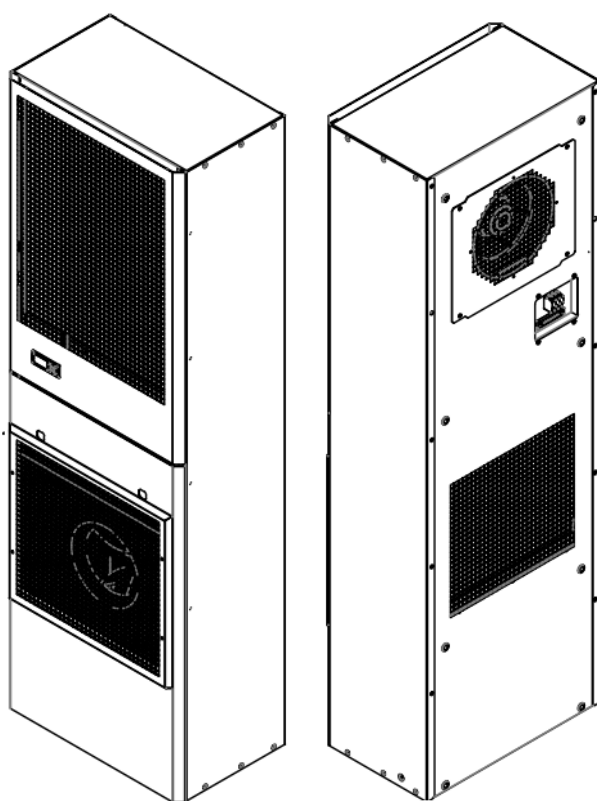


用户手册

User Manual

室内专用机柜空调器

Indoor Cabinet AC Air Conditioner



在产品安装使用前请仔细阅读本手册！

Reading this manual carefully before installation and using!

前言 Foreword

本手册介绍了 AC 系列空调的使用须知、产品接线、操作指导、日常维护等信息。

本手册主要用来指导用户进行安装，维护本系列空调产品。

针对本系列产品的任何操作必须由专业的技术人员根据本手册的要求进行。

The manual describes a series of AC air conditioners' instructions, wiring, operating instructions.

The manual is mainly used to guide users to install and maintain the series of air conditioners.

For the series of products of any operation must be made by the professional technicians according to the requirements of the manual.

变更记录 **Change History**

版本//Version	文件历史 // Change History	日期 // Date
A	创建 // Created	23.07.29

目录 contents

前言 Foreword	2
变更记录 Change History	3
声明 Declaration	5
1. 简介 Brief Introduction.	6
1.1 产品描述 PRODUCT DESCRIPTION.....	6
1.2 符合标准 CONFORM TO THE STANDARD.....	7
2. 包装与运输 Packing and Shipping	7
3. 安装 Installation.	9
3.1 安装前准备 BEFORE INSTALLATION.....	9
3.2 安装示意 SCHEMATIC OF INSTALLATION	9
3.3 空调器安装 AIR CONDITIONER INSTALLATION	10
3.4 电气布线 ELECTRICAL WIRING.....	11
4. 运行逻辑 Operation Logic	12
4.1 开机运行 RUNNING	12
4.2 控制逻辑 CONTROL LOGIC.....	13
4.3 手操器使用说明 INSTRUCTIONS OF DISPLAY PANEL	14
4.4 告警与故障 ALARM AND FAULT	16
4.5 其他故障分析与处理 OTHER FAULT ANALYSIS AND PROCESSING.....	18
5. 产品维护 Maintenance.	20
6. 产品质保 Warranty	21
7. 回收处理 Reclaim.	22

声明 **Declaration**

RoHS Compliance Declaration of Cabinet AC air conditioner

European Guidelines 2015/863 (RoHS)

Legal regulation for Substances

Dear Sir/Madam,

Referring to the European guideline of **2015/863**, we confirmed that according to the current status of our knowledge and in accordance with the regulations, we could produce products complying with above mentioned guidelines especially for below type:

