	7200	7280	7360
20	5760	6480	7200	7840	8240	8800	8640
24	6000	7200	8000	8800	9200	9840	7840

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

27K

COOLING CAPACITY (W)

Indoor temperature		Outdoor temperature (℃ DB)						
(℃ DB)	(℃ WB)	15	20	25	30	35	40	45
22	16	6560	6800	6880	7120	7200	6400	5360
27	19	8480	8400	8320	8160	8000	7200	5840
30	22	8400	8800	8720	8800	8960	8000	6400

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

HEATING CAPACITY (W)

Indoor temperature	Outdoor temperature (℃ DB)						
(℃ DB)	-10	-5	0	5	10	15	20
16	6300	7020	7920	8100	8100	8190	8280
20	6480	7290	8100	8820	9270	9900	9720
24	6750	8100	9000	9900	10350	11070	8820

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

5. CAPACITIES AND SELECTION DATA

36K

COOLING CAPACITY (kW)

Indoor temperature		Outdoor temperature (℃ DB)						
(℃ DB)	(℃ WB)	15	20	25	30	35	40	45
22	16	8200	8500	8600	8900	9000	8000	6700
27	19	10600	10500	10400	10200	10000	9000	7300
30	22	10500	11000	10900	11000	11200	10000	8000

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

HEATING CAPACITY (W)

Indoor temperature	Outdoor temperature（℃ DB）						
(℃ DB)	-10	-5	0	5	10	15	20
16	7700	8580	9680	9900	9900	10010	10120
20	7920	8910	9900	10780	11330	12100	11880
24	8250	9900	11000	12100	12650	13530	10780

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

42K

COOLING CAPACITY (W)

Indoor temperature		Outdoor temperature (℃ DB)						
(℃ DB)	(℃ WB)	15	20	25	30	35	40	45
22	16	10250	10625	10750	11125	11250	10000	8375
27	19	13250	13125	13000	12750	12500	11250	9125
30	22	13125	13750	13625	13750	14000	12500	10000

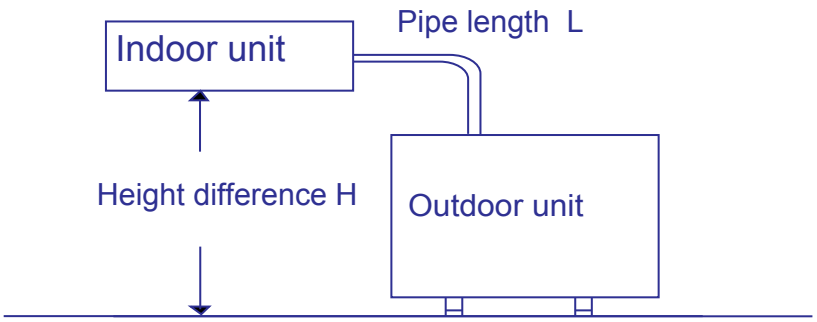
(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

HEATING CAPACITY (W)

Indoor temperature	Outdoor temperature（℃ DB）						
(℃ DB)	-10	-5	0	5	10	15	20
16	9450	10530	11880	12150	12150	12285	12420
20	9720	10935	12150	13230	13905	14850	14580
24	10125	12150	13500	14850	15525	16605	13230

(℃ DB) : Dry Bulb Temperature (℃)
(℃ WB) : Wet Bulb Temperature (℃)

5.2 Piping length correction factor



The correction factor is based on the equivalent piping length in meters (EL) and the height between outdoor and indoor units in meters (H).

H:

Height between indoor unit and outdoor unit (m).

• H>0: Position of outdoor unit is higher than position of indoor unit (m).

• H<0: Position of outdoor unit is lower than position of indoor unit (m).

L:

Actual one-way piping length between indoor unit and outdoor unit (m).

EL:

Equivalent one-way piping length between indoor unit and outdoor unit (m).

Gas Diameter (mm/inch)	9.52 (3/8')	12.7 (1/2')	15.88 (5/8')	19.05 (3/4')
90°Elbow	0.15	0.2	0.25	0.35

Cooling

Model \ EL	10	15	20	25	30	40	45	50	60	70	80
12K/14K/18K	1.00	0.96	0.92	0.88	0.85	--	--	--	--	--	--
21K/24K	1.00	1.00	0.98	0.96	0.94	0.92	0.90	--	--	--	--
27K/36K	1.00	1.00	1.00	0.98	0.95	0.93	0.90	0.88	0.85	--	--
42K	1.00	1.00	1.00	1.00	0.98	0.94	0.93	0.90	0.85	0.75	0.72

Heating

Model \ EL	10	15	20	25	30	40	45	50	60	70	80
12K/14K/18K	1.00	0.96	0.92	0.88	0.85	--	--	--	--	--	--
21K/24K	1.00	1.00	0.98	0.95	0.92	0.88	0.85	--	--	--	--
27K/36K	1.00	1.00	1.00	0.98	0.95	0.92	0.88	0.86	0.84	--	--
42K	1.00	1.00	1.00	1.00	0.97	0.93	0.90	0.88	0.83	0.73	0.68

5. CAPACITIES AND SELECTION DATA

The correction factor of height between indoor unit and outdoor unit

Height difference	5m	10m	15m
Factor	1.0	0.95	0.88

To ensure correct unit selection, consider the farthest indoor unit.

NOTE:

1. Above data is assuming that the height difference between indoor unit and outdoor unit is 0m.
2. Be sure to minimize length of connection pipes to optimize performance. If the outdoor unit is installed higher or lower than the indoor unit, it is necessary to apply height correction factor additionally to length correction factor to calculate cooling/heating.
   If outdoor unit is higher, correction should be applied to cooling capacity, if outdoor unit is lower, correction should be applied to heating capacity.

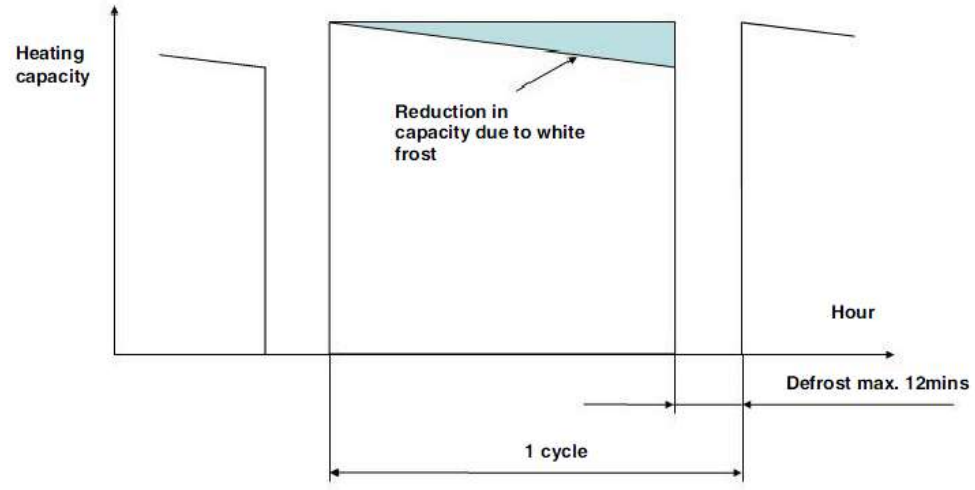
5.3 Correction factors according to defrosting operation

The heating capacity in the preceding paragraph, excludes the condition of the frost or the defrosting operation period. In consideration of the frost or the defrosting operation, the heating capacity is corrected by the equation below.

Corrected heating capacity = Defrost Correction factor x unit capacity

OUTDOOR TEMPERATURE (°CDB)	-15	-10	-5	0	7	10	15
Correction factor (humidity rate85% RH)	0.95	0.95	0.91	0.81	1.0	1.0	1.0

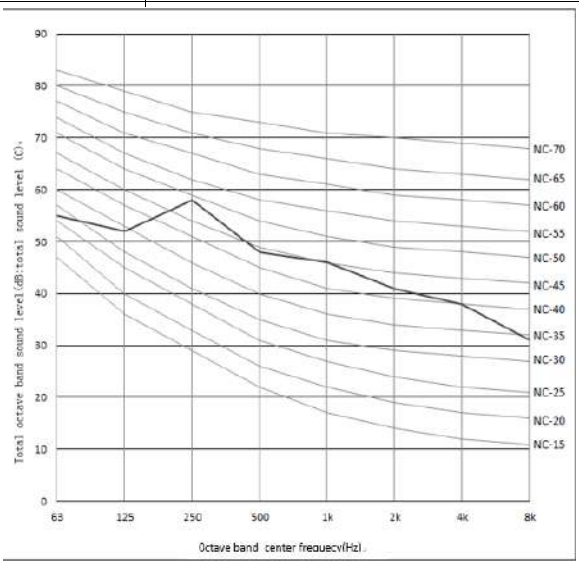
Correction Factor



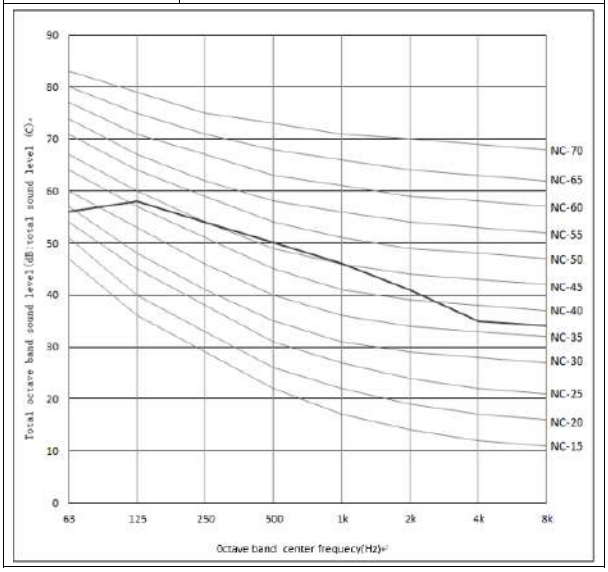
NOTE:
The correction factor is not valid for special conditions such as snowfall or operation in a transitional period.

6. Sound pressure data

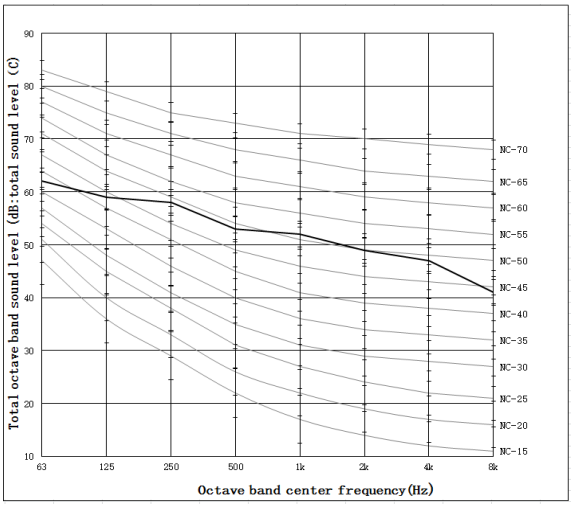
Model	12K/14K
Test condition	1.0m ahead of the unit; 0.92m high from the bottom of the unit; 1.0m high from the ground.



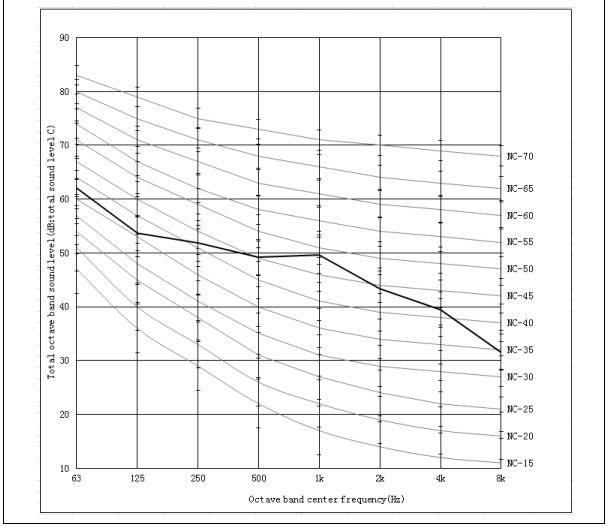
Model	18K
Test condition	1.0m ahead of the unit; 0.92m high from the bottom of the unit; 1.0m high from the ground.



Model	AMW3-24U4RAA
Test condition	1.0m ahead of the unit; 0.92m high from the bottom of the unit; 1.0m high from the ground.

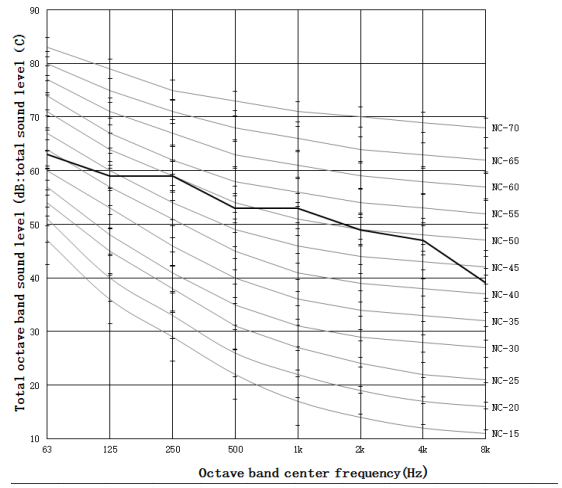


Model	AMW3-24U4RFA、AMW3-21U4RFA
Test condition	1.0m ahead of the unit; 0.83m high from the bottom of the unit;1m high from the ground.

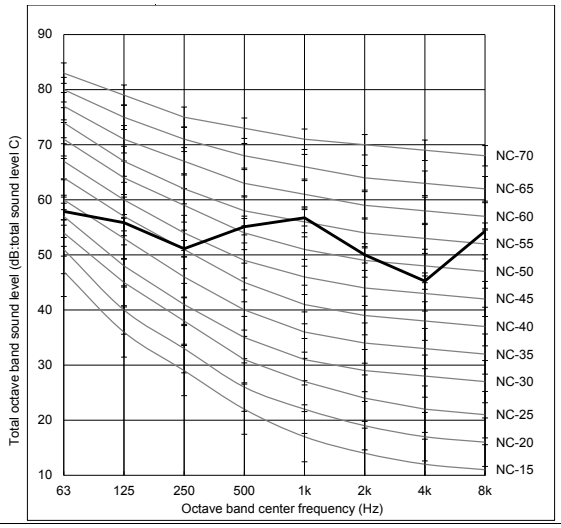


6. SOUND PRESSURE DATA

Model	27K/36K
Test condition	1.0m ahead of the unit; 0.92m high from the bottom of the unit; 1.0m high from the ground.



Model	42K
Test condition	1.0m ahead of the unit; 1.0m high from the ground.



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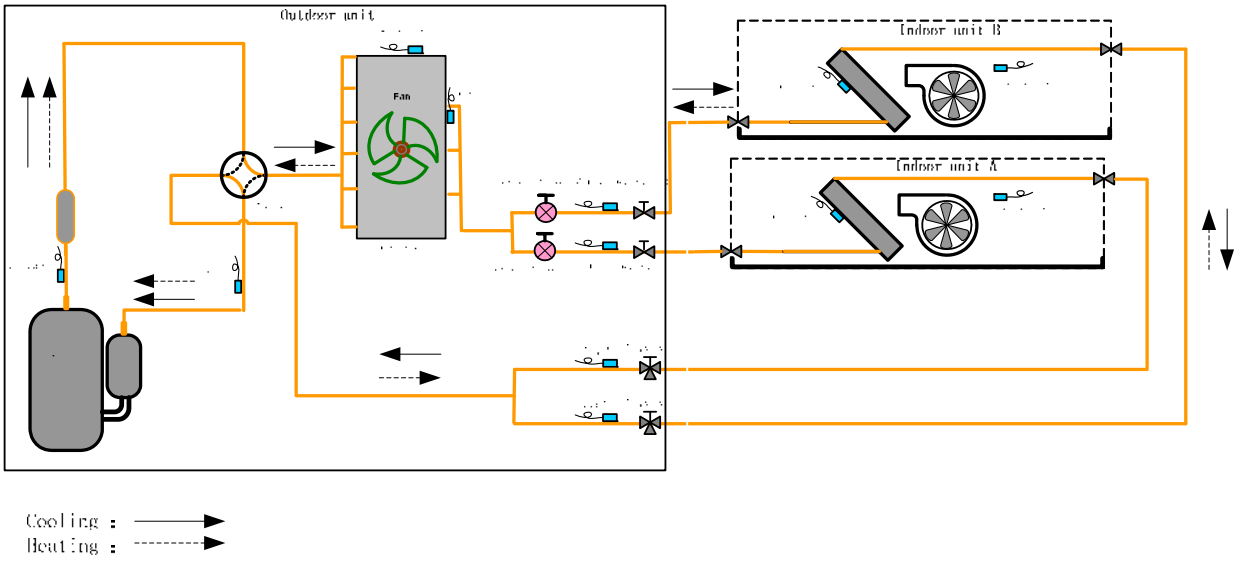
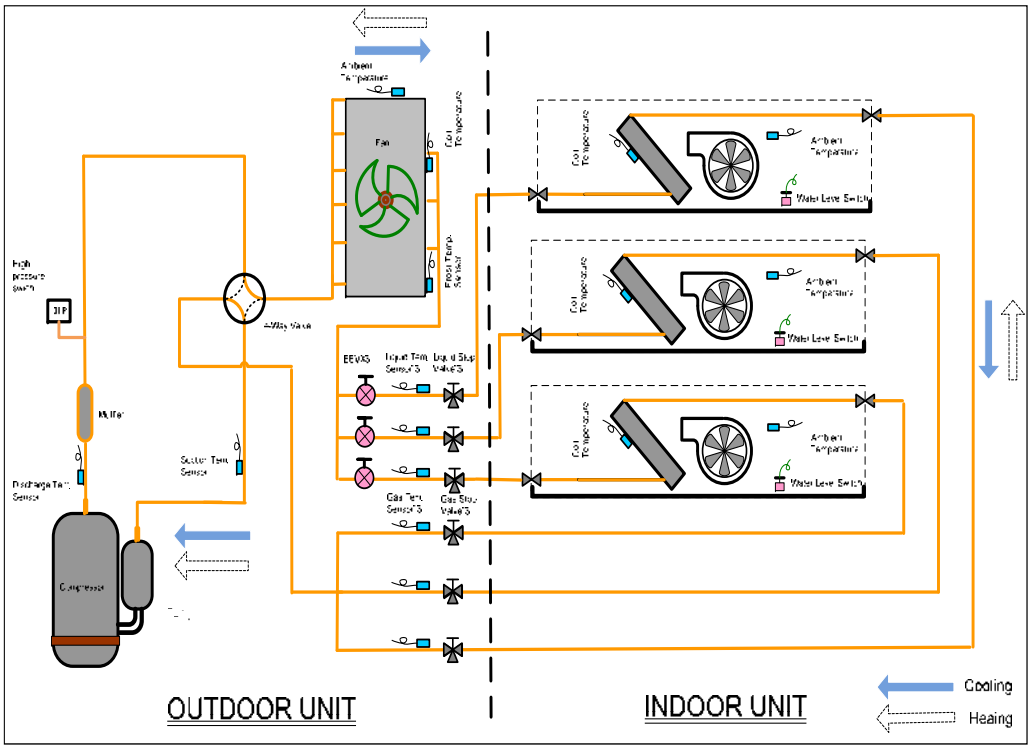
7. Refrigerant cycle

