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## Preface - About Products and the Manual

### [Manual Use]

This manual contains the product overview, working principle, controller characteristics and other contents of air-cooled small room air conditioners, as well as commissioning, maintenance and troubleshooting methods to provide users with information such as usage, commissioning and maintenance.

### [Use Objects]

- ◇ Technical support engineer
- ◇ Service engineer
- ◇ Selling engineer
- ◇ Commissioning engineer
- ◇ User

### [Exemption Clauses]

1. Beyond the free warranty period;
2. Dismantling or modifying products without authorization;
3. Violation of product operation or use specifications;
4. Man-made fault;
5. Loss caused by force majeure or other external factors on the client side.

◇ **Note: Any of the above exemption clauses will not be covered by warranty.**

### [Related Descriptions]

1. This manual is provided with the product. Please keep it properly so that you can check it at any time when necessary. In case this manual is accidentally lost or damaged, please ask the manufacturer or local distributor directly.
2. This manual is written for small room air-cooled products, and the contents may not be applicable to other models;
3. Due to product version upgrade or other reasons, the contents of this manual will be updated irregularly. Unless otherwise agreed, this manual is only used as a guide, and all statements, information and suggestions in this manual do not constitute any express or implied guarantee.

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# Chapter I Product Overview

## 1.1 Product Introduction

### About the Product

The air-cooled small room air conditioner is a computer room air conditioner specially designed for heat dissipation and cooling of precision equipment, which is suitable for environmental control of equipment room or computer room. The products have the characteristics of intelligent control and high reliability.

### Model Description

The series products are divided into two types according to their functions: single cooling and constant temperature and humidity. The single-cooling type has the functions of refrigeration and dehumidification, while the constant temperature and humidity type has the main functions of refrigeration, dehumidification, humidification and heating.

### Model Description

The series products are divided into 5.5kW, 7.5kW, 12.5kW, 17kW and 20.5kW units according to the cooling capacity. Customers can choose according to the actual demand.

The air conditioner unit adopts a split floor standing, which consists of an indoor unit and an outdoor unit.

### Product Features

1. High reliability, high sensible heat ratio and large air volume;
2. New touch screen with beautiful interface, smooth and convenient operation, real-time display of temperature and humidity curve, and multi-functional human-computer interaction interface;
3. R410A green refrigerant is adopted, which meets the requirements of international green refrigerant;
4. Electronic expansion valve is adopted with the characteristics of fast response speed, high adjustment precision, high efficiency and energy saving;
5. High-quality refrigeration valves are adopted to ensure more reliable operation;
6. The heat exchangers are all designed with internally threaded copper pipes and punched slots, so that the heat exchange efficiency is further improved;
7. Simple disassembly design of unit components with convenient maintenance;
8. Multiple options provide users with multiple choices.

## 1.2 System Composition

### 1.2.1 Main Components

Indoor unit of air-cooled small room air conditioner includes the following main components:

- 1) Compressor - adopt high-efficiency compressor, which has the characteristics of low vibration, low noise and high reliability.
- 2) Evaporator - a finned tube heat exchanger with high-efficiency internal threaded copper tube and aluminum fins plated with hydrophilic layer is adopted with the application of flow field analysis and optimized matching design, thus the heat exchange efficiency is greatly improved;
- 3) Expansion valve - electronic expansion valve is adopted, which has the characteristics of fast response, high adjustment precision, high efficiency and energy saving.
- 4) Fan - the backward-tilting AC centrifugal fan with high efficiency and reliability is adopted, which has the characteristics of large air volume, long air supply distance, direct drive and convenient maintenance; Backward centrifugal EC fan can also be used, with stepless speed regulation and wide adjustment range, which can save energy more than 30% compared with ordinary fan.
- 5) Display screen - 4.3-inch touch screen is adopted, which is simple and atmospheric, and supports the display of temperature and humidity curve and graphic status.
- 6) Compressor Crankcase heater - used to heat the oil pool of compressor crankcase. The crankcase heater must be energized for at least 12 hours before starting.
- 7) Drying filter - it can remove the moisture in refrigerant pipeline, filter impurities, effectively reduce the damage probability of system components, and ensure the efficient and reliable operation of components.
- 8) Pressure sensor - it is equipped with high and low pressure sensors, which can control the system state more accurately and provide safer protection.

### 1.2.2 List of Optional Configuration

- 1) Heater - PTC heater is adopted, which has the characteristics of fast heating start-up, large heating amount and even heat dissipation.
- 2) Humidifier - optional electrode humidification component or wet film humidification component. Wet film

humidification is clean and noiseless, and electrode humidification has the advantages of automatic control, energy saving and water saving, automatic drainage, automatic cleaning, cleanliness and sanitation and convenient maintenance, etc.

3) Supply air temperature and humidity sensor - collecting supply air temperature and humidity, which is helpful to accurately feedback and control the temperature and humidity of the computer room.

4) Differential pressure switch - when the filter screen is blocked, the differential pressure sensor can trigger an alarm to prompt the filter screen to be cleaned and replaced.

5) Condensed water pump - compact structure, large flow and high lift, which ensures that the unit has the ability to overcome the height difference and discharge water.

6) Liquid sight glass - the window of system circulation, which can observe the state of refrigerant and is mainly used to observe the water content of the system.

7) Water leakage induction rope - high detection sensitivity, rapid and reliable response and timely detection of water leakage of the unit.

8) Smoke alarm - point photoelectric smoke detector is selected, which can detect smoke generated during fire and send out alarm signal in time.

9) Low-temperature components - When the outdoor ambient temperature of air-cooled air conditioner is below  $-20^{\circ}\text{C}$ , low-temperature components should be added to ensure the stable and reliable operation of the unit in the environment above  $-40^{\circ}\text{C}$ .

10) Extension components - extension components shall be added when the equivalent length of connecting pipe exceeds 30m in one way, so as to ensure the normal startup and operation of the unit and improve the reliability of the unit.

## 1.3 Environmental Requirements

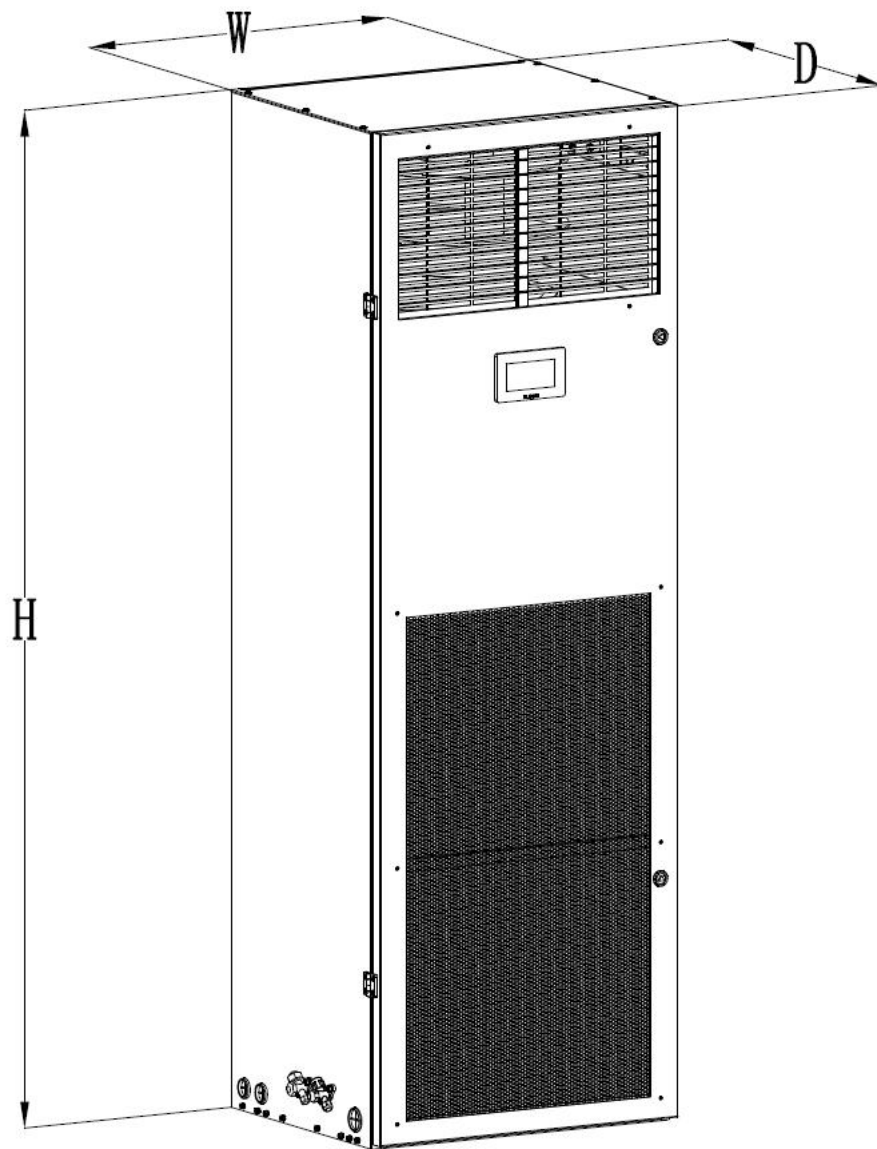
See Table 1-1 for the operating environment requirements of the air-cooled small room air conditioner:

**Table 1-1 Operating Environment and Requirements**

Item	Parameter	Indoor side	Outdoor side
Operating parameters	Temperature	18°C~35°C	-20°C~+45°C (Regular type) -40°C~+45°C (Low-temperature type)
	Humidity	20%~80%RH	—
Operating requirements	Altitude	Altitude is ≤1000m, and it needs derating if it is greater than 1000m	
	Power	Indoor 5.5kW/Indoor 7.5kW: scope of voltage: 187V~242V; frequency: 50Hz±2Hz Indoor 12.5kW/Indoor 17kW/Indoor 20.5kW: scope of voltage: 323V~418V; frequency: 50Hz±2Hz	

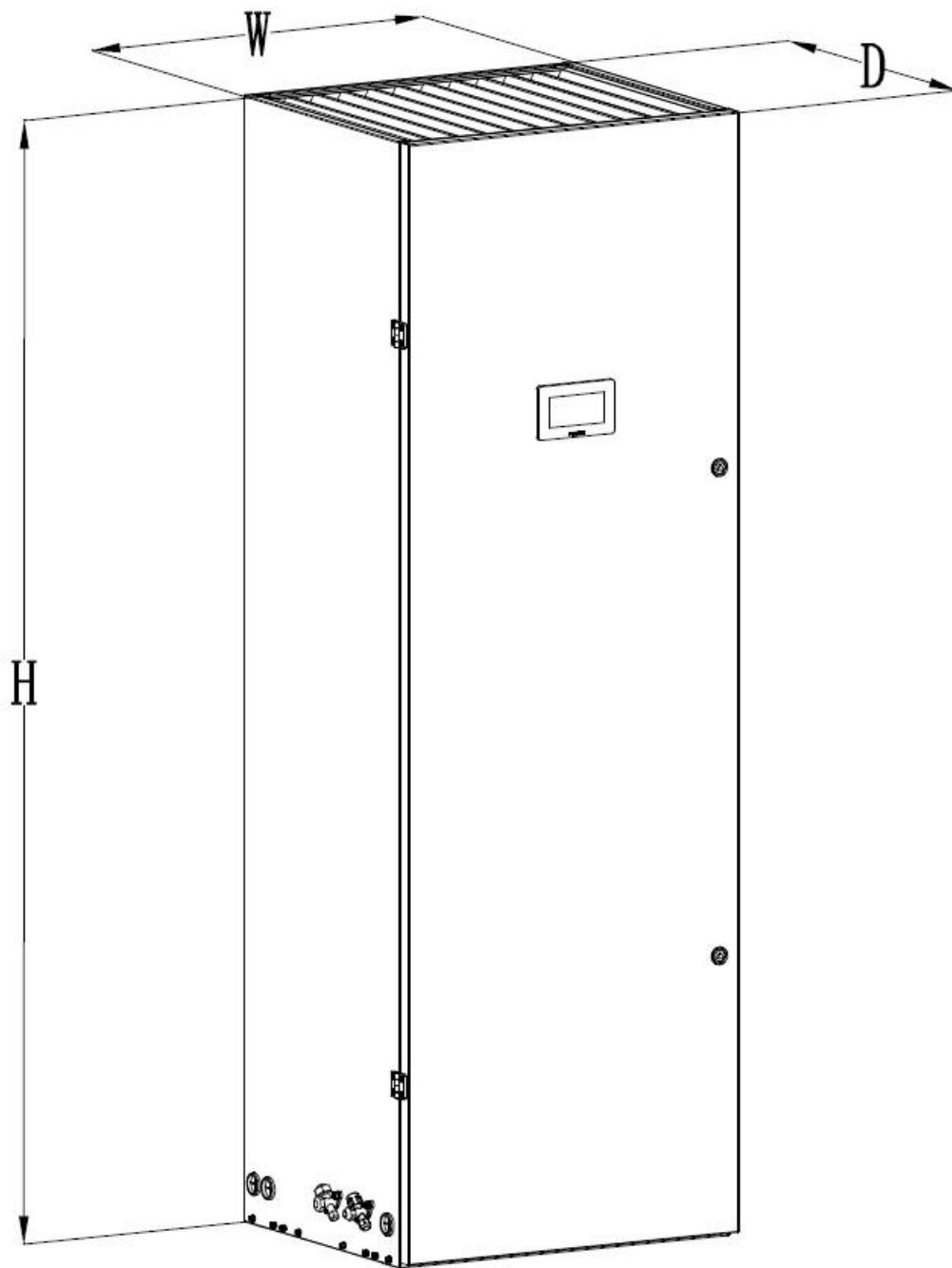
## 1.4 Product Specifications

### 1.4.1 Product Appearance

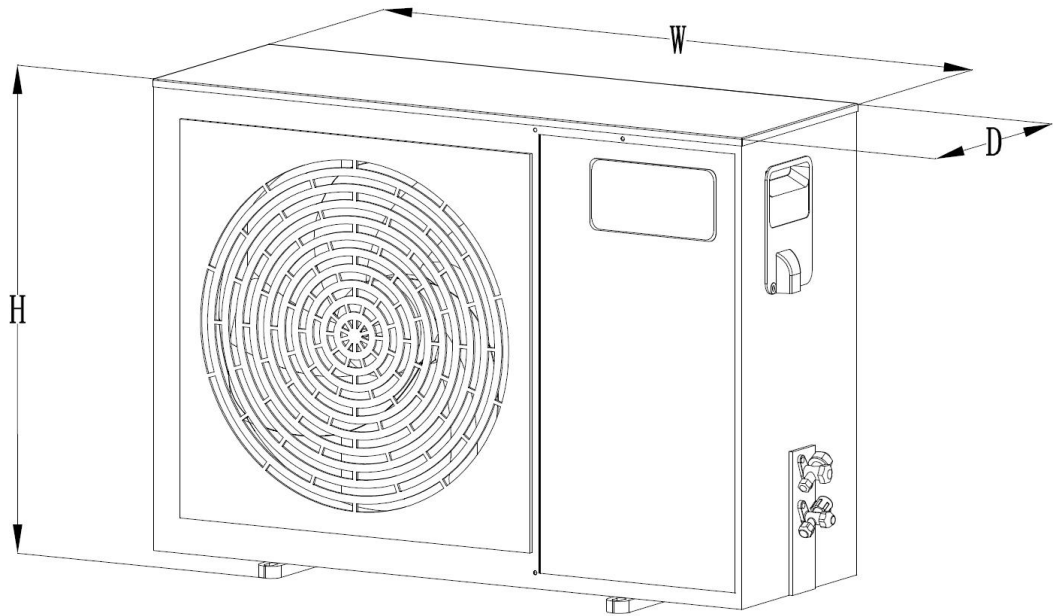


**Fig. 1-3 Diagrammatic Sketch of the Appearance of Indoor Unit of Top Front Air Supply**

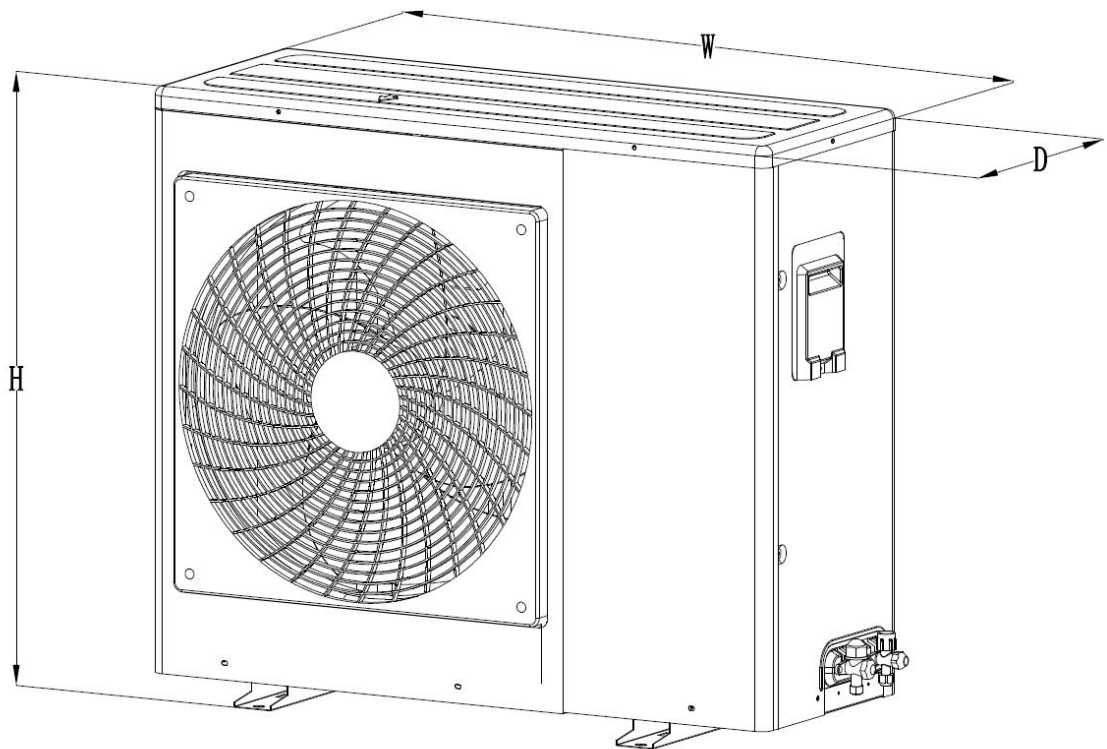




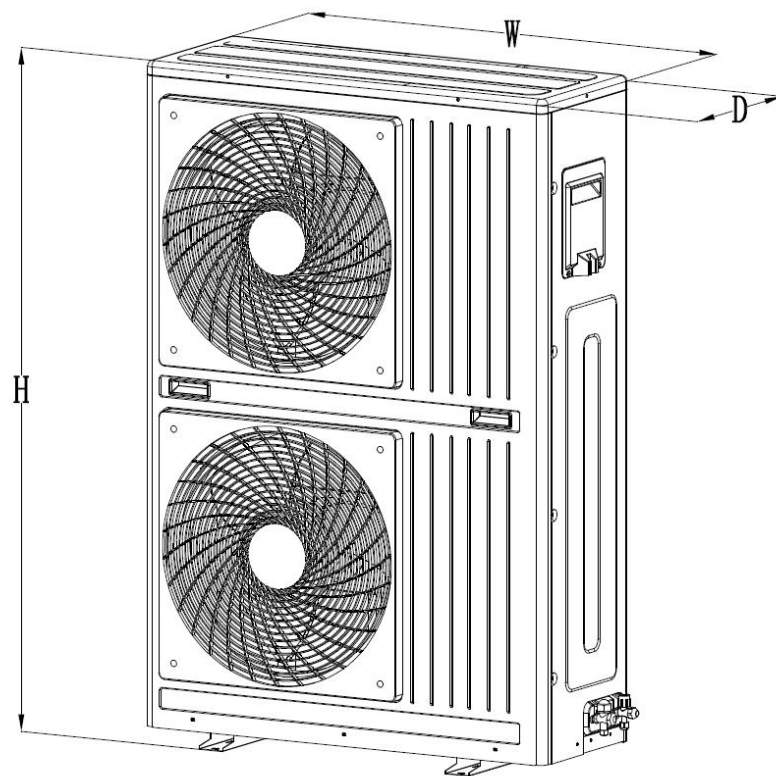
**Fig. 1-4 Diagrammatic Sketch of the Appearance of Indoor Unit of Downflow Air Supply**



