



酷克
QUICK

机架型精密机房专用空调

安装使用说明书

Installation and Operation Manual
for Rack-Mounted Precision Air Conditioner

Cyber Drawer :机架式精密空调
Rack-Mounted Precision Air Conditioner



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安装、使用前请仔细阅读本说明书

Please read this manual carefully before installation and use

请妥善保管本说明书

keep it properly

本说明书包含合格证

This manual includes the Certificate of Conformity

尊敬的用户：

Dear User,

您所使用的精密空调机组需要进行定期的维护和保养。如果您的空调不能得到正确的维护和保养，其故障率将增加且使用寿命将大为缩减。

The precision air conditioner unit you are using requires regular maintenance. If your air conditioner is not properly maintained, its failure rate will increase and service life will be greatly shortened.

请您在购买空调之后及时与当地服务网点或直接与我公司联系，签署一个定期的维护保养协议。我公司将指派专业服务人员给你提供有偿的清洗、保养、检查和维修服务，万一您的空调发生故障时，给您的生活和工作带来不便。

Please contact your local service center or our company directly after purchase to sign a regular maintenance agreement. Our company will assign professional service personnel to provide paid cleaning, maintenance, inspection and repair services to avoid inconvenience to your life and work in case of air conditioner failure.

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1 产品概述 Product Overview

1-1 产品简介 Product Introduction

机架式精密空调机组是一种满足 IT 机柜环境的温湿度控制系统。旨在保证机柜设备，诸如敏感设备、工业过程设备、通信设备和计算机等设备拥有一个合理的运行环境。

The rack-mounted precision air conditioner unit is a temperature and humidity control system for IT cabinet environments. It ensures a proper operating environment for cabinet equipment such as sensitive equipment, industrial process equipment, communication equipment and computers.

1-2 主要部件 Main Components

1-2-1 室内机 Indoor Unit

机架精密空调室内机的主要部件包括蒸发器、加热器、风机、控制器、电子膨胀阀等部件。

Main components of the indoor unit include evaporator, heater, fan, controller, electronic expansion valve, etc.

1) 蒸发器:蒸发器采用带内螺纹的铜管以及冲缝型翅片，换热效率大大提升。

Evaporator: Adopts internally threaded copper tubes and lanced fins, greatly improving heat exchange efficiency.

2) 电子膨胀阀:采用优质电子膨胀阀，使膨胀阀对冷媒的流量调节更准确。

Electronic Expansion Valve: High-quality electronic expansion valve is used for more precise refrigerant flow regulation.

3) 风机:采用高效率、高可靠性的EC风机，风量大、通用性好，维护方便。

Fan: High-efficiency, high-reliability EC fan with large air volume, good versatility and easy maintenance.

4) 绝缘型陶瓷 PTC 电加热: PTC 电加热发热量随风量的大小而变化，电加热表面不带电，安全性能高、加热表面不带电。

Insulated Ceramic PTC Electric Heater: The heating capacity varies with air volume; the heater surface is non-charged, ensuring high safety.

1-2-2 室外机 Outdoor Unit

机架式精密空调室外机主要包括压缩机、轴流风机、冷凝器等部件。

The main components of the rack-mounted precision air conditioner outdoor unit include compressor, axial fan, condenser, etc.

1) 压缩机:采用高效压缩机,运行更加平稳。

Compressor: High-efficiency compressor for smoother operation.

2) 轴流风机:采用高效率、高可靠性的轴流风机,风量大,维护方便。

Axial Fan: High-efficiency, high-reliability axial fan with large air volume and easy maintenance.

3) 冷凝器:冷凝器采用带内螺纹的铜管以及冲缝型翅片,换热效率大大提升。

Condenser: Adopts internally threaded copper tubes and lanced fins, greatly improving heat exchange efficiency.

1-3 产品特点 Product Features

机架式精密空调机组具有高效制冷、兼容多种应用场景、智能监控、快速安装和环保等特点。

The rack-mounted precision air conditioner unit features high-efficiency cooling, compatibility with multiple application scenarios, intelligent monitoring, quick installation and environmental protection

1) 高效制冷:使用变频转子压缩机,并有最优系统匹配和高效制冷盘管设计,保证高效换热;

High-efficiency Cooling: Equipped with variable-speed rotary compressor, optimized system matching and high-efficiency cooling coil design for efficient heat exchange.

2) 兼容多种应用场景:多种出风方式可满足多种的出风机柜设备,排水方式(自排+强排)可根据外机安装条件进行选择。

Multi-scenario Compatibility: Multiple air outlet modes meet various cabinet equipment requirements; drainage methods (gravity drainage + forced drainage) are selectable based on outdoor unit installation conditions.

3) 智能监控:可通过终端设备对系统进行监控和参数设定,实现良好的人机交互;

Intelligent Monitoring: System monitoring and parameter setting via terminal devices for good human-machine interaction.

4) 快速安装:室内机、室外机分别预装快速接头,配套安装铜管,使安装更为快速简便;

Quick Installation: Pre-installed quick connectors for indoor and outdoor units with matching copper pipes for faster and easier installation.

5) 应用环保冷媒: R410A。

Eco-friendly Refrigerant: R410A.

1-4 应用场景 Application Scenarios

1)该产品是专为通讯或相关工业设备应用场合而设计的高性能交流变频型空调器,用于交流 220 伏的电源供电。

This product is a high-performance AC variable-speed air conditioner specially designed for communication or related industrial equipment applications, powered by 220V AC.

2) 其安装的意义在于对机柜(正常工作时为密闭状态)内部实行温度和湿度控制,将机柜内温度控制在 20~40°C 之间,以保证机柜内的所有电子元件可以正常工作,发挥其最佳工作性能。

It controls temperature and humidity inside the cabinet (normally sealed during operation), maintaining cabinet temperature between 20–40°C to ensure all electronic components work properly and achieve optimal performance.

注意：1、当单台机架式精密空调对应的服务器实际总负载小于空调额定制冷量的20%或机房机柜密封性不好时，可能出现机柜湿度过高情况，此情况的产生不属于产品质量范畴，建议在机柜内增加除湿机。2、禁止将载有机架空调的机柜安装在办公室、会议室等对噪声敏感场所。

Notes:

1、 High cabinet humidity may occur if the actual total server load corresponding to a single rack-mounted precision air conditioner is less than 20% of the rated cooling capacity, or the cabinet has poor sealing. This is not a product quality issue; it is recommended to add a dehumidifier inside the cabinet.

2、 Do not install cabinets equipped with rack-mounted air conditioners in noise-sensitive areas such as offices and meeting rooms.

2 机械安装 Mechanical Installation

2-1 运输与验收 Transportation and Acceptance

2-1-1 空调在运输过程中的注意事项 Transportation Precautions

1) 运输时，尽量选择铁路运输、海运。选择汽运时，应选择路况较好的公路，防止过度颠簸。

Use rail or sea transportation as much as possible. For road transportation, choose well-paved roads to avoid excessive vibration.

2) 搬运或者运输过程中空调必须按朝上放置。严禁倒置、平放、过度倾斜及碰撞。

Keep the air conditioner upright during handling and transportation. Inversion, horizontal placement, excessive tilting and collision are strictly prohibited.

3) 空调为精密设备，在搬运或者运输过程中，应小心轻放，包装箱上禁止踩踏，禁止站立或放置其他重物。

As precision equipment, handle with care. Do not step, stand or place heavy objects on the packaging box.

4) 搬运或运输过程中，注意防潮、防水、防雨。

Protect against moisture, water and rain during handling and transportation.

2-1-2 开箱验收 Unpacking and Acceptance

1) 开箱前请注意外包装箱按照图 2-1 所示直立放置，请检查包装箱是否破损、变形、潮湿。

Place the outer box upright as shown in Figure 2-1 before unpacking. Check for damage, deformation and moisture.

2) 使用剪刀剪开打包带和胶带，将包装箱拆除。

Cut the packing belt and tape with scissors and remove the box.

3) 打开包装后，请按照装箱清单核对产品，其中铜管选配 5m，如现场安装需要更长铜管，则需要购买安装辅材。

After unpacking, check the product against the packing list. The standard copper pipe length is 5m; purchase additional accessories if longer pipes are needed.

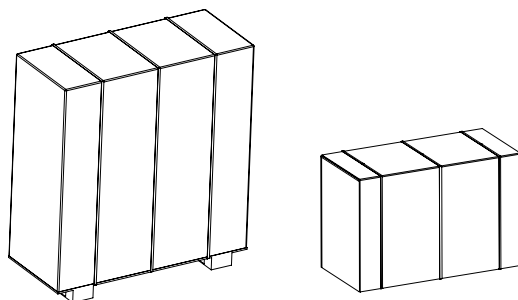


图 2-1 设备包装外观图 Figure 2-1 Equipment Packaging Appearance

2 机械安装 Mechanical Installation

表 2-1 设备物料清单

Table 2-1 Equipment Material List

名称Item	型号/规格Model/Specification	数量Quantity	单位Unit
内机 Indoor Unit	3.5/5/7.5/12.5kw	1	套 Set
外机 Outdoor Unit	3.5/5/7.5/12.5kw	1	套 Set
用户手册 User Manual	机架空调说明书 Rack AC Manual	1	册 Book
冷媒连接管 (选配件) Refrigerant Pipe (Optional)	φ6.35/φ9.52 液管 φ6.35/φ9.52 liquid;	1	件 Pcs
	φ12.7/15.88 气管 φ12.7/15.88 gas	1	件 Pcs
空调温湿度延长线 Temp & Humidity Extension Cable	温湿度传感器延长线 Temperature & Humidity Sensor Extension Cable	2	米 Meter
穿墙盖 Wall Hole Cover	/	1	个 Pcs
空调专用密封胶泥 Sealant Mud	/	1	包 Pack
连接管包扎带 Pipe Wrapping Tape	/	1	件 Pcs

2 机械安装 Mechanical Installation

2-2设备尺寸 Equipment Dimensions

- 3.5、5kW室内机的外形尺寸如图2-2所示：
- 3.5、The overall dimensions of the 3.5kW and 5kW indoor units are shown in Figure 2-2.

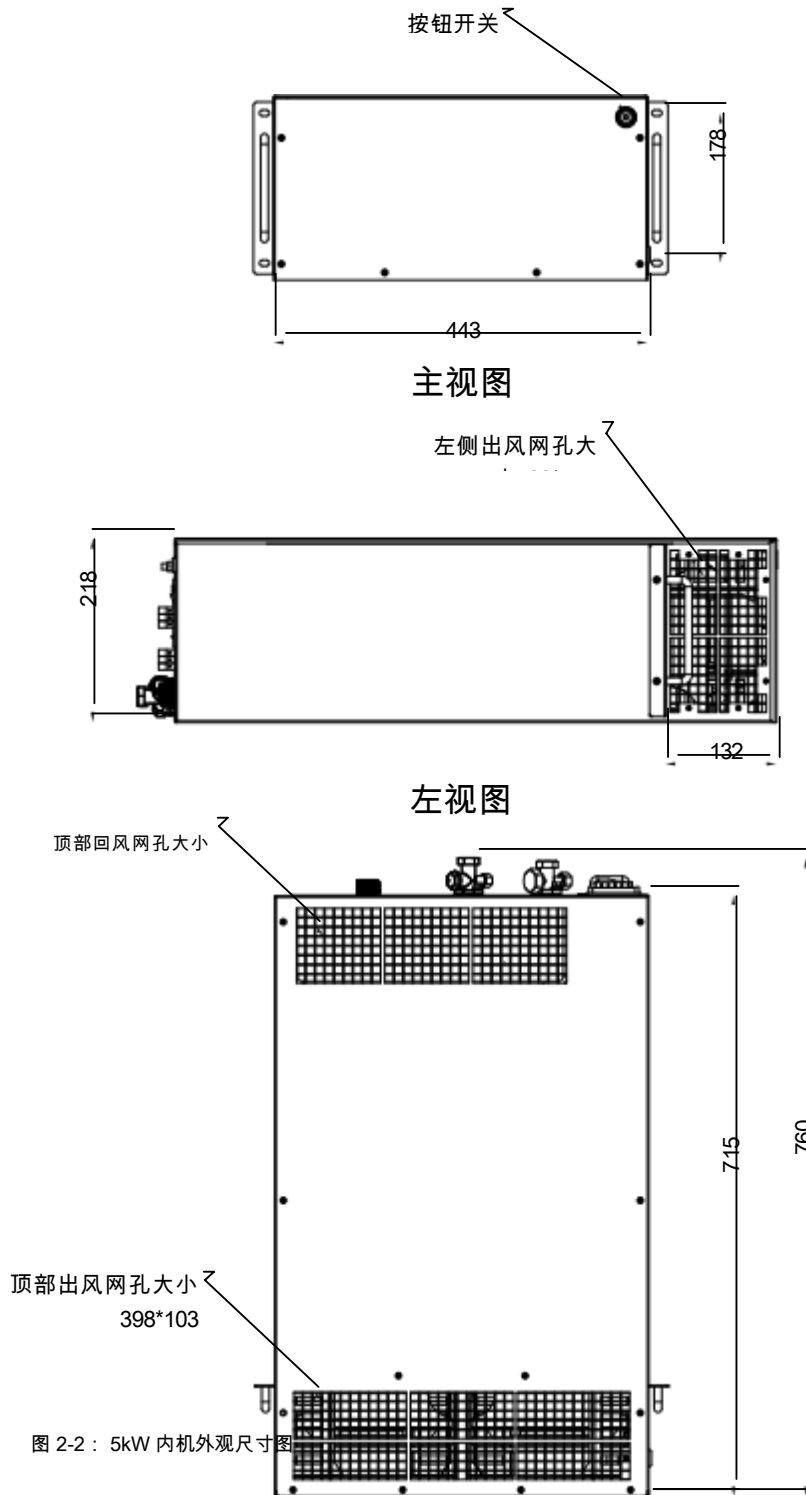


图 2-2：5kW 内机外观尺寸图

Outline Dimension Drawing of 5kW Indoor Unit

2 机械安装 Mechanical Installation

- 7.5kw室内机的外形尺寸如图2-3所示。The external dimensions of the 7.5kW indoor unit are illustrated in Fig. 2-3

