

Assembly Instructions

空调器说明书

Air conditioner

产品名称: **1500W 空调器**

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CONTENTS:

目录:

1.Application

应用

2.Technical data

技术数据

3.Assembly

装配

4. Electrical connection

电气连接

5.Commencing operation and control behavior

设备启动及操作

6.Technical information

技术信息

7.Maintenance

维护

8.Scope of supply and guarantee

设备的供应范围和保证

9.Spare parts

备件

1.Application

应用

This series of product can be widely used in enclosed area for climate control, such as wireless communication cabinet, industry control cabinet etc;

本产品广泛应用于户外通讯机柜、电力户外柜等需要散热的场合;

- 实现遥测、遥信、遥调，可实现多重自动保护和全面的故障自诊断功能;
- Remote measuring, remote communication, remote control, which can realize multiple automatic protection and comprehensive self-testing function;
- 精湛工艺及高质量知名配件确保产品更加稳定可靠;
- Strict process control and famous components to ensure high quality and reliability of this product;
- 适合T3高温工况、R134a环保制冷剂;
- Fit for harsh condition (T3), R134a refrigerant ;
- 多重保护功能、可视化人机界面、RS485接口(MODBUS-RTU);
- Multiple self-protection design & visible monitoring interface, RS485 communication port (MODBUS-RTU protocol);
- LED数码管显示，现场参数可设置;
- LED display, all the settings can changed at the field;
- 具备加热功能;
- The heating function can be used;
- 干接点告警输出，常开/常闭可选;
- Dry contact alarm output,NO/NC optional;
- 安全防盗，无需增加防护罩。
- Anti-theft design, without the protection cover.

如果您没有按照威图的指导方法来安装空调器到机柜上，请和我们联系后再进行这样的安装。

2. Technical data

技术数据

| | | |
|---|-----|--------------------------|
| Model No.: 威图公司产品代码: | | 1194327 |
| | | |
| Rated voltage 额定电压 | (V) | 230V |
| Starting / rated current 起动/额定电流 | | 18A / 2.95A |
| Pre fuse 前置保险丝 | | 10A |
| Dimensions 外形尺寸 W 宽 H 高 D 深 | mm | 490 790 175 |
| Wall mounted 安装方式: 侧装 | | |
| min. dimension of CS modular enclosure B x H W x D 所适应安装的最小机柜尺寸 | mm | |
| Material / Colour 材料和颜色 | | SGCC+RAL7035 |
| Specific thermal output 空调器的输出功率 | | 1500W |
| Temperature range 温度范围 | | -15℃ to +55℃ |
| Weight 重量 | | 40Kg |
| Temperature control 温度控制模式 | | Microcontroller 微处理器 |
| Protection category (external to internal circuit) 保护类别 (外循环到内循环) | | IP 55 |
| Type of connection 连接类型 | | via plug panel 通过插头面板 |
| Heater 加热器 | | 可选 800W |

Special voltages available on request / Technical modifications reserved

威图公司可以根据需要提供用户指定的电压的设备/威图公司保留对该设备进行技术改进的权利。

3.Assembly

装配

3.1 Safety advice

安全建议

In order to prevent the enclosure from tipping due to the mounted air conditioner attach the enclosure to the floor with bolts.

安装空调器时，请固定机柜（使用地脚螺栓），避免安装时机柜发生倾覆。

3.2 Assembly instructions

安装指导

Prior to mounting, ensure that

安装前请确认。

the site of the enclosure and hence the arrangement of the air conditioner, is selected in such a way as to ensure good ventilation

机柜的安装场所以及空调器的位置，应选择在良好的通风地方。

the location is free from excessive dirt and moisture

安装场所的粉尘和湿度不要过大。

the cut-out for air extraction is located in the upper area of the enclosure

空调器的热风出口应位于机柜上部

the mains connection ratings, as stated on the name plate of the unit, are available

空调器的接口连接，应在设备面板上标注。

the ambient temperature does not exceed + 65°C

环境温度不得大于 65°C

the packaging shows no signs of damage. Any damage to the packaging may be the cause of subsequent malfunctions

空调器的包装应无损伤，任何包装的损坏将可能导致以后使用中产生故障。

the enclosure is sealed on all sides. Condensation will occur if the enclosure is leaky

机柜各面必须密封，如果有漏缝，将会使得冷凝水在机柜内部产生。

the distance of the units from the wall should not be less than 200 mm

空调器和安装地点的墙壁距离应大于 200 毫米

air inlet and outlet are not obstructed on the inside of the enclosure

空调器在机柜内部的进风和出风位置不允许有堵塞。

units should only be fitted vertically in the specified position. Max. deviation from true vertical: 2°

空调器应垂直安装在指定位置，且安装垂直度应不大于：2°

Electrical connection and repairs must only be carried out by authorised, qualified staff; use only original spare parts!