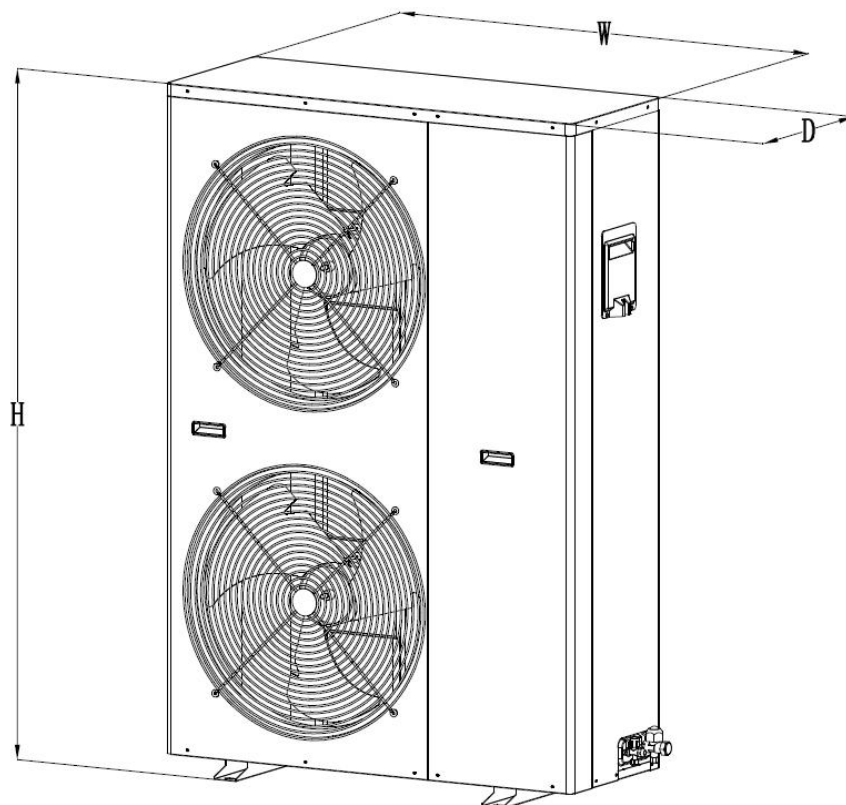
**Fig. 1-5 Outside Drawing of Outdoor 7kW**



**Fig. 1-6 Outside Drawing of Outdoor 10kW**



**Fig. 1-7 Outside Drawing of Outdoor 18kW**



**Fig. 1-8 Outside Drawing of Outdoor 24kW/Outdoor 28kW**

## 1.4.2 External Dimension and Net Weight

See Table 1-2 for the corresponding relationship between the indoor and outdoor models of the air-cooled small room air conditioners.

**Table 1-2 Check List of Indoor and Outdoor Models of Air-cooled small room Air Conditioners**

Model				
Indoor 5.5kW	Indoor 7.5kW	Indoor 12.5kW	Indoor 17kW	Indoor 20.5kW
Outdoor 7kW	Outdoor 10kW	Outdoor 18kW	Outdoor 24kW	Outdoor 28kW

See Table 1-3 for the external dimension and net weight of the air-cooled small room air conditioners.

**Table 1-3 External Dimension and Net Weight of the Air-cooled small room Air Conditioners**

Model	External dimension (mm) W×H×D	Net weight (kg)
Indoor 5.5kW	520×420×1750	62
Indoor 7.5kW	520×420×1750	65
Indoor 12.5kW	600×520×1800	100
Indoor 17kW	700×700×1900	120
Indoor 20.5kW	700×700×1900	130
Outdoor 7kW	840×285×606	38
Outdoor 10kW	830×311×720	42
Outdoor 18kW	832×330×1246	50
Outdoor 24kW	1050×400×1560	90
Outdoor 28kW	1050×400×1560	90

[Note: W-width; D-depth; H-height]

See Table 1-4 for the package dimension and gross weight of the air-cooled small room air conditioners.

**Table 1-4 Package Dimension and Gross Weight of This Series Air-cooled small room Air Conditioners**

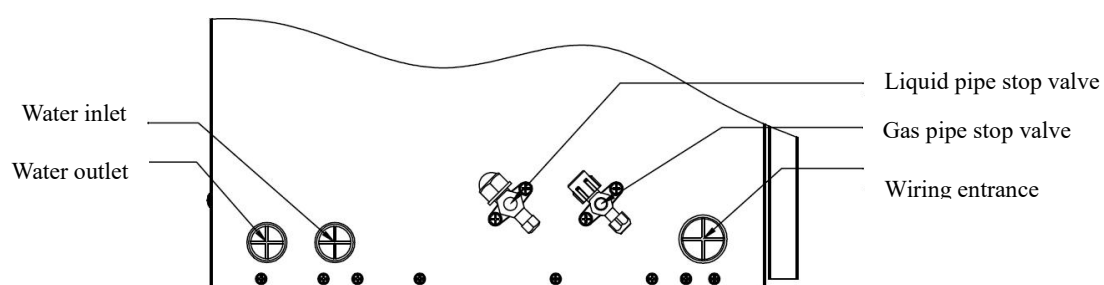
Model	Packaging dimension (mm) W×D×H	Gross weight (kg)
Indoor 5.5kW	650×570×1915	67
Indoor 7.5kW	650×570×1915	70
Indoor 12.5kW	715×635×1972	105
Indoor 17kW	855×855×2050	125
Indoor 20.5kW	855×855×2050	135
Outdoor 7kW	980×380×764	43

Outdoor 10kW	945×390×755	47
Outdoor 18kW	945×390×1417	55
Outdoor 24kW	1150×490×1722	95
Outdoor 28kW	1150×490×1722	95

[Note: W-width; D-depth; H-height]

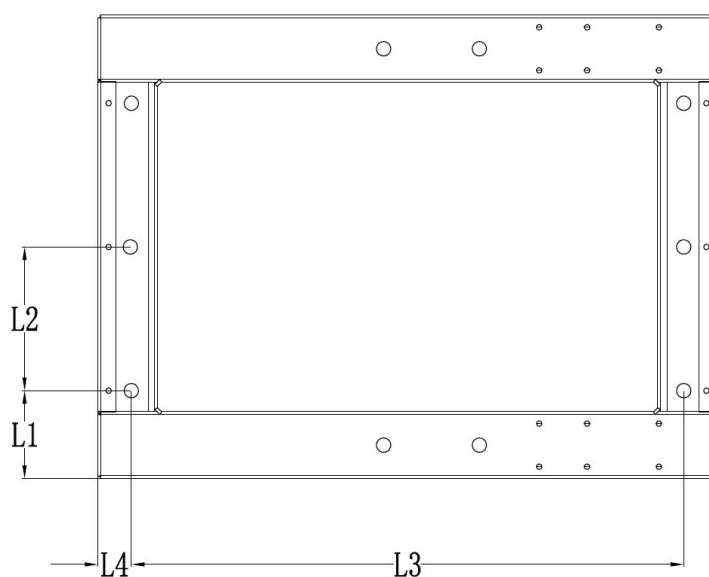
### 1.4.3 Description of Hole Position

The left panel of the indoor unit is provided with a water outlet, a water inlet and a user service entrance, and the positions of hole sites are shown in Fig. 1-9. The water pipe for supplying water to the humidifier needs to pass through the water inlet and then be connected with the water inlet valve of the humidifier; the drainage pipe of the unit needs to pass through the drain outlet and then connect with the external drainage pipe; the external power supply cable of the unit needs to pass through the user inlet and then be connected to the electric control box.



**Fig. 1-9 Diagrammatic Sketch of Hole Position of Indoor Unit**

Indoor unit should be installed on the base, and the bolt holes are shown in Fig. 1-10. The air conditioners can be fixed on the bracket only by punching M8 bolts on the left and right holes.



**Fig. 1-10 Schematic Diagram of Bolt Position of Fixing Hole Position of Base**

The fixed positions of screw holes of indoor unit base are shown in Table 1-5:

**Table 1-5 Schematic Diagram of Bolt Hole Position of base**

Type	Model	L1(mm)	L2(mm)	L3(mm)	L4(mm)
Top Front Air supply	Indoor 5.5kW、 Indoor 7.5kW	60	250	470	25
	Indoor 12.5kW	30	290	550	25
	Indoor 17kW、 Indoor 20.5kW	100	400	650	25
	Indoor 5.5kW、 Indoor 7.5kW	74	120	462	29
Downflow Air Supply	Indoor 12.5kW	94	150	542	29
	Indoor 17kW、 Indoor 20.5kW	124	210	642	29

## Chapter 2 Product Transportation and Receiving

### 2.1 Product Transportation

#### About the Product

The air-cooled small room air conditioners contain mechanical, electrical and other equipment. Improper transportation and handling may result in product damage and equipment failure. Please strictly observe the following precautions during transportation and handling:

1. No rainfall;
2. Put vertically;
3. No stacking;
4. Be careful of collision.



#### Tips

- 1) The specific requirements shall be subject to the packaging requirements;
- 2) Please try to choose a better mode of transportation (such as railway transportation and shipping). When choosing automobile transportation, please choose road with good road conditions to prevent excessive bumps;
- 3) Transportation environment and placement requirements shall be implemented according to relevant requirements;
- 4) Please use mechanical handling tools when unloading and handling.

### 2.2 Product Receiving

The air conditioners have undergone strict quality testing and inspection before leaving the factory. Please carefully check the equipment when receiving the products to ensure that the equipment is not damaged during transportation.

#### Receiving process

The receiving process of the air conditioner products is suggested to operate according to Fig. 2-1. If the user installs the unit immediately after unpacking, there is no need to perform the “packing” operation described in the

process, and the acceptance can be carried out directly after the inspection is correct; if the unit installation is not carried out temporarily after unpacking, the “packing” operation described in the process should still be carried out after the inspection is correct, and the products should be stored as required.



**Fig. 2-1 Simulated Schematic Diagram of Receiving Process**

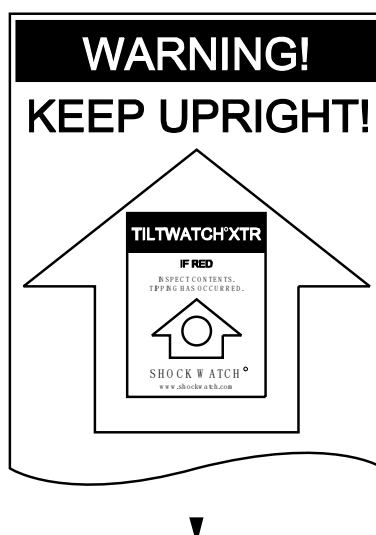
Please refer to the following instructions for the related process described in Fig. 2-1.

### ● External Inspection

The contents of external inspection include external product packaging and product exterior, etc.

Inspection contents:

1. Whether the external packaging has been unpacked;
2. Whether the external packaging has obvious damage and collision marks;
3. Whether the exposed parts of the equipment are damaged, such as sunken fins, structural deformation and peeling off of top paint, etc.
4. Whether the anti-tilt label turns red (refer to Fig. 2-2).



Check the circle turns red or not

**Fig. 2-2 Schematic Diagram of the Anti-tilt Label**



- 1) If it is found that the anti-tilt label has turned red or the package has been unsealed, please check the bill of



loading or other aspects for any information. If not, please contact the technical service department;

2) If the product is damaged, please indicate the corresponding information on the bill of lading and submit the damage claim to the transportation company.

### ● **Unpacking**

Unpacking suggestions:

1. It is recommended that users carry the products to the place close to the installation place (or to the storage place) before unpacking;
2. When unpacking, users are advised to consider the recycling of packing boxes.

Unpacking steps:

- 1) Remove the packaging materials

The unit uses high-strength environmentally-friendly paper packaging, and the paper packaging, wrapping film and protective materials are removed on site in turn.

- 2) Remove the bottom tray

The unit is fixed on the bottom tray of the package with M8 bolts, and can be disassembled with M8 wrench, ratchet wrench or sleeve.



#### **Tips**

- 1) This series air-cooled small room air conditioners are packed in cartons, so users must be careful when unpacking, so as to avoid equipment damage caused by improper operation and affect the normal use of the unit;
- 2) If the equipment is damaged due to improper human operation, the product is not covered by the manufacturer's warranty.

### ● **Internal Inspection**

Inspection Contents:

1. After unpacking, please carefully check whether all the components inside the equipment are complete and damaged;
2. Check whether the accessories are complete according to the packing list.



#### **Tips**

- 1) If any parts are found missing or damaged during inspection, it shall be reported to the carrier

immediately; if hidden damage is found, please report it to the carrier and product supplier;

- 2) If the inventory according to the packing list is incomplete, please contact the after-sales service department of the product supplier immediately.

## 2.3 Product Storage

When the user does not need to install the product after receiving it, it should be properly stored according to the following requirements (refer to Table 2-1).

**Table 2-1 Requirements on Equipment Storage**

Contents	Requirements
Storage environment	Safe and clean (dust-free)
Storage temperature	-40°C ~ 70°C
Storage humidity	<95%RH (no condensation)
Storage time	The total transportation and storage time shall not exceed 6 months, and the performance shall be recalibrated after 6 months.

### Notes

- 1) Long-term exposure of the equipment to the outside environment after taking out the packing box may cause equipment damage. If the equipment has been unpacked, it should be repackaged and placed according to the original packaging requirements.

## Chapter 3 Product Installation

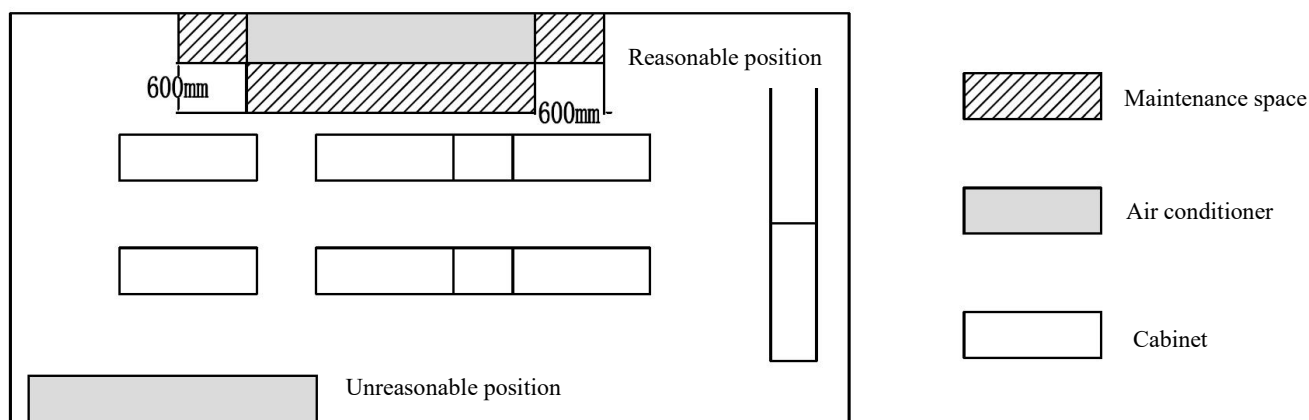
### 3.1 Site Requirements

In order to facilitate the installation of the unit, before installing the equipment, the user should consider the relevant factors of the installation site to ensure that the room and outdoor environment meet the use requirements.

