

Service Manual/服务手册

DC Air conditioner 450/直流空调 450W

366273



Dantherm Air Handling (Suzhou) Co. Ltd., China/丹腾空气系统（苏州）有限公司

Address: Building 9, No.855 ZhuJiang Road, SuZhou New District, JiangSu, China, 215129, China/江苏省苏州市高新区珠江路 855#狮山工业廊 9#厂房

Phone: +86-0512- 66678500 **Fax:** +86-0512-66678501 **Homepage:** <http://www.dantherm.com>

Revision History/修订信息

Revision/版本	Description/描述	Author/作者	Date/日期
A	First version/第一版	Scott	2014-11-18

Table of contents 索引

1 INTRODUCTION 简介	4
1.1 Purpose 目的.....	4
1.2 Usage of the product 产品使用.....	4
1.3 Storage 存储.....	4
1.4 Copyright © 版权所有.....	4
1.5 Declaration of conformity 符合性声明.....	5
2 INSTALLATION AND START-UP 安装和启动	6
2.1 Package 包装.....	6
2.2 Contents in the package 包装内容.....	6
2.3 Tools 工具.....	6
2.4 Mounting 装配.....	7
2.5 DC power 直流电源.....	7
2.6 Start-up 启动.....	8
2.7 Demounting 拆卸.....	8
2.8 Alarm 报警.....	8
3 IDENTIFICATION OF THE UNIT 机器的识别	8
4 DESCRIPTION OF FUNCTIONALITY 功能描述	9
4.1 General Description 总体描述.....	9
4.2 Temperature 温度.....	9
4.3 Set points 设置点.....	10
4.4 Compressor operation 压缩机运转.....	11
4.5 Compressor protection 压缩机保护.....	11
4.6 Condenser fan operation 冷凝风扇运转.....	11
4.7 Internal fan operation 内风扇运转.....	11
5 TECHNICAL DATA 技术数据	12
6 PREVENTIVE MAINTENANCE 定期维护	13
6.1 General Description 总体描述.....	13
6.2 Clean-up methods 清洗方法.....	14
6.3 Check list 检查清单.....	16
7 REPLACEMENT OF SPARE PARTS 更换备件	17
7.1 Replacing the internal fan (see below pictures) 更换内风扇（如下图）.....	17
7.2 Replacing the internal fan 更换外风扇.....	19
8 SCRAPPING 报废	21
9 PERFORMANCE 性能曲线	22
10 SPARE PARTS LIST 备件清单	23
11 MODEL DRAWINGS AND WIRE DIAGRAM 尺寸图与电路图	24
11.1 Model drawings 尺寸图.....	24
11.2 Wiring diagram 接线图.....	25
12 HOTLINE HELPS 热线帮助	26

1 Introduction 简介

1.1 Purpose 目的

This Service Manual is addressed to the technical crew, who installs and maintains, repairs the DC Air Conditioner 450 through all steps in its lifetime.

该用户/服务手册帮助工程师安装、维护和修理丹腾直流空调 450W。

The manual includes descriptions of functionality, replacement of parts as well as how to carry out preventive maintenance.

此手册包括功能描述，零件更换和如何进行定期维护。

1.2 Usage of the product 产品使用

The DC Air Conditioner 450 is especially designed for cooling of electronic equipment and for in and out door installation. The unit must not be used for other purposes under any condition and should be installed and placed according to the instructions in this manual.

丹腾直流空调 450 是为冷却电子设备并用于室内/户外安装而设计的，此机器不能用于其他目的，并且必须依照此手册的说明进行安装和更换。

1.3 Storage 存储

During storage and transportation the unit must be kept in an upright position.

在存储和运输中，机器必须保持竖直向上的位置放置

1.4 Copyright © 版权所有©

This manual is subject to change without notice. The manual or its parts are not allowed to be copied without a written permission of the Dantherm Group.

未通知此手册不能做任何更改。未经丹腾空气系统（苏州）有限公司的书面允许，不得拷贝或部分拷贝本手册的内容

1.5 Declaration of conformity 符合性声明

Dantherm declares, meet 2002/95/EC.ROHS directive for mass production. This unit is in conformity with the following directives and standards:

丹腾公司申明，产品符合 2002/95/EC.ROHS 标准，产品符合如下指示和标准：

(Note: These directives or standards all adopt the latest edition! 注意：所有的标准都使用的最新的版本!)

Directive	Name / Area
2006/42/EC	Directive on the Safety of Machines
2006/95/EC	Low Voltage Directive
2004/108/EC	EU EMC Directive (December 2004)
97/23/EC	The Pressure Equipment Directive
2004/12/EC	Packing Directive
Standard	Name / Area
EN ISO 12100	Machine safety
EN 60 950-1	Electrical machinery safety
EN 60 335-1	Low voltage
EN 60 335-2-40	Low voltage particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
EN 61000-6-2	Immunity(industrial enviroments)
EN 61000-6-3	Emission (residential, commercial and light-industrial Enviroments)
EN 50 106	Safety for electrical machinery (Particular rules for routine tests)
GR-487-CORE	According to Belcore (shock)
GR-63-CORE	According to Belcore (shock)
IEC 60529	IP Rating According to IEC
UL 484	Safety for Electrical Machinery
ETSI EN 300-019-1-2	Transportation shock
ETSI EN 300-019-1-4	Operation shock

Kristian Askegaard



General Manager, Dantherm Air handling (Suzhou) Co., Ltd.

总经理，丹腾苏州空气系统（苏州）有限公司

2 Installation and start-up 安装和启动

This section describes the procedure from unpacking to start-up.

在这部分将描述拆包启动的程序。

2.1 Package 包装

The air conditioner can be delivered in different packages depend on shipping method. Here the solution is each unit wrapped with PE bag and packed in carton protected with foam. Then per twenty units are carried in a plywood box.

根据运输方式的不同，空调采用不同的包装方式。此处每台空调套装 PE 袋后放置在一个纸箱中，然后每二十台放在一个木箱中。

2.2 Contents in the package 包装内容

The DC Air Conditioner 450 is delivered with an installation kit with the following contents:

丹腾直流空调 450 附带如下成套装置交货。

Item description 描述	Quantity 数量	Unit 单位
DC Air Conditioner 450/直流空调 450	1	Pcs.
Service manual/服务手册	1	Pcs.
Cable tie/扎带	10	Pcs.
Power cable/电源线	5	m
Hose/水管	1.0	m
M6*16 screw/ M6*16 螺栓	8	Pcs.
M6 Nut/M6 螺母	8	Pcs.
Flat washer M6 /M6 平垫	8	Pcs.
Tooth washer M6/M6 齿垫	8	Pcs.