12K/14K/18K

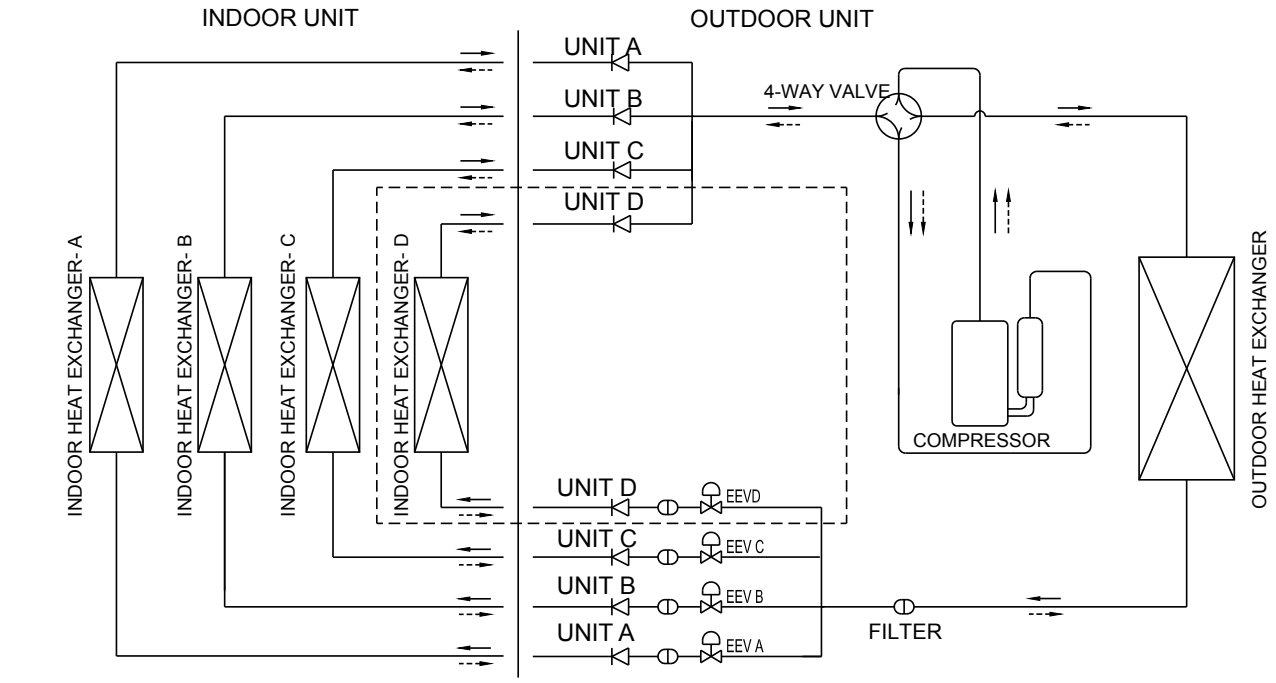


21K/24K



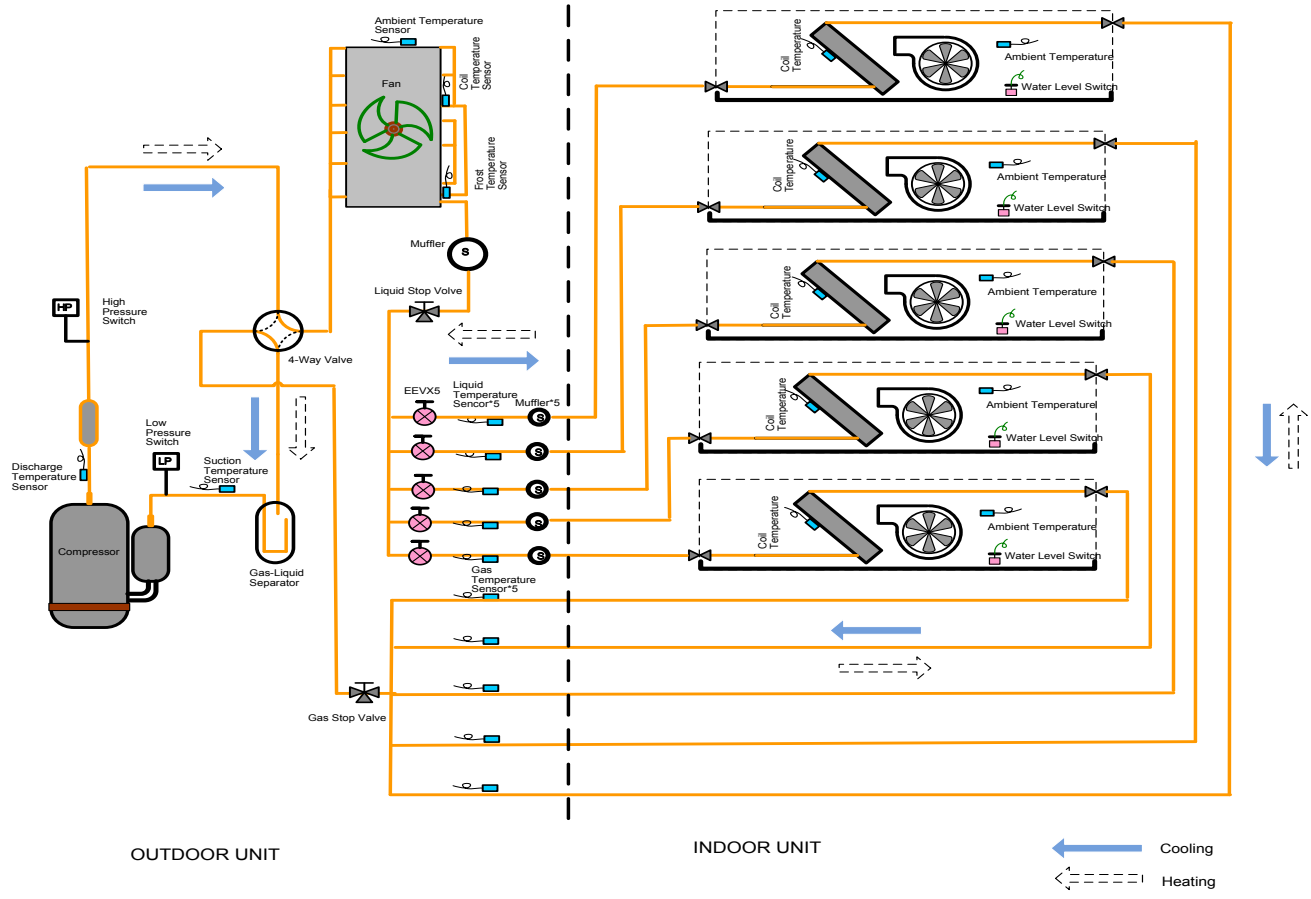
7. REFRIGERANT CYCLE

27K/36K



Cooling cycle
Heating cycle

42K



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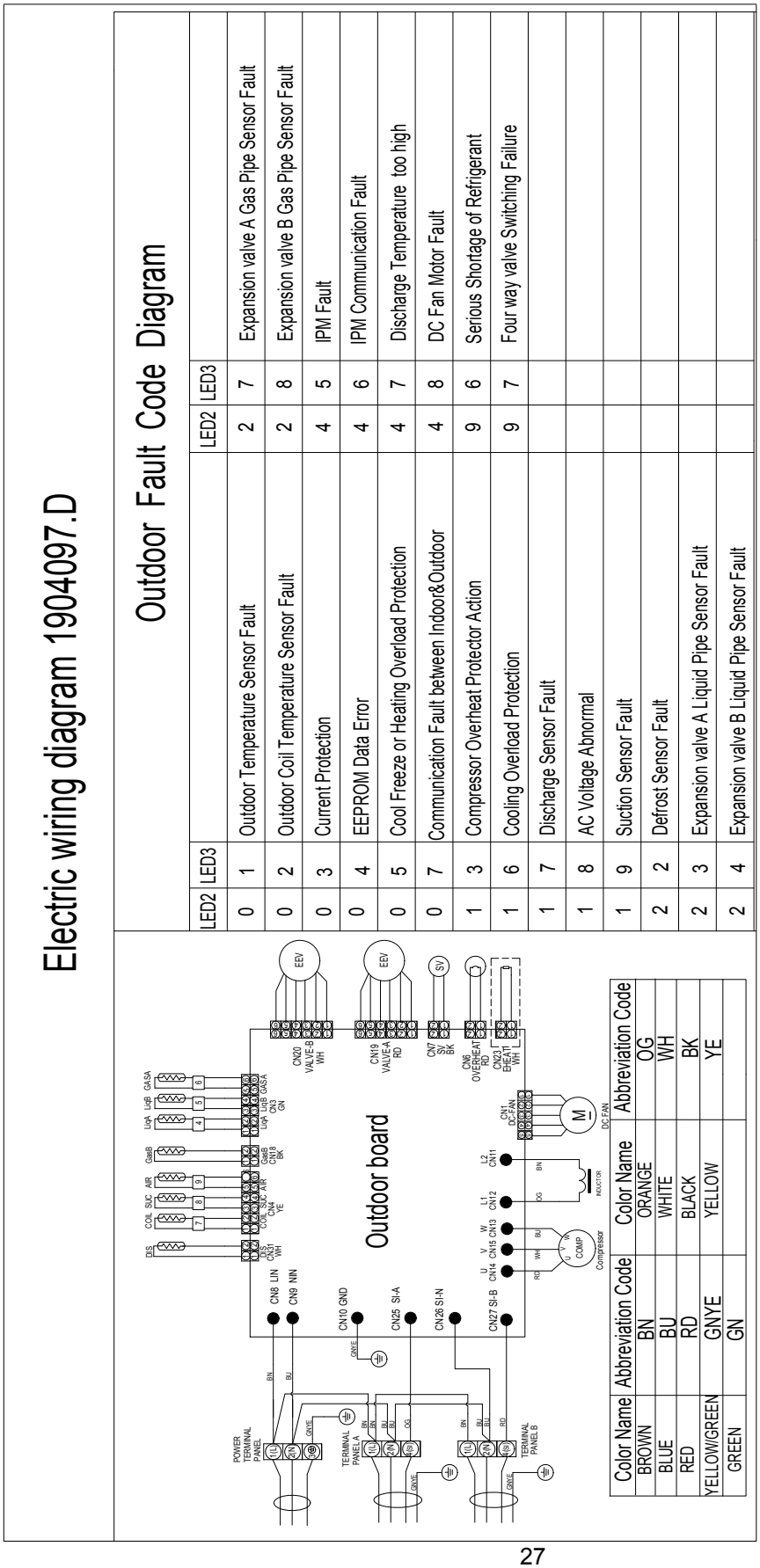
8. Wiring diagram

8.1 Electrical wiring diagram

12K/14K/18K



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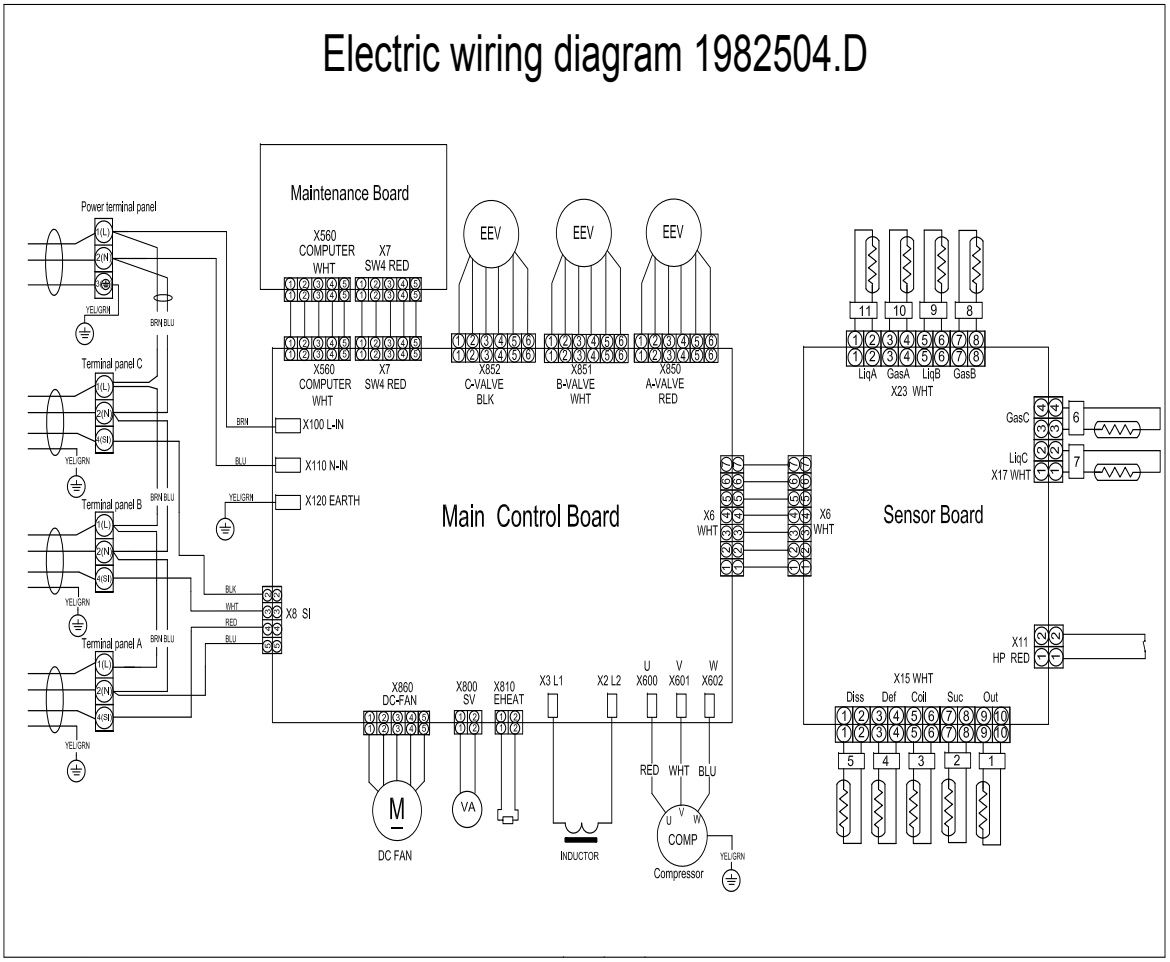
8. WIRING DIAGRAM

21K/AMW3-24U4RFA



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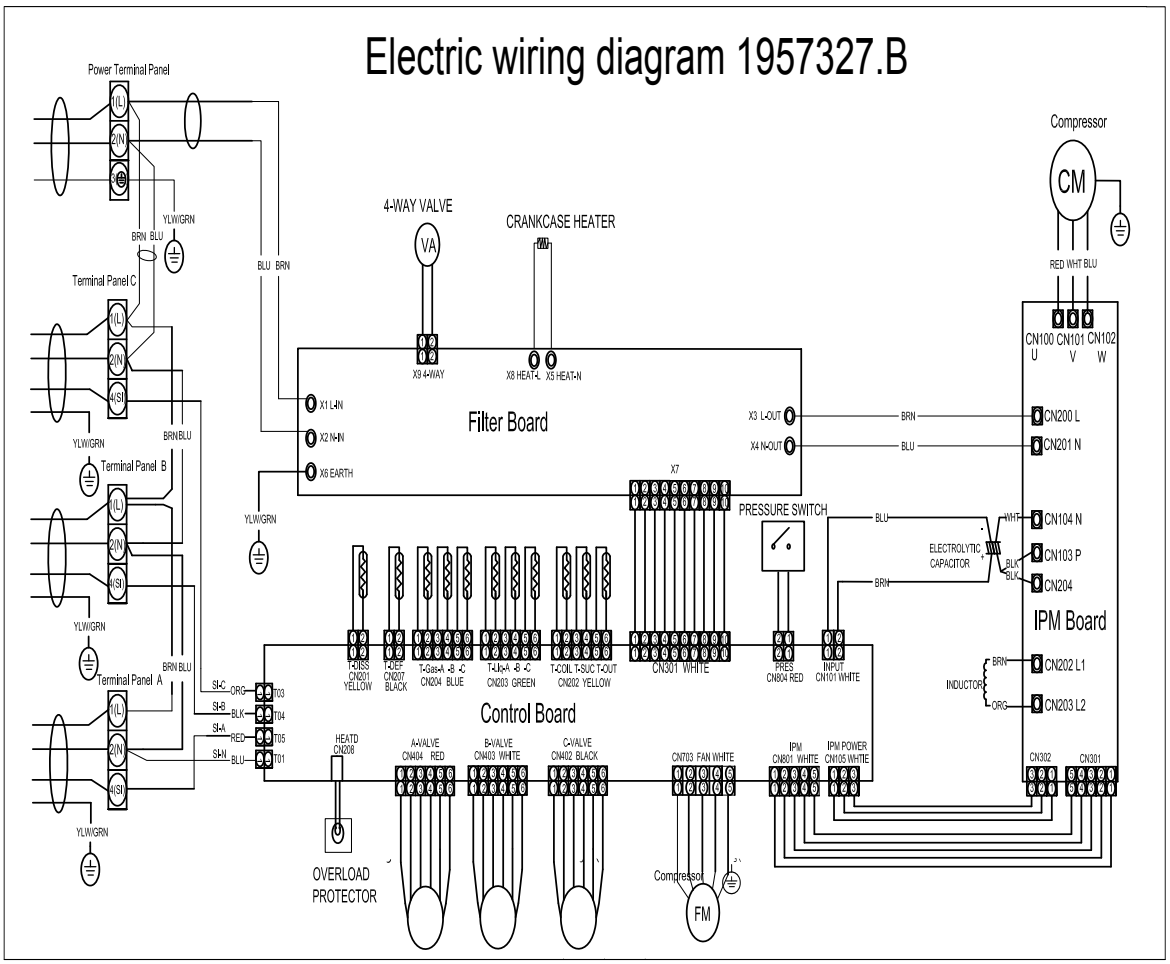
8. WIRING DIAGRAM