Before installation, please confirm whether the installation site meets the following requirements:

1. Whether it is convenient for the equipment to enter the installation site and whether the pipeline and wiring are convenient;
2. The engine room should have good heat insulation and a closed moisture-proof layer. The moisture-proof layer of the ceiling and walls must be made of polyethylene film;
3. The entrance of outdoor air may increase the load of heating, cooling, humidification and dehumidification of the system. Therefore, it is necessary to minimize the entrance of outdoor air into the engine room. It is suggested that the intake of outdoor air should be kept below 5% of the total indoor circulating air.
4. All doors and windows in the engine room should be fully enclosed, and the gap should be as small as possible;
5. The air conditioner will produce condensed water, and water leakage may cause damage to other nearby precision equipment. Therefore, the air conditioner should not be installed near the precision equipment, and a drainage pipeline must be provided at the installation site;
6. The site where the Downflow Air Supply unit is installed needs to ensure a reasonable height of electrostatic floor, which should be 300mm higher than the ground, and 400mm higher than the ground if there is a sinking air supply. Please contact professionals for the specific actual height and design according to the site requirements.

**Note:** In order to ensure the normal operation of indoor units, spacious open space should be selected as the installation site of indoor units as far as possible; avoid placing the indoor unit in a narrow place, otherwise it will hinder the air flow, shorten the refrigeration cycle, and lead to short circuit of return air and air noise; avoid placing indoor units at the end of concave or narrow rooms; avoid multiple indoor units close together to avoid cross air flow, unbalanced load and competitive operation. In order to facilitate daily maintenance, do not install other equipment (such as smoke detectors) above the cabinet, and reserve a maintenance space of  $\geq 600\text{mm}$  around the unit. See Fig. 3-1 for the installation position of indoor unit.



**Fig. 3-1 Schematic Diagram of Reference Installation Position of Indoor Unit**



### Tips

The above factors are for reference only, please hire professional engineers to design according to the relevant specifications according to the site conditions;

## 3.2 Installation Forms

The installation forms of the small room air conditioners are divided into positive drop and negative drop:

- Positive drop: the installation position of outdoor unit is higher than that of indoor unit (Fig. 3-2). The installation layout in this application should follow the following principles:

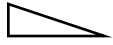
- 1) The maximum allowable positive drop of vertical height of indoor and outdoor units shall not exceed 20m, and extension components shall be added after the positive drop exceeds 10m;
- 2) In order to ensure the reliability of the system, an oil trap should be set every 5m at the vertical height of the gas pipe, and an inverted trap should be set at the inlet and outlet of the outdoor unit, which should be higher than the highest row of copper pipes in the condenser;
- 3) When the vertical height of indoor and outdoor units exceeds 20m, please contact our technical department for solution.

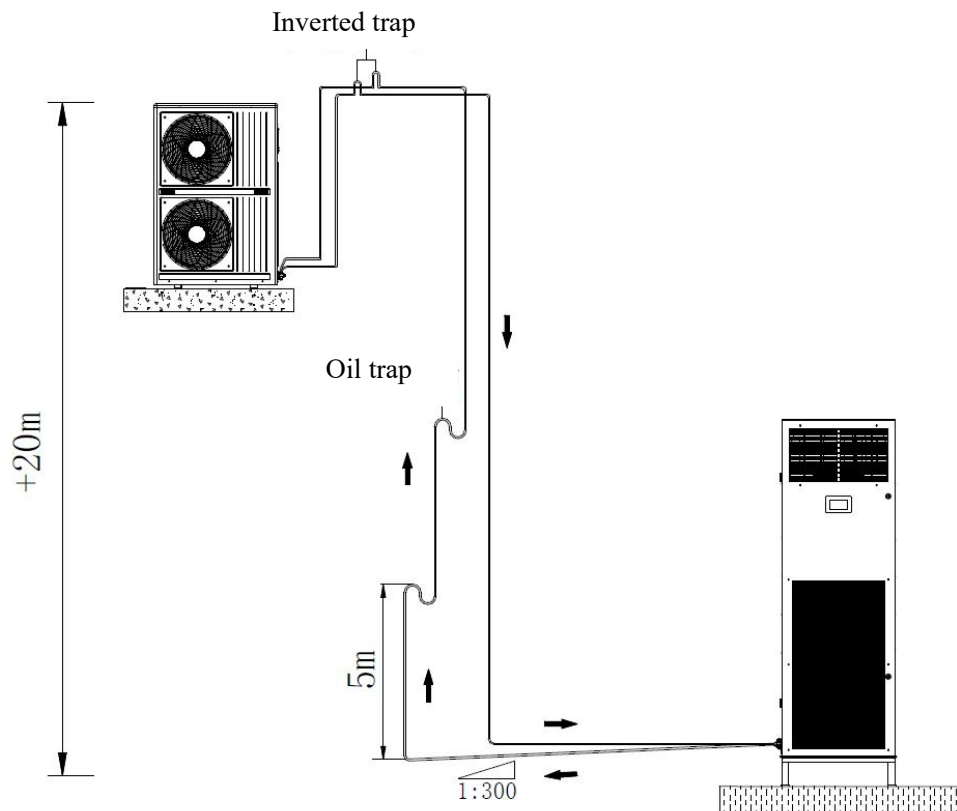
- Negative drop: the installation position of indoor unit is higher than that of outdoor unit (Fig. 3-3).

The installation layout in this application should follow the following principles:

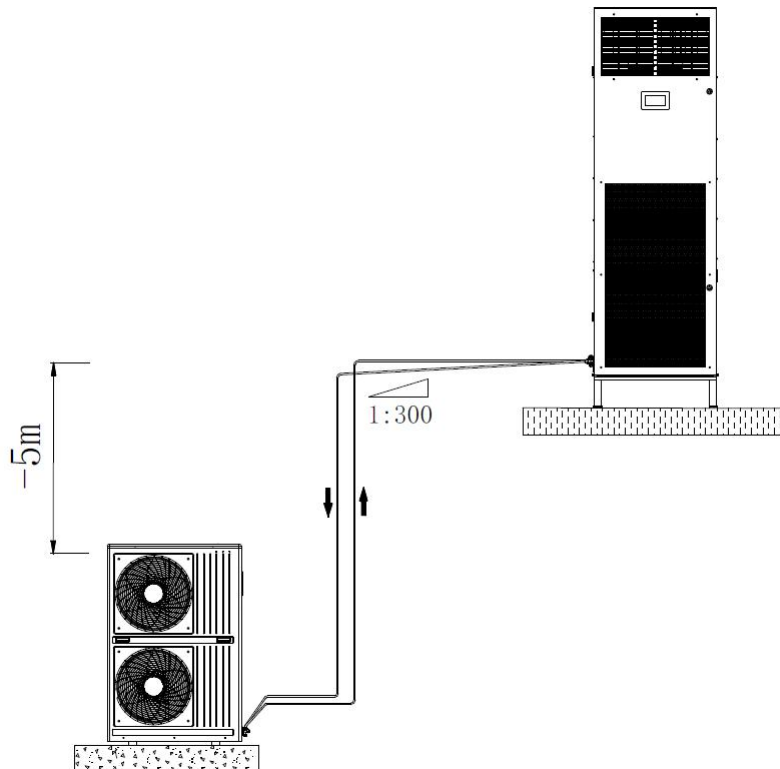
The maximum allowable negative drop of vertical height of indoor and outdoor units shall not exceed 5m.

 Tips

- 1) When calculating the height difference, the indoor unit is based on the bottom of the compressor, and the outdoor unit is based on the highest copper tube of the condenser;
- 2)  in the figure is the inclination icon, and the inclination direction of the pipeline should be the same as the oblique side of the right angle, and the inclination of the pipeline it refers to should be at least 1:300.
- 3) Casing should be set at the place where the pipeline passes through the wall and floor of the main engine room, and sealing measures should be taken between the pipeline and the casing.



**Fig. 3-2 Schematic Diagram of Positive Drop Installation**



**Fig. 3-3 Schematic Diagram of Negative Drop Installation**

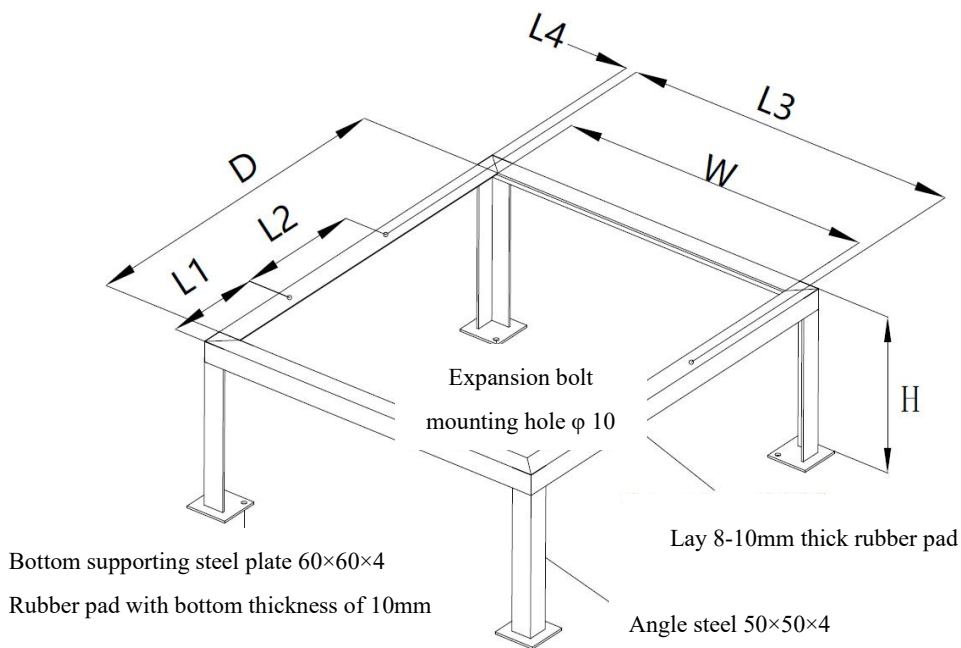
### 3.3 Mechanical Installation

#### 3.3.1 Installation of Indoor Unit

**Step 1** Fix the installation base made by the user on the selected indoor unit installation position. The installation and dimensions of the base are shown in Fig. 3-4 and Table 3-1.

**Step 2** Lay a layer of 8mm-10mm thick rubber pad on the base;

**Step 3** Put the indoor unit on the installation base and fix it with nuts, spring pads, flat pads and bolts.



**Fig. 3-4 Schematic Diagram of small room Air Conditioner Base Bracket**

**Table 3-1 Specification of small room Air Conditioner Base Bracket**

Item		Specification(mm)	Remark
Angle iron		50×50×4	/
Rubber shock absorber pad	Upper	Thickness: 8.0-10.0	/
	Bottom	Thickness: 10.0	
Expansion bolt mounting hole (mm)		4- $\phi$ 12	/
Installation hole of small room air conditioner (mm)		4- $\phi$ 10	/
Indoor 5.5kW Indoor 7.5kW	W(mm)	420	H $\geq$ 150mm (upflow air supply)
	D(mm)	290	
	L1(mm)	31	H $\geq$ 300mm (non-sinking Downflow Supply)
	L2(mm)	250	
	L3(mm)	470	H $\geq$ 400mm (sinking Downflow Supply)
	L4(mm)	25	
Indoor 12.5kW	W(mm)	500	The actual dimension is determined according to the
	D(mm)	390	

	L1(mm)	31	actual needs of the site
	L2(mm)	290	
	L3(mm)	550	
	L4(mm)	25	
Indoor 17kW Indoor 20.5kW	W(mm)	600	
	D(mm)	570	
	L1(mm)	71	
	L2(mm)	400	
	L3(mm)	650	
	L4(mm)	25	
Indoor 5.5kW Indoor 7.5kW	W(mm)	420	
	D(mm)	380	
	L1(mm)	120	
	L2(mm)	120	
	L3(mm)	462	
	L4(mm)	29	
Indoor 12.5kW	W(mm)	500	
	D(mm)	470	
	L1(mm)	135	
	L2(mm)	150	
	L3(mm)	542	
	L4(mm)	29	
Indoor 17kW Indoor 20.5kW	W(mm)	600	
	D(mm)	580	
	L1(mm)	130	
	L2(mm)	210	
	L3(mm)	642	



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	L4(mm)	29	
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### 3.3.2 Installation of Outdoor Unit

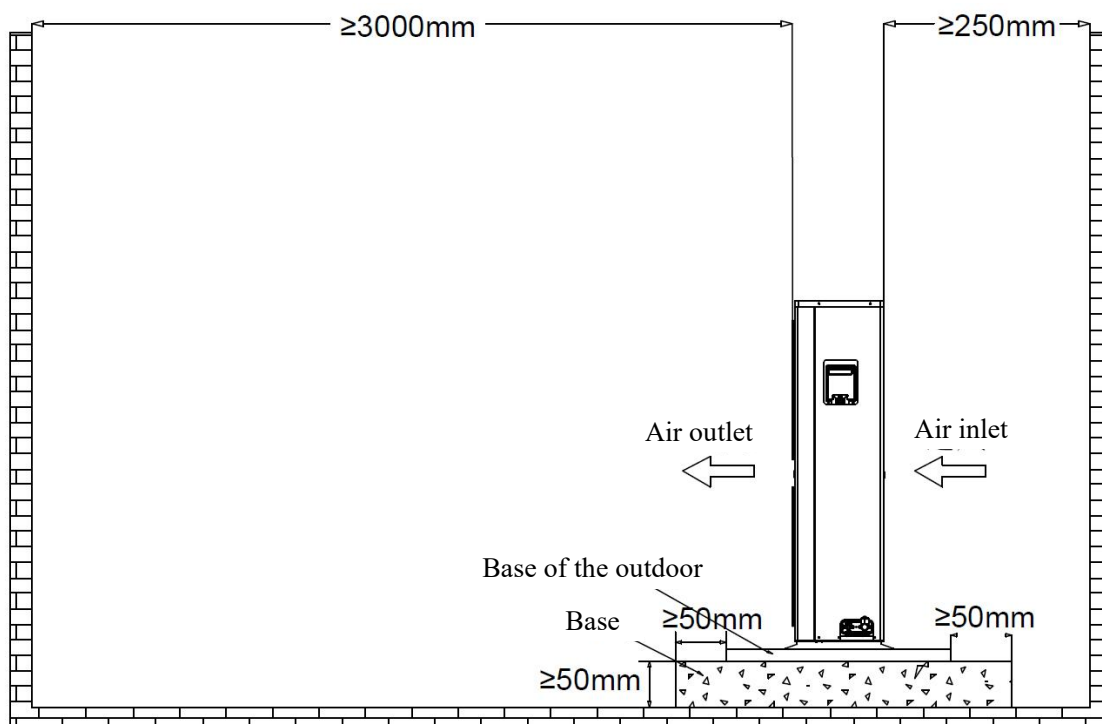
#### Installation Requirements

1. When installing the outdoor unit, ensure that the air inlet and outlet of the condenser are not blocked, and try to install it in a clean place and as far away as possible from residential areas;
2. Avoid installation in an environment containing more salt or other corrosive gases;
3. The installation place should be dry and ventilated with no gas leakage, so as to avoid fire disaster caused by flammable gas leakage;
4. The outdoor unit should keep a distance of more than 250mm from walls, obstacles or adjacent equipment (refer to Fig. 3-5);
5. The outdoor unit should be installed on a base that can bear the weight of the outdoor unit (see Table 1-4 for the specific weight of the outdoor unit). The base should be at least 50mm higher than the surrounding ground, and the size of the base should be 50mm larger than that of the outdoor unit.

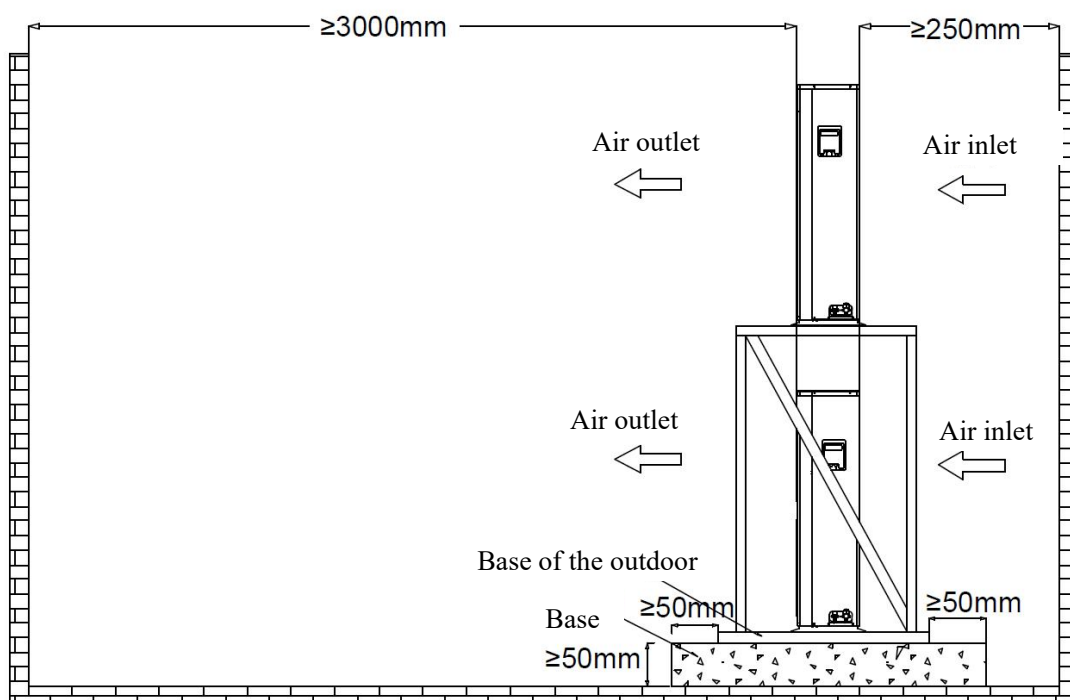
#### Installation Steps

**Step 1** Place the outdoor unit on the base.

**Step 2** Fix the outdoor unit on the base with expansion bolts.



**Fig. 3-5 Diagrammatic Sketch of the Installation of Outdoor Unit**



**Fig. 3-6 Diagrammatic Sketch of the Overlap Placement Installation of Outdoor Unit**



**Notes**

1. When the outdoor units need to be overlapped, the upper unit must be installed on the bracket (as shown in Fig. 3-6), and a buffer pad is installed between the unit and the bracket to play the role of isolation. It

is forbidden to directly connect the two units by screws!

