



CHILLERS
制冷机组系列
A4

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机电设备安装工程专业承包壹级资质
The First-grade Certification of Electromechanical Equipment Installation
ISO9001质量管理体系认证
Certified by ISO9001 quality system
ISO14001环境管理体系认证
Certified by ISO14001 environment system
首批荣获国家质检总局颁发全国工业产品生产许可证
First got the refrigeration equipment
production permit issued by National Quality Testing Bureau

Air Cooled Cold/hot Water Chiller

风冷冷（热）水机组



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We knew the world before, the world knows us now.

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中国德州亚太集团

DEZHOU YATAI GROUP

CHINA

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亚太的品牌理念

全力推动创新科技的应用

致力于人类生活品质的提升、让科技引领生活

创世界满意品牌

THE CONCEPT OF YATAI BRAND

Promotes,with full strength,the application of innovative technology.Strives for the extension of living quality for human being,let the science and technology lead the new life and creates world satisfactory brand.

全球信赖品质

World Trusted Quality



德州亚太集团是国内大型中央空调制冷系统集成供应商。

集多年潜心研究，博采众长自成体系，打造出一流的中央空调全套设备和众多精品工程。国内以中央电视台新址、酒泉卫星发射中心、国家质检总局、三峡工程及近二十个北京奥运场馆等为代表，国外以巴基斯坦乌奇电厂、柬埔寨金边市大都会广场、印度帕帕多拉工程为代表的重点项目，采用了亚太中央空调设备，长期稳定，节能环保，获得了广泛的赞誉。

ISO9001、14001、OHSAS18001、3C、UL、CE、CRAA 等一系列认证；主机列入节能产品政府采购清单、数十项国家专利、国家级高新技术企业、中国驰名商标，充分标明了亚太集团的管理水平和产品水平。

与荷兰阿波罗合资，以欧洲标准制造的洁净设备全部返销发达国家、中央空调设备相继进入十几个国家和地区，展示亚太集团已经步出国门，与国际接轨。

植根齐鲁大地，秉持“以人为本”的经营理念，崇尚“以德待人”的儒家文化，亚太集团愿与您共同开创明天的辉煌。

Dezhou Yatai Group is a supplier of large central air conditioning and refrigeration system in China.

Yatai has developed whole set of advanced central air conditioner and lots of wonderful projects based on long-term research and features of the others. Many famous projects adopted Yatai central air conditioners that run smoothly, save energy, protect environment and won good reputation widely like the New CCTV, the Jiuquan Satellite Launching Center, the General Bureau of National Quality Inspection, Three-gorge Engineering Project, over 20 Beijing Olympic Stadiums and others in China; the UCH Power Plant in Pakistan, the Phnom Penh Capital Squire in Cambodia, the Priyadarshini Jurala Project in India and others across the world.

Yatai has certified by ISO9001, 14001, OHSAS18001, 3C, UL, CE, CRAA and others; its chiller names have been put on the government purchasing list as energy saving products and obtained dozens of national patents, National High-technology Enterprise and Chinese Famous Trademark, which show the managements and product qualities of Yatai Group.

The filtering equipment made by the joint venture, co-invested with Dutch Afpro Company, according to the European Standards air exported fully to the developed countries; the central air conditioners have exported to over 10 countries or regions, which show that Yatai Group has stepped into oversea market and been in the line with the international.

Located at Shandong Province, insisting on business idea of "humanism" and advocating the Confucianism of "getting along with people by morality" Yatai Group wishes to create a brilliant future with you.



中国德州亚太集团
CHINA DEZHOU YATAI GROUP



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Developing the omni-directional products by the first-class technology

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Using high-quality goods Making high-quality goods

The modernized equipment produced by world famous manufacturers And the high content leading in the same profession
Are Yatai's guarantee of maintaining his competitive advantage all the time

全球信赖品质

World Trusted Quality



机电设备安装工程专业承包壹级资质
The First-grade Certification of Electromechanical Equipment Installation
ISO9001质量管理体系认证
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First got the refrigeration equipment
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Honorable Qualification



CHILLERS

制冷机组系列

Air Cooled Cold/hot Water Chiller

风冷冷(热)水机组

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水冷冷水机组
Water-cooling chiller system