Warning: the air conditioner have two types, in-door version and for out-door version, the only difference is the out-door version have a shield on the external side-avoiding be drenched(could be demounted by four nut). In the following article, we only show the out-door production as sample, please take notice.

警告：这款空调包含两款产品：室内安装版和户外安装版，区别仅在户外版带一个防止暴雨浸透机器的外罩(可拆卸)。同时请注意下面的文章中只列举出户外版为例。

2.3 Tools 工具

For installation: 用于安装

- PH3 Cross Screwdriver PH3 十字螺丝刀
- 10# Wrench 十号扳手

2.4 Mounting 装配

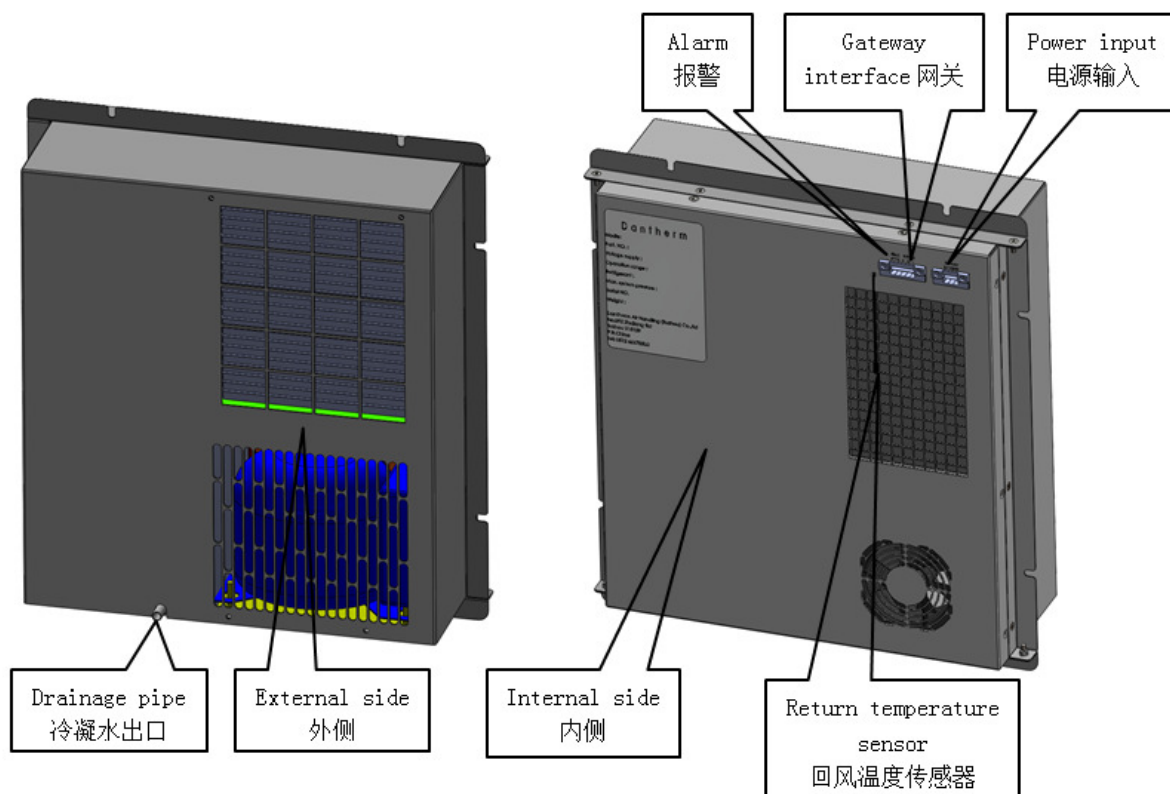
Mounting procedure 装配程序

The mounting procedure of the air conditioner unit should follow below steps:

- ✓ Demount the package.
- ✓ Install the water tube, fasten with a cable tie, and cut the extra part.
- ✓ Lift the unit up and place it in the wall of cabinet, fasten the brackets and flanges with M6 bolts & nuts (fixing unit by installation hole).
- ✓ Connect the power cable.

此空调必须按照如下步骤安装:

- ✓ 拆除空调外包装。
- ✓ 安装上水管并固定。
- ✓ 将空调竖直靠墙放置在机柜墙上，用 M6 螺栓固定安装法兰与支架；
- ✓ 连接电源线。



2.5 DC power 直流电源

Place the main power cable, and connect it to the 48VDC power supply.

放置并连接好直流 48 伏电源线。

2.6 Start-up 启动

Turn on the power and the internal fans start running directly. The compressor is switched on when the internal temperature reaches or exceeds 25°C. External fan starts running when the condenser air temperature exceeds 35 °C.

开启电源，内风扇将即时运转；压缩机在内腔温度达到或超过 25 °C（default setting/默认设置）时开始工作；外风扇在冷凝器温度超过 35 °C 时启动。

2.7 Demounting 拆卸

If the unit by any need should be demounted the steps below should be followed:

- ✓ Uninstall the main power cable from power supply. (Make sure that the power supply is powered off)
- ✓ Demount all screws on the flanges.
- ✓ Take off the air-conditioner.

在需要拆卸时，请按照下面的步骤拆卸：

- ✓ 卸掉主电源线。（确保供电电源关掉）
- ✓ 拆卸法兰上所有螺丝。
- ✓ 卸下空调。

2.8 Alarm 报警

When the internal temperature of Air-con exceed 40°C ,the normally closed alarm output into a normally open; Until the internal temperature of the unit dropped to 25°C,the alarm output will become normally closed.

当空调内腔温度超出 40°C时，报警输出由常闭变为常开；直到内腔温度降到 25°C，报警输出才会由常开变为常闭。

3 Identification of the Unit 机器的识别

All units have a silver type plate label, where all the important information about the specific unit can be found. Also the Dantherm address and phone numbers are printed here so the contact can be made on the site.

所有空调都贴有标明机器规格的重要信息的标签。在标签上也有丹腾公司的地址和电话号码。

Serial number 序列号

Especially the serial number is important, and should always be mentioned when Dantherm is contacted about issues concerning the specific unit.

序列号尤其重要，当涉及到丹腾公司机器的细节问题时都会用到该序列号。

4 Description of functionality 功能描述

4.1 General Description 总体描述

The air conditioner contains a compressor, evaporator, condenser, condenser fans, and various cooling components as expansion valves, dry filter and an internal fan. The internal cabinet air is continuously circulated in a closed loop by the evaporator fan. This draws warm air from the top cabinet and supplies the internal environment with cooled air in the bottom area via the evaporator coil. Heat is transferred from the internal air to the refrigerant and exhaust to the ambient air through the condenser coil. The closed loop internal circuit protects the enclosed equipment all types of hostile environments and control the internal thermal conditions with clean air.