## 3.4 Pipeline Connection

There are the following kinds of pipelines to be connected:

1. Refrigeration pipeline between indoor unit and outdoor unit.
2. Condensate water drain pipe of indoor unit.
3. Water inlet pipe of humidifier (When configuring humidifier).

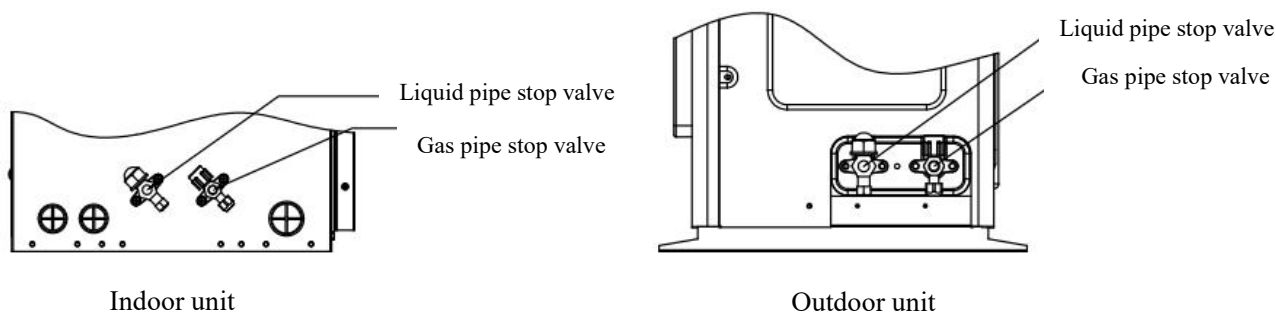
### General principles:

1. The indoor unit and outdoor unit are connected by copper pipes, and their joints are all British fast threaded joints. When the pipe length exceeds the standard pipe length and straight copper pipe is adopted, welding shall be adopted for connection;
2. You must choose and lay pipelines, vacuumize the system and charge refrigerant according to industry standards. The standard refrigerant of this air conditioner unit is R410A;
3. The pressure drop of pipeline and oil return of compressor should be considered to avoid leakage and blockage of system components and minimize noise and vibration;
4. If the equivalent length exceeds 30m or the vertical height difference between indoor unit and outdoor unit exceeds the maximum allowable value of positive or negative drop, please consult the manufacturer before installation to confirm whether it is necessary to add pipeline extension components and other measures.

### 3.4.1 Connection of the Refrigeration Pipeline of the Unit

#### 3.4.1.1 Pipe Joint Dimension

The pipeline interfaces of this series indoor units and outdoor units are male threaded connectors, and the position of the stop valves of indoor units and outdoor units of the upflow air supply type is shown in Fig. 3-7 (the stop valves of the downflow supply type are installed inside the unit, and the pipeline size is the same as that of the upper air supply type). When installing on site, connect the connecting pipes of indoor and outdoor units to the corresponding pipe interfaces of indoor and outdoor units.



**Fig. 3-7 Diagrammatic Sketch of Stop Valve**

Refer to Table 3-2 for the dimension of stop valve.

**Table 3-2 Check List of Dimension of Stop Valve**

Type	Dimension of liquid pipe stop valve	Dimension of gas pipe stop valve
Indoor 5.5kW/Outdoor 7kW	Pipe diameter 3/8", joint 5/8-18UNF	Pipe diameter 1/2", joint 3/4-16UNF
Indoor 7.5kW/Outdoor 10kW	Pipe diameter 3/8", joint 5/8-18UNF	Pipe diameter 1/2", joint 3/4-16UNF
Indoor 12.5kW/ Outdoor 18kW	Pipe diameter 3/8", joint 5/8-18UNF	Pipe diameter 1/2", joint 3/4-16UNF
Indoor 17kW/Outdoor 24kW	Pipe diameter 1/2", joint 3/4-16UNF	Pipe diameter 3/4", joint 1-1/16-14UNF
Indoor 20.5kW/Outdoor 28kW	Pipe diameter 1/2", joint 3/4-16UNF	Pipe diameter 3/4", joint 1-1/16-14UNF

Specifications of copper pipes required for the connection of indoor and outdoor units are shown in the following table:

**Table 3-3 Specification Table of Copper Pipes Connecting Indoor and Outdoor Units**

Type	Pipeline	10m	20m	30m	40m	50m	60m
Indoor 5.5kW	Liquid pipe (in)	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
	Gas pipe (in)	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Indoor 7.5kW	Liquid pipe (in)	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
	Gas pipe (in)	1/2"	1/2"	1/2"	5/8"	5/8"	5/8"
Indoor 12.5kW	Liquid pipe (in)	3/8"	3/8"	3/8"	1/2"	1/2"	1/2"
	Gas pipe (in)	1/2"	5/8"	5/8"	5/8"	5/8"	5/8"

Indoor 17kW	Liquid pipe (in)	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
	Gas pipe (in)	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Indoor 20.5kW	Liquid pipe (in)	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
	Gas pipe (in)	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"



### Notes

1. It is needed to consult the technical department for solutions if the copper pipe of Indoor 5.5kW/Indoor 7.5kW models exceeds 30m;
2. It is needed to increase the outdoor unit and consult the technical department for solutions when the connecting pipe of Indoor 12.5kW model exceeds 30m.

### 3.4.1.2 Precautions

#### Precautions of Joint Installation

Be especially careful when installing quick threaded joints. Before operation, please read the following precautions carefully:

1. Remove the dust cover of the valve joint;
2. Carefully wipe the connecting seat and threaded surface with a clean cloth;
3. Lubricate the mating surface of the joint with refrigerant oil;
4. Screw the connecting nut onto the joint and ensure that the front of the thread is matched;
5. Tighten the hexagon nut of the connector and the connecting valve until you feel obvious resistance;
6. During the installation process, two wrenches must be used to cooperate with the operation. The operation of one wrench can easily damage the connecting copper pipe of the valve. Refer to Table 3-4 for the recommended tightening torque value.

**Table 3-4 Recommended Tightening Torque Values for Quick Threaded Joints**

Threaded joint dimension (in)	Torque value (N.m)
1/4"	10~12
3/8"	15~18
1/2"	20~23
5/8"	28~32
3/4"	35~40
7/8"	45~47

1-1/16"	47~55
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### Precautions of Pipeline Installation

1. Indoor 5.5kW, Indoor 7.5kW and Indoor 12.5kW models are equipped with 5m connecting copper pipes for indoor and outdoor units while delivering, while connecting copper pipes of Indoor 17kW and Indoor 20.5kW models need to be prepared by customers according to the site conditions. See Table 3-3 for the specifications of copper pipes;
2. The indoor unit and outdoor unit are connected by copper pipes. When the pipe length exceeds the standard pipe length by 5m, the added copper pipes shall be connected by welding;
3. Refrigerant pipelines should be as short as possible, neat and beautiful, horizontal and vertical, with elbows minimized and fixed;
4. Meet the installation requirements of positive drop or negative drop;
5. See Table 3-5 for the equivalent length of local components, and the resistance loss caused by elbow and valve has been calculated.
6. Be careful when installing and disassembling refrigerant pipelines to prevent them from being twisted or damaged.
7. The refrigerant pipeline support frame should be arranged before the pipeline erection, and the refrigerant pipeline and the support frame should be connected and fixed by pipe clamps and pipe hoops to avoid direct contact. See Table 3-6 for support intervals.
8. When the refrigerant pipeline passes through the wall or other obstacles, it is necessary to adopt measures such as adding shock absorbing pads to avoid direct contact between the copper pipe and the wall or other obstacles, so as to prevent the pipeline from being damaged and reduce the vibration at the same time.
9. The slope of the horizontal pipeline shall comply with the design requirements, so as to facilitate oil return of the unit;
10. When the installation position of the outdoor unit is 5m higher than that of the indoor unit, the gas side pipe should be equipped with an oil storage bend.
11. Before using the refrigerant pipeline, leak detection, pressure keeping and vacuum pumping should be carried out, and the refrigerant pipeline should be separated from the building by a support frame.

**Table 3-5 Equivalent Length of Local Components**

External diameter of copper pipe (in)	45° bend (Unit: m)	90° bend (Unit: m)	180° bend (Unit: m)	Triple valve (Unit: m)


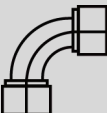
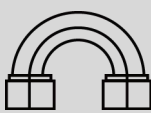
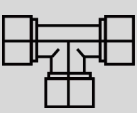
				
3/8"	0.12	0.21	0.40	0.60
1/2"	0.14	0.25	0.50	0.65
5/8"	0.17	0.30	0.60	0.70
3/4"	0.20	0.35	0.70	0.80
7/8"	0.24	0.42	0.80	1.20
1"	0.28	0.50	1.00	1.30
1-1/8"	0.32	0.60	1.20	1.40

Table 3-6 Reference Table of Pipeline Support Spacing

Outer diameter of pipeline		Maximum pivot point spacing (m)
mm	inch	
6~12	1/4"~1/2"	1.2
16~22	5/8"~7/8"	1.5
28~35	1-1/8"~1-3/8"	2.0
42~54	1-5/8"~2-1/8"	2.5

### 3.4.1.3 Refrigeration Pipeline Insulation

Heat insulation measures must be taken for the connecting pipeline of the refrigeration system, and both the gas side pipeline and the liquid side pipeline need to be insulated. Proper thermal insulation measures will directly affect the performance of the unit. Please follow the following requirements during operation:

1. Please choose insulation pipeline with good thermal insulation performance, suitable size, environmental protection and durability. The thickness of insulation pipeline shall be selected according to engineering design standards.
2. When the insulation pipeline is pasted, it must be ensured that the insulation pipeline is sealed, firm and close to the pipeline.

#### Notes

The heat insulation project should be carried out after the leak detection, pressure maintaining and vacuum pumping inspection of the refrigeration system of the unit. Refer to 3.5 Nitrogen Filling and Pressure Maintaining for specific operation.

### 3.4.2 Connection of the Water Inlet and Drainage Pipes of the Unit

#### 3.4.2.1 Connection of Drainage Pipes of Indoor Unit

Drainage pipes have been pre-installed inside the unit when it leaves the factory for this series, and users can install a drainage pipe according to the needs of the site. The standard water pipe length of non-pump model is 2m and that of condensate pump model is 1m. If it is necessary to lengthen the water pipe at the site, select the appropriate length according to the size of the drainage pipe noted in Table 3-7 for continuous connection.

**Table 3-7 Specifications of Dimensions of Drainage Pipes**

Model	Remark	Drainage pipe (external diameter×internal diameter)
Indoor unit	Without condensate pump	Ø22×Ø15mm
	Operational condensate pump	Ø14×Ø10mm

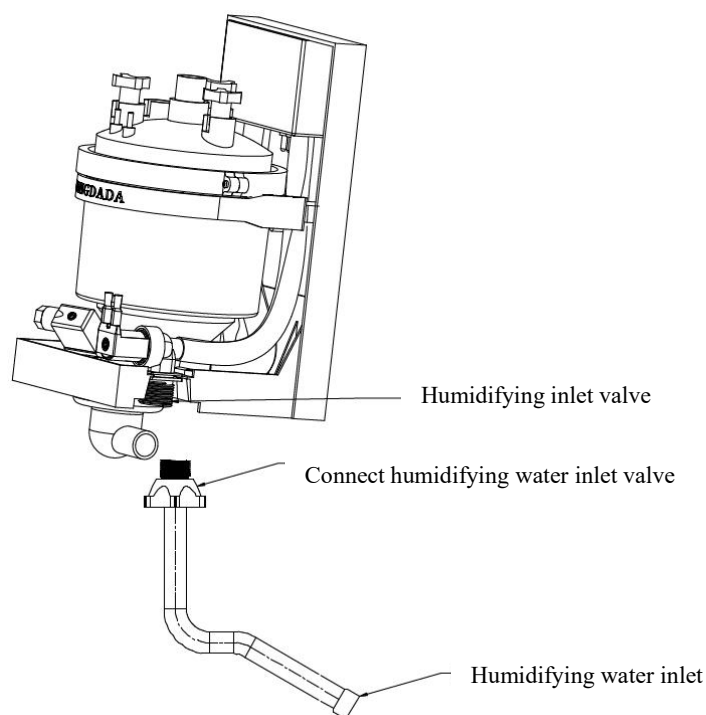
#### Notes

- 1) Drainage pipes cannot be placed at the freezing point!
- 2) Pipe diameter and slope shall be strictly guaranteed when installing drainage pipes.
- 3) Do the water storage and drainage test with smooth drainage required, and install the trap on the drainage pipe.
- 4) The unit equipped with electrode humidifier, the water discharged from humidifier and the condensate from evaporator converge through the water receiving tray, and then are discharged through the drainage pipe. Due to the high temperature water flowing in the electrode humidifier, the drainage pipe must be made of materials with temperature resistance above 100°C. Generally, steel pipe, copper pipe and PPR pipe are used, and PVC pipe is absolutely not allowed.

#### 3.4.2.2 Connection of Inlet Pipes of Indoor Unit

For models equipped with humidification function, see Fig. 3-8 for the layout of humidification inlet pipe. Before the installation of the unit, please set the water inlet pipe in advance as required.





**Fig. 3-8 Humidifying Water Inlet Pipe**

## Electrode humidification

For units equipped with electrode humidifier, the humidifier drainage pipes have been connected to the triple valve connected to the evaporator water tray, and only the inlet pipe of the humidifier needs to be connected on site (see Fig. 3 9 for water inlet and outlet joints). The following matters should be noted when connecting the humidifying inlet pipe:

1. The joint between the humidifying water inlet pipe and the water inlet side is G1/2 (internal thread), the water inlet pipe needs to be equipped with a filter/check isolation valve, and the joint between the humidifying water inlet pipe and the humidifying water inlet valve is G3/4 (external thread), and the connecting pipes need to be sealed to prevent water leakage;
2. Where the pressure of the main pipeline may exceed 0.4MPa, a pressure reducer shall be installed. Where the main pipeline pressure is lower than 0.1MPa, a water collecting tank and a water pump system shall be installed.
3. The electrode humidifier can use tap water, and it is recommended to use purified water (deionized water and distilled water are not allowed) with following specific requirements:
  - 1) Water inlet temperature: 4~40°C
  - 2) Water inlet pressure: 0.1~0.4Mpa

3) Electrical conductivity: 350~750 $\mu$ s/cm;

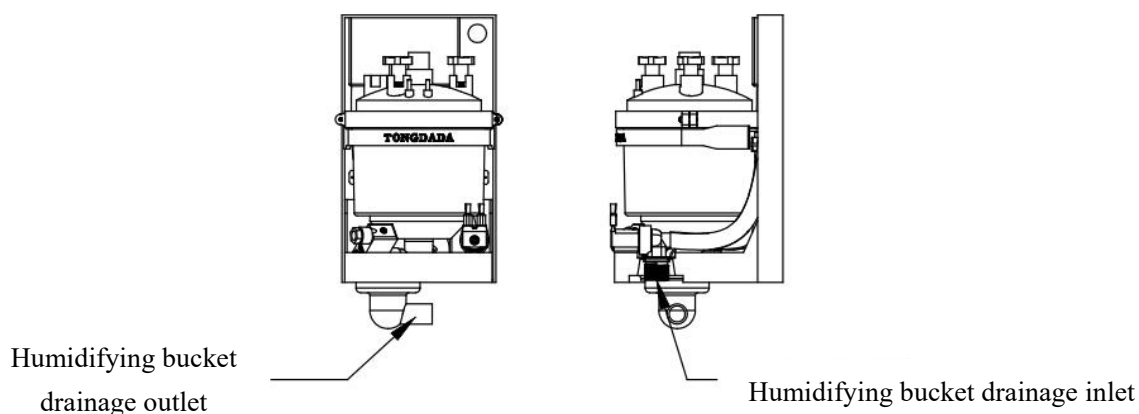


Fig. 3-9 Schematic Diagram of Inlet and Drainage Outlet Of Humidifying Bucket

### 3.5 Nitrogen Filling and Pressure retention, Vacuumizing

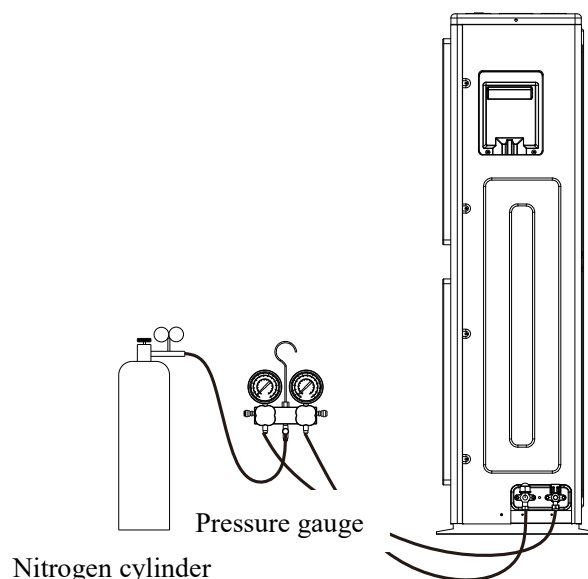
#### Precautions

1. The indoor and outdoor units of 5.5kW, 7.5kW and 12.5kW air conditioners are pre-filled with refrigerant when leaving the factory. Therefore, after the stop valves of indoor and outdoor units are closed, it is only necessary to fill nitrogen and maintain pressure on the connecting pipes and vacuumizing.
2. For 17kW and 20.5kW air conditioners, the indoor and outdoor units are filled with nitrogen when leaving the factory. Therefore, after the installation of the units, it is necessary to exhaust the nitrogen, vacuumize and maintain the pressure. After the installation, the corresponding amount of refrigerant should be filled. See Table 3-8 for the refrigerant filling amount.
3. It is forbidden to use oxygen or other combustible gases for airtight test;
4. The nitrogen pressure charged in the system leak detection shall not exceed the nominal maximum working pressure on the nameplate of the unit.