1. 简介 Brief Introduction

1.1 产品描述 Product description

该系列产品是针对通讯或相关工业设备应用场合而设计的高性能交流型空调器，适用于机柜内部设备发热量大、温度敏感，且内外完全隔离的应用场合。

电网适用范围：交流 220VAC $\pm$ 15% 50Hz/60Hz

其他电源制式请参考铭牌。

注意：在运输、储存以及使用过程中，必须严格按照包装上的指示保持空调竖直向上放置。

This series of products are designed for communication or related industrial equipment applications of high-performance ac type air conditioning unit, cabinet internal devices suitable for heat, temperature sensitive, and inside and outside completely isolated applications.

Grid application scope: AC 220VAC $\pm$ 15% 50Hz/60Hz

Other power supply system, please refer to the nameplate.

Warning: In the process of transportation, storage and use must be in strict accordance with the instructions on the package to keep air conditioning placed vertically upward.

1.2 符合标准 Conform to the standard

Standard	Description
GB/T 17626.7-1998	Electromagnetic compatibility(EMC)
GB4706.1	Safety household and similar electrical appliance
GB4798.1	Environmental conditions existing in the application of electric and electronic products - storage
GB4798.2	Environmental conditions existing in the application of electric and electronic products - transport
GB4798.3	Environmental conditions existing in the application of electric and electronic products - use
CE	The third party certification

2. 包装与运输 Packing and Shipping

- 空调采用纸箱包装，附件等资料也放置于包装箱内。

Air conditioner packed in paper cases, the package includes Annex.

- 空调在运输时请注意以下事项：

The air conditioner during the transportation, please pay attention to the following matters:

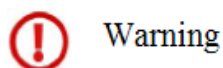
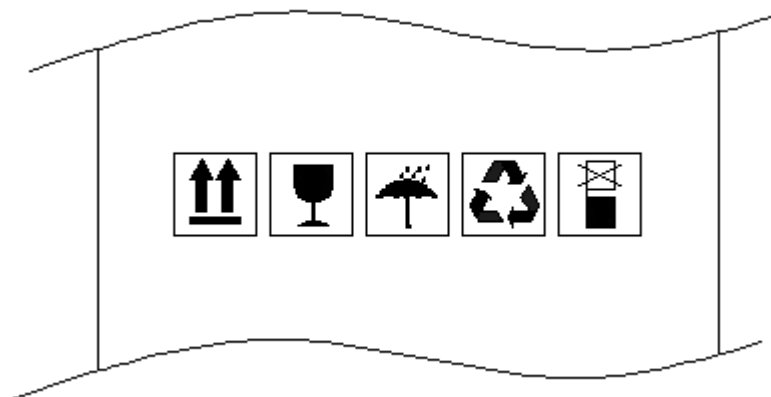


图 2-1 包装箱标识

Figure2-1 Packing mark



- 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。
During Handling or transport, Air conditioner must be upward placed as.  No inverted, flat, excessive tilt and collision.
- 空调为精密仪器，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。
Air conditioner is precision instrument, in handling or transport process, should be handled with care, package boxes do not step, prohibit standing or placing other heavy objects.
- 搬运或运输过程中，注意防潮、防水、防雨。
During Handling or transporting, pay attention to moisture, water, rain.

