Precision Air Conditioner

AirSafe CR

User Manual

425704912311A

Foreword——About the Product and Manual

[To the Users]

Dear users, we are glad that you choose AirSafe CR series Precision Air Conditioner. Before using the product, please read the manual carefully. Proper operation is required to meet longer life and high reliability.

[Product Guarantee]

The product can enjoy the maintenance service provided by our company with the purchase contract or relevant approval procedures.

[Exceptions]

1. Beyond the period of free warranty.
2. Disassemble the product without authorization.
3. Violation of product operation.
4. Human failure.
5. Loss caused by force majeure or external factors at site.

[Note: Any of the above exceptions will not be covered by the warranty.]

[Customer Service]

Our company provides the overall technical guidance for customers. Customers can contact the nearest office or customer service center.

[Related notes]

1. This manual is provided with the product, please keep it properly so that you can check it at any time when you need. Lost or damaged, please ask it from the manufacturer.
2. This manual is written for AirSafe CR series air-cooled Precision Air Conditioner, the content may not be applicable to other series.
3. The copyright of this manual belongs to our company. All rights are reserved .The content is subject to change without notice.
4. When the product is scrapped, please contact the nearest hazardous waste treatment station for scrap treatment.

Contents

Chapter1 Summary

Summary —— This chapter mainly discusses five aspects, including product introduction, operating parameters and requirements, model description, system composition, and product specifications.

§ 1-1 Introduction

About the Product

AirSafe CR series precision air conditioner is the new generation of advanced, reliable, energy efficient, safe and environmentally friendly product. Integrated with the most advanced energy-saving and environmentally friendly technology, well-designed refrigerant system and powerful control system, this product can ensure the efficient and reliable operation of key equipment.

Model

AirSafe CR air conditioning has various types, such as upper air supply type, lower air supply type, air-cooled compressor refrigeration type, chilled water type and double cooling source type. For the long connection, it can be equipped with extension components; for winter outdoor low temperature, it can be equipped with low temperature components; for the northern region, it can be equipped with fluorine pump energy saving module.

Cooling Capacity

The cooling capacity of AirSafe CR series precision air conditioners ranges from 25kW to 120kW.

Features

1. High reliability, high sensible heat ratio and high airflow.
2. Well-designed refrigeration system ensures the most optimal operation.
3. Modular and compact structural design, making the layout more flexible, smaller footprint, on-site disassembly does not damage the copper pipe.
4. 100% full frontal maintenance for easy maintenance and management.
5. Adopting R410A green and environmentally friendly refrigerant, meeting international requirements for green and environmentally friendly refrigerants;
6. The design of large area "V" or "A" evaporator makes the heat transfer higher.
7. The electronic expansion valve is used to precisely control the refrigerant flow in the system, which is reliable in operation and efficient in energy saving.
8. Using 7-inch graphic true color touch screen, beautiful and generous, easy to operate.
9. Using fully enclosed high efficiency inverter compressor, its excellent quality ensures the

high efficiency and stability of the unit.

10. High quality refrigeration valve parts are used to operate more reliably.
11. A variety of air supply methods, cooling methods and optional accessories, to provide users with a variety of choices.
12. Adopt high efficiency energy saving EC fan, can realize step less speed regulation, stable operation, low noise and reliable.

§ 1-2 Operating parameters and requirements

Table1-1 Operating parameters and requirements

	Items	Indoor	Outdoor
Parameters	Temp. (℃)	17℃～35℃	Air-cooled: -40°C～+45°C (When the outdoor temperature is below -20℃， the low temperature components should be selected) Water-cooled: 4°C～40°C
	Humidity (RH)	20%～80%	——
Requirements	Altitude (m)	The altitude should be less than 1000 meters, otherwise please contact the manufacture	
	Power (V and Hz)	The range of voltage and frequency are from 342 to 415 and from 48 to 52 respectively	

§ 1-3 Model Description

For example: model – EACCR030DDXAS

0	1	2	3	4	5	6	7	8	9	10	11	12
E	A	C	C	R	0	3	0	D	D	X	A	S

0	E	ENERSAFE
1-2	AC	AIRE ACONDICIONADO
3-4	CR	PERIMETRAL
5-6-7	XXX	CAPACIDAD KW
8	D	SALIDA AIRE DOWFLOW
	U	SALIDA AIRE UPFLOW
9-10	DX	EXPANSION DIRECTA
	CW	CHILLED WATER
11	A	ENFRIADO POR AIRE
	W	ENFRIADO POR AGUA
12	S	CIRCUITO SIMPLE
	D	CIRCUITO DOBLE

§ 1-4 Components

AirSafe CR series precision air conditioner mainly comprises refrigeration system, control system, ventilation system, humidification system and heating system. Main components are shown as below.

1. Compressor——High efficiency frequency conversion compressor, high efficiency, energy saving, safety and reliability, long life, low noise, etc.
2. Evaporator——Large area "V" or "A" type evaporator design for higher heat exchange.

3. Electronic expansion valve——Wide adjustment range, accurate flow regulation, high operation reliability.
4. Heater——PTC heater, fast heating speed, uniform heating.
5. Electrode humidifier——Automatic control, energy and water saving, automatic drainage, automatic cleaning, easy maintenance.
6. Wet film humidifier——Low power consumption, large humidification capacity, water saving, easy maintenance.
7. Dry filter——It protects refrigeration systems from moisture, acids and solid impurities.
8. Hydroscope——The window of the refrigeration system cycle to observe the status of the refrigerant and the water content.
9. Compressor Heating Belt——Heating the compressor crankcase oil pool. The heating belt must be energized for at least 12 hours before starting up.
10. Centrifugal fan——Adopt backward centrifugal EC fan, high efficiency and energy saving, stable operation, low noise, wide range of static pressure adjustment.
11. Air filter——Filter dust and impurities in the air to ensure the cleanliness of the environment.
12. Controller——HCC intelligent control system can carry on group control management to up to 32 units, can set up rotation backup, automatic switching operation, avoid competitive operation and other functions, standard RS485 communication interface, with automatic call start, level 3 password protection and other management and alarm protection functions.
13. Display——7 inch graphic true color touch display screen, customers can easily understand the operation status of each part of the unit, as well as all kinds of parameter settings.
14. Extended components (optional)——When the pipeline length exceeds 30m, it is necessary to add extension components to ensure the normal start-up and operation of the unit, and improve the reliability of the unit.
15. Low temperature components (optional)——When the outdoor ambient temperature is lower than -20 °C, add low-temperature components to ensure reliable operation of the unit above -35 ℃.
16. Fluorine pump energy-saving module (optional)——In cold areas, when the outdoor ambient temperature is below 5 °C in winter, the pure fluorine pump refrigeration function is enabled; When the outdoor ambient temperature is 5 ~ 15 °C, the mixed refrigeration function of compressor and fluorine pump is enabled. The use of outdoor natural cold source for refrigeration can improve energy saving effect. Referring to the outdoor unit, the energy-saving module of fluorine pump is divided into external type and built-in type.

§ 1-5 Specifications

1.5.1 Dimensions and Net Weight

Table 1-2 Dimensions and Net Weight

Models	Dimensions (mm)W×H×D	Net Weight (kg)
EACCR025（Single System）	1128×1975×995	≤350
EACCR030（Single System）	1128×1975×995	≤370
EACCR035（Single System）	1128×1975×995	≤380
EACCR040（Single System）	1128×1975×995	≤390
EACCR045（Single System）	1128×1975×995	≤400
EACCR050（Single System）	1128×1975×995	≤410
EACCR040（Dual System）	1128×1975×995	≤490
EACCR050（Dual System）	1128×1975×995	≤510
EACCR060（Dual System）	2228×1975×995	≤680
EACCR070（Dual System）	2228×1975×995	≤690
EACCR080（Dual System）	2228×1975×995	≤700
EACCR090（Dual System）	2228×1975×995	≤780
EACCR100（Dual System）	2228×1975×995	≤790
EACCR120（Dual System）	2228×1975×995	≤800

[**Notes**：W-width；H-height；D-height]

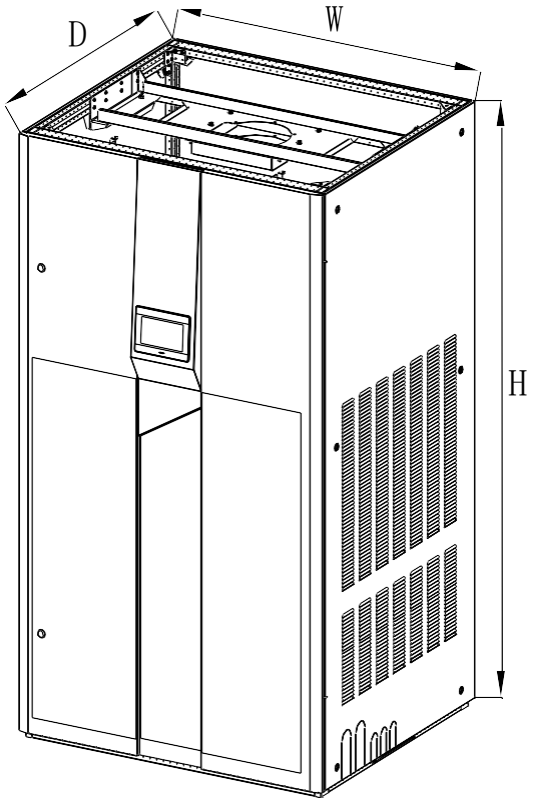


Figure 1-1 Dimensions of EACCR025 / 030 / 035 / 040 / 045 / 050 Upper Air Supply Models

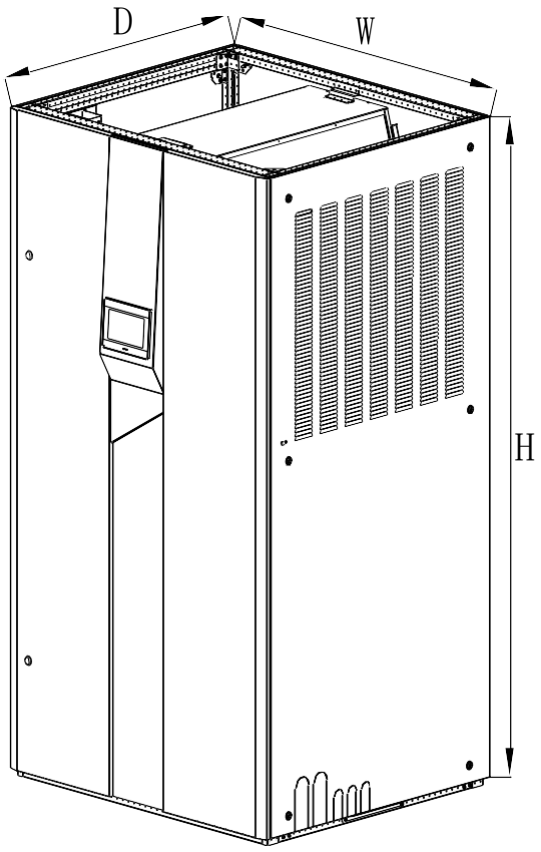


Figure 1-2 Dimensions of EACCR025 / 030 / 035 / 040 / 045 / 050 Lower Air Supply Models

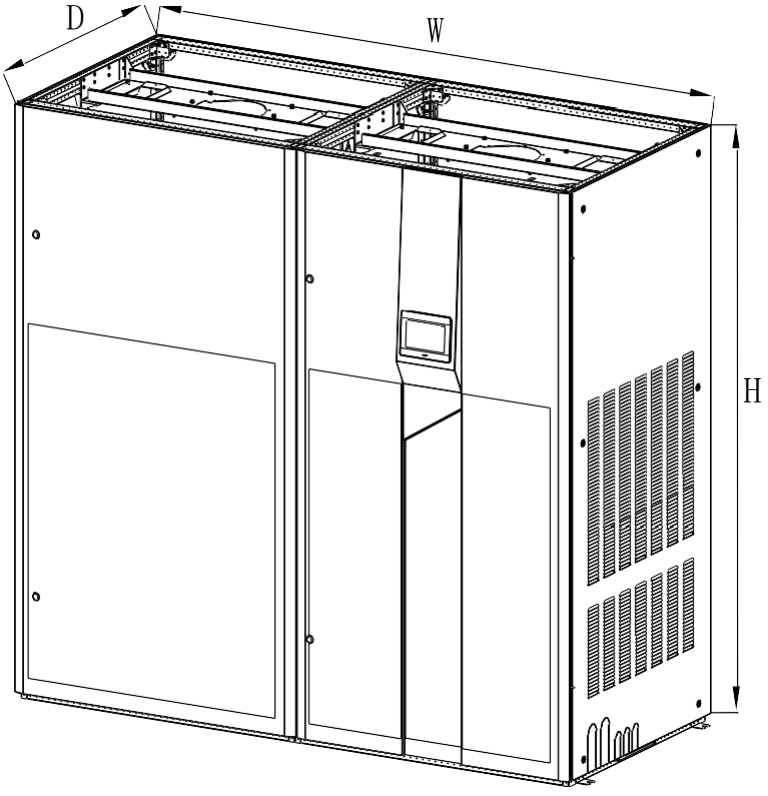


Figure 1-3 Dimensions of EACCR060 / 070 / 080 / 090 / 100 / 120 Upper Air Supply Models

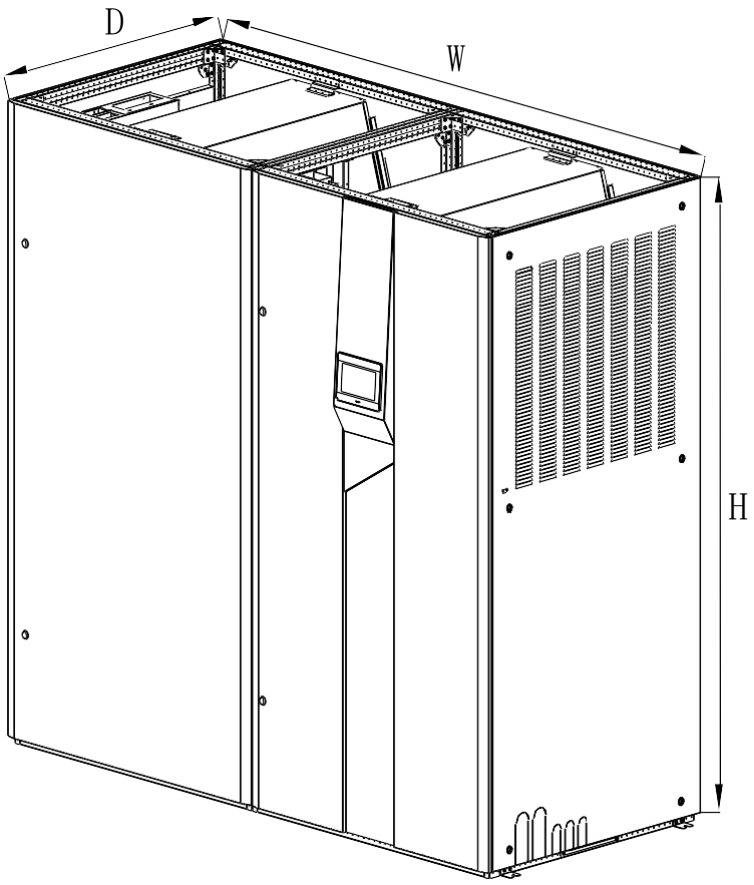


Figure 1-4 Dimensions of EACCR060 / 070 / 080 / 090 / 100 / 120 Lower Air Supply Models

1.5.2 Side Plate

EACCR series models side plate hole size as shown in Figure 1-5, Figure 1-6.

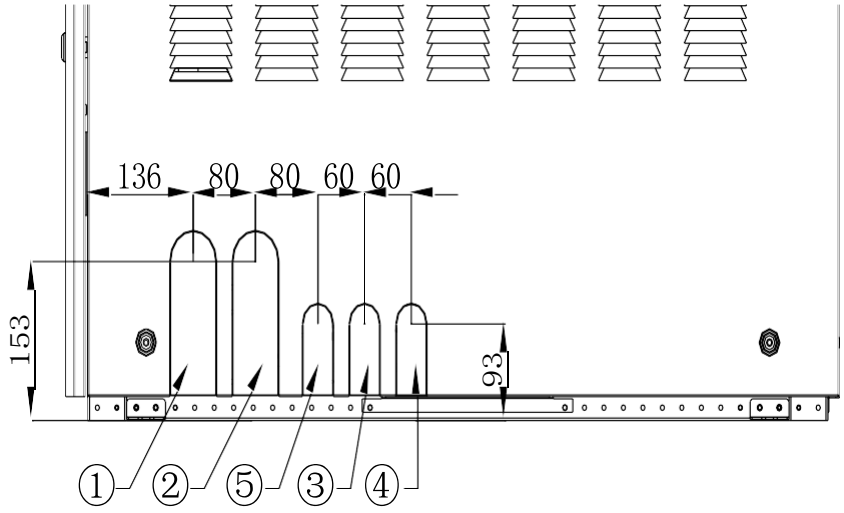


Figure 1-5 EACCR series upper air supply models side plate knockout hole size

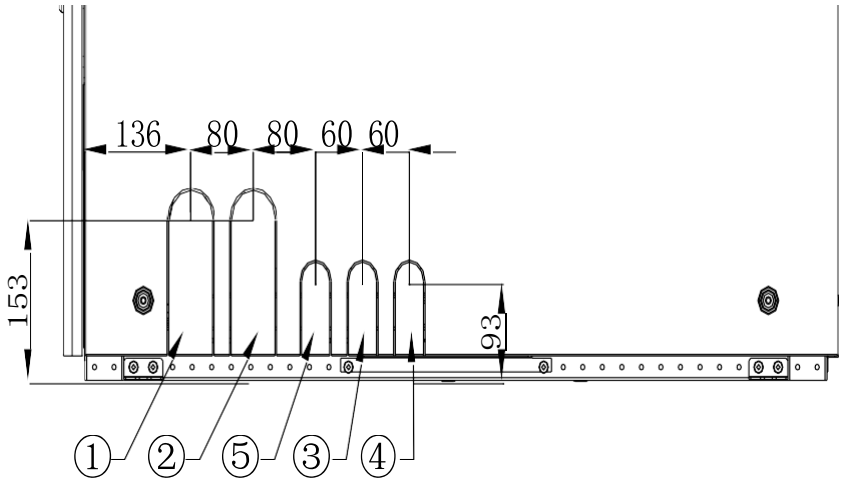


Figure 1-6 EACCR series lower air supply models side plate knockout hole size

Side plate knock out hole explanation:

Items	Explain	Items	Explain
①	Through hole of gas pipe	②	Through hole of liquid pipe
③	Through hole of inlet pipe	④	Through hole of drain pipe
⑤	Through hole of cable		

1.5.3 Base Plate

The dotted line in the figure below is represented as the door plate, and the circular hole in the figure is a knock hole.