#### 3.5.1 Operation Steps of Nitrogen Filling and Pressure Maintaining

1. Make sure that the indoor and outdoor unit stop valves are closed, and then connect the indoor and outdoor unit connecting pipes;
2. Connect the pipe of the pressure gauge to the air and liquid pipe stop valve of the outdoor unit and the nitrogen bottle respectively (It can also be connected to the indoor unit stop valve);

3. Click “System Settings” from the display screen, enter the “Maintenance Settings” after entering the password, click the evacuation control and turn on the vacuumizing enable to keep the electronic expansion valve and the hydraulic solenoid valve open;
4. Fill the connecting pipe with nitrogen of 3.0MPa and keep the pressure for 24 hours. Under the condition that the ambient temperature is similar before and after the pressure keeping, the system pressure should not decrease; if there is a slight deviation of the pressure due to a big change in the ambient temperature, it is recommended to do the pressure maintaining test again;
5. If it is determined that there is welding leakage, find and repair the leakage in time. Refer to Fig. 3-10 for operation.

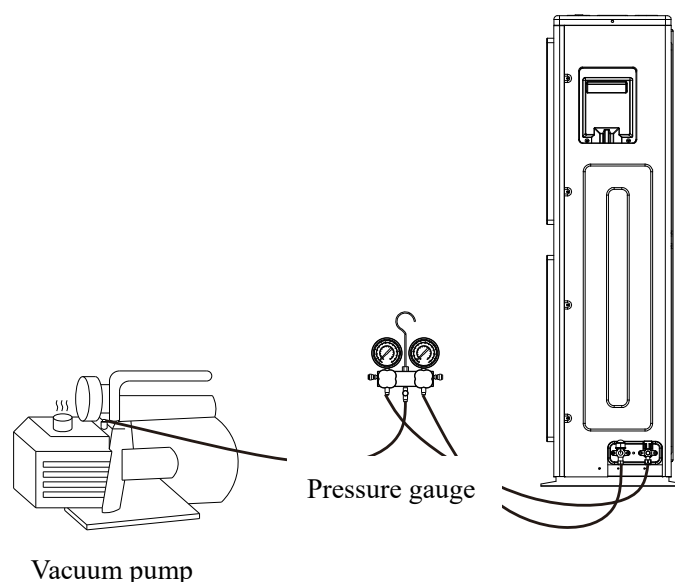


**Fig. 3-10 Schematic Diagram of Nitrogen Filling and Pressure Maintaining Operation**

### 3. 5. 2 Operation Steps of Vacuumizing

1. If the pressure is well maintained, after nitrogen is discharged from the outdoor unit stop valve, connect the pressure gauge connecting pipe to the outdoor unit gas and liquid pipe stop valve and vacuum pump respectively;
2. Click “System Settings” from the display screen, enter the “Maintenance Settings” after entering the password, click the evacuation control and turn on the vacuumizing enable to keep the electronic expansion valve and the hydraulic solenoid valve open;
3. Turn on the vacuum pump and start vacuum pumping;

4. At the beginning of vacuum pumping, the sound of the vacuum pump is loud, and “white smoke” emerges from the exhaust port. If “white smoke” still emerges after 10 minutes, it may be that the pipeline has leaked, and it should be continuously observed for 10 minutes.
5. 20 minutes later, the pressure gauge pointer should be in the negative value area, and the sound of the vacuum pump is small. At this time, the vacuum gauge can be turned off and turned on several times repeatedly. Before and after the pressure gauge pointer is turned off, the sound of the vacuum pump should have no obvious change, otherwise the pipeline may leak.
6. After confirming that there is no leakage in the refrigeration system, the vacuumizing time should generally not be less than 90 minutes, and finally the pressure displayed by the vacuum pump should not be greater than 60Pa; (if the pressure gauge can't accurately display to 60Pa, vacuumizing should keep the pressure gauge at the minimum scale, the pressure holding time should be delayed to 1h, and the pressure gauge should not obviously rise)
7. After vacuum pumping, first close all valves of the pressure gauge, then turn off the vacuum pump, without dismantling the connection, and keep the pressure for 10 minutes. The pressure of the refrigeration system should not be greater than 90pa (absolute pressure). Refer to Fig. 3-11 for operation.



**Fig. 3-11 Schematic Diagram of Vacuum Pumping Operation**

### 3.6 Charging of Refrigerant

5.5kW, 7.5kW and 12.5kW air conditioner have been pre-filled with standard refrigerant charge in the factory, while 17kW and 20.5kW are pre-filled with nitrogen. Please refer to Table 3-8 for the refrigerant charge standard of each model.

**Table 3-8 Refrigerant Charge**

Model	Unit	Refrigerant charge (kg)
<b>Indoor 5.5kW/Outdoor 7kW</b>	Indoor unit	0.5
	Normal-temperature type outdoor unit	1.2
	Low-temperature type outdoor unit	3.7
<b>Indoor 7.5kW/Outdoor 10kW</b>	Indoor unit	0.5
	Normal-temperature type outdoor unit	1.6
	Low-temperature type outdoor unit	4.1
<b>Indoor 12.5kW/Outdoor 18kW</b>	Indoor unit	1.1
	Normal-temperature type outdoor unit	1.5
	Low-temperature type outdoor unit	5.0
<b>Indoor 17kW/Outdoor 24kW</b>	Normal-temperature type whole unit	5
	Low-temperature type whole unit	7.5
<b>Indoor 20.5kW/Outdoor 28kW</b>	Normal-temperature type whole unit	5
	Low-temperature type whole unit	7.5

5.5kW, 7.5kW and 12.5kW units are equipped with 5m-long connecting pipes as standard. When the one-way connecting pipes of indoor and outdoor units on site are longer than 5m, the refrigerant needs to be supplemented. Refrigerant replenishment can refer to the following calculation formula:

- Refrigerant supplement (kg) = refrigerant addition in liquid pipe (kg/m) × extended liquid pipe length (m)

Among them, the amount of refrigerant added per unit length of liquid pipe can be calculated with reference to Table 3-9.

**Table 3-9 Refrigerant Charge Per Unit Length of Liquid Pipes with Different Pipe Diameters**

External diameter of liquid pipe (in)	Refrigerant Charge (kg/m)
1/4	0.020
3/8	0.060
1/2	0.112

5/8	0.181
3/4	0.261
7/8	0.362
1-1/16	0.618



#### Notes

- 1) Whether the refrigerant charge is proper or not will directly affect the performance of the unit, and it must be operated by a professional engineer;
- 2) The above refrigerant charge can be used as the initial budget before installation, or as the guidance for charging refrigerant after installation. The actual charge of engineering installation is subject to the final commissioning result.

### 3.7 Charge of Lubricating Oil

When the connecting pipes of indoor and outdoor units are long enough, and the amount of lubricating oil adhering to the pipe wall along with the suction and exhaust of the compressor and mixed in the refrigerant affects the oil return cycle, it is necessary to supplement the lubricating oil to the refrigeration system to ensure the normal and efficient operation of the compressor. Please consult the relevant service departments for questions about the charging amount of lubricating oil of the compressor.

### 3.8 Disassembly of Transportation Fasteners and Vibration Dampers

In order to prevent some parts from being deformed and damaged due to bumps, impacts and resonances during transportation, fasteners or vibration dampers are added at necessary places when leaving the factory. Before the unit is installed and commissioned, the transportation fasteners and vibration dampers must be disassembled. During transportation, the three fixed feet of the compressor are equipped with L-shaped sheet metal for transportation and fixation. Please remove the three L-shaped fixed metal plates before the installation and commissioning of the unit, and then install the bolts and gaskets in the reverse order of disassembly. The tightening torque of bolts is  $12 \pm 1 \text{ N}\cdot\text{m}$ .

## 3.9 Electrical Installation

### Operation Items

1. The main power line connection of the unit;
2. Connection of outdoor unit line;
3. Communication line connection.

### Precautions

1. The connection of all lines must comply with the provisions of national and local electrical codes;
2. Please refer to the equipment nameplate for the full load current of relevant units;
3. The main power supply meets the unit requirements. Please refer to the equipment nameplate;
4. Electrical installation must be carried out by qualified professional installers;
5. Before connecting the circuit, measure the input power supply voltage with a voltmeter to make sure that the power supply has been disconnected;
6. If the power cord is damaged, it must be replaced by professionals of the manufacturer or other professional institutions to avoid danger;
7. During on-site wiring, the wiring mode of wiring diagram should be strictly followed, and it is not allowed to be connected by mistake or in disorder.

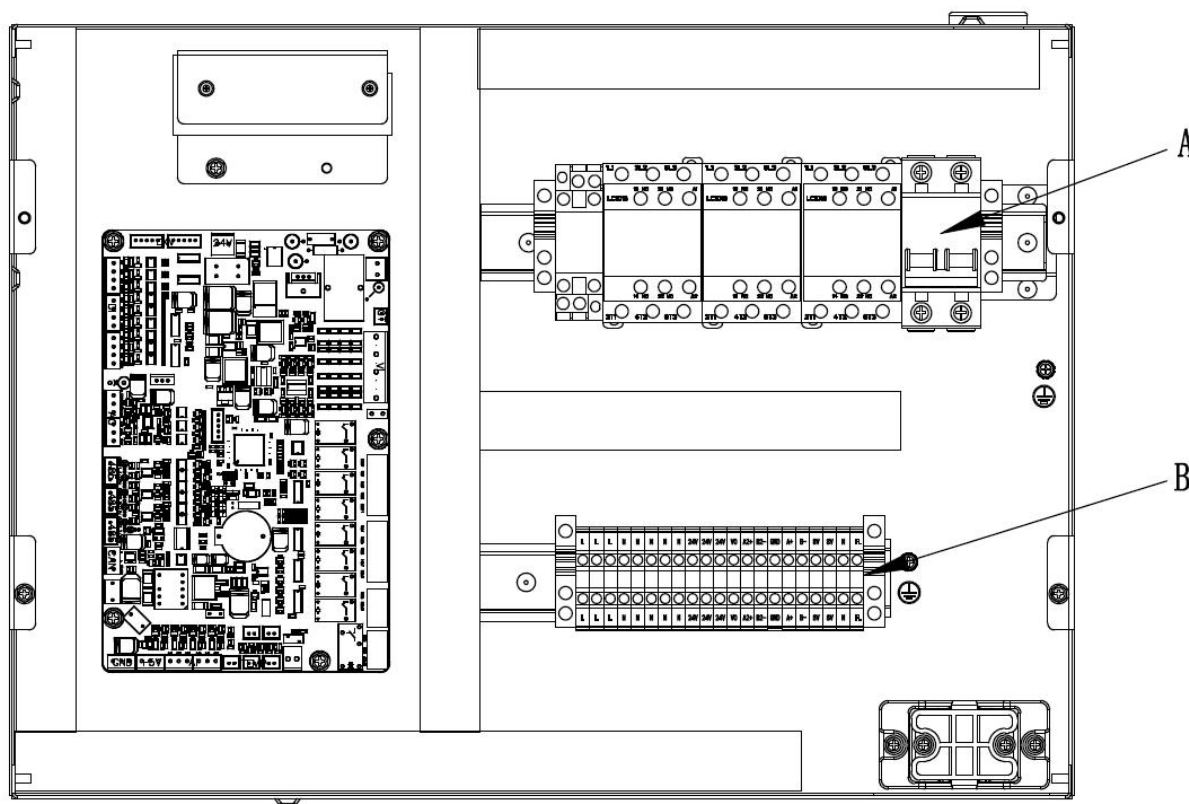
### 3.9.1 Operating Instructions

**Step 1** Determine the wiring mode. The power cord of the unit is connected to the electric control box through the right user inlet hole.

**Step 2** Determine the connection port. Open the cabinet door and remove the electric control box cover plate to see the inside of the electric control box. The schematic structure of the electric control box is shown in Fig. 3-12.

**Step 3** Connect the power cables of the indoor and outdoor units. For Indoor 5.5kW/Indoor 7.5kW unit, connect the indoor power supply incoming line L/N/PE to the fixed hole marked L/N in the customer wiring area and the right ground wire; for Indoor 12.5kW/Indoor 17kW/Indoor 20.5kW units, connect the indoor power supply incoming line L1/L2/L3/N/PE to the customer wiring area marked L1/L2/L3/N and the right ground wire fixing hole; connect the FL/N/PE of the indoor and outdoor unit connection line to the customer connection area marked

FL/N and the right ground wire fixing hole.



**Fig. 3-12 Schematic Diagram of Electric Control Box Structure**

**A**—— Connecting port of main power supply

**B**—— Signal interface and connection port of indoor and outdoor units

The specifications of the power cord are recommended to be selected according to the national standard. Refer to Table 3-10 for the specifications of the power cord of the unit.

**Table 3-10 Parameters of Unit Power Cord**

Name		Recommended cable specifications (core number × cross-sectional area)	Remark
Power cord of indoor unit	Indoor 5.5kW/Indoor 7.5kW	Electronic power cable-3×4.0mm <sup>2</sup>	Prepared by the client
	Indoor 12.5kW/Indoor 17kW/Indoor 20.5kW	Electronic power cable-5×4.0mm <sup>2</sup>	Prepared by the client
Power cord of outdoor unit	Indoor 5.5kW/Indoor 7.5kW	Electronic power cable-3×1.5mm <sup>2</sup>	Accessories are attached



	Indoor 12.5kW/Indoor 17kW/Indoor 20.5kW	Electronic power cable-3×1.5mm <sup>2</sup>	Prepared by the client
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**Step 4** Connect the control signal line. Refer to Table 3-11 for the corresponding description of signal output terminals shown in Fig. 3-12 and recommended cable specifications.

**Table 3-11 Parameter Table of Signal Line of the Unit**

Mark	Description	Recommended cable specifications (core number × cross-sectional area)	Remark
SV/SV	Low-temperature component magnetic valve power cord	Electronic power cable-2×1.0mm <sup>2</sup>	Prepared by the client
HE/HE	Low-temperature component crankcase heater power cord	Electronic power cable-2×1.0mm <sup>2</sup>	Prepared by the client
A+/B-	Moving-ring monitoring communication line	Shield line - 2×0.5mm <sup>2</sup>	Prepared by the client
A2+/B2-/GND	Rotating group control communication line	Shield line - 2×0.5mm <sup>2</sup>	Prepared by the client

### 3.9.2 Wiring Inspection

After the electrical installation is completed, the following inspections must be carried out:

1. Make sure that the cables of indoor unit and outdoor unit are connected correctly;
2. The power supply voltage is consistent with the rated voltage on the equipment nameplate;
3. There is no open circuit or short circuit in the electrical circuit of the system.
4. All terminal connections are fastened in place;
5. The front end of the main power supply terminal of air conditioner should be equipped with all-pole disconnecting device, and its rating should be confirmed.

## Chapter 4 Controller


### 4.1 Display and Description

#### 4.1.1 Main Interface of Display Screen



**Fig. 4-1 Schematic Diagram of Main Interface of Display Screen**

The main interface is mainly divided into three parts: menu bar, label bar and display area.

1. Menu bar: located at the bottom of the main interface, including 6 icons, such as home page, running status, data management, alarm management, system settings and startup/shutdown .
2. Label bar: located at the top of the main interface, showing the current state of the unit and alarm information; when the alarm beeps, click the alarm mute to cancel the alarm.
3. Display area: divided into equipment operation mode and current temperature and humidity. For example, the refrigeration is on, indicating that the unit is currently in the refrigeration mode.

### 4. 1. 2 Navigation Picture of Display Screen

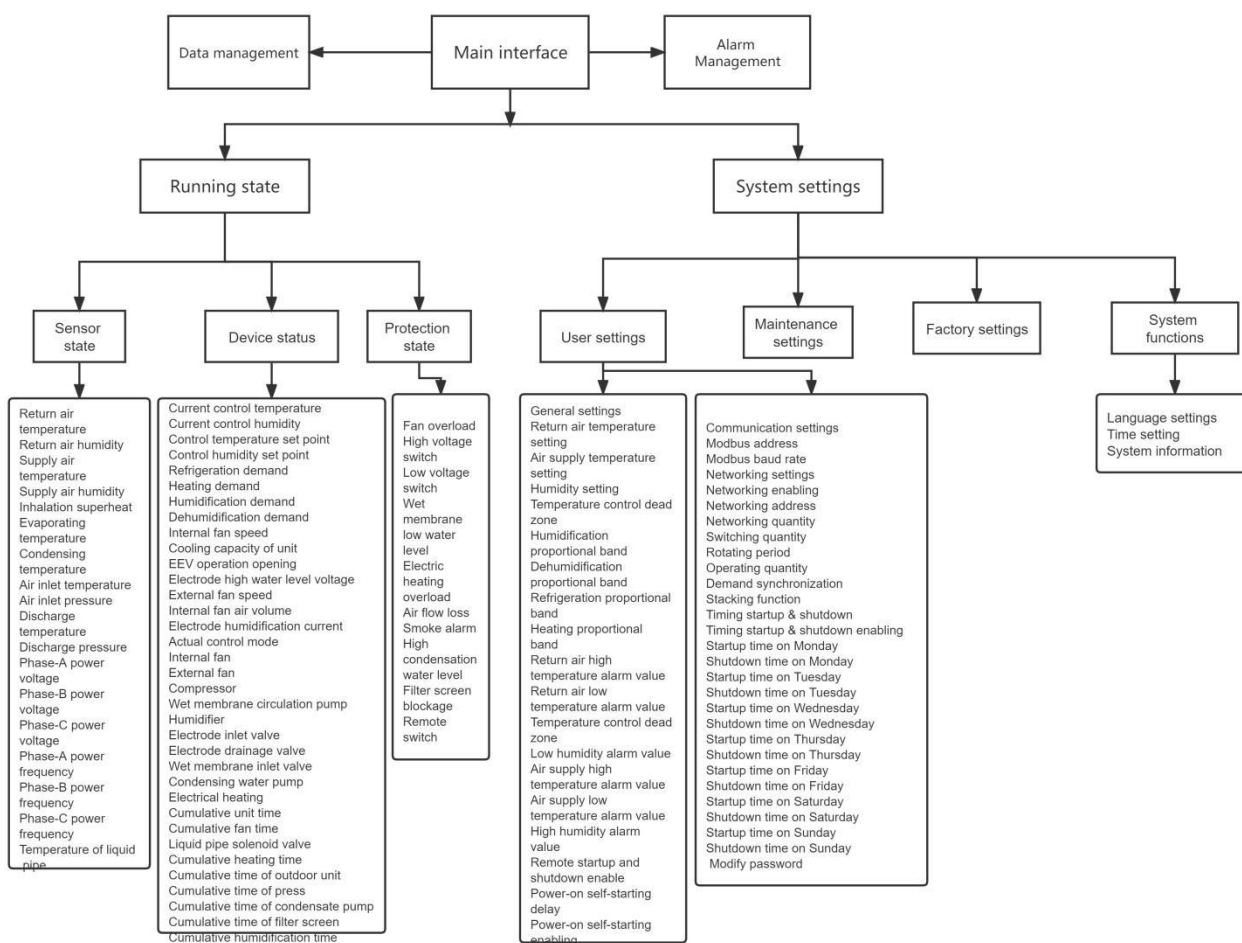


Fig. 4-2 Navigation Picture of Display Screen

### 4. 1. 3 Running State

Click “Running Status” option in the menu bar of the main interface of the display screen to view the sensor status, equipment status and protection status.