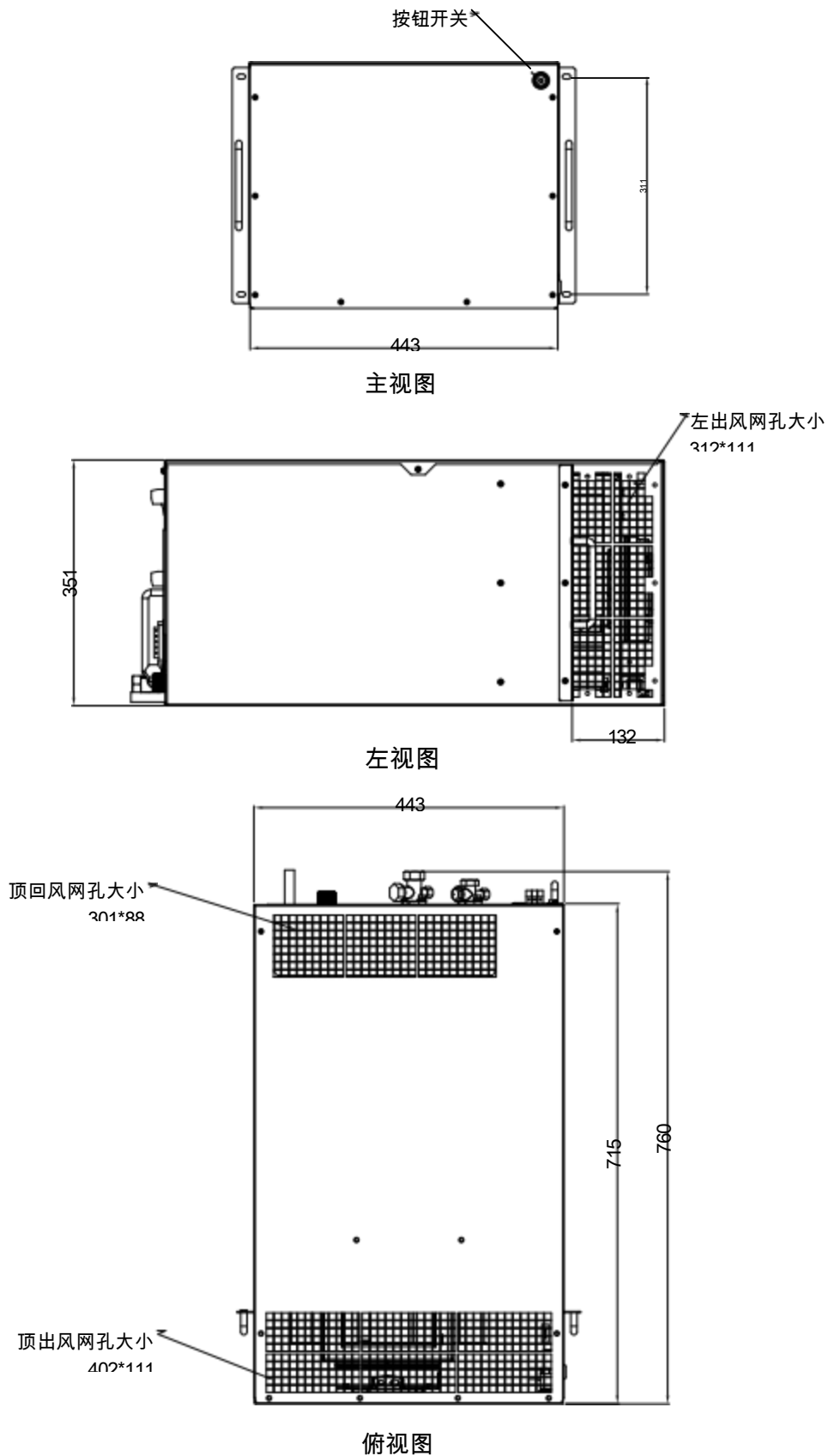
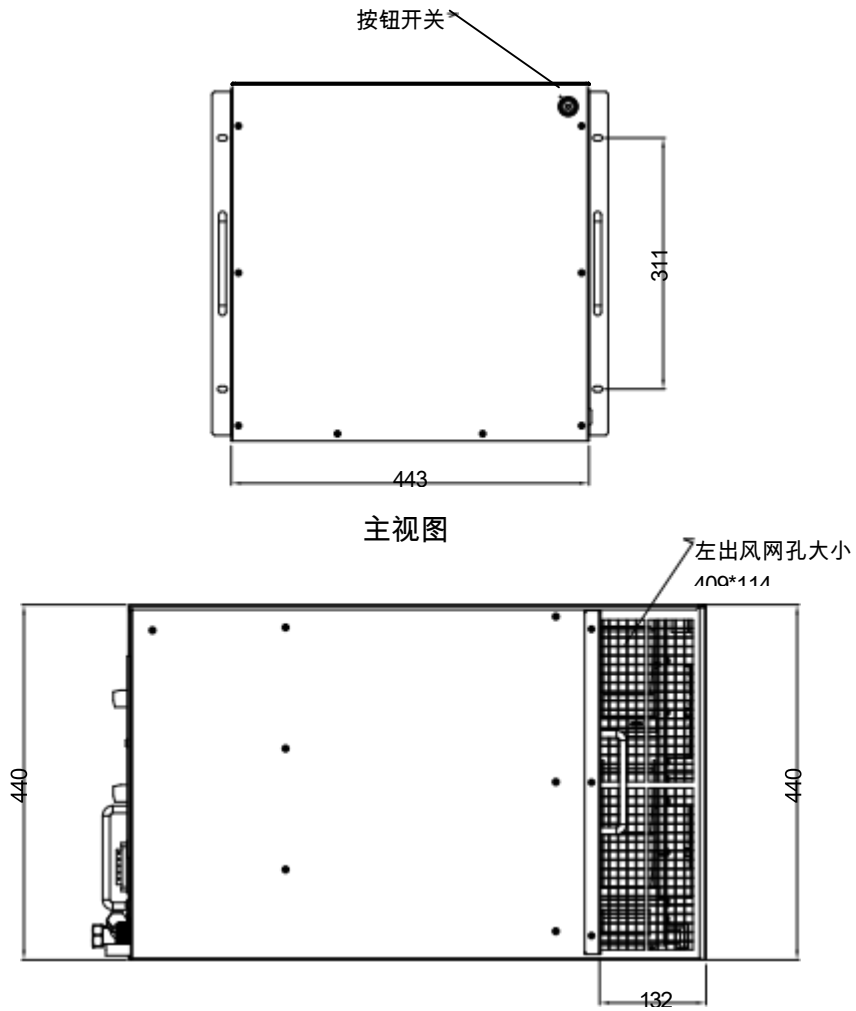
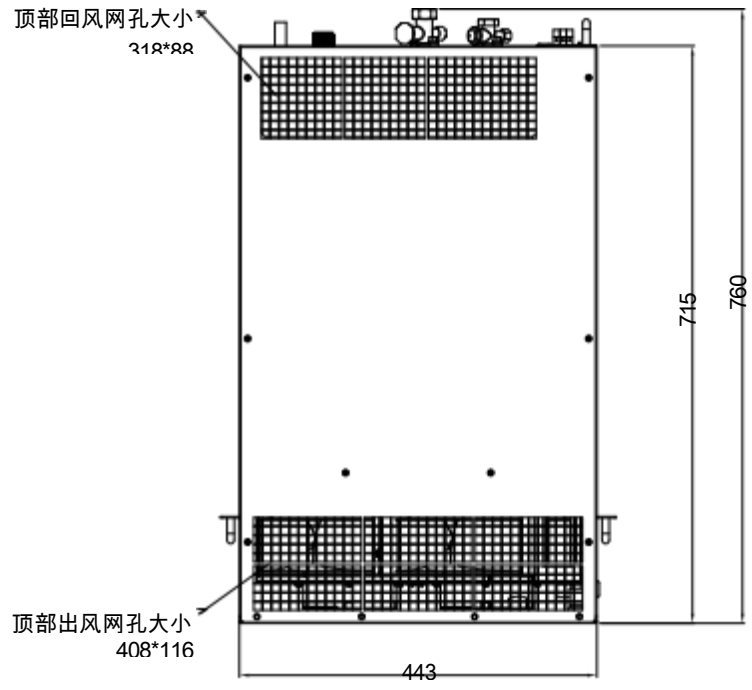


图 2-3 : 7.5kw 内机外观尺寸图 Fig. 2-3: Outline Dimensions of 7.5kW Indoor Unit

2 机械安装 Mechanical Installation

- 12.5kw室内机的外形尺寸如图2-4所示：
- The overall dimensions of the 12.5kW indoor unit are shown in Figure 2-4.





俯视图

图 2-4 : 12.5kw内机外观尺寸图
Fig. 2-4: Outline Dimensions of 12.5kW Indoor Unit

2 机械安装 Mechanical Installation

- 3.5、5kw室外机机壳的外观尺寸如下图所示：The external dimensions of the 3.5kW and 5kW outdoor unit casings are shown in the figure below.

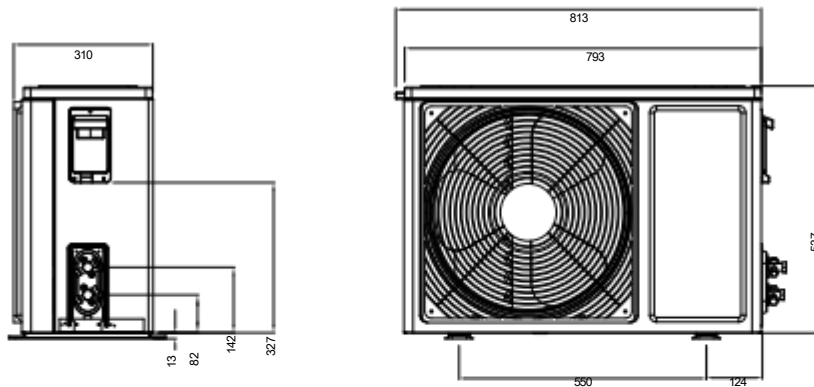


图 2-5：3.5、5kw外机外观尺寸图

- 3.5、5kw机架外机底盘支脚孔位距离(安装支架孔位距离)为长乘宽为550*325mm.The mounting hole spacing of the base feet for the 5kW frame-type outdoor unit (installation bracket hole spacing) is 550×325 mm (length × width).

- 7.5kw 的室外机机壳的外观尺寸如下图所示：The outline dimensions of the 7.5kW outdoor unit housing are as shown below.

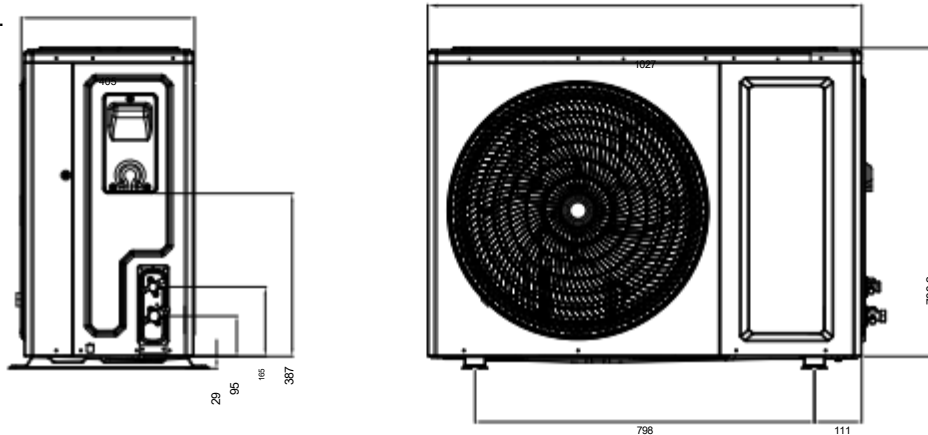


图 2-6：7.5kw外机外观尺寸图 Fig. 2-6: Outline Dimensions of 7.5kW Outdoor Unit

- 12.5kw 的室外机机壳的外观尺寸如下图所示：The outline dimensions of the 12.5kW outdoor unit housing are as shown below.