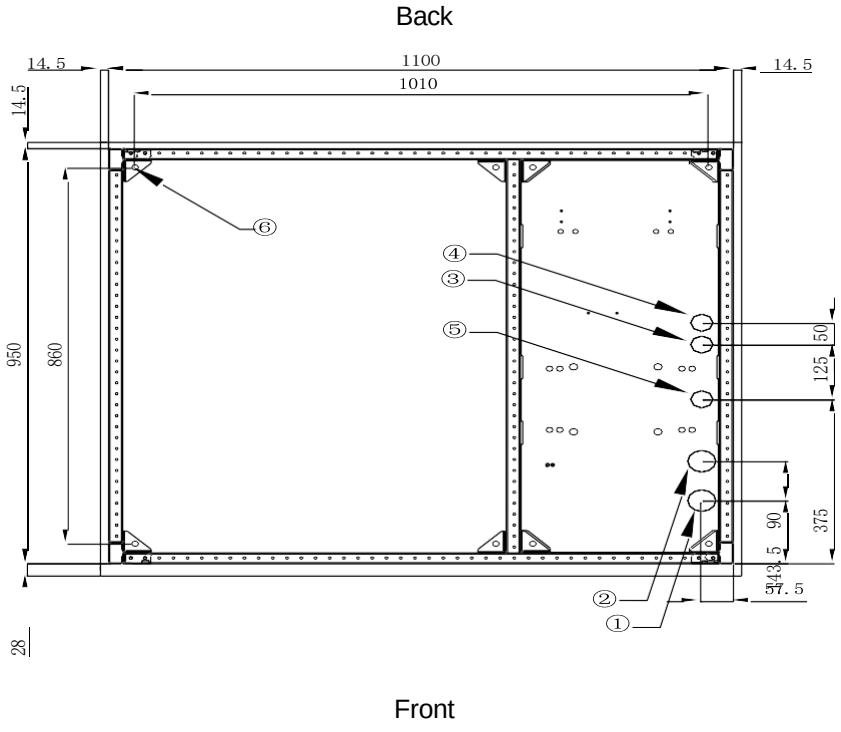


Figure 1-7 Schematic diagram of base plate of lower air supply models on single system of EACCR025/030/035/040/045/050

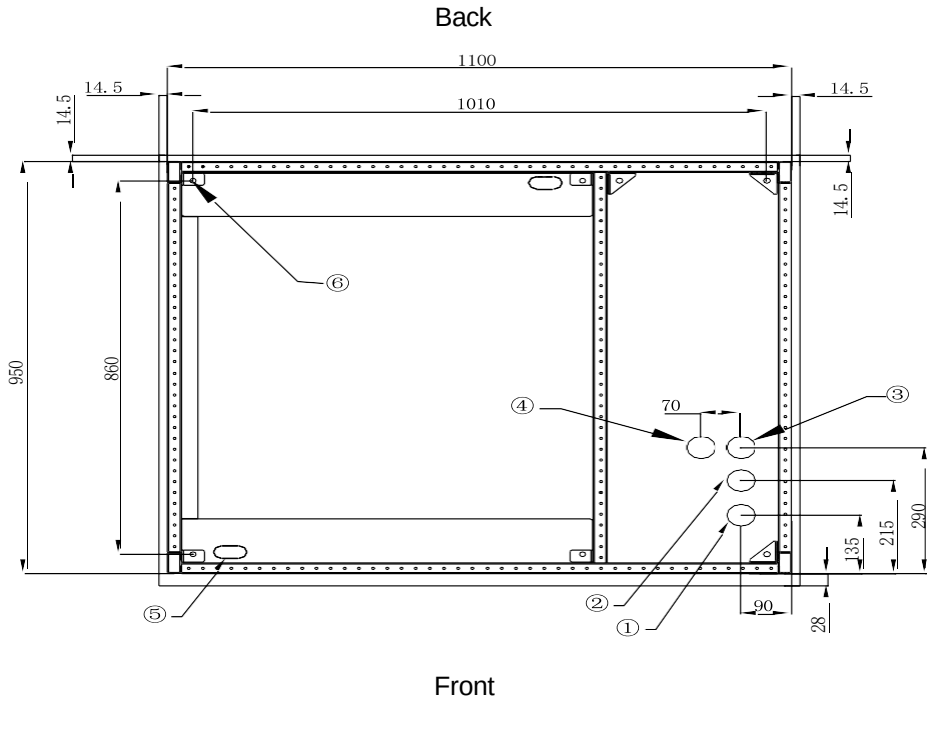


Figure 1-8 Schematic diagram of base plate of upper air supply models on single system of EACCR025/030/035/040/045/050

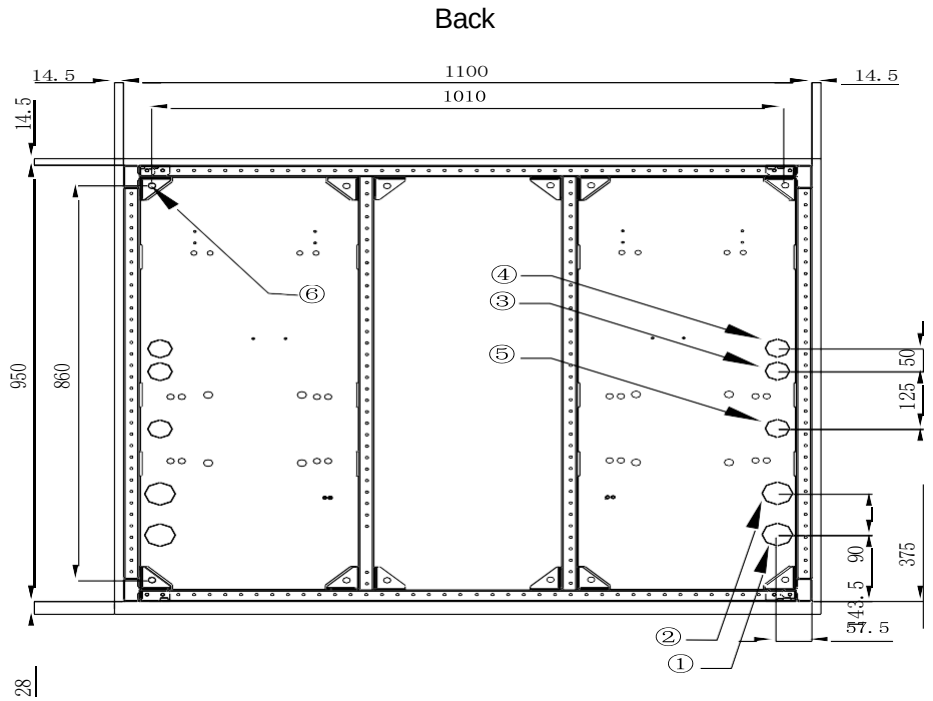


Figure 1-9 Schematic diagram of base plate of upper air supply models on dual system of EACCR040/050

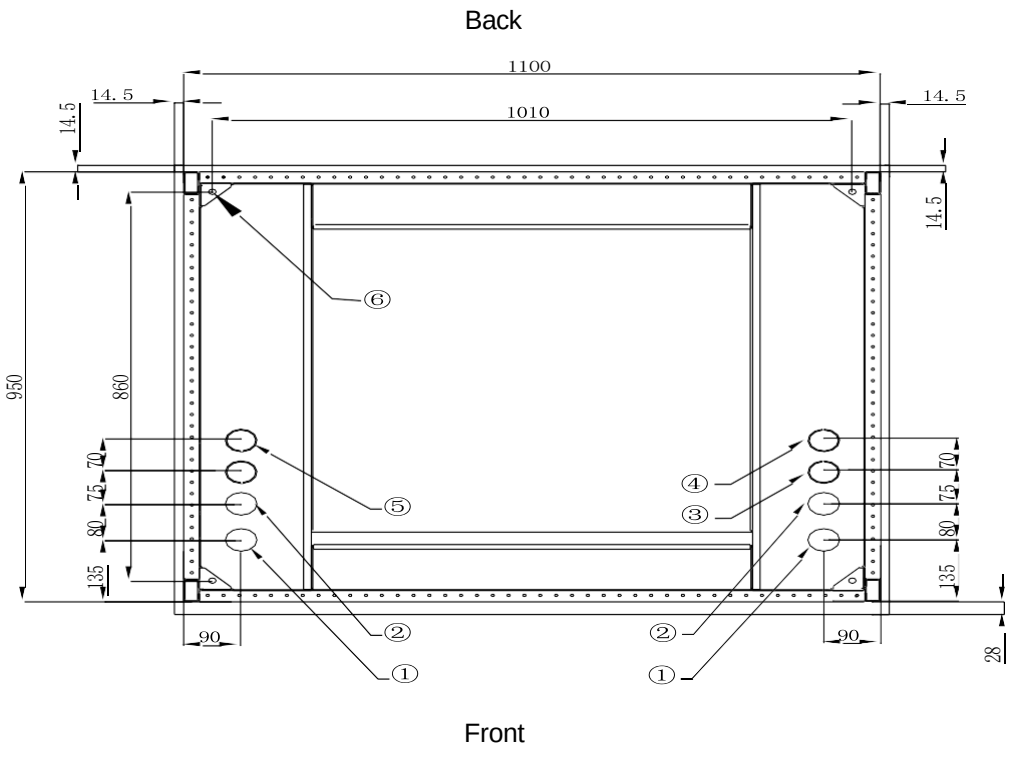


Figure 1-10 Schematic diagram of base plate of lower air supply models on dual system of EACCR040/050

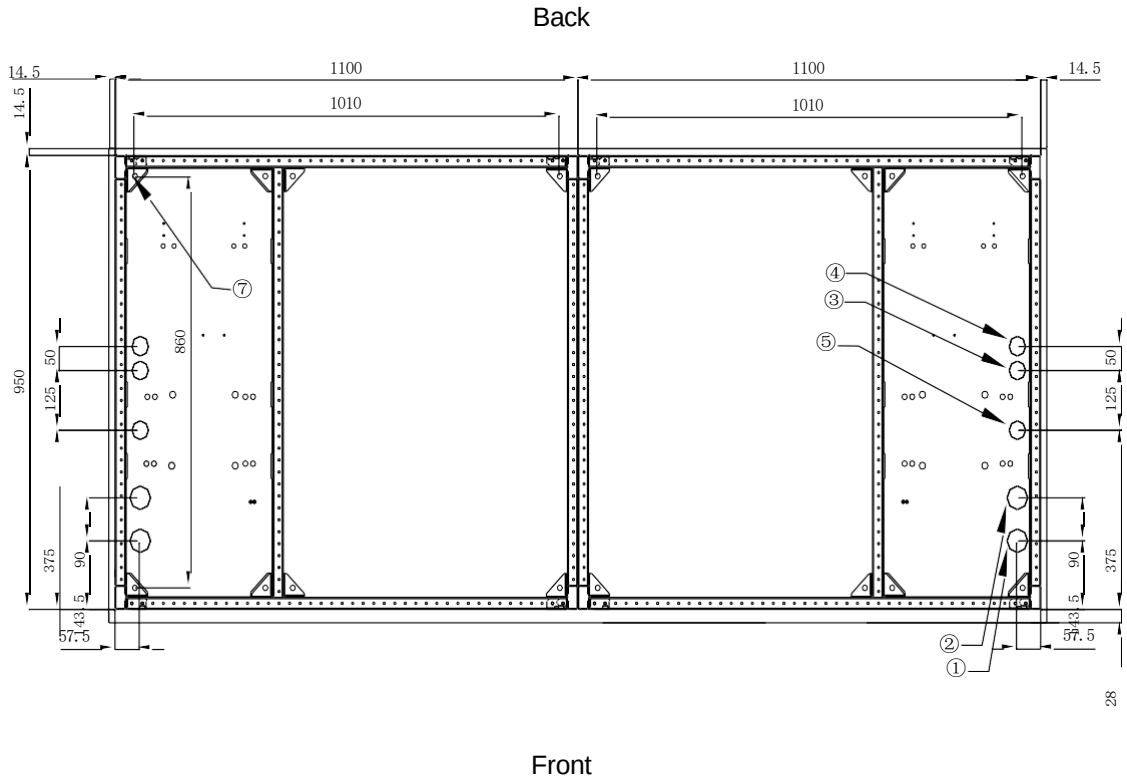


Figure 1-11 Schematic diagram of base plate of upper air supply models on dual system of EACCR060/070/080/090/100/120

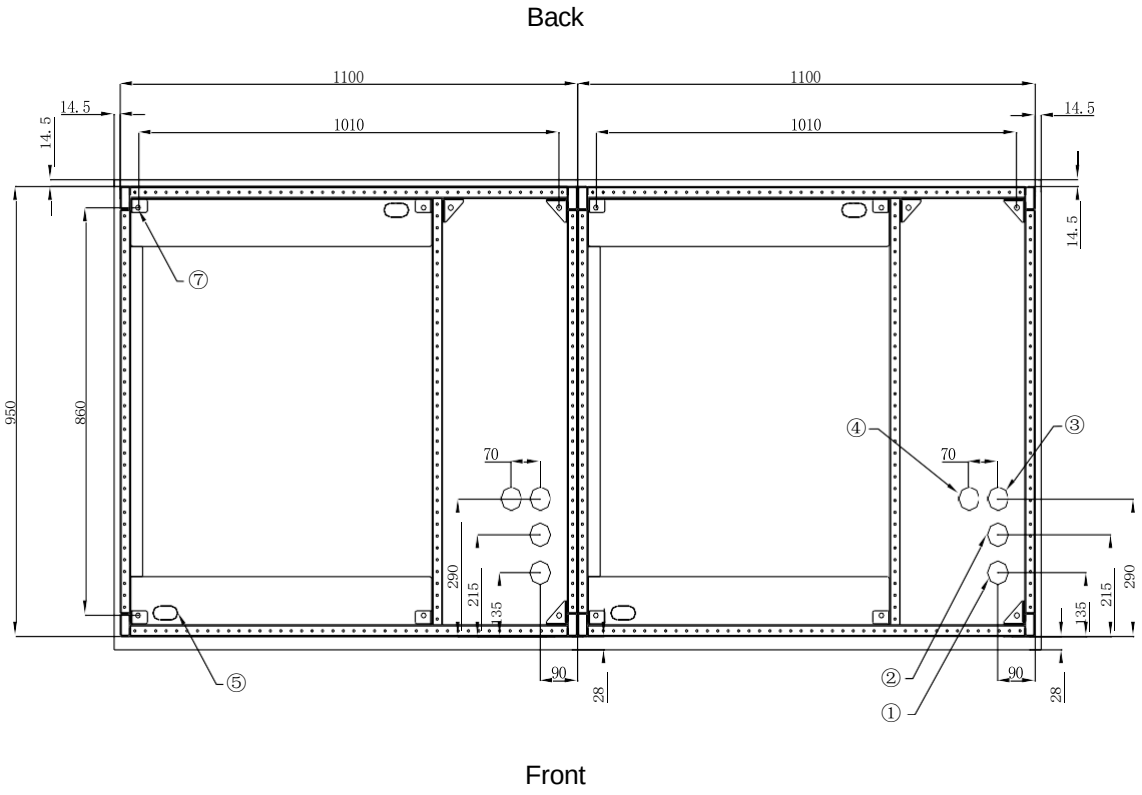


Figure 1-12 Schematic diagram of base plate of lower air supply models on dual system of EACCR060/070/080/090/100/120

Base plate knock out hole explanation:

Items	Explain	Items	Explain
①	Through hole of gas pipe	②	Through hole of liquid pipe
③	Through hole of inlet pipe	④	Through hole of drain pipe
⑤	Through hole of cable	⑥	4-Ø12 Fixing hole
⑦	8-Ø12 Fixing hole		

Chapter2 Reception

Summary——This chapter focuses on the process and related considerations during the transportation, handling and receipt of products.

§ 2-1 Transportation

About the Product

AirSafe CR precision air conditioners contain mechanical and electrical equipment. Improper transportation and handling may cause damage to the product and result in the equipment not being able to be used normally.

Notes

Precautions related to transportation and handling:

1. Please try to choose a better mode of transportation (e.g., railroad transportation, shipping), and when choosing motor vehicle transport, you should choose a highway with better road conditions to prevent excessive bumps.
2. Please follow the relevant requirements for transportation environment and placement, etc.
3. Please use mechanical handling tools as much as possible when unloading and handling.
4. The indoor unit carrying angle should be in the range of 75°to 105°.
5. Crash-proof, rain-proof, etc.

Table 2- 1 AirSafe CR precision air conditioner packing dimensions and gross weights

Model	Dimension of Packaging (mm)W×D×H	Gross Weight (kg)
EACCR025 (single system)	1260×1120×2150	≤370
EACCR030 (single system)	1260×1120×2150	≤390
EACCR035 (single system)	1260×1120×2150	≤400
EACCR040 (single system)	1260×1120×2150	≤410
EACCR045 (single system)	1260×1120×2150	≤420
EACCR050 (single system)	1260×1120×2150	≤430
EACCR040 (dual system)	1260×1120×2150	≤510
EACCR050 (dual system)	1260×1120×2150	≤530
EACCR060 (dual system)	2360×1120×2150	≤700
EACCR070 (dual system)	2360×1120×2150	≤710
EACCR080 (dual system)	2360×1120×2150	≤720
EACCR090 (dual system)	2360×1120×2150	≤800

EACCR100 (dual system)	2360×1120×2150	≤810
EACCR120 (dual system)	2360×1120×2150	≤820

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

§ 2-2 Product Acceptance

About the Product

AirSafe CR precision air-conditioning products have been subjected to stringent quality assurance tests and inspections before leaving the factory. Users should check the equipment carefully and meticulously when receiving the products to ensure that the equipment has not been damaged during transportation.

2.2.1 Receiving

In view of the arrival of the product, the user has two cases of immediate installation and temporary installation, in order to provide users with a better reception program, the following simulation of the reception process is given for users' reference; please select the optimal program according to the specific circumstances of the user.

Flow Chart

Figure 2-1 below shows a schematic of the reception process simulation, with the specifics in each step described in this section.

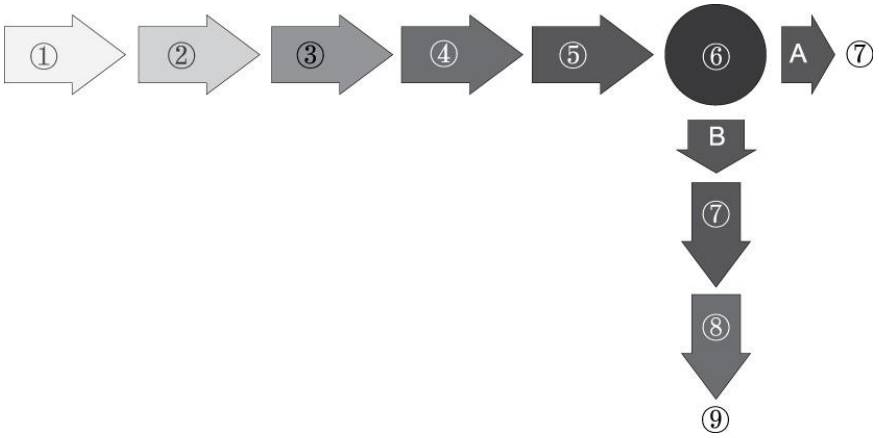


Figure 2-1 Receiving flow simulation diagram

The figure illustrates the reception process under two conditions, condition A and condition B.

A——Immediate installation

B——Temporary uninstallation

Items	Explain	Items	Explain
①	Arrival	②	Appearance Inspection
③	Handling	④	Unpacking

Items	Explain	Items	Explain
⑤	Internal Inspection	⑥	Acceptance
⑦	A：Completion	⑦	B：Airproof
⑧	Storage	⑨	Completion

2.2.2 Appearance Inspection

Transportation Inspection

Upon arrival, check transportation for compliance with shipping requirements.

Transportation requirements:

1. No rain
2. Upright placement
3. No stack.
4. No collision.

[**Note:** The specific requirements refer to the requirements print on the package.]

Appearance Inspection

Appearance inspections include product packaging and product exteriors.

Check contents:

1. Whether or not the outer packaging has ever been opened.
2. Whether the outer packaging has obvious damage and signs of collision.
3. Are there any damages to the exposed parts of the equipment, such as: dented fins, structural deformation, peeling off of top coat, etc.?
4. Does the anti-tilt label turn red?

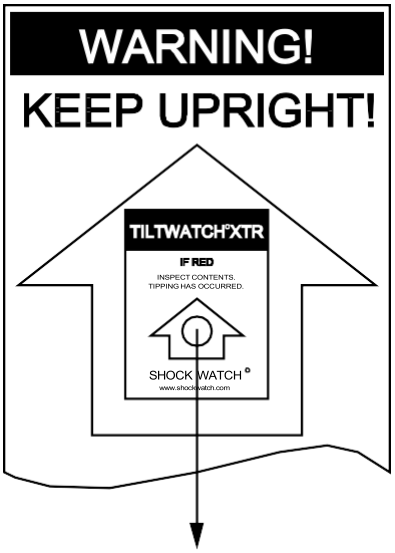


Figure 2-2 Anti-Tilt label related

Tips

1. If you find that it has been previously unpacked, check whether there is any information on the bill of lading or otherwise to indicate this; if not, contact the appropriate authorities;
2. If damage is found, note the appropriate damage on the bill of lading and submit a damage claim to the transportation company;
3. The above problems may cause damage to the product and equipment, so that the product can’t be used normally, please check carefully, if there is a problem, please contact our service department.

2.2.3 Unpacking Suggestion

Recommendation

1. It is recommended that the user carry the product as close as possible to the place of installation (or carry it to the place of storage) before unpacking;
2. When performing unboxing operations, the user is advised to consider the reusability of the box.

Related Tips

1. The product is packed in heavy duty carton, users must be careful when performing the unboxing operation so as not to cause damage to the equipment and failure to use it properly due to improper operation.
2. Damage to the equipment may occur due to improper human handling, which may void the manufacturer's warranty.

2.2.4 Internal Inspection

Content

1. After opening the box, users are requested to carefully and meticulously check whether all the internal parts of the equipment are complete or damaged.
2. Check that the accessories are complete by taking an inventory according to the packing list.

Related Tips

1. After opening the box, users are requested to carefully and meticulously check whether all the internal parts of the equipment are complete or damaged.
2. Check that the accessories are complete by taking an inventory according to the packing list.

2.2.5 Storage

When the user receives the product, please store it properly according to the following requirements.

Table 2-2 Equipment Storage Requirements

Element	Request
Storage Environment	Safe and clean.
Temp	-40℃～70℃
Humidity Level	<95%RH
Storage Time	Transportation and storage time should not exceed a total of 6 months, beyond which the performance needs to be recalibrated.

◆ Warnings

1. If the equipment has been unpacked, it must be repacked in accordance with the original packaging requirements;

2. Prolonged exposure to the outside environment after the equipment is removed from its packaging may result in damage and void the manufacturer's warranty.

Chapter3 Installation Guide

Summary——This chapter introduces the installation requirements of the unit, installation forms, indoor and outdoor unit installation, piping installation, nitrogen charging and pressure preservation, and user wiring.

§ 3-1 Overall Server Room Requirements

In order to make the unit easy to install and run in the best condition, before carrying out the installation of the equipment, the user needs to consider the factors related to the installation place to ensure that the room meets the requirements for use.

Consideration

1. Ease of access of equipment to air-conditioned premises and ease of plumbing and wiring;
2. Insulate and adiabatic treatment of air-conditioned premises to minimize heat loads; maintain positive pressure to prevent dust from entering through gaps to reduce other heat and humidity and dust filtration loads;
3. When using the downward air supply method, plan the placement of all cables and ducts. All cables and ducts under the antistatic floor should be placed horizontally, as far as possible parallel to the direction of cold air flow;
4. Ensure that the air conditioning unit supply and return air passages are clear;
5. The height of the raised floor shall be ⩾ 420 mm when using the fan sinking operation mode.

◆ **Explain**

The above factors are for reference only, please hire a professional engineering firm to design according to the site conditions and the requirements of the relevant specifications.

◆ **Note**

The installation location of the unit is very important for efficient and balanced control of the indoor environment, and the user should hire a professionally qualified unit or engineer to make the selection.

§ 3-2 Installation Form

AirSafe CR precision air-conditioning system compressor is installed in the indoor unit, with the compressor as the base point, the system installation form is divided into two forms of positive fall and negative drop (this installation form is only applicable to air-cooled series units).

Positive fall： This refers to the installation of the outdoor unit at a higher vertical height than the indoor unit, see Figure 3-1 for the installation schematic.

Negative fall: means the vertical height of the outdoor unit installation is lower than the indoor unit, see Figure 3-2 for installation schematic.