Click “Sensor Status”, “Equipment Status” and “Protection Status” to view the corresponding status parameter values. For example, click “Sensor Status” to view the status parameters such as return air temperature/humidity, air supply temperature, inhalation superheat and evaporating temperature, etc. Click  to turn the page to view the status parameters of the next page, and click  to return to the previous page.



Fig. 4-3 Schematic Diagram of Operating Status

#### 4. 1. 4 Data management

Click the “Data Management” option in the menu bar of the main interface of the display screen to view the “Temperature and Humidity Curve” and “Historical Data”.

“Temperature and Humidity Curve” shows the return air temperature and humidity curve of the current day. Select the date to view at “Date and Time” and click OK to view the temperature and humidity curve of the specified date. Click  or  to view the historical temperature and humidity curve.

“Historical Data” displays the temperature and humidity parameters in a certain time period in the past. Select the specified time period in “Date and Time” and click “Query” to view the temperature and humidity parameters in the specified time period.

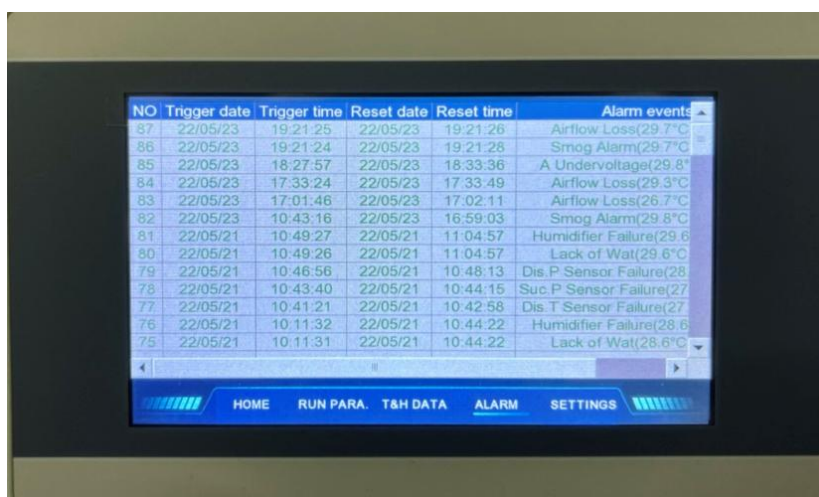


Fig. 4-4 Diagrammatic Sketch of Temperature and Humidity Curve

### 4.1.5 Alarm Management

Click the “Alarm Management” option in the menu bar of the main interface of the display screen to view the “Current Alarm” and “Historical Alarm”. “Current Alarm” displays the current alarm events and their occurrence time. After the alarm is cleared, the alarm that can be reset automatically will not be displayed in the current alarm. For the alarm that needs to be reset manually, click the “Alarm Reset” button to reset it manually.

The “Historical Alarm” page can view detailed historical alarm information, including alarm time, trigger time and recovery time. The red font indicates that the current alarm event has not been reset and the green font indicates that the alarm event has been reset.

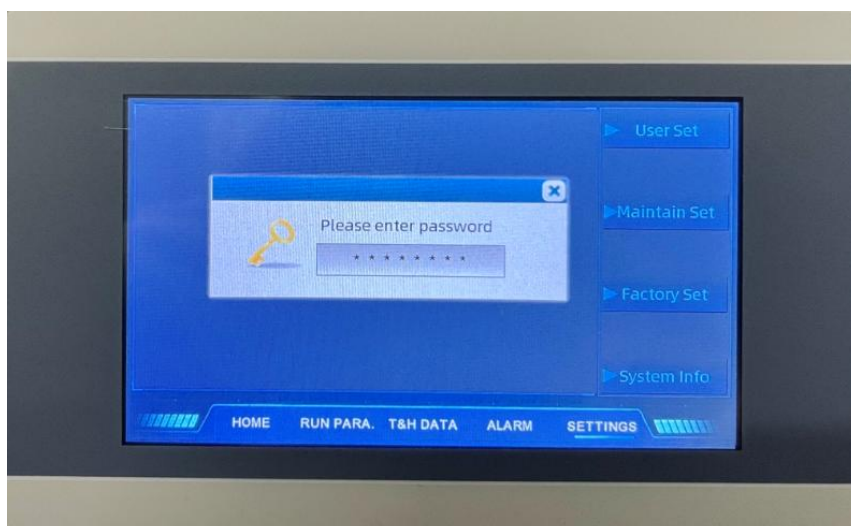


NO	Trigger date	Trigger time	Reset date	Reset time	Alarm events
87	22/05/23	19:21:25	22/05/23	19:21:26	Airflow Loss(29.7°C)
86	22/05/23	19:21:24	22/05/23	19:21:26	Smog Alarm(29.7°C)
85	22/05/23	18:27:57	22/05/23	18:33:36	A Undervoltage(29.8°C)
84	22/05/23	17:33:24	22/05/23	17:33:49	Airflow Loss(29.3°C)
83	22/05/23	17:01:46	22/05/23	17:02:11	Airflow Loss(26.7°C)
82	22/05/23	10:43:16	22/05/23	16:59:03	Smog Alarm(29.8°C)
81	22/05/21	10:49:27	22/05/21	11:04:57	Humidifier Failure(29.6°C)
80	22/05/21	10:49:26	22/05/21	11:04:57	Lack of Wat(29.6°C)
79	22/05/21	10:46:56	22/05/21	10:48:13	Dis.P Sensor Failure(28.6°C)
78	22/05/21	10:43:40	22/05/21	10:44:15	Suc.P Sensor Failure(27.6°C)
77	22/05/21	10:41:21	22/05/21	10:42:58	Dis.T Sensor Failure(27.6°C)
76	22/05/21	10:11:32	22/05/21	10:44:22	Humidifier Failure(28.6°C)
75	22/05/21	10:11:31	22/05/21	10:44:22	Lack of Wat(28.6°C)

Fig. 4-5 Diagrammatic Sketch of Current Alarm

### 4.1.6 System Settings

Click “System Settings” on the home page, enter the settings page, click “User Settings” and enter the password 515800 to set the relevant sub-menus at this level. Its submenus include “General Settings”, “Communication Settings”, “Networking Settings”, “Timing Startup & Shutdown” and “Modify Password”.



**Fig. 4-6 Diagrammatic Sketch of Password Entry of System Settings**

“General Settings” can view the current temperature and humidity control parameters, and users can adjust the parameters according to actual needs.



**Fig. 4-7 Diagrammatic Sketch of System Settings Interface**

“Timing Startup & Shutdown” function is used to set the unit to be turned on or off at the specified time on the specified date. If the user needs to set the timing startup & shutdown, firstly set the timing startup & shutdown function to enable.

When the startup time and shutdown time of the same date are both set to 0:0, it means the unit does not start up all day; when the startup time of the same date is set to 0:0 while the shutdown time is set to 24:0, it means that the unit runs all day.



**Fig. 4-8 Diagrammatic Sketch of Timing Startup & Shutdown**

Click “System Function” to carry out “Language Settings” and “Time Settings” and view “System Information”. “Language Settings” can select Chinese or English as the interface language, and “Time Settings” can calibrate the unit time.



**Fig. 4-9 Diagrammatic Sketch of System Function**

## 4.2 Introduction and Control of Monitoring Function

The air conditioners provide RS485 communication interface, which supports the upper monitor to comprehensively monitor and maintain the air conditioner. The RS485 communication interface of air conditioner has been connected to terminals A+ and B-. After connecting the communication lines to terminals A+ and B-, the upper monitor can query the operation data and alarm records in any time period, and can also directly issue operation instructions to the air conditioners to set and adjust the related parameters.

**Note: twisted-pair shield lines should be used for communication lines.**



**Fig. 4-10 Diagrammatic Sketch of Monitoring Function Settings**

### 4.3 Introduction and Control of Group Control Function

Introduction to group control function:

Time rotating: starting from the “rotating time”, every “rotating period” automatically switches the units according to the “rotating number”, so that the number of running units and the “running number” are consistent.

Alarm rotating: when the running unit has a serious alarm, the same number of standby units will be turned on. If the turned-on standby unit also has a serious alarm, the same number of standby units will be turned on until the number of units without serious alarm reaches the set “running number”. When the running unit is shut down, the same number of standby units will be turned on.

✧ Note: Stop all units in case of fireworks alarm.

Demand synchronization:

The demand synchronization can be set to be enabled or not. When enabled (the demand synchronization can only be enabled if the running number is  $\geq 2$ ), it has the following functions:

When networking units are in the refrigeration mode, other units are restricted from entering heating mode.



When networking units in the network are in dehumidification mode, other units are restricted from entering humidification mode.

## Group control function setting

Enter the networking setting parameter interface and the parameters to be set are as follows (The required parameters shall be subject to the actual situation on site).



**Fig. 4-11 Diagrammatic Sketch of Networking Settings**

### Parameter definition:

Networking enabling: the units participating in networking need to enable this function;

Networking address: the address of each unit during networking rotating, and the address setting must start from 00 and be continuous;

Number of networking: the total number of all networking units K (including main unit and standby unit), 1-64, automatically synchronize the parameter settings of main unit;

Switch number: switch the number of units when the rotating time is up. If the rotating time is set to 2, when the rotating time is up, two running units will stop, and two standby units will start, and automatically synchronize the parameter settings of the main unit;

Rotating period: set the rotating time, and how often it is rotated. When it is set to 0, the rotating will enter the test mode, and it will rotate every 8 minutes according to the set parameters, and automatically synchronize the parameter settings of the main unit;

Running number: set the number of enabled units  $N$ ,  $0-63$ ,  $N \leq K-1$ , and automatically synchronize the parameter settings of the main unit;

Demand synchronization: manage the operation modes of all units in a unified way to avoid competitive operation;

Cascading function: when the running units can't meet the requirements of the computer room, the number of operating units will be automatically increased;

## Chapter 5 Inspection and Commissioning

### 5.1 Installation Inspection

#### Inspection of Mechanical Installation

1. The installed fastening parts have been locked;
2. Pipelines connecting the indoor unit and outdoor unit have been installed;
3. The drainage pipe of the unit has been connected;
4. The water supply pipe connected to the humidifier has been connected (when the humidifier is configured);
5. All pipe joints have been tightened;
6. After the equipment installation is completed, the sundries inside or around the equipment have been removed (such as transportation materials, structural materials and tools, etc.);
7. Whether there is a certain equipment maintenance space around the unit.

#### Inspection of Electrical Installation

1. The power supply voltage is the same as the rated voltage on the equipment nameplate;
2. There is no open circuit or short circuit in the electrical circuit of the system;
3. The power cable, signal cable and grounding cable of indoor unit and outdoor unit have been connected;
4. All cables and circuit connectors have been fastened, and fastening screws are not loose.

### 5.2 Function Commissioning

#### Tips

Please ensure that the unit has been strictly inspected as required before starting the unit.

#### Inspection Contents

- a) Inspect the voltage at the power connection point, and the voltage reading shall not exceed  $\pm 10\%$  of the rated value of the nameplate;
- b) Check whether the fan steering is correct;
- c) Control function inspection.

## 5.3 System Commissioning

### Tips

- 1) **Before system commissioning, the compressor crankcase heater must be energized and preheated for at least 12 hours, otherwise it will cause irreparable damage to the compressor;**
- 2) According to the design parameters of the unit (supercooling degree, superheat degree and pressure, etc.), the refrigerant charge of the unit should be calibrated for start-up and running, so that the refrigerant charge can meet the requirements.

### Commissioning contents

- a) Measure and record the operation parameters of the unit;
- b) Commissioning of compressor operation;
- c) Commissioning of fan operation;
- d) Commissioning of humidifier operation (only applicable to units with humidification function);
- e) Commissioning of electric heater operation (only applicable to the unit with heating function).



### Notes

System commissioning shall be completed by professional engineer.

## Chapter 6 Maintenance and Troubleshooting

### 6.1 Daily Maintenance

#### 1. Electric control system

- a) Static test of whether the suction of each contactor is flexible and whether there is any jam;
- b) Dust the electrical and control components with a brush or dry compressed air;
- c) Check whether there is arcing and burn marks in the contact attraction of contactor, when serious, replace the corresponding contactor;
- d) Fasten all electrical connection terminals;
- e) Check whether the quick butt joint is in good contact, and replace the terminal if any looseness is found.

#### 2. Indoor fan

- a) Confirm that there is no deformation of indoor fan net cover;
- b) Confirm that there is no damage to indoor fan blades;
- c) Confirm that there is no abnormality in the running sound of indoor fan;
- d) Confirm that the fixing screws for indoor fan installation are not loose or deformed.

#### 3. Electrode humidifier

- a) It needs to be cleaned regularly to make sure that there is no scale accumulation in the humidifying water receiving tray and drainage pipe;
- b) Check whether the humidifying water inlet solenoid valve and the drainage solenoid valve work normally;
- c) If the humidifier keeps water inlet, or the input voltage of the humidifying electrode is normal, the water can't boil all the time, indicating that the humidifier has reached its service life and needs to be replaced;
- d) Confirm that the humidifier has no running timeout alarm.

#### 4. Heater

- a) Confirm that the fixing of electric heating is not loose;

- b) Confirm that the electric heating surface is free of corrosion.
5. Return air filter
- a) Make sure that the return air filter is free from dirty blockage;
  - b) Confirm that the return air filter is free from damage or deformation;
  - c) Confirm that the return air filter has no running timeout alarm.
6. Compressor
- a) Confirm that the compressor fixing nut is not loose;
  - b) Confirm that the compressor running sound is normal;
  - c) Confirm that the refrigerant pipeline is free of oil stains and rust;
7. Outdoor unit
- a) Ensure the connection with the ground is firm;
  - b) Ensure that the fan is running without abnormal sound, abnormal vibration and blade sticking;
  - c) Confirm that the fan inlet and outlet are free of obstacles.

## 6.2 Troubleshooting of Common Faults

Common faults mainly include refrigeration system fault, control system fault, ventilation system fault, heating and humidification system fault. See Table 6-1-Table 6-5 for some common faults and treatment suggestions.



### Notes

- 1) Only professional and technical personnel are allowed to maintain the unit.
- 2) For the diagnosis and treatment of complex faults, please contact Technical Service Department for support.

