

专注制冷

50 年

Dedicated to refrigeration for 50 years.

PRECISION AIR COOLING UNIT

PAC医用精密空调

OPTIMAL SOLUTION FOR REFRIGERATION
OF MEDICAL IMAGE ROOM

医疗影像机房制冷 最优解决方案

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PRODUCT OVERVIEW

产品概述 ///

- 本系列精密空调是针对大型影像设备 CT、MRI 机房设计开发的一款空调产品。
 - 标配为恒温恒湿机型，配备有电加热器、加湿器。可选配紫外线杀菌模块。
 - 具备前风帽上送风、风管上送风、地板下送风等多种气流组织形式。
 - 使用 R410A 和 R407C 环保冷媒。
 - 我们也为客户提供量身定制制冷解决方案，使客户的设备能在东南亚一些高温和低温的极端环境下正常工作，从而满足最终用户对更高制冷系数、更高能效比、更低故障率的产品需求。
- This series of precision air cooling units is specially designed and developed for machine rooms of large medical imaging CT and MRI.
 - The standard unit is equipped with electrical heater and humidifier to ensure a constant temperature and moisture level. It could be equipped with ultraviolet rays for disinfection of bacteria as an option.
 - The airflow can be supplied from multiple outlets, from the top and the bottom.
 - Environmentally friendly refrigerants of R410A and R407C are being used.
 - We also provide our customers with tailor-made cooling solutions, enabling their machines to work even under extreme conditions (high ambient and low ambient) found in Southeast Asia to meet end customers' requirements on higher COP's and EER values, less breakdowns for products.



APPLICATION ENVIRONMENT

MRI系统专用精密空调适用场合



大型影像设备制冷解决方案
Solution for large medical
imaging equipment



CT 和 MRI
专用制冷解决方案
Specialized cooling solution
for CT, MRI



对温湿度有一定要求的
中、大型设备间
Large equipment rooms, which have strict
requirements on temperature and moisture

FEATURES

精密空调的特点

- 大风量、小焓差设计，适合机房主设备散热特点。
 - 高显热比、高效率的制冷系统设计。
 - 高可靠、超长寿命设计：24 小时365 天不间断运行设计，设计寿命为10 年。
 - 标准室外机可适应室外-15° C 环境温度，最高温度可适应室外45°C 环境温度。
 - 极强的电源适应能力：超宽输入电压适应范围380V±10%，具备缺相保护、提示和告警功能。
 - 根据MRI 房间空气中的细菌数量，启动杀菌功能。
 - 强大的控制与通讯功能，选配RS485 监控接口，支持 Modbus 通讯协议。具备轮值、远程开关机、群控、后台监控等功能。
 - 机组采用“/”型蒸发器，可在更小的机组尺寸内实现更大的换热面积，换热效率高，且节省占地空间。
 - 灵活、强大的定制化设计能力，可以全面覆盖市场的不同需求。
- Large air volume, small enthalpy difference, suitable for heat dissipation for the major facilities in machine room.
 - Meticulous designed refrigeration system for higher sensible heat ratio and energy efficiency.
 - High reliability and long service life; 24-hour-operation, and 365 days continuous operation throughout a year for 10 years projected lifetime.
 - Standard outdoor unit can be workable at ambient temperatures between-15 C to 45 C.
 - Strong adaptability of power supply: input voltage 380V±10% with phase loss protection, prompt and alarm functions.
 - Ultraviolet ray sterilization would be activated according to bacteria quantity in the air of equipment room.
 - Powerful control and communication capabilities. Adopting RS485 as an optional interface, the unit supports Modbus communication protocol for functions such as rotation, remote switch, group control, background monitoring, etc.
 - “/” shaped evaporator is used, which can achieve a larger-heat exchange area in a smaller unit size and lead to high-heat exchange efficiency and more space being saved.
 - Flexible and powerful customized designs can fully cover various needs of the market.