地下环路式（地埋管）水源热泵机组
Underground water circuit (embedded pipeline) water source heat pump units



地下水式水源热泵
Underground water circulating type Water source heat pump



风冷冷(热)水机组
Air Cooled Cold/hot Water Chiller



超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Cold/hot Water Chiller

产品概述

Product Outline



亚太牌风冷冷（热）水机组是在充分吸收国内外空调领域最新发展技术的基础上研制开发的成熟定型产品，是山东德州亚太集团有限公司研制开发的系列中央空调系列产品之一。

亚太牌风冷热水机组主要包括整体式风冷螺杆冷（热）水机组和模块式风冷冷（热）水机组，该系列机组以空气为冷（热）源，以水为供冷（热）介质，为用户提供舒适的生活环境或适宜的工艺环境。因其能效高、噪音低、结构合理、操作简便、运行安全、安装维护方便等突出优点受到国内外制冷行业的瞩目，从而被广泛应用于宾馆、商场、办公楼、展览馆、机场、体育馆等公共设施的舒适性中央空调系统以及电子、制药、生物、轻纺、化工、冶金、制药、电力、机械等行业的工艺性空调系统之中。

风冷冷（热）水机组按功能可划分为单冷型和热泵型两种类型，其中热泵型风冷热水机组集制冷、供热功能于一身，既可实现夏季降温，又可实现冬季供热，因此广泛应用于冬季有采暖需要，但又无供热锅炉或供热热网的空调场所，并成为暖通空调工程设计中首选设备方案。

该系列机组可与风机盘管、柜式空气处理机、吊顶式空气处理机、新风机组、组合式空气处理机等空调末端设备一起组成半集中式或集中式中央空调系统。该系列机组无需建造机房，可直接放在建筑物屋顶、裙楼平台或水平地面上，安全而洁净，没有冷却水系统，因而省却了冷却塔、冷却水泵以及相应的管道系统等许多附件，系统结构简单，管理维护方便，尤其适合缺水地区使用。

Yatai air cooled cold/hot water chiller is a sophisticated and approved product by borrowing most advanced technologies home and abroad, and one of the serial central air conditioning researched and developed by Dezhou Yatai Group Co., Ltd..

Yatai air cooled cold/hot water chiller consists of packaged air cooled screw cold/hot water chiller and modular air cooled cold/hot water chiller. This serial chillers take air as cold/hot source, take water as cooling/heating medium to create a comfortable living or technology environment for customers. It has attracted worldwide attention for its outstanding features like high efficiency, low noise, reasonable structure, easy operation, safe running, easy installation and maintenance and so on, thus is applied on a wide scale to communal facilities as comfortable air conditioning such as hotel, shopping mall, office building, exhibition hall, air port, gymnasium and to industries as technology air conditioning such as electricity, pharmaceutical, biology, textile, chemical, metallurgy, electric power, mechanical and so on.

Air cooled cold/hot water chiller can be divided into cooling only type and heat pump type according to its function, among of them, the heat pump type chiller ont only cooling in summer but also heating in winter, thus it can be applied on a wide scale to places where heating is necessary in winter but no boiler or heating net-work, and is preferable when designing HVACR projects This serial chiller can co-work with other terminal units and become into a half centralized or centralized air conditioning system such as fan coil units, cabinet air handling units, ceiling air handling units, fresh air units, combined air handling units and so on.

This serial chiller can be fixed on building rooftop or ground directly, special machine house is unnecessary. Its structure is very simple, and no cooling tower, cooling pump and other accessories. It is more suitable for water deficient regions.