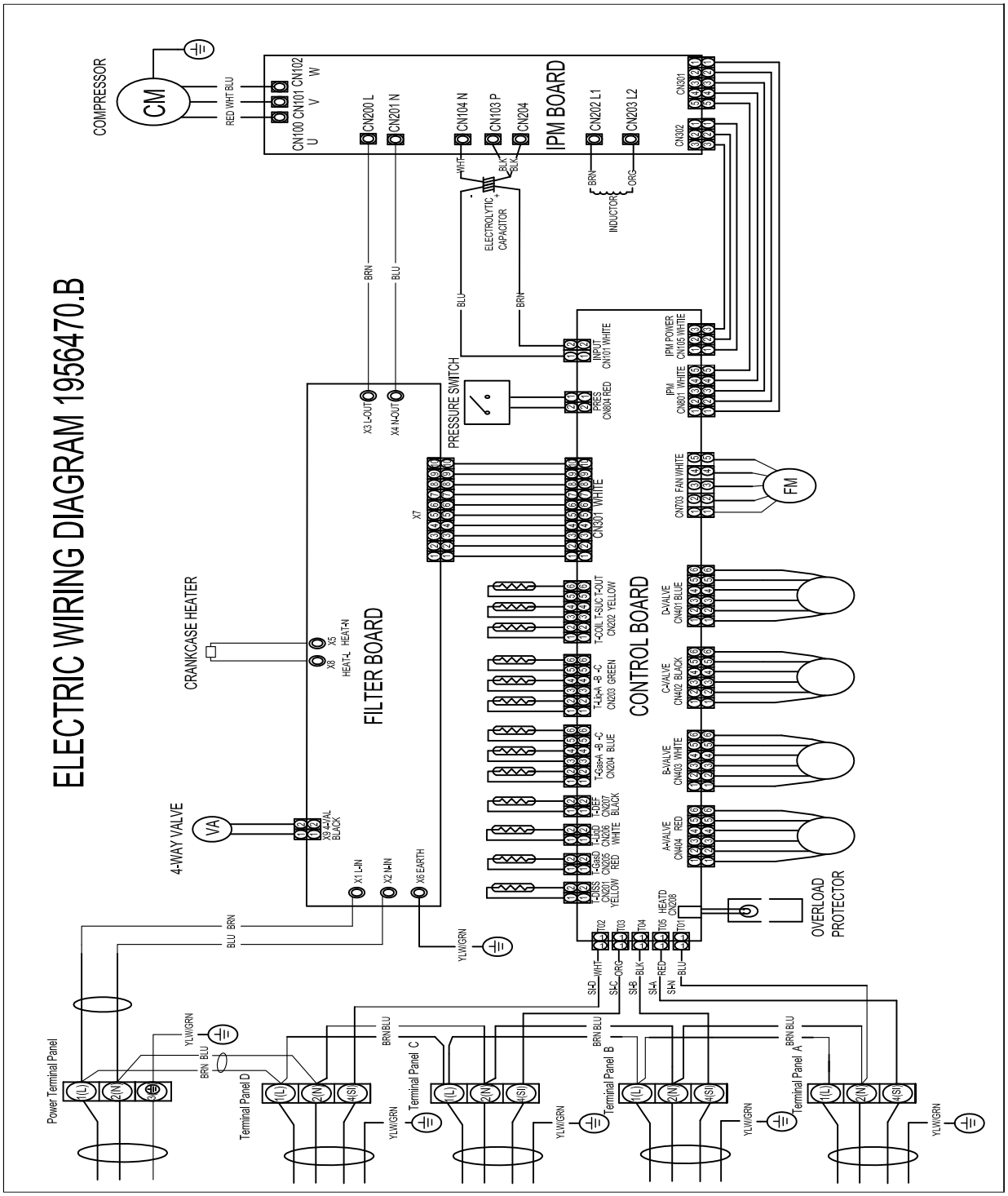
AMW3-24U4RAA



CIRELIUS

8. WIRING DIAGRAM

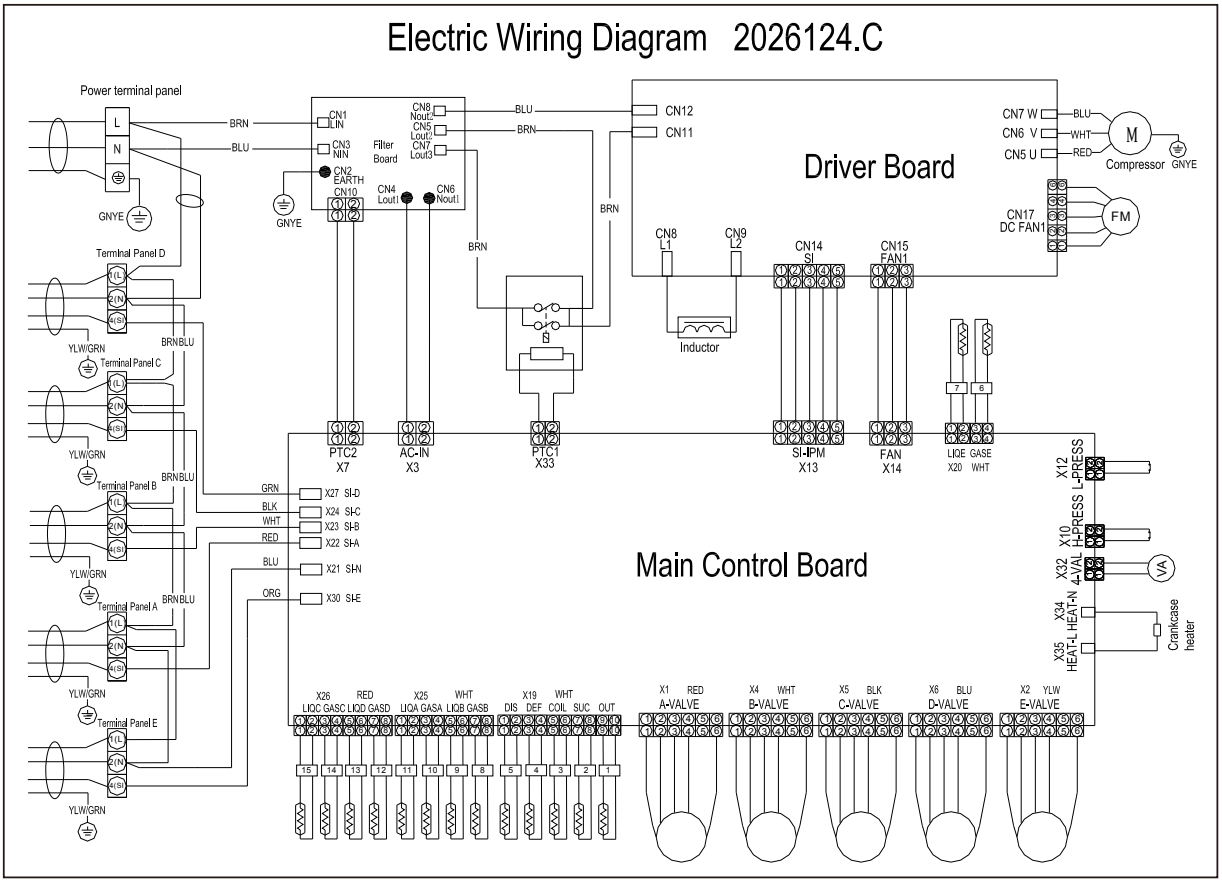
27K/36K



CIRELIUS

8. WIRING DIAGRAM

42K

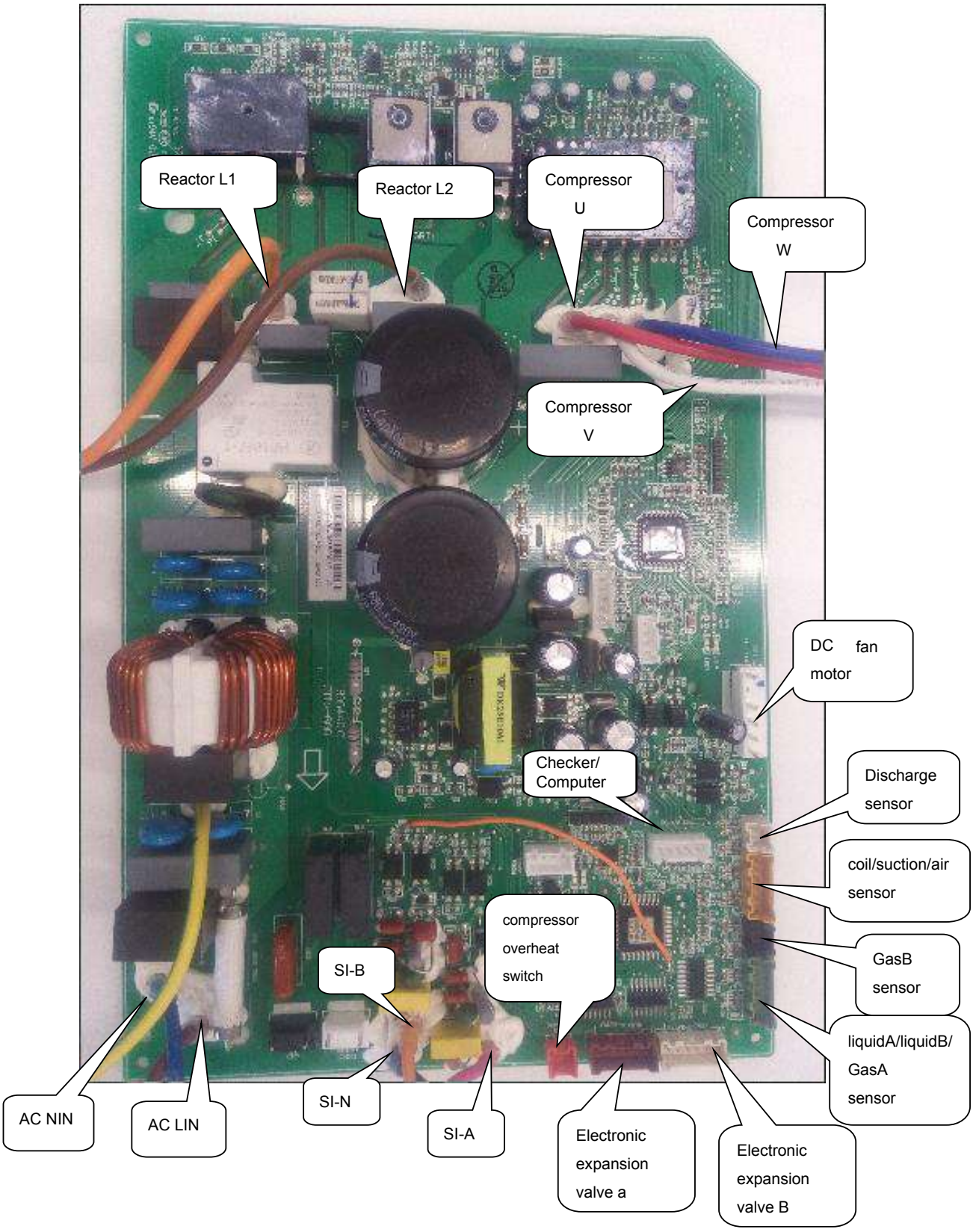


CIRELIUS

8. WIRING DIAGRAM

8.2 Control board picture

12K/14K/18K

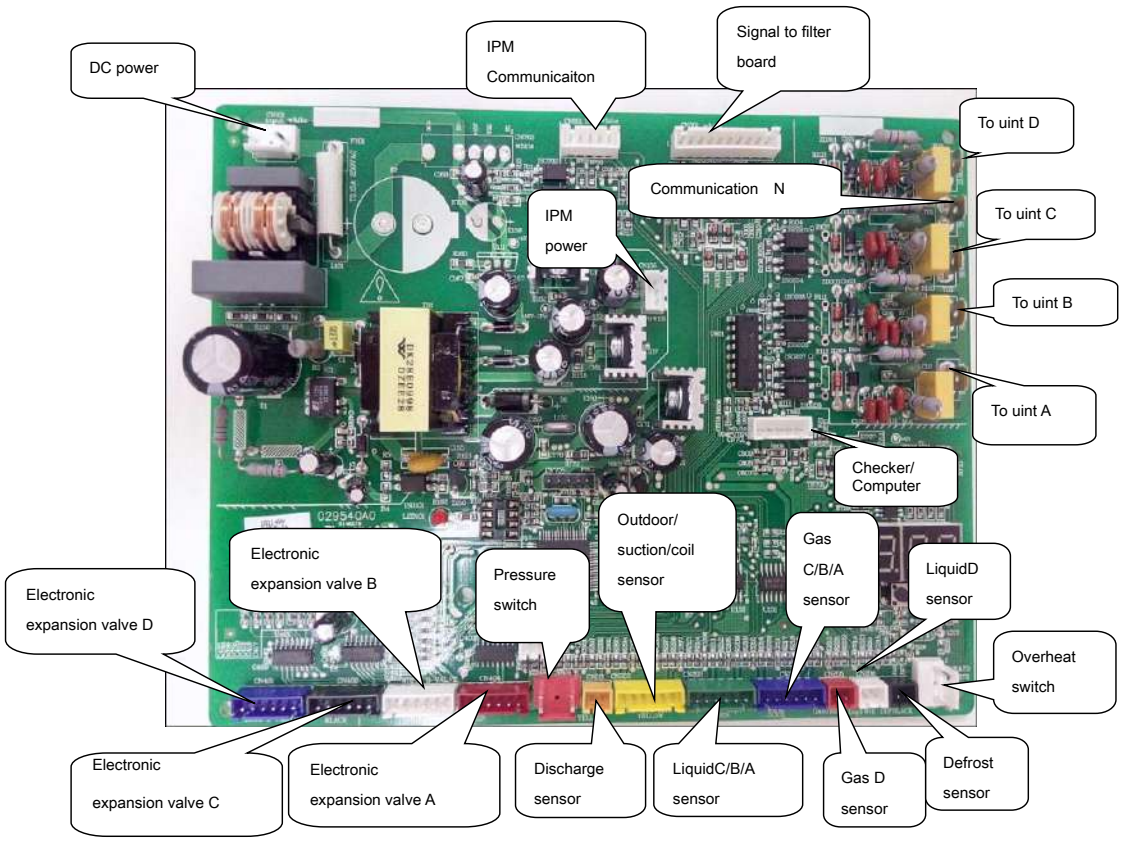


CIRELIUS

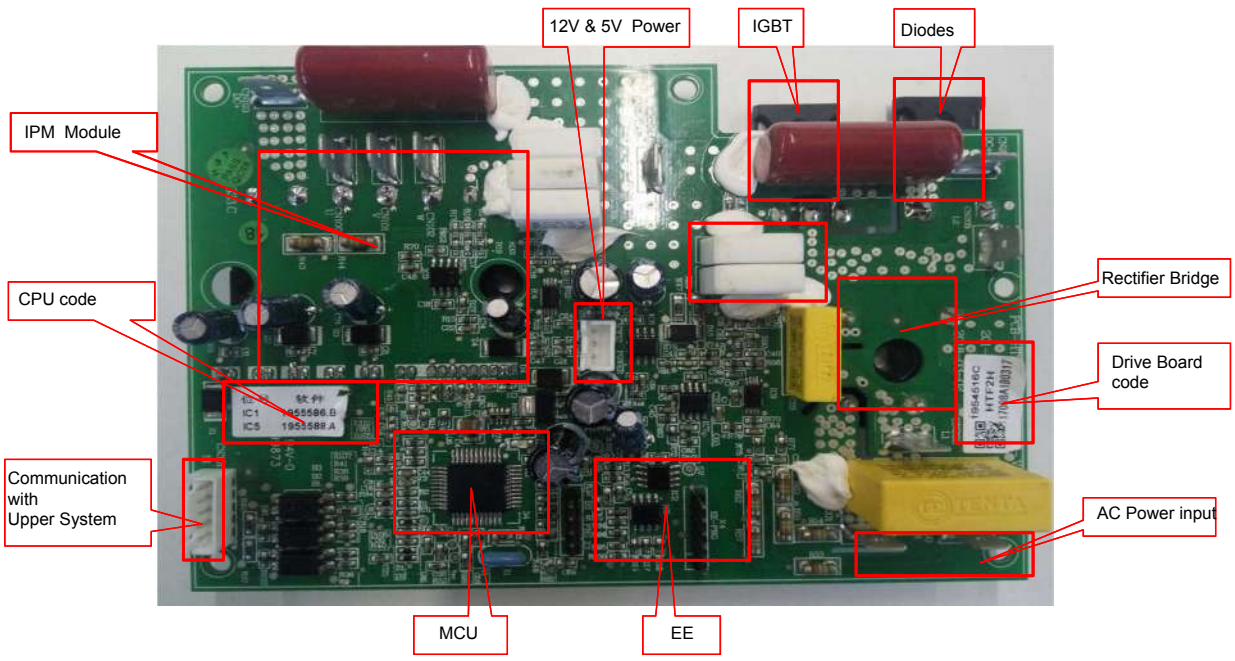
8. WIRING DIAGRAM

AMW3-24U4RAA /27K/36K

Main control board



Drive board



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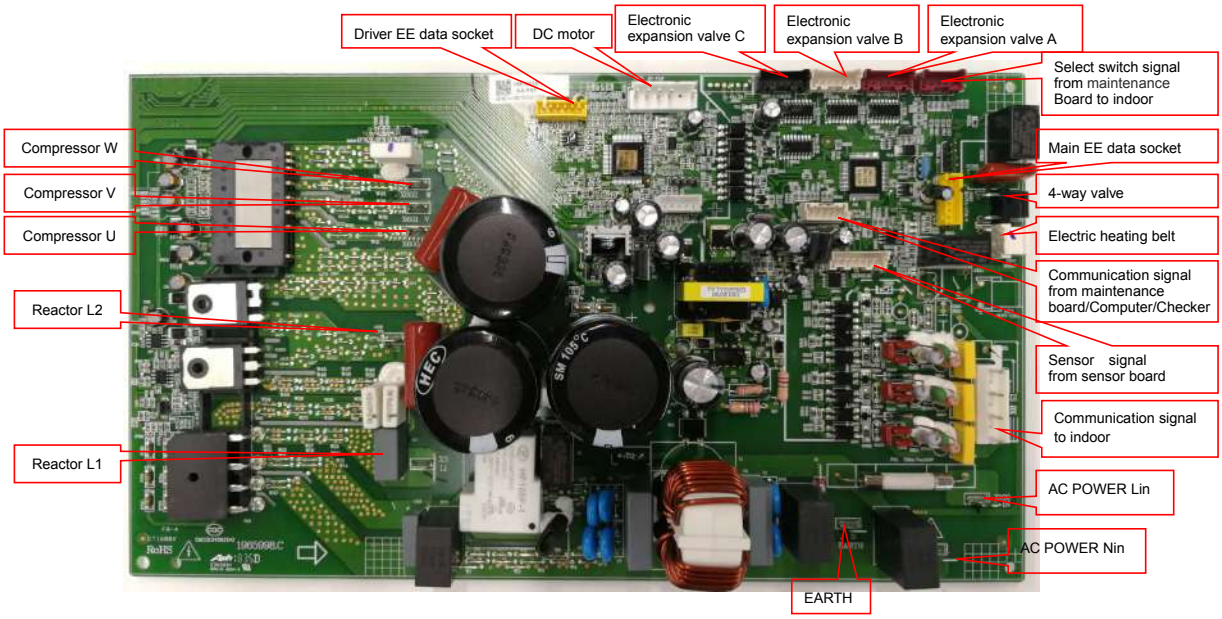
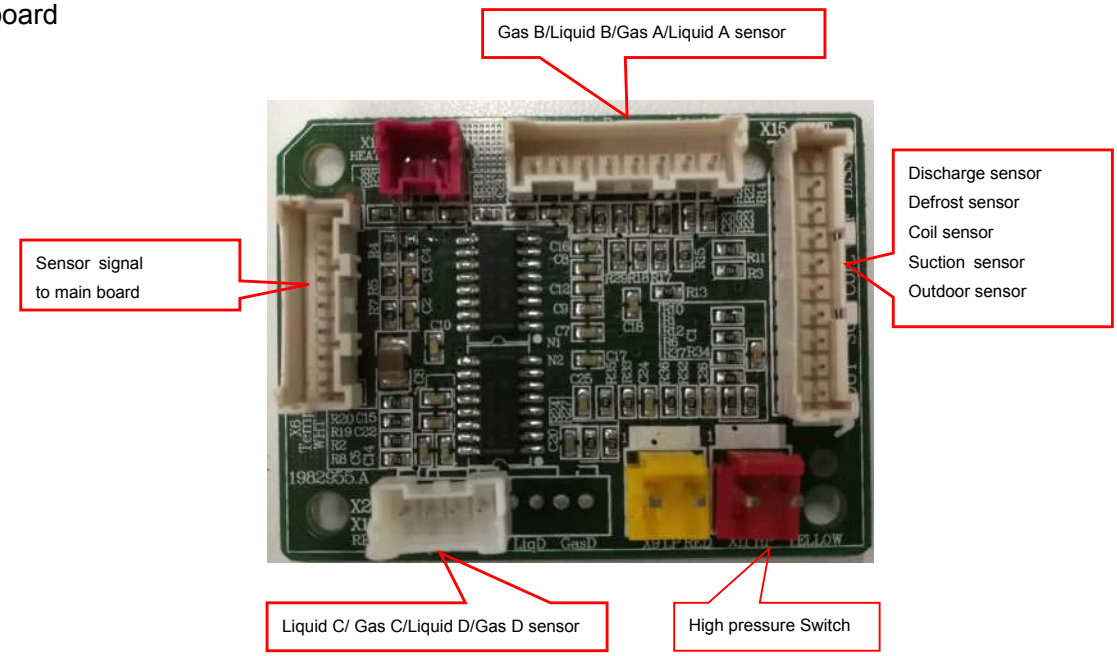
8. WIRING DIAGRAM