◆ **Explain**

In the figure ① represents the outdoor unit, ② represents the indoor unit, other labeling instructions are detailed in Table 3-2.

3.2.1 Specific Value

Table 3-1 Specific Value

Forms	Vertical Height	Note
Positive Fall	Maximum: 20m	Outdoor units are higher than indoor units
Negative Fall	Maximum: 5m	Outdoor units are lower than indoor units

3.2.2 Installation Requirements

1. Positive fall installation, it is necessary to install a reverse bend in the outdoor unit's air inlet pipe and liquid discharge pipe to avoid liquid backflow during shutdown. When installing the reverse bend, it must be ensured that the top bend of the reverse bend is higher than the highest row of copper pipes of the outdoor unit coil;
2. If the positive fall is more than 10m or the negative fall is more than 5m or the equivalent length of the connecting pipe is more than 30m, it is necessary to add extension components;

   3. For positive fall installation, oil storage bends need to be installed at every 5m vertical height position of the vertical air pipe;
3. When installing with a positive drop, oil traps should be installed at every 5m vertical height of the vertical air pipe
4. The fluid tube must not be exposed to direct sunlight;
5. The indoor unit system gas pipe and condensate drain pipe are inclined downward at a certain angle (≥0.3°horizontal inclination of the exhaust pipe);
6. For negative fall installation, the condenser outlet liquid tube is tilted down the tube at a certain angle (≥ 0.3°horizontal inclination for gas tube);
7. Installation instructions for the negative fall assembly, booster pump assembly, flat panel outboard and energy saving module are detailed in the outdoor unit installation manual.
8. If a fluorine pump energy-saving module is selected for installation, the bottom of the outdoor condenser should be higher than the bottom of the energy-saving module chassis, with a height difference of ≥ 800mm, as shown in Figure 3-3.

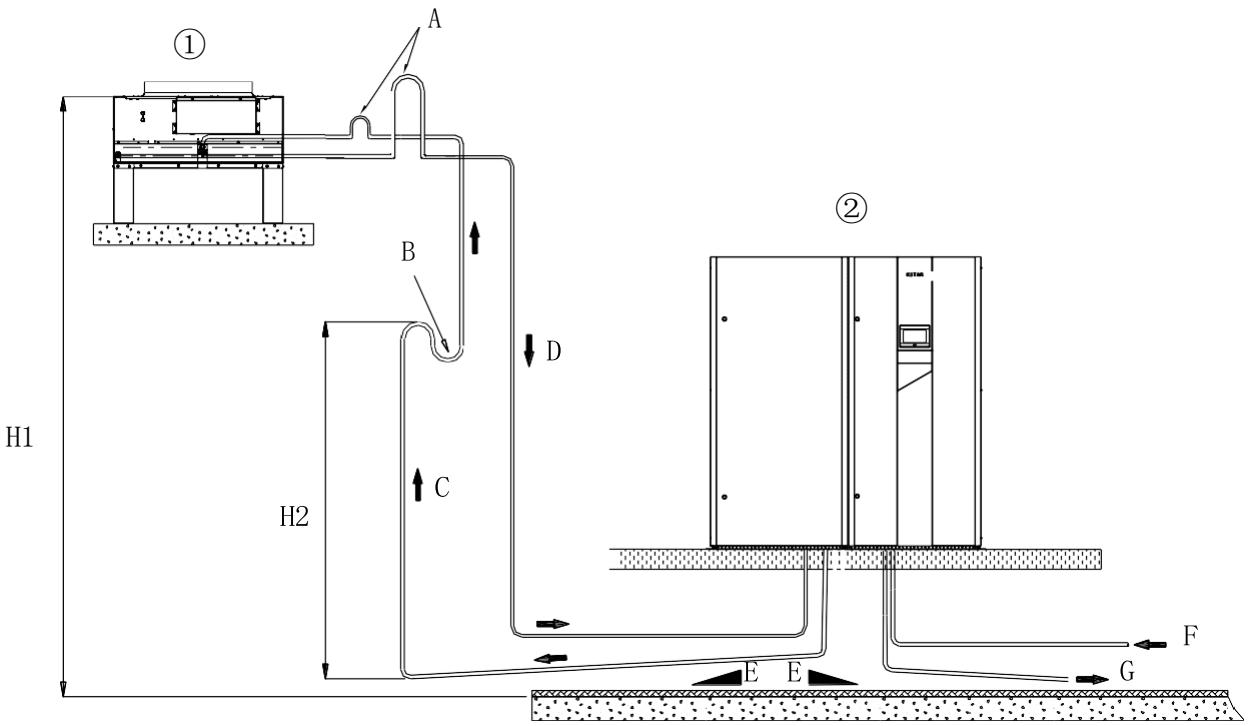


Figure 3-1 Positive Fall Installation Schematic

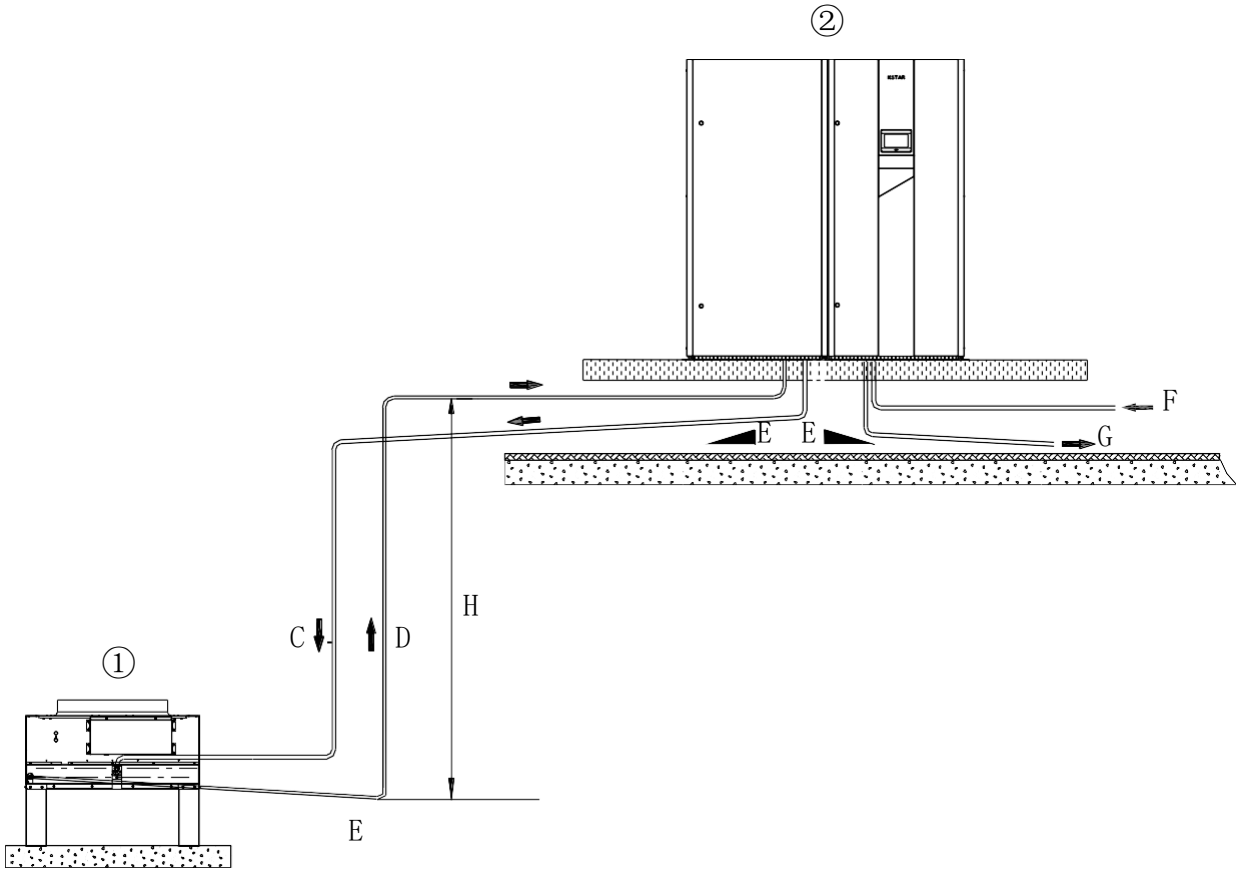


Figure 3-2 Negative Fall Installation Schematic

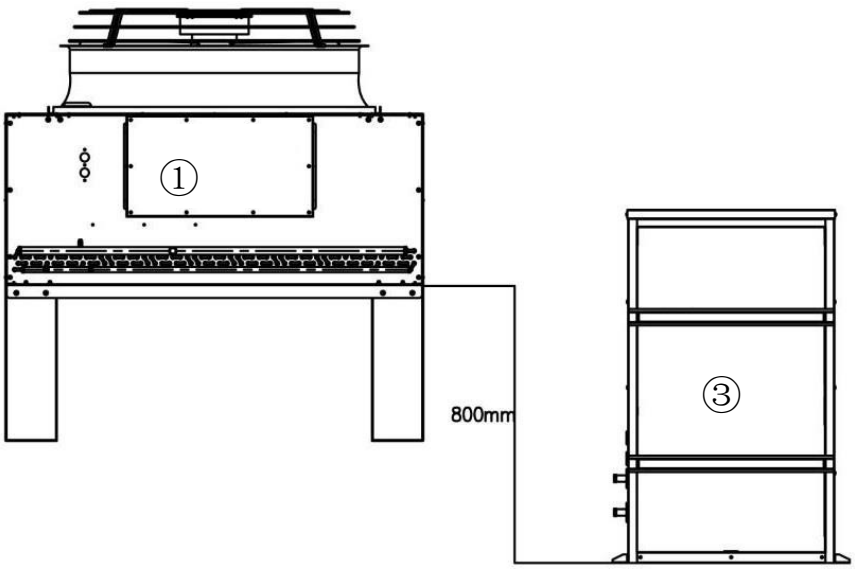


Fig. 3-3 Installation Diagram of Fluorine Pump Energy-Saving Module

Items	Explain
①	Outdoor unit
②	Indoor unit
③	Fluorine pump energy-saving module

Table 3-2 Installation Schematic Labeling

Figure 3-1 Illustration of Positive Fall Installation Related Representations									
Encodings	H1	H2	A	B	C	D	E	F	G
Explain	20m	5m	Reserved bend	Oil Storage Bend①	Gas flow	Liquid flow	Outlet pipe tilt	Water supply	Drainage
Figure 3-2 Negative Fall Installation Related Representation Explanation									
Encodings	H	—	—	—	C	D	E	F	G
Explain	5m	—	—	—	Gas flow	Liquid flow	Outlet pipe tilt	Water supply	Drainage

§ 3-3 Indoor Unit Installation

3.3.1 Server Room Requirements

The machine room requirements are as follows:

1. In order to ensure that the environmental control system in the air-conditioned room works properly, it should be well protected from moisture and insulated.
2. The machine room should be well insulated and have an airtight vapor barrier; the ceiling and wall vapor barriers must be made of polyethylene film material or painted with vapor barrier paint.
3. The entry of outdoor air may increase the load on the system for heating, cooling, humidification and dehumidification, so it is important to minimize the entry of outdoor air

into the equipment room. It is recommended that outdoor air intake be kept to less than 5% of the total indoor circulating air volume.

4. All windows and doors should be fully enclosed with the smallest possible gaps.

◆ **Note**

AirSafe CR series precision air conditioners are specialized equipment, and the indoor unit is prohibited from being used in an open, harsh outdoor environment!

3.3.2 Mounting Space

Air conditioners produce condensate, which may leak due to irregular installation or use. Therefore, this system should not be installed near precision equipment to avoid affecting its normal operation, and the installation site must be provided with a drain line. Since the air-conditioning unit is free-draining by gravity, the drain pipe outside the unit should be kept straight and should not be connected to a U-bend or a structure similar to a U-bend outside the unit, or else condensate from the unit cannot be discharged in time, thus triggering a leakage alarm.

1. To ensure proper operation of the indoor unit, a spacious space should be chosen as the installation site for the indoor unit as much as possible.
2. Avoid placing the indoor unit in a narrow area, as this will impede air flow, shorten the cooling cycle, and lead to short-circuiting of the discharge and return air and air noise.
3. Avoid placing the indoor unit in a recess or at the end of a long, narrow room.
4. Avoid placing multiple indoor units in close proximity to each other to avoid cross airflow, load imbalance and competing operations.
5. To facilitate routine care and maintenance, do not install other equipment above the cabinet (e.g., smoke detectors, etc.).

Maintenance Space Requirements

Normally 900mm of maintenance space needs to be ensured in front of the air conditioning unit, as shown in Figure 3-4 and Table 3-3.

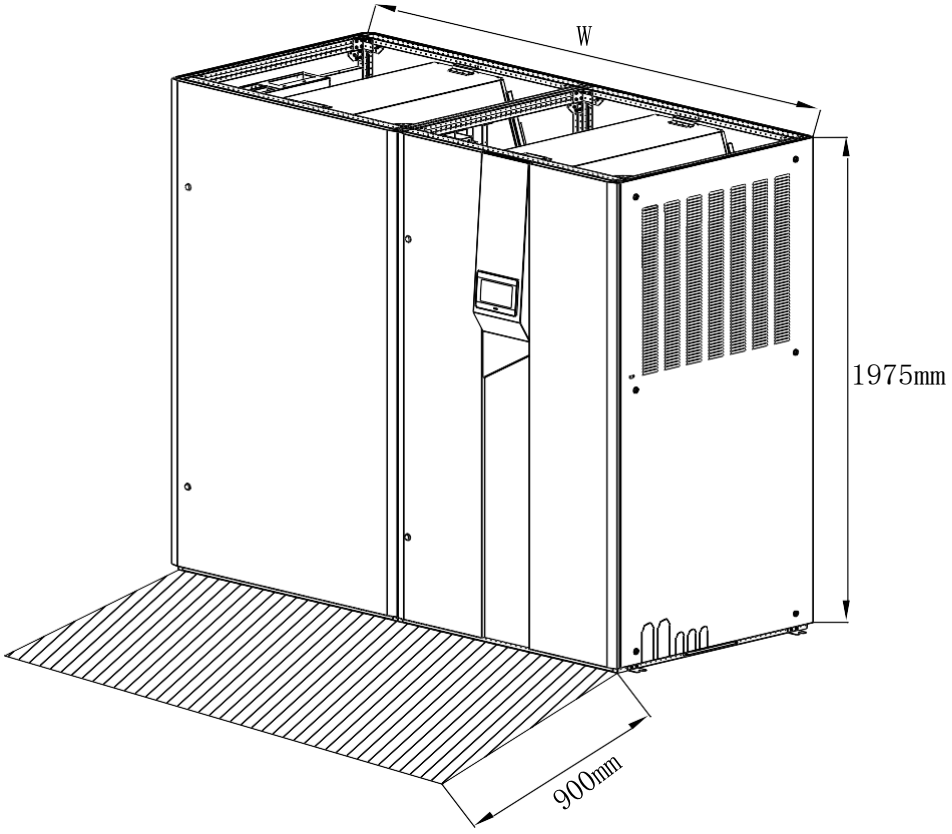


Figure 3-4 Schematic Diagram of Aircrew Maintenance Space

Minimum maintenance space requirements are shown in Table 3-3

Table 3-3 Minimum Maintenance Space of Aircrew (unit: mm)

Spatial Location	Air Cooling
Front	900
Left Side	0
Right Side	0
Back	0
NOTE: These spaces are used to provide for recurring maintenance such as changing filters, tuning fans, etc.	

◆ **Note**

For special applications, please consult our company.

3.3.3 Plenum

Please make the plenum according to the dimensions in Table 3-4 and Figures 3-4 and 3-5. Before proceeding with equipment installation, please verify that the raised floor and stand dimensions and load bearing meet the requirements according to the selected product. See table 3-4 for plenum stand dimensions, and table 1-2 for external dimensions and load bearing requirements. Please use a plenum stand that meets the requirements.

Table 3-4 Dimensions of the Plenum

Model Number	EACCR025/030/035/040/045/050 （Single system）	EACCR040/050 （Dual system）	EACCR060/070/080/090/100/120 （Dual system）
Icon	Figure 3-4	Figure 3-4	Figure 3-5
L(mm)	1050	1050	2150
L1(mm)	1010	1010	1010
L2(mm)	--	--	1010
L3(mm)	--	--	--
L4(mm)	20	20	20
L5(mm)	--	--	--
W(mm)	900	900	900
W1(mm)	860	860	860
W2(mm)	--	--	--
W3(mm)	20	20	20
W4(mm)	--	--	--
H(mm)	on-the-spot	on-the-spot	on-the-spot
Angle Size	50mm×50mm×5mm angle recommended		

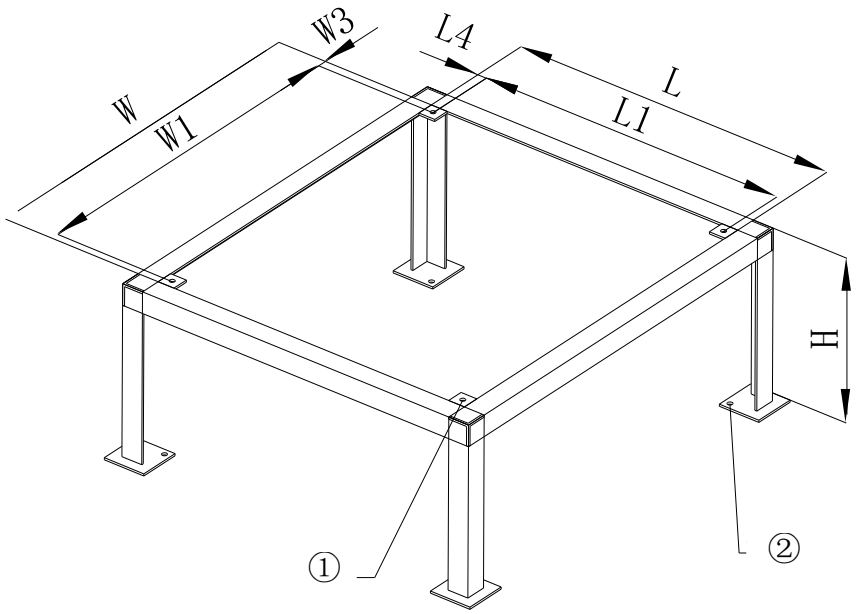


Figure 3-5 EACCR025/030/035/040/045/050 Single System Model Air Conditioner Plenum

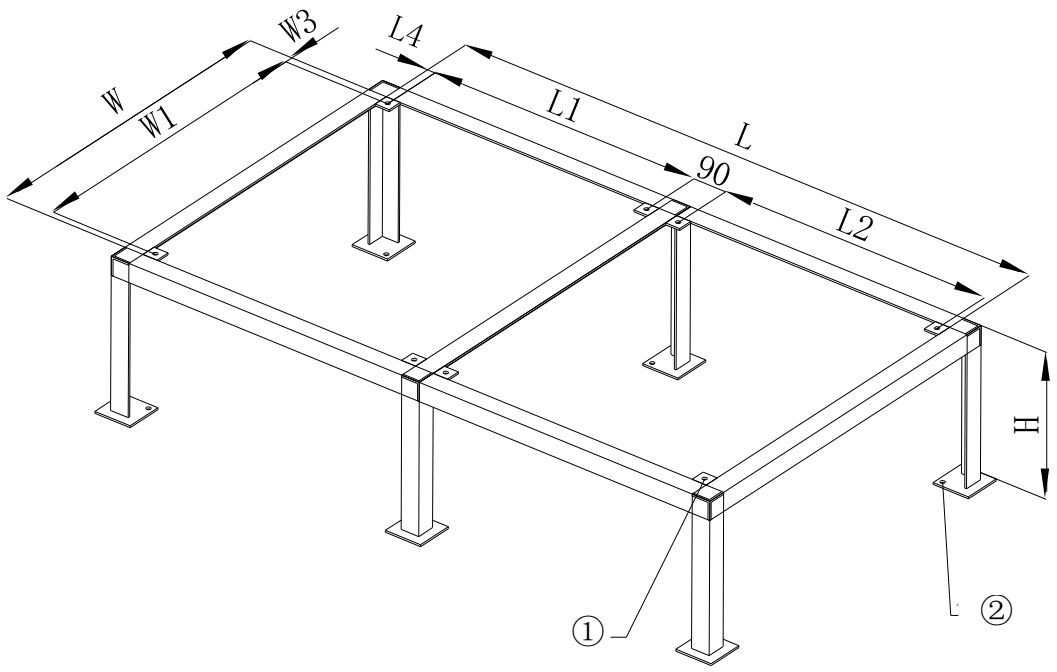


Figure 3-6 EACCR040/050/060/070/080/090/100 Dual System Model Air Conditioner Plenum

[**Note:** The plenum can be made by the user or by contacting the manufacturer.]

Items	Explain
①	Fixed mounting holes for equipment Ø12
②	Expansion bolt mounting hole size shall not be less than M12.

Request

1. The plenum must meet the dimensional requirements and load bearing requirements of the unit;
2. When installing the unit, a layer of vibration damping rubber must be laid on the top, sides and bottom of the bracket according to the bracket size;
3. The height H of the plenum support must comply with the requirements for use;
4. The size of the expansion bolts for fixing the plenum shall not be less than M12.

Relevant Specifications

Figure 3-5, Figure 3-6 in the plenum is used 50mm ×50mm ×5mm angle steel according to the size of the equipment manufacturing, with expansion bolts fixed to the ground and painted with antirust paint, and if necessary, then painted with equipment similar to the top coat.