The air conditioner is designed as an on/off system, where the control board controls the compressor in accordance to the return temperature. When the active cooling is operating, the condenser fans run in full speed. The unit could work in extreme temperatures ranging from -5°C to +55°C. Internal side working humidity ranging from 0%--80%

空调主要包括压缩机、蒸发器和冷凝器、冷凝风扇以及如膨胀阀、干燥过滤器和内风扇等各种冷却装置。内部空气随着蒸发器风扇而循环流动。热空气从顶部进入，经过蒸发器冷却后由下部出口排出。热量从内部空气传递到制冷剂，然后通过冷凝器排放到外部环境中。这个闭环内电路保护了所有不良环境类型下的附属设备，以洁净的空气调节内部环境。

空调作为开关系统设计，控制板控制着压缩机与回风温度相一致。当机器主动运行时冷凝风扇全速运行。此空调的工作温度范围是：-5°C 到+55°C。内侧工作湿度 0%--80%。

Active parts 主要零件

The active parts that are controlled by the Control board are:

- Compressor
- Condenser fan

控制板控制的主要零件有：

- 压缩机
- 冷凝风扇

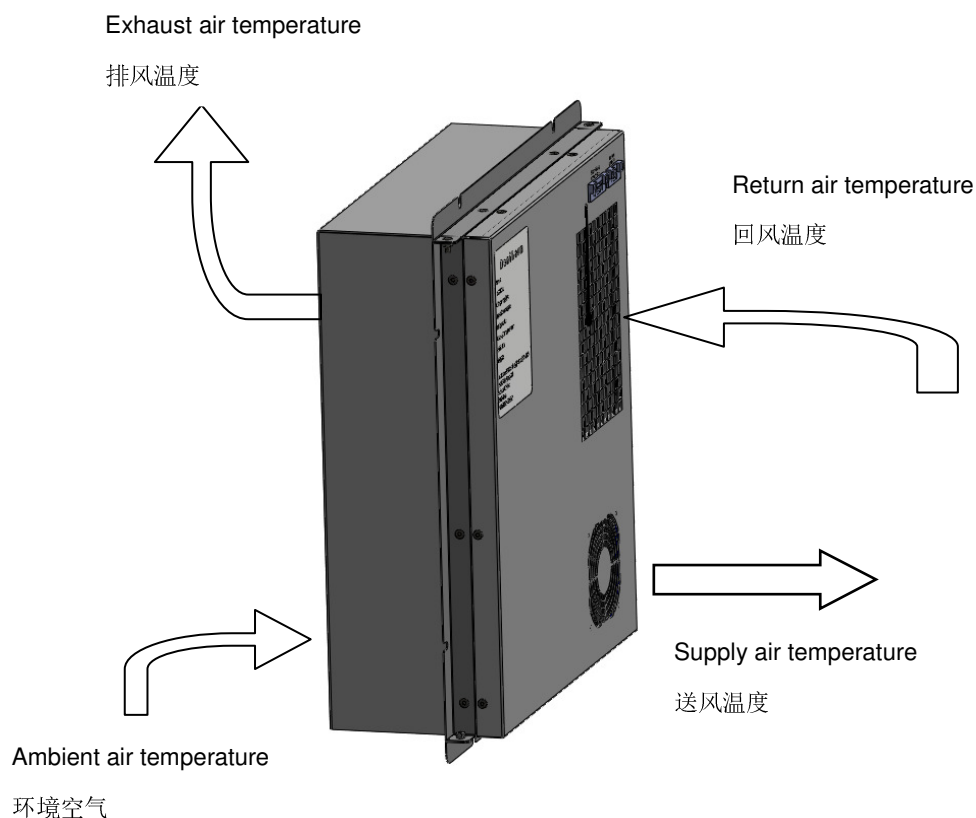
4.2 Temperature 温度

The following terms for temperatures are used in the following description (see below figure):

- ✓ Supply air temperature is the temperature of the air leaving the unit to cool down the electronic equipment.
- ✓ Return air temperature is the temperature of the air entering the air conditioner from the electronic equipment.
- ✓ Ambient air temperature is the outside air temperature.
- ✓ Exhaust air temperature is the temperature of the air leaving the unit to the ambient.
- ✓ Condenser temperature is the average temperature of the condenser coil

以下是对几种温度的描述（如下图）：

- ✓ 送风温度是离开空调用于冷却电器设备的风的温度
- ✓ 回风温度是从电器设备进入空调的风的温度
- ✓ 环境空气温度是外界的空气温度
- ✓ 排风温度是从空调排到外界环境的温度
- ✓ 冷凝温度是指冷凝器的平均温度



4.3 Set points 设置点

The set points can be adjusted through controller software.

设置点可以通过压缩机控制板软件调整。

The table below shows the set point related information.

下面的表格显示所有设置点的相关信息。

Standard settings 标准设置	Range 范围	Unit 单位	Description 描述	Function 功能
25	[20-40]	°C	Compressor start-up set Temp. 压缩机工作设点温度	If the return air Temp. exceeds set Temp and the compressor starts running. 如果回风温度超过设置点，压缩机启动。 The compressor stops when the return air Temp is lower 3°C than set Temp. (default 22°C). 当回风温度比设定温度低 3°C 时（默认为 22°C）压缩机停止。

4.4 Compressor operation 压缩机运转

- If the electricity was suddenly cut off, the compressor runs again after 30 seconds while re-connected.
- If the compressor failed to start-up by the normal power supply, the compressor will try to start with a delay of a minute. If it failed again, the control will send the alarm signal until the failure solved.
- 如果压缩机突然断电后又恢复，压缩机将延时 30 秒启动。
- 如果压缩机在正常供电情况下未能启动，压缩机将在一分钟后再次尝试。如果连续两次没有能正常启动那么主板将输出一个报警信号直至故障解除。

4.5 Compressor protection 压缩机保护

During the operation, when the current too large or overload, the compressor would shut down unless the failure solved, and restart later.

当空调运行时，如果压缩机的负载过大或运行电流过大，压缩机将停机，直至故障解除，会重新运行。

4.6 Condenser fan operation 冷凝风扇运转

Here are two condenser fans, they operate when the condenser temperature (see page 10) exceeds 35°C. Once working, they run at the 100% speed.