3. 安装 Installation

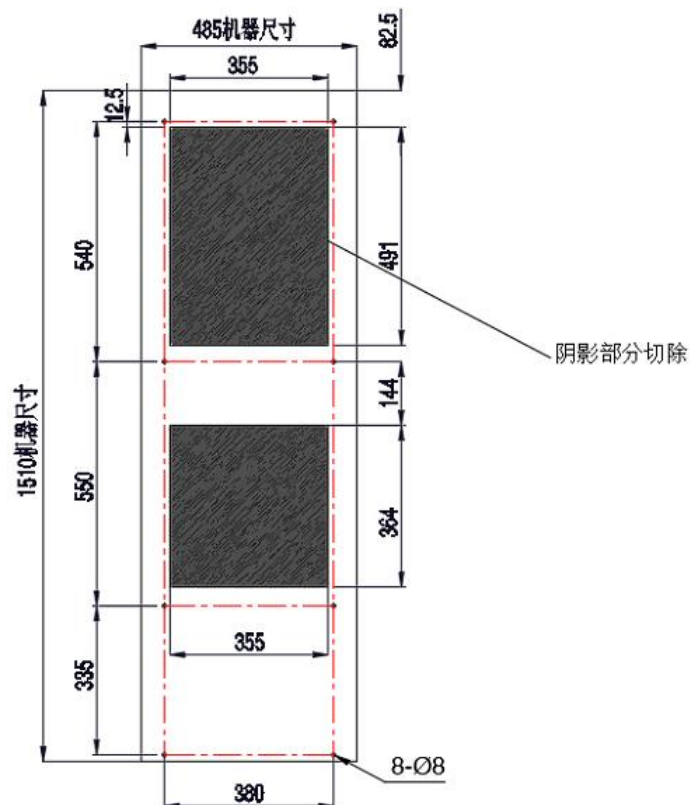
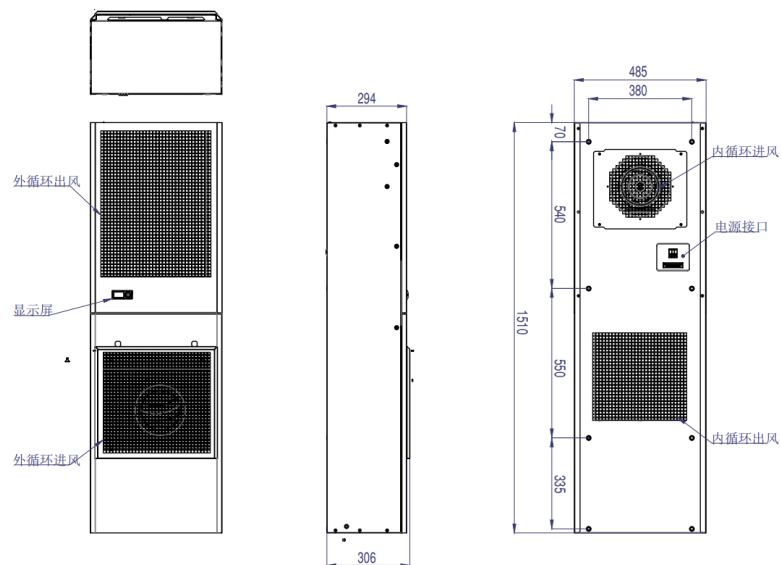
3.1 安装前准备 Before Installation

安装前至少需准备以下工具：十字螺丝刀、一字螺丝刀、密封条、老虎钳。

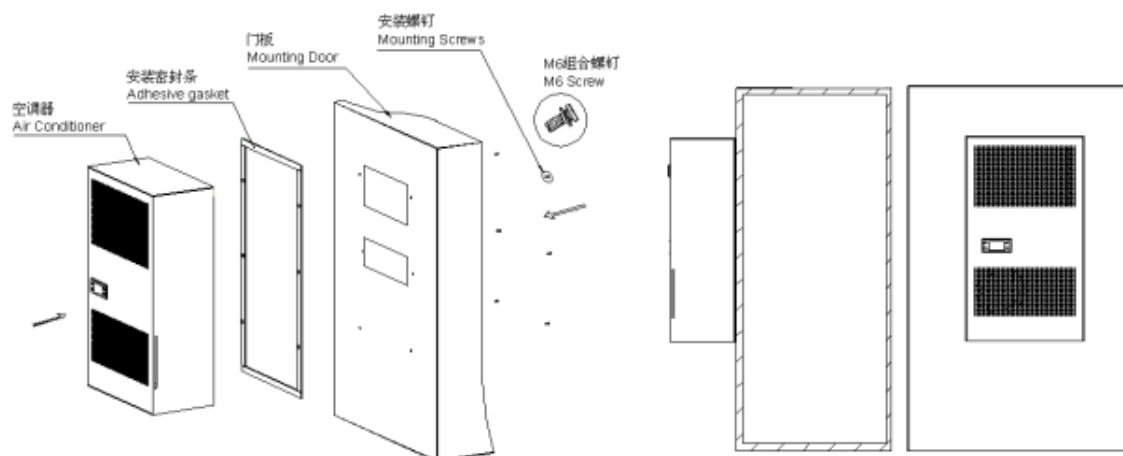
You have to prepare the following tools before installation: cross screwdriver, slot type screwdriver, sealing strip, vice.