型号规格汇总

Summary of Model and Specification

机组型号 Model			制冷量 Cooling capacity			制热量 (单冷型无此项) Heating capacity(Except cooling only type)			冷(热)水 流量 Cold/hot water flow rate	外形尺寸 Outline size	机组重量 Weight
			kW	10 ⁴ Kal/h	RT	kW	10 ⁴ Kal/h	RT	m ³ /h	mm	kg
模块系列 Modular series	常规制冷剂 Conventional refrigerant	YFM-U-(R)-60	68	5.84	19.32	70	6.02	19.91	12	1056×2110×1830	800
		YFM-U-(R)-120	136	11.68	38.65	140	12.04	39.82	23	2460×2110×1830	1600
		YFM-U-(R)-180	204	17.53	57.97	210	18.06	59.73	35	3830×2110×1830	2400
		YFM-U-(R)-240	272	23.37	77.29	280	24.08	79.64	47	5200×2110×1830	3200
		YFM-U-(R)-300	340	29.21	96.62	350	30.09	99.54	58	6570×2110×1830	4000
		YFM-U-(R)-360	408	35.05	115.94	420	36.11	119.45	70	7940×2110×1830	4800
		YFM-U-(R)-420	476	40.89	135.26	490	42.13	139.36	82	9310×2110×1830	5600
		YFM-U-(R)-480	544	46.73	154.58	560	48.15	159.27	93	10680×2110×1830	6400
		YFM-V-60	68	5.84	19.32	/	/	/	12	1056×2110×1830	800
		YFM-V-120	136	11.68	38.65	/	/	/	23	2460×2110×1830	1600
		YFM-V-180	204	17.53	57.97	/	/	/	35	3830×2110×1830	2400
		YFM-V-240	272	23.37	77.29	/	/	/	47	5200×2110×1830	3200
		YFM-V-300	340	29.21	96.62	/	/	/	58	6570×2110×1830	4000
		YFM-V-360	408	35.05	115.94	/	/	/	70	7940×2110×1830	4800
		YFM-V-420	476	40.89	135.26	/	/	/	82	9310×2110×1830	5600
		YFM-V-480	544	46.73	154.58	/	/	/	93	10680×2110×1830	6400
	环保制冷剂 Environment friendly refrigerant	YFM-U-(R)-60C	65	5.59	18.49	67	5.76	19.04	11	1056×2475×2000	900
		YFM-U-(R)-120C	130	11.18	36.97	134	11.52	38.09	22	2460×2475×2000	1800
		YFM-U-(R)-180C	195	16.77	55.46	201	17.27	57.12	34	3830×2475×2000	2700
		YFM-U-(R)-240C	260	22.36	73.95	268	23.02	76.16	45	5200×2475×2000	3600
		YFM-U-(R)-300C	325	27.94	92.43	335	28.78	95.20	56	6570×2475×2000	4500
		YFM-U-(R)-360C	390	33.53	110.92	402	34.54	114.24	67	7940×2475×2000	5400
		YFM-U-(R)-420C	455	39.12	129.41	469	40.29	133.28	78	9310×2475×2000	6300
		YFM-U-(R)-480C	520	44.71	147.90	536	46.05	152.32	89	10680×2475×2000	7200
		YFM-V-(R)-60A	68	5.84	19.32	70	6.02	19.91	12	1200×2356×1970	800
		YFM-V-(R)-120A	136	11.68	38.65	140	12.04	39.82	23	2748×2356×1970	1600
		YFM-V-(R)-180A	204	17.53	57.97	210	18.06	59.73	35	4296×2356×1970	2400
		YFM-V-(R)-240A	272	23.37	77.29	280	24.08	79.64	47	5844×2356×1970	3200
		YFM-V-(R)-300A	340	29.21	96.62	350	30.09	99.54	58	7392×2356×1970	4000
		YFM-V-(R)-360A	408	35.05	115.94	420	36.11	119.45	70	8940×2356×1970	4800
		YFM-V-(R)-420A	476	40.89	135.26	490	42.13	139.36	82	10488×2356×1970	5600
		YFM-V-(R)-480A	544	46.73	154.58	560	48.15	159.27	93	12036×2356×1970	6400



水冷冷水机组
Water-cooling chiller system



地下环路式（地埋管）水源热泵机组
Underground water circuit (embedded pipeline) water source heat pump units