21K/AMW3-24U4RFA

Main control board



Sensor board



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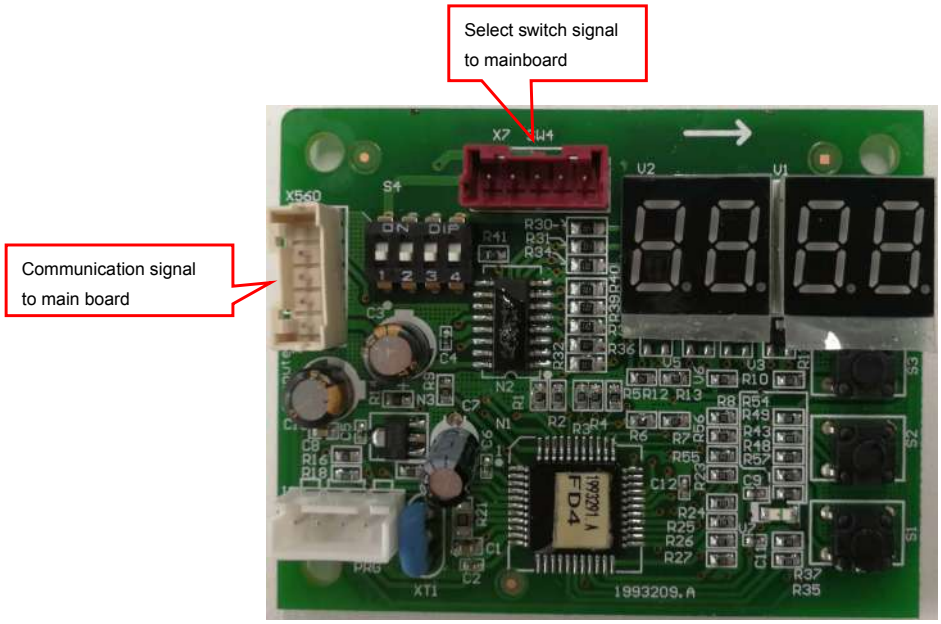
8. WIRING DIAGRAM

Maintenance board



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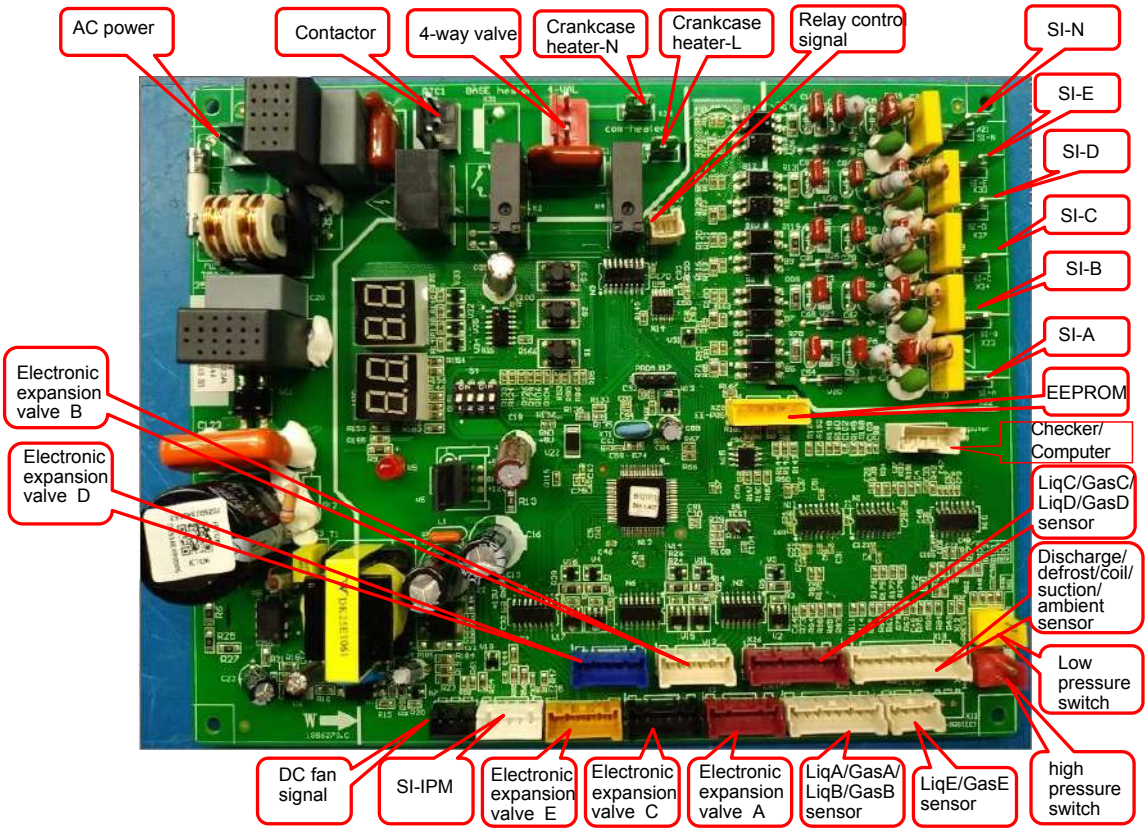
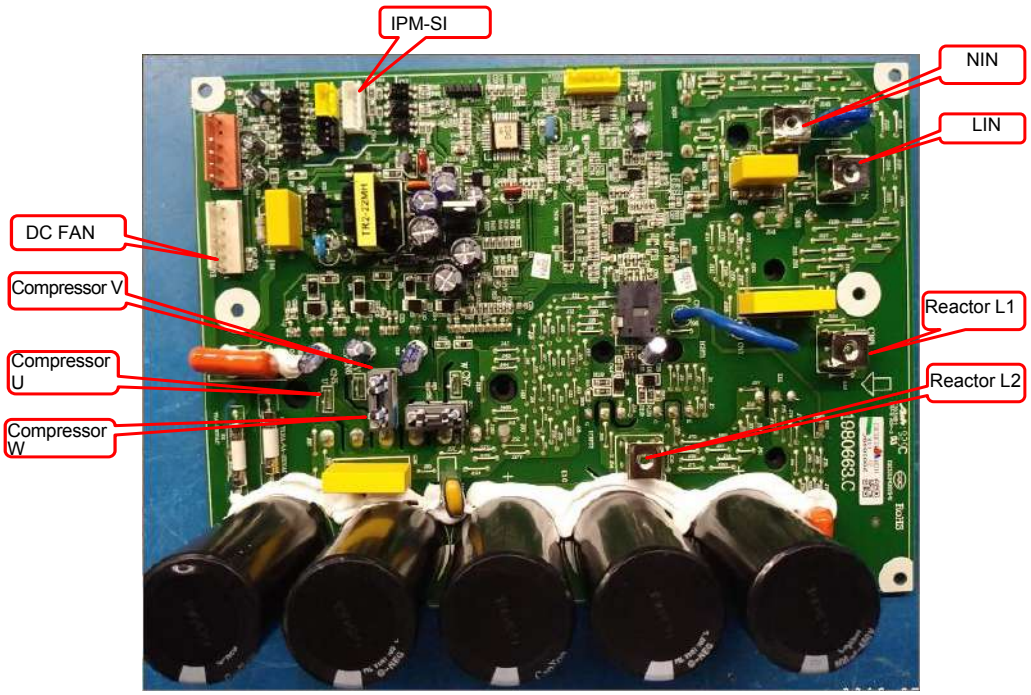
8. WIRING DIAGRAM

42K

Main control board



Drive board



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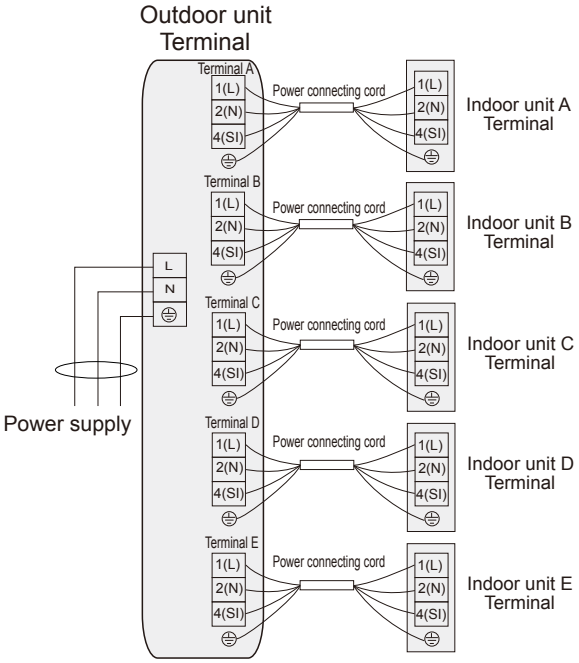
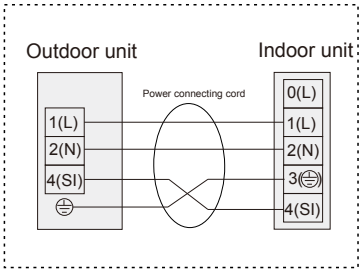
8.3 Common wiring

Electrical wiring diagram



Note: For some indoor units



NOTES:

1. For 12K/14K/18K models, there is no INDOOR UN C, D and E.
2. For 21K/24K models, there is no INDOOR UN D and E.
3. For 36K model, there is no INDOOR UN E.

Recommend Wire Size

Model Capacity	Power Supply	ELB		Power Source Cable Size	Transmitting Cable Size	Circuit Breaker(A)
		Nominal Current (A)	Nominal Sensitive Current (mA)	EN60335-1	EN60335-1	
12K/14K/18K	220-240V ~, 50Hz	25	30	3×1.5mm²	4×1.5mm²	25
21K/24K/ 27K/36K	220-240V ~, 50Hz	32	30	3×2.5mm²	4×1.5mm²	32
42K	220-240V~, 50Hz	63	30	3×6.0mm²	4×1.5mm²	63

Max. Running Current (A): REFER TO NAMEPLATE

- Use an ELB (Electric Leakage Breaker).
- Do not operate the system until all the check points have been cleared.

(A) Check to ensure that the insulation resistance is more than 2 Mega Ohm,by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.

(B) Check to ensure that the stop valves of the outdoor unit are fully opened and then start the system.

8. WIRING DIAGRAM

● Pay attention to the following items while the system is running.

Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 90℃.

Note：

(1) Follow local codes and regulations when select field wires, and all the aboveare the minimum wire size.

(2) Use the wires which are not lighter than the ordinary polychloroprene sheathed flexible cord. (Cord designation H07RN-F).

(3) The wire sizes marked with *1 in the above table are selected at the maximum current of the unit according to the European Standard,EN60335-1.

(4) When transmitting cable length is more than 15 meters, a larger wire size should be selected.

(5) Install main switch and ELB for each system separately. Select the high response type ELB that is acted within 0.1second. Recommended capacity to see outdoor machine switch capacity.

(6) In the case that power cables are connected in series, add each unit maximum current and select wires below.

Selection According to EN60335-1

Current i (A)	Wire Size (mm^2)
i≤6	0. 75
6<i≤10	1
10<i≤16	1. 5
16<i≤25	2. 5
25<i≤32	4
32<i≤40	6
40<i≤63	10
63<i	*

* in the case that current exceeds 63A, do not connect cables in series.

9. Field Setting

9.1 DIP Setting

21K/AMW3-24U4RFA/42K

Dip Switch Setting of Outdoor Unit

Mark of "■" indicates the position of dip switches.
Switch is valid when is ON.

Dip switch S4

Factory Setting	
Refrigerant Collection	
Manual Defrost	

Refrigerant collection function

By default setting is OFF.

OFF ----normal mode

ON----refrigerant collection mode

When the power is ON, the dial changed from OFF to ON, enters into refrigerant collection mode. During refrigerant recovery mode, system low pressure protect will not occurs, and compressor will stops after 5 minutes, and will turn to normal state when power on again.

Manual defrost function

By default setting is OFF.

OFF ----normal mode

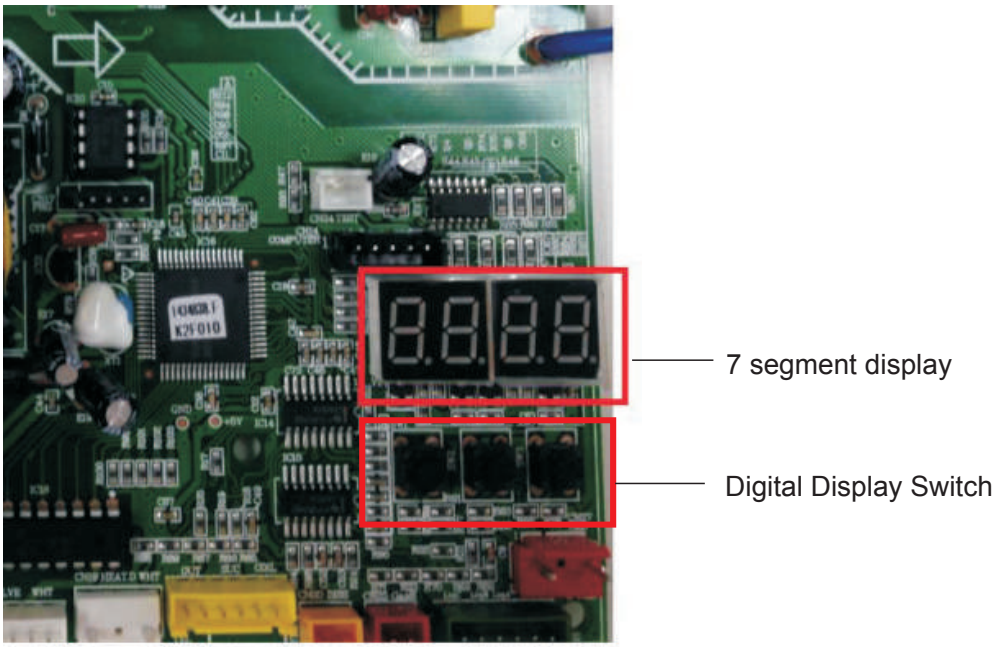
ON----defrost mode

When the dial changed from OFF to ON in heating mode, enters into defrost mode, and only valid once.

9.2 Running Parameter Query

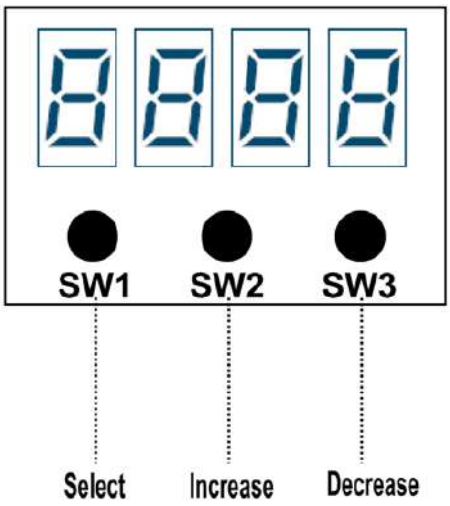
AMW3-24U4RAA/27K/36K

Outdoor Running parameters can be checked by 7 segment display.



Outdoor control board

For AMW3-24U4RAA /27K/36K:



There are 3 buttons on the digital display board：
1) Select button: Select the corresponding parameters of the serial number when it is pressed
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.
Hold down SW1 and SW2 simultaneously, the number will rise, and the parameter will be displayed when released.
Hold down SW1 and SW3 simultaneously, the number will decrease, and the parameter will be displayed when released.

9. FIELD SETTING

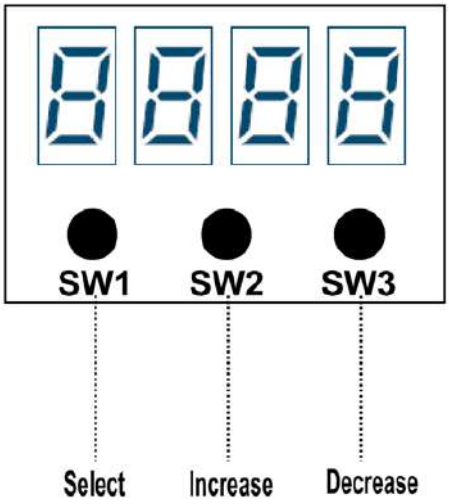
Parameters can be checked as following table below.

Note：
(1) ●:Valid； ○: Invalid.
(2) The right is therefore reserved to EE changing without notice.

Parameter code	Descriptions	Dual	Trio	Quattro	Note
0	Display limit frequency or frequency reduction when Compressor running; Display error code when stops.	●	●	●	
1	Compressor Frequency	●	●	●	
2	Current：actual value＝display value /10	●	●	●	
3	AC Input Voltage	●	●	●	
4	EEV set Opening (A)	●	●	●	
5	EEV set Opening(B)	○	●	●	
6	EEV set Opening(C)	○	●	●	
7	EEV set Opening(D)	○	○	●	
16	Indoor A set fan speed	●	●	●	
17	Indoor B set fan speed	●	●	●	
18	Indoor C set fan speed	○	●	●	
19	Indoor D set fan speed	○	○	●	
24	IPM error code 1	●	●	●	
25	IPM error code 2	●	○	○	
26	IPM error code 3	●	○	○	
27	IPM error code 4	●	○	○	
40	Discharge temperature	●	●	●	
41	Outdoor ambient temperature	●	●	●	
42	Suction temperature	●	●	●	
43	Outdoor coil temperature	●	●	●	
44	Indoor Unit A liquid pipe temperature	●	●	●	
45	Indoor Unit B liquid pipe temperature	●	●	●	
46	Indoor Unit C liquid pipe temperature	○	●	●	
47	Indoor Unit D liquid pipe temperature	○	○	●	
48	Indoor Unit A gas pipe temperature	●	●	●	
49	Indoor Unit B gas pipe temperature	●	●	●	
50	Indoor Unit C gas pipe temperature	○	●	●	
51	Indoor Unit D gas pipe temperature	○	○	●	
52	Defrosting temperature	○	●	●	
53	Room A ambient temperature	●	●	●	
54	Room B ambient temperature	●	●	●	
55	Room C ambient temperature	○	●	●	
56	Room D ambient temperature	○	○	●	
57	Room A coil temperature	●	●	●	
58	Room B coil temperature	●	●	●	
59	Room C coil temperature	○	●	●	
60	Room D coil temperature	○	○	●	
61	Room A set temperature	●	●	●	
62	Room B set temperature	●	●	●	
63	Room C set temperature	○	●	●	
64	Room D set temperature	○	○	●	
255	Target frequency	●	●	●	1Valid

9. FIELD SETTING

For 21K/AMW3-24U4RFA/42K



There are 3 buttons on the digital display board：

1) Select button: Select to display outdoor/indoor unit parameter.
"P." -- Parameter of outdoor unit
"A." -- Parameter of indoor unit A
"b." -- Parameter of indoor unit B
"C."-- Parameter of indoor unit C
"d."-- Parameter of indoor unit D
"E."-- Parameter of indoor unit E

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 automatically displayed after the parameter code is selected for 3s.

Parameters can be checked as following table below.

Note：

(1) ●:Valid； ○: Invalid.

(2) The right is therefore reserved to EE changing without notice.