3.2 安装示意 Schematic of Installation

安装门板开孔及外形图如下：



Air Conditioner-Series' schematic of installation as follow:



3.3 空调器安装 Air Conditioner Installation

➤ 安装步骤:

1. 在安装面上画出柜门开孔示意图，将阴影部分切割掉。不同型号空调的柜门开孔示意图请参考相应规格书；
2. 根据安装示意图中示意的方向，将空调安装在机柜上；
3. 如果需要安装水管，请将水管安装在底部接水管处。

➤ Installation steps:

1. Draw on the cabinet mounting cut-out map according to Figure, cut off the shadow part. Different models of air conditioner cabinet mounting cut-out maps refer to its specification.
2. According to the direction of the schematic of installation, installed the air conditioner on the cabinet.
3. Please to install drain pipe on drain hole if you need.

➤ 安装完成后的确认检验项:

1. 请勿在高油污、易燃气体、高腐蚀性及环境温度超过 55℃、湿度超过 95%的环境下使用该产品；
2. 确保产品安装后倾斜度不大于 3°；
3. 确保控制柜密封良好以免漏入空气产生不必要的冷量损失和产生过多的冷凝水；
4. 产品安装结束后，确保产品直立 30 分钟后再加电运行。

➤ Double check lists after Installation:

- 1. Don't apply this unit in high oil, burning gas, explosive gas, strong corrosively condition, the ambient air must be under 55℃, and the humidity not higher than 95%;
- 2. Make sure that the lean of the product no more than 3°;
- 3. Make sure that the cabinet should be sealed well to avoid the cooling losing and avoid ambient moisture penetrate into cabinet, this will avoid produce more condensate water;
- 4. Ensure that the product is up and running in upright 30 minutes.

3.4 电气布线 Electrical Wiring

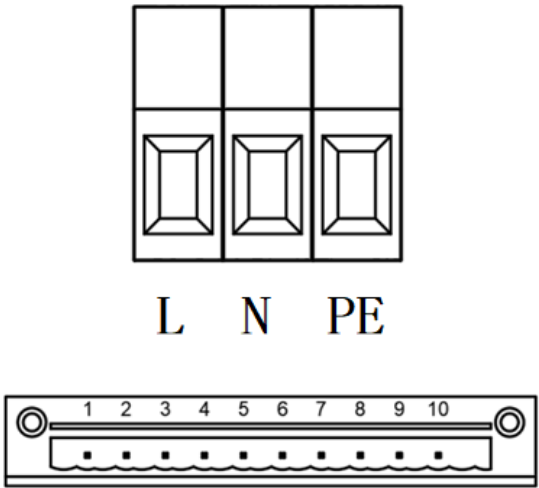
空调器在使用前需根据本手册的说明进行电气连接，建议客户优先使用附件中的线缆。客户可以自备线缆，如果客户不能确定所选电缆规格是否合适，可联系售后服务部门。

Does Electrical Wiring according to the manual before use the air conditioner; we suggested preferring to use cables in the attachments. You should call the After-sale Service Department, if you cannot sure the cable specification be made by your-self.