这款空调含两个冷凝风扇，一旦冷凝温度超过 35°C，风扇就开始工作，且转速为 100%。

4.7 Internal fan operation 内风扇运转

The purpose of the fan is to circulate the internal air, and therefore the internal fan will constantly be running when the power supply is turned on.

内风扇的目的是使内部空气循环，因此内风扇将在电源接通后持续不断的运转。

5 Technical data 技术数据

Performance: Ambient/return = 35 °C / 35 °C 性能: 环境/回风 35°C / 35 °C			
Specification 规格	Unit 单位	Designation 设计	Value 值
Voltage 电压	V	Voltage supply 供电电压	45-57
Current 电流	A	Max. cooling current 最大制冷电流	6
Loads 功率	W	Total unit 总功率	190
Cooling capacity 制冷能力	W	Incl. osmotic heat and solar gain 包括渗透热量和太阳光热量	420
Refrigerant 制冷剂	G	R134a	170
Int. air flow 内侧风量	m ³ /h		180
Ext. air flow 外侧风量	m ³ /h		330
Pressure 压力			
Operation 操作	Pa	Operating pressure 操作压力	101.3 (70-106)
Drop 压降	Pa	Estimated pressure drop internal 估计内侧压降	80
Temperature & noise 温度&噪音			
T _{cooling}	°C	Cooling set point 冷却设置点	25[+20 – +40]
t _{operate}	°C	Operating temperature 操作温度	-10 - +55
Noise level	dB(A)	Sound Pressure @ 25 [°C] 声压	65

Cabinet data 机柜数据			
Specification 规格	Unit 单位	Designation 指示	Value 值
Dimensions. 尺寸	mm	Height x Width x Depth 长 x 宽 x 高	491.5x443x158
Weight 重量	kg	Net Weight 净重(in-door)	18
Metal sheet material 钣金材料	mm	stainless steel & Aluzinc steel 不锈钢&覆铝 锌板	1.5 / 1.0
Packaging 包装	mm	Single Packaging 单台包装	540x482x240
	mm	Multi packaging (20pcs) 多台包装(20台)	1272x1002x1250
Signal 信号	-	Type signal and warnings 信号和警告类型	/

6 Preventive maintenance 定期维护

6.1 General Description 总体描述

This heat management system contains moving mechanical parts, and is often placed in rough environments with high temperatures, humidity and dirt. To keep the air conditioner in a shape where it will perform according to the specifications, preventive maintenance has to be carried out.

这个热处理系统包括可移机构件，它可以在高温潮湿污垢的恶劣环境下经常更换。执行定期维护可保持空调按规格正常运行。

Warning 警告

Do not start working on the unit before the power is safely switched off. Do not switch it on before all the work has been performed and the unit is ready for use. Only trained and certified technicians are allowed to carry out replacement of parts and other maintenance tasks!

在电源安全关闭前不要在空调上维护。在维护完成并准备使用前不要接通电源。仅受过培训并被鉴定的技术员才能执行零件更换或其他维护任务！

The air conditioner cleaning and maintenance is the key to ensure the cooling capacity, improve life time, higher energy saving, and better performance. After the air conditioner installing, environmental conditions, climatic conditions, the frequency of the compressor start/stop, dust and air pollution, cleanliness of the cabinets and many other factors, determine the maintenance frequency. Normally, the period of preventive maintenance should not surpass six months. In case of very bad air quality, the period of two months need to be considered.

定期对空调进行清洗维护，能保证空调的制冷能力，延长使用寿命，节约能量并更好的发挥其性能。空调装好以后，需要根据环境状况，气候条件，压缩机启动/停止的频率，灰尘，空气污染，机柜的清洁度等因素来决定维护的频率。通常的维护的周期不应该超过 6 个月，在糟糕的空气质量下，建议 2 个月维护一次。

Conditions of warranty 保修条件

The factory warranty is only valid if documented preventive maintenance has been carried out with an interval of maximum 6 months (normally air quality location) or 2 months (very bad air quality location). The documentation could be in form of a written log on the site, or a report from the computer test program.

工厂保修仅适用于有保修卡的承保产品，且保修期最长不超过 6 个月（在正常空气状况下）或 2 个月（极其糟糕的空气状况下）。该保修卡必须是书面形式的记录或电脑测试程序的报告。

6.2 Clean-up methods 清洗方法

Make sure that the power to the unit is safely switched off. 确保电源已安全切断。

clean-up method 清洗方法	Needed Tools and materials 工具和材料
Mechanical cleaning 机械清洗	Vacuum cleaner or compressed air 吸尘器或高压空气 Soft bristle brush 软毛刷 Screwdriver 螺丝刀
Liquid cleaning 液体清洗	NHR-60 cleaning agent for coil's fins 清洗剂 Screwdriver 螺丝刀 Water 水

Mechanical Cleaning (recommended cleaning method)

机械清洗（推荐使用方法）

Step 步骤	Action 动作
1	Open the units cover, use a vacuum cleaner very careful clean-up the dust, especially at air ducts, condenser and evaporator fan, Condenser and evaporator coil. Then use pressurized air/brush to remove/loosen dust that the vacuum cleaner could not remove. Then use a vacuum cleaner to remove the remaining matter. 打开盖子，用真空吸尘器小心的吸掉灰尘，特别是风道，冷凝器和蒸发器，风扇，然后是用高压空气或毛刷除掉吸尘器无法清洗的灰尘，然后再使用吸尘器清除剩余的问题。
2	Finish all the items in the below check list. 完成下面的检查事项清单中所有项目。

Liquid Cleaning 液体清洗

Step 步骤	Action 动作
1	Open the units cover, use CNHR-60 cleaning agent sprayed evenly on the surface of the condenser and evaporator fins, condenser fan, air duct; five minutes later, then use the low pressure water to rinse them. 打开盖子，将 CNHR-60 清洗剂均匀的喷洒在冷凝器和蒸发器的翅片、冷凝器风扇、风道上，5 分钟后使用低压水冲洗下。
2	Finish all the items in the below check list. 完成下面的检查事项清单中所有项目。

After you finished the cleaning, please check the unit following the check list. And then install the unit and power cable. The cleaning and maintenance process is finished.

完成清理工作后，请按照检查清单检查机器，然后将机器盖板安装好并接通电源，清洁和维护工作就结束了。

6.3 Check list 检察清单

Checklist 检察事项	Yes 是	No 否
Are the fans clean and free of corrosion? 风扇是否清洁生锈?		
Are the coolant pipes free of obstructions, damage, corrosion and show no obvious signs of leakage? 制冷系统管道是否有堵塞, 破坏, 生锈, 是否有明显泄漏?		
Are the coil lamellas clean and undamaged? 冷凝器和蒸发器翅片是否清洁, 完整?		
Are all fan blades free of obstructions, cracks, missing blades and in balance? 所有风扇是否完整, 运转是否平稳?		
Do the fans rotate freely and are they free from excessive vibration or noise? 风扇是否自由运转, 有无异常噪音或震动?		
Is all wiring and insulation undamaged? 电线和绝缘是否破损?		
Are all connectors seated properly and in good conditions? 所有接头是否正常?		