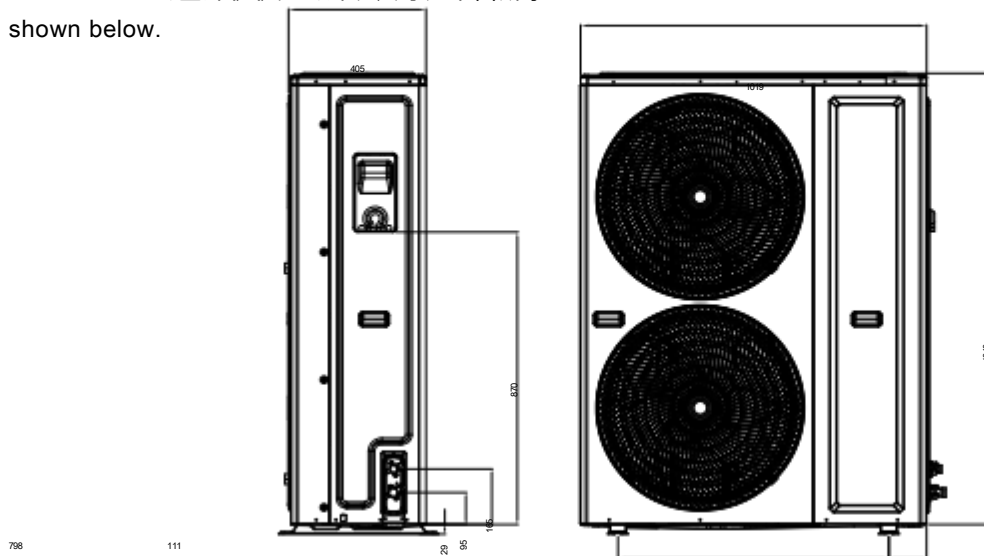


图 2-7：12.5kw 外机外观尺寸图 Fig. 2-7: Outline Dimensions of 12.5kW Outdoor Unit

- 7.5kw、12.5kw机架外机底盘支脚孔位距离(安装支架孔位距离)为长乘宽798*435mmThe length and width of the base foot mounting hole pitch for 7.5kW and 12.5kW rack outdoor units are 798×435 mm..

2 机械安装 Mechanical Installation

2-3 安装准备 2-3 Installation Preparation

(1) 安装人员 Installers

安装人员必须有空调的安装经验。或者必须经过专业的培训后具有安装空调的安装能力。

Installers must have air conditioner installation experience, or possess the installation capability after receiving professional training.

(2) 安装工具 Installation Tools

表 2-2 安装工具清单

Table 2-2 List of Installation Tools

序号 No.	名称 Name	序号 No.	名称 Name
1	冲击钻及钻头 Impact drill and drill bits	6	剪刀、卷尺 Scissors, tape measure
2	活口扳手(2Pcs) Adjustable wrench (2Pcs)	7	φ10 和 φ6 钻头 (如果用膨胀螺栓固定支架) φ10 & φ6 drill bits (for bracket fixing with expansion bolts)
3	M4 十字螺丝刀 M4 Phillips screwdriver	8	锤子 (如果用膨胀螺栓固定支架) Hammer (for bracket fixing with expansion bolts)
4	M3 一字螺丝刀 M3 flat screwdriver	9	万用表、压力表、真空泵 Multimeter, pressure gauge, vacuum pump
5	斜口钳 Diagonal pliers	10	5mm 内六角扳手 mm hexagon socket wrench

2-4 室内机安装 Indoor Unit Installation

根据现场送风方式(侧送风、前送风)需要,拆卸或安装室内机送风口盖板。将室内机放置在机柜内最

下层位置,选择合适的固定位置(1或2),用 M6 螺丝将室内机固定于机柜上,如图 2-8 和图 2-9 所示。

Adjust the air outlet cover according to side/front air supply. Install the indoor unit at the bottom of the cabinet. Secure with M6 screws. As shown in Figure 2-8 and Figure 2-9.

2 机械安装 Mechanical Installation

2-3 安装准备 2-3 Installation Preparation

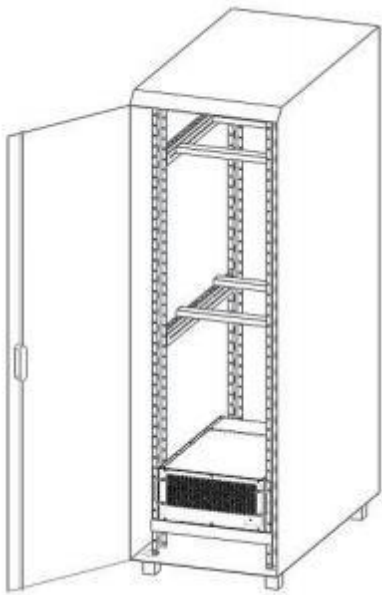
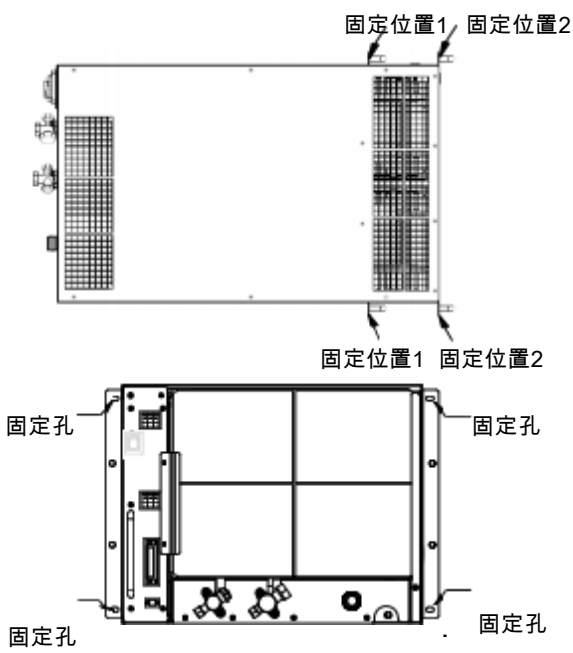


图 2-8 机柜内室内机放置位置
Figure 2-8 Installation Position of Indoor Unit in Cabinet



2 机械安装 Mechanical Installation

2-5 室外机安装 Outdoor Unit Installation

(1) 室外机的搬运Handling :

a. 因为室外机的重心不在中心，所以搬运室外机时，请谨防倾倒；

Center of gravity is offset; avoid tipping.

b. 请勿握持外壳上的吸风口，否则会使其变形；

Do not grip the air inlet on the enclosure, otherwise it will cause deformation..

c. 请勿握持外壳上的吸风口，否则会使其变形；

Do not grip the air inlet on the enclosure, otherwise it will cause deformation.

d. 不要倾斜45°以上搬运，不要横卧存放；

Do not carry the unit with an inclination over 45°, and do not store it horizontally.

e. 若室外机安装在地下室、室内或其他密闭空间内，必须保证室外机与室外空气的循环；

If the outdoor unit is installed in a basement, indoor area or other enclosed space, ensure adequate air circulation between the unit and the outdoor atmosphere.



(2) 室外机的安装Installation

安装场所的选择：Selection of Installation Location

a. 室外机可安装在未封闭的阳台或外墙，同时，请做好防水措施；

The outdoor unit can be installed on an unenclosed balcony or external wall, and proper waterproof measures shall be taken.

b. 能提供足够的安装和维护空间，室外机的进出风口无障碍物阻挡，且强风不可吹倒；

Sufficient space shall be reserved for installation and maintenance; no obstacles shall block the air inlet and outlet of the outdoor unit, and the unit shall not be blown over by strong wind.

c. 干燥通风良好，避开易燃易爆气体、易泄漏处和有强腐蚀气体的环境；

The location shall be dry and well ventilated, away from flammable and explosive gas leakage points and environments with strong corrosive gas.

d. 便于安装连接管和电气线路；

Convenient for routing connecting pipes and electrical wiring.

e. 支撑面平坦，能承受室外机重量，可以水平安装室外机，且不会增加振动和噪音。若基础为金属部件，则必须做好绝缘处理，并且符合相关技术标准；

2 机械安装 Mechanical Installation

2-5 室外机安装 Outdoor Unit Installation

The supporting surface shall be flat and capable of bearing the weight of the outdoor unit to ensure horizontal installation without increasing vibration and noise. If the base is made of metal parts, reliable insulation treatment must be performed in compliance with relevant technical standards.

- f. 运行噪音及冷空气排出不影响自己及邻居 ;
The operating noise and discharged cold air shall not affect the user or neighboring residents.
- g. 避开强电、强磁场直接作用的地方。
Keep away from areas directly affected by strong electric field and strong magnetic field.

安装在下列场所可能会导致机器故障(若不可避免，请咨询相关经销商)：

Installation in the following locations may cause equipment failure. Consult the relevant dealer if installation in such locations is unavoidable:

- a. 有诸如切削机油等矿物油的地方 ;
Places with mineral oil such as cutting oil;
- b. 在海边等空气中含有较多盐分的地方 ;
Coastal areas and other locations with high salt content in the air;
- c. 在温泉地区等存在如硫磺气体等腐蚀性气体的地方 ;
Hot spring areas and other places containing corrosive gases such as sulfur gas;
- d. 电源电压波动严重的地方 ;
Areas with severe power supply voltage fluctuation;
- e. 汽车或舱室内等地方 ;
Inside vehicles, cabins and similar enclosed spaces;
- f. 存在强烈电磁波的地方 ;
Places with strong electromagnetic waves;
- g. 存在易燃气体或易燃材料的地方 ;
Locations with flammable gas or flammable materials;
- h. 存在酸性或碱性气体蒸发的地方 ;
Areas with evaporation of acidic or alkaline gases;
- i. 其它特殊环境条件处。 Other places with special environmental conditions.

2 机械安装 Mechanical Installation

(3)室外机安装要点：

Key Installation Points for Outdoor Unit

- a. 室外机可以通过固定支架悬挂在墙壁上(供选择)或者自由直立在地上(基座要稍微垫高的地方)；

The outdoor unit can be wall-mounted on a fixing bracket (optional) or placed freely on the ground (the base shall be properly raised).

- b. 安装前，检查基座的强度是否牢固，基座是否水平，使用地脚螺栓牢固固定基座；

Before installation, check the firmness and levelness of the base, and fix the base securely with anchor bolts.

- c. 如是混凝土基座要求如下:用水泥或类似材料建一个牢固的基座，通常基座高度应大于等于5cm，检查基座的强度和固定地脚螺栓，地脚螺栓露出基座表面的高度应小于25mm；

Requirements for concrete base:Construct a solid base with cement or equivalent materials.

Normally, the base height shall be no less than 5 cm. Check the base strength and anchor bolts; the exposed height of anchor bolts above the base surface shall be less than 25 mm.

- d. 如是在砖墙或水泥墙上固定：用钻头在墙上钻安装孔，将膨胀螺栓用锤子敲进安装孔中，安装支架固板，用螺母锁在膨胀螺栓上（图 2-10）。如果是铁皮墙，用 $\phi 4.2$ 的钻头在墙上钻安装，用铆钉将安装支架固定板固定在墙上，随后将室外机小心放置于支架上，用螺栓螺母将外机底脚固定在安装支架上（图 2-11）；

Fixing on brick wall or cement wall:Drill mounting holes in the wall, drive expansion bolts into the holes with a hammer, install the bracket fixing plate and fasten it to the expansion bolts with nuts (see Figure 2-10).For iron sheet walls: Drill mounting holes with a $\phi 4.2$ drill bit, fix the mounting bracket plate to the wall with rivets, then carefully place the outdoor unit on the bracket, and fasten the unit feet to the bracket with bolts and nuts (see Figure 2-11).

- e. 机组安装及维护所需的空间，机组需预留足够的回风、检修的空间，且便于散热及通风，出风口2m内无任何遮拦物，回风口 30cm 内不应有遮挡物（图 2-12、图 2-13），且风口不应与风向相对。

Space reservation for unit installation and maintenance:Reserve sufficient space for air return and maintenance to ensure good heat dissipation and ventilation.No obstacles are allowed

within 2 meters of the air outlet, and no shelters within 30 cm of the air return inlet (see Figure 2-12, Figure 2-13). The air outlets shall not face the prevailing wind direction.