图 3-1 电源端子示意图

Figure 3-1 Schematic of power terminal

电气接线示意图



序号	描述
L	电源火线
N	电源零线
PE	电源地线
1	NA
2	
3	
4	通讯正极（TR+）
5	通讯负极（TR-）
6	干接点告警常开端口NO
7	干接点告警公共端口COM
8	干接点告警常闭端口NC
9	外部控制输入端口
10	

表 3-1 接线端子说明 Table 3-1 Terminal instructions

序号 / Number	符号 / Symble	定义 / Definition	描述 / Description
L	L	交流电源火线 Live line of AC power	/
N	N	交流电源零线 Neutral line of AC power	/
PE	PE	交流电源地线 Ground wire of AC power	/

1/2/3	NA/	/	/
4	TR/+	RS485通讯正极 Positive pole of 485 communication	
5	TR/-	RS485通讯负极 Negative pole of 485 communication	
6	NO	干接点告警常开端口 Normal open port of dry contract alarm output	干接点告警： 6、7端口：干接点告警常开状态； 7、8端口：干接点告警常闭状态。 Dry contact alarm: Pin 6&7: Normal open Pin 7&8 :Normal closed
7	COM	干接点告警公共端口 Common port of dry contract alarm output	
8	NC	干接点告警常闭端口 Normal closed port of dry contract alarm output	
9/10	I/O	排氢或外部控制输入端口 Hydrogen discharging port or external signal input port	排氢接口或外部控制输入， 两个功能只能选其一： 做为排氢接口：接排氢风机（交流或直流风机） 排氢风机的电流应小于1A； 做为外部控制输入接口：接受外部控制信号来控制空调。

4. 运行逻辑 Operation Logic

4.1 开机运行 Running

接线完成并确认接线正确后，此时可接通交流电源使空调首次上电运行。

空调上电后，首先执行自检程序，依次对内风机、温度传感器、外风机、压缩机进行检验。

自检过程中若发现故障则显示相应故障告警并进入告警状态。

Completed and confirmed the wiring correct, then you can connect to the AC power to air conditioner for the first time to run on electricity.

After power on air conditioner, first of all it will be self-checking: internal fan, temperature sensor, heater, external fan, and compressor.



Warning

空调上电运行过程中，若发生异常噪音、震动，请立即切断电源，并通知专业人士进行检查。

When the air conditioner is running, if there is abnormal noise, vibration, please cut off power immediately and notify the professionals to inspect.

4.2 控制逻辑 Control Logic

运行模式：待机模式、制冷模式、告警模式。

Operational mode: standby, cooling, heating, and alarming.

➤ 待机模式

若回风温度 < 压缩机启动设置温度（默认 38℃），则空调处于待机模式，此时只运行内风机，显示器显示当前回风温度。

➤ Standby mode

If the return air temperature is lower than the default set point of Compressor start temperature (35℃), the air conditioner is in a standby mode. At this time, the internal fan is running only, the monitor displays the current return air temperature.

➤ 制冷模式

若回风温度 ≥ 压缩机启动设置温度（默认 38℃），则空调进入制冷模式。外风机运行 60 秒后，压缩机启动。压缩机一旦启动，最小运行时间不小于设定值（默认为 5 分钟）。

若回风温度 ≤ 压缩机启动设置温度（默认 38℃）— 压缩机运行回差值（默认 5℃），且压缩机持续运行时间 ≥ 最小运行时间（默认 5 分钟），则系统停止制冷。此时压缩机先关闭，外风机滞后一段时间再关闭

➤ Cooling mode

If the return air temperature is greater than or equal to the default set point of compressor start temperature (38℃), the air conditioner enters the cooling mode. The compressor is running after external fan 60 seconds, If the compressor is running, the minimum running time is less than the set time (default time is 5 minutes).

If the return air temperature is less than or equal to the default set point of compressor start temperature (38℃) subtracts compressor stop hysteresis temperature (5℃), and the compressor running time is more than or equal to the minimum set time (the default time is 5 minutes), then the compressor stopped.. The external fan stopped after a while.