24 hours 10 years



HIGH SENSIBLE HEAT RATIO 高显热比

机房内电子设备释放出大量的显热，本系列精密空调针对机房特点实现0.9以上的高显热比。

Specially designed for facilities in machine room, which release a large amount of sensible heat, this series of precision air conditioners achieve a high sensible heat ratio of 0.9 or more based on the characteristics of the computer room.

HIGH ENERGY EFFICIENCY 高能效比

- 系统采取吸风设计，充分保证了蒸发器表面风速的均匀性，蒸发器的换热效率比吹风设计提升10%，系统风阻比吹风结构降低30%。
- 加湿蒸汽直接送到风机进风口，确保湿蒸汽充分混合，避免出风口的凝露情况。
- 加热布置在风机回风口，确保加热后的气流通过风机进行充分混合，避免出风口的局部热点出现。
- 全年能效比>4.0以上。
- The system adopts an air suction design to fully ensure the uniformity of the surface wind speed of the evaporator. The heat exchange efficiency of the evaporator is 10% higher than that of the blower end, and the system wind resistance is 30% lower than that of the blower structure.
- The humidified steam is directly sent to the air inlet of the fan to ensure that the wet steam is fully mixed and avoid condensation at the air outlet.
- The heating device is placed at the air inlet of fan to ensure the heated air is fully mixed to avoid partial overheating.
- Energy efficient ratio in one whole year >4.0 .

ADVANCED PROGRAMMABLE LOGIC CONTROLLER 先进的可编程逻辑控制器

- 易操作的人性化界面。
- 精确的逻辑控制系统。
- 多级密码保护，防止误操作。
- 记录各主要部件的运行时间。
- 储存多条历史告警信息。
- 具有来电自启动及延时设定功能。
- 参数自动保护，即使停电后也可以保存运行参数和告警记录。
- The user-friendly interface for easy operation.
- Precise logical control system.
- Multi-level password protection to prevent unauthorized operation.
- Record main component operation time.
- Store more messages of history alarming.
- Auto start after power resumption and has delayed setup function.
- Auto record parameters, even after power cut off, the operation parameters and alarming record would also be recorded.



NETWORK ADMINISTRATION 超强网络管理功能

- 标配RS485 监控接口实现远程手机监控。
- 强大的群控功能，可实现16台机组的群控。
- 实现机组自动切换、备份、轮流值班、避免竞争运行等功能。
- 方便的远程开关机和管理功能。
- 远程告警及查询和远程故障处理。
- The standard RS485 interface realizes remote monitoring through mobile phone.
- Powerful group control function realizes group control over 16 units.
- It realizes the functions of automatic switchover, backup, shift duty, and avoiding competition operation.
- Convenient remote switch on and off and management functions.
- Remote alarm and query, and remote troubleshooting.

EASY MAINTENANCE DESIGN 易操作维护的结构设计

机组结构紧凑，只需很小的维修空间及地面空间，机组维护方便易行，安装位置更灵活。

The unit has a compact structure, requiring only a small maintenance space and floor space. The unit is easy to maintain with flexible installation.

HIGH RELIABILITY 高可靠性

机组的主要部件均由国内外知名厂商的供应，包括高效涡旋式压缩机、免维护风机、高精度膨胀阀等等，都是按照每天24小时、全年365天不间断工作而设计制造的，可长时间稳定运行。

All critical components including high efficient scroll compressor, maintenance free fans, high precision expansion valve etc are supplied by famous domestic and international manufacturers who design those components for stable operation in 24-hour operation and 365 days without a stop.

ELECTRICITY CONTROL SUITABLE FOR BAD POWER ENVIRONMENT 适合恶劣电源环境的电控控制

- 为恶劣电源环境专业设计，输入电源电压适应范围为380V±10%。
- 缺相保护、提示、告警功能，避免因缺相导致设备损坏。
- 相序检测、提示、告警、功能，避免因相序反导致烧压缩机。
- Professionally designed for harsh power environment, the input power voltage adaptable range is 380V±10%.
- The lack of phase protection, prompts, and alarm functions can prevent equipment damage due to lack of phase.
- Functions of phase protection, prompt and alarm efficiently avoid device damage caused by fluctuating phase.