电气的连接和维修必须有授权的专业人员来操作，并使用原装配件。

To achieve a permanent seal between the air conditioner and the enclosure, the mounting surface may have to be strengthened or supported

空调器的安装表面必须有足够的强度和支撑，以保证机柜和空调器之间得到持久的可靠的密封。

The discharge of possible splashing water has to be ensured

必须确保喷溅进入空调器的水能顺利排出设备和机柜。

Fig.3.2 Side mounting dimension
侧装空调器的外形尺寸图

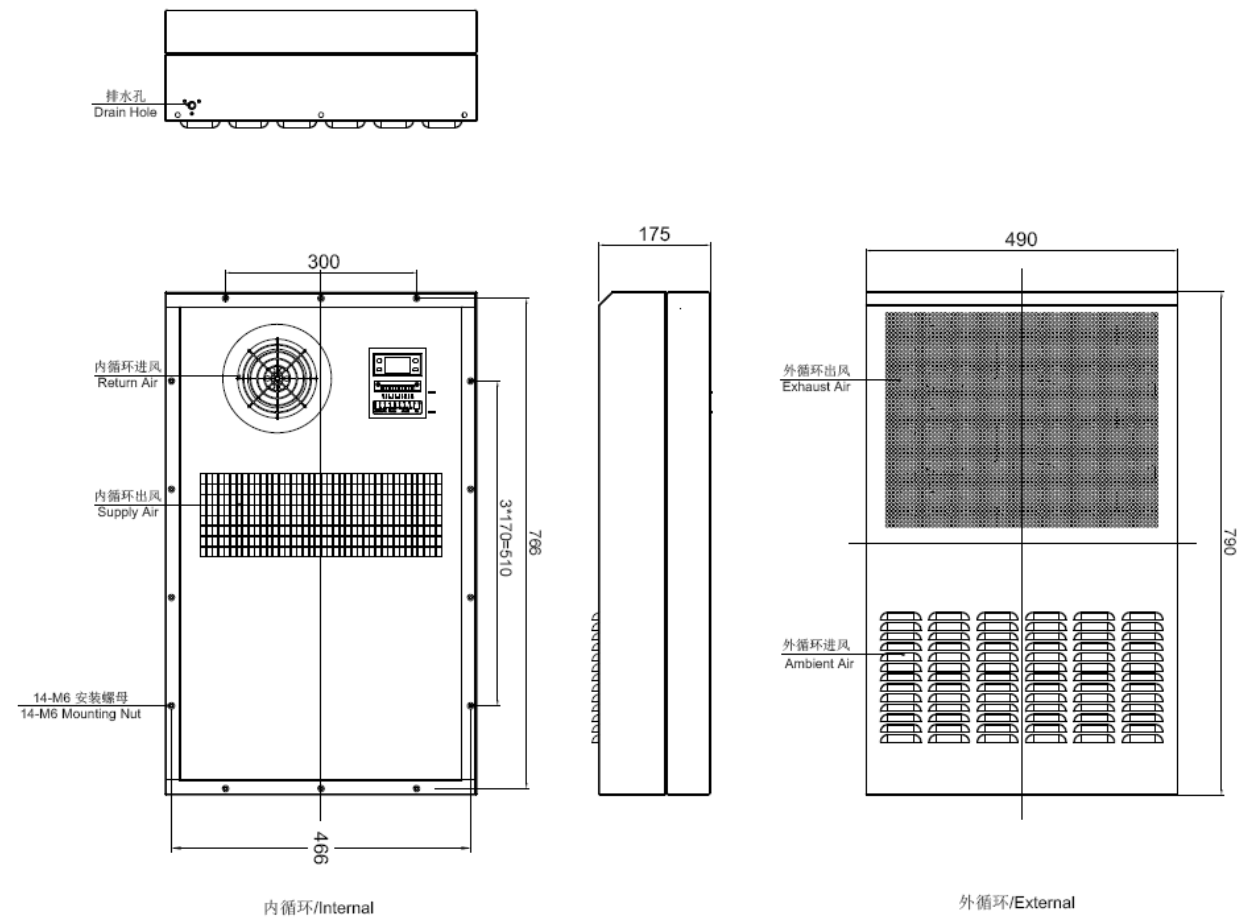
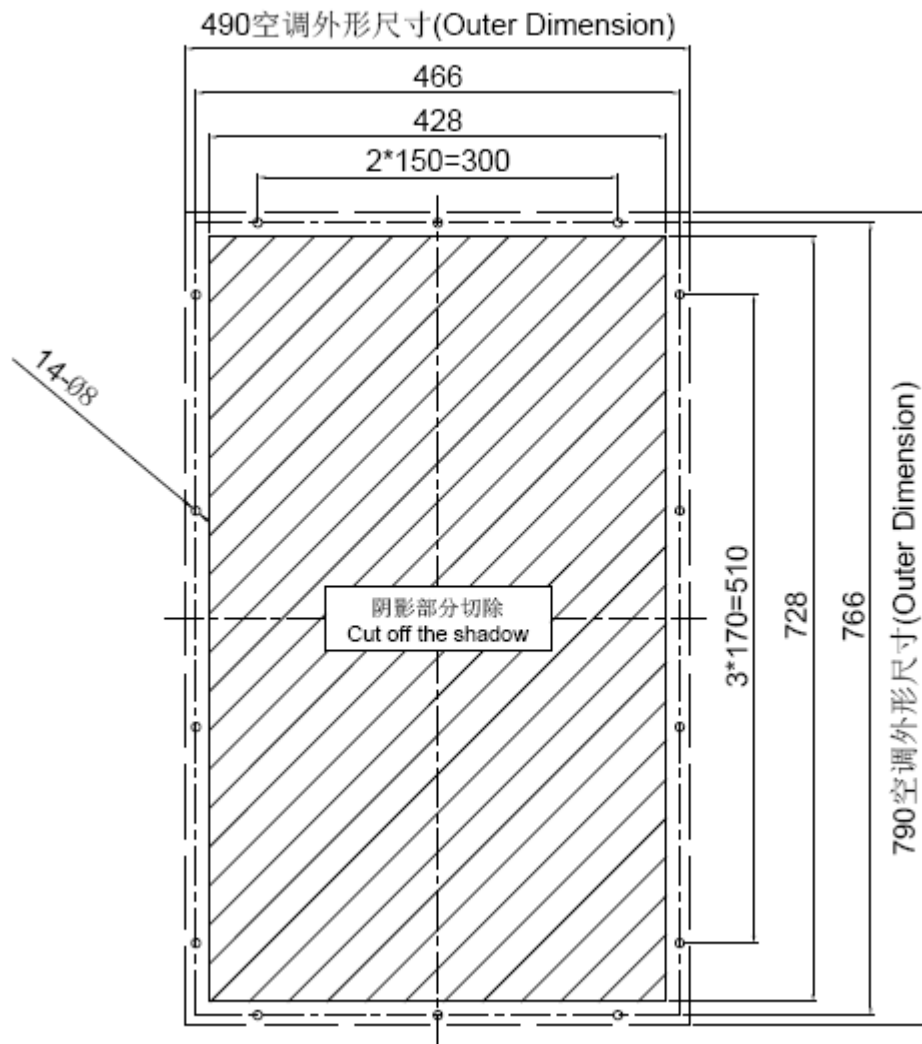


Fig.3.3 Mounting cutout
空调器的机柜开孔图



4.Electrical connection

电气连接

输入电压必须和设备铭牌上的数据相一致。

The air conditioner does not have its own disconnecting device. For this reason, it must be connected to the mains via a disconnecting device which ensures a contact opening of at least 3 mm in the deactivated state, such as a motor circuit- breaker

空调器没有自带的断路器，因此在连接设备和主电源之间，需要加装一个断路器（确保断开状态下的触电开距大于3mm）

The PE conductor must be connected

PE接地必须可靠

The air conditioner The connection voltage must match the nominal values specified on the rating plate
must not have any additional temperature control connected upstream at the supply end

在空调器的电源端禁止安装任何的温度控制器

The unit does not have a built-in electrical fuse, therefore the pre-fuse specified on the rating plate must be provided as line protection