4.3 手操器使用说明 Instructions of Display Panel



操作及参数说明

4.3.1 如何设定参数

①采用中文文本方式显示。

②初次上电后，手操器先显示手操器的硬件版本、手操器的软件版本；

③主界面上的文本信息采用四行显示：第一行显示柜内温度（显示精度 0.1℃）、第二行显示柜内湿度（如果不配置湿度传感器，则显示“-.-%”）、第三行显示故障信息（如有多项故障告警，则各告警交替显示，间隔时间 1S）、第四行显示运行状态（空调制冷、加热、系统有故障（休眠时无显示）、换热、除湿）。

如果故障不会导致制冷或加热、或换热、或除湿关闭，则仍显示“空调制冷”或“加热”、或“换热”、或“除湿”；如果故障会导致制冷或加热关闭，则显示“系统有故障”。

④在主界面按下“

① Display with Chinese text.

② After the initial energization, the Manual Operator first display, and then the hardware

version of μ ADC, software version of μ ADC, hardware version of Manual Operator and software version of Manual Operator;

③ The text information on the main interface displays in four lines: the first line displays the temperature inside the cabinet (0.1℃ for display accuracy), the second line displays the humidity inside the cabinet (if humidity sensor is not equipped, it displays “-.-%”), the third line displays fault information (in case of multiple fault warnings, then all warnings display alternately with interval of 1S), and the fourth line displays operating status (refrigeration with air conditioner, heating, system failures (no display during sleeping), heat exchange and dehumidification).

If the fault does not result in the stop of refrigeration or heating, or heating or dehumidification, then it still displays “refrigeration with air conditioner” or “heating”, or “heat exchange” or “dehumidification”; if the fault may cause the stop of refrigeration or heating, then it displays “system failure”.

序号	参数名称	参数范围	默认值	Modbus 地址	属性
1	蒸发器表面温度	-40.0~110.0℃	——	40010	只读
2	柜内温度	-40.0~110.0℃	——	40002	只读
3	软件版本 (硬件为 uADC)	——	2.00 /3.00	40209	只读
4	压缩机	0: 关、1: 开	——	00016	只读
5	内风机 (AC/DC)	0: 关、1: 开	——	00003	只读
6	故障告警输出 (干节点有输出)	0: 关、1: 开	——	00012	只读
7	外风机 (AC/DC)	0: 关、1: 开	——	00004	只读
8	开关量输入 ID1 (门禁开关)	0: 无、1: 有 (随“门禁输入”自动变化)	——	00054	只读
9	高压开关 (制冷系统高压)	0: 无、1: 有	——	00056	只读
10	系统有故障 (产生任一告警)	0: 无、1: 有	——	00041	只读

4.3.3 进入用户级操作状态:

在主界面按下“” (菜单键) 显示“无密码级参数 “、” 用户级参数 “、” 厂家级参数 “ 的文字, 按“” (上键) 或“” (下键) 在显示” 用户级参数 “ 文字时按“” (确认键) 显示“0”, 此时按“” (上键) 或“” (下键) 更改数值, 当输入数值等于用户级密码时 (123 为用户密码), 按下“” (确认键) 即进入用户级级参数设置界面。用户级参数见参数列表; 重复按“” (返回键) 可返回主界面; 更改参数的方法同输入密码;

Press “” (menu key) on the main interface to display words of “no password-level parameter”, “user-level parameter” and “factory-level parameter”, press “” (Up key”) or “” (Down key) and press “” (Enter key) during display words of “user-level parameter” to display “0”, press “” (Up key”) or “” (Down key) at the moment to change value. When the entered value is equal to user-level password (123 is user password), press “” (Enter key) to enter into user-level parameter setting interface. See parameter list for user-level parameters; and press “” (Backspace key) repeatedly to return to the main interface; the method of changing parameters is the same as that of entering password;

相关参数及说明如下：

序号	参数名称	参数范围	默认值	Modbus 地址	属性
1	制冷开启点	20~60℃	38℃	40005	读写
2	制冷回差	3~10℃	5℃	40006	读写
5	高温告警设定值	35~60℃	55℃	40010	读写
6	高温告警回差	3~10℃	5℃	40009	读写
7	低温告警设定值	-15~+10℃	-1℃	40011	读写
8	低温告警回差	3~10℃	5℃	40087	读写
9	串行通讯地址	1~255	1	40266	读写