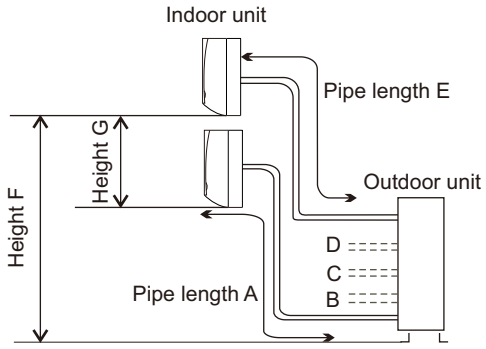
Parameter Code	Descriptions	Dual	Trio	Quattro	1 by 5
P.0	Fault codes	●	●	●	●
P.1	Compressor actual frequency	●	●	●	●
P.2	Compressor driving frequency	●	●	●	●
P.4	Compressor target frequency	●	●	●	●
P.5	Compressor exhaust temperature	●	●	●	●
P.6	Outdoor suction Temperature	●	●	●	●
P.7	Outdoor ambient temperature	●	●	●	●
P.8	Outdoor coil temperature	●	●	●	●
P.9	Outdoor defrosting temperature	●	●	●	●
P.10	IPM module temperature	●	●	●	●
P.11	Outdoor capacity requirement	●	●	●	●
P.12	IPM fault codes	●	●	●	●
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 overheaingt	●	●	●	●
P.22	Actual suction overheating (heating)	●	●	●	●
P.23	Actual exhaust overheating (heating)	●	●	●	●

9. FIELD SETTING

Parameter Code	Descriptions	Dual	Trio	Quattro	1 by 5
A.1	Unit A fault codes	●	●	●	●
A.2	Unit A valve actual opening	●	●	●	●
A.4	Unit A liquid pipe temperature	●	●	●	●
A.5	Unit A gas pipe temperature	●	●	●	●
A.6	Unit A coil temperature	●	●	●	●
A.7	Unit A ambient temperature	●	●	●	●
A.8	Unit A set temperature	●	●	●	●
A.9	Unit A capacity	●	●	●	●
A.10	Unit A set fan speed	●	●	●	●
A.11	Unit A actual suction overheating (cooling)	●	●	●	●
B.1	Unit B fault codes	●	●	●	●
B.2	Unit B valve actual opening	●	●	●	●
B.4	Unit B liquid pipe temperature	●	●	●	●
B.5	Unit B gas pipe temperature	●	●	●	●
B.6	Unit B coil temperature	●	●	●	●
B.7	Unit B ambient temperature	●	●	●	●
B.8	Unit B set temperature	●	●	●	●
B.9	Unit B capacity	●	●	●	●
B.10	Unit B set fan speed	●	●	●	●
B.11	Unit B actual suction overheating (cooling)	●	●	●	●
C.1	Unit C fault codes	○	●	●	●
C.2	Unit C valve actual opening	○	●	●	●
C.4	Unit C liquid pipe temperature	○	●	●	●
C.5	Unit C gas pipe temperature	○	●	●	●
C.6	Unit C coil temperature	○	●	●	●
C.7	Unit C ambient temperature	○	●	●	●
C.8	Unit C set temperature	○	●	●	●
C.9	Unit C capacity	○	●	●	●
C.10	Unit C set fan speed	○	●	●	●
C.11	Unit C actual suction overheating (cooling)	○	●	●	●
D.1	Unit D fault codes	○	○	●	●
D.2	Unit D valve actual opening	○	○	●	●
D.4	Unit D liquid pipe temperature	○	○	●	●
D.5	Unit D gas pipe temperature	○	○	●	●
D.6	Unit D coil temperature	○	○	●	●
D.7	Unit D ambient temperature	○	○	●	●
D.8	Unit D set temperature	○	○	●	●
D.9	Unit D capacity	○	○	●	●
D.10	Unit D set fan speed	○	○	●	●
D.11	Unit D actual suction overheating (cooling)	○	○	●	●
E.1	Unit E fault codes	○	○	○	●
E.2	Unit E valve actual opening	○	○	○	●
E.4	Unit E liquid pipe temperature	○	○	○	●
E.5	Unit E gas pipe temperature	○	○	○	●
E.6	Unit E coil temperature	○	○	○	●
E.7	Unit E ambient temperature	○	○	○	●
E.8	Unit E set temperature	○	○	○	●
E.9	Unit E capacity	○	○	○	●
E.10	Unit E set fan speed	○	○	○	●
E.11	Unit E actual suction overheating (cooling)	○	○	○	●

10. Piping work and refrigerant charge

10.1 Max. pipe length allowed



Item \ Model		12K/14K/18K	21K/24K	27K/36K	42K
Piping to each indoor unit (A/B/C/D/E)	m	≤15	≤20	≤20	≤20
Total length of piping between all units	m	A+B≤30	A+B+C≤45	A+B+C+D≤60	A+B+C+D+E≤80
Max Height Between Indoor Unit and Outdoor Unit (F)	m	⩽15			
Max Height Between Indoor Units (G)	m	⩽7.5			

Additional refrigerant charge

The unit has been filled with refrigerant, but if L (total pipe length) exceeds 15m(12K/14K/18K/21K/24K) /20m (27K/36K) /25m(42K), additional charge with refrigerant (R32) is necessary.

For 12K/14K/18K/21K/24K

Additional refrigerant charge =(L-15)×12g/m

For 27K/36K

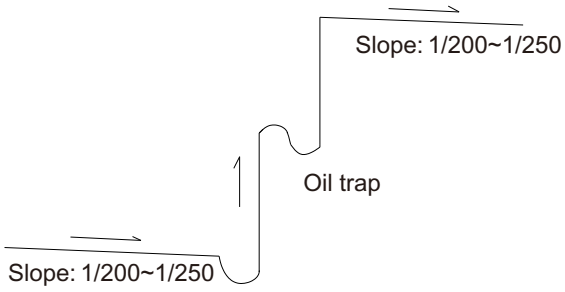
Additional refrigerant charge =(L-20)×12g/m

For 42K

Additional refrigerant charge =(L-25)×12g/m

10.2 Oil trap

When the indoor unit is lower than outdoor unit and height is larger than 5m, set an oil trap every 5m (height difference) on suction piping.



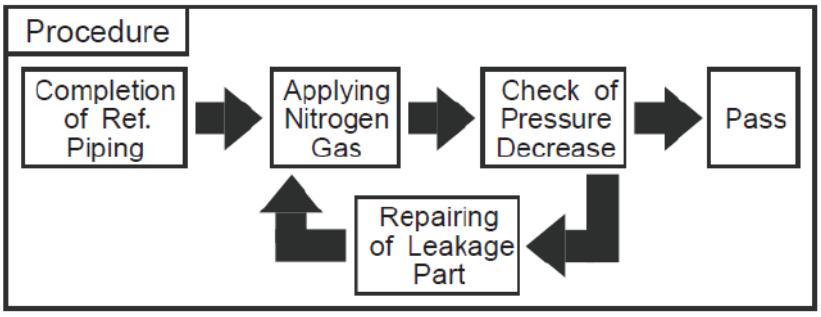
NOTE:

1) To avoid storing too much oil in the oil trap, the oil trap should be as short as possible.
2) The horizontal piping should be slope down along the refrigerant flow direction, to bring the oil back to compressor, the slope is about 1/200 to1/250.
3) In order to ensure cooling/h ting performance better, the refrigerant piping should be as short and straight as possible.

10.3 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 4.15MPa.Check for any gas leakage at the flare nut connections, or brazed parts by gas leak detector or foaming agent. Gas pressure does not decrease is OK. After the air tight test, release nitrogen gas.



Air tight procedure

10.4 Additional refrigerant charge

Although refrigerant has been charged into this unit, additional refrigerant charge is required according to 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 (kg))

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(W0(g))	Total refrigerant pipe length	
		0-15m	over 15m
12K/14K	950	0g	Xg = 12g / m × (Total pipe length(m) -15)
18K	1070	0g	
21K/AMW3-24U4RFA	1450	0g	
AMW3-24U4RAA	1800	0g	

Model	Refrigerant precharged before shipment(W0(g))	Total refrigerant pipe length	
		0-20m	over 20m
27K	2200g	0g	Xg = 12g / m × (Total pipe length(m) -20)
36K	2200g	0g	

Model	Refrigerant precharged before shipment (W0(g))	Total refrigerant pipe length	
		0-25m	over 25m
42K	3000g	0g	Xg = 12g / m × (Total pipe length(m) -25)

11. Installation tools and installation flow chart

11.1 Necessary tools and instrument list for installation

No.	Tool	No.	Tool	No.	Tool	No.	Tool
1	Handsaw	6	Copper Pipe Bender	11	Spanner	16	Leveler
2	Phillips Screwdriver	7	Manual Water Pump	12	Charging Cylinder	17	Clamper for Solder-less Terminals
3	Vacuum Pump	8	Pipe Cutter	13	Gauge Manifold	18	Hoist (for Indoor Unit)
4	Refrigerant Gas Hose	9	Brazing Kit	14	Cutter for Wires	19	Ammeter
5	Megohmmeter	10	Hexagon Wrench	15	Gas Leak Detector	20	Voltage Meter

Use tools and measuring instruments only for the new refrigerant which is directly touch to refrigerant.

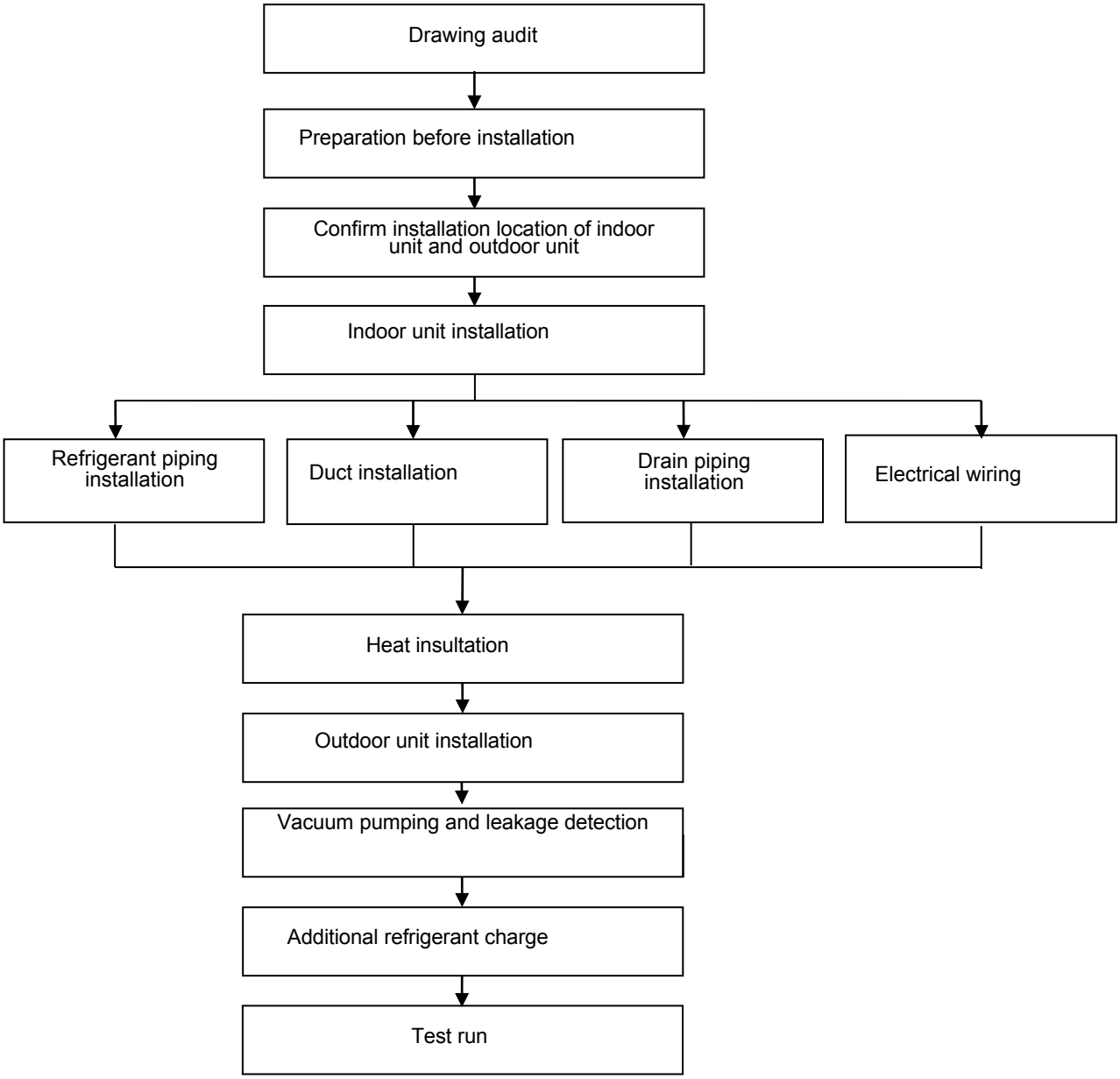
✧: Interchangeability is available with R410A ●: Only for Refrigerant R32

×: Prohibited ✦: Only for Refrigerant R22

Measuring Instrument and Tool for R410A		R32	R22	Reason of Non-Interchangeability and Attention (*: Strictly Required)	Use
Refrigerant Pipe	Pipe Cutter Chamfering Reamer	✧	✧	-	Cutting Pipe Removing Burrs
	Flaring Tool	✧	✧	* The flaring tools for R32 are applicable to R22/R410A. * If using flaring tube, make dimension of tube larger for R410A. * In case of material 1/2H, flaring is not available.	Flaring for Tubes
	Pipe Bender	✧	✧	* In cas of material 1/2H, bending is not available. Use elbow for bend and braze.	Bending
	Expanding Tool	✧	✧	* In cas of material 1/2H, expanding of tube is not available. Use socket for connecting tube.	Expanding Tubes
	Torque Wrench	✧	××	* or ϕ1/2, ϕ5/8, spanner size is up 2mm.	Connection of Flare Nut
		✧	✧	* Fo ϕ1/4, ϕ3/8, ϕ3/4, spanner size is the same.	
	Brazing Tool	✧	✧	* Perform correct brazing work.	Brazing for Tubes
	Nitrogen Gas	✧	✧	* Strict Control against Contamin (Blow nitrogen during brazing.)	Prevention from Oxidation during Brazing
	Lubrication Oil (for Flare Surface)	●	✦	* Use a synthetic oil which is equivalent to the oil used in the refrigeration cycle. * Synthetic oil absorbs moisture quickly.	Applying Oil to the Flared Surface
Vacuum Drying& Refrigerant Charge	Refrigerant Cylinder	×	×	* C eck refrigerant cylinder color. * Liquid refrigerant charging is required regarding zeotoropic refrigerant. * Use the weight scale.	Refrigerant Charging
	Vacuum Pump	✧	✧	* The current ones are applicable. However, it is required to mount a vacuum pump adapter which can prevent from reverse flow when a vacuum pump stops, resulting in no reverse oil flow.	Vacuum Pumping
	Adapter for Vacuum Pump	✧	✦		
	Manifold Valve	✧	✦	* No interchangeability is available due to higher pressures when compared with R22. * Do not use current ones to the different refrigerant. If used, mineral oil will flow into the cycle and cause sludges, resulting in clogging or compressor failure. * Connection diameter is different; R32/R410A: UNF1/2, R22: UNF7/16.	Vacuum Pumping, Vacuum Holding, Refrigerant Charging and Check of Pressures
	Charging Hose	✧	×		
	Weight Scale	✧	✧		Measuring Instrument for Refrigerant Charging
	Refrigerant Gas Leakage Detector	×	×	* Th current gas leakage detector (R22) is not applicable due to different detecting method.	Gas Leakage Check

11. INSTALLATION TOOLS AND INSTALLATION FLOW CHART

11.2 Installation flow chart



Note: this flow is only for reference; detailed see installation manual section.

12. Control mode

1) Cooling Anti-freeze Protection

To prevent freezing caused by too low temperature of indoor evaporator, the air conditioner will implement real-time detection over the indoor coil temperature. If the indoor coil temperature is too low, the compressor will be prohibited from increasing the frequency or decrease the frequency even shut down automatically

2) Heating Overload Protection

To prevent system overload caused by excessive pressure in heating operation, the machine will implement real-time detection over the indoor fan-coil temperature:

If the indoor coil temperature grows higher, the compressor will be prohibited from increasing the frequency; If the temperature continues to rise, the compressor will decrease the frequency; If the indoor coil temperature is too high, the compressor will stop working immediately. The compressor then will reboot after the indoor coil temperature reduces.

3) Cooling Overload Protection

To prevent system overload due to excessive pressure during cooling operation, the machine will implement real-time detection over the outdoor condenser coil temperature: If the outdoor coil temperature grows higher, the compressor will be prohibited from increasing the frequency; If the temperature continues to rise, the compressor will decrease the frequency; If the outdoor fan-coil temperature is too high, then the compressor will stop working immediately. The compressor will reboot after the outdoor coil temperature reduces.

4) Discharge Temperature Protection

To prevent working conditions of compressor from deteriorating due to high discharge temperature, the machine will implement real-time detection over the discharge temperature.

If the discharge temperature grows higher, the compressor will be prohibited from increasing the frequency; if the temperature continues to rise, the compressor will decrease the frequency automatically; if the discharge temperature is too high, the compressor will stop working immediately. The compressor will then reboot when the discharge temperature returns to normal condition.

5) Oil-return Control

When the compressor continues to operate at low frequency, there will be an oil return. The compressor increases the frequency, and thus to return the oil in refrigerate system to the compressor.

6) Operation Mode

a. Mode Categori

Air conditioning mode is the operation mode set by users through remote controller, four modes are available: cooling, heating, dehumidification, as well as fan mode.

b. Mode conflict

The operating mode of outdoor unit is decided by the operating mode of the indoor unit firstly booted. Indoor unit subsequently booted will firstly determine whether it's own mode is conflict with the outdoor mode. If so, the indoor unit will automatically shut down after three beeps; If there is no conflict, the indoor unit will boot normally. The relationship of mode conflict is as follows:

Driven choice / Active mode	Cooling	Dehumidification	Heating	fan
Cooling	√	√	×	√
Dehumidification	√	√	×	√
Heating	×	×	√	×
Fan	√	√	×	√

√———Mode conflict will not happen

×———Mode conflict will happen

7) Outdoor four-way Valve Control

Four-way valve of the outdoor machine shuts down when cooling but starts when heating. The operation of heating defrosting refers to defrosting operation and, when the heating remote shutdown, the four-way valve disconnects in 50s when the compressor stops working.

8) Start-up Protection

To prevent compressor from restart frequently in the condition that system pressure has not been completely balanced, it can't be restarted within 3 minutes.

9) Pressure Protection

Pressure switch is normally kept open. When the pressure grows too high, the pressure switch will close and soft will enter pressure protection control. soft will automatically decrease the frequency. If the pressure is still unable to return to normal condition after decreasing frequency, compressor will stop and report the fault code of pressure protection.