ULTRAVIOLET STERILIZING 紫外线杀菌

- 高强度精准254nm光束，可以有效破坏病毒细胞DNA结构，达到快速消杀目的；灯管平均寿命>9000小时，光衰小，后期维护成本低；提供专业配套驱动电源，有效延长紫外灯使用寿命。
- High strength 254nm precise light beam can damage the DNA structure of the virus for rapid sterilization. The average lifetime of light tube is >9000 hours with small decay. Therefore, it has less maintenance cost at later stage with specially made matching drive power to extend service life.



CRITICAL COMPONENTS

主要部件 ///

COMPRESSOR

压缩机

本系列精密空调为了保证系统安全,采用高效涡旋压缩机,高效节能具有可靠性高、噪音低、寿命长、易安装等特点。

For system safety purpose, this series precision air conditioners adopts scroll compressor that has features such as low energy consumption, low noise, longer life and easy installation.



CENTRIFUGAL FAN

离心风机

AC530S 和 AC535S 机组采用无蜗壳设计的后曲叶片离心风机,采用马达直联式驱动,噪音低,振动小。AC540S、AC545S 和 AC550S 采用有蜗壳皮带式传动离心风机。

Backward curve centrifugal fan without volute is applied on AC530S and AC 535S, which can lower the noise and vibration with its motor direct drive. AC5 40S, AC545S and AC550S use volute belt-driven centrifugal fan.

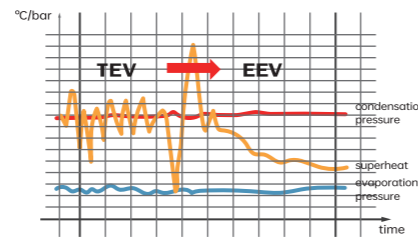


HIGH EFFICIENT AND ENERGY SAVING EXPANSION VALVE

高效节能的膨胀阀

机组采用国际知名品牌膨胀阀,具备控制精度高,调节性能好,可靠性高的特点。可满足机组全天候运行的经济性和持续性。

The unit adopts the internationally famous brand expansion valve, which is famous for high accuracy, easy adjustment and high reliability to meet economical purpose and continuous operation for 24 hours.

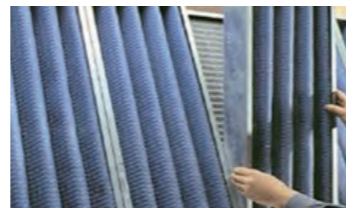


FILTER SCREEN

过滤网

标准机采用双层尼龙滤网或无纺布滤网,方便更换。可以选配效率等级为 G3/G4 (EN779),平均过滤效率达 90% 以上 (ASHRAE52.1-1992),从而有效地保证机房的洁净度。

Standard units use Nylon filter screen in two layers or non-woven filter screen which is easy for replacement. The efficiency grade can be selected with option of G3/G4 (EN779, which has a filtration efficiency rate over 90% (ASHRAE52.1-1992) so as to ensure the cleanliness of equipment room.

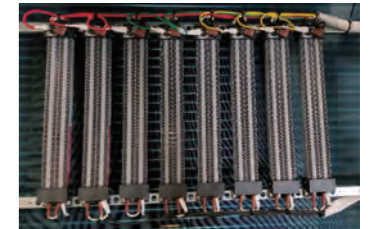


ELECTRIC HEATER

电加热器

采用 PTC 正温度系数陶瓷式电热器,PTCR 热敏陶瓷元件具有热阻小、热交换率高、发热迅速稳定等显著特点。

We use ceramic electric heater of positive temperature coefficient. The components of PTCR thermal sensitive ceramic heater has characteristics of low thermal resistance, high heat exchange efficiency, rapid and stable heating.