4.4 报警代码及相关说明

序号	名称	故障告警干节点是否上传	Modbus 地址	属性
1	柜内高温告警	是	00009	只读
2	柜内温度探头故障	否	00005	只读
3	压力开关动作	否	00014	只读
4	柜内低温告警	否	00010	只读
5	蒸发器探头故障	否	40350	只读
6	蒸发器冻结	否	00015	只读
7	门开告警	否	00008	只读

4.4 告警与故障 Alarm and Fault

显示器正常时显示回风温度值，告警时交替显示回风温度和告警代码，告警代码定义如下表：

The monitor displays return air temperature at normal, If the alarms, temperature and alarm codes are displayed alternately, the alarm code as follows:

表 4-3 故障代码

Table 4-3 Alarm Code

故障名称 Code Name	故障机制 Principle	故障处理方法 Process Method
-------------------	-------------------	--------------------------

回风温度传感器故障 Return air temperature sensor fault	回风温度传感器短路或断路 Return air temperature sensor is short circuit or open circuit	1、用万用表检查回风温度传感器是否有断路或者短路现象。 Use the multimeter to check whether the return air temperature sensor is short circuit or open circuit. 2、回风温度传感器脱落。 Check whether the return air temperature sensor is loosening.
蒸发温度传感器告警 Evaporator temperature sensor alarm	蒸发温度传感器短路或断路 Evaporator temperature sensor is short circuit or open circuit	检查蒸发温度传感器是否有断路或者短路现象。 Check whether the evaporator temperature sensor is short circuit or open circuit.
冷凝温度传感器告警 Condenser temperature sensor alarm	冷凝温度传感器短路或断路 Condenser temperature sensor is short circuit or open circuit	检查冷凝温度传感器是否有断路或者短路现象。 Check whether the condenser temperature sensor is short circuit or open circuit.
内风机告警 Internal fan alarm	1、内风机不能正常工作 The internal fan is not working properly. 2、蒸发器盘管温度一直连续15 分钟低于 0 度 The evaporator temperature has been below zero in 15 minutes.	1、检查内风机线和内风机的连接是否脱落或松动。 Check Whether the internal fan line is loosening. 2、检查系统是否泄漏。 Check whether the system leakage.

外风机告警 External fan alarm	1、外风机不能正常工作 The external fan is not working properly 2、冷凝器盘管温度一直连续 15 分钟高于 77 度 The condenser temperature has been above 77 degrees in 15 minutes.	1、检查外风机线和外风机的连接是否脱落或松动。 Check Whether the external fan line is loosening. 2、检查系统是否泄漏。 Check whether the system leakage.
低温告警 Low temperature alarm	机柜内温度低于设定值 The cabinet temperature is higher than the set point	加热器开启，直到告警消除。 The heater is running until the alarm elimination.
高温告警 High temperature alarm	机柜内温度高于设定值 The cabinet temperature is higher than the set point.	打开机柜门散热，直到告警消除。 Open the cabinet door until the alarm stop.

4.5 其他故障分析与处理 Other fault analysis and processing

故障状态 Fault state	原因分析 Analysis of the reasons	故障排除方法 Solutions
---------------------	---------------------------------	---------------------

电源接通后，柜内温度过高，但空调不运转。 Power on the switch, the cabinet temperature is too high but the air conditioner is not working.	1、停电或无电源。 Power failure or no power. 2、设定温度高于柜内温度。 The cooling set temperature is higher than the cabinet temperature. 3、系统故障。 System fault.	1、检查电源、电路。 Check the power supply and the electric circuit. 2、根据需要设定压缩机启动温度。 Setting cooling temperature according to the needs. 3、请与专业维修人员联系。 Please contact professional maintenance.
设备正常运转，但制冷效果不理想 The air conditioner is running but the cooling effect is not good.	1、该机型制冷能力与负荷不匹配。 The cooling capacity of the air conditioner is not match with the load. 2、环境温度过高。 The ambience temperature is too high. 3、其他系统故障。 Other system fault.	1、根据负荷大小重新选配或增配制冷设备。 To add or choose another air conditioner according to the load. 2、请确保机器工作环境温度在正常使用范围内。 Ensure the machine is used in the correct range. 3、请与专业维修人员联系。 Please contact professional maintenance.
正常运转中。突然停止制冷，且电器系统无故障。 The machine is stopping suddenly, and the electric system is normal.	1、柜内温度已达到设定温度。 The cabinet temperature greater than or equal to the cooling set temperature. 2、其他系统故障。 Other system fault.	1、根据需要设定压缩机启动温度。 Setting cooling temperature according to the needs. 2、请与专业维修人员联系。 Please contact professional maintenance.