13. Sensor parameter

1. THE PARAMETER OF OUTDOOR COMPRESSOR DISCHARGE TEMPERATURE SENSOR:

（R_0=187.25K±6.3%；R_{100}=3.77K±2.5K；B0/100=3979K±1%）

T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
-30	908.2603	985.5274	1065.1210	-7.84	7.47
-29	855.3955	927.6043	1001.9150	-7.78	7.42
-28	805.9244	873.4324	924.8368	-7.73	5.56
-27	759.6097	822.7471	887.5944	-7.67	7.31
-26	716.2320	775.3041	835.9165	-7.62	7.25
-25	675.5881	730.8775	787.5529	-7.56	7.20
-24	637.4902	689.2583	742.2720	-7.51	7.14
-23	601.7645	650.2533	699.8601	-7.46	7.09
-22	568.2499	613.6835	660.1191	-7.40	7.03
-21	536.7970	579.3832	622.8658	-7.35	6.98
-20	507.2676	547.1989	587.9307	-7.30	6.93
-19	497.5332	516.9882	555.1565	-3.76	6.88
-18	453.4748	488.6192	524.3977	-7.19	6.82
-17	428.9819	461.9693	495.5191	-7.14	6.77
-16	405.9517	436.9251	486.3954	-7.09	10.17
-15	384.2888	413.3808	442.9105	-7.04	6.67
-14	363.9047	391.2386	418.9563	-6.99	6.62
-13	344.7169	370.4072	396.4325	-6.94	6.56
-12	326.6497	350.8019	375.2461	-6.88	6.51
-11	309.6286	332.3441	355.3104	-6.83	6.46
-10	293.5903	314.9620	336.5448	-6.79	6.41
-9	278.4719	298.5822	318.3744	-6.74	6.22
-8	264.2156	283.1464	302.2294	-6.69	6.31
-7	250.7678	268.5936	286.5448	-6.64	6.26
-6	238.0783	254.8686	271.7603	-6.59	6.22
-5	226.1003	241.9200	257.8193	-6.54	6.17
-4	214.7903	229.6997	244.6593	-6.49	6.11
-3	204.1073	218.1630	232.2612	-6.44	6.07
-2	194.0135	207.2681	220.5495	-6.39	6.02
-1	184.4732	196.9759	209.4913	-6.35	5.97
0	175.4533	187.2500	199.0468	-6.30	5.93
1	166.8952	178.0255	189.1529	-6.25	5.88
2	158.8023	169.3067	179.8058	-6.20	5.84
3	151.1467	161.0633	170.9724	-6.16	5.80
4	143.9026	153.2667	162.6216	-6.11	5.75
5	137.0455	145.8905	154.7246	-6.06	5.71
6	130.5528	138.9097	147.2544	-6.02	5.67
7	124.4033	132.3011	140.1856	-5.97	5.62
8	118.5769	126.0429	133.4946	-5.92	5.58
9	113.0550	120.1146	127.1591	-5.88	5.54
10	107.8202	114.4973	121.1586	-5.83	5.50
11	102.8560	109.1728	115.4734	-5.79	5.46
12	98.1470	104.1246	110.0855	-5.74	5.41
13	93.6787	99.3367	104.9778	-5.70	5.37
14	89.4378	94.7946	100.1342	-5.65	5.33
15	85.4114	90.4842	95.5398	-5.61	5.29
16	81.5875	86.3926	91.1805	-5.56	5.25
17	77.9551	82.5076	87.0430	-5.52	5.21
18	74.5034	78.8177	83.1150	-5.47	5.17

13. SENSOR PARAMETER

T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
19	71.2227	75.3122	79.3848	-5.43	5.13
20	68.1036	71.9808	75.8414	-5.39	5.09
21	65.1373	68.8141	72.4746	-5.34	5.05
22	62.3155	65.8032	69.2746	-5.30	5.01
23	59.6306	62.9395	66.2324	-5.26	4.97
24	57.0752	60.2152	63.3395	-5.21	4.93
25	54.6424	57.6227	60.5877	-5.17	4.89
26	52.3258	55.1551	57.9695	-5.13	4.85
27	50.1192	52.8058	55.4778	-5.09	4.82
28	48.0168	50.5684	53.1058	-5.05	4.78
29	46.0133	48.4371	50.8472	-5.00	4.74
30	44.1034	46.4046	48.6960	-4.96	4.71
31	42.2825	44.4711	46.6466	-4.92	4.66
32	40.5458	42.6261	44.6937	-4.88	4.63
33	38.8891	40.8668	42.8323	-4.84	4.59
34	37.3084	39.1890	41.0576	-4.80	4.55
35	35.7998	37.5883	39.3653	-4.76	4.51
36	34.3596	36.0609	37.7511	-4.72	4.48
37	32.9844	34.6030	36.2109	-4.68	4.44
38	31.6710	33.2113	34.7412	-4.64	4.40
39	30.4164	31.8823	33.3383	-4.60	4.37
40	29.2176	30.6130	31.9988	-4.56	4.33
41	28.0718	29.4004	30.7197	-4.52	4.29
42	26.9765	28.2417	29.4979	-4.48	4.26
43	25.9293	27.1342	28.3306	-4.44	4.22
44	24.9277	26.0755	27.2150	-4.40	4.19
45	23.9697	25.0632	26.1488	-4.36	4.15
46	23.0530	24.0950	25.1293	-4.32	4.12
47	22.1757	23.1688	24.1545	-4.29	4.08
48	21.3360	22.2826	23.2221	-4.25	4.05
49	20.5321	21.4345	22.3301	-4.21	4.01
50	19.7623	20.6226	21.4766	-4.17	3.98
51	19.0261	19.8468	20.6612	-4.14	3.94
52	18.3211	19.1040	19.8808	-4.10	3.91
53	17.6458	18.3926	19.1338	-4.06	3.87
54	16.9986	17.7113	18.4185	-4.02	3.84
55	16.3784	17.0537	17.7335	-3.96	3.83
56	15.7839	16.4332	17.0774	-3.95	3.77
57	15.2139	15.8338	16.4488	-3.92	3.74
58	14.6673	15.2592	15.8464	-3.88	3.71
59	14.1430	14.7083	15.2690	-3.84	3.67
60	13.6400	14.1799	14.7154	-3.81	3.64
61	13.1573	13.6730	14.1846	-3.77	3.61
62	12.6941	13.1868	13.6756	-3.74	3.57
63	12.2494	12.7202	13.1872	-3.70	3.54
64	11.8224	12.2723	12.7186	-3.67	3.51
65	11.4124	11.8424	12.2690	-3.63	3.48
66	11.0185	11.4295	11.8373	-3.60	3.45
67	10.6401	11.0331	11.4230	-3.56	3.41
68	10.2765	10.6522	11.0251	-3.53	3.38
69	9.9271	10.2863	10.6429	-3.49	3.35
70	9.5912	9.9348	10.2756	-3.46	3.32
71	9.2682	9.5968	9.9231	-3.42	3.29
72	8.9576	9.2720	9.5841	-3.39	3.26
73	8.6589	8.9597	9.2583	-3.36	3.23
74	8.3716	8.6594	8.9451	-3.32	3.19

13. SENSOR PARAMETER

T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
75	8.0951	8.3705	8.6440	-3.29	3.16
76	7.8290	8.0926	8.3544	-3.26	3.13
77	7.5730	7.8252	8.0758	-3.22	3.10
78	7.3264	7.5679	7.8078	-3.19	3.07
79	7.0891	7.3202	7.5499	-3.16	3.04
80	6.8605	7.0818	7.3018	-3.12	3.01
81	6.6403	6.8522	7.0629	-3.09	2.98
82	6.4282	6.6311	6.8329	-3.06	2.95
83	6.2239	6.4182	6.6115	-3.03	2.92
84	6.0269	6.2131	6.3982	-3.00	2.89
85	5.8371	6.0154	6.1928	-2.96	2.86
86	5.6542	5.8249	5.9949	-2.93	2.84
87	5.4777	5.6413	5.8042	-2.90	2.81
88	5.3076	5.4644	5.6205	-2.87	2.78
89	5.1435	5.2937	5.4433	-2.84	2.75
90	4.9853	5.1292	5.2726	-2.81	2.72
91	4.8326	4.9705	5.1079	-2.77	2.69
92	4.6852	4.8174	4.9492	-2.74	2.66
93	4.5430	4.6697	4.7960	-2.71	2.63
94	4.4058	4.5272	4.6483	-2.68	2.61
95	4.2733	4.3896	4.5058	-2.65	2.58
96	4.1453	4.2568	4.3683	-2.62	2.55
97	4.0218	4.1287	4.2355	-2.59	2.52
98	3.9024	4.0049	4.1074	-2.56	2.50
99	3.7872	3.8854	3.9837	-2.53	2.47
100	3.6758	3.7700	3.8643	-2.50	2.44
101	3.5661	3.6585	3.7512	-2.53	2.47
102	3.4601	3.5509	3.6419	-2.56	2.50
103	3.3577	3.4468	3.5362	-2.59	2.53
104	3.2588	3.3463	3.4341	-2.61	2.56
105	3.1632	3.2491	3.3353	-2.64	2.58
106	3.0708	3.1551	3.2398	-2.67	2.61
107	2.9816	3.0643	3.1475	-2.70	2.64
108	2.8953	2.9765	3.0582	-2.73	2.67
109	2.8118	2.8915	2.9717	-2.76	2.70
110	2.7311	2.8093	2.8881	-2.78	2.73
111	2.6531	2.7299	2.8072	-2.81	2.75
112	2.5776	2.6530	2.7289	-2.84	2.78
113	2.5046	2.5785	2.6531	-2.87	2.81
114	2.4340	2.5065	2.5798	-2.89	2.84
115	2.3656	2.4368	2.5087	-2.92	2.87
116	2.2995	2.3693	2.4400	-2.95	2.90
117	2.2354	2.3040	2.3733	-2.98	2.92
118	2.1734	2.2407	2.3088	-3.00	2.95
119	2.1134	2.1795	2.2463	-3.03	2.97
120	2.0553	2.1201	2.1858	-3.06	3.01
121	1.9991	2.0626	2.1271	-3.08	3.03
122	1.9446	2.0070	2.0702	-3.11	3.05
123	1.8918	1.9530	2.0151	-3.13	3.08
124	1.8406	1.9007	1.9617	-3.16	3.11
125	1.7911	1.8500	1.9099	-3.18	3.14
126	1.7430	1.8009	1.8597	-3.22	3.16
127	1.6965	1.7533	1.8110	-3.24	3.19
128	1.6514	1.7071	1.7638	-3.26	3.21
129	1.6076	1.6623	1.7180	-3.29	3.24
130	1.5652	1.6189	1.6736	-3.32	3.27

13. SENSOR PARAMETER

2. THE PARAMETER OF THE OTHER SENSOR IN INDOOR AND OUTDOOR UNIT：

（R_0=15K±2%；B0/100=3450K±2%）

T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
-30	60.78	64.77	68.99	-6.16	6.12
-29	57.75	61.36	65.16	-5.88	5.83
-28	54.89	58.15	61.58	-5.61	5.57
-27	52.19	55.14	58.23	-5.35	5.31
-26	49.63	52.30	55.08	-5.11	5.05
-25	47.21	49.62	52.13	-4.86	4.81
-24	44.92	47.10	49.37	-4.63	4.60
-23	42.76	44.73	46.78	-4.40	4.38
-22	40.71	42.49	44.34	-4.19	4.17
-21	38.77	40.38	42.05	-3.99	3.97
-20	36.93	38.39	39.90	-3.80	3.78
-19	35.18	36.51	37.87	-3.64	3.59
-18	33.53	34.74	35.97	-3.48	3.42
-17	31.96	33.06	34.17	-3.33	3.25
-16	30.48	31.47	32.49	-3.15	3.14
-15	29.07	29.97	30.89	-3.00	2.98
-14	27.73	28.56	29.39	-2.91	2.82
-13	26.46	27.22	27.98	-2.79	2.72
-12	25.26	25.95	26.64	-2.66	2.59
-11	24.11	24.75	25.38	-2.59	2.48
-10	23.03	23.61	24.19	-2.46	2.40
-9	21.99	22.53	23.06	-2.40	2.30
-8	21.01	21.51	22.00	-2.32	2.23
-7	20.08	20.54	20.99	-2.24	2.14
-6	19.19	19.62	20.04	-2.19	2.10
-5	18.35	18.74	19.14	-2.08	2.09
-4	17.55	17.92	18.29	-2.06	2.02
-3	16.78	17.13	17.48	-2.04	2.00
-2	16.06	16.38	16.71	-1.95	1.97
-1	15.36	15.67	15.98	-1.98	1.94
0	14.70	15.00	15.29	-2.00	1.90
1	14.08	14.36	14.64	-1.95	1.91
2	13.48	13.75	14.02	-1.96	1.93
3	12.91	13.17	13.43	-1.97	1.94
4	12.36	12.62	12.87	-2.06	1.94
5	11.85	12.09	12.34	-1.99	2.03
6	11.35	11.59	11.83	-2.07	2.03
7	10.88	11.11	11.35	-2.07	2.11
8	10.43	10.66	10.89	-2.16	2.11
9	9.999	10.230	10.450	-2.26	2.11
10	9.590	9.816	10.040	-2.30	2.23
11	9.199	9.422	9.647	-2.37	2.33
12	8.826	9.047	9.269	-2.44	2.40
13	8.470	8.689	8.910	-2.52	2.48
14	8.129	8.347	8.567	-2.61	2.57
15	7.804	8.021	8.240	-2.71	2.66
16	7.493	7.709	7.928	-2.80	2.76
17	7.196	7.412	7.630	-2.91	2.86
18	6.912	7.127	7.346	-3.02	2.98
19	6.640	6.855	7.074	-3.14	3.10
20	6.381	6.595	6.815	-3.24	3.23
21	6.132	6.347	6.567	-3.39	3.35
22	5.894	6.109	6.330	-3.52	3.49

13. SENSOR PARAMETER

T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
23	5.667	5.882	6.103	-3.66	3.62
24	5.449	5.664	5.886	-3.80	3.77
25	5.240	5.456	5.678	-3.96	3.91
26	5.048	5.260	5.478	-4.03	3.98
27	4.864	5.072	5.286	-4.10	4.05
28	4.687	4.891	5.101	-4.17	4.12
29	4.517	4.717	4.924	-4.24	4.20
30	4.355	4.550	4.753	-4.29	4.27
31	4.198	4.390	4.589	-4.37	4.34
32	4.048	4.236	4.431	-4.44	4.40
33	3.904	4.089	4.280	-4.52	4.46
34	3.766	3.946	4.134	-4.56	4.55
35	3.663	3.810	3.994	-3.86	4.61
36	3.506	3.679	3.859	-4.70	4.66
37	3.383	3.552	3.729	-4.76	4.75
38	3.265	3.431	3.604	-4.84	4.80
39	3.152	3.314	3.484	-4.89	4.88
40	3.043	3.202	3.368	-4.97	4.93
41	2.938	3.094	3.257	-5.04	5.00
42	2.838	2.990	3.149	-5.08	5.05
43	2.741	2.890	3.046	-5.16	5.12
44	2.648	2.793	2.946	-5.19	5.19
45	2.558	2.701	2.850	-5.29	5.23
46	2.472	2.611	2.758	-5.32	5.33
47	2.389	2.525	2.669	-5.39	5.40
48	2.309	2.443	2.583	-5.49	5.42
49	2.232	2.363	2.500	-5.54	5.48
50	2.158	2.286	2.421	-5.60	5.58
51	2.087	2.212	2.344	-5.65	5.63
52	2.018	2.140	2.269	-5.70	5.69
53	1.952	2.072	2.198	-5.79	5.73
54	1.888	2.005	2.129	-5.84	5.82
55	1.827	1.941	2.062	-5.87	5.87
56	1.767	1.880	1.998	-6.01	5.91
57	1.710	1.820	1.936	-6.04	5.99
58	1.655	1.763	1.876	-6.13	6.02
59	1.602	1.707	1.818	-6.15	6.11
60	1.551	1.654	1.762	-6.23	6.13
61	1.502	1.602	1.709	-6.24	6.26
62	1.452	1.553	1.657	-6.50	6.28
63	1.409	1.505	1.606	-6.38	6.29
64	1.364	1.458	1.558	-6.45	6.42
65	1.322	1.413	1.511	-6.44	6.49
66	1.280	1.370	1.466	-6.57	6.55
67	1.241	1.328	1.422	-6.55	6.61
68	1.202	1.288	1.379	-6.68	6.60
69	1.165	1.249	1.339	-6.73	6.72
70	1.129	1.211	1.299	-6.77	6.77
71	1.095	1.175	1.261	-6.81	6.82
72	1.061	1.140	1.224	-6.93	6.86
73	1.029	1.106	1.188	-6.96	6.90
74	0.9977	1.073	1.153	-7.02	6.94
75	0.9676	1.041	1.120	-7.05	7.05
76	0.9385	1.011	1.088	-7.17	7.08
77	0.9104	0.9810	1.056	-7.20	7.10
78	0.8833	0.9523	1.026	-7.25	7.18

13. SENSOR PARAMETER

T [℃]	Rmin [KΩ]	Rnom [KΩ]	Rmax [KΩ]	DR(MIN)%	DR(MAX)%
79	0.8570	0.9246	0.9971	-7.31	7.27
80	0.8316	0.8977	0.9687	-7.36	7.33
81	0.8071	0.8717	0.9412	-7.41	7.38
82	0.7834	0.8466	0.9146	-7.47	7.43
83	0.7604	0.8223	0.8888	-7.53	7.48
84	0.7382	0.7987	0.8639	-7.57	7.55
85	0.7167	0.7759	0.8397	-7.63	7.60
86	0.6958	0.7537	0.8161	-7.68	7.65
87	0.6755	0.7322	0.7933	-7.74	7.70
88	0.6560	0.7114	0.7712	-7.79	7.75
89	0.6371	0.6913	0.7498	-7.84	7.80
90	0.6188	0.6718	0.7291	-7.89	7.86
91	0.6011	0.6530	0.7051	-7.95	7.39
92	0.5840	0.6348	0.6897	-8.00	7.96
93	0.5674	0.6171	0.6709	-8.05	8.02
94	0.5514	0.6000	0.6527	-8.10	8.07
95	0.5359	0.5835	0.6350	-8.16	8.11
96	0.5209	0.5675	0.6179	-8.21	8.16
97	0.5064	0.5519	0.6014	-8.24	8.23
98	0.4923	0.5369	0.5853	-8.31	8.27
99	0.4787	0.5224	0.5698	-8.37	8.32
100	0.4655	0.5083	0.5547	-8.42	8.36
101	0.4528	0.4946	0.5401	-8.45	8.42
102	0.4404	0.4814	0.5259	-8.52	8.46
103	0.4284	0.4685	0.5121	-8.56	8.51
104	0.4168	0.4561	0.4988	-8.62	8.56
105	0.4056	0.4440	0.4859	-8.65	8.62
106	0.3947	0.4323	0.4733	-8.70	8.66
107	0.3841	0.4210	0.4611	-8.76	8.70
108	0.3739	0.4100	0.4493	-8.80	8.75
109	0.3640	0.3993	0.4379	-8.84	8.81
110	0.3544	0.3890	0.4267	-8.89	8.84
111	0.3450	0.3789	0.4159	-8.95	8.90
112	0.3360	0.3692	0.4055	-8.99	8.95
113	0.3272	0.3597	0.3953	-9.04	9.01
114	0.3187	0.3505	0.3854	-9.07	9.06
115	0.3104	0.3416	0.3758	-9.13	9.10
116	0.3024	0.3330	0.3665	-9.19	9.14
117	0.2947	0.3246	0.3574	-9.21	9.18
118	0.2871	0.3164	0.3468	-9.26	8.77
119	0.2798	0.3085	0.3401	-9.30	9.29
120	0.2727	0.3008	0.33	-9.34	9.34

14. Troubleshooting

14.1 Trouble guide

Troubleshooting for Normal Malfunction

Troubleshooting	Possible Reason 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 air inlet and outlet has been blocked.	Remove block obstacles.
Poor cooling/heating	1. The outdoor heat exchanger is dirty, such as condenser; 2. There are heating devices indoors; 3. The air tightness is not enough. People come in and out too frequently. 4. Block of outdoor heat exchanger; 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 thermal deformation of plastic parts.	It is not abnormal, and the sound will disappear soon.
Water leakage	1. Drainage pipe blocked or broken; 2. Wrap of refrigerant pipe joint is not closed completely.	1. Change drainage pipe. 2. Re-wrap and make it tight.

14. TROUBLESHOOTING

When the air conditioner failure occurs, the fault code will displays on control board.

HOW TO CHECK FAULT CODES

1) 12K/14K/18K

There are 4 LED lamps on control board, LED2,LED3,LED4 and LED7.

LED2 and LED3 indicate outdoor main control fault ,LED 4 and LED7 indicate drive fault.

Main control failure:

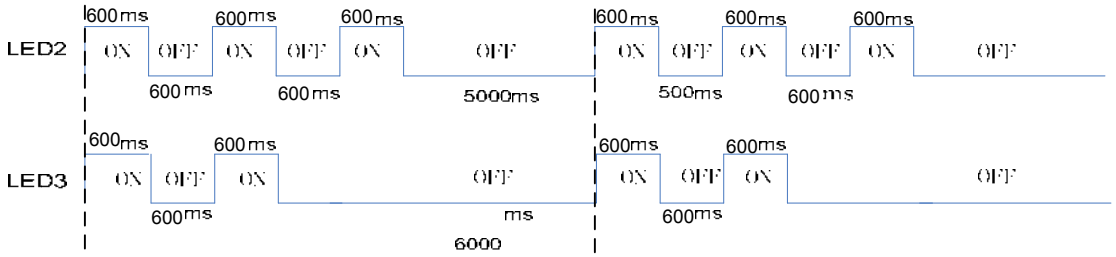
Lamp LED2 display fault code ten digit number, LED3 display fault code single digit number.

Drive failure:

Lamp LED4 display fault code ten digit number, LED7 display fault code single digit number.