HUMIDIFIER

加湿器

配带有独特的可拆卸电极式加湿器。可拆卸滤芯,电极及罐体进行清洗,非专业人士也可进行。对水质无特殊要求,无须事先预处理。

The unique electrode humidifier and filter element are replaceable. Its electrode and tank can be cleaned even by non-professionals. There are no special requirements for water quality and no pre-treatment is required.



EVAPORATOR

蒸发器

采用“/”形式蒸发器,配置亲水铝箔膜,内螺纹铜管,换热效率更高。针对具体机型进行设计和验证的分配器保证冷媒在每个回路分配的均匀性,极大地提高了换热器的效率。

The evaporator is of an “/” type shape with hydrophilic aluminum foil and internal grooved cooper tube to ensure high heat exchange efficiency. The distributor, which is specially designed and verified for individual mode, can guarantee the uniformity of refrigerant distribution in each circulation so as to improve the heating radiation significantly.

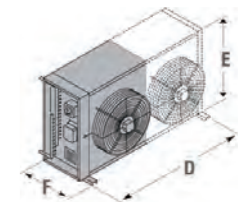


OUTDOOR UNIT

室外机

室外机主要由冷凝器、风机、压力开关、钣金等部件组成室外机采用可垂直和水平安装的形式;运行范围 -15°C~45°C。

Maintaining stable operation in ambient temperature between -15°C to 45°C, the outdoor unit mainly consists of condenser, fan motor, pressure switch and metal sheet, which can be installed vertically or horizontally.



INSTALLATION REQUIREMENT

设备安装方案及要求 ///

REQUIREMENT ON MOVING IN 进场要求

- 留给空调进机房现场通道需要满足设备最大尺寸要求：位宽度不小于 1000mm。
- 最大尺寸及机组重量见参数表。
- The entrance for moving into installation site should meet the maximum equipment size requirement with width not smaller than 1000mm.
- The maximum size and unit weight are shown in the parameter table.

INSTALLATION REQUIREMENTS 安装要求

A Ready Unit 机组就位

- 室外机：安装方式可采用室外侧式安装或卧式安装，机组放置于平台上，平台高度不小于 30cm。
- 室内机：根据房间布局摆放在合适位置，且要固定在支架上（由安装单位来制作）。机组正前方预留 60cm 以上空间。
- The outdoor unit can be installed on platform with at least 30cm height sideways or horizontally way.
- Indoor Unit: It should be placed at suitable position according to room layout and fixed on bracket (provided by installation party). 60cm should be left in the front of unit.

C Water draining of indoor unit 室内机排水

- 需要在机组附近提供下水道地漏，如果业主不能提供，业主需要告诉我们排水位置，为了机房安全，建议排水口低于机组底座 100mm，排水管采用 PPR 热水管。
- Water draining of indoor unit: Drainage for water should be provided near to the installation location. If the owner cannot provide it, one water draining site should be given to installation party. The outfall should be lower than the unit base by 100 mm concerning the safety, and PPR hot water pipe should be provided also.

B Water Filling of Indoor Unit 室内机补水

- 需要引一路自来水到室内机机组位置附近。
- One tap water pipe should be led to the area near to indoor unit.

D Refrigeration Copper Pipe 制冷铜管

- 机组铜管穿过静电地板和墙体连接室内外机。
- The copper tubes connecting the outdoor and indoor units need to go through static floor and wall.