Before leaving the site! 在离开前!

Make sure that there is no alarm and the BTS is in operation before leaving the site.

在你离开前, 请确保 BTS 正常运转且无报警

7 Replacement of spare parts 更换备件

No components in the DC 450 are to be replaced regularly. This section is therefore only describing how to replace the spare parts if they are not running smoothly – so only replace if the component is faulty!

直流空调 450 中没有零件是经常更换的。因此这部分只描述部分零件没有平缓运行时如何更换它们 – 所以只更换有问题的零件！

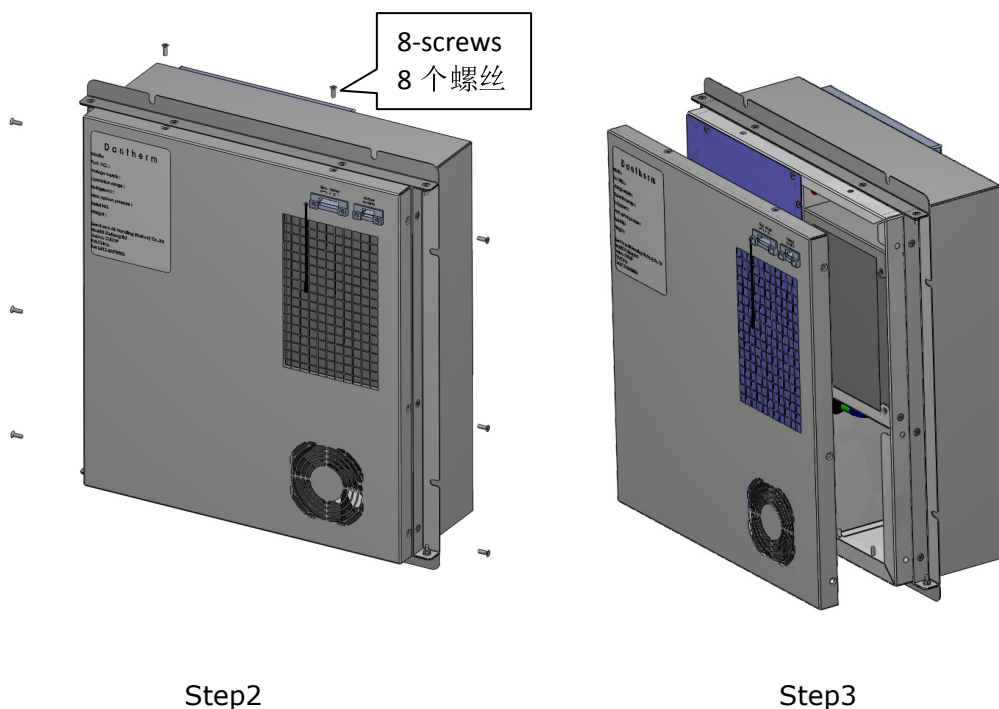
Before demounting the old part, it is very important to order the new spare part from Dantherm. To do this most effectively, the product version and serial number should be checked so this information can be passed on when ordering. This information can be found on the silver type plate on the cabinet.

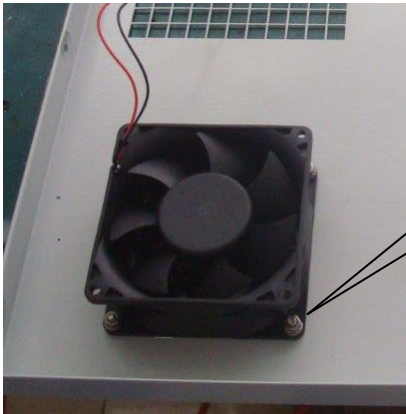
在拆卸旧零件前向丹腾公司订购新的零件。为了最有效的完成此过程，请检查产品的版本和序列号并在订购前传递给丹腾公司。这个信息可以在箱体上的银色型号标签上找到。

7.1 Replacing the internal fan (see below pictures) 更换内风扇（如下图）

Tools 工具:

- PH0 Slotted screwdriver #0 一字螺丝刀
- Cutting tools 剪刀
- T20 screwdriver T20 螺丝刀
- M7 Socket Wrench M7 开口扳手