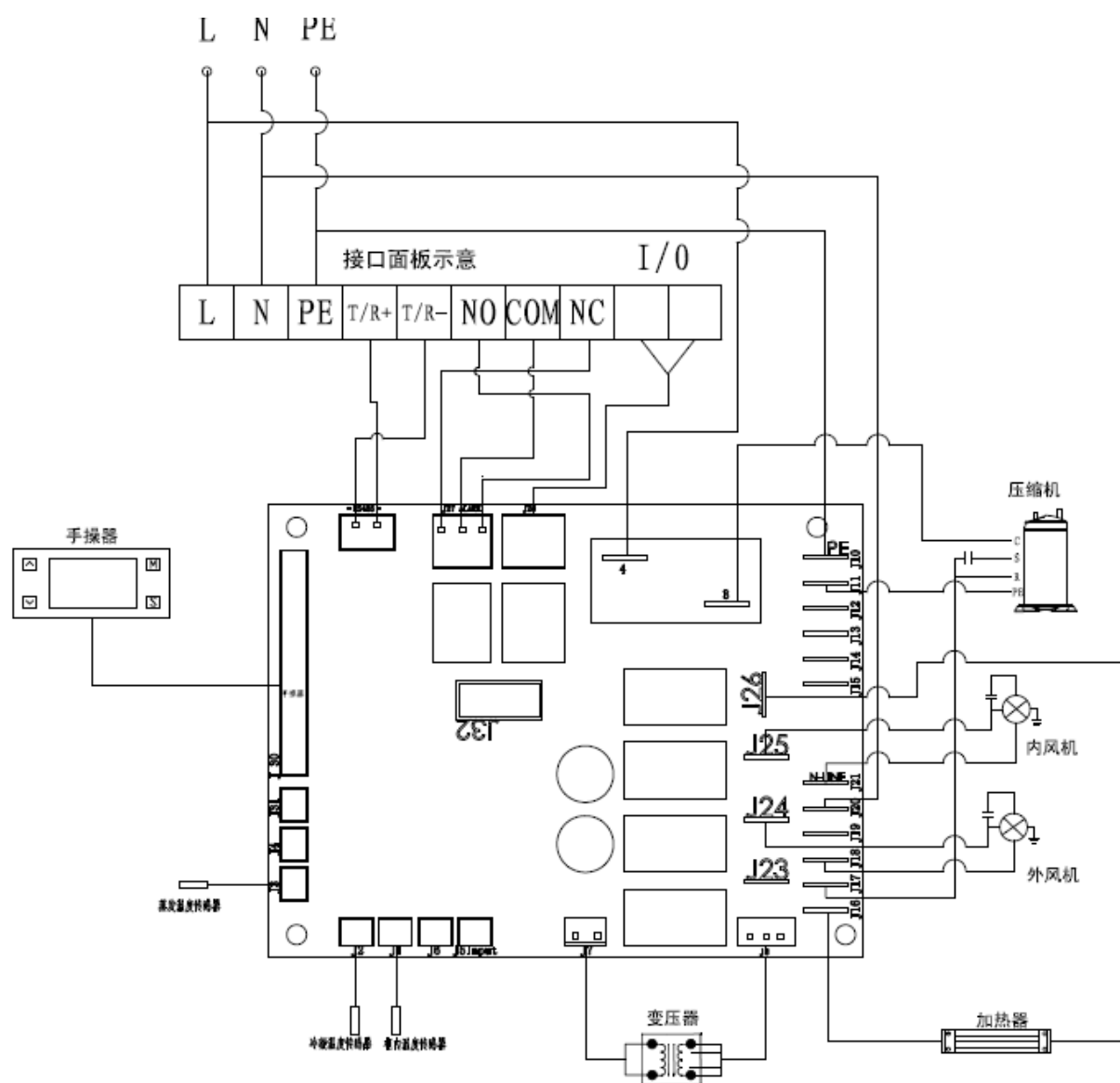
空调器没有内置电气保险开关，因此必须在电源线路中提供电路保护装置。

The unit must be disconnected prior to checking the PE conductor, high voltage and insulation in the enclosure
在连接上电源之前，必须先检查好接地，电压以及绝缘状况。

Please observe the locally valid regulations when installing!