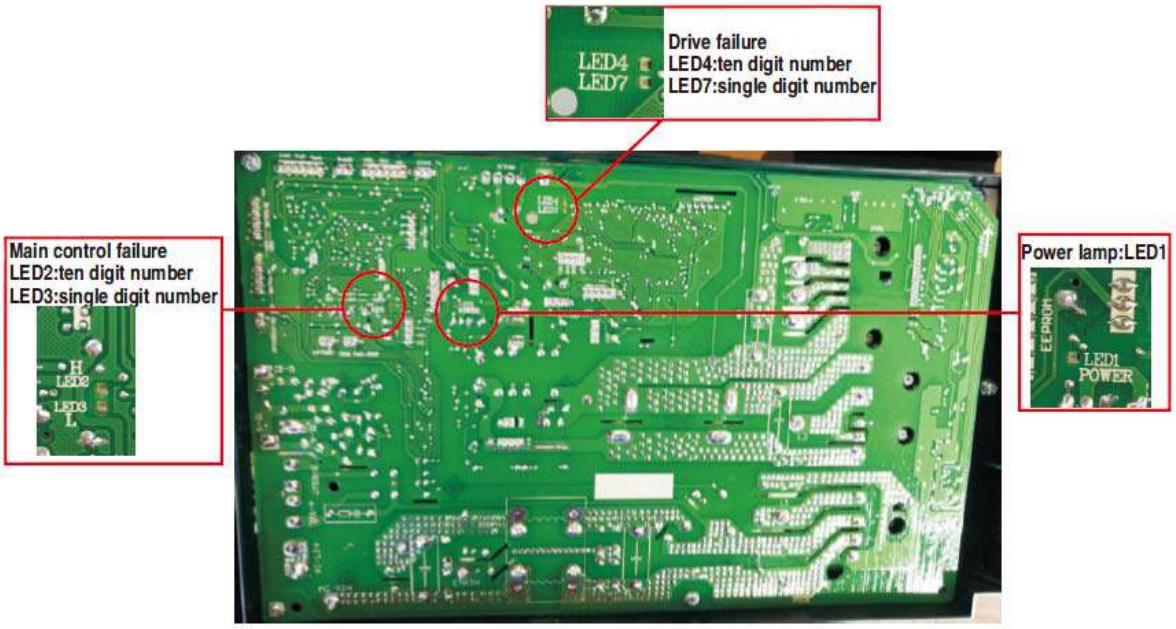
Failures display with 5s interval .It means LED will off 5s to report next failure code. System protect codes display is the same with main control, and LED lamps will off when There is no failure ,protect or preheating.

For example, outdoor main control fault 32:



Outdoor control board

12K/14K/18K



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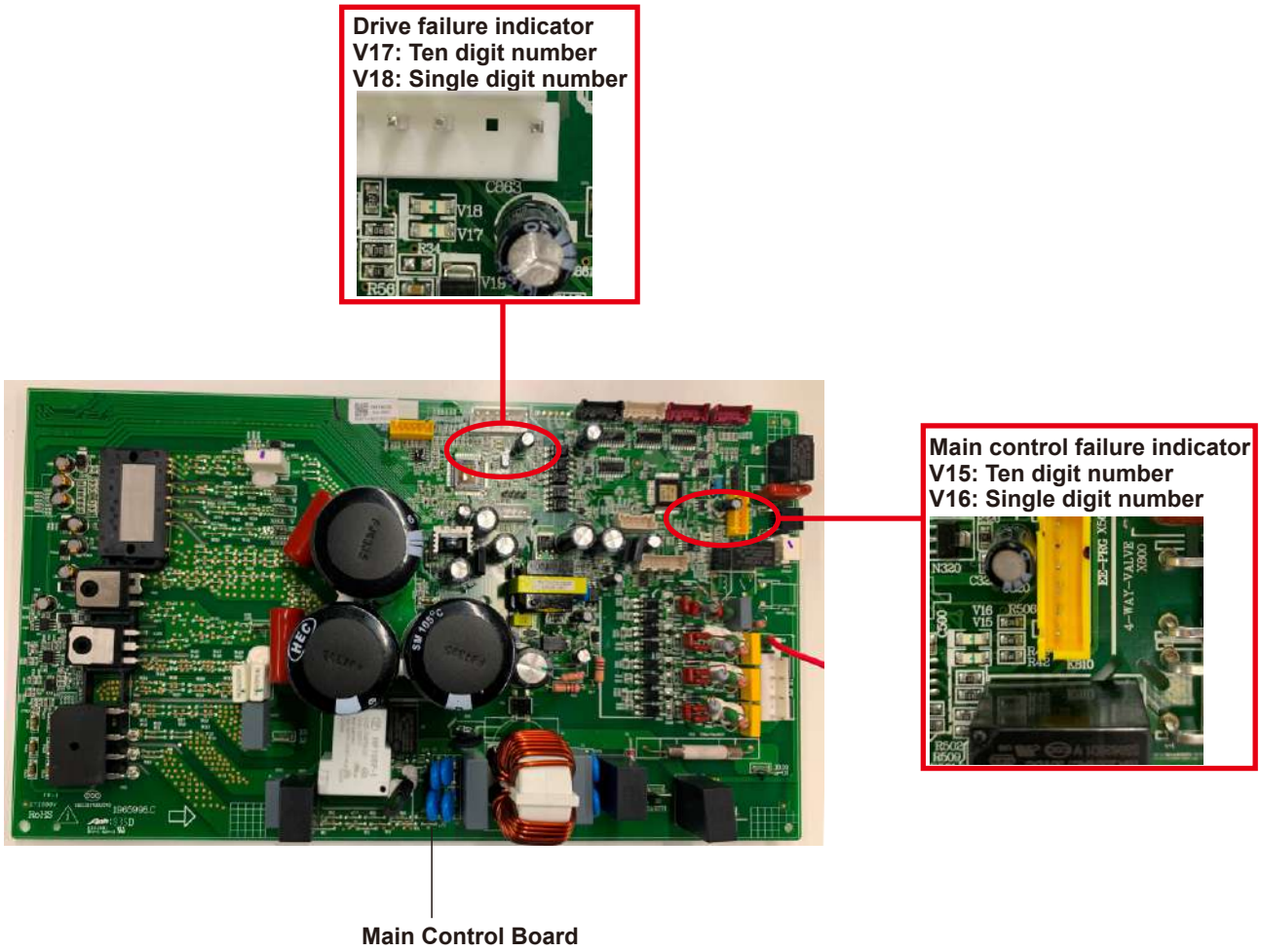
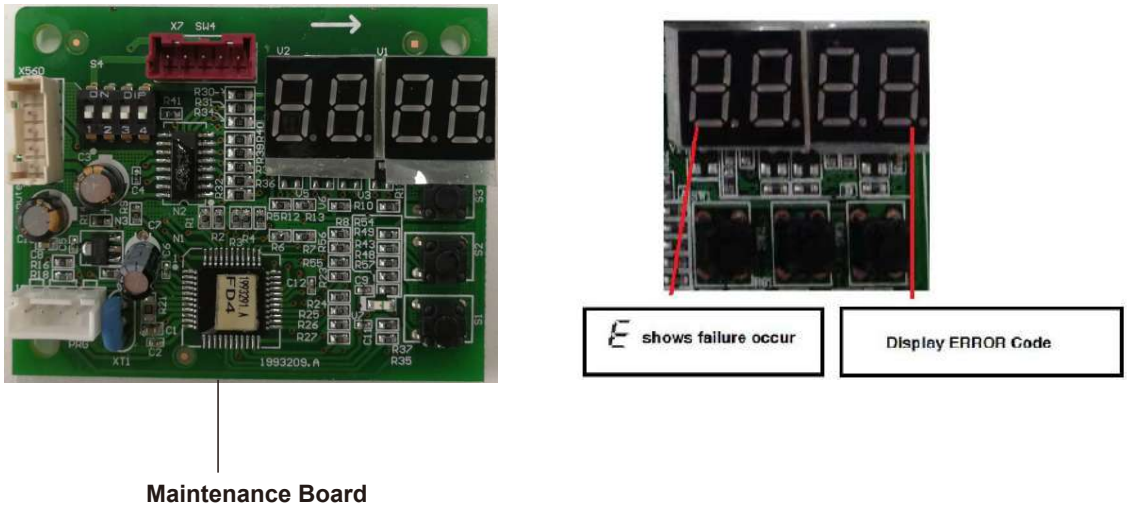
2) 21K/AMW3-24U4RFA



Main control failure:

a. Check by 7 segment display on maintenance board.
b. Check by lamp on main control board.
Lamp V15 display fault code ten digit number, V16 display fault code single digit number.



14. TROUBLESHOOTING

Drive failure:

Check by lamp on main control board

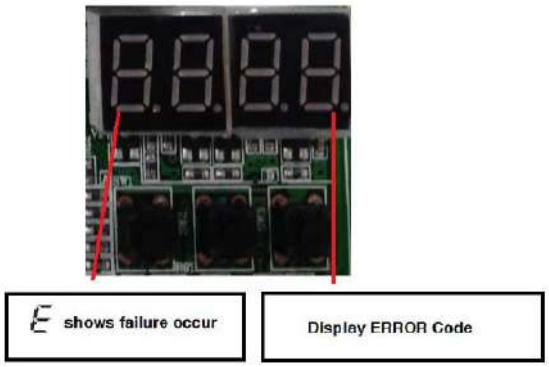
Lamp V17 display fault code ten digit number, V18 display fault code single digit number.

The failure lamp flicking times shows the failure code.

3) AMW3-24U4RAA/27K/36K/42K

Main control failure

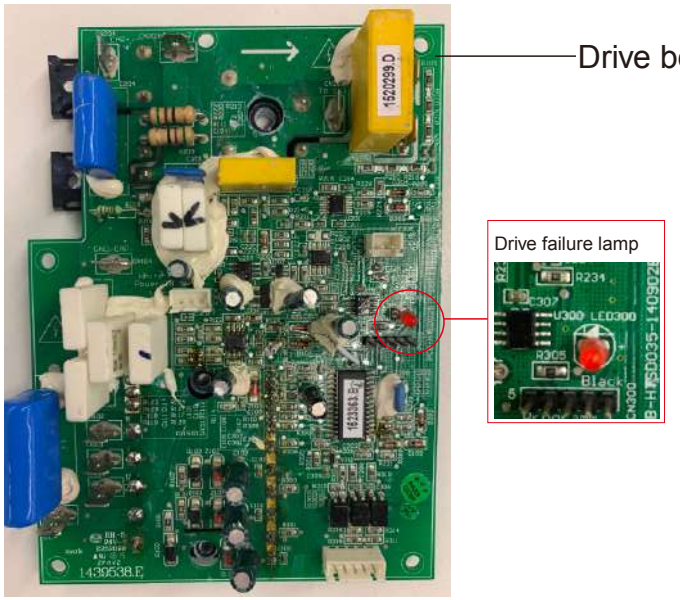
Fault code will display on 7 segment display on outdoor control board.



Drive fault code display

The lamp of drive board flash shows failure occur.

The drive failure lamp flicking times shows the failure code.



The drive failure lamp flicking times shows the failure code.

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14.2 Fault codes

The following is the fault code table of outdoor.

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. Normally protection; 3. Replace the compressor; 4. Please see the Note 3; 5. Please see the 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 result 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	

14. TROUBLESHOOTING

Fault Code	Fault Description	Possible Reason of Abnormality	How to Deal With	Remarks
12	voltage absent phase	1. Three-phase power is abnormal; 2. The outdoor wiring connects wrong; 3. The outdoor control board is failure.	1. Normally protection 2. Check the wiring connection refer to the wiring diagram; 3. Replace the outdoor control board.	
13	Compressor overheat protector device	1. The wiring of the overload protector connection is loose. 2. The overload protector is failure. 3. The refrigerant is not enough; 4. The installation pipe is too long than normal, but not add the enough refrigerant; 5. The expansion valve is failure; 6. The outdoor control board is failure.	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.	Com-pressor overheat protector device
14	High pressure switch operate or the unit turn off for high pressure protection	1. The wiring of the high pressure protector connect loose; 2. The high pressure protector is failure; 3. The outdoor control board is abnormal; 4. Overload in cooling; 5. Overload in heating.	1. Reconnect the wiring the high pressure protector; 2. Replace the high pressure protector; 3. Replace the outdoor control board; 4. Please refer to the Note 3; 5. Please refer to the Note 4.	Valid for models with high pressure switch or pressure sensor
15	Low pressure switch protection or the unit turn off for low pressure protection	1. The wiring of the low pressure switch connect loose; 2. The low pressure switch is failure; 3. The refrigerant is not enough; 4. The expansion valve failure 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 is leakage, and then add some refrigerant; 4. Replace the expansion valve; 5. Replace the outdoor control board.	For models with low pressure switch or pressure sensor
16	overload protection in cooling mode	System overload	Please refer to the Note 3.	
17	Discharge temperature sensor fault	1. The wiring of the discharge temperature sensor connect loose; 2. The discharge temperature sensor is failure; 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 abnormally.	1. Normally protection, please check the supply power; 2. Replace the driver board.	
19	Suction temperature sensor fault	1. The wiring of the suction temperature sensor connect loose; 2. The suction temperature sensor is failure; 3. The sampling circuit is abnormally.	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 connect loose; 2. The defrosting sensor is failure; 3. The sampling circuit is abnormally	1. Reconnect the wiring of the defrosting sensor; 2. Replace the defrosting sensor; 3. Replace the outdoor control board.	

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Fault Code	Fault Description	Possible Reason of Abnormality	How to Deal With	Remarks
23	Expansion valve A tube (thin) sensor fault	1. The wiring of the sensor for the expansion valve A(thin tube) connect loose; 2. The sensor for the expansion A(thin tube) is failure; 3. The sampling circuit is abnormally.	1. Reconnect the wiring of the sensor for the expansion valve A (thin tube); 2. Replace the sensor for the expansion valve A (thin tube); 3. Replace the outdoor control board.	
24	Expansion valve B (thin)tube sensor fault	1. The wiring of the sensor for the expansion valve B (thin tube) connect loose; 2. The sensor for the expansion valve B(thin tube) is failure; 3. The sampling circuit is abnormally	1. Reconnect the wiring of the sensor for the expansion valve B(thin tube); 2. Replace the sensor for the expansion valve B(thin tube); 3. Replace the outdoor control board.	
25	Expansion valve C (liquid) pipe sensor fault	1. The wiring of the sensor for the expansion valve C (liquid pipe) is connected loosely; 2. The sensor of the expansion valve C (liquid pipe) fails; 3. The sampling circuit fails.	1. Reconnect the wiring of the sensor for the expansion valve C (liquid pipe). 2. Replace the sensor for the expansion valve C (liquid pipe); 3. Replace the outdoor control board.	
26	Expansion valve D (liquid) pipe sensor fault	1.The wiring of the sensor for the expansion valve D (liquid pipe) is connected loosely; 2.The sensor of the expansion valve D (liquid pipe) fails; 3.The sampling circuit fails.	1. Reconnect the wiring of the sensor for the expansion valve D (liquid pipe); 2. Replace the sensor for the expansion valve D (liquid pipe); 3. Replace the outdoor control board.	
27	Expansion valve A (gas pipe) sensor fault	1. The wiring of the sensor for the expansion valve A (gas pipe) is connected loosely; 2. The sensor of the expansion valve A (gas pipe) fails; 3. The sampling circuit fails.	1. Reconnect the wiring of the sensor for the expansion valve A (gas pipe); 2. Replace the sensor for the expansion valve A (gas pipe); 3. Replace the outdoor control board.	
28	Expansion valve B (gas pipe) sensor fault	1. The wiring of the sensor for the expansion valve B (gas pipe) connect is connected loosely; 2. The sensor of the expansion valve B (gas pipe) fails; 3. The sampling circuit fails.	1. Reconnect the wiring of the sensor for the expansion valve B (gas pipe); 2. Replace the sensor for the expansion valve B (gas pipe); 3. Replace the outdoor control board.	
29	Expansion valve C (gas pipe) sensor fault	1. The wiring of the sensor for the expansion valve B (gas pipe) connect is connected loosely; 2. The sensor of the expansion valve C (gas pipe) is fails; 3. The sampling circuit fails.	1. Reconnect the wiring of the sensor for the expansion valve B (gas pipe); 2. Replace the sensor for the expansion valve C (gas pipe); 3. Replace the outdoor control board.	
30	Expansion valve D (gas pipe) sensor fault	1. The wiring of the sensor for the expansion valve B (gas pipe) is connected loosely; 2. The sensor of the expansion valve D (gas pipe) fails; 3. The sampling circuit fails.	1. Reconnect the wiring of the sensor for the expansion valve B (gas pipe); 2. Replace the sensor for the expansion valve D (gas pipe); 3. Replace the outdoor control board.	
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 5, table 6.	See attached "analysis of the driving board fault".	

14. TROUBLESHOOTING

Fault Code	Fault Description	Possible Reason of Abnormality	How to Deal With	Remarks
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	Outdoor DC fan motor fault (upper fan motor)	1. The wiring of the down DC fan motor connect loose; 2. The cord of the down DC fan motor is failure; 3. The down DC fan motor is failure; 4. The drive circuit of the down DC fan motor is failure; 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.	
50	Expansion valve E (gas pipe) sensor fault	1. The wiring of the sensor for the expansion valve E (gas pipe) is connected loosely; 2. The sensor of the expansion valve E (gas pipe) fails; 3. The sampling circuit fails.	1. Reconnect the wiring of the sensor for the expansion valve E (gas pipe); 2. Replace the sensor for the expansion valve E (gas pipe); 3. Replace the outdoor control board.	
53	Expansion valve D (liquid) pipe sensor fault	1.The wiring of the sensor for the expansion valve D (liquid pipe) is connected loosely; 2.The sensor of the expansion valve D (liquid pipe) fails; 3.The sampling circuit fails.	1. Reconnect the wiring of the sensor for the expansion valve D (liquid pipe); 2. Replace the sensor for the expansion valve D (liquid pipe); 3. Replace the outdoor control board.	
91	The unit turn off due to the IPM board over heating fault the refrigerant of the unit is not enough fault	1. The outdoor ambient 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 has been installed without standard; 4. The supply power is too low.	1. Normally protection; 2. Check the fan capacitor, and replace the fan capacitor if it is failure; 3. Reinstalled the outdoor unit refer to the installation user manual; 4. Normally 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.	

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Fault Code	Fault Description	Possible Reason of Abnormality	How to Deal With	Remarks
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 4-way valve.	

NOTE 1:

If the indoor unit can not turn on or the indoor unit turn off itself after 30s, at the same time the unit do not display the fault code, please check the fire and the socket of the control board.

NOTE 2:

If the indoor unit display 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 whether exists short circuit.

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 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 has been blocked.	Remove the blocked objects.
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 measure**
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 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 has been blocked.	Remove the blocked objects.
8	The expansion valve or the capillary fails.	Replace the expansion valve or the capillary.

14. TROUBLESHOOTING

Table 3 Drive Fault code (12K/14K/18K/21K/AMW3-24U4RFA/42K)

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 the power supply 2. Change the 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 the compressor wire connection; 2. Change the driver board ; 3. Change the 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 failure; 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 overloads, and the 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.
25	EE data abnormal	Driver board EEPROM is abnormal.	1. Change EEPROM ; 2. Change the driver board.
26	DC voltage mutation error	1. Power input changes suddenly 2. Driver board fails.	1.Check the power supply, to provide stable power supply; 2.Change the driver board.
27	D axis current control error	1. System overload, phase current is too high; 2. Driver board fails.	1. Check if the system is normal. 2. Check if the stop valve is open; 3. Change the driver board.
28	Q axis current control error	1. System overload, phase current is too high ; 2. Driver board fails.	1. Check if the system is normal; 2. Check if the stop valve is open; 3. Change the driver board.
29	Saturation error of D axis current control integral	1. System overloads suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check if the system is normal. 2. Check if the stop valve is open; 3. Change the driver board.
30	Saturation error of Q axis current control integral	1. System overloads suddenly; 2. Compressor parameter is not suitable; 3. Driver board fails.	1. Check if the system is normal. 2. Check if the stop valve is open; 3. Change the driver board.

14. TROUBLESHOOTING

Table 4 Drive Fault Code (AMW3-24U4RAA/27K/36K)

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 compressor wire; 2. Change the driver board ; 3. Turn on the unit 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 the 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 overloads or current overloads. 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 connect not well; 2. Driver board fault; 3. Control board fault;	1. Check the 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 is abnormal, and power frequency is 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 a fault; 3. Change the driver board.

14. TROUBLESHOOTING

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 receive data fault	Abnormal communication loop.	Change the drive board.
20	PFC soft start is abnormal	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.