### 6.2.1 Fault Diagnosis and Treatment of the Whole Product

**Table 6-1 Fault Diagnosis and Treatment of the Whole Product**

<b>Fault</b>	<b>Possible reason</b>	<b>Frequently inspected items or treatment methods</b>
Unit does not start	Unit power is not connected	Check whether the input power input has been turned on

## 6. 2. 2 Fault Diagnosis and Treatment of the Fan

**Table 6-2 Fault Diagnosis and Treatment of the Fan**

Fault	Possible reason	Frequently inspected items or treatment methods
Fan does not operate	No power input	Check whether the input and output voltages of the fan contactor are normal and whether the cables are loose
		Check whether the contact coils A1 and A2 of the fan have 220Vac voltage output. If so but the contactor does not close, replace the contactor; if not, check the line fault
	Fan overload	Check whether the fan has overcurrent
		Check whether the fan motor is overheated
	Fan damage	Replace the fan

## 6. 2. 3 Fault and Treatment of the Compressor and Refrigeration System

**Table 6-3 Fault and Treatment of the Compressor and Refrigeration System**

Fault	Possible reason	Frequently inspected items or treatment methods
Compressor does not operate	No power input	Check whether the input and output voltages of the compressor are normal and whether the cables are loose
		Check whether the contact coils A1 and A2 of the compressor have 220Vac voltage output. If so but the contactor does not close, replace the contactor; if not, check the line fault
	No refrigeration or dehumidification requirements	Check whether the temperature and humidity setting points meet the compressor requirements
	High pressure alarm	Condenser dirt and blockage
		Condenser fan does not run
		Excessive refrigerant charge
		Check whether the high voltage switch is disconnected
	Outdoor ambient temperature is too high	
Low pressure alarm	The original refrigerant charge of the system is	

		insufficient or the refrigerant leaks during operation
		Chopping commissioning failure of external fan
		Check whether the filter screen is dirty or blocked
		Check whether air supply of the unit is unsmooth
		Check whether the temperature and humidity sensor is installed and the wiring is correct.
	Check whether the low voltage switch is disconnected	
	Exhaust high temperature alarm	Outdoor ambient temperature is too low or too high
		The refrigerant charge of the system is too low
	Sensor fault alarm	Check whether the inhalation pressure sensor and exhaust pressure sensor are installed with correct wiring
		Check whether the inhalation temperature sensor is installed with correct wiring
Check whether the temperature and humidity sensor is installed with correct wiring		
Compressor damage	Replace compressor	
Compressor noise is large	Return liquid	Check whether the return air temperature is too low
		Check whether the air supply and return air are smooth
	Poor lubrication	Add lubricating oil
	The transportation fixing pieces of the compressor have not been removed	Remove transportation fixing pieces
Return air high temperature	Compressor fault shutdown	See the treatment methods of above-mentioned “compressor does not operate”
	The set value of high temperature alarm is unreasonable	Adjust the set value of high temperature alarm
	The load of engine room exceeds the design capacity of air conditioner	Check the room sealing or further expansion
Return air low temperature	Heater is not activated or electric heating protection alarm appears	See the treatment methods of above-mentioned “heating failure”
	The set value of low temperature	Adjust the set value of low temperature alarm



	alarm is unreasonable	
Return air high humidity	The set value of high humidity alarm is unreasonable	Adjust the set value of high humidity alarm
	The engine room is not moisture-proof	Check environmental moisture-proof measures
Return air low humidity	The set value is unreasonable	Adjust the set value of low humidity alarm
	Dehumidification enabling is not enabled	Enable dehumidification function

#### 6. 2. 4 Fault and Treatment of the Heating System

**Table 6-4 Fault and Treatment of the Heating System**

Fault	Possible reason	Frequently inspected items or treatment methods
Electric heating function is failed	No power input	Check whether the input and output voltages of the electric heating relay are normal and whether the cables are loose
		Check whether the contact coils A1 and A2 of the heating relay have 220Vac voltage output. If so but the relay does not close, replace the relay; if not, check the line fault.
	Heating function is not enabled	Check whether the number of heater is “1”
	No heating output	Check whether there is an open circuit of protection caused by heater overload
	Electrical heating protection	Replace electric heating
	Heater damage	Cut off the power supply and check the resistance of the heater with a multimeter

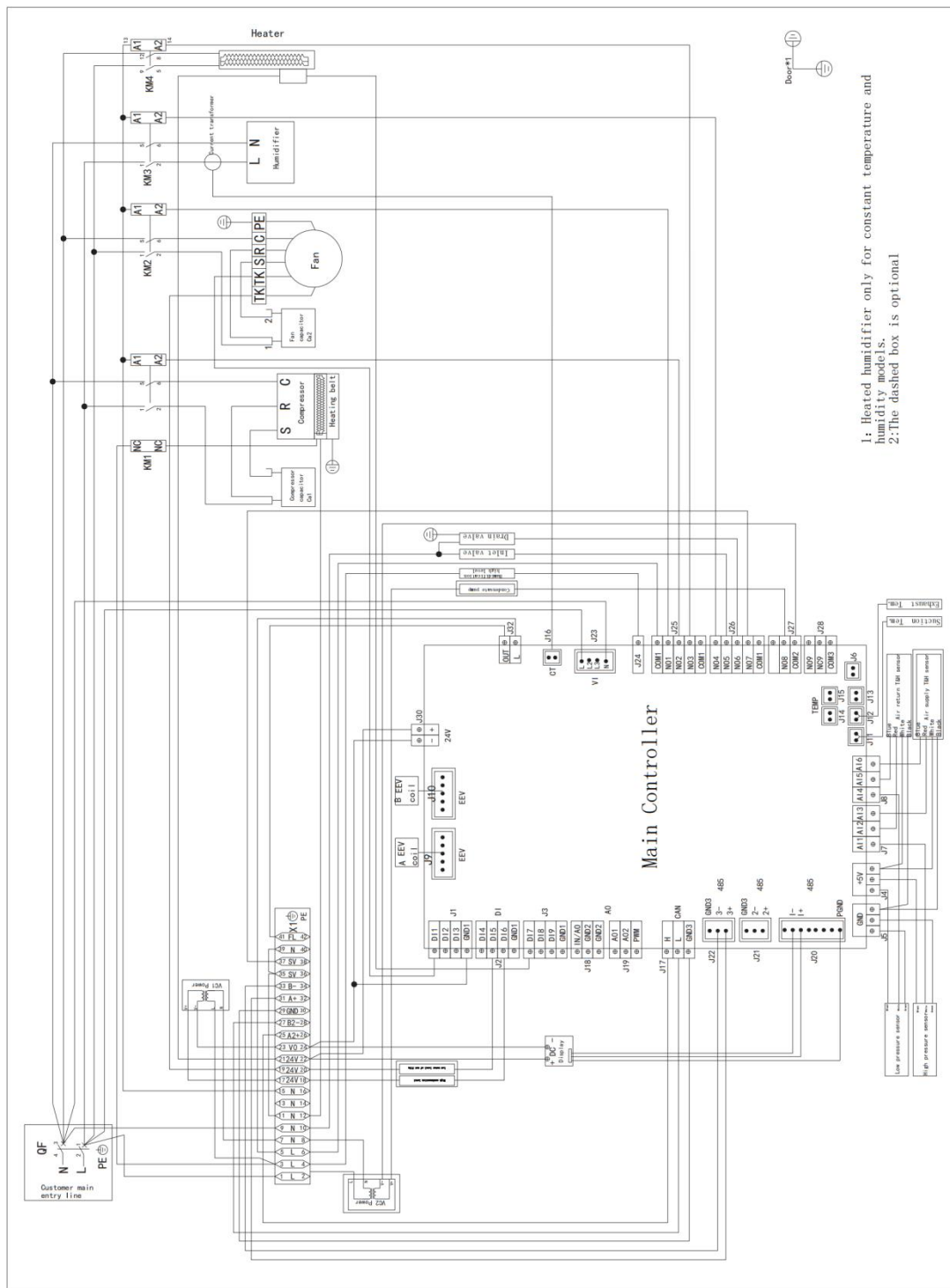
#### 6. 2. 5 Fault and Treatment of the Humidification System

**Table 6-5 Fault and Treatment of the Humidification System**

Fault	Possible reason	Frequently inspected items or treatment methods
Humidification fault	No power input	Check whether the input and output voltages of the humidifier contactor are normal and whether the cables are loose

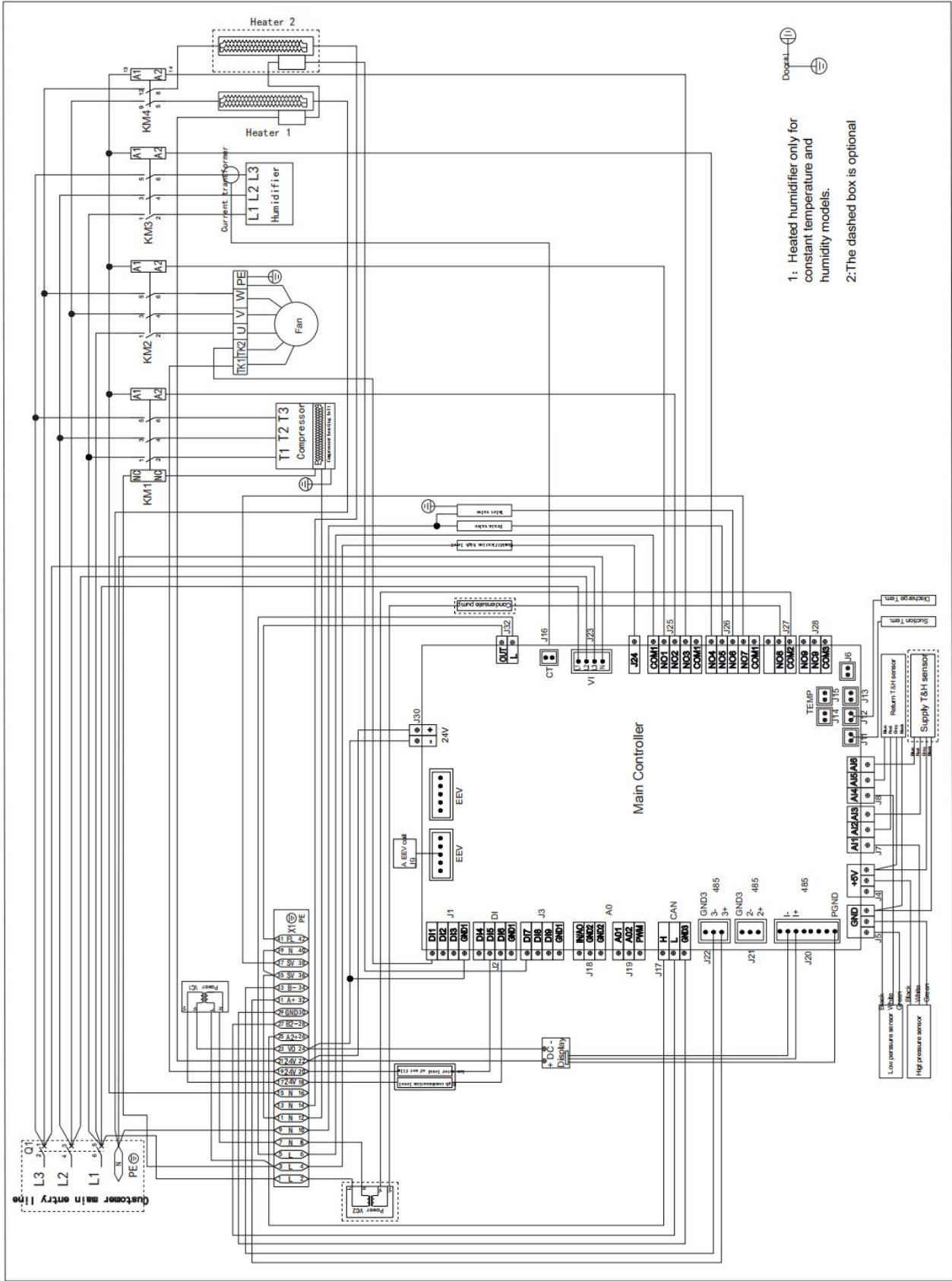
		Check whether the contact coils A1 and A2 of the humidifier have 220Vac voltage output. If so but the contactor does not close, replace the contactor; if not, check the line fault
	No refrigeration or dehumidification demand	Adjust humidity set point to humidification output demand range
	No water flow	Check whether the front-end water supply is set properly
	Humidification type is not matched	Check whether the controller setting is consistent with the actual humidifier type
	Humidifier fault	During the operation of the electrode humidifier, alarms such as “drainage valve fault” and “humidification current detection fault” appear
		During the operation of the wet membrane humidifier, alarms such as “wet membrane low water level fault” appear

# Annex I Electrical schematic Diagram of Indoor Unit



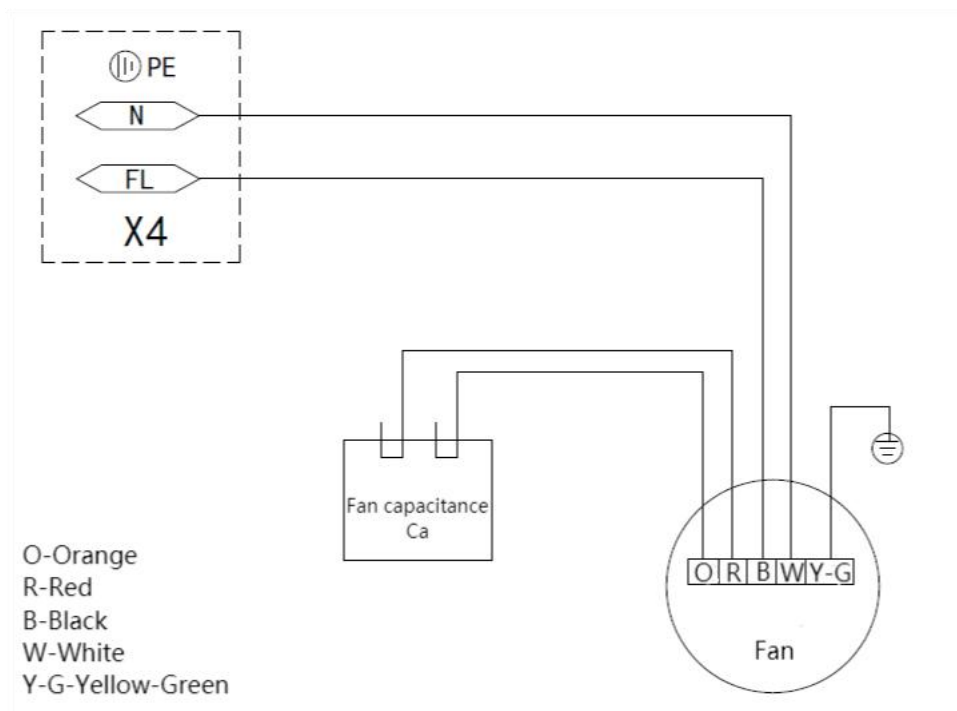
Attached Fig. 6-1 Electrical Schematic Diagram of Indoor 5.5kW/Indoor 7.5kW

- 1: Humidifiers and heaters are only for constant temperature and humidity model
- 2: The items in the dotted box are optional



Attached Fig. 6-2 Electrical Schematic Diagram of Indoor 12.5kW/Indoor 17kW/Indoor 20.5kW

## Annex II Electrical Schematic Diagram of Outdoor Unit



Attached Fig. 6-3 Electrical Schematic Diagram of Outdoor 7kW Regular Type

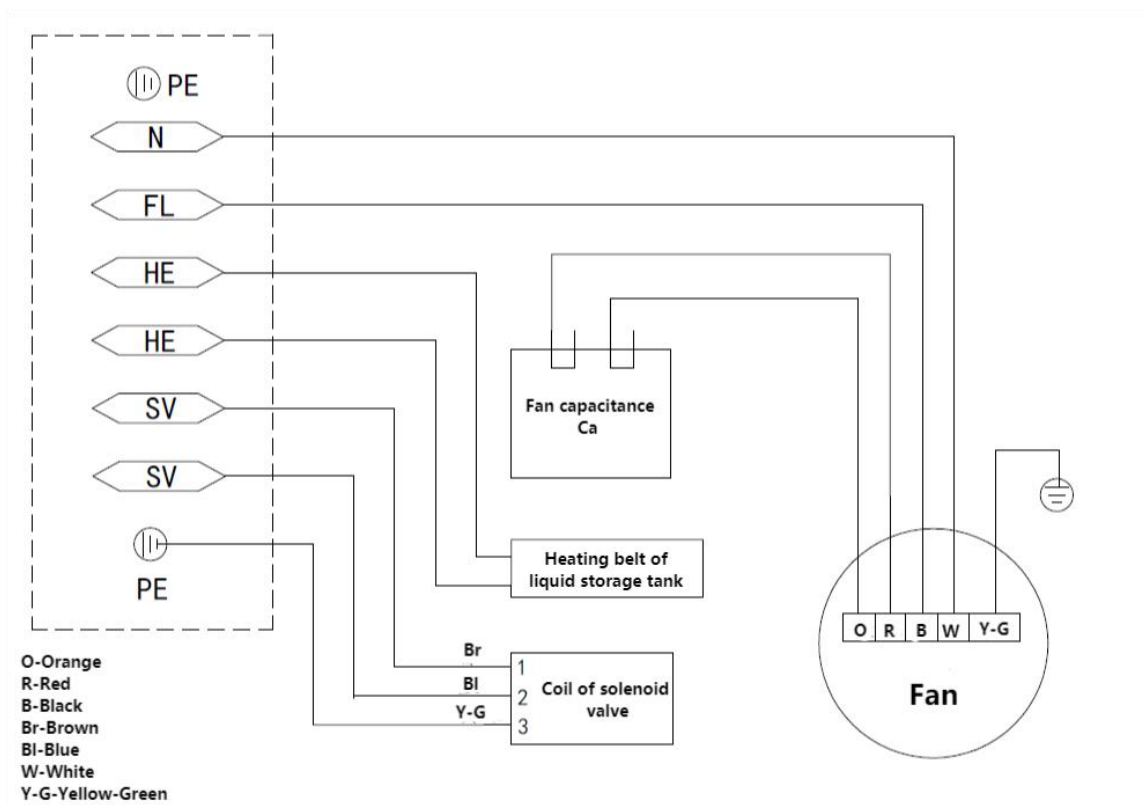
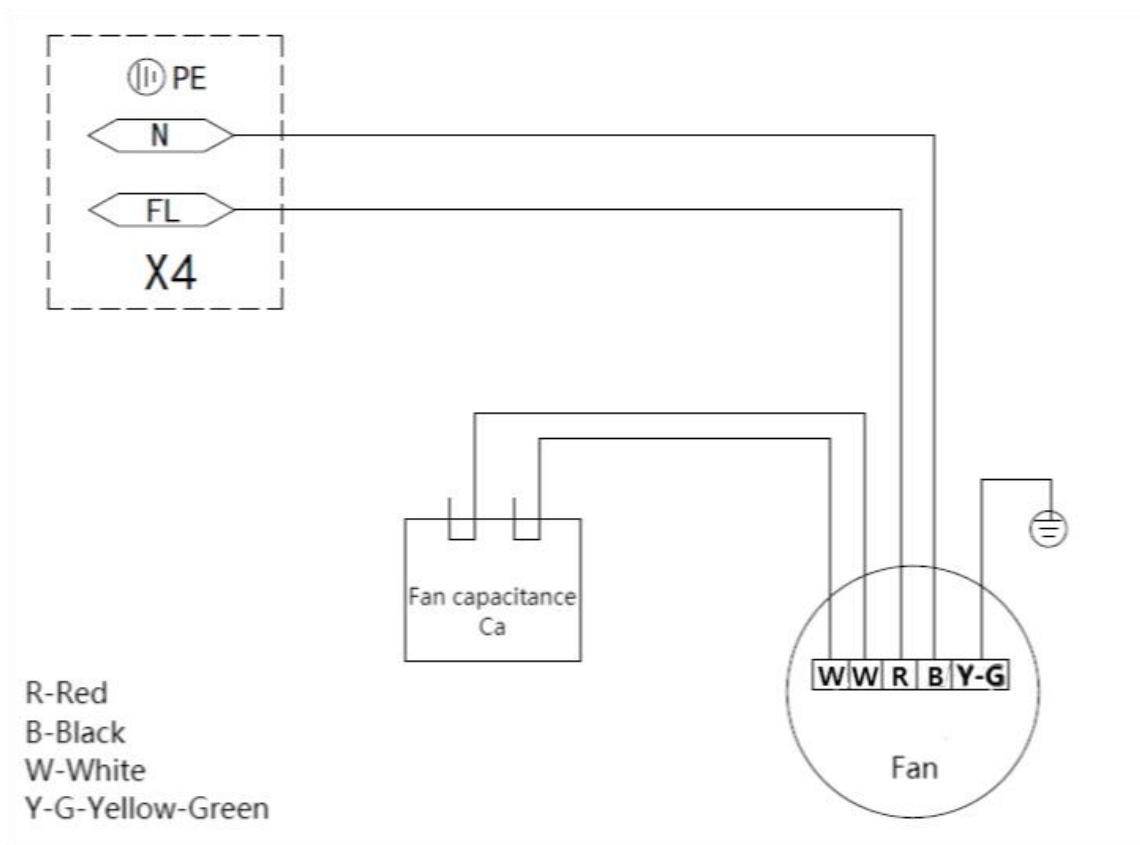