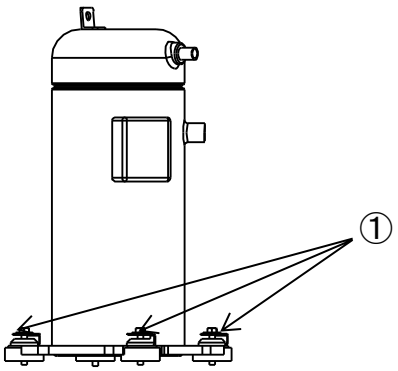
Table 3-5 Plenum Specifications

Name		Specification(mm)	Note
Steel Base Plate		100 ×100 ×(5~7)	Recommended use
Angle		50 ×50 ×(3~5)	Recommended thickness 5mm
Shock Absorber	**Top Surface**	3~5	thicknesses
	Lateral Side	2~3	thicknesses
	Bottom Side	10~12	thicknesses
Height of Base Support (H)		According to the site, the following air supply must be ≥450mm	

[**Note:** When the fan is mounted on the bottom, the minimum value of H should be ≥ 450 mm.]

3.3.4 Removal of Compressor Transportation Fixing Sheet Metal

In order to cushion the vibration of compressor operation and reduce vibration noise, vibration-damping rubber pads are installed at the foot of the compressor. However, this vibration damping technology does not suppress the compressor's shaking during transportation, and may result in loosening of the relevant connections or wear and tear of certain parts. In order to eliminate this possible disadvantage, a "U" shaped fixing plate for transportation has been added to the three fixed feet of the compressor during transportation. The compressor fixing plate must be dismantled before the unit is installed and commissioned, as shown in Fig. 3-7.



Items	Explain
①	Compressor fixing sheet

Figure 3-7 Compressor Fixed Sheet Metal Removal Schematic

§ 3-4 Outdoor Unit Installation

For installation of the outdoor unit, please refer to the ECOND Air-Cooled Condenser Owner's Manual, Chapter 2: Condenser Installation.

§ 3-5 Fan Sinking Installation Guidelines

This section applies to downdraft (sunken fan) models only. If the fan is to be installed in a sunken position, please refer to the following instructions according to the actual model.

3.5.1 Basic Operating Guidelines--for Downdraft Fan Models Procedure

Procedure

Step 1: After removing the fan set screws, hold the puller and pull the fan out horizontally (as shown in Figure 3-8)

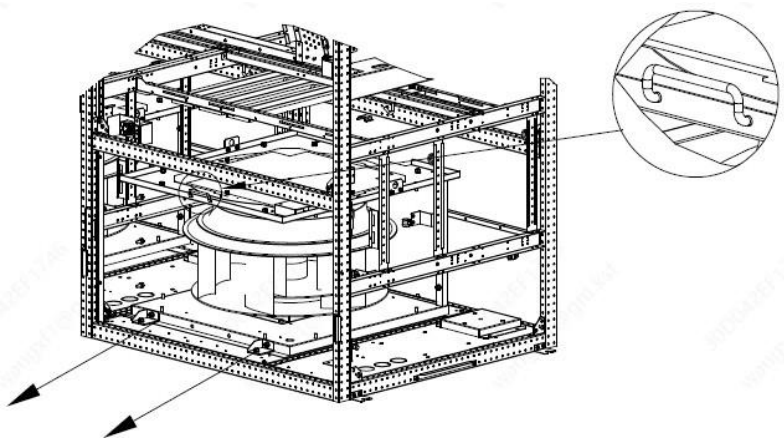


Figure 3-8 Diagram of Step 1

Step 2: Lift the blower assembly onto the base plate and slide it forward at a certain tilt angle. When it reaches the top, slowly lower the blower assembly and tighten the set screws when it is leveled (as shown in Figure 3-9).

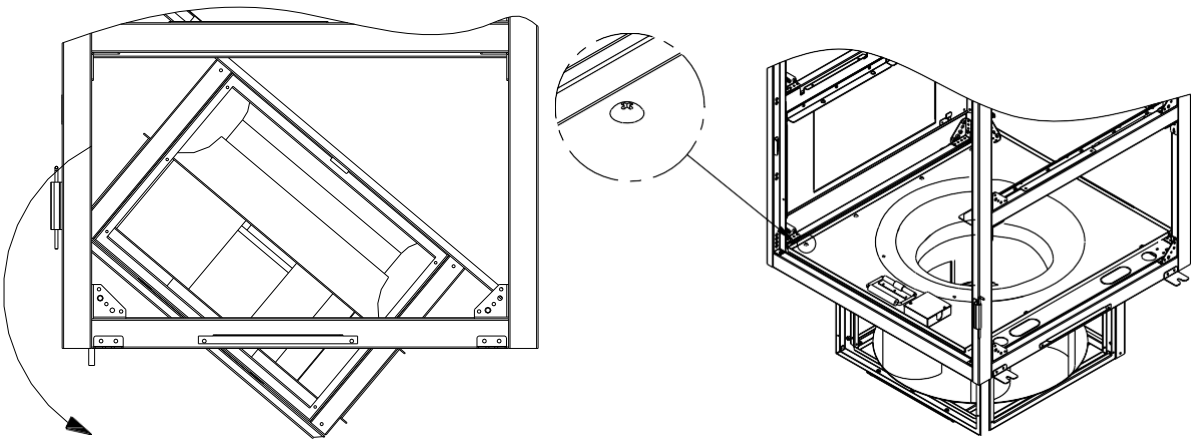


Figure 3-9 Diagram of Step 2

3.5.2 Electric Heating Installation Guidelines--For Downdraft Fan Models

1） EACCR060/070/080/090/100/120 dual-system models: the electric heating does not sink with the fan, fixed in the factory position (behind the electronic control box), the fan sinking does not need to dismantle the electric heating for synchronized sinking.

2） EACCR025/030/035/040/045/050 single system models: The electric heating sinks with the fan and is fixed in the factory position.

3） EACCR040/050 dual-system model: electric heating is sunk with the fan, firstly the electric heating assembly is removed, then the fan is sunk, and finally the electric heating is installed on-site.

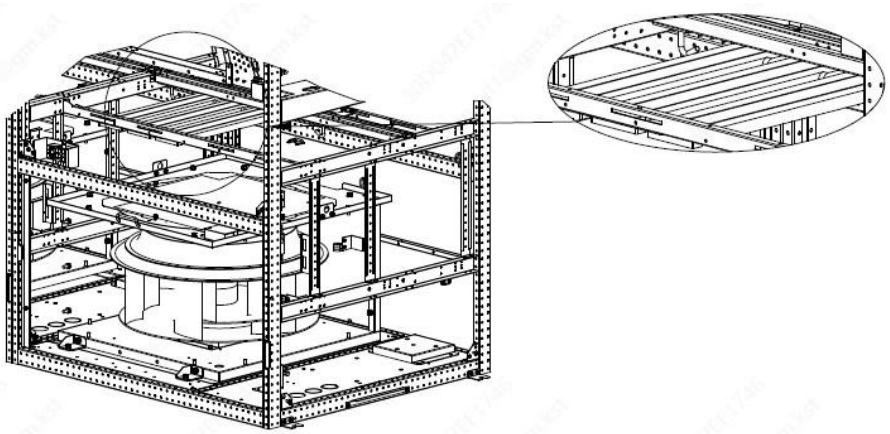


Figure 3-10 Schematic Diagram of Electric Heating Position for EACCR060/070/080/090/100/120 Dual System

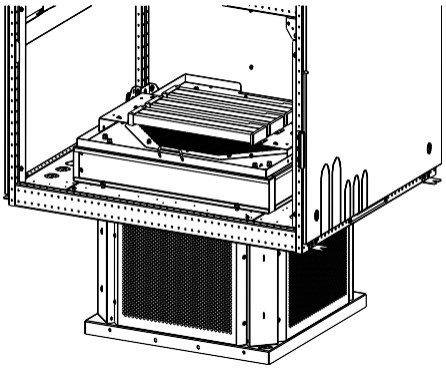


Figure 3-11 EACCR025/030/035/040/045/050 Single-System Model Electric Heating Position Diagram

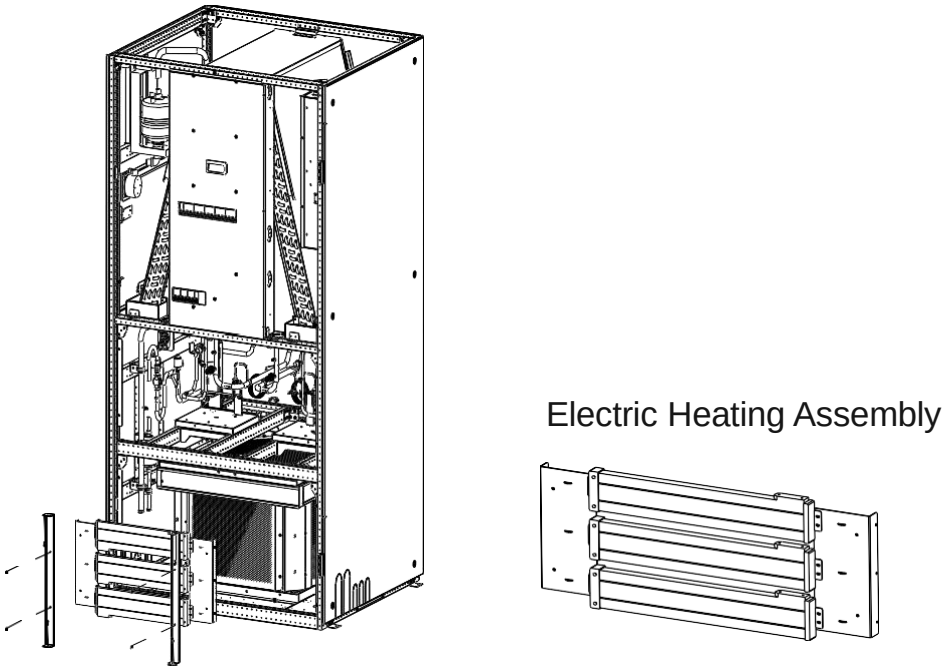


Figure 3-12a EACCR040/050 Dual System Model Electric Heating Installation Step 1 (Remove Electric Heating Assembly)

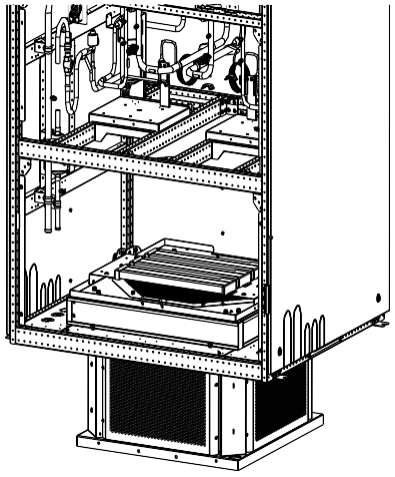


Figure 3-12b EACCR040/050 Dual-System Model Electric Heating Installation Step 2 (after fan is sunk, install electric heating assembly)

3.5.3 Detailed Operating Instructions--for Downdraft Models

Explain

1. Users are required to provide their own sinker cables (as shown in Figure 3-13).
2. The down-feeder model is provided with a hook and beam structure (as shown in Figures 3-14 and 3-15).

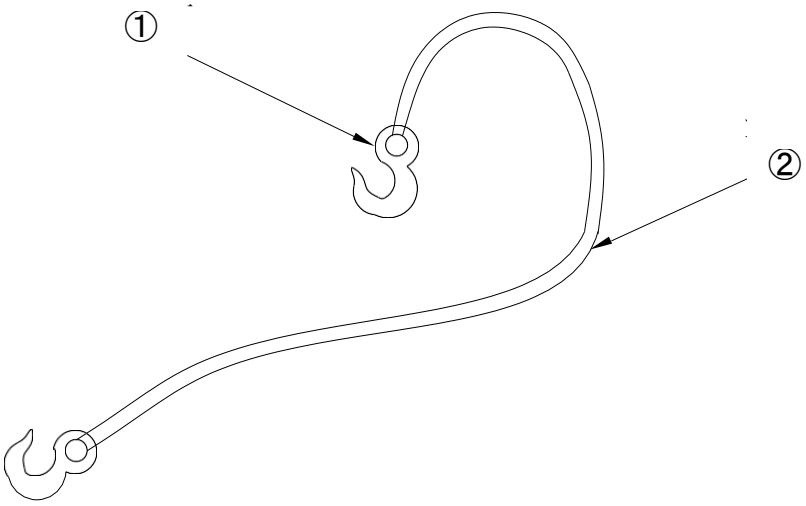


Figure 3-13 Schematic of Sinker Cord

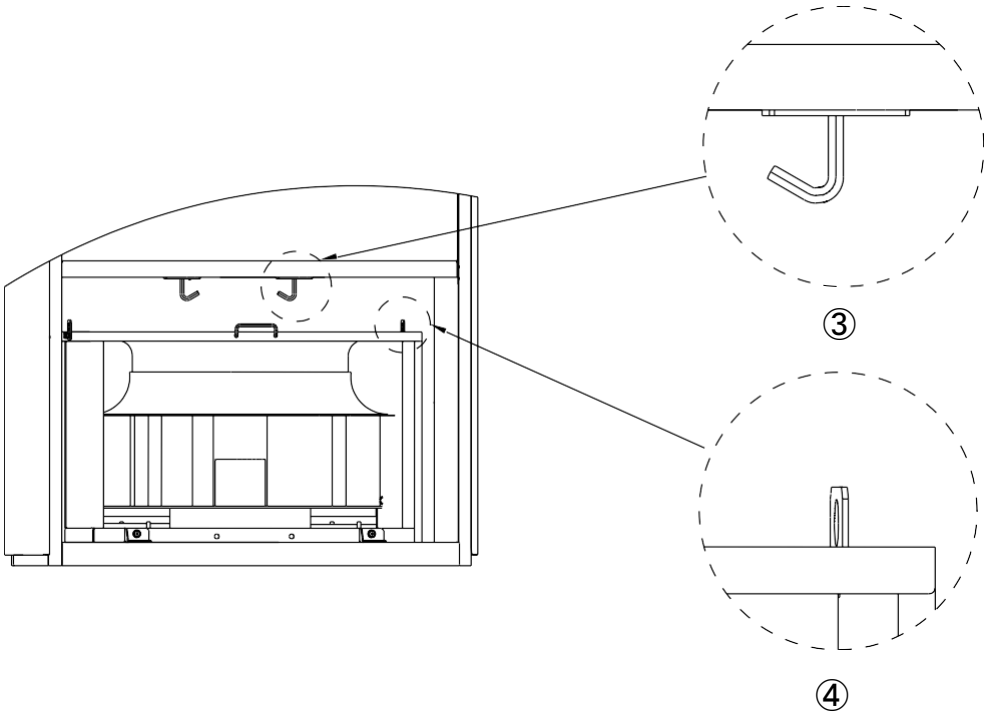


Figure 3-14 Enlarged Diagram of Hooks and Lugs

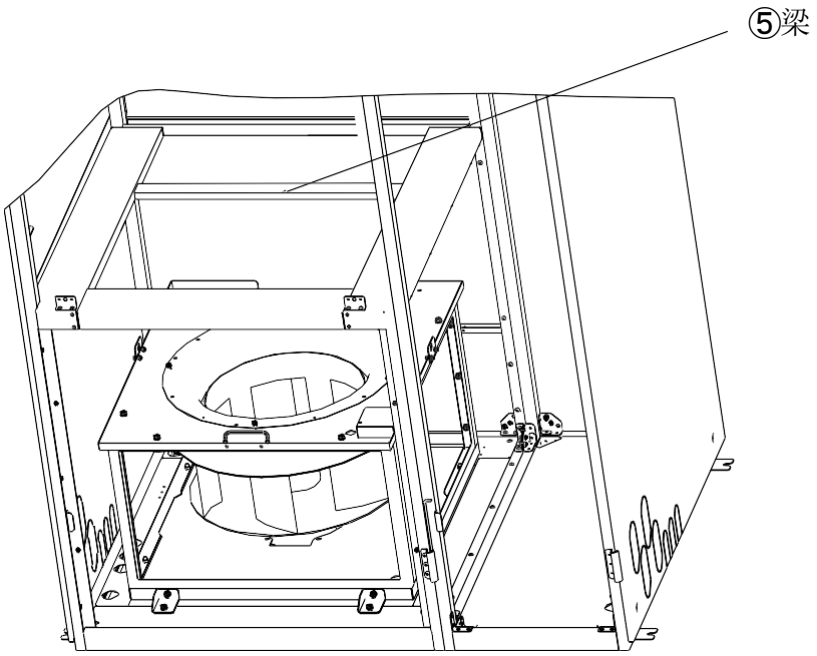


Figure 3-15 Diagram of Crossbeam Structure

Items	Explain	Items	Explain
①	hanger	②	sinking rope
③	hook	④	lug
⑤	crossbar		

Procedure Step

Step 1:

① **[Applicable to downdraft (fan sinking) models]**

Wrap the sinker cable around the two hooks on the unit, with the hooks at its ends hooked to the lugs on the left and right sides of the fan, pull the sinker cable between the two hooks, and exert force in the horizontal direction to pull the fan tight (as shown in Figure 3-16).

② **[Applicable to downdraft (fan sinking) models]**

Wrap the sinking rope around the beam of the unit, hook the hooks at its two ends to the hanging lugs on the left and right sides of the fan, pull the sinking rope, and exert force in the horizontal direction to tighten the fan (as shown in Figure 3-17).

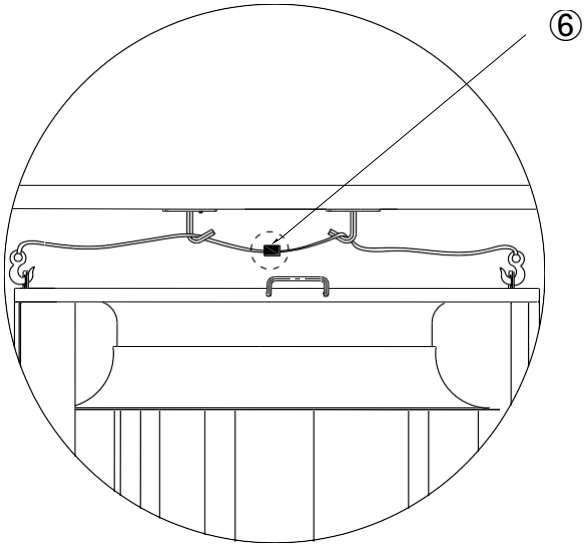


Figure 3-16 Schematic Diagram of Step 1 Operation1

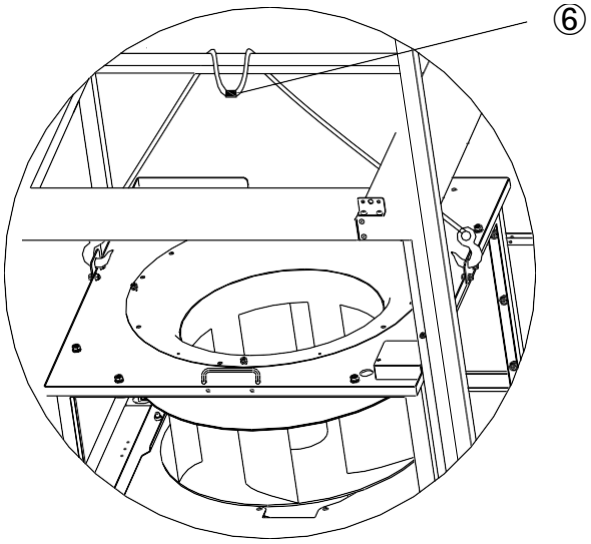


Figure 3-17 Schematic Diagram of Step 1 Operation 2

Items	Explain
⑥	The point of force of the sinking rope, thus pulling the sinking rope and pulling the wind turbine with force in the horizontal direction.

Step 2:

Remove the screws of the fan fixing bracket and take off the fixing bracket, hold the puller and pan the fan forward by 2-3cm (as shown in Figure 3-18).

◆ **Note**

To avoid damage to the fan from falling, ensure that step 1 is done properly before proceeding to step 2, when the fan is already tensioned.

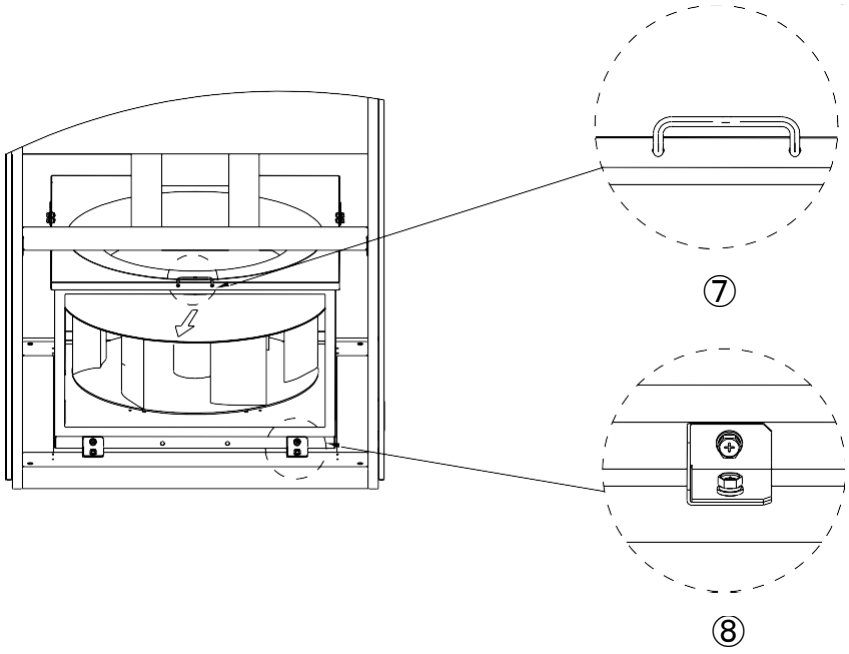


Figure 3-18 Schematic Diagram of Step 2 Operation

Step 3:

Slowly loosen and release the sinking ropes, and after sinking the fan assembly to the base plate, secure the fan using 4-M8 screws (as shown in Figure 3-19).