14. TROUBLESHOOTING

Table 5 Limitation code

Code	Definitions	Reasons
101	When overcurrent occurs, stop the frequency from increasing.	Current control
102	When overcurrent occurs, reduce the frequency.	Current control
103	When the temperature of IPM module is too high, stop the frequency from increasing.	Frequency control to keep appropriate temperature of IPM module.
104	When the temperature of IPM module is too high, reduce the frequency.	Frequency control to keep appropriate temperature of IPM module.
105	When the discharge temperature is too high, stop the frequency from increasing.	Frequency control to keep appropriate discharge temperature.
106	When the discharge temperature is too high, reduce the frequency.	Frequency control to keep appropriate discharge temperature.
107	In cooling mode, when the temperature of the outdoor unit coil is too high, stop the frequency from increasing.	Frequency control to keep appropriate temperature of the outdoor unit coil in cooling mode.
108	In cooling mode, when the temperature of the outdoor unit coil is too high, reduce the frequency.	Frequency control to keep appropriate temperature of the outdoor unit coil in cooling mode.
113	To prevent the indoor unit from being frozen or high temperature, stop the frequency from increasing.	Frequency control to keep appropriate temperature of the indoor unit coil.
114	To prevent the indoor unit from being frozen or high temperature, reduce the frequency.	Frequency control to keep appropriate temperature of the indoor unit coil.
119	When DSH exceeds the target value, the valve opening gets wider.	Control on expansion valve based on DSH.
120	When DSH exceeds the target value, the valve opening gets narrower.	Control on expansion valve based on DSH.
121	When DSH exceeds the target value, stop the valve opening from getting narrower.	Control on expansion valve based on DSH.
122	When DSH exceeds the target value, stop the valve opening from getting wider.	Control on expansion valve based on DSH.
131	When the temperature of IPM module is too high, stop the frequency from increasing.	Frequency control to keep appropriate temperature of IPM module.
132	When the temperature of IPM module is too high, reduce the frequency.	Frequency control to keep appropriate temperature of IPM module.
134	When the discharge temperature is too high, stop the valve opening getting narrower.	Control on discharge temperature expansion valve.
140	The compressor overloads.	Control on the compressor output.
141	The compressor current overloads.	Control on the output torque of the compressor.

※ DSH: Discharge Super Heat

These codes appearing in the operation process indicate some kind of operation state, instead of faults.

15.Checking components

15.1 Check refrigerant system

TEST SYSTEM FLOW

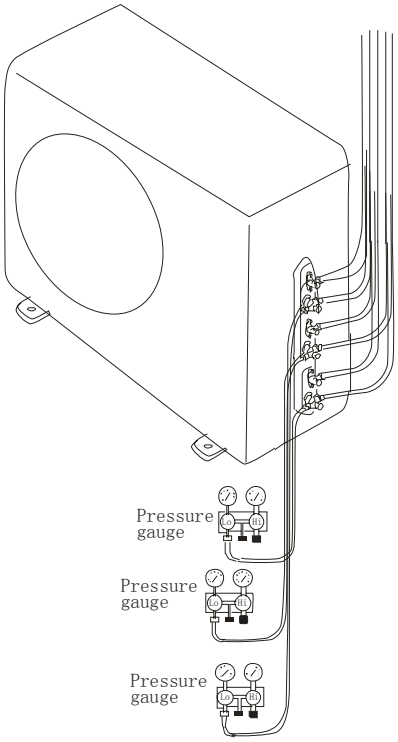
Conditions: ① Compressor is running.
② The air condition should be installed in good ventilation.

Tool: Pressure Gauge

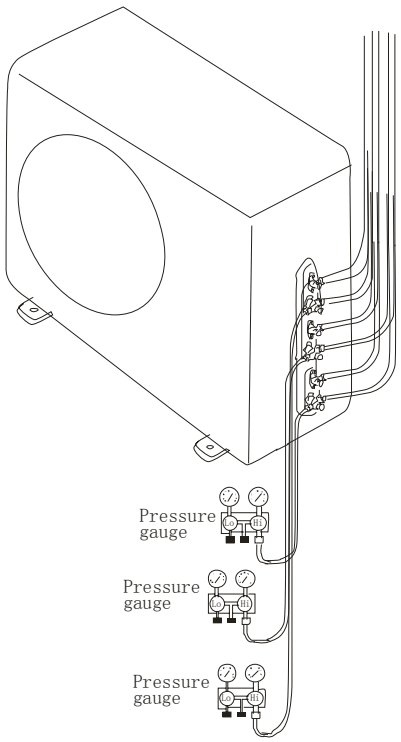
Technique: ① see ② feel ③ test

SEE ----- Tube defrost.
FEEL ----- The difference between tube's temperature.
TEST ----- Test pressure.

cooling run

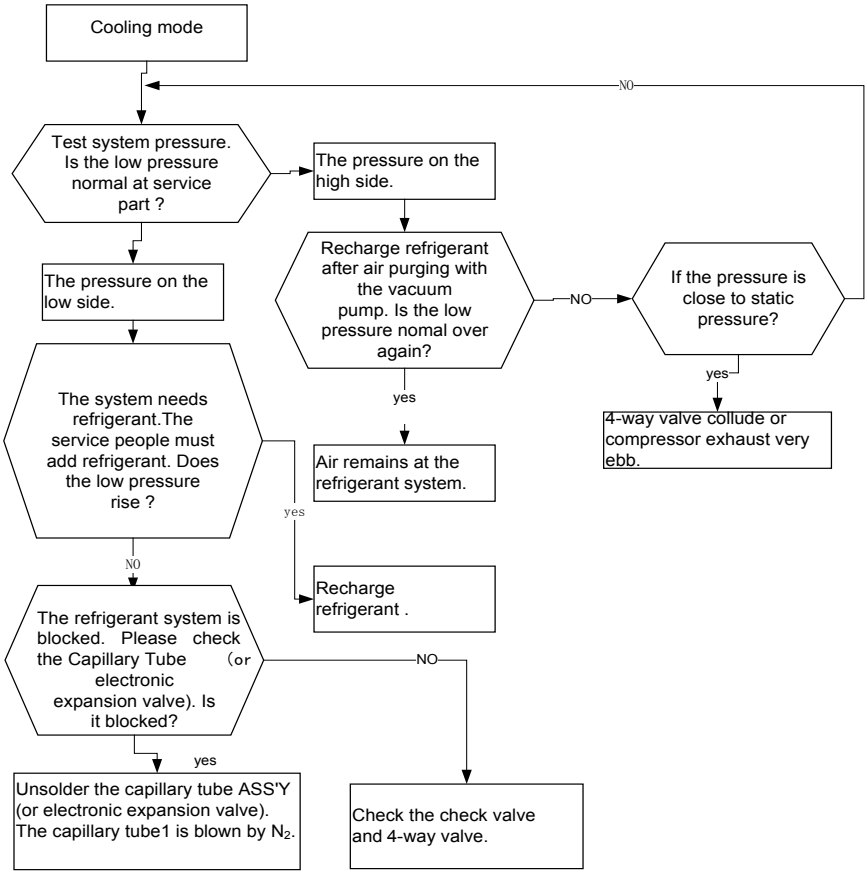


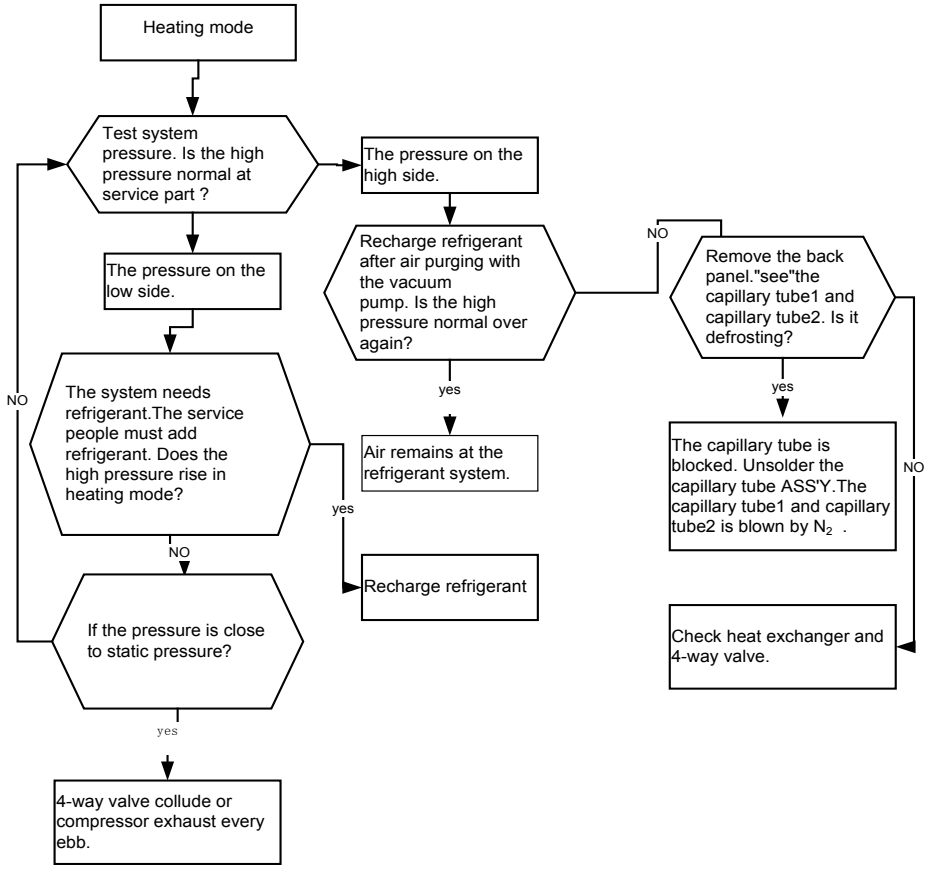
heating run



15.CHECKING COMPONENTS

Test system flow





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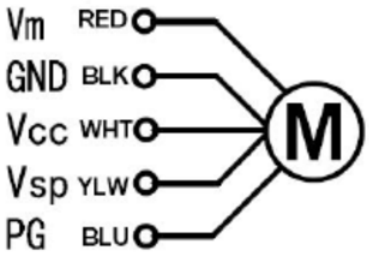
15.2 Check parts unit

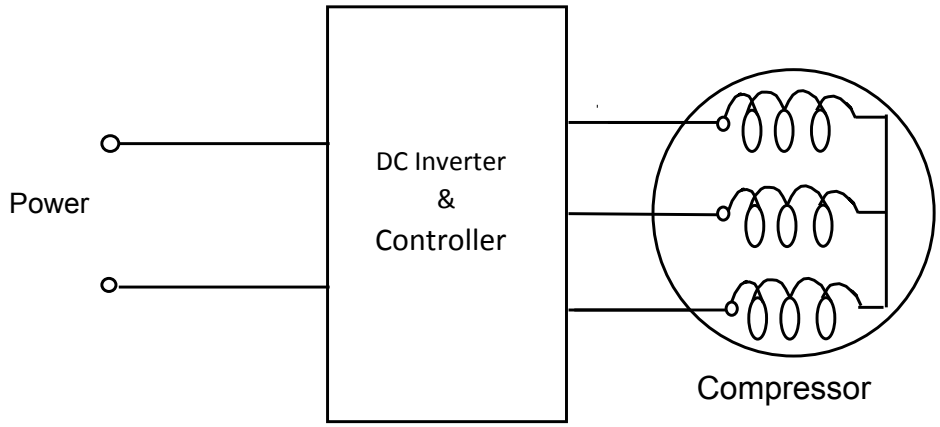
1. Fan motor



DC motor
12K/14K
Model: SIC-52FV-F130-3
18K
Model: ZWA228D44B
21K~36K
Model: SIC-71FW-D8121-1
42K
Model: SIC-81FW-F1138-1

2. Compressor

COMPRESSOR EXAMINE AND REPAIR
14K
Model: GSD113RKRA8JV6
18K
Model: KTN150D42UFZ
21K/AMW3-24U4RFA
Model: KTM240D57UMU
AMW3-24U4RAA /27K/36K
Model: KTF235D22UMT
42K
Model:KTF400D64UMT



15. CHECKING COMPONENTS

Test in resistance.

TOOL: Multimeter.

Test the resistance of the winding. The compressor is fault if the resistance of winding 0(short circuit)or∞（open circuit）

Familiar error:

1) Compressor motor lock.
2) Discharge pressure value approaches static pressure value .
3) Compressor motor winding abnormality.

Notes：

1) Don't put a compressor on its side or turn over.
2) Please assembly the compressor in your air conditioner rapidly after removing the plugs. Don't place the comp. In air for along time.
3) Avoiding compressor running in reverse caused by connecting electrical wire incorrectly.
4) Warning! In case AC voltage is impressed to compressor, the compressor performance will below because of its rotor magnetic force decreasing.

4. Inductance

Familiar error:

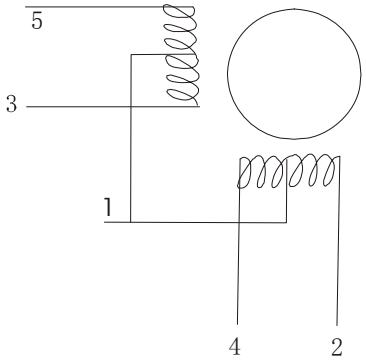
1) Sound abnormality
2) Insulation resistance disqualification.

5. Step motor

Test in resistance.

TOOL: Multimeter.

Test the resistance of winding. The stepper motor is fault if the resistance of winding 0 (short circuit)or ∞（open circuit）.



15. CHECKING COMPONENTS

6. Fuse

Checking continuity of fuse on PCB ASS'Y.

Remove the PCB ASS'Y from the electrical component box. Then pull out the fuse from the PCB ASS'Y (Fig.1)

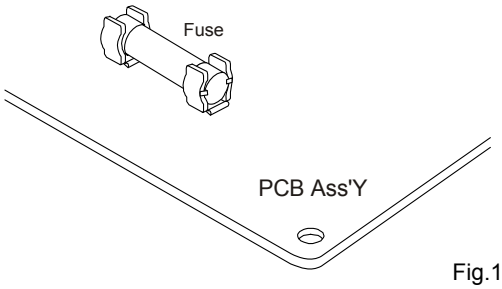


Fig.1

2) Check for continuity by a multimeter as shown in Fig.2.

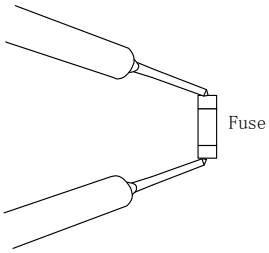


Fig.2

7.Capacitor

1) Remove the lead wires from the capacitor terminals, and then place a probe on the capacitor terminals as shown in Fig.3.
2) Observe the deflection of the pointer, setting the resistance measuring range of the multimeter to the maximum value.
3) The capacitor is "good" if the pointer bounces to a great extent and then gradually returns to its original position.
4) The range of deflection and deflection time differ according to the capacity of the capacitor.

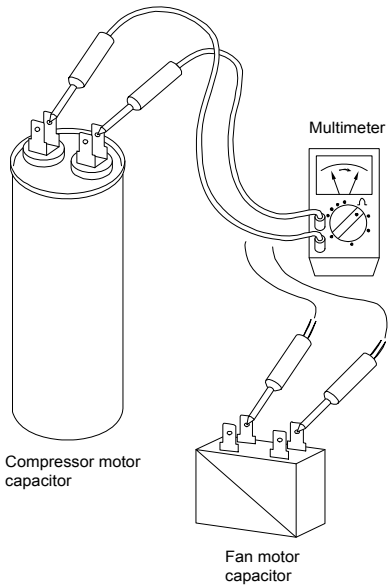


Fig.3

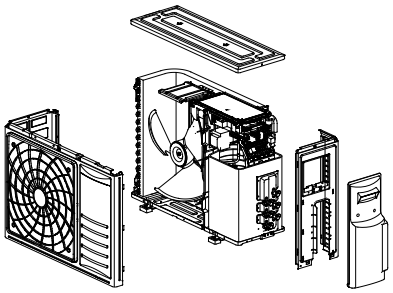
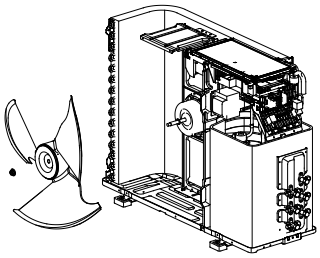
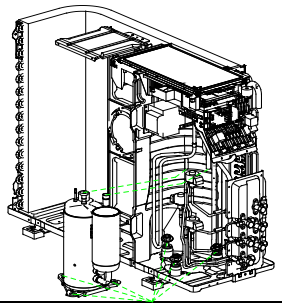
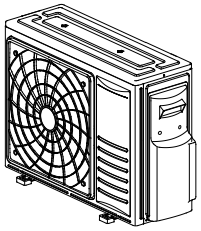
16. Disassembly and assembly for compressor and motor

The special tools for compressor & motor disassembly and assembly：

	Tool
1	Hexagon Screwdriver 
2	Hexagon Socket 

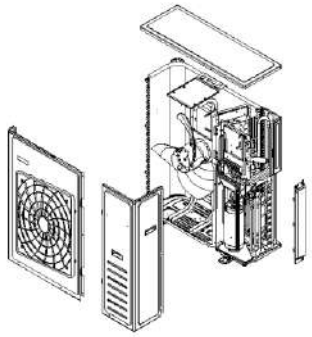
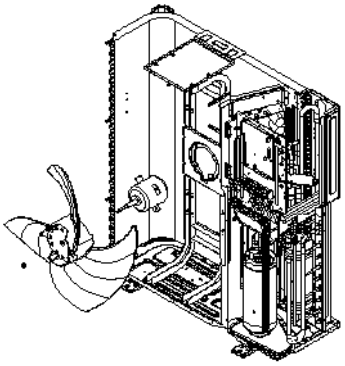
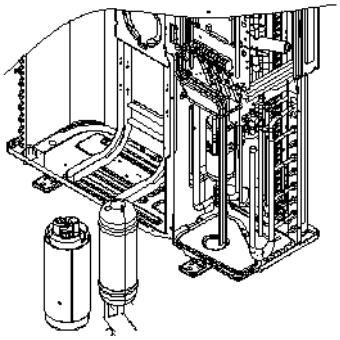
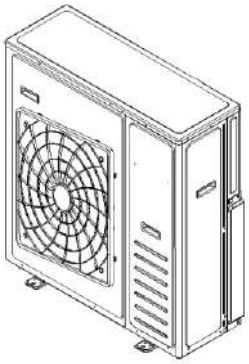
Outdoor unit

12K/14K/18K/21K/24K/27K/36K

Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.		
Step	**Illustration**	**Handling Instruction**
1.Remove external casing		1. Remove the top cover, handle and valve cover; 2. Remove the outer case and right side plate.
2.Remove motor		1. Remove the blade nut and then remove the blade; 2. Remove the motor from motor supporter
3.Remove compressor		1. Reclaim the refrigerant from the entire system. 2. Unsolder the 4-way valve piping assy from compressor; 3. Remove the compressor mounting bolts; 4. Carefully remove the compressor from chassis.
4. Assemble unit		Assemble the unit in the reverse order of disassembly.

16. DISASSEMBLY AND ASSEMBLY FOR COMPRESSOR AND MOTOR

42K

Important: Before disassembly and assembly, make sure that the power to the system has been disconnected and verified as voltage free.		
Step	**Illustration**	**Handling Instruction**
1. Remove external casing		1. Remove the top cover, handle and valve cover; 2. Remove the outer case and right side plate.
2. Remove motor		1. Remove the blade nut and then remove the blade; 2. Remove the motor from motor supporter
3. Remove compressor		1. Reclaim the refrigerant From the entire system. 2. Unsolder the 4-way valve piping assy from compressor. 3. Remove the compressor mounting bolts. 4. Carefully remove the compressor from chassis.
4. Assemble unit		Assemble the unit in the reverse order of disassembly.

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Product improvement, specifications and appearance in this manual are subject to change without prior notice.