地下式水式水源热泵
Underground water circulating type Water source heat pump



风冷冷(热)水机组
Air Cooled Cold/Hot Water Chiller



超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Cold/Hot Water Chiller

型号规格汇总

Summary of Model and Specification

机组型号 Model			制冷量 Cooling capacity			制热量（单冷型无此项） Heating capacity(Except cooling only type)			冷(热)水 流量 Cold/hot water flow rate	外形尺寸 Outline size	机组重量 Weight
			kW	10 ⁴ Kal/h	RT	kW	10 ⁴ Kal/h	RT	m ³ /h	mm	kg
Modular series 模块系列	Conventional refrigerant 常规制冷剂	LSBLG(R)F-150Z	151	12.98	42.92	157	13.48	44.60	26	2302 × 2170 × 2307	2250
		LSBLG(R)F-180Z	183	15.74	52.05	192	16.51	54.61	31	2650 × 2170 × 2307	2400
		LSBLG(R)F-220Z	218	18.74	61.99	227	19.54	64.62	37	3023 × 2170 × 2307	2570
		LSBLG(R)F-250Z	254	21.86	72.30	262	22.56	74.63	44	3480 × 2170 × 2307	2950
		LSBLG(R)F-280Z	283	24.36	80.59	294	25.31	83.73	49	3480 × 2170 × 2500	3320
		LSBLG(R)F-350Z	351	30.16	99.76	368	31.64	104.66	60	3880 × 2170 × 2500	4500
		LSBLG(R)F-380Z	388	33.37	110.38	403	34.67	114.68	67	4176 × 2170 × 2500	4750
		LSBLG(R)F-420Z	424	36.45	120.58	445	38.25	126.51	73	5800 × 2170 × 2500	4920
		LSBLG(R)F-450Z	454	39.07	129.23	474	40.72	134.70	78	5800 × 2170 × 2500	4920
		LSBLG(R)F-500Z	502	43.18	142.83	518	44.57	147.44	86	6800 × 2170 × 2500	4970
		LSBLG(R)F-560Z	564	48.46	160.31	586	50.35	166.55	97	6800 × 2170 × 2500	5670
		LSBLG(R)F-700Z	705	60.58	200.38	739	63.56	210.24	121	7400 × 2170 × 2500	5720
	Environment friendly refrigerant 环保制冷剂	LSBLG(R)F-150ZA	153	13.16	43.52	156	13.41	44.37	26	2650 × 2170 × 2307	2700
		LSBLG(R)F-180ZA	184	15.82	52.33	190	16.32	53.99	32	3023 × 2170 × 2307	2880
		LSBLG(R)F-220ZA	225	19.35	63.99	233	20.01	66.20	39	3480 × 2170 × 2307	3084
		LSBLG(R)F-250ZA	255	21.93	72.53	263	22.61	74.80	44	3480 × 2170 × 2500	3540
		LSBLG(R)F-280ZA	285	24.51	81.06	294	25.29	83.66	49	3880 × 2170 × 2500	3984
		LSBLG(R)F-300ZA	315	27.09	89.59	326	28.02	92.67	54	4176 × 2170 × 2500	5400
		LSBLG(R)F-350ZA	356	30.61	101.25	368	31.62	104.58	61	5800 × 2170 × 2500	5700
		LSBLG(R)F-400ZA	415	35.68	118.03	430	36.99	122.37	71	5800 × 2170 × 2500	5904
		LSBLG(R)F-440ZA	450	38.69	127.99	463	39.84	131.77	77	6800 × 2170 × 2500	5904
		LSBLG(R)F-500ZA	510	43.85	145.05	526	45.25	149.68	88	6800 × 2170 × 2500	5964
		LSBLG(R)F-560ZA	570	49.01	162.12	580	49.90	165.06	98	7400 × 2170 × 2500	6804
		LSBLG(R)F-600ZA	599	51.53	170.46	615	52.88	174.93	103	8352 × 2170 × 2500	6864
		LSBLG(R)F-700ZA	712	61.22	202.50	713	61.33	202.86	122	9000 × 2170 × 2500	6720



产品型号规格命名

Nomenclature of Model and Specification

Y FM - U(V) - R - □ □

制冷剂代号: C-R407C、A-410A、R22不予标注
Refrigerant code: C-R407C, A-410A, no code for R22

名义制冷量: 单位kW
Nominal cooling capacity: Unit kW

热泵型机组, 单冷型不表示
Heat pump type, no code for cooling only type

UVW: 冷凝器结构
UVW: Condenser structure

风冷模块机组
Air cooled modular chiller

亚太集团
Yatai group

L S BLG R F - □ Z □

制冷剂: A表示制冷剂为R134a, R22不予表示
Refrigerant: A means refrigerant is R134a, R22 No code.