请在设备安装前了解当地的有效规范。

9



5. Commencing operation and control behavior

设备启用及操作

运行模式：待机模式、制冷模式、加热模式、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35℃），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35℃），则空调进入制冷模式。外风机先运行，显示器上  标志亮。

外风机运行60秒后，压缩机启动， 标志亮。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35℃）— 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， 熄灭。外风机滞后一段时间

再关闭， 熄灭 Cooling mode


If the return air temperature is greater than or equal to the default set point of compressor start temperature (35℃), the air conditioner enters the cooling mode. The external fan is running, the monitor display  symbol.


The compressor is running after external fan 60 seconds, the  symbol is bright. 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 (35℃) 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


 symbol is extinguished. The external fan stopped after a while, and the  symbol extinguished.

加热模式

若回风温度 ≤ 加热器设置温度（默认0℃）- 加热器运行回差温度（默认5℃），则加热器开启，对系统进行加热，此时  亮。

若回风温度 ≥ 加热器设置温度（默认0℃）+ 加热器运行回差温度（默认5℃），则加热停止， 熄灭。

Heating mode

If return air temperature is less than or equal to heater start temperature (0℃) subtracts heater stop hysteresis temperature (5℃), the heater runs to heat the system and the  symbol bright.

If the return air temperature is greater than or equal to heater start temperature (0℃) plus heater stop hysteresis temperature (5℃), the heater is stopped and the ☀ symbol extinguished.

Fig.5.1 Controller panel introduction 控制面板介绍



面板上的指示灯从左到右排列的功能含义如下表：

The definition of the symbols from left to right are as follows:

表5-1 面板指示灯含义Table5-1 Definition of the symbols

| 指示灯 Indicator | 指示灯含义 Definition | 亮 Light | 闪烁 Flicker |
|------------------|-----------------------|-------------------------------|-----------------------------|
| | 设定温度 Point setting | 正在温度设置状态 Under setting | 自检 Self test |
| | 制冷 Cooling | 正在制冷 Cooling running | 压缩机故障 Compressor alarm |
| | 制热 Heating | 正在制热 Heat running | 加热器故障 Heat Alarm |
| | 外风机 External fan | 外风机运转 Extrenal fan running | 外风机故障 External fan Alarm |
| | 告警Alarm | 告警发生 Alarm Occurs | ----- |
| | 除湿Desiccant | ----- | ----- |

蒸发盘管温度查询：
在主显示界面，按一次“▲”键，将显示蒸发盘管温度，再按一次“▲”键或按一次 “M”键返回到显示回风温度的主界面。

冷凝盘管温度查询：
在主显示界面，按一次“▼”键，将显示冷凝盘管温度，再按一次“▼”键或按一次 “M”键返回到显示回风温度的主界面。

注：空调出厂时已经进行过参数设置，默认参数请参考表5-2；部分参数需要密码才能设置，请联系客服。

The evaporator temperature query:

Under the return air temperature interface, press“▲”once will show evaporator temperature, press again or press“M”, the monitor will return the main interface.

The Condenser temperature query:

Under the return air temperature interface, press“▼”once will show condenser temperature, press again or press“M”, the monitor will return the main interface.

Attention: Air conditioner has been setting parameters, the default parameters refer to table 5-2;

Part of the parameters need to password, please contact our customer service.

参数设置:

长按“M”键5秒，进入参数设置状态，显示参数代码，用“▲▼”键选择参数代码，选择一个代码后按“Set”键则显示该代码对应的参数值，这时再用“▲▼”键即可对参数值进行设置，设置完成后再按“Set”键，回到显示参数代码状态。在显示参数时按“M”键可退出参数设置状态，在设置参数值的过程中按“M”键表示放弃，退出但不改变参数值。

Parameter setting:

Long press "M" key for 5 seconds, enter the parameter setting mode, then display the code of parameters, with "▲▼" key to select the code of parameters, select a code and press "Set" button will display corresponding parameter values of the code, then re-use "▲▼" button can set the parameters, after finished the setting, press "Set" button, back to display states. During the setting mode, Press "M" key to exit the parameter setting mode, in the process of the parameter values setting by pressing "M" button that give up, quit, but does not change the parameter value.