4-Serrated washer
and nut

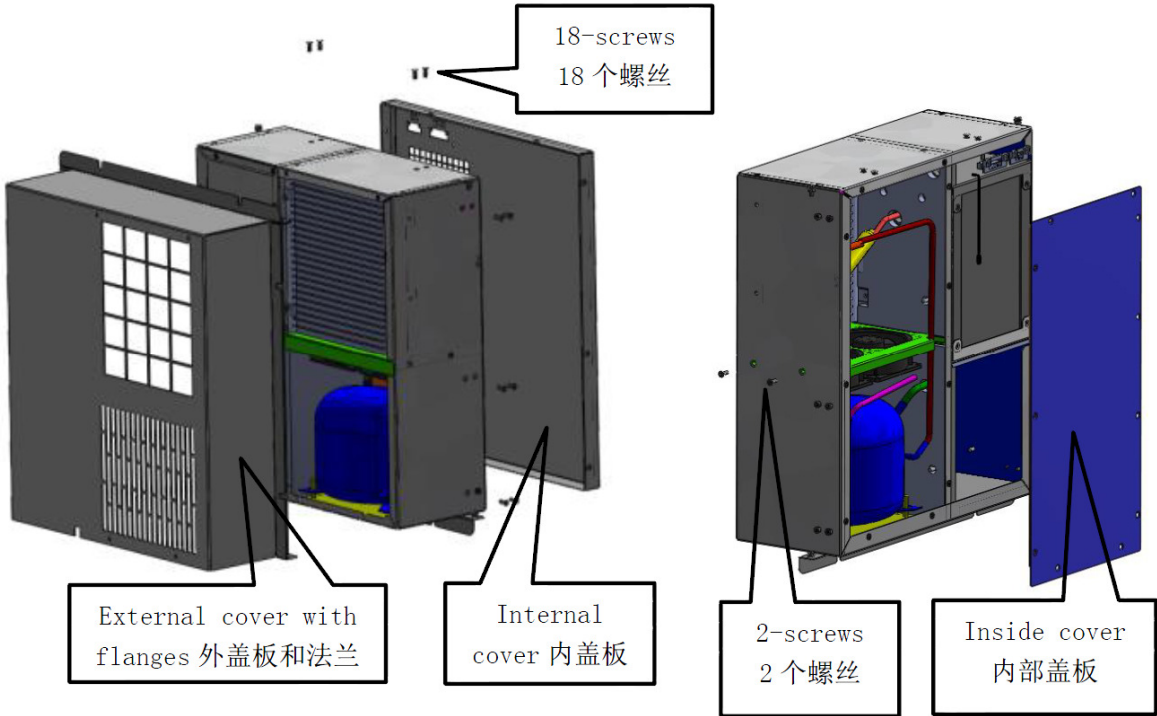
4-齿垫和螺母

Step 步骤	Action 行动
1	Power off and Uninstall A/C from the cabinet. 断电并将空调从机柜上卸下。
2	Trim the cable tie mounting the sensor on internal cover grid, remove 8 hexagon lobular socket countersunk head bolts mounting the internal cover and unplug the cable connector. 去掉用于固定内盖板的 8 个内六角沉头螺丝并剪掉固定传感器的束带。
3	Unplug the power supply connector, unscrew the bolts connecting the gateway cable and interface, unplug the internal fan connector, demount the internal cover. 拔掉电源插头，拧松网关面板上的螺丝，拔掉内风扇电源接头，卸下内盖板。
4	Demount the four serrated washers and nuts, remove the internal fan. 卸下齿垫和螺母，并取下风扇。
5	replace the new fan, and install the unit by steps(for gateway interface: white cable match “-“, blue cable match “C”, brown cable match “+”) 更换风扇，一步步的组装机 (网关接线：白接负，蓝接 C，棕接正)

7.2 Replacing the internal fan 更换外风扇

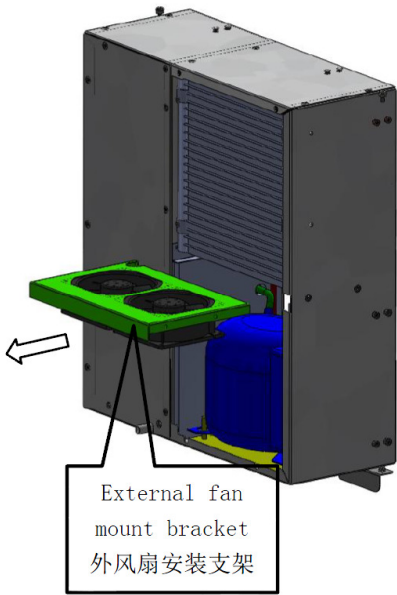
Tools 工具:

- Cutting tool 剪刀
- PH1 Phillips screwdriver #1 十字螺丝刀
- Knife 美工刀
- T20 Hexgonal screwdriver T20 螺丝刀
- M7 Socket Wrench M7 开口扳手
- Joint sealant 密封胶

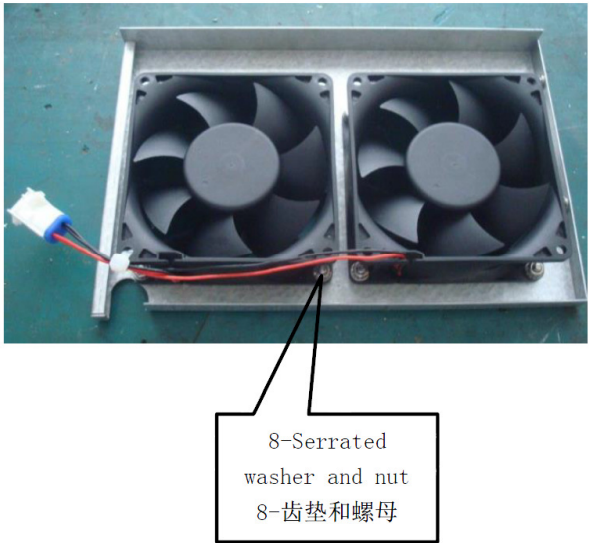


Step1

Step2



Step3



Step4

Step 步骤	Action 行动
1	<p>Remove 18 hexagon lobular socket countersunk head bolts around the flange (besides the bottom), then demount two more nuts fastening the bottom flange and sides; Demount the internal cover just as mentioned above, then demount the external side cover lightly.</p> <p>卸下用于固定法兰和内外盖板的 18 颗内六角沉头螺丝，然后卸下底部法兰两侧的螺母；依照上述替换外风扇中的步骤卸下内盖板，然后轻轻的拆卸外侧盖板。</p>
2	<p>Demount 11 bolts fastening the inside cover plate, remove the plate. Then demount 2 bolts fastening at the side.</p> <p>卸下固定内侧面板的 11 颗螺丝，取下内侧板；接着卸下固定外风扇支架的 2 颗螺丝。</p>
3	<p>Unplug the connector and pulling out the external fan mount bracket.</p> <p>拔掉接头，抽出外风扇安装支架。</p>
4	<p>Demount 8 serrated washer and nuts and replace the external fan.</p> <p>卸下 8 个螺母和齿垫更换外风扇。</p>
5	<p>Install the unit with nuts and joint sealant. 组装机。</p>

8 Scrapping 报废

Main components 主要部件

The main components of the unit are:

- The cooling circuit including the compressor, coils and refrigerant liquid.
- The printed circuit boards (PCB's) with electronic components and connecting wires
- Fans
- Metal parts such as shell

主要部件有：

- 制冷循环包括压缩机、蒸发器，冷凝器和制冷剂。
- 具有电子部件的主板和电线
- 风扇
- 钣金等等。

Cooling circuit 制冷循环

Refrigerant gas 制冷气体

When scrapping an air conditioner the refrigerant needs to be removed from the unit even though the air conditioner is using an environmental friendly type of refrigerant gas named R134a.

空调报废时需要将制冷剂从机器中移除去，即使空调使用的是环保型制冷剂 R134a。

Only a certified cooling technician should carry out the evacuation by using the necessary evacuation and recycling equipment. If the refrigerant gas is not to be recycled by the evacuator it must be passed on to the local authorities for decomposition.

只有有鉴定资格的技术员才能使用必要的撤除和回收设备撤除。如果制冷气体不用撤除机器回收，必须经当局许可才分解。

Compressor 压缩机

The compressor contains oil and precautions must be taken to prevent the oil from polluting our environment. The compressor should together with the copper tubes be left at local recycling authorities.