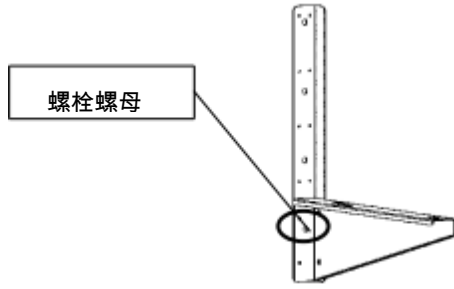


图 2-10 支架固定示意图

Figure 2-10 Bracket Fixing Schematic Diagram

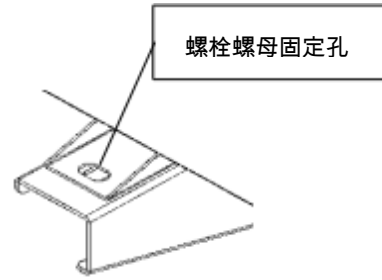


图 2-11 外机底脚固定示意图

Figure 2-11 Outdoor Unit Foot Fixing Schematic Diagram

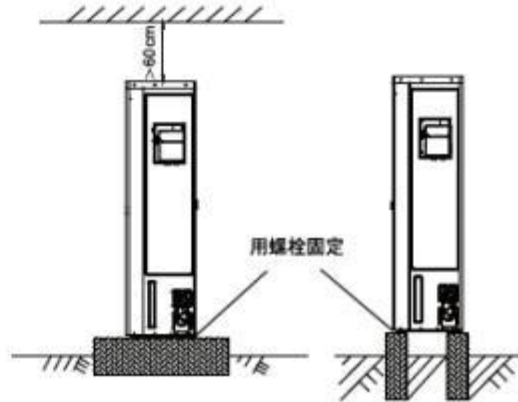
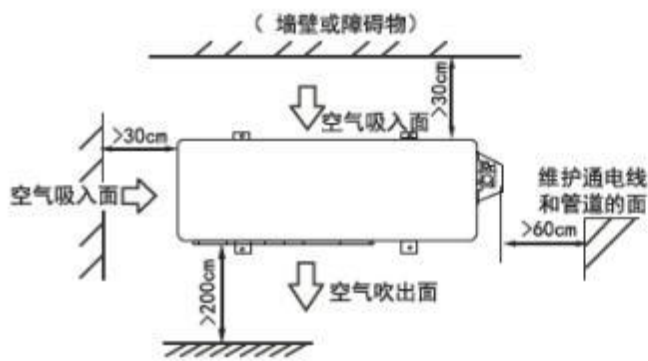


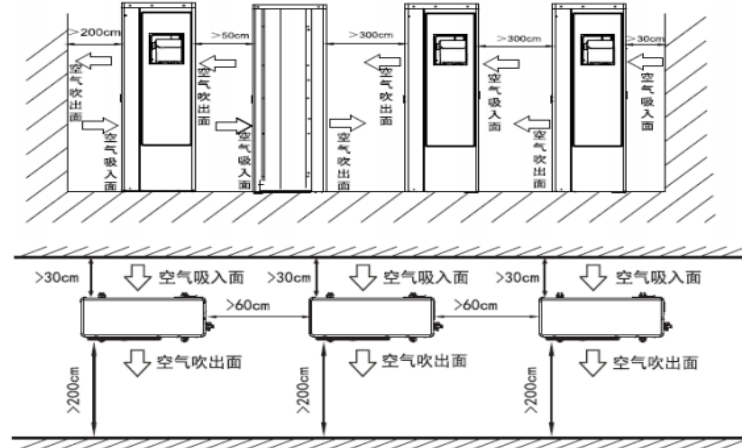
图 2-12 单台室外机安装维护空间示意图

Figure 2-12 Single Outdoor Unit Installation and Maintenance Space Schematic Diagram

2 机械安装 Mechanical Installation

图 2-13 多台室外机安装维护空间示意图

Figure 2-13 Schematic Diagram of Installation and Maintenance Space for Multiple Outdoor Units



(4) 室外机布置 Layout of Outdoor Unit

空调室外机必须竖直安装，实际安装中有两种情况：室外机低于室内机和室外机高于室内机，如图 2-14、图 2-15 所示。

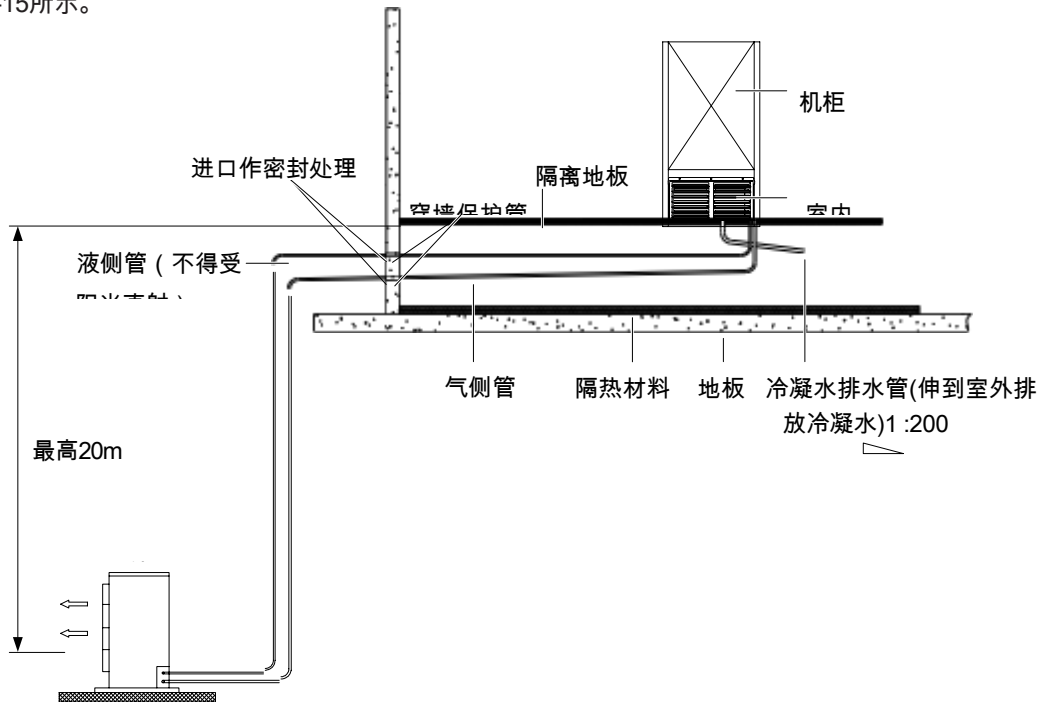


图2-14 室外机低于室内机 (正落差)

2 机械安装 Mechanical Installation

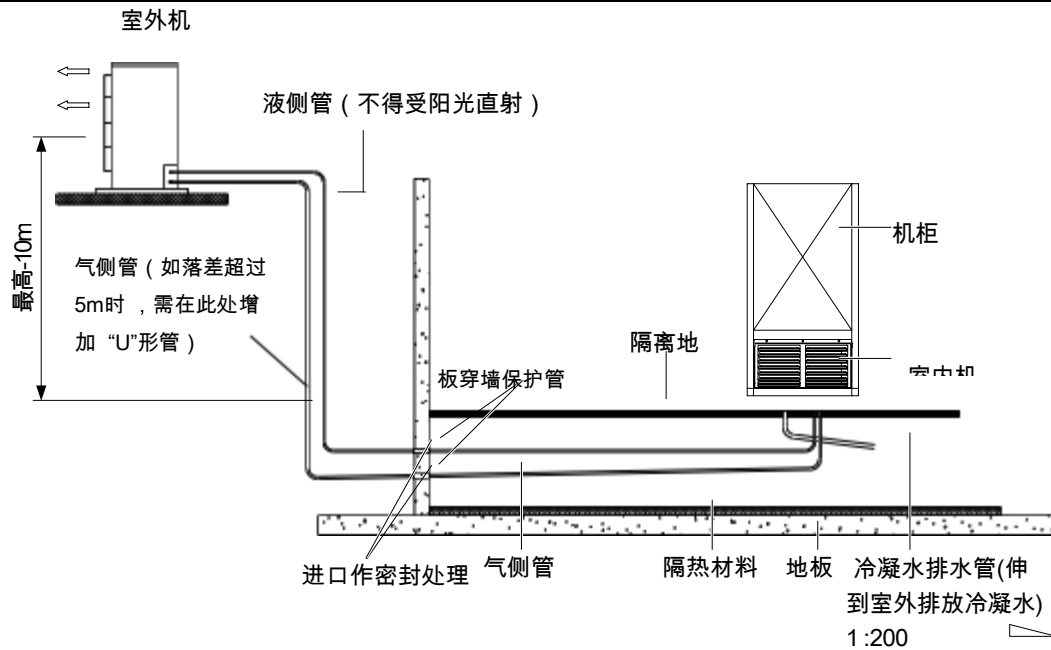


图 2-15 室外机高于室内机 (负落差)

Figure 2-15 Outdoor Unit Higher Than Indoor Unit (Negative Height Difference)

注意：因压缩机装配于室外机内，室外机高于室内机安装高度超过5m时，务必在气管侧每5m增加“U”形管，以保证压缩机的回油！

Note: Since the compressor is installed inside the outdoor unit, if the installation height of the outdoor unit is more than 5m above the indoor unit, a U-tube must be added every 5m on the gas pipe side to ensure oil return of the compressor.

2-6 铜管连接 Copper Pipe Connection

(1) 一般原则 General Rules

室内机与室外机之间采用铜管连接，其接头均为快速螺纹接头。当管路长度超过标准配管长度 5 米而采用直铜管时，需采用焊接方式连接。

Indoor and outdoor units are connected by copper pipes with quick threaded joints at all connections. When the pipeline length exceeds the standard piping length of 5 meters and straight copper pipes are adopted, the connection shall be made by welding.

要考虑管路压降、压缩机回油等情况，避免系统部件泄漏和阻塞，最大限度地降低噪声和振动。

It is necessary to take into account pipeline pressure drop, compressor oil return and other conditions, so as to avoid leakage and blockage of system components, and minimize noise and vibration.

正负高差不要超过限值，室内外机最大连接管长不要超过 60米。

The positive and negative height difference shall not exceed the limit value, and the maximum connecting pipe length between indoor and outdoor units shall not exceed 60 meters.

2 机械安装 Mechanical Installation

当室外环境温度低于-15°C时，请向厂家咨询以确认是否需要加装低温组件等措施。

When the outdoor ambient temperature is lower than -15°C, consult the manufacturer to confirm whether it is necessary to install low-temperature accessories or take other corresponding measures.

表 2-3 室内机与室外机的垂直高度差

Table 2-3 Vertical Height Difference Between Indoor and Outdoor Unit

相对位置Relative Position		取值Limit Value
正落差 Positive Height Difference	室内机高于室外机 (Indoor unit higher than outdoor unit)	最大：20m Max: 20 m
负落差 Negative Height Difference	室外机高于室内机 (Outdoor unit higher than indoor unit)	最大：10m Max: 10 m

(2) 内外机铜管连接 Copper Pipe Connection Between Indoor and Outdoor Unit

注意：安装时不要使外界灰尘、杂物、水分带入管内，所以未安装时不要拆开连接管密封盖。

Note: Do not allow external dust, debris or moisture to enter the pipes during installation. Do not remove the sealing caps of connecting pipes before installation.

安装步骤：将盘成一圈的连接铜管展开。展开时外侧的一头先拉直，然后用脚踩住或用手摁住，其余部分，如图2-16方向展开。将管线穿出墙孔，将连接铜管慢慢弯转至接头能对上内机的铜管接头，拧紧管时应避免用力不足，拧不紧而致使制冷剂泄露，不同机型对应的铜管直径如表 2-4所示。

Installation Steps:Unfold the coiled connecting copper pipe. Straighten the outer end first, then step on or press it firmly; unfold the rest of the pipe in the direction shown in Figure 2-16.Pass the pipes through the wall hole, slowly bend the copper connecting pipe until the pipe joint aligns with the indoor unit pipe interface.Tighten the joints with proper force; insufficient tightening may cause refrigerant leakage.The copper pipe diameters corresponding to different models are listed in Table 2-4.