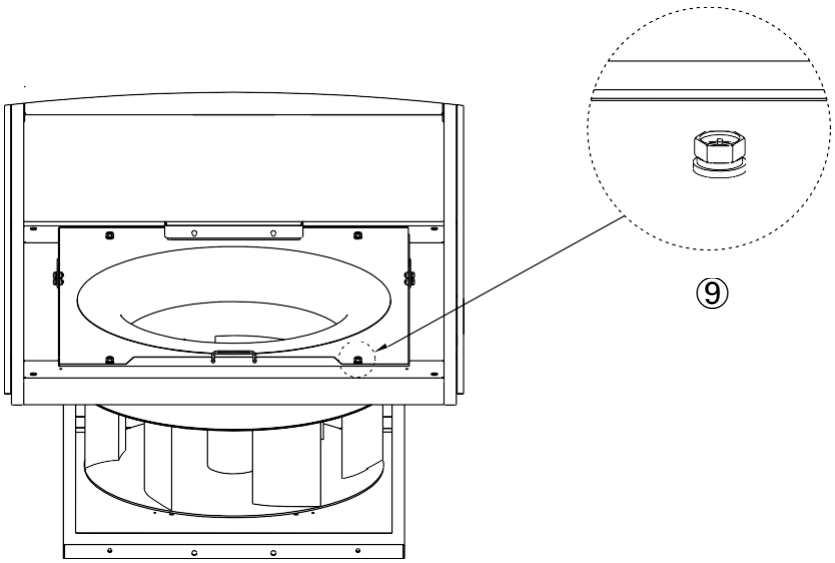


Figure 3-19 Schematic Diagram of Step 3 Operation

Items	Explain
⑦	handle
⑧	Fixed brackets and screws
⑨	4-M8 set screws

§ 3-6 Refrigeration Piping Connections

Piping Installation Requirements and Dimensions

All refrigeration pipe fittings shall be silver brazed. Selection, arrangement and fixing of piping, system evacuation and refrigerant charging shall be operated in accordance with industry standards. The design and construction process shall take into account the piping pressure fall, compressor oil return, and noise and vibration reduction. Considering the influence of pipe diameter on system pressure fall, refrigerant flow rate and compressor oil return, the recommended pipe diameter of copper pipe connecting indoor and outdoor units is shown in Table 3-7（Note: Equivalent length calculation method is shown in Table 3-6 below).

Table 3-6 Local Component Equivalent Lengths

Copper Pipe Diameter(mm)	Equivalent Length (M)		
	90°elbow	45°elbow	Tee
10	0.21	0.10	0.76
13	0.24	0.12	0.76
16	0.27	0.15	0.76
19	0.30	0.18	0.76
22	0.44	0.24	1.1
28	0.56	0.30	1.4

Table 3-7 Suggested Pipe Sizes

Model Number	Tube Length (Equivalent)											
	10m		20m		30m		40m		50m		60m	
	ØD (mm)	ØL (mm)	ØD (mm)	ØL (mm)	ØD (mm)	ØL (mm)	ØD (mm)	ØL (mm)	ØD (mm)	ØL (mm)	ØD (mm)	ØL (mm)
EACCR025	19	16	19	16	19	16	22	16	22	16	25	19
EACCR025*	19	16	19	16	19	16	22	16	22	16	25	19
EACCR030	19	16	19	16	19	16	22	16	22	16	25	19
EACCR030*	19	16	19	16	19	16	22	16	22	16	25	19
EACCR035	19	16	19	16	22	16	22	16	25	19	25	19
EACCR035*	19	16	19	16	22	16	22	16	25	19	25	19
EACCR040 single system	22	16	22	16	22	16	25	19	25	19	25	19
EACCR040 single system*	22	16	22	16	22	16	25	19	25	19	25	19
EACCR045	22	16	22	16	25	19	25	19	25	19	28	22
EACCR045*	22	16	22	16	25	19	25	19	25	19	28	22
EACCR050 single system	22	16	22	16	25	19	25	19	25	19	28	22
EACCR050 single system*	22	16	22	16	25	19	25	19	25	19	28	22
EACCR040 dual system	19	16	19	16	19	16	19	16	22	16	22	16
EACCR040 dual system *	19	16	19	16	19	16	19	16	22	16	22	16
EACCR050 dual system	19	16	19	16	19	16	19	16	22	16	22	16
EACCR050 dual system *	19	16	19	16	19	16	19	16	22	16	22	16
EACCR060	19	16	19	16	19	16	22	16	22	16	25	19
EACCR060*	19	16	19	16	19	16	22	16	22	16	25	19
EACCR070	19	16	19	16	22	16	22	16	25	19	25	19
EACCR070*	19	16	19	16	22	16	22	16	25	19	25	19
EACCR080	22	16	22	16	22	16	25	19	25	19	25	19
EACCR080*	22	16	22	16	22	16	25	19	25	19	25	19
EACCR090	22	16	22	16	25	19	25	19	25	19	28	22
EACCR090*	22	16	22	16	25	19	25	19	25	19	28	22
EACCR100	22	16	22	16	25	19	25	19	25	19	28	22
EACCR100*	22	16	22	16	25	19	25	19	25	19	28	22
EACCR120	22	16	22	16	25	19	25	19	25	19	28	22
EACCR120*	22	16	22	16	25	19	25	19	25	19	28	22

◆ **Explain**

1. ØD represents the diameter of the trachea tube and ØL represents the diameter of the liquid tube;
2. "*" is the model with the energy-saving function of fluorine pump;
3. If the length of one-way connecting pipe exceeds 60 meters, please consult the manufacturer's technical personnel to confirm the connecting pipe specification.

Piping Principles

1. All refrigerant piping should be as short as possible and be attractive, neat, straight and horizontal, with a minimum of elbows.
2. Conforms to positive and negative fall installation requirements;
3. See Table 3-8 for wall thickness requirements for the piping used;
4. Adhere to standard procedures for pipe sizing;
5. It is recommended that the connecting copper pipe between the indoor unit and the outdoor unit is more than 30m need optional extension components and other accessories, the maximum length of the connecting pipe is 60m, such as more than this distance or fall greater than 20m application, please contact the manufacturer for assistance;
6. Through the brick structure of all copper pipes should be parallel across, plus casing, piping installation is completed after the wall holes should be sealed accordingly.
7. Pipe supports should be laid out and completed prior to pipe erection, and the pipe needs to be supported and secured at the specified distances, see Table 3-9.

Table 3-8 Piping Wall Thickness Requirements

Piping Size (O.D. Mm)	Wall Thickness (O.D. Mm)
16	**≥1.2**
19	**≥1.2**
22	**≥1.5**
25	**≥1.5**
28	**≥1.5**
32	**≥1.5**

Note: The copper pipe shown in Table 3-8 must be the hard state pipe (Y) that meets the requirements of national standard GB/T18033-2007. If the project site adopts semi-hard or soft state copper pipe, the wall thickness selection needs to be consulted with professional technicians, otherwise it may lead to leakage of the system or bursting of the pipe.

Table 3-9 Pipe Support Interval Reference Table

Copper Pipe Diameter	Maximum Pivot Distance	Support Distance
mm	**inch**	**m**
6～12	**1/4"～1/2"**	**1.2**
16～22	**5/8"～7/8"**	**1.5**
25～35	**1"～1-3/8"**	**2.0**
42～54	**1-5/8"～2-1/8"**	**2.5**

Insulation

Refrigeration system connecting pipeline must do a good job of heat insulation and heat preservation measures, especially the liquid pipe insulation measures are appropriate will directly affect the unit refrigeration performance and energy saving effect. When the copper pipe passes through the wall or other obstacles, it is necessary to avoid the direct contact between the copper pipe and the wall through vibration damping measures such as shock absorbing pads, and at the same time to prevent dust, water vapor, solid particles, etc. from entering the copper pipe.

◆ **Request**

1. Please use insulation pipes that are well insulated, properly sized, and environmentally friendly and durable;
2. When attaching the insulation pipe, it is important to ensure that the insulation pipe is sealed and fits tightly into the pipe;
3. Insulation pipe wall thickness≥9mm;
4. Please take precautions to protect the insulation pipe.

Connection Operation

1. For safety, always vent nitrogen from both the outdoor and indoor units to relieve pressure in the system and check that the inside of the fittings is dry and clean before welding the lines;
2. In the welding process, should pass nitrogen (0.03MPa) for protection, the use of the correct tools and solder, welding work area should be cleaned up, surrounded by non-flammable items to prevent the production of toxic gases, and do all the safety precautions;
3. Care should be taken to control the temperature when welding related parts to prevent high temperature damage to the parts (e.g., ball valves);
4. Use straight pipe joints and 90°elbow joints, and insulate the ground below the indoor unit support;
5. When the pipeline is attached to the external wall or installed in the ceiling: all pipeline support frames are complete and meet the strength requirements; there is no direct contact between the metal support frame and the surface of the copper pipe tubing; the slope of the horizontal pipeline meets the design requirements and is conducive to the return of refrigeration oil.

§ 3-7 Water Supply and Drainage Installation

Installation Steps

1. The customer is responsible for the water inlet pipe and drain pipe to the equipment, to be installed next to the unit, easy to operate in the place of the water inlet pipe manual shut-off valve, the handle shall not be down, in order to repair and maintenance of isolation of the humidifier; if the water pressure is higher than 0.4MPa, by the customer is responsible for the system of water supply pipeline to install a pressure reducing valve;
2. Connect the inlet and drain hoses to the indoor unit;
3. Drainage pipes are installed with strict pipe diameter and slope;
4. Do water storage and drainage test, require smooth drainage, drain pipe installation of water storage bend;
5. Drainage pipes need to be wrapped in insulating cotton to prevent condensation.

Table 3-10 Drainage Related Dimensions

Model Number	Humidifier Inlet Ø	Drain Ø
EACCR025~120	**3/4″**	**20mm**

Relevant Recommendations

Humidifier has certain requirements for water supply, including water pressure, temperature and water quality; if the relevant parameters of the water supply do not meet the requirements, it will affect the effect and life of the humidifier; in order to make the humidifier work in the optimal state, the user needs to be in accordance with the relevant requirements for the unit to provide a suitable water supply system.

Electrode Humidifier:

Electrode humidifier feed water requirements:

1. Inlet water quality: clean tap water;
2. Conductivity: 350～750μs/cm;
3. Inlet water temperature: 4～40℃;
4. Inlet pressure: 0.1～0.4MPa.

[**Note:** Electrode humidifiers cannot use deionized or distilled water]

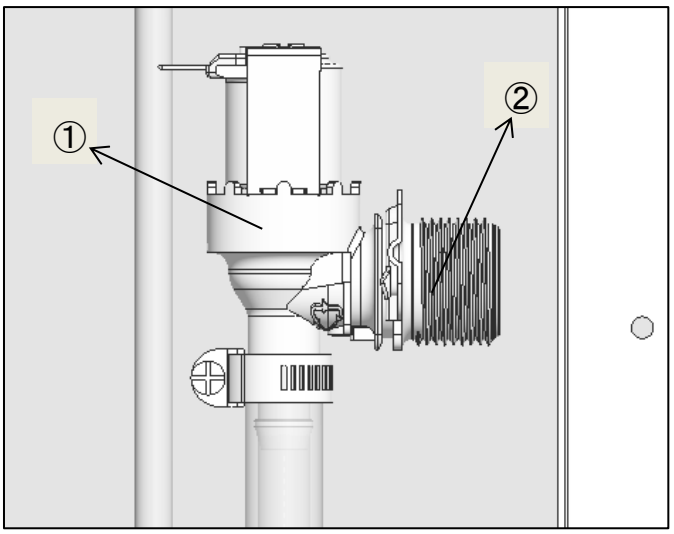
◆ **Note**

The intelligent control system of the electrode humidifier can automatically adjust the discharge cycle of the humidifier according to the change of the soluble mineral ion content (conductivity) of the water in the humidifier, thus greatly reducing the deposition rate of calcium and magnesium and other minerals on the electrode surface and in the tank, and extending the service life of the humidifier. If your local water quality exceeds the above recommended range, we recommend that you contact our service department to choose a humidifier designed for your water quality.

Wet Film Humidifier:

Configuration of wet film humidification, the factory has used the water inlet hose to connect the water inlet solenoid valve and humidifier, the customer only needs to use the threaded connector to connect the water inlet end of the water inlet solenoid valve, according to Figure 3-20 shows the connection.

Pressure reducers should be installed where mains pressures may exceed 700kPa. Where the mains pressure is less than 100kPa, there should be a catch basin and pumping system.



Items	Explain
①	Water inlet solenoid valve
②	Male G3/4 fitting

Figure 3-20 Wet Film Humidification Inlet Hose Connection

Attention!

The main line inlet pipe must be made in accordance with local codes.

§ 3-8 Nitrogen Charging and Pressure Maintaining

1. After all piping connections are completed, leak test with nitrogen, filling pressure should be ≥3.5MPa, and nitrogen should be filled from high and low pressure parts at the same time until balanced. When the system is equipped with low temperature components, nitrogen should be filled into the condenser outlet pipe at the same time;
2. After filling nitrogen, 24 hours of pressure holding time should be no leakage, such as temperature changes in 24 hours, due to the thermal expansion and contraction characteristics of the gas, the pressure will have a small change, such as the temperature difference of 3 ℃, the pressure change of ≤ 1%, it should be normal, if the value of the pressure change exceeds the standard, then leaks should be found out, and rewilding test pressure.

◆ **Note**

1) The use of oxygen or other flammable gases for the gas tightness test is strictly prohibited;
2) The nitrogen pressure charged to the system for leak detection must not exceed the nominal maximum working pressure of the unit.

§ 3-9 Optional Component Mounting

3.9.1 Low Temperature Component Installation

When the outdoor temperature is lower than -20℃, in order to ensure the normal refrigeration operation of precision air conditioning, it is necessary to configure the low-temperature component. It consists of liquid reservoir, check valve, safety valve, shut-off valve, electric heating belt, etc. The installation position refers to the system schematic diagram in section 6.1.2.

The dimensions of the cryogenic assembly are shown below in Figure 3-21 and Figure 3-22, and the specific structural parameters are shown in Table 3-11.

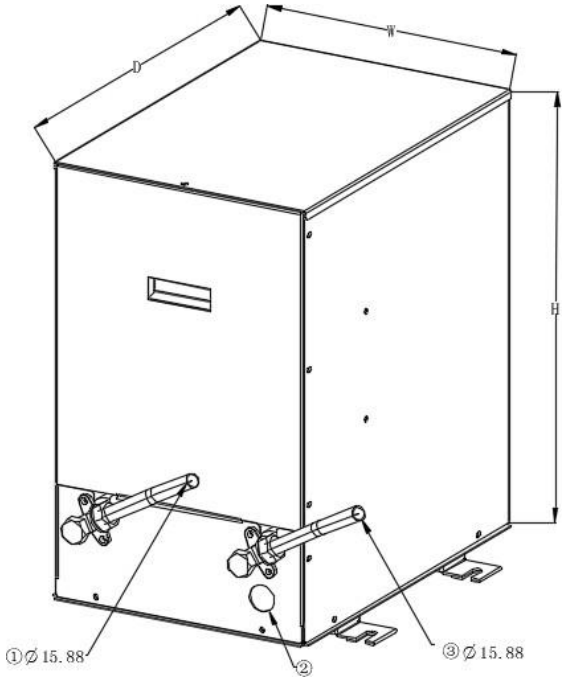


Figure 3-21 Schematic Structure of DW-07 Cryogenic Assembly

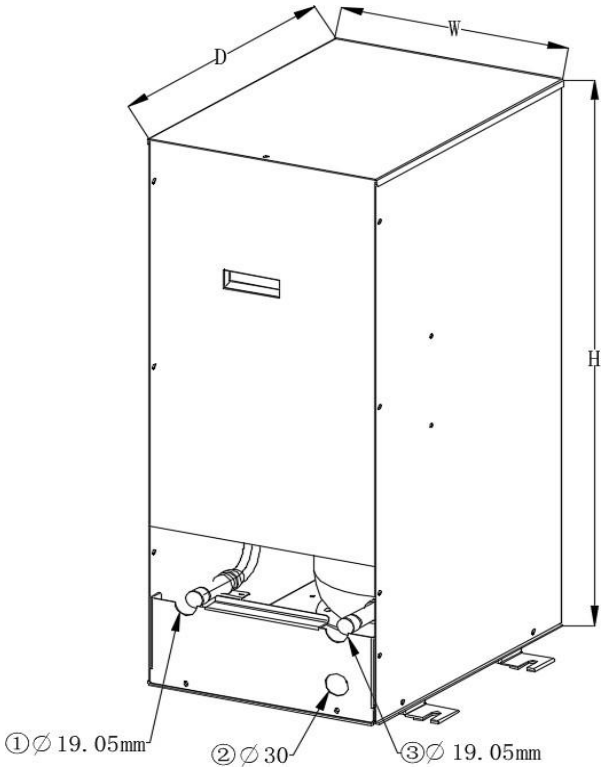


Figure 3-22 Schematic Structure of DW-14 Cryogenic Assembly

Items	Explain
①	Inlet tube
②	Inlet cable
③	Outlet tube

Table 3-11 Structural Parameters of Cryogenic Components

Model Number	Configuration	Dimensions(mm)		
		D	W	H
DW-07	EACCOND032S, EACCOND036S, EACCOND042S, EACCOND048S, EACCOND048D	430	300	500
DW-14	EACCOND054S, EACCOND064S, EACCOND072S, EACCOND084S, EACCOND096S, EACCOND108S, EACCOND170S, EACCOND054D, EACCOND064D, EACCOND072D, EACCOND084D, EACCOND096D, EACCOND108D, EACCOND128D, EACCOND150D, EACCOND170D	430	300	750

◆ **Note**

The dual system outdoor unit is configured with a 2 PCS cryogenic component.

3.9.2 Extension Kit Installation

When the length of the connecting pipeline exceeds 30m or the positive fall exceeds 10m, an extension kit is required. It consists of a check valve, and the installation position refers to the system schematic diagram in section 6.1.2 (installed near the air inlet of the outdoor unit). Please contact our technical staff for technical support.

3.9.3 Negative Fall Component Installation

When the unit is installed with negative fall, in order to avoid abnormal operation, when the unit is installed with a negative fall of more than 5m, it is necessary to configure a negative fall component; it consists of a liquid reservoir, check valve, pressure regulating valve, etc., and the installation position is referred to the system schematic diagram in section 6.1.2 (installed close to the indoor unit, and the distance from the inlet of the indoor unit is ≤2m).

When the negative fall component when the unit installation negative fall more than 15m, please contact our relevant technical personnel to obtain technical support.

3.9.4 Hoods

Air cap as an optional accessory, the user can choose whether the air cap is needed according to the site conditions, the user who chooses the air cap assembly can choose according to the following table 3-12.

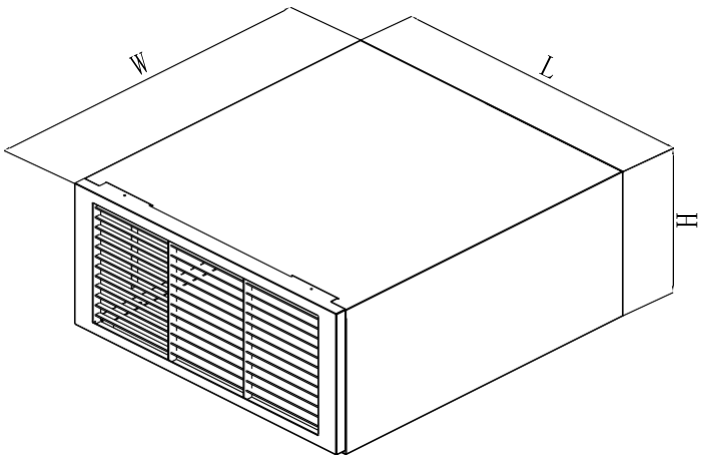


Figure 3-23 Schematic Diagram of Wind Cap

Table 3-12 AirSafe CR Inverter Precision Air Conditioner Hood Size

Model Number	L(mm)	W(mm)	H(mm)
EACCR025/030/035/040/045/050	1130	995	400
EACCR060/070/080/090/100/120	2230	995	400

[**Note**: Our standard air cap size height is 400mm, if you need other sizes, you can contact us for non-standard customization].

§ 3-10 User Wiring

Operational Items

a) Unit main power line connection;

b) Outdoor unit wiring connections;

c) Communication line connection.

Caveat

1. The unit requires a three-phase power supply;
2. The power supply must comply with the standards of the country/region where it is to be used;
3. The unit must be grounded;
4. Refer to the unit nameplate for the relevant unit full load current;
5. Tolerance: rated voltage ±10%, rated frequency ±2Hz (if the front-end voltage fluctuation exceeds the tolerance range, it is recommended that the front-end increase the voltage regulator, purchase our power detection module, otherwise it will lead to air conditioning frequent alarms cannot run normally);
6. Electrical installation work must be carried out by a trained professional installer;
7. Before connecting the circuit, determine the input supply voltage with a voltmeter to make sure the power is off.

Sensing

1. Make sure that the indoor unit and outdoor unit cables are connected correctly and that the PE/N/L1/L2/L3 wiring is in the correct phase sequence.
2. The supply voltage is the same as the rated voltage on the nameplate of the unit;
3. All connections are tight;
4. Circuit breakers or fuses are correctly rated.