Fig. 6-4 Electrical Schematic Diagram of Outdoor 7kW Low-temperature Type



Attached Fig. 6-5 Electrical Schematic Diagram of Outdoor 10kW Regular Type

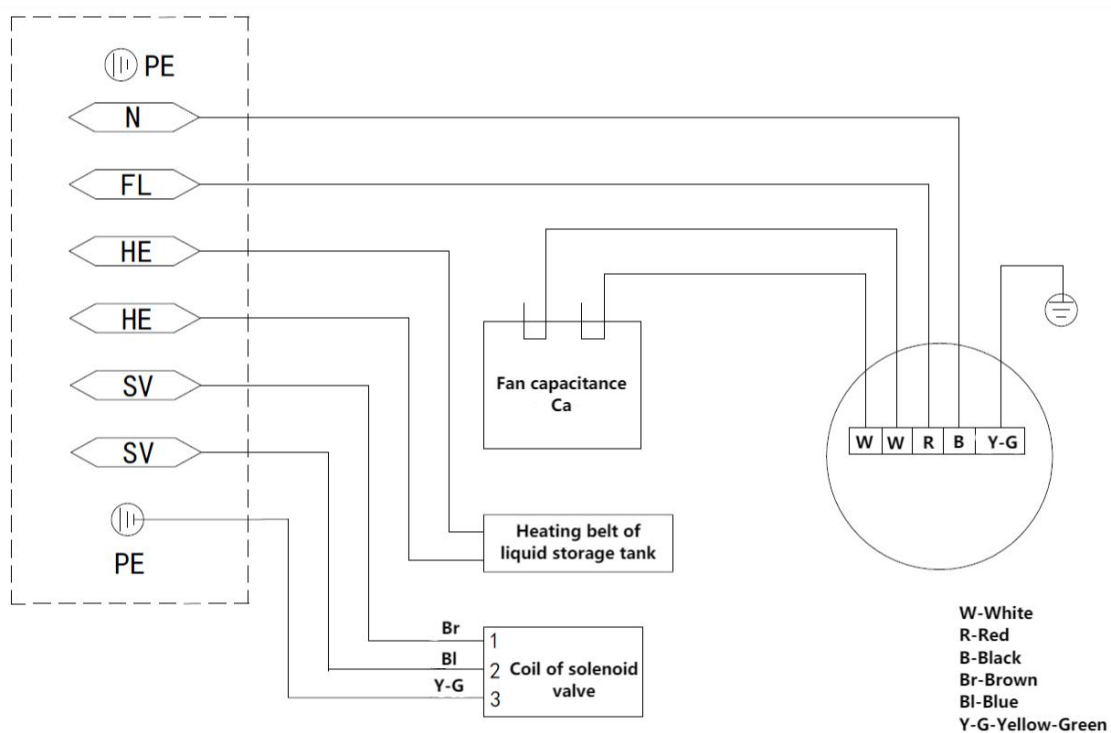
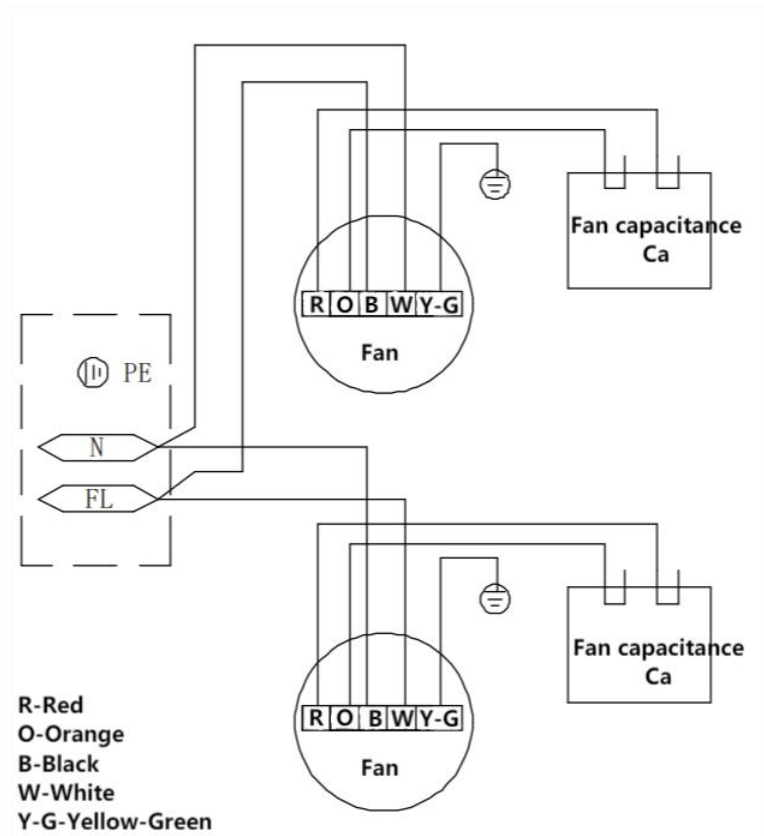


Fig. 6-6 Electrical Schematic Diagram of Outdoor 10kW Low-temperature Type



Attached Fig. 6-7 Electrical Schematic Diagram of Outdoor 18kW Regular Type

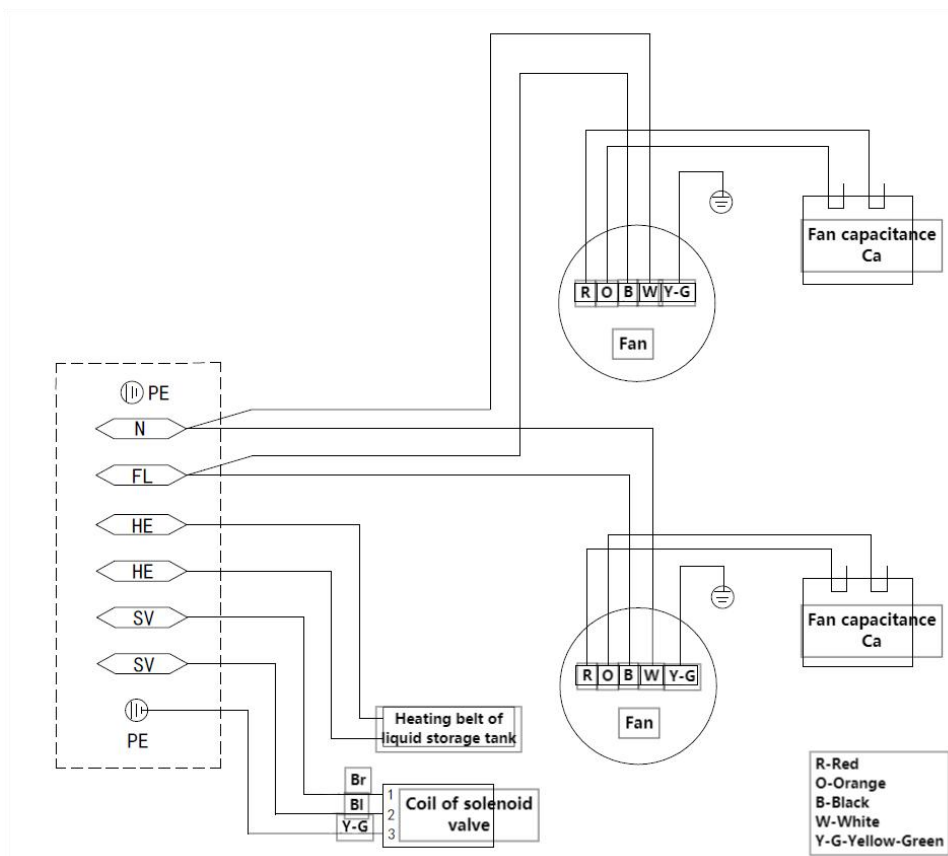
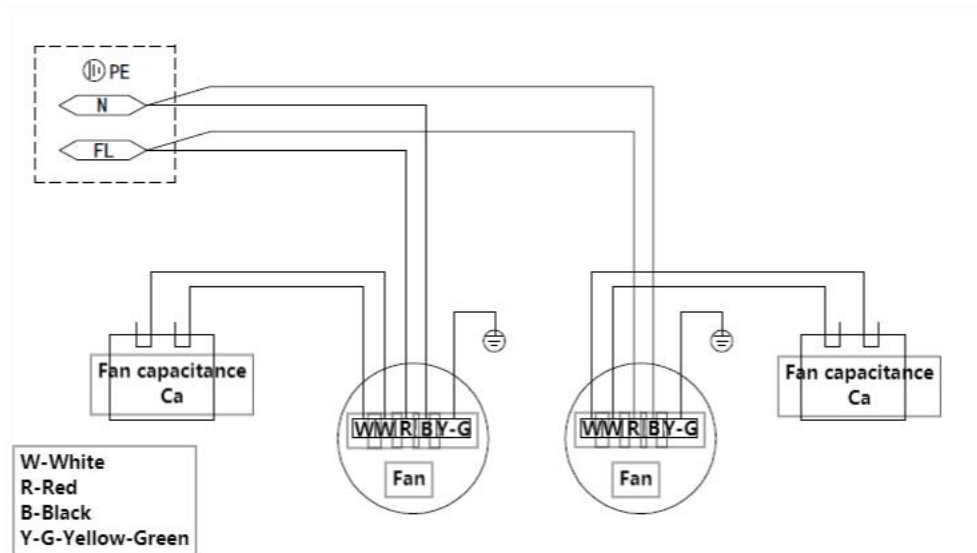


Fig. 6-8 Electrical Schematic Diagram of Outdoor 18kW Low-temperature Type



Attached Fig. 6-9 Electrical Schematic Diagram of Outdoor 24kW/Outdoor 28kW Regular Type

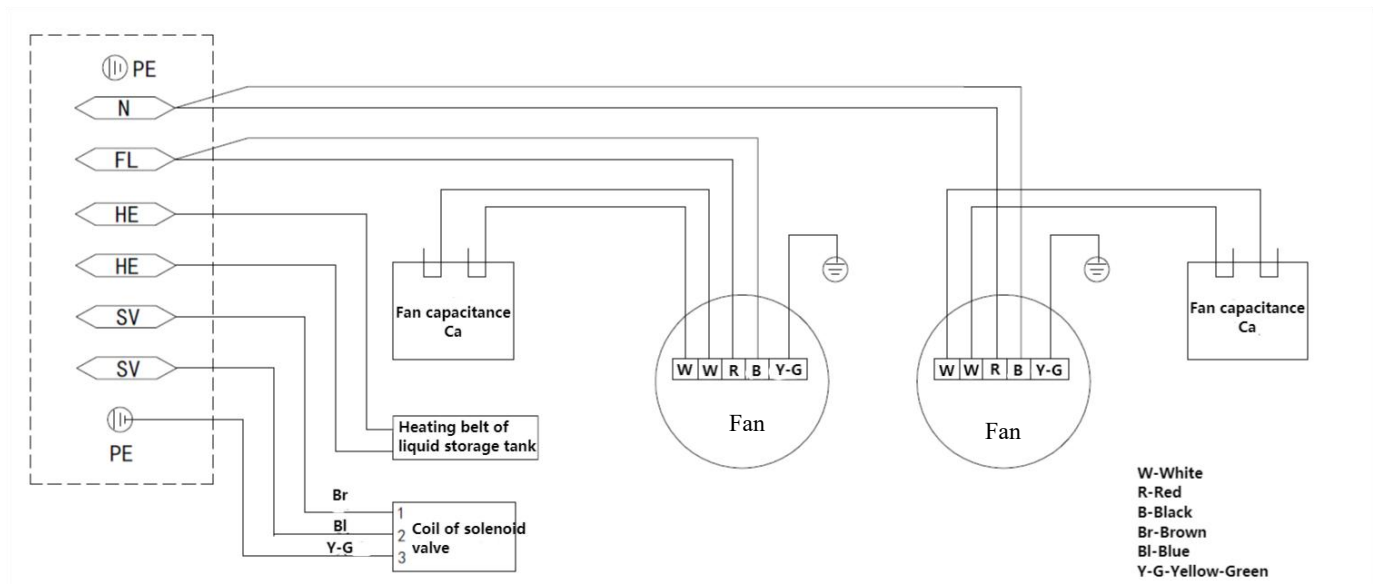


Fig. 6-10 Electrical Schematic Diagram of Outdoor 24kW/Outdoor 28kW Low-temperature Type



## Annex III Name and content of table of hazardous substances in the product

Part name	Hazardous substances					
	Aluminum (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chrome (Cr (VI) )	Polybrominated Biphenyls (PBB)	Polybromine biphenyl ether (PBDE)
Cabinet	×	○	○	○	○	○
Refrigeration fittings	×	○	○	○	○	○
Fan unit	×	○	×	○	○	○
Heating unit	×	○	○	○	○	○
Electronic control unit	×	○	×	○	○	○
Display screen	×	×	○	○	○	○
Manufactured board	×	○	○	○	○	○
Heat exchanger	×	○	○	○	○	○
Copper pipe	×	○	○	○	○	○
Cable	×	○	○	○	○	○
<p>This form is compiled according to SJ/T 11364.</p> <p>O: means that the content of the toxic and harmful substances in all homogeneous materials of this part is below the limit requirement specified in GB/T 26572;</p> <p>X: means that the content of the toxic and harmful substances in at least one homogeneous material of the component exceeds the limit specified in GB/T 26572.</p>						
<p>The following components or applications contain toxic and harmful substances, which are limited to the current technical level and cannot be reliably replaced or there is no mature solution:</p> <ol style="list-style-type: none"> <li>1. Causes of lead in the above components: the copper alloy of the components contains lead; high temperature solder contains lead; the middle and high temperature solder of diode contains lead; resistance glass containing lead in uranium (exemption); lead in ceramics (exemption);</li> <li>2. The backlight tube contains mercury;</li> <li>3. The switch contacts of the power distribution part contain cadmium and cadmium compounds.</li> </ol>						
<p>Description of environmental protection service life: the environmental protection service life of this product (marked on the product body) refers to the life time when the toxic and harmful substances or elements contained in this product (except batteries) will not seriously affect the environment, people and property from the date of production under the normal service conditions and the safety precautions of this product.</p>						
<p>Scope of application: Small room precision air conditioner</p>						

## Appendix IV Equipment Maintenance Checklist (Monthly)

Component	Inspection contents	Remark
Filter screen	Check whether the filter screen is damaged or blocked	
	Clean filter screen	
Fan	Make sure the fan net cover is not deformed	
	Confirm whether the fan blades are damaged or not	
	Make sure that the fan is fixed without loosening	
	Make sure there is no abnormal noise in fan operation	
	Make sure the fan circuit connector is not loose	
Compressor	Make sure the compressor fasteners are not loose.	
	Confirm the running sound and observe that there is no abnormality in the running vibration	
	Make sure the compressor circuit connector is not loose	
Air-cooled condenser	Make sure the condenser fins are free of dirt and blockage	
	Make sure that the condensing fan is firmly fastened without loosening	
	Make sure the condensing fan is not damaged	
	Make sure that the condenser fan circuit connector is not loose	
Wet film humidifier	Make sure that the wet film is free from dirt or blockage	
	Make sure that the wet film is free from serious damage or mildew	
	Confirm whether the wet film has too much dust which cannot be cleaned	

Date: \_\_\_\_\_

Equipment model: \_\_\_\_\_

Inspected by: \_\_\_\_\_

## Appendix V Equipment Maintenance Checklist (Six months)

Component	Inspection contents	Remark
Filter screen	Confirm whether the filter screen is damaged or blocked	
	Clean filter screen	
Fan	Make sure the fan net cover is not deformed	
	Confirm whether the fan blades are damaged or not	
	Make sure that the fan is fixed without loosening	
	Make sure there is no abnormal noise in fan operation	
	Make sure the fan circuit connector is not loose	
Compressor	Make sure the compressor fasteners are not loose.	
	Confirm the running sound and observe that there is no abnormality in the running vibration	
	Make sure the compressor circuit connector is not loose	
Air-cooled condenser	Make sure the condenser fins are free of dirt and blockage	
	Make sure that the condensing fan is firmly fastened without loosening	
	Make sure the condensing fan is not damaged	
	Make sure that the condenser fan circuit connector is not loose	
Wet film humidifier	Make sure that the wet film is free from dirt or blockage	
	Make sure that the wet film is free from serious damage or mildew	
	Confirm whether the wet film has too much dust which cannot be cleaned	
Heating system	Make sure that the electric heater fixture is not loose	
	Make sure there is no excessive ash accumulation on the surface of electric heater	
	Confirm the surface corrosion of electric heater	
Electric control system	Make sure the electric heater circuit connector is not loose	
	Make sure that the wiring of electrical components is not loose	
	Make sure the cable is not aged	
	Confirm that the contactor and relay coils work normally	

Date: \_\_\_\_\_

Equipment model: \_\_\_\_\_

Inspected by: \_\_\_\_\_