表 2-4 不同机型对应的铜管规格表

Table 2-4 Copper Pipe Specifications for Different Models

机型Model	气管Gas Pipe	液管Liquid Pipe
3.5、5kw	12.7mm	6.35mm
7.5、12.5kw	15.88mm	9.52mm

2 机械安装 Mechanical Installation

若室内、外机间的连接管路较长，为降低系统阻力，需要适当增大连接管径。管路建议尺寸如下表所示：

If the connecting pipeline between the indoor and outdoor units is long, properly increase the pipe diameter to reduce system resistance. The recommended pipeline dimensions are shown in the table below:

型号 Model	3.5、5kW		7.5/12.5kW	
	液管 Liquid Pipe	气管 Gas Pipe	液管 Liquid Pipe	气管 Gas Pipe
管长 Pipe Length				
10m	6.35	12.7	9.52	15.88
20m	9.52	12.7	9.52	15.88
30m	9.52	15.88	12.7	19.05

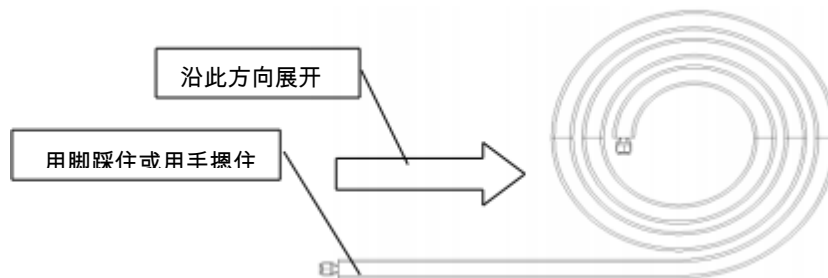


图 2-16 铜管展开示意图

Figure 2-16 Copper Pipe Unfolding Schematic Diagram

2-7 水管连接 Water Pipe Connection

1. 将冷凝水管与室内机排水口（位置如图2-17所示,包含黑色自排水管、透明强排水管）连接，插牢，并用管箍固定，防止冷凝水渗出。

Connect the condensate drain pipe to the drain outlet of the indoor unit (as shown in Figure 2-17, including black gravity drain pipe and transparent forced drain pipe). Insert firmly and fasten with pipe clamps to prevent condensate water leakage.

自然排水：排水管的任何部位都应低于室内机排水口，排水管顺着流水方向坡度应 $\geq 2\%$ 。排水管上必须制作存水弯（如图 2-18所示），否则机组将有漏水风险。

Gravity Drainage: All sections of the drain pipe shall be lower than the indoor unit drain outlet. The pipe gradient along the water flow direction shall be $\geq 2\%$. A water trap must be installed on the drain pipe (see Figure 2-18); otherwise, there is a risk of water leakage from the unit.

2 机械安装 Mechanical Installation

强制排水：排水管的出口与室内机排水口垂直高度差值不大于 5m。

Forced Drainage: The vertical height difference between the drain pipe outlet and the indoor unit drain outlet shall not exceed 5 m.

管材：强排水管为 PU管 8*5mm，自然排水管为硅胶软管 14*10mm，所注尺寸为外径*内径。

Pipe Material: The forced drain pipe is PU pipe 8×5 mm; the gravity drain pipe is silicone hose 14×10 mm. The specified dimensions are outer diameter × inner diameter.

2. 将加湿进水管 (位置如图 2-17所示)与室内机进水口连接，拧紧，防止漏水。

Connect the humidification inlet pipe (see Figure 2-17 for position) to the water inlet of the indoor unit and tighten securely to avoid water leakage.

加湿进水管承接头外径为 15*G1/2的螺纹接头，且为公螺纹，需要自行配置对应的母螺纹接头及水管。加湿进水压力范围需满足0.15至0.35MPa，进水管耐压应大于0.4MPa，否则机组会有漏水风险。

The spigot outer diameter of the humidification water inlet connector is 15×G1/2 male thread.

Matching female thread connector and water pipe shall be prepared on site. The humidification inlet water pressure shall be within 0.15 ~ 0.35 MPa, and the pressure resistance of the inlet pipe shall be higher than 0.4 MPa. Otherwise, water leakage may occur.

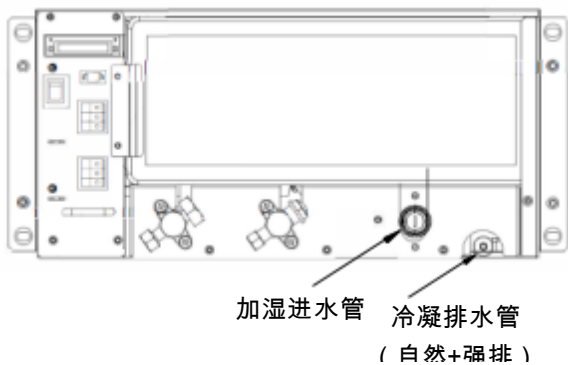


图 2-17 室内机水管接管示意图

Figure 2-17 Schematic Diagram of Water Pipe Connection for Indoor Unit

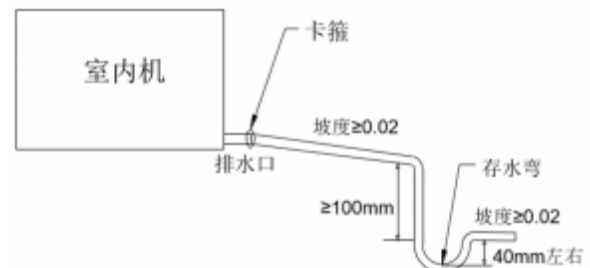


图 2-18 自然排水管连接示意图

Figure 2-18 Schematic Diagram of Gravity Drain Pipe Connection

3 电气安装 Electrical Installation

3-1 内机接线说明 Indoor Unit Wiring

内机接线说明如图 3-1 所示：

Indoor unit wiring instructions are shown in Figure 3-1:

- a) 将室内机电源线接到主电源端子上，注意需要压接端子，固定牢靠；

Connect the indoor unit power cord to the main power terminal. Ensure crimp terminals are used and securely fastened.

- b) 室外机电源线可从室内机上室外机主电源接口接入，如果室外侧接线方便也可从室外取电。

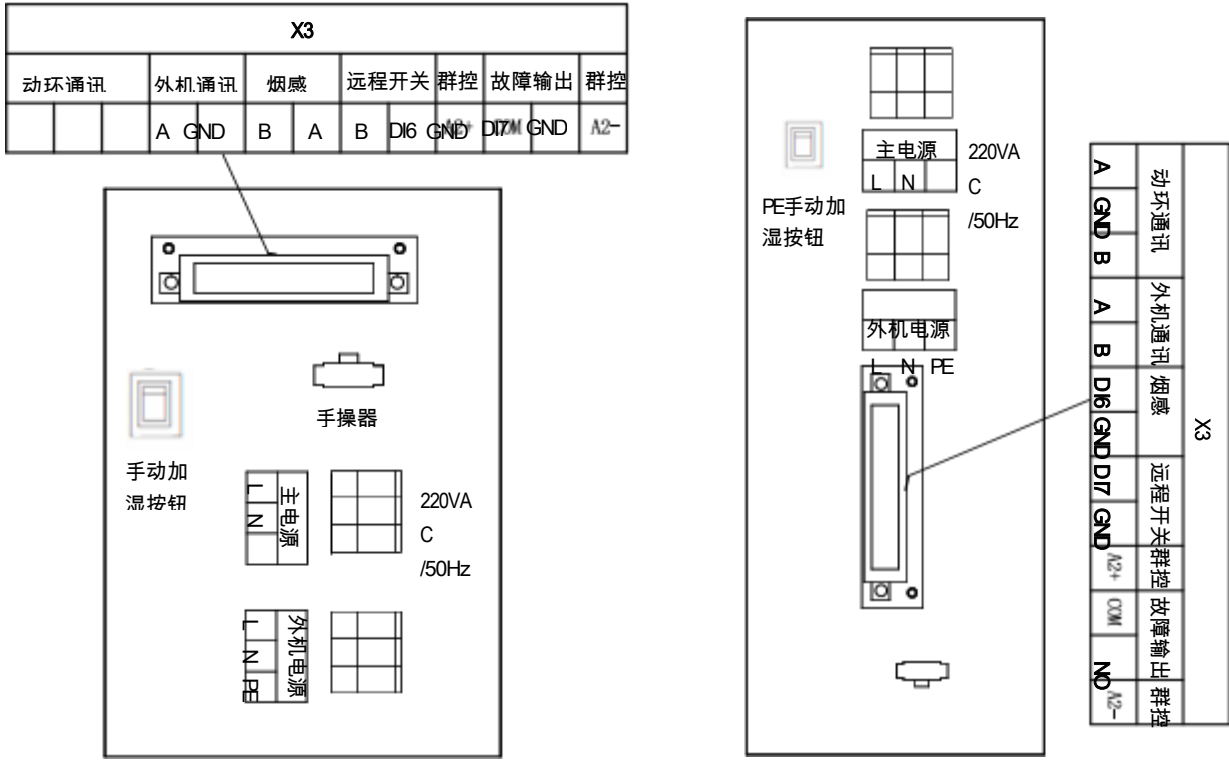
The outdoor unit power cord can be connected to the outdoor unit main power interface on the indoor unit. If wiring is more convenient at the outdoor side, power can also be taken from the outdoor unit side.

- c) 信号线的端子如图所示，室外机通讯线必须与室外机连接。动环通讯、群控通讯等其他端口可根据需求决定是否连接。

The signal wire terminals are as shown in the figure. The outdoor unit communication wire must be connected to the outdoor unit. Other ports such as dynamic environment monitoring communication and group control communication may be connected as required.

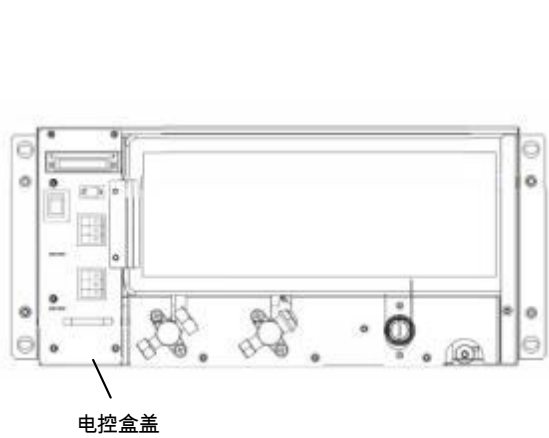
3 电气安装 Electrical Installation

3-1 内机接线说明 Indoor Unit Wiring

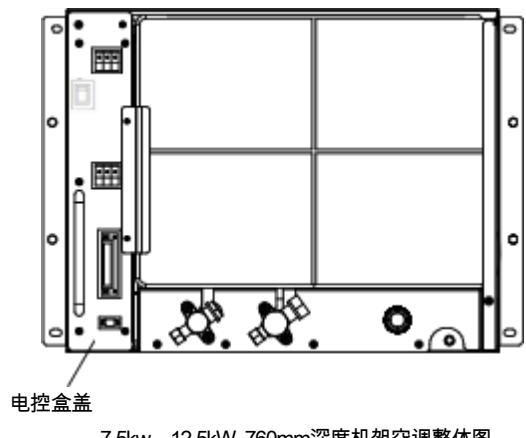


3.5kW室内机电控盒接线局部放大图

7.5kW、12.5kW室内机电控盒接线局部放大图



3.5、5kw 760mm深度机架空调整体图

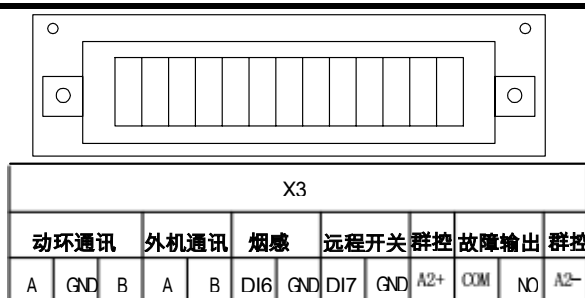


7.5kw、12.5kW 760mm深度机架空调整体图

图3-1：内机接线位置示意图

Figure 3-1: Schematic Diagram of Indoor Unit Wiring Position

3 电气安装 Electrical Installation



内机多位端子说明：

Indoor Unit Multi-position Terminal Description

1. 动环通讯，与机柜控制器相连，可与机柜控制器通讯，监测和控制空调；
Dynamic Environment Communication: Connect to the cabinet controller, enabling communication with the cabinet controller to monitor and control the air conditioner.
2. 外机通讯，与外机通讯端口相连，可与外机通讯，监测和控制外机；
Outdoor Unit Communication: Connect to the communication port of the outdoor unit, realizing communication with the outdoor unit for its monitoring and control.
3. 烟感，与机柜内的烟感检测报警装置相连，当检测到该端口闭合时，空调进行烟雾报警相关动作；
Smoke Detection: Connect to the smoke detection and alarm device inside the cabinet. When port closure is detected, the air conditioner will trigger corresponding smoke alarm actions.
4. 远程开关，可与远程开关按钮连接，当检测到该端口闭合时关闭空调，检测到端口端口时开启空调；
Remote Switch: Can be connected to a remote switch button. The air conditioner turns off when port closure is detected, and turns on when the port is open.
5. 群控，可与多台空调的群控端口连接（A2+接A2+，A2-接A2-），将多台空调通过该端口串联实现群控；
Group Control: Connect to the group control ports of multiple air conditioners (A2+ to A2+, A2- to A2-). Multiple air conditioners can be connected in series via this port to achieve group control.
6. 故障输出，可与机柜的报警装置连接，当空调有故障发生时，该端口会闭合；
Fault Output: Connect to the cabinet alarm device. This port will close when a fault occurs in the air conditioner.