The layout of the indoor electromechanical control box is shown in the figure below

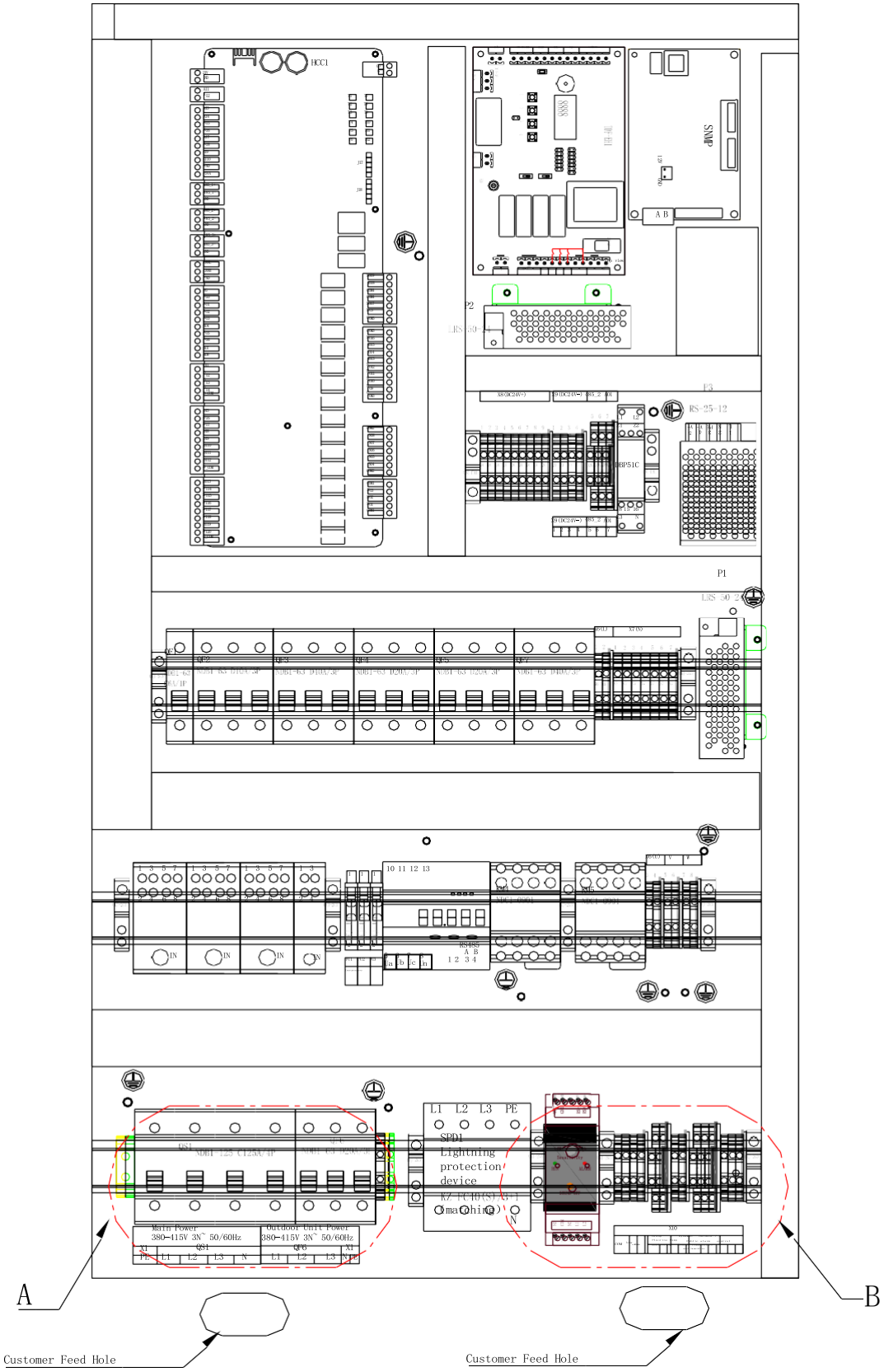


Figure 3-24 Layout of the Indoor Motor Control Box for EACCR Series Models

Where: A - main power supply and outdoor unit power interface

B - Communication cable terminals

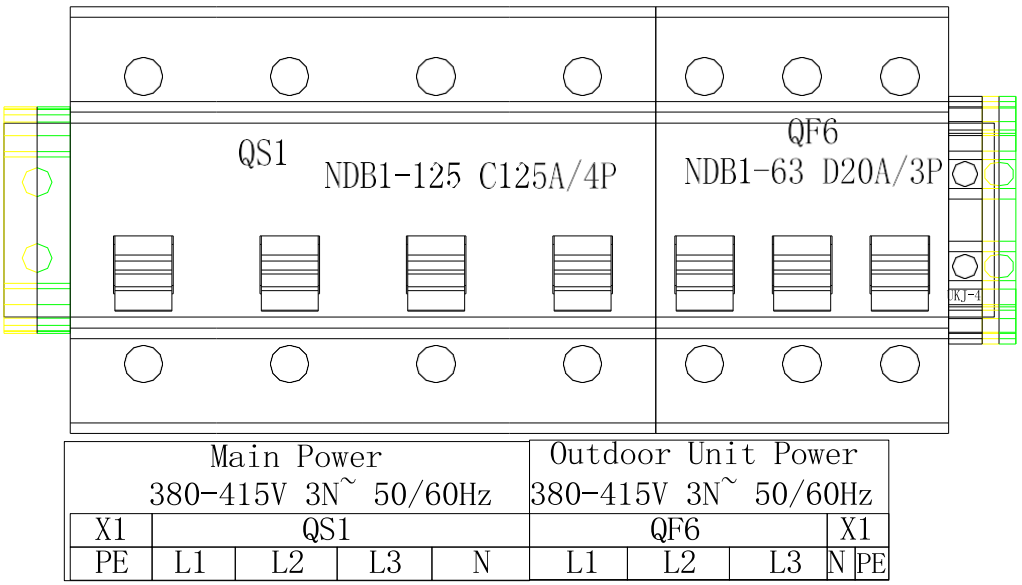
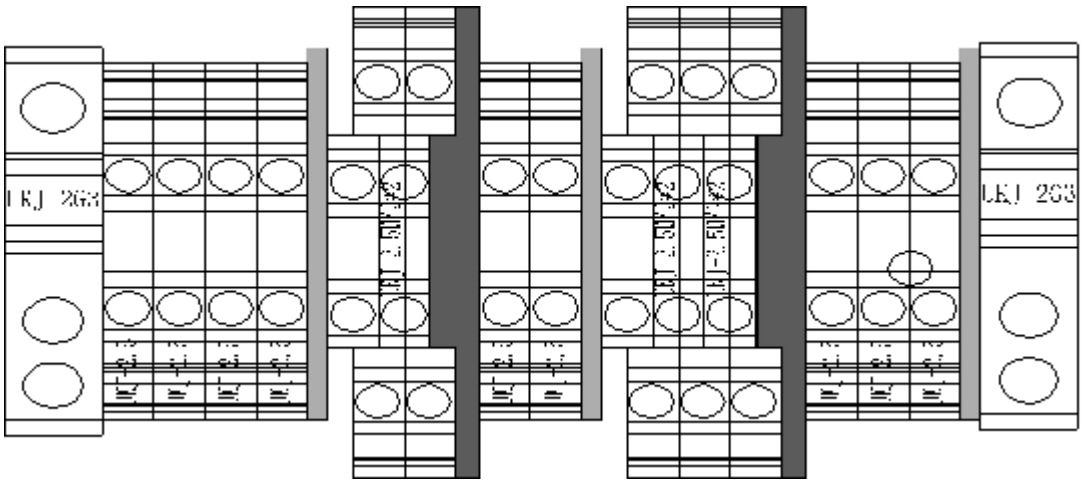


Figure 3-25 Power Wiring Blank (at A)



X10													
Common Terminal		Remote Control	Smoke Alarm	Combined Control		Monitoring SNMP		Outdoor/Remote T&H/Fluoride Pump			Public alarm Port		
COM	COM						B	A	B				

Figure 3-26 Communication Cable Terminal (at B)

⚠ **Warnings**

Before connecting the control wires, the wiring personnel must take appropriate antistatic measures.

Indoor Electromechanical Wiring

1. Connect the communication line between indoor and outdoor units

This unit needs to transmit data with the outdoor unit through RS485 communication. The wiring ports of the indoor unit are the outdoor (A2), outdoor (B2), and GND ports of the terminal block, corresponding to the X1 (A2+), X2 (B2-), and GND ports of the X1 terminal block of the outdoor unit.

2. Dynamic loop communication wiring

When the dynamic loop monitoring function is required, the field wiring and parameter settings are as follows:

a) Connect the dynamic ring (A) and dynamic ring (B) ports of the terminal block to the positive and negative ports of the monitoring system interface respectively.

b) Enter "Installation Parameters" menu → "Function Setting" menu, "Remote Communication Address" to the same as the monitoring system, and "Remote Baud Rate" to 9600.

3. Group control communication wiring

Group control function up to 32 units (address 00 ~ 31) unit network management, communication interface is a CAN interface, need to use the group control function needs to be based on the situation first pull out the middle jumper cap R36 on the main control board, the number of not more than 2 units do not need to pull out the jumper cap, more than 2 units in accordance with the order of connection to pull out the jumper cap in the middle of the unit, the first and last two jumpers do not need to be pulled out of the hat, the scene wiring and Parameter setting is carried out according to the following:

a) Sequentially connect the group control communication line from the group control (H) and group control (L) ports of the terminal row of the previous unit to the group control (H) and group control (L) ports of the terminal row of the next unit until it is connected to the last unit.

b) Each unit should be parameterized, enter the "Installation Parameters" menu → "Function Setting" menu on the display, and set the parameters of "Group Mode" to "Group Control", and then set according to the actual situation.

c) When the on-line machine that is not the host machine drops power, goes off-grid, fails to stop the whole machine, fails to stop the fan, shuts down locally by pressing the key, or shuts down remotely (dry contact/communication), the machine exits from the rotation queue, and 1 standby machine will be enabled automatically; 1 standby machine will be added automatically for each occurrence of the above situations, until all standby machines are put into operation. When the host machine is powered down or off-grid, it enables all standby machines by itself, and all units work independently by themselves; the previous state is restored after the fault is recovered.

d) Remote shutdown

To configure the remote shutdown switch, set the Remote Switch Enable to Enable in the Installation Parameters under "Feature Settings".

e) Public Alarm Terminal

Access to external common alarm terminals, which are controlled by the board's common alarm relay, and whose outputs are used to connect external alarm devices, such as smoke alarms. The contacts close in the event of a serious alarm. This can be used to send a remote alarm, signal a building management system or automatically dial a paging system. The user is required to provide their own power supply for the public alarm system circuit.

Other terminal definitions are detailed in the wiring diagrams and labels.

Power incoming wiring diagram

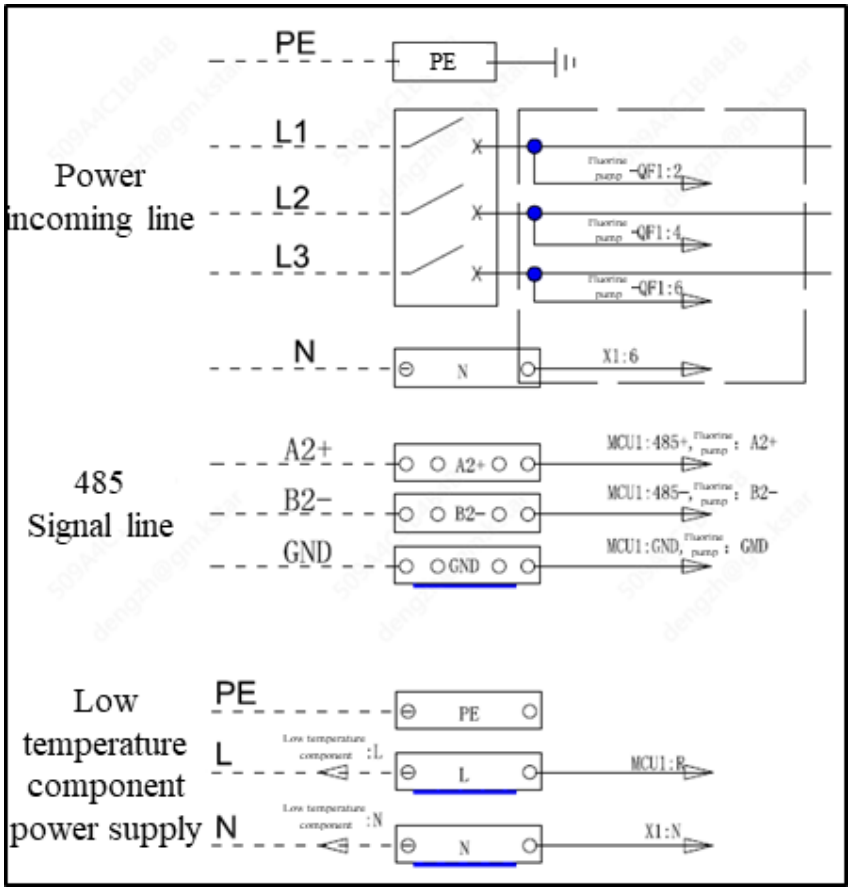


Figure 3-27 Schematic Diagram of the Main Power Supply Wiring of the Outdoor Unit

Attention!

1. The cable size should comply with local wiring rules, and D-type circuit breakers should be used for air switches.
2. After completing the wiring, waterproof adhesive needs to be applied at the waterproof joint.
3. Cables should not come into contact with high-temperature objects (uninsulated copper pipes, water pipes) to avoid damaging the

insulation layer.

4. Users should equip their own communication cables based on the actual installation location of the on-site unit. It is recommended to use RVVP two core cables, with a minimum cross-sectional area of no less than 0.5mm ^{2}.

Chapter4 Controllers

Summary——This chapter mainly introduces the operation and parameter settings of the controller.

§ 4-1 Summarize

AirSafe CR series precision air-conditioning units adopt self-developed HCC intelligent controller to achieve precise temperature and humidity control and ensure stable and reliable operation of the units. The controller stores the programmable control program and all operating parameters, and can be viewed through the user terminal.

Make Up

- main controller
- user terminal

Function

1. Fully automatic alarm and protection;
2. Record all alarm events;
3. Automatically activated on incoming call;
4. Remote control to turn on/off the unit;
5. Set the temperature and humidity;
6. Calculate the running time of major components;
7. Displays operating conditions and real-time values;
8. Programmable LAN management for group control and LAN management of up to 32 units;
9. Allows manual control of major components;
10. The operating status of the electronic expansion valve can be set;
11. 3 levels of password protection (user password, maintenance password and factory password);
12. Connection to centralized monitoring system via RS485 serial interface.

§ 4-2 User Terminal

The user terminal adopts a 7-inch color touch screen, with a beautiful and generous design, and

easy and convenient operation; through this controller, the user can conveniently understand the running status of each component of the unit, as well as set up all kinds of parameters.

Figure 4-1 User Terminal

No.	Icon	Name	Parameter description	Function description
1		Run	Running status query	1. Click this icon to query the current system status and equipment operating status.
2		Off	On/off control	1. On the home page, click this icon to turn on/off the unit. 2. The upper right corner of the screen is red when the unit is turned off, and green when the unit is turned on
3		Back	Back icon	1. On any page except the home, click this icon to return to the previous menu; 2. In parameter setting state, click this icon to give up the parameter editing, exit to the upper level parameter setting interface, and the data will not be stored.
4		advance and retreat	Page turning icon	1. Click this icon to turn the page on the multi-parameter page except the home page.
5		Home	Home Icon	1. Click this icon to return to the home page from any page except the home.
6		Alarm	Fault query; fault clearance; record query	1. Check the fault information of indoor unit and outdoor unit on the fault query page; 2. Choose whether to manually reset the current fault on the fault clearing page; 3. Select to view historical data, alarms and operation records on the record query page;
7		Settings	Set user parameters, installation parameters, manufacturer parameters	1. Set relevant operating parameters and alarm parameters on the user parameter page; 2. Set the communication method, temperature and humidity correction value on the installation parameter page; 3. Set function options, equipment parameters, and test mode on the vendor parameter page.
8		Maintenance	Maintenance settings	1. Manual commissioning; 2. Device running time; 3. Clear records.

§ 4-3 Basic Operation

4.3.1 User Settings

1. Click on the parameter to be set, the numeric keypad will pop up (beyond the set range, the parameter setting does not go down), click Enter to confirm the modification when the parameter setting is finished;

2. Click the "Back" menu icon to return to the previous menu and cancel the operation;

3. Modify the operation status of equipment and devices, which can be directly modified by clicking the parameters;

4. When there is no operation during the screen protection time, it will automatically return to the main interface display.

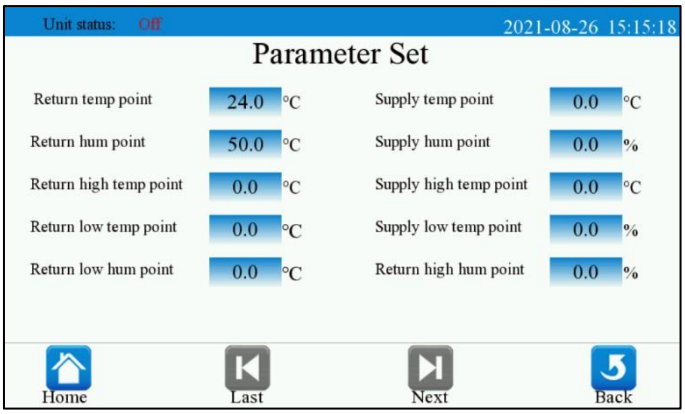


Figure 4-2 Parameter Setting Page

4.3.2 Initial State of the System

The system powers up and initializes, the display powers up with service information and enters the main page.

4.3.3 Main Page Display

After powering up the display switches to the main page display as shown below:

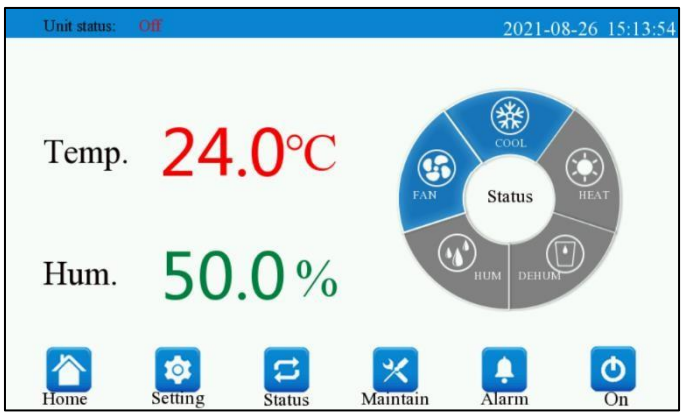


Figure 4-3 Main Page

The main interface temperature and humidity display shows the current calculated temperature and humidity of the indoor environment, if the humidity sensor is invalid, the line shows (---); the temperature and humidity setting display area shows the set temperature and humidity;

Dial: Displays the current unit status: standby (fan), cooling, humidification, heating, dehumidification, cooling and humidification, dehumidification heating, heating and humidification.

4.3.4 Current Fault View Page

In the main page: Unit status: Off, if an alarm message appears, it indicates that the current system is faulty;

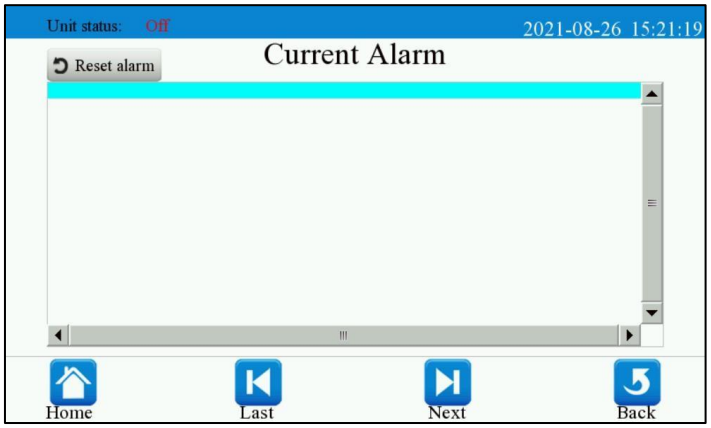


Figure 4-4 Current Fault Screen

On the main page, press  to alarms and select "Current Fault Query" to view the current fault; after troubleshooting, select "Reset Alarm" on the Alarms page to clear the current fault;

4.3.5 Current Status View Page

In the main page, press  to select "Operation Status" to check the current operation status of the unit;

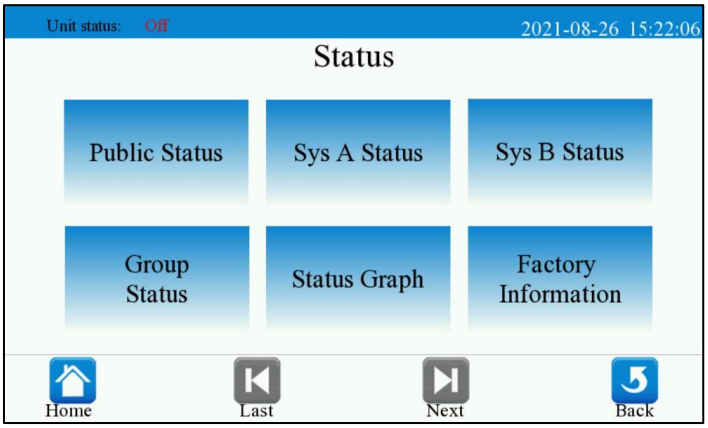


Figure 4-5 Running Status

4.3.6 History View

Under the main page, tap  to enter the alarm page, and then tap to turn the page to enter the history fault query page.

Click on the Historical Fault Inquiry drop-down icon to query fault information for a particular day;

Click Clear Historical Alarm Messages to clear the history.