PPR
PPR hot water pipe is chosen

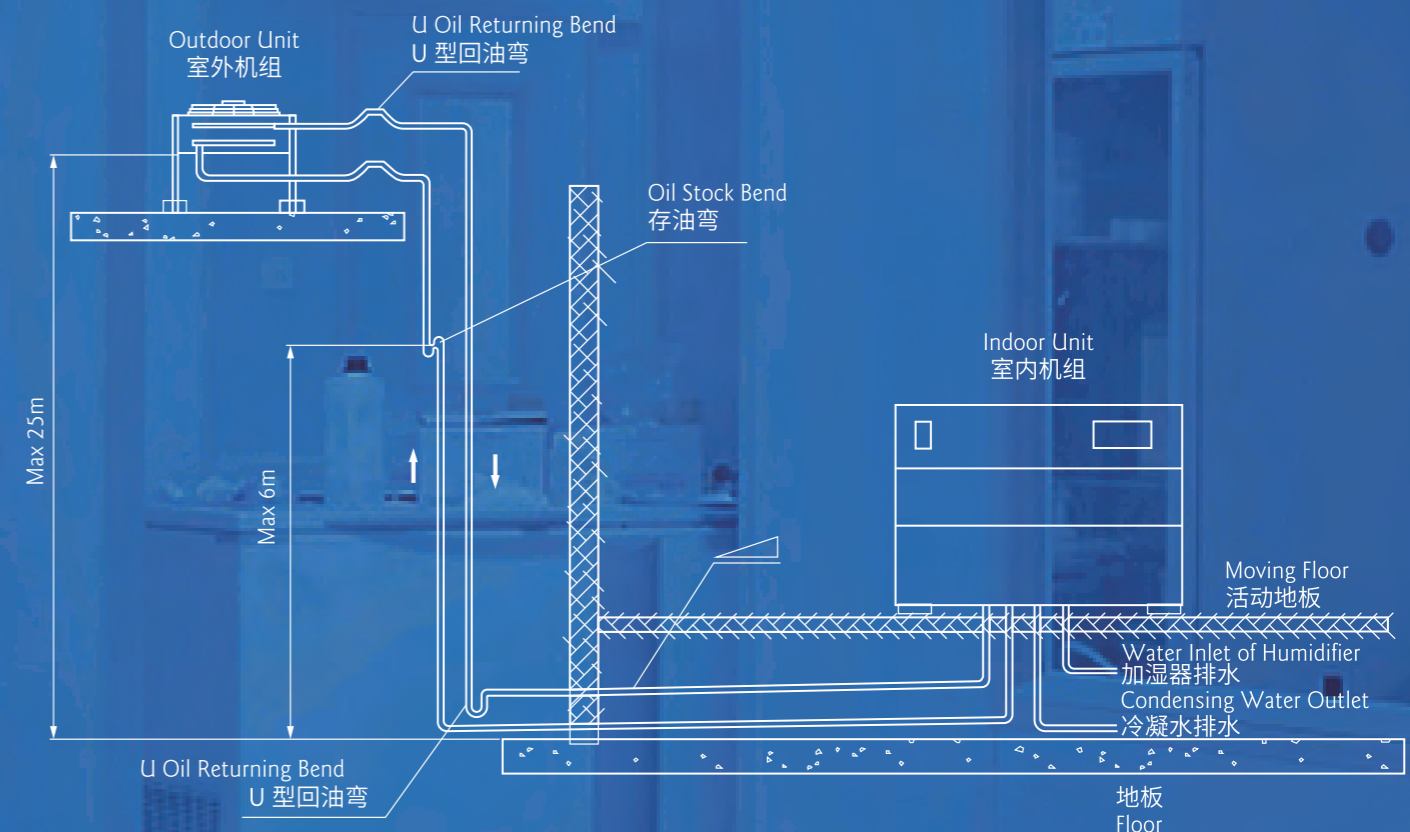
E Unit Power Supply 机组电源

- 室内机：需要 380V 动力电源，配电柜提供给空调的空气开关电流应该不小于设备最大运行电流（一台配备一个空开）。
- 室外机：由我们机组内引电给室外机，连线采用 PVC 管套装，由空调厂家安装自备。
- Indoor unit: 380V power supply is required. The air switch current provided by power cabinet should be not lower than the maximum operation current of equipment (one unit with one air switch).
- Outdoor unit is powered by indoor unit and PVC pipe will be used for connection which is prepared by manufacturer.

F Punch Position 打孔位置

- 业主和安装方共同协商确定所有管线打孔位置。
- The punch position should be confirmed by owner and installation party under agreement of both parties.