Fig.5.2 User parameter 用户参数

用户参数如下：The user parameters are as follows:

表3-2用户参数 Table 3-2 User parameter

| 代码 Code | 参数名称 Parameter name | 默认值 Default Value | 范围 Range | 备注 Remarks |
|------------|---|----------------------|-------------|---------------|
| F01 | 压缩机启动温度 Compressor start temperature | 35 | 20~50℃ | |
| F02 | 压缩机停止回差温度 Compressor stop hysteresis temperature | 5 | 2~8℃ | |
| F03 | 加热器启动温度 Heater start temperature | 0 | -5~10℃ | |
| F04 | 加热器停止回差温度 Heater stop hysteresis temperature | 5 | 1~5℃ | |
| F05 | 高温告警温度 High temperature alarm | 55 | 35~70℃ | |
| F06 | 低温告警温度 Low temperature alarm | -40 | -42~15℃ | |

| | | | | |
|-----|-------------------------------|---|-------|--|
| F07 | 通信地址 Communication address | 1 | 1~255 | |
|-----|-------------------------------|---|-------|--|

Fig.5.3 Alarm and fault management 告警与故障管理

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 5-3 告警代码 Table 5-3 Alarm code

| 代码 Code | 故障名称 Code Name | 故障机制 Principle | 故障处理方法 Process Method |
|------------|--|--|---|
| E01 | 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. |
| E02 | 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. |
| E03 | 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. |

| | | | |
|-----|--------------------------------------|--|---|
| E04 | 内风机告警 Internal fan alarm | <p>1、内风机不能正常工作</p> <p>The internal fan is not working properly.</p> <p>2、蒸发器盘管温度一直连续 15 分钟低于 0 度</p> <p>The evaporator temperature has been below zero in 15 minutes.</p> | <p>1、检查内风机线和内风机的连接是否脱落或松动。</p> <p>Check Whether the internal fan line is loosening.</p> <p>2、检查系统是否泄漏。</p> <p>Check whether the system leakage.</p> |
| E05 | 外风机告警 External fan alarm | <p>1、外风机不能正常工作</p> <p>The external fan is not working properly</p> <p>2、冷凝器盘管温度一直连续 15 分钟高于 77 度</p> <p>The condenser temperature has been above 77 degrees in 15 minutes.</p> | <p>1、检查外风机线和外风机的连接是否脱落或松动。</p> <p>Check Whether the external fan line is loosening.</p> <p>2、检查系统是否泄漏。</p> <p>Check whether the system leakage.</p> |
| E06 | 制冷剂泄漏告警 Refrigerant leakage alarm | <p>1、系统内制冷剂不足</p> <p>Lack of refrigerant</p> <p>2、蒸发盘管温度传感器松脱</p> <p>The evaporator temperature sensor is loosening</p> | <p>1、检查系统是否泄漏。</p> <p>Check whether the system leakage.</p> <p>2、检查蒸发盘管温度传感器是否松脱。</p> <p>Check whether the evaporator temperature sensor is loosening..</p> |

| | | | |
|-----|--------------------------------------|---|--|
| E07 | 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. |
| E08 | 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. |

6. Technical information

技术信息

6.1 Splash water discharge

溅水的排出

The air conditioner has an integrated splashing water discharge

空调器内部集成了溅水的排出装置

Splash water which may occur is collected at the bottom of the unit and is discharge through a hole

溅入的水，将汇集到空调底部，并通过排水孔排出。

6.2 General

总则

Storage temperature: The air conditioner must not be exposed to temperatures above +70°C during storage

仓储温度：空调器的仓储温度应不大于+70°C

Disposal: Disposal may be carried out at the Rittal works.

装配：由威图工人来进行。

Technical modifications reserved

威图公司保留变更技术数据的权利

6.3 Characteristics of all-electronic control:

电气控制特性

-The internal and external fans are controlled independently of one another.

内外循环风机的控制互相独立

-Control is dependent upon the internal temperature of the enclosure

控制系统根据机柜内部温度来做控制判断

-Accuracy of temperature sensors: $\pm 1.5K$

温度感应器的精度： $\pm 1.5K$

-All-electronic control and monitoring of the fans

电气系统控制和监测风机的运行

-Permanent self-monitoring of the air conditioner.

空调器具有持续自检测功能

-Alarm output via relays

通过继电器输出报警

-Self-resetting alarms(alarm interface)

报警的故障解除自动设定复原（报警接口）

7.Maintenance 维护保养

7.1 General 总则

Caution: Prior to any maintenance work, the air conditioner must be switched free from potential on the supply side

注意：在开始任何的维护保养工作前，必须将空调器的电源切断。

Depending on the level of contamination of the ambient air, the unit must be serviced at least twice a year.