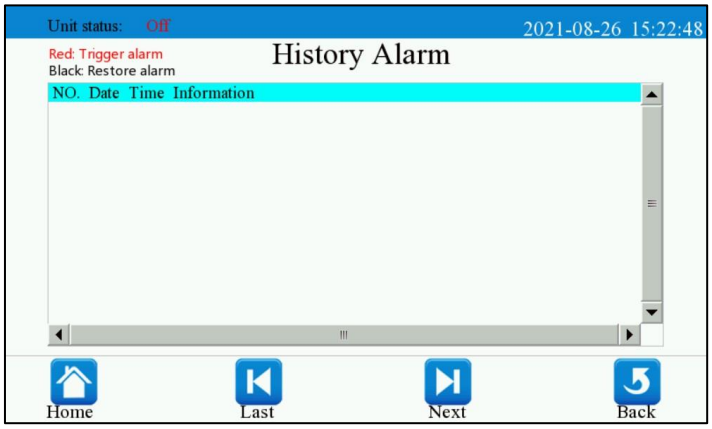


Figure 4-6 Historical Faults

4.3.7 Temperature and Humidity Curve Inquiry

Select the temperature and humidity curve in the status bar to view the curve of temperature and humidity over time, and you can also pause the curve and clear the curve record.

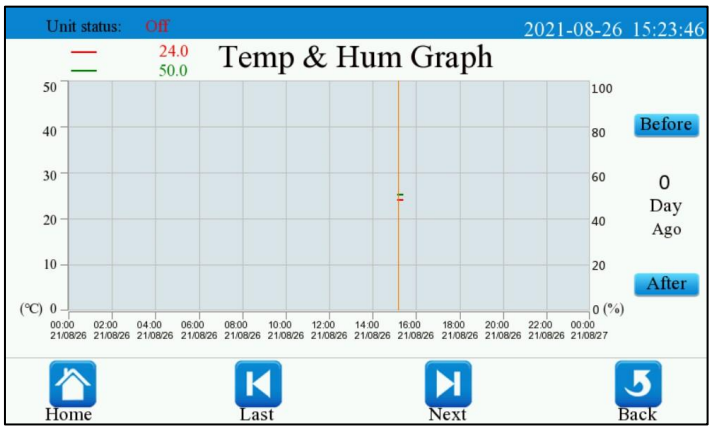


Figure 4-7 Temperature and Humidity Curve

4.3.8 Manual Control

From the Main page, tap  , enter the Maintenance page to access the Manual Mode Control screen.

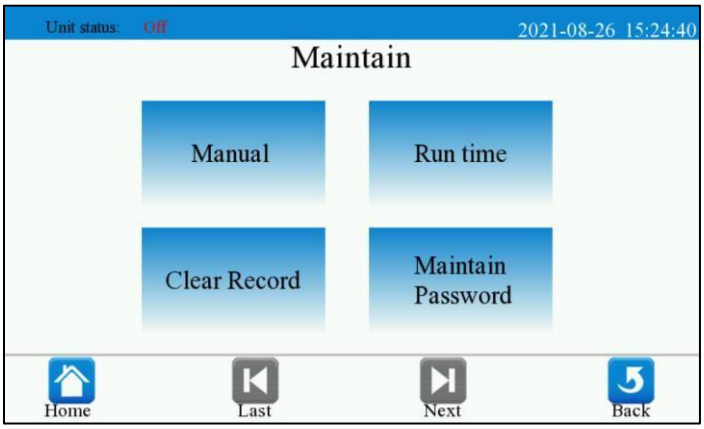


Figure 4-8 Maintenance Interface

4.3.9 Power-Down Memory Function

After the system is powered down abnormally and powered up again, the system will operate according to the working status before power down, memorize parameters, set temperature values, etc.

4.3.10 Incoming Call Self-Start

After a power failure, once the power supply is restored, the control board can realize self-start on incoming call according to the status before the power failure.

4.3.11 Real Time Clock

Factory written, can be modified directly by clicking on the time setting on the user parameter interface and clicking on the corresponding number to pop up the input keyboard.

4.3.12 Newsletter

Through the RS485 interface on the control board, it can communicate with the main board according to the requirements of the communication protocol. Communication mode: serial asynchronous half-duplex; Baud rate: 9600BPS;

4.3.13 Power Switch

Under the main page, tap the on/off icon to perform the on/off operation, and the current status of the unit will be displayed on the main page. When the on/off icon shows red font, it means the unit is in off state; if you need to turn on the unit, tap the icon to turn on the unit;

When the display on/off icon shows a green font, it indicates that the unit is on.

4.3.14 Password Input

In the state of password input or confirmation/deselection page, the operation is as follows:

When entering the password input interface, it is not selected by default. Click on the numeric keypad to enter the password, and then click enter to enter the interface; Default password: user parameter 333, please contact the manufacturer for installation parameters and manufacturer password.

Figure 4-9 Password Input

4.3.15 User Parameter Settings

All user parameters are listed in the user parameter list in the table below; when a user parameter needs to be modified, follow the steps below:

Click the parameter, the numeric keyboard will pop up, input the parameter, click enter to modify.

Table 4-1 User Parameter Default Table

Parameters	Default Value	Unit	Minimu Value	Maximu Values	Note
On/Off	0		0	1	0：OFF|1：ON
Supply air temperature Setting	18	℃	15	45	/
Return air temperature Setting	24	℃	15	45	Temperature default return air temperature control
Supply air humidity Setting	75	%	10	95	/
Return air humidity Setting	50	%	10	95	Humidity default return air humidity control
Supply air high temperature alarm	26	℃	20	50	/
Supply air low temperature alarm	8	℃	0	30	/
Return air and high humidity larm	80	%	10	95	/
Return air low humidity alarm	30	%	10	95	/
Return air high temperature alarm	30	℃	20	50	/
Return air low temperature alarm	15	℃	0	30	/

4.3.16 Manufacturer's Parameters and Parameter Settings

All system parameters are listed in the System Parameters table;

When a system parameter needs to be modified, the procedure is the same as the user parameter setting method.

4.3.17 Maintenance Parameters and Parameter Settings

All system parameters are listed in the System Parameters table;

When a system parameter needs to be modified, the procedure is the same as the user parameter setting method.

4.3.18 Temperature Logic and Setting

The cooling and heating operation of the unit is mainly determined by the difference between the return air temperature of the room and the set temperature, and the unit adjusts the heating or cooling output proportionally according to the difference between the two values. The high and low temperature alarms will generate an alarm signal and have a default delay time. The temperature setpoint can be modified in the "Return Air Temperature Setting" of the "Parameter Setting" under the "User Setting" interface. The logic diagram of the unit temperature control is shown below as Figure 4-10:

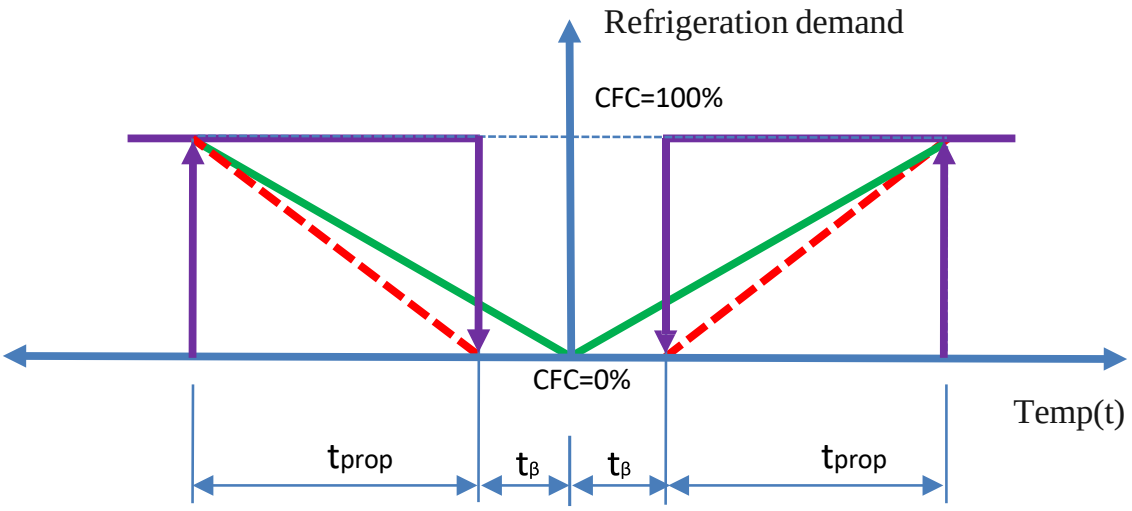


Figure 4-10 Logic Diagram for Temperature Control of the Unit

4.3.19 Humidity Logic and Setting

The humidifying and dehumidifying actions are determined by the return value of the humidity probe, and the unit adjusts the humidifying and dehumidifying quantities proportionally by comparing the difference between the set point and the measured value of the humidity probe. The humidity set point can be modified in the "Return Air Humidity Setting" of "Parameter Setting" under the "User Setting" interface. The logic diagram of humidity control of the unit is shown below as Figure 4-11:

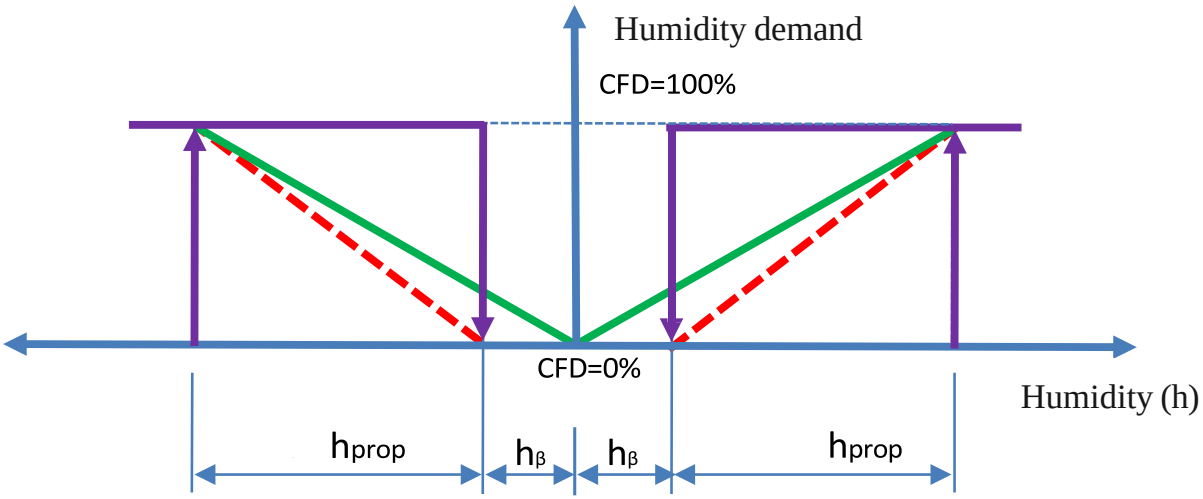


Figure 4-11 Logic Diagram for Humidity Control of the Unit

Chapter5 Inspection and Commissioning

Summary——This chapter focuses on inspection, functional testing and commissioning of the unit after installation is complete.

§ 5-1 Inspection

Initial Inspection

The initial inspection ensures that there are no problems with the unit installation and other processes, as shown in Table 5-1 Initial Inspection Program Recommendations.

Table 5-1 Initial Inspection Program Recommendations

Inspection Items	Element
Framework	Ensure that the unit is securely and horizontally mounted on the plenum or platform
Grout	Ensure that all unit connections are properly connected
Disclose Information	Ensure that the air distribution system is properly installed
Else	Ensure that unit-related transportation fasteners, temporary connections, etc. have been properly removed

Electrical Inspection

Electrical inspection to ensure that all electrical connections are correct and reliable, and to confirm that the unit has been properly grounded, all electrical wiring must comply with the standards of the country/region where it is to be used, for specific inspections, please refer to the following table 5-2 Electrical Inspection Items Suggestions.

Table 5- 2 Electrical Inspection Program Recommendations

Inspection Items	Element
Power Supply	Whether to meet the requirements (400V/50Hz/3PH), voltage deviation ±10%, frequency deviation ±2%
Grounding	Grounded as required (no water pipe grounding)
Grout	All electrical connections are correct
Internal and External Communications	Is the communication between the outdoor unit and indoor unit normal
Monitor Communications	connected or not
Group Communication	connected or not

[NOTE: Always make sure that the air conditioner input power cord does not have wrong phase or missing phase, otherwise it will cause irreparable damage to the air conditioner**]**.

Pipeline Inspection

This check ensures that the field piping has been properly installed and is capable of facilitating the return of refrigerant oil to the compressor. Failure to properly install piping and oil storage bends

may cause the unit to operate improperly or even cause the compressor to wear out from lack of oil, which could result in irreparable damage to the compressor. See Table 5-3 Refrigeration Piping Inspection Program Recommendations for specific inspection items.

Table 5- 3 Refrigeration Piping Inspection Program Recommendations

Inspection Items	Element
Piping	Whether the piping arrangement is performed as required
Oil Return	Whether to install oil return measures such as oil storage bends, horizontal piping inclination, etc. as required
Thermos (Bottle)	Whether the insulation measures are perfect, whether there are any exposed parts of the pipeline
Safeguard	Whether the pipes are protected as required

§ 5-2 Vacuum

After completing 3.8 Nitrogen filling and pressure holding, the user should release the nitrogen in the system and turn on the vacuum pump to evacuate the system for not less than 90 minutes until the absolute vacuum of the system is infinitely close to 100 Pa. If it is a low-temperature type outdoor unit, it is necessary to let the solenoid valve of the low-temperature component remain energized while evacuating the low-temperature component to make sure that the low-temperature component can be vacuumed.

Before evacuating, the unit needs to be powered up and enter the maintenance page, select the manual mode page and turn on the evacuation mode so that the expansion valve and the liquid pipe solenoid valve will open.

◆ **Tips**

It is recommended that evacuation be completed prior to functional testing.

§ 5-3 Refrigerant Charging

After vacuum treatment, the refrigerant charge of the unit shall be determined based on the total effective pipe length after connecting the piping.

Table 5-4 gives the standard refrigerant charge of the system with the length of the connecting pipe within 10m; if the length of the connecting pipe is more than 10m, the refrigerant additive quantity = standard charge + refrigerant additive quantity.

The calculation of the refrigerant charge is based on the following formula:

Refrigerant addition (kg) = Refrigerant addition per unit length of liquid pipe (kg/m) × extension of liquid pipe length (m) + addition of cryogenic component (or addition with fluorine pump)

Among them, the extended liquid pipe length (m) = the total length of the liquid pipe between the inner and outer machine (m) - 10m, if the total length of the liquid pipe between the inner and outer machine is less than 10m, then it will be calculated according to 10m.

Check Table 5-5 for "Refrigerant Additions per Unit Length of Liquid Tube".

Table 5-4 Standard Refrigerant Charge for 10m Continuous Tube System

Model	Standard Charge (Kg / System)	Replenishment With Fluorine Pump (Kg /System)
EACCR025	6.5	23
EACCR030	9	23
EACCR035	11.5	23
EACCR040(Single)	12.5	23
EACCR045	16	23
EACCR050(Single)	17	23
EACCR040(Double)	6.5	23
EACCR050(Double)	8.5	23
EACCR060	9	23
EACCR070	11.5	23
EACCR080	12.5	23
EACCR090	16	23
EACCR100	17	23
EACCR120	18	23

Table 5-5 Refrigerant charge per unit length of liquid tube for different outside diameters of liquid tube

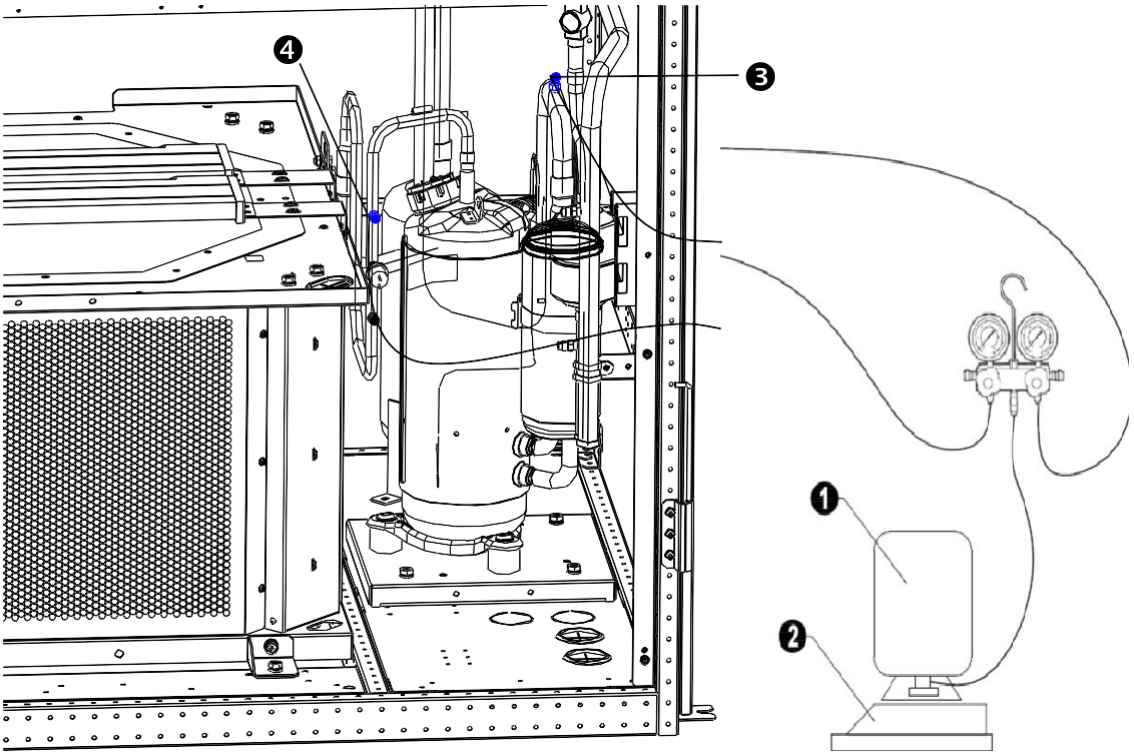
Outer Diameter of Liquid Tube(mm)	Refrigerant Charge Per Unit Length (kg/m)	Outer Diameter of Liquid Tube(mm)	Refrigerant Charge Per Unit (kg/m)
15.88	0.174	19.05	0.245
22	0.321	25	0.431

Operational Steps:

1. After the end of evacuation, static charging from the charging valve port directly into the liquid refrigerant. Static charging, charging port for the suction pipe and exhaust pipe at the same time charging refrigerant, static charging as shown in Figure 5-1, when the system refrigerant charge more and in the static charging process to a certain amount of refrigerant added to the refrigerant, and at this time the refrigerant charge does not reach the required amount of charge, need to be charged according to the 5-6 subsection of the dynamic charging method, dynamic charging, can only be in the suction pipe refrigerant charging.

2. The refrigerant model should be determined according to the model of the unit and the contents of the nameplate, and the actual required charge should be confirmed by contacting the relevant service department of our company.

3. Start-up operation calibrates the refrigerant charge so that the unit meets the requirements for sub cooling and superheating during smooth operation.



Items	Explain
❼	refrigerants
❷	electronic balance
❷	Suction Needle Valve
❹	venting needle valve

Figure 5-1 Static Charge of Refrigerant

◆ **Note**

1) The second step must be carried out only after a function test has been carried out to ensure that there are no errors and the compressor heating band has been energized and warmed up for at least 12 hours, otherwise the unit will be damaged.

2) The proper charge of refrigerant will directly affect the performance of the unit and must be operated by a professional engineer.

§ 5-4 Refrigerated Oil Addition

1. The unit has added part of the refrigeration oil before leaving the factory to satisfy the oneway 30 meters connecting pipe. If the unit's one-way connecting pipe is >30 meters, calculate and add additional refrigeration oil according to the following requirements:

Amount of refrigeration oil to be added to the system (kg) = [(length of one-way connecting pipe of the system - 30m) × amount of refrigerant added to the liquid pipe per unit length + (amount of low-temperature components added OR amount of energy-saving module added)] × 0.08.

2. If the length of one-way connecting pipe of the system is <30m, the amount of refrigeration oil to be added is: Amount of refrigeration oil to be added to the system (kg) = [(length of one-way connecting pipe of the system - 30m) × amount of refrigerant to be added to the liquid pipe per unit length + (amount to be added to the cryogenic component or amount to be added to the energy-saving module)] × 0.08 (the first half of the formula is a negative number).

3. Refrigeration oil addition should be calculated before refrigerant charging and completed during vacuuming.

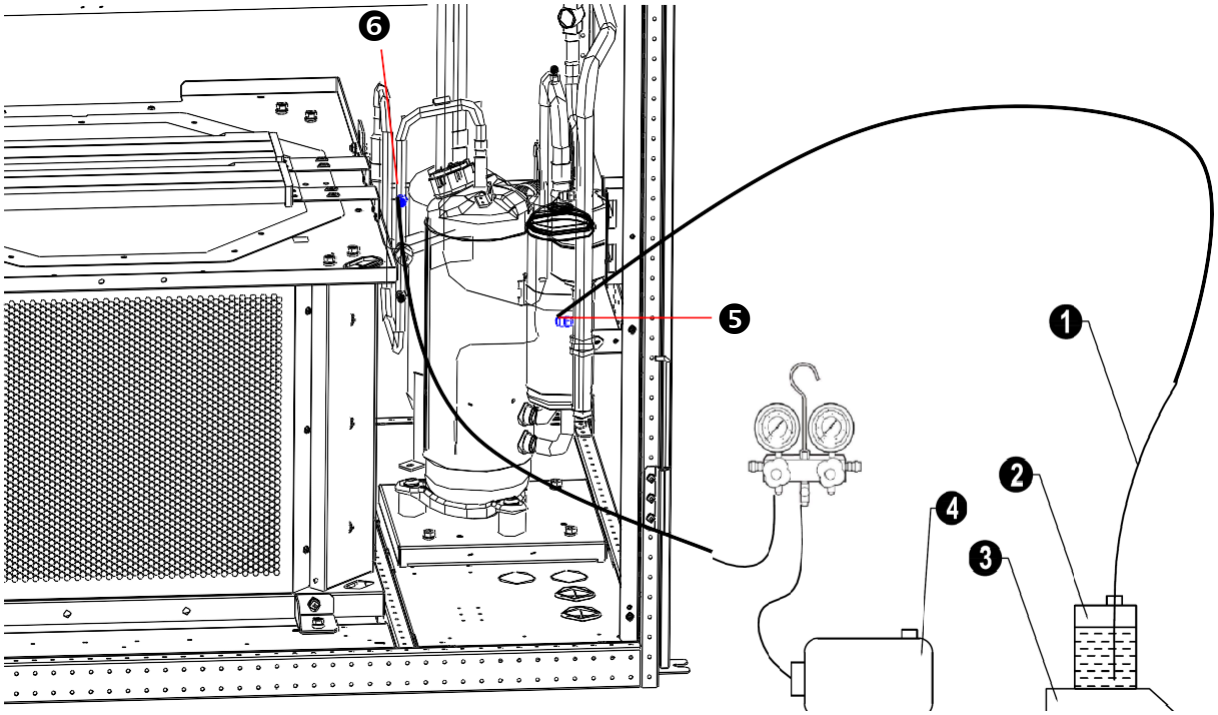
4. Refrigeration oil should be filled at the needle valve in the liquid line or at the needle valve in the outdoor unit.