注：除外机通讯端口必须与外机连接外，其他端口都是空调的拓展功能，不连接也不会影响空调的正常运转。

Note: Except that the outdoor unit communication port must be connected to the outdoor unit, all other ports are extended functions of the air conditioner. Disconnection of these ports will not affect the normal operation of the air conditioner.

3-2 外机接线说明 Outdoor Unit Wiring

如图 3-2 所示：

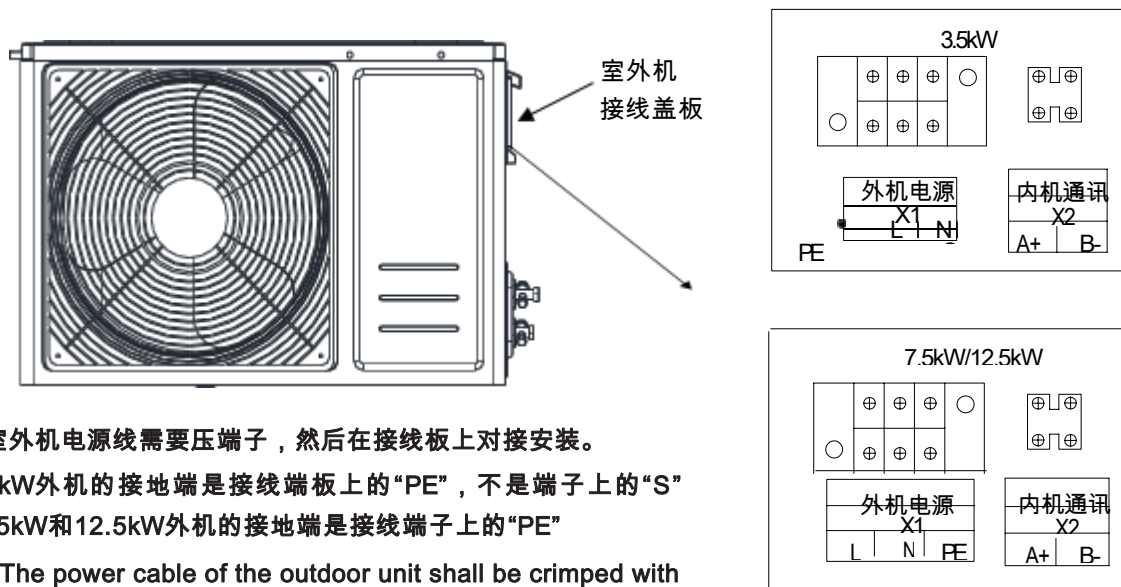
As shown in Figure 3-2:

- 1) 用十字螺丝刀将室外机接线盒盖板的M4 螺钉卸掉，将接线盒盖取下，露出外机接线板。
Use a Phillips screwdriver to remove the M4 screws on the outdoor unit junction box cover, then take off the cover to expose the outdoor unit terminal block.

3 电气安装 Electrical Installation

2) 室外机的通讯接口 A/B 分别接室内机的通讯端口 A+/A-。

Connect the outdoor unit communication interface A/B to the indoor unit communication port A+/A- respectively.



注：室外机电源线需要压端子，然后在接线板上对接安装。

3kW外机的接地端是接线端板上的“PE”，不是端子上的“S”

7.5kW和12.5kW外机的接地端是接线端子上的“PE”

Note: The power cable of the outdoor unit shall be crimped with terminals before connection and installation on the terminal block.
For the 3kW outdoor unit, the grounding point is marked PE on the terminal block, not the terminal marked S.

For 7.5kW and 12.5kW outdoor units, the grounding point is the PE

图3-2：外机接线位置示意图

Figure 3-2: Schematic Diagram of Outdoor Unit Wiring Position

各型号机组所用的线缆规格如下表所示：

Cable specifications for each unit model are shown in the table below:

机型Model	内机电源线 Indoor Unit Power Cable	外机电源线 Outdoor Unit Power Cable	室内外机通讯线 Indoor and Outdoor Unit Communication Cable
3.5、5kw	(L、N、PE) 3×2.5mm ²	(L、N、PE) 3×1.5mm ²	(双绞线或屏蔽线) 2×0.5mm ² (Twisted pair or shielded cable) 2×0.5mm ²
7.5kw	(L、N、PE) 3×4mm ²	(L、N、PE) 3×2.5mm ²	(双绞线或屏蔽线) 2×0.5mm ² (Twisted pair or shielded cable) 2×0.5mm ²
12.5kw	(L、N、PE) 3×6mm ²	(L、N、PE) 3×4mm ²	(双绞线或屏蔽线) 2×0.5mm ² (Twisted pair or shielded cable) 2×0.5mm ²

3 电气安装 Electrical Installation

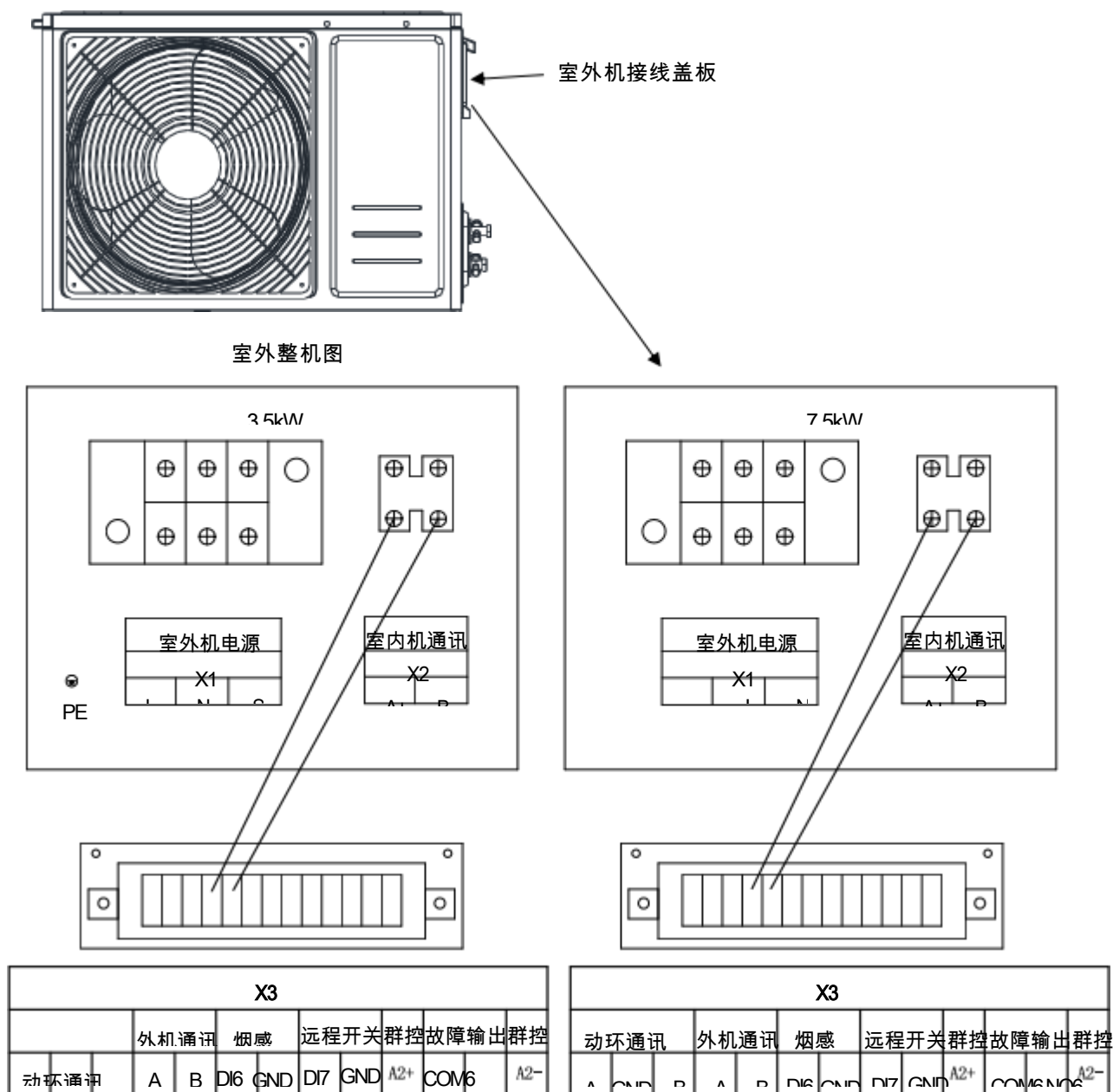


图 3-2 : 外机接线位置示意图

Figure 3-2: Schematic of Outdoor Unit Wiring Layout

3-3 按钮开关功能说明 Push Button Switch Function Description

按钮开关功能说明如下：

1，按钮开关灯亮表示机组开机状态，长按3s可以使机组关机；按钮开关灯灭表示关机状态，长按3s可以使机组开机；

Light on: Unit on; long press 3s to turn off. Light off: Unit off; long press 3s to turn on.

3 电气安装 Electrical Installation

2, 按钮开关绿灯常亮表示当前机组正常运行且无故障报警。

Green light steady: Normal operation, no fault alarm.

3, 按钮开关绿灯闪亮表示当前机组有故障报警, 短按 1s 可临时清除当前故障, 可在触摸屏上查看当前的告警信息;

Green light flashing: Fault alarm; short press 1s to temporarily clear the fault. View alarm info on the touch screen.

4, 机组运行详细状态及各项参数需外接触摸屏查看及设置。

Detailed operation status and parameters are viewed and set via an external touch screen.

4 系统调试及维护 System Commissioning and Maintenance

4-1 抽真空及充注制冷剂 Vacuum Pumping and Refrigerant Charging

(1) 抽真空 Vacuum Pumping

A 用扳手拧下内机的针阀口阀帽，阀帽位置详见图4-1。用压力表软管连接内机的气管接头、液管接头的针阀口，用软管把压力表和真空泵连接起来，参见图 4-2。（注意：机组室内外机内均含有冷媒）

Remove the valve cap of the indoor unit needle valve with a wrench. Connect the pressure gauge hoses to the gas and liquid pipe needle valves, and connect the pressure gauge to the vacuum pump.

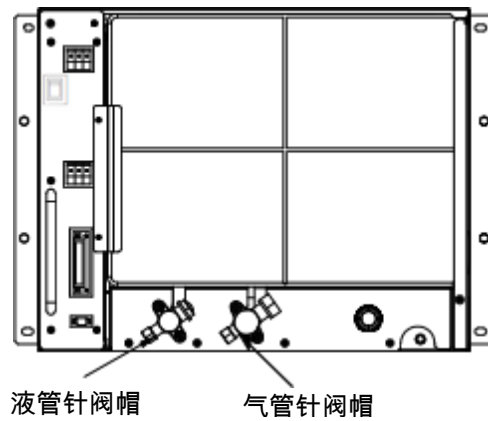


图 4-1 内机针阀位置

Figure 4-1: Position of Indoor Unit Needle Valve

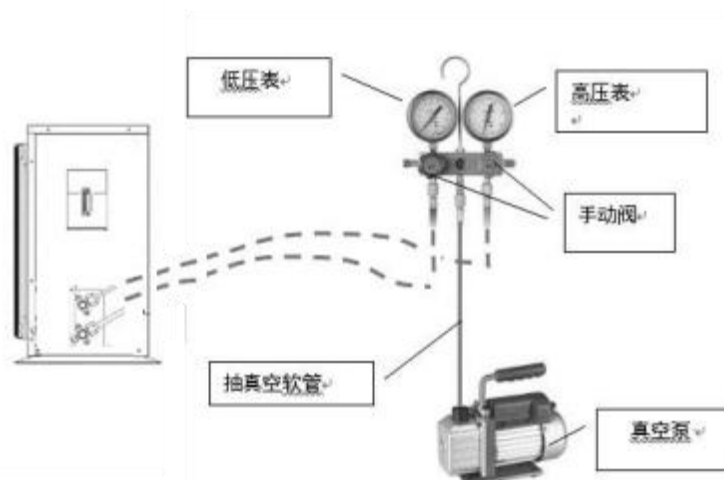


图 4-2 抽真空示意图

Figure 4-2: Vacuum Pumping Schematic Diagram

4 系统调试及维护 System Commissioning and Maintenance

B 启动真空泵，直到压力表指示为-0.1MPa，真空泵至少运行 30 分钟，关闭压力表手动阀。

Start the vacuum pump until the pressure gauge reads -0.1MPa. Run the pump for at least 30 minutes, then close the pressure gauge manual valve.