5. 产品维护 Maintenance

➤ 准备工具 Prepare tools

表 5-1 维护工具 (Table 5 -1 Malignance Tools)

序号//No.	工具 Tools
1	万用表//Multimeter
2	十字螺丝刀//Phillips screwdriver
3	一字螺丝刀//Slotted screwdriver

➤ 日常维护 Routine maintenance

表 5-2 日常维护 (Table 5 -2 Routine maintenance)

序号 No.	检测项目 Check items	检验方法 Check methods	故障解决方法 Solution
1	电源线牢固性 Power line firm	1、关闭空调输入电源。 Turn off the supply power 2、用手拉动电源线，观察是否有松脱现象。 Pulled the power line, watch whether the line is loosening 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。Screw the screws on the power cord terminals with a screwdriver, watch whether the screw is loosening	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。If there is a power line to loose or loosening, You should be used to tie tight power line; use a screwdriver to loose screw.
2	电压稳定性 Voltage Stability	用万用表测量空调输入电压，观察用电压是否在正常范围内 Use the multimeter to measure air conditioner input voltage to watch whether the voltage is within normal range.	若电压不在正常供电范围，请立刻关闭输入电源。直到输入电源稳定后才可再次运行空调。If the voltage is not within the normal range, Please turn off the power supply immediately. Power on the air conditioner until the supply voltage within normal range.
3	安装螺丝牢固性 Screw firmly	用螺丝刀拧动空调的安装螺丝，观察是否有松动现象。Use screwdriver to screw the screws and watch whether the screw is loosening	若有松动现象，则拧紧螺丝 If the screw is loosening, please tighten it.

序号 No.	检测项目 Check items	检验方法 Check methods	故障解决方法 Solution

6. 产品质保 Warranty

➤ 保修期 Warranty Period

产品质保期以公司的协议为准。

The product guarantee period depends on agreement with the company.

➤ 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标号。但是由以下任何原因造成的故障不属于我司的保修范围。

- 1) 已超过保修期的；
- 2) 不能提供产品出厂编号的（见机身贴示的铭牌）；
- 3) 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；
- 4) 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；
- 5) 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；
- 6) 诸如火灾、地震、洪水等不可抗力而造成损坏的故障。

During the warranty period, all belong to the product itself quality problems caused by fault, the company will be free for you to repair; Household repair is required to provide the product label. But by any of the following causes the failure does not belong to our warranty.

- 1) Out of the Warranty period
- 2) Cannot provide the product label(the product label is on the nameplate);
- 3) Because of the abnormal condition or environment ,or the instructions specified in the inappropriate installation, maintenance or operation causes the fault;
- 4) Not caused by equipment failure, caused by user's other equipment or software.
- 5) User changed or disassembles by their-selves, or maintained by the person without authorization.
- 6) Caused by force majored such as fires, earthquakes, floods and other damage to the fault.

➤ 免责声明 Disclaim

我司的保修仅限于已发送的产品。我司对可能由设备故障衍生的任何损失不负责任。

The warranty is for the delivered products.

Irresponsible is for any loss that may be caused by equipment failure.

7. 回收处理 Reclaim



到本产品使用期限或不再使用该产品时，请勿将本产品直接作为垃圾处理，请交给当地政府认可的废物收集中心进行处理。

At the end of the unit working life, the produce must not be disposed of as urban waste; it must be taken to a special local authority differentiated waste collection centre or to a dealer providing this service.