空调器至少每半年需要维护一次（如果使用环境粉尘较多，需要增加维护频率）

Cleaning, maintenance and repair work to the unit must only be carried out by authorised, trained staff.

执行维护和修理空调器的人员必须由经培训的授权人员来执行。

Before carrying out any repair work, the system must be disconnected from the mains.

在任何的维护保养工作前，必须将空调器的电源切断。

Only original spare parts must be used.

仅允许使用原厂配件

Following all work, both the anti-corrosion protection and all seals must be checked for damage and repaired or replaced as necessary.

维修保养过程中，必须检查防腐蚀保护和密封的情况，必要的话进行维修或者更换。

The installed maintenance-free fans run in ball races, they are protected from moisture and dust, and are fitted with a temperature monitor. The life expectancy is at least 30,000 operating hours. The air conditioner is thus largely maintenance-free

空调器上的风机在正常使用下是免维护的，防湿气和灰尘，并安装由温度监测器。使用寿命大约30000运转小时。因此，该空调器是基本属于免维护产品。

All that may be required from time to time is that the components of the external circuit are cleaned by compressed air. The use of a filter mat is recommended only if large particles of lint are present in the air, so that blockage of the air conditioner is prevented

外循环的部件需要经常性的用压缩空气进行清洁，在空气中棉绒含量较高的地区，建议增加滤网，来减少空调器的堵塞的发生。

7.2 Cleaning the heat exchanger module

清洁空调器模块

If contaminated with dry dust, blowing out with compressed air is sufficient for cleaning purposes. If contaminated with greasy or oily substances, the module should be washed out with a suitable detergent (max. 75°C).

如果空调器模块仅受灰尘污染，可使用压缩空气来吹除就足够了。但是如果空调器表面受油垢油脂的污染，就必须使用适当的清洁剂来擦洗（温度应不大于75°C）

7.3 Replacing the internal fan

更换内循环风机

To replace the internal fan unit, consisting of one centrifugal fan and a support plate, first disconnect the connector plug. After unscrewing the support plate, the unit can be removed.

要更换内循环风机，包括更换离心风扇以及支撑板，应首先切断空调连接电缆，卸下螺栓，取出支撑板，就可以取出风扇了。

When re-installing the fan unit, particular attention should be paid to correct electrical wiring. Incorrect

connection may cause severe damage

当重新装上风机时，特别要注意正确的电线连接，否则将导致风机的严重损坏。

7.4 Replacing the external fan

更换外循环风机

To replace the external fan unit, consisting of one centrifugal fan and a support plate, first disconnect the connector plug. After unscrewing the support plate, the unit can be removed.

要更换外循环风机，包括更换离心风扇以及支撑板，应首先切断空调连接电缆，卸下螺栓，取出支撑物，就可以取出风扇了。

When re-installing the fan unit, particular attention should be paid to correct electrical wiring. Incorrect connection may cause severe damage

当重新装上风机时，特别要注意正确的电线连接，否则将导致风机的严重损坏。

8.Scope of supply and guarantee

设备供货范围和质量保证

1 air conditioner unit, ready for connection

一个空调器设备单元（带安装到机柜上的附件）

1 set of assembly instructions

一套使用说明书

Guarantee: This unit is covered by a 1-year guarantee from the date of supply, subject to correct usage.

Within this period, the returned unit will be repaired in the factory or replaced free of charge.

The air conditioner is to be used for the cooling of enclosures only. If it is connected or handled improperly the manufacturer's guarantee does not apply and in this case we are not liable for any damage caused.

Please refer to relative service contract between customer and Rittal.参考威图的售后服务协议书。

质量保证：根据威图公司的协议，该设备的保修期时间为发货日期起的12个月，在此期间，用户可以得到免费的设备更换，或者工厂的免费维修。

该空调器仅供在机柜方面用于冷却机柜温度的。如果你的线路连接或操作不正确，威图将不负责保修，并且我们不对由此引起的损坏有任何的义务。

9.Spare parts 配件

| 名称 | 型号 | 数量 |
|------|-----------|----|
| 蒸发风机 | 交流 190 风机 | 1 |
| 冷凝风机 | 交流 225 风机 | 1 |
| 主控制板 | JYJLV20 | 1 |
| 压缩机 | HIGHLY | 1 |