装有油的压缩机必须被防范以防止空气污染。压缩机和铜管应该留在当地的回收机构。

PCB 控制板

In most places there are local rules for scrapping PCB's as well as for connecting wires, and these rules are to be followed. Generally it is important to separate the metal parts from the wires and PCB's before scrapping.

在大多数地方，都由当地的法规规定了 PCB 与连接线废弃方法。一般地，在废弃前，非常重要的一点就是要将钣金件与连接线和 PCB 板分开。

Fans 风扇

The fans consist of plastic, metal and an internal PCB. They are subject to recycling and should be left to the local "scrap dealer".

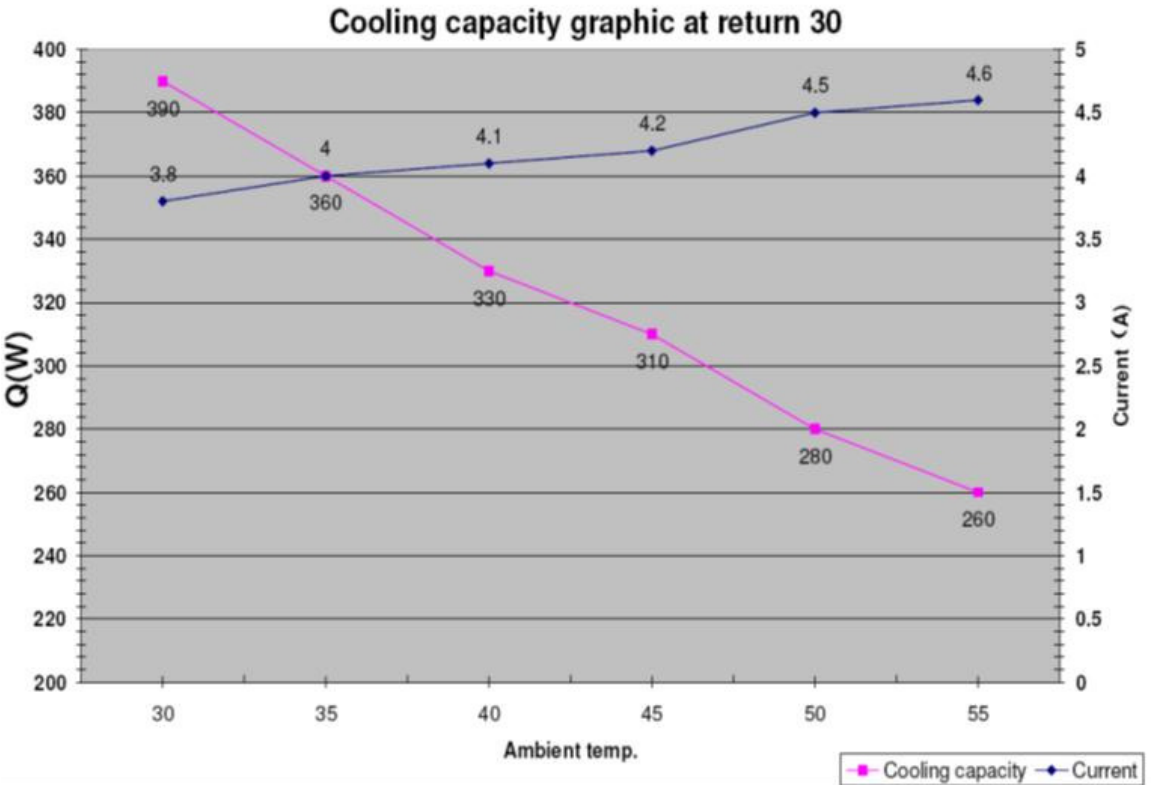
风扇是由塑料，金属和内部的 PCB 组成。它们可以进行循环利用,应当送到当地的废弃物经销商

Metal parts 钣金件

The metal parts are uncritical to scrap and can be left to local “scrap dealer”. A few parts might have a thin visible layer of PVC-foam insulation. In that case the PVC should be separated from the metal part and scrapped separately.

钣金件的废弃要求不高，可以送到当地的废弃物经销商，零件可能有微小的可见绝缘层，在某种程度上，绝缘层应当与钣金和循环利用单独分开。

9 performance 性能曲线



10 spare parts list 备件清单

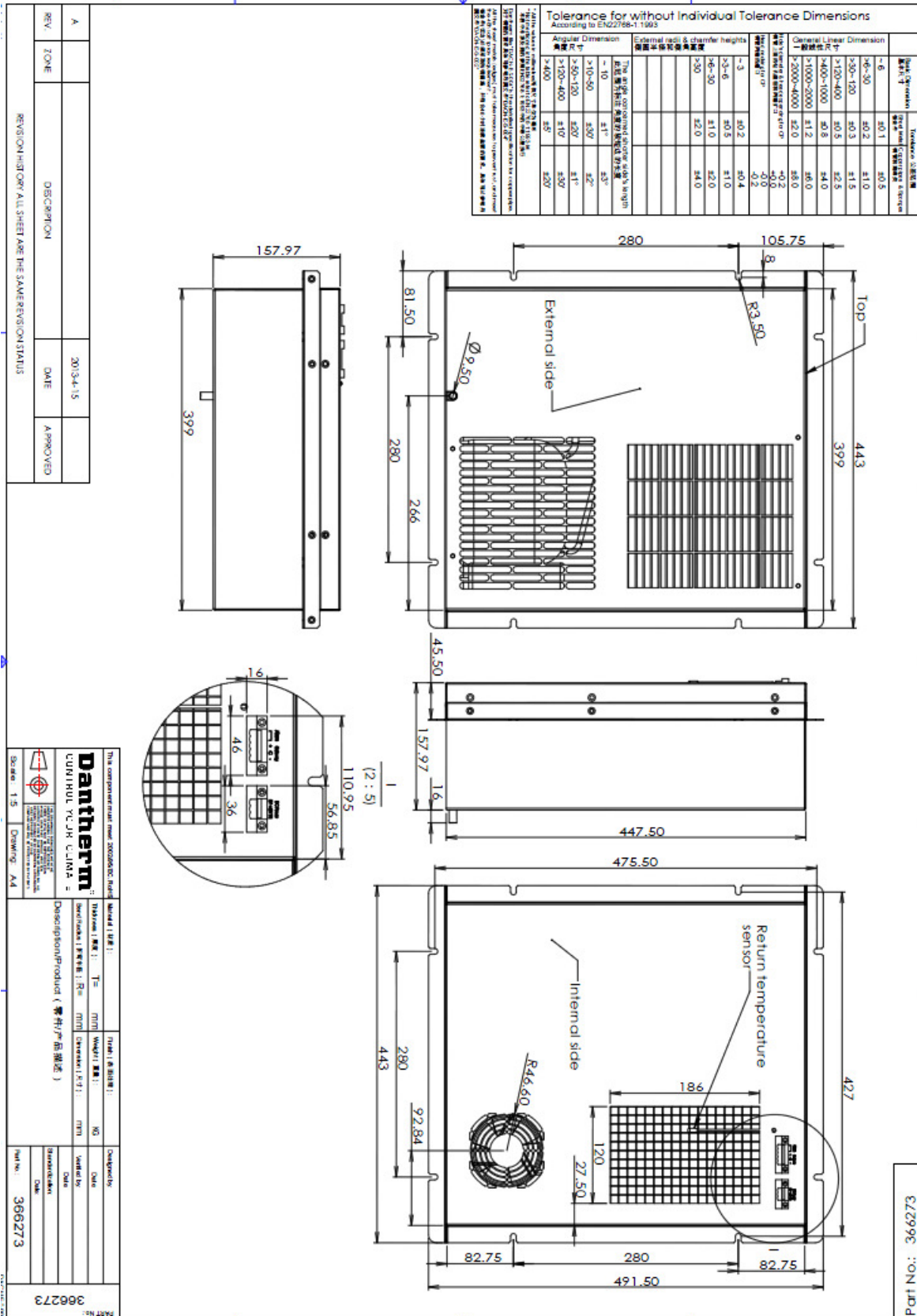
If you want to replace the spare parts, please accorded to the following table and contact with service to purchase.