INSTALLATION DIAGRAM 安装示意图



Installation Diagram of Indoor Unit in a Higher Position than Outdoor Unit
室外机高于室内机的安装示意图

TECHNICAL SPECIFICATION

技术参数表 ///

机组型号 Unit Model	AC530S	AC535S	AC540S	AC545S	AC550S	
供电电源 Power	380V/3N~/50HZ					
总冷量 Total Cooling Capacity	kW	30	35	39.2	43.1	50.6
显冷量 Sensible Cooling Capacity	kW	27.3	31.5	35.3	38.8	45.5
风机数量 Fan Motor Qty	台	1	1	3	3	4
循环风量 Circulating Air Volume	m³/h	9650	9650	10500	10500	14000
最大机外余压 Maximum Excess Pressure of Outdoor Unit	Pa	150	150	250	250	200
风机功率 Fan Motor Power	kW	1.46	1.46	3×0.75	3×0.75	4×1.1
压缩机形式 Compressor Mode	涡旋式定频压缩机 Scroll constant frequency compressor					
压缩机数量 Compressor Qty		2	2	2	2	2
额定蒸汽产生量 Rated Steam Volume	Kg/h	5	5	8	8	8
加湿器额定功率 Rated Power Of Humidifier	kW	3.75	3.75	6	6	6
电加热器 Electric Heater	kW	9	9	12	12	18
制冷剂 Refrigerant		R410A	R410A	R407C	R407C	R407C

• 本参数表为默认加湿 / 加热量, 如果需要选配其他加湿量 / 加热量需要非标选择。

This technical specification is based on default humidification/heating volume. If optional humidification/heating volume is required, non-standard option will be made.

• 送风方式“T”为上送风, “U”为下送风, “S”为标准机型, “D”为带有杀毒功能的机组。

Air supply mode: T stands for air supply from top; U stands for air supply from under part; S stands for standard unit; D stands for unit owing disinfection function.

机组型号 Model		AC530S	AC535S	AC540S	AC545S	AC550S	
内机参数 Indoor Unit Parameters	长 Length	mm	1320	1320	1760	1760	2200
	宽 Width	mm	890	890	840	840	840
	高 Height	mm	1960	1960	1950	1950	1950
	重量 Weight	Kg	425	440	520	530	700
	气管 / 液管 Air Pipe/ Fluid Pipe	mm	2X16/2X12	2X16/2X12	2X22/2X16	2X22/2X16	2X22/2X16
	冷凝水排水 Condenser Water Outlet	mm	22	22	22	22	22
外机参数 Outdoor Unit Parameters	室外机型号 Outdoor Unit Model		2*CS5	2*CS08	2*CS08	2*CS08	2*CS10
	室外机数量 Outdoor Unit Qty	台	2	2	2	2	2
	室外机风机风量 Air Volume Of Outdoor Unit Fan	m³/h	2*6900	2*10600	2*10600	2*10600	2*10100
	输入功率 Input Power	kW	2*0.45	2*0.76	2*0.76	2*0.76	2*0.78
	风机总电流 Total Fan Motor Current	A	2*2.1	2*3.5	2*3.5	2*3.5	2*3.6
	运输重量 Transportation Weight	Kg	2*87	2*117	2*117	2*117	2*123
	长 Length	mm	1180	1422	1422	1422	1422
	宽 Width	mm	640	545	545	545	545
	高 Height	mm	890	1098	1098	1098	1098
	重量 Weight	Kg	2*74	2*99	2*99	2*99	2*105
气管 / 液管 Air Pipe/ Fluid Pipe	mm	16/12	16/12	22/16	22/16	22/16	

• 最大运行功率和电流指的是: 按上述参数表配置, 在使用环境温度 45°C 时, 风机全速运行时的功率和电流。

Maximum operation power and current means the power when fan is fully operating at ambient temperature of 45°C according to above technical specification.