C 关闭真空泵，观察压力表指针，5 分钟后看指针是否回转。如果系统压力泄露大于-0.08MPa，即说明系统有泄露，如泄露则需检查可能漏点并重复上述操作抽真空过程。

Stop the vacuum pump and observe the gauge for 5 minutes. Leakage is confirmed if pressure rises above -0.08MPa. Check leaks and repeat vacuum pumping if needed.

D 确认无泄露后，使用内六角扳手逆时针旋转多圈至完全打开室内、外机的角阀，将室内机及室外机中的制冷剂释放至管路中。

After confirming no leakage, fully open the angle valves of indoor and outdoor units counterclockwise with a hex key to release refrigerant into the pipes.

E 快速地把软管从内机的针阀口上拆掉并将拆下的阀帽在原位置拧紧。

Quickly remove the hoses from the indoor unit needle valves and tighten the valve caps.

(2) 长连管系统增加制冷剂及冷冻油 Refrigerant and Refrigeration Oil Addition for Long Pipes

A 空调器在出厂时已经在外机中按照设计充注了定量的制冷剂。在工程安装中，如果室内外机间的连接管路超过 5m，则需添加制冷剂以使系统正常运行。制冷剂添加量根据如下公式计算：

The air conditioner is factory-charged with a specified amount of refrigerant in the outdoor unit. Add refrigerant if the pipe length exceeds 5m.

制冷剂添加量 (g) = 单位长度液管制剂添加量 (g/m) × 延长液管总长度 (m)

Refrigerant addition (g) = Refrigerant per meter of liquid pipe (g/m) × Extended liquid pipe length (m)

延长液管总长度 (m) = 液管总长度 (m) - 5m

Extended liquid pipe length (m) = Total liquid pipe length (m) - 5m

(2) 长连管系统增加制冷剂及冷冻油

Refrigerant and Refrigeration Oil Addition for Long Piping System

A 空调器在出厂时已经在外机中按照设计充注了定量的制冷剂。在工程安装中，如果室内外机间的连接管路超过 5m，则需添加制冷剂以使系统正常运行。制冷剂添加量根据如下公式计算：

The air conditioner is pre-charged with a fixed amount of refrigerant in the outdoor unit before delivery according to design requirements. During on-site installation, if the piping length between the indoor and outdoor unit exceeds 5 m, additional refrigerant is required for normal system operation.

Refrigerant addition amount calculation formula:

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制冷剂添加量 (g) = 单位长度液管制冷剂添加量 (g/m) × 延长液管总长度 (m)
 Refrigerant addition (g)=Refrigerant per meter (g/m)×Extended liquid pipe length (m)

“单位长度液管制冷剂添加量”见表 4-1 ,

The value of Refrigerant per meter is shown in Table 4-1.

而延长液管总长度 (m) = 液管总长度 (m) - 5m。

Extended liquid pipe length (m)=Total liquid pipe length (m)-5m

B 在工程安装中，如果室内外机间的连接管路超过 15m，则需添加冷冻油以使系统正常运行。冷冻油添加量
 During on-site installation, if the piping length between the indoor and outdoor unit exceeds 15 m, additional refrigeration oil is required for normal system operation.

根据如下公式计算：

Refrigeration oil addition amount calculation formula:

冷冻油添加量 (ml) = 单位长度液管冷冻油添加量 (ml/m) × 延长液管总长度 (m)

Refrigeration oil addition (ml)=Oil per meter (ml/m)×Extended liquid pipe length (m)

“单位长度液管冷冻油添加量”见表 4-1 ,

The value of **Oil per meter** is shown in Table 4-1.

而延长液管总长度 (m) = 液管总长度 (m) - 15m。

Extended liquid pipe length (m)=Total liquid pipe length (m)-15m

表 4-1 液管外径对应的单位长度液管制冷剂、冷冻油添加量

Table 4-1 Refrigerant and Refrigeration Oil Addition per Unit Length Corresponding to Liquid Pipe Outer Diameter

液管外径 (mm) Liquid Pipe Outer Diameter (mm)	单位长度制冷剂添加量 (g/m) Refrigerant Addition per Unit Length (g/m)	单位长度冷冻油添加量 (ml/m) Refrigeration Oil Addition per Unit Length (ml/m)
6.35	25	10
9.52	60	10
12.7	120	10

C 机架空调不同机型对应冷冻油牌号见表4-2

C Refrigeration Oil Grade for Different Rack Air Conditioner Models

表 4-2 不同机型对应的冷冻油牌号

Table 4-2 for the corresponding refrigeration oil grade of each rack air conditioner model.

机型 Model	压缩机型号 Compressor Model	冷冻油牌号 Refrigeration Oil Grade
3.5、5kW	凌达ATz-SM141AXBA	RB68EP
7.5kW	凌达ATz-SB238ANAA	RB68EP
12.5kW	凌达QXAS-D32zX090B	FV50S

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如因特殊原因使用除以上型号外的压缩机，请向厂家咨询冷冻油型号。

If compressors other than the above models are used due to special reasons, please consult the manufacturer for the applicable refrigeration oil type.

4-2 上电运行 Power-On Operation

- 1) 接线完毕后，给主机上电。

Power on the main unit after wiring is completed

- 2) 首先执行自检试运行，连接触摸屏查看机组各项运行参数是否正常。自检运行通过后进入正常运行状态。

Perform a self-test run first. Connect the touch screen to check parameters. Enter normal operation after passing self-test.

- 3) 空调上电运行过程中，若发生异常噪音、震动，请立即关闭电源，并通知专业人士进行检查。

If abnormal noise or vibration occurs during operation, cut off power immediately and contact a professional.

- 4) 自检过程中若发现故障，则产生告警 (机组前方点动按钮绿灯闪亮)，可在触摸屏上查看当前告警，并按报警内容进行相应排查；

If a fault is detected during self-test, an alarm is triggered (green light flashing). View the alarm on the touch screen and troubleshoot accordingly.

- 5) 自检过程中如无故障，则自检结束后按照正常模式运行 (机组前方点动按钮绿灯常亮) ；

If no fault is found, the unit runs in normal mode after self-test.

- 6) 用触摸屏临时更改过相关控制参数，拔掉触摸屏前请复原相关参数。否则将引起设备控制异常甚至直接损坏。

Restore control parameters before disconnecting the touch screen to avoid abnormal control or equipment damage.

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4-3 产品维护 Product Maintenance

4-3-1 维护准备工具 Maintenance Tools

表 4-3 维护工具

Table 4-3 Maintenance Tools

序号No.	工具Tool	图片Picture
1	万用表 Multimeter	
2	十字螺丝刀 Phillips screwdriver	
3	一字螺丝刀 Flat screwdriver	
4	2 把活口扳手 Adjustable wrench (2 pcs)	

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4-3-2 一般性检查 General Inspection

表 4-4 一般性检查

Table 4-4 General Inspection Items

序号 No.	检测项目 Inspection Item	检验方法 Inspection Method	故障解决方法 Troubleshooting Method
1	电源线牢固性 Power cable firmness	<p>1、关闭空调输入电源。 Turn off the input power of the air conditioner.</p> <p>2、用手拉动电源线，观察是否有松脱现象。 Pull the power cable manually and check for looseness or disconnection.</p> <p>3、用螺丝刀拧动电源线端子上的螺丝，观察是否有松动现象。 Turn the screws on the power cable terminals with a screwdriver and check if they are loose.</p>	<p>若发现有电源线有松脱或者松动现象，应重新用扎带绑紧电源线；用螺丝刀将松动的螺丝拧紧。</p> <p>If the power cable is loose or disconnected, re-fasten the cable with cable ties; tighten any loose terminal screws with a screwdriver.</p>
2	供电电压稳定性 Power supply voltage stability	<p>用万用表测量空调输入电压，观察电压是否在正常范围内。</p> <p>Measure the input voltage of the air conditioner with a multimeter and check whether the voltage is within the normal range.</p>	<p>若电压不在正常供电范围，请立即关闭输入电源。直到输入电源稳定后才可再次运行空调。</p> <p>If the voltage is out of the normal range, immediately cut off the input power. Do not restart the air conditioner until the power supply becomes stable.</p>
3	外机安装螺栓的牢固性 Fastness of outdoor unit mounting bolts	<p>用活口扳手拧动空调的安装螺栓，观察是否有松动现象。</p> <p>Turn the outdoor unit mounting bolts with an adjustable wrench and check for looseness.</p>	<p>若有松动现象，则拧紧螺丝，或重打铆钉</p> <p>If loose, tighten the bolts or reinstall rivets.</p>
4	内机是否松动 Indoor unit fixing condition	<p>观察内机固定的螺栓是否有松脱现象</p> <p>Check whether the fixing bolts of the indoor unit are loose or detached.</p>	<p>若有松动现象，则拧紧螺丝</p> <p>If loose, tighten the bolts.</p>
5	管路是否有泄漏	<p>用湿毛巾或海绵蘸肥皂水，将肥皂水滴在接口处，停留不得少于 30 秒，如果有气泡冒出，</p>	<p>若接头有泄漏，需拧紧接口螺母</p>

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	Pipeline Leakage	<p>说明有泄漏。</p> <p>Dip a wet towel or sponge into soapy water, apply it to the pipe joints, and hold for no less than 30 seconds. Bubbles appearing indicate leakage.</p>	<p>Tighten the joint nut if leakage occurs at the pipe connection.</p>
6	<p>系统制冷</p> <p>System Refrigeration Status</p>	<p>系统断电后重新上电，观察空调自检程序是否正常。</p> <p>Power off and restart the system, then check whether the air conditioner self-check program operates normally.</p>	<p>1、若发现自检过程中，有异常震动或声音，请立即关闭电源，并联系我司技术服务工程师。</p> <p>2、自检过程中若发生告警，请联系我司技术服务工程师。</p> <p>1. If abnormal vibration or abnormal noise occurs during self-check, cut off the power immediately and contact our technical service engineer. 2. If an alarm is activated during self-check, please contact our technical service engineer.</p>

4-3-3 维护与清洁 Maintenance and Cleaning

(1) 准备事项：Preparation:

A 为了安全起见，在清洁维护工作开始之前，请切断空调器主电源。

Cut off main power before maintenance.

B 清洁时请勿将水浇在室内机上，否则将损坏内部电器元件或引起安全事故。

Do not splash water on the indoor unit.

C 可用吸尘器或清洁的软布擦拭机壳。

Wipe the casing with a vacuum cleaner or soft cloth.

D 如果机壳较脏，可用干净的软布蘸中性洗涤剂擦拭，清洁外壳时，注意不用太用力，以免损坏网孔。

If the unit casing is dirty, wipe it with a clean soft cloth dampened with neutral detergent. Do not wipe with excessive force when cleaning the outer shell, so as to avoid damaging the mesh holes.

E 切忌用烈性的化学制品或溶剂进行清洁。

Never clean with strong chemicals or solvents.

F 如果将停止使用本设备超过 1 个月，请切断电源。

If the equipment will be out of use for more than one month, disconnect the power supply.

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(2) 室内机过滤网维护 Indoor Unit Filter Maintenance

A 置于内机后部的过滤网，应该至少每隔三个月进行一次检查或清洗。

The filter screen installed at the rear of the indoor unit shall be inspected and cleaned at least once every three months.

B 拆卸过滤网 (图4-3)

Remove the filter screen (see Figure 4-3).

C 拧松固定螺钉，移开过滤网固定板

Loosen the fixing screws and remove the filter fixing plate.

D 将过滤网取下

Take down the filter screen.

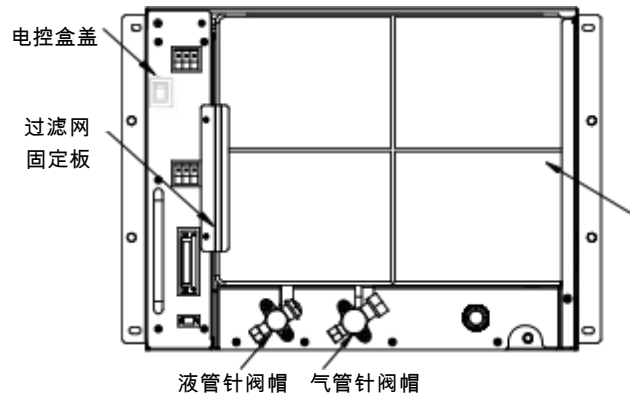


图 4-3 过滤网维护示意图

Figure 4-3: Schematic Diagram of Filter Screen Maintenance

E 清洁过滤网

Clean the filter screen.