如果您需要更换备件，请按照下表联系丹腾售后进行采购。

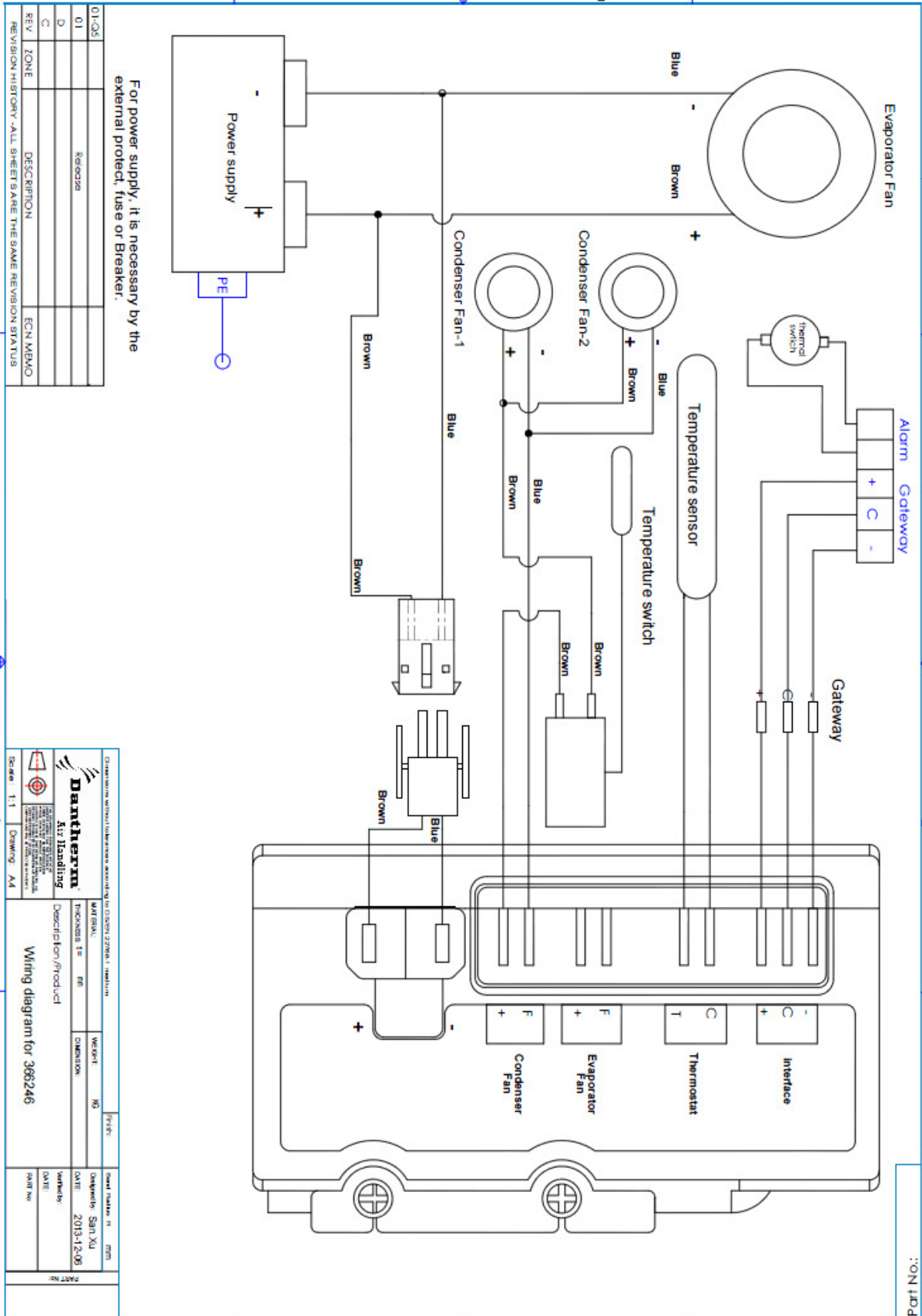
NO.	Supplier	P/N	Name	Quantity	Picture
1		220455	Internal fan 内风扇	1	
2		220455	External fan 外风扇	2	

11 Model drawings and wire diagram 尺寸图与电路图

11.1 Model drawings 尺寸图



11.2 Wiring diagram 接线图



12 Hotline helps 热线帮助

The service department of Dantherm is ready to help in case of a problem. Please help yourself and us by having the following information's prepared before making the call.

Your name: _____ Company name: _____

Country: _____ Site/Location: _____

Phone No.: _____ E-mail (if possible): _____

Unit model: _____ Unit part No.: _____

Unit serial No.: _____

Description of problem: _____

Then call +86 0512 66678500 and ask for the service department or fax +86 0512 66678501, help will be provided as soon as possible.

丹腾的售后服务会帮助解决一些问题. 但是在这之前请先填写下面的一些信息:

名字: _____ 公司名称: _____

国家: _____ 地点: _____

电话号码.: _____ E-mail : _____

产品型号: _____ 部件编号.: _____

机器序列号.: _____

故障描述: _____

请拨打电话+86 0512 66678500 或者发送传真+86 0512 66678501 通知售后提供帮助, 我们会尽快为您解答。