5. Please consult the manufacturer's after-sales personnel for the type of refrigeration oil and recommended model for different models and compressors.

◆ **Tips**

⊙ When refueling is required for project installation, please contact our service department for the actual amount of refrigeration oil to be added.

⊙ HFC refrigerant (R410A) must be used with synthetic oil. When refueling is required on site, contact us for technical support.



Items	Explain
❶	Refrigerant hoses
❷	Compressor Refrigeration Oil
❸	Electronic weighing scale
❹	Vacuum pumps
❺	Liquid pipe needle valve
❻	Gas pipe needle valve

Figure 5-2 Schematic Diagram of Adding Refrigeration Oil

§ 5-5 Function Testing Draw

Prompt

Before starting the unit, make sure that the unit has been rigorously inspected as required, that the interior of the unit is free of debris, that the filters are clean and correctly installed, etc.

Test Content

a) Apply power to the unit and perform a no-load test.

b) Test the voltage at the power connection point, the voltage reading shall not exceed ±10% of the nameplate rating.

c) Test the compressor and fan for proper steering.

d) Control function testing.

§ 5-6 Runtime Debugging

Tip:

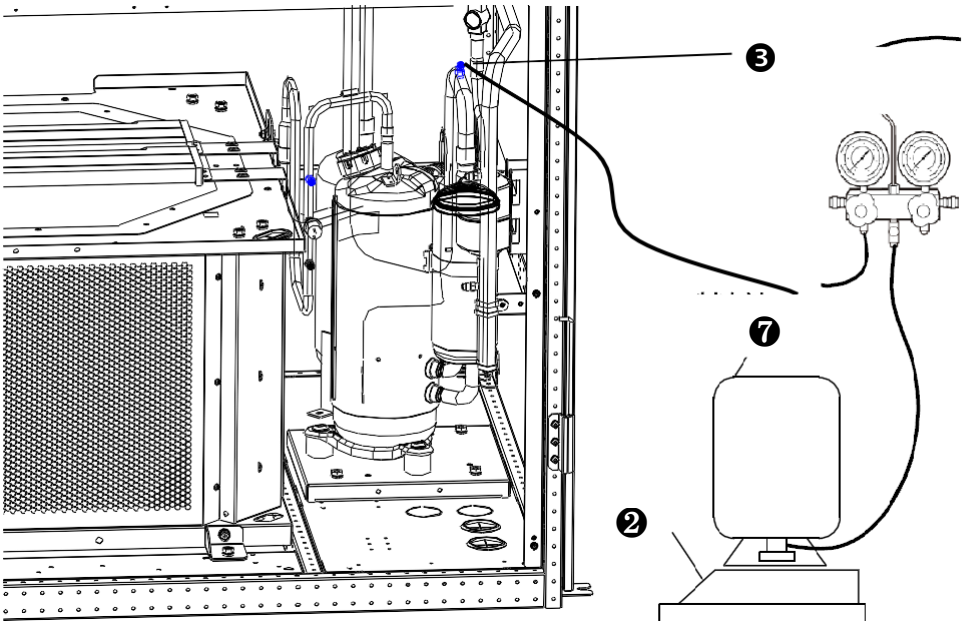
The compressor heating tape must be energized and warmed up for at least 12 hours before running the commissioning, otherwise irreparable damage to the compressor will result.

1. Refrigerant charge is more accurate

If the static charge of refrigerant does not reach the calculated charge, a dynamic charge is required, as follows:

a. Connect the refrigerant bottle, pressure gauge and needle valve on the compressor suction pipe through the refrigerant hose as shown in Figure 5-3.

b. Ensure that the external machine is in the power state, open the internal fan, compressor open, enter the "user parameters" page, set the "set temperature" set value to the lowest value, return to the main page of the touch screen, click on the boot, run the refrigeration mode, when the compressor opens 5 minutes later, slightly open the valve on the pressure gauge, so that the refrigerant is slowly charged until the total refrigerant charge reaches the calculated charge. After 5 minutes, slightly open the valve on the pressure gauge, so that the refrigerant is slowly charged until the total refrigerant charge reaches the calculated charge, close the pressure gauge valve.



Items	Explain
❶	Refrigerants
❷	Electronic weighing scale
❸	Suction pipe needle valve

Figure 5-3 Dynamic Charging of Refrigerant

2. Commissioning Content

a) Measure and record the unit's operating parameters.

b) Commissioning of compressor operation.

c) Fan operation commissioning.

d) Commissioning of electrode humidifier operation.

e) Commissioning of electric heater operation.

⚠ **Warning**

1. It is forbidden to turn on the compressor immediately after the static charge of refrigerant. Before starting the compressor must ensure that the crankcase of the compressor with heat tape preheating for more than 12 hours, if the preheating time is not enough, should be used before the start of the compressor shell with a hot hairdryer and other safe heat source heating the lower part of the compressor shell for about 30min, to avoid the compressor with liquid start-up operation, affecting the service life of the compressor.

2. At the end of the test, adjust the temperature setting back to the default setting or initial setting.

3. Start-up and commissioning operations should be completed by a professional engineer.

Chapter6 Daily Operation

Summary——This chapter focuses on the basic principles related to unit cooling and control, the daily operation of precision air conditioning and the phenomenon of system failure and treatment methods.

§ 6-1 Related Principle

6.1.1 Refrigeration System Main Components and Role

Table 6-1 Main Components and Functions of the Refrigeration System

Part Name	Function
Compactors	Raising the pressure of the refrigerant ensures that the gaseous refrigerant can condense to the pressure required to form a liquid at room temperature, while powering the refrigeration cycle.
Condensers	Condenses high temperature gaseous refrigerant into liquid state by heat exchange with heat exchange medium (air, water).
Expansion Valve	Reduce the work pressure, so that the pressure reaches the corresponding evaporation temperature requirements, while controlling the work flow and ensure that the evaporation superheat.
Evaporators	The work material in the evaporator evaporates and absorbs the heat of the medium (air, water) to realize the purpose of refrigeration.

6.1.2 Schematic Diagram of Refrigeration System

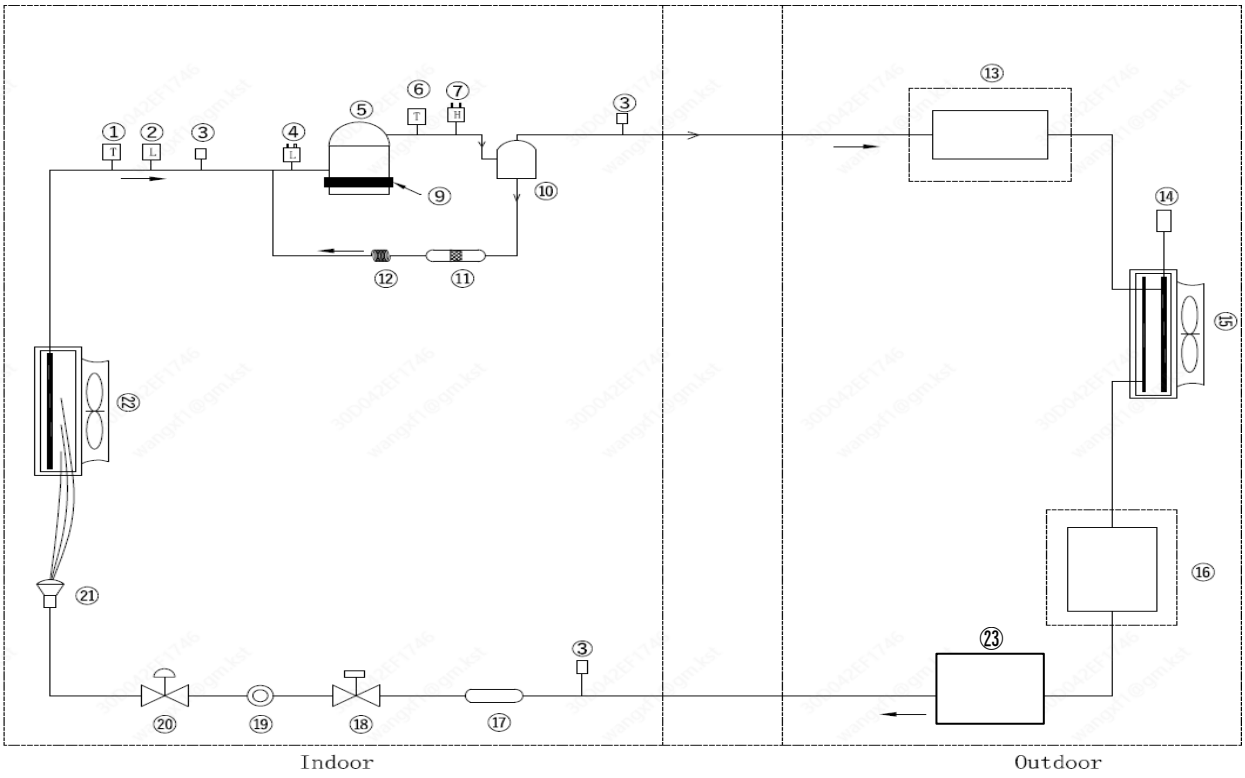


Figure 6-1 Schematic Diagram of the Refrigeration System (Without Fluorine Pump Energy Saving Module)

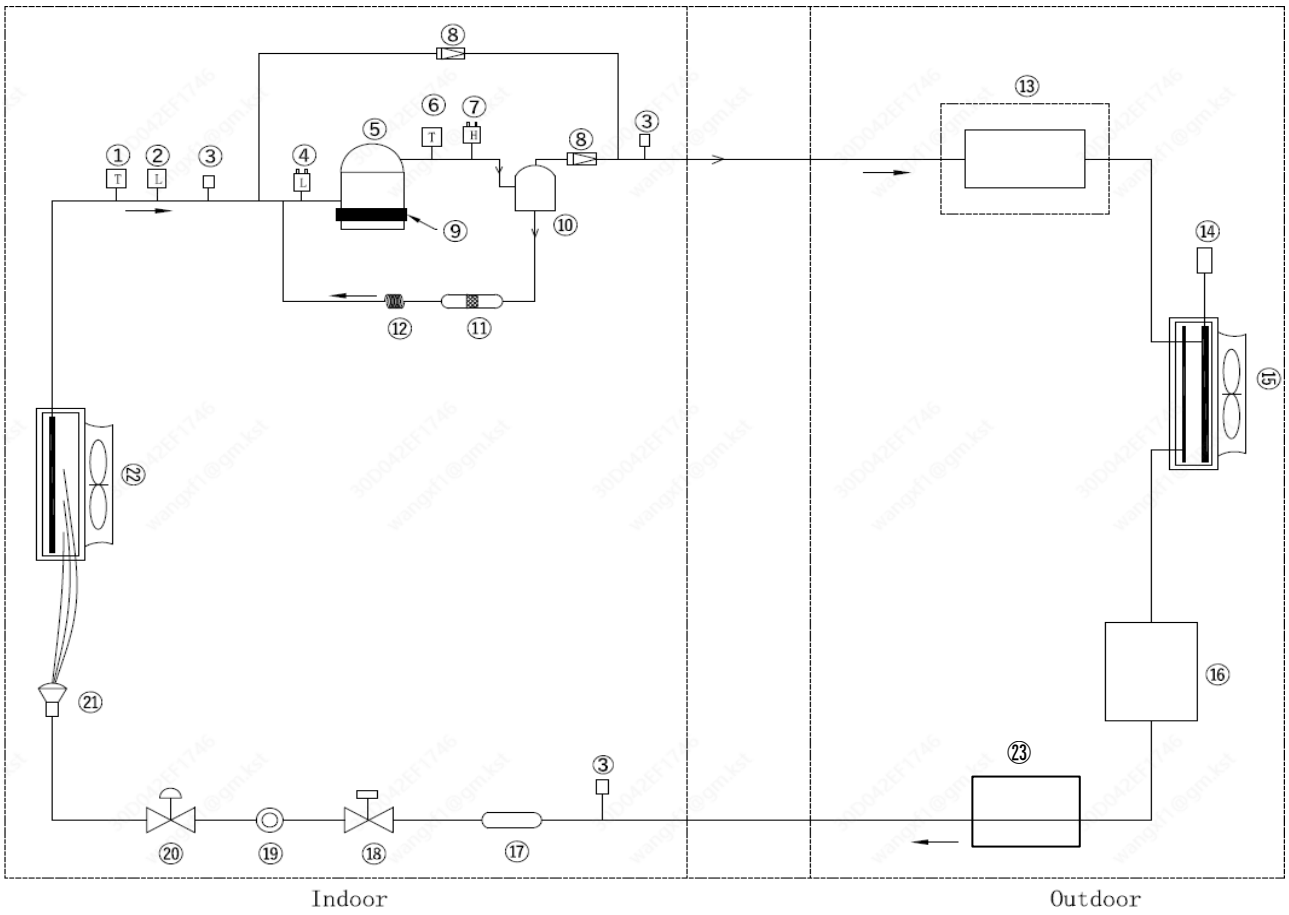


Figure 6- 2 Schematic Diagram of the Refrigeration System (With Fluorine Pump Energy Saving Module)

Items	Explain	Items	Explain
①	Suction temperature	⑪	Oil filter
②	Suction pressure Sensor	⑫	Oil return capillary
③	Needle valve	⑬	Extension assembly (optional)
④	Low Pressure Switch	⑭	Discharge pressure Sensor
⑤	Compressor	⑮	Outdoor unit
⑥	Discharge temperature	⑯	Fluorine pump energy saving module
⑦	High Pressure Switch	⑰	Dry filter
⑧	Check valve	⑱	Solenoid valve
⑨	Electrical Heating Belt	⑲	Liquid-viewing mirror
⑩	Oil separator	⑳	Electronic Expansion Valve
㉑	Dispenser	④	Evaporator + Fan
㉓	Cryogenic assembly/Negative drop assembly (optional)		

6.1.3 Control Principle

See Chapter 5 Controller for unit control logic

6.1.4 Humidification and Dehumidification

The unit is controlled to dehumidify or humidify by judging the difference between the actual humidity detected by the humidity sensor and the user's set value. The humidification process is

accomplished by an electrode humidifier, and dehumidification is accomplished by a refrigeration cycle.

6.1.5 Heater

The unit is heating the medium with an electric heater.

6.1.6 Daily Operation

In the daily management of the server room, the management and maintenance of precision air conditioning is mainly the refrigeration system, fans, air filters, humidifiers, heaters, drains and so on. Whether the daily operation and management is appropriate, will have an important impact on the stable operation of the unit, life and energy saving effect, please users strictly implement the daily management of precision air conditioning.

Table 6-2 Daily Operation

Items	Content
Inspection	Check that the air conditioning system is operating properly
	Whether the functions and parameters are normal, such as the case of alarm to check the alarm record, and analyze the cause of the alarm
Ventilation System	Check the air filter
	Check the blower for abnormal noises
	Check if the motor current is normal
	Check the airflow loss alarm for proper functioning
Refrigeration System	Suction pressure and exhaust pressure are normal
	Confirm proper refrigerant charge
	Any refrigerant leakage
	View Sight Glass Color
	Does the expansion valve appear to be frosted
	Does the compressor appear to be frosted
	Does the evaporator appear to be frosted
	Whether the piping is damaged
	Pipe insulation is normal
Humidifier	Fouling
	Is the water supply and drainage smooth
	Smoothness of the steam pipe
Else	Check for looseness at the top and bottom of the terminal block.
	Check for screws that have not fallen out
	Check that the supply voltage is in the normal range
	Check for normal conditions underneath the floor
	Check for loose indoor unit fixing

§ 6-2 Common Fault Alarm Phenomenon and Measures

Precision air conditioning unit failure is mainly manifested in the refrigeration system failure, control system failure, ventilation system failure and heating and humidification and other device failure, common failure phenomenon/alarm phenomenon and measures are shown in the table below.

[**Note:** When the unit malfunctions and simple troubleshooting is not possible, users are requested to contact the

service department for technical support.]

⚠ **Warning**

The system part of the circuit is 220V/50Hz or 400V/50Hz AC, only professional technicians are allowed to carry out maintenance operations on the unit, in principle, it is not permitted to carry out operations with electricity; when it is necessary to carry out operations with electricity, special care must be taken and at least one person must be present at all times to assist.

Table 6-3 Fan Troubleshooting

Symptomatic	Possible Causes	Items To Be Checked Or Treatments
Fan won't start	No mains power	Check voltage ratings of L1, L2 and L3.
	Circuit breaker tripped or fuse blown	Check main fan fuses and circuit breakers
	Overload, air switch tripped	Manual reset. Checking the average value of current
	Control board failure	According to the contents of the circuit diagram, check whether there is an output from the motherboard console
	Failure of the fan itself	Replacement of fans
fan noise	Loose fan mounting screws	Check the tightness of the screws of the fan fixing bracket
	Abnormal fan bearing	Replacement of fans

Table 6-4 Troubleshooting the Dehumidification System

Symptomatic	Possible Causes	Items To Be Checked Or Treatments
No dehumidifying effect	Control system did not request dehumidification function	Check control system status
	Compressor contactor will not engage	Refer to Table 6-4
	Compressor not running, blown fuse or tripped circuit breaker	Refer to Table 6-4 Check fuses or circuit breakers and their contacts, check line voltage

Table 6-5 Humidifier Troubleshooting

Symptomatic	Possible Causes	Items To Be Checked Or Treatments
No humidification effect	not filled with water	Checking the water supply
		Check that the water fill solenoid valve is working
		Check inlet hose for obstruction
		Humidification pump failure
	No humidification required	Checking the controller status

Table 6-6 Troubleshooting the Heating System

Symptomatic	Possible Causes	Items To Be Checked Or Treatments
Heating system does not run, contactor does not engage	Heat on condition not reached	Checking the status of the controller
Displayed heating, but electric heating did not heat up	Loose electric heating terminals	Detecting whether the terminals are tightly inserted
Contactor engaged, no heating effect	The heater is burned out.	Disconnect the power supply and test the resistance characteristics of the heater with an ohmmeter

Table 6-7 Compressor and Refrigeration System Troubleshooting

Symptomatic	Possible Causes	Items To Be Checked Or Treatments
Compressor won't start	Unpowered (off)	Check main power switch, fuse or circuit breaker and connecting wires
	Power overload air switch tripped open	Manual reset, check current average
	Loose circuit connections	Tighten circuit connectors
	Compressor coil short circuit burned	Inspect the motor and replace it immediately if defects are found
Compressor does not run, contactor does not engage	No refrigeration requirements	Check Controller Status
	High-voltage protective action	Detection of high-pressure switches and high-pressure pressure values
Contactor engaged, compressor does not run	Blown fuse or tripped circuit breaker	Check line voltage after checking fuses or circuit breakers and contactors
	Compressor built-in protector disconnected	If compressor coil is open circuit. wait for cool and reset automatically
Compressor stops running after 5 min, contactor disconnected.	Refrigerant leakage, low pressure protection operation	Checking suction pressure
High exhaust pressure	Dirty condenser blockage	Cleaning the condenser
	Condensing equipment not running check water system	Checking procedure
	Excessive refrigerant charge	Check for excessive sub cooling
Low exhaust pressure	refrigerant leak	Leak detection and repair and refrigerant charging
	Outdoor fan speed controller malfunction, output voltage is always full load voltage, does not change with the change of condensing pressure	If a defect is found, replace the speed controller immediately
No change in suction and discharge pressure after startup	Compressor reversal or internal gas strings	If the compressor is reversed, replace any two L wires of the compressor; if there is gas inside the compressor, replace the compressor.
Low suction pressure or fluid return	Insufficient refrigerant in the system	Check for leaks, repair and add refrigerant.
	Air filter too dirty	Replacement of filters
	Clogged filter drier	Replacement of filters
	Improper regulation of overheating	Strictly follow the expansion valve adjustment procedure
	Defective expansion valve sensing element	Replace the expansion valve
	Poor air flow distribution	Inspection of air supply and return systems
	Low condensing pressure	Check for condenser failure
	fluid return	See "Low suction pressure or fluid return" for treatment.
Excessive compressor noise	Loss of refrigeration oil leads to bearing wear	Add Refrigeration Oil
	Loose compressor or line fixing	Clamps for fastening
Compressor runs too hot	Excessive compression ratio	Check the settings of the high- and low-pressure protection values and check that the condenser is not blocked
		Check all evaporator and condenser fans for proper operation
	High suction temperature	Adjust the expansion valve or add the right amount of refrigerant