F 可用吸尘器将污物吸去，如果过滤网较脏，可用温热的肥皂水清洗，然后用干纱布擦干。

Use a vacuum cleaner to remove dirt. If the filter screen is heavily soiled, clean it with warm soapy water, then dry it with dry gauze.

G 安装过滤网

Install the filter screen.

H 将过滤网装回内机上，用过滤网固定钣金固定。

Put the filter screen back onto the indoor unit and secure it with the filter fixing sheet metal.

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(3) 冷凝器清洗 Condenser Cleaning

A 卸掉外机盖板固定螺钉，取下外机盖板 (图4-4)

Remove the fixing screws of the outdoor unit cover, then take off the cover (see Figure 4-4).

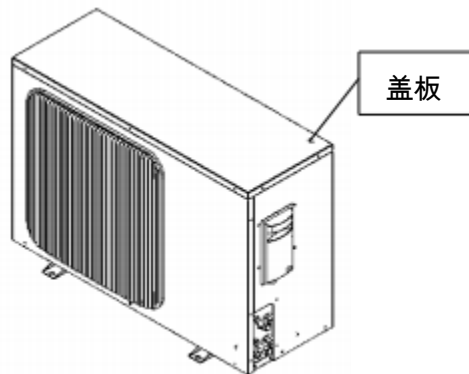


图 4-4 外机示意图

Figure 4-4 Schematic Diagram of Outdoor Unit

B 为了确保制冷系统良好的运行，请每年至少清洗一次冷凝器，可用压缩空气对冷凝器进行清洗。

To ensure good operation of the refrigeration system, clean the condenser at least once a year. The condenser can be cleaned with compressed air.

(4) 压缩机 Compressor

如果压缩机损坏，需联系我司技术服务工程师，如有必要及时更换压缩机。

If the compressor is damaged, please contact our technical service engineer and replace the compressor in a timely manner if necessary.

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4-4 故障分析与处理 Fault Analysis and Troubleshooting

表 4-5 其他故障分析与处理

Table 4-5 Other Fault Analysis and Troubleshooting

故障模式 Fault Mode	原因分析 Cause Analysis	故障排除方法 Troubleshooting Method
电源接通后，柜内温度过高，但空调不运转 Power is on, the cabinet temperature is too high, but the air conditioner does not run	停电或无电源。 Power failure or no power supply.	检查温度探头、电源、电路。 Check the temperature sensor, power supply and circuit.
	设定温度高于柜内温度。 Set temperature is higher than cabinet internal temperature.	根据需要设定送风温度（或回风温度）。 Set the supply air temperature (or return air temperature) as required.
	系统故障。 System fault.	请与专业维修人员联系，可连接触摸屏查看系统运行状态及各项参数。 Contact professional maintenance personnel; connect the touch screen to view system operating status and parameters.
设备正常运转，但制冷效果不理想 The unit runs normally but with poor cooling effect	该机型制冷能力与负荷不匹配。 Cooling capacity mismatches the actual load.	根据负荷大小重新选配或增配制冷设备。 Re-select or add cooling equipment according to the actual load.
	环境温度过高。 Ambient temperature is too high.	请确保机器工作环境温度在正常使用范围内。 Ensure the operating ambient temperature is within the normal working range.
	过滤网或冷凝器污染或堵塞。 The filter screen or condenser is contaminated or blocked	清洗过滤网或冷凝器。 Clean the filter screen and condenser.
	制冷剂不足。 Insufficient refrigerant.	充注制冷剂。 Recharge refrigerant.
	其他系统故障。 Other system faults.	请与专业维修人员联系，可连接触摸屏查看系统运行状态及各项参数。 Contact professional maintenance personnel; connect the touch screen to view system operating status and parameters.

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正常运转中。突然停止制冷，且电器系统无故障。	柜内温度已达到设定温度。 Cabinet temperature has reached the set value.	根据需要设定送风温度（或回风温度）。 Set the supply air temperature (or return air temperature) as required.
Cooling stops suddenly during normal operation, with no electrical system fault	其他系统故障。 Other system faults.	请与专业维修人员联系，可连接触摸屏查看系统运行状态及各项参数。 Contact professional maintenance personnel; connect the touch screen to view system operating status and parameters.

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4-5 售后服务和维修 After-Sales Service and Repair

(1) 保修期 Warranty Period

产品标准质保为 12 个月（从产品发货日时起）。

Standard 12-month warranty from shipment date.

(2) 质保范围 Warranty Coverage:

本产品 在保修期内，凡属于产品本身质量问题而导致故障的，本公司将为您免费维修，客户报修时需提 供产品编号。但是由以下任何原因造成的故障不属于我司的保修范围。

Free repair for product quality defects. Exclusions: improper use, incorrect installation, force majeure, etc.

A 已超过保修期的。

The product is out of warranty period.

B 不能提供产品出厂编号的。

The product factory serial number cannot be provided.

C 由于在异常条件或环境中运行，或者用非本使用说明书中指定的不恰当安装方式安装、维护或操作导致 的故障。

Faults caused by operating under abnormal conditions or environments; or caused by improper installation, maintenance or operation not specified in this user manual.

D 非本设备造成的故障，比如由用户的设备、用户的软件等造成的故障。

Faults not originated from this equipment, such as those caused by the user's own equipment, software and other external factors.

E 用户自行更换或拆装产品零部件造成损坏的，或由非授权维修服务者拆修而造成损坏的。

Damage caused by the user voluntarily replacing or disassembling product parts, or damage caused by disassembly and maintenance performed by unauthorized service personnel.

F 诸如火灾、地震、洪水等不可抗力而造成损坏的故障。

Damage and faults caused by force majeure such as fire, earthquake, flood and other natural disasters.

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4-6 免责声明 Disclaimer

我司的保修仅限于已发送的产品。我对可能由其他设备故障衍生的任何损失不负责任。以下条款属于我司免责范围。

Our warranty is only limited to the products supplied by our company. We shall not be liable for any consequential losses arising from faults of other external equipment. The following items fall within our scope of exemption from liability.

表 4-6 免责注意事项
Table 4-6 Exemption Notes

分类 Category	免责注意事项 Exemption Notes
系统温度 System Temperature	如果空调器长期运行在正常工作环境温度范围之外，而导致系统温度异常、压缩机寿命减少或损坏。 If the air conditioner operates for a long time beyond the specified ambient temperature range, resulting in abnormal system temperature, shortened compressor service life or compressor damage.
蒸发器过滤网的清洗 Evaporator Filter Cleaning	如果因为没有按期检查或清洗蒸发器过滤网，导致空调器制冷能力下降。 Reduction of air conditioning cooling capacity caused by failure to inspect or clean the evaporator filter on a regular basis.
外循环风机 External Circulation Fan	如果外循环风机长期运行在正常工作环境温度范围之外，而导致寿命减少或损坏。 Shortened service life or damage of the external circulation fan caused by long-term operation beyond the normal ambient temperature range.
内循环风机 Internal Circulation Fan	由于非空调原因导致内循环温度异常，而导致内循环风机寿命减少或损坏。 Shortened service life or damage of the internal circulation fan caused by abnormal internal circulation temperature due to non-air-conditioning factors.
管路、内部器件摩擦 Friction of Piping and Internal Components	由于搬运不规范，导致内部管路、器件变形、摩擦、碰撞，导致泄漏。 Refrigerant leakage caused by deformation, friction and collision of internal pipelines and components due to non-standard handling.

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<p>安装位置 Installation Location</p>	<p>如果没有按说明书规定，正确选择安装位置，导致性能和寿命下降。 Degradation of unit performance and service life caused by failure to select the installation location in accordance with the manual requirements.</p>
<p>安装支架 Mounting Bracket</p>	<p>如果没有按说明书规定，正确安装支架，导致承载能力下降。 Reduction of bearing capacity caused by improper installation of the mounting bracket not complying with the manual specifications.</p>
<p>冷凝水排出 Condensate Drainage</p>	<p>安装室内机时若未按规定执行，而导致室内机冷凝水无法排出。 Failure to follow specified requirements during indoor unit installation, resulting in unsmooth condensate drainage of the indoor unit.</p>
<p>内外机连接铜管 Connecting Copper Pipes between Indoor and Outdoor Unit</p>	<p>如果没有按照说明书连接铜管，导致接口处密封不严，进而导致制冷剂泄露，丧失制冷功能。 Failure to connect copper pipes in accordance with the manual causes poor sealing at joints, further leading to refrigerant leakage and loss of cooling function.</p>
	<p>如果安装时，排除内机及连接管内的空气不彻底，导致空气进入系统，而降低机组性能及运行可靠性。 Incomplete air evacuation from the indoor unit and connecting pipes during installation allows air to enter the system, reducing unit performance and operation reliability.</p>
	<p>如果连接铜管后，截止阀未完全打开，导致降低机组制冷性能。 Failure to fully open the stop valve after copper pipe connection will degrade the cooling performance of the unit.</p>
<p>压缩机电缆 Compressor Cable</p>	<p>如果压缩机电缆未按标识规定接线，导致压缩机损坏。 Improper wiring of compressor cable not in accordance with marking specifications will cause compressor damage.</p>
	<p>如果连接压缩机电缆时，未旋紧压接螺钉，而导致压缩机运行时产生错误故障，影响压缩机可靠性。 Loose crimping screws when connecting the compressor cable will cause abnormal faults during operation and affect compressor reliability.</p>
<p>外机电缆 Outdoor Unit Cable</p>	<p>如果连接外机电缆时未卡紧端子，而导致运行时误告警，影响运行功能。 Loose terminal clamping during outdoor unit cable connection will cause false alarms during operation and affect normal operating functions.</p>

附件 1 有害物质参数表 Appendix 1 Hazardous Substance Parameter List

部件名称 Part Name	有毒有害物质或元素 Hazardous Substances or Elements					
	铅	汞	镉	六价铬	多溴联苯	多溴联苯醚
	Pb	Hg	Cd	Cr6+	PBB	PBDE
机柜 Cabinet	x	o	o	o	o	o
制冷配件 Refrigeration Accessories	x	o	o	o	o	o
风机单元 Fan Unit	x	o	x	o	o	o
加热单元 Heating Unit	x	o	o	o	o	o
电控单元 Electronic Control Unit	x	o	x	o	o	o
显示屏 Display Screen	x	x	o	o	o	o
制成板 Printed Circuit Assembly	x	o	o	o	o	o
换热器 Heat Exchanger	x	o	o	o	o	o
铜管 Copper Pipe	x	o	o	o	o	o
电缆 Cable	x	o	o	o	o	o

o : 表示该有毒有害物质在该部件所有均质材料中的含量在SJ/T-11363 - 2006 规定的限量要求以下 ;
Indicates that the content of the hazardous substance in all homogeneous materials of the part is below the limit specified in SJ/T 11363-2006.

x表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363 - 2006 规定的限量要求
Indicates that the content of the hazardous substance in at least one homogeneous material of the part exceeds the limit specified in SJ/T 11363-2006.

我司一直致力于设计和制造环保的产品，我们会通过持续的研究来减少和消除产品中的有毒有害物质。以下部件或者应用中含有有毒有害物质是限于目前的技术水平无法实现可靠的替代或者没有成熟的解决方案：

Our company is always committed to designing and manufacturing environmentally friendly products. We will reduce and eliminate hazardous substances in products through continuous research. The presence of hazardous substances in the following parts or applications is due to the current technical limitations, where reliable substitution or mature alternative solutions are not yet available:

1. 以上各部件含铅的原因：部件铜合金含铅；高温焊料含铅；二极管中高温焊料含铅；电阻体玻璃釉含铅（豁免）；电子陶瓷含铅（豁免）；

Reasons for lead contained in the above parts: Lead contained in copper alloy parts; lead contained in high-temperature solder; lead contained in high-temperature solder of diodes; lead contained in resistor glass glaze (exempted); lead contained in electronic ceramics (exempted).

2. 配电部分的开关触点含有镉及其镉化合物

Switch contacts in the power distribution part contain cadmium and cadmium compounds.

关于环保使用期限的说明：本产品的环保使用期限（已标识在产品本体），是指在正常的使用条件和遵守本产品的安全注意事项的情况下，从生产日起本产品（蓄电池除外）含有的有毒有害物质或元素不会对环境、人身和财产造成严重影响的期限

Explanation of Environmentally Friendly Service Life

The environmentally friendly service life of this product (marked on the product body) refers to the period starting from the production date, under normal service conditions and compliance with product safety precautions, during which hazardous substances contained in the product (excluding storage batteries) will not cause serious impact on the environment, personal safety and property.



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