结构类型: Z-整体式, M-模块式
Structure type: Z-Packaged, M-Modular.

名义制冷量: 单位为kW
Nominal cooling capacity: Unit is kW.

冷凝器冷却方式: F表示风冷式
Condenser cooling type: F Means air cooled.

机组类型: R表示热泵型, 单冷不表示
Chiller type: R means heat pump type, cooling only type no code.

压缩机类型: BLG表示半封闭双螺杆式压缩机
Compressor type: BLG means half-closed double screw .

载冷剂: S表示载冷剂为水
Cooling medium: S means cooling medium is water.

类型: L-冷水机组
Type: L means cold water chiller.

产品介绍

Product Introduction

1. 选择范围广

- ▲ 本系列机组制冷(热)量从60kW~1750kW有多种规格可供选择。
- ▲ 每种规格机组均有单冷型与热泵型。
- ▲ 有整体式结构机组和模块式结构可以供用户选择。
- ▲ 每种规格机组均有标准型与豪华型两种电脑控制方式。
- ▲ 可根据用户的特殊要求, 提供辅助电加热器、内置水泵、水流开关等功能性器件。
- ▲ 可承接低水温型的乙二醇风冷冷水机组、风冷压缩冷凝机组等非标产品, 非标产品请来电来函咨询。

2. 机组能效比高, 能量消耗少, 运行费用低

亚太集团精选国际知名品牌的高能效比半封闭式螺杆压缩机、冷凝风机和制冷系统配件, 运用最新空调技术和控制技术进行优化设计, 采用先进的加工设备精心制造, 经过亚太集团先进的国家级机组性能试验室的严格检测, 合格后方能出厂, 从根本上确保了亚



太牌风冷冷（热）水机组的节能性和可靠性，提高了机组对各种可能发生的恶劣工况的适应性，减缓了热泵型风冷冷热水机组在冬季低温工况制热运行时的能量衰减。

3.安全保护措施齐全

机组均设有温度保护开关、过载继电器、高低压安全开关、水流开关、防冻开关及延时启动等保护装置，确保机组安全可靠运行及设备管理维护简便。

4.模块化设计

多机头机组采用模块组合式结构，提高了机组通用率，使设备的运输、安装、调试与维护更加方便，降低了设备吊运、安装、运行维护费用。

5.超低噪声，运转宁静

- ▲ 采用最新半封闭螺杆压缩机或全封闭涡旋式压缩机，运转平稳，噪声低，振动小。
- ▲ 采用名牌冷凝轴流风机，其叶轮和外转子电机整体式设计，结构简凑，具有良好的空气动力特性，确保风机在较低噪声下高效运转。

6.控制先进、质量稳定、性能可靠

- ▲ 采用先进的微电脑进行智能化控制，全中文显示，操作界面友好，使用者在操作时对机组的运行状况一目了然。
- ▲ 自动化程度高，功能齐全，能实现机组启停程度管理、定时控制、水泵管理、全功能故障报警及故障自我诊断功能等。同时配备RS485/RS232通讯接口，方便用户实现对机组的集中监控和远程监控。
- ▲ 微电脑及电控元件均进口国外著名公司的产品，质量好，控制准确，性能可靠。运用亚太专用技术—热泵型风冷冷（热）水机组软件，更进一步提高了机组热泵运行时的可靠性。
- ▲ 微电脑控制器具有智能除霜，除霜准确有效，避免热量损耗。同时具备故障诊断、能量调节管理、防冻监测、运行模式等多项自动控制功能外，同时机组还配置了高低压、防冻、油温保护、过载保护、相序保护、缺水保护等多重安全保护装置，确保机组运转安全可靠。

7.外形精巧、美观

- ▲ 风冷冷凝器采用倒“M”型布局，提高了空间利用率，增大了风冷冷凝器换热面积，改善了风冷冷凝器气流组织，减小了机组体积。
- ▲ 机组有关部件及系统配管经合理布局，使得机组外观显得清晰、流畅、优雅。
- ▲ 机组壳体采用粉末静电喷塑处理，颜色均匀、恒久。机组外壳色调可根据用户喜好选择；也可以选用不锈钢板做机壳。

8.节省室内建筑空间

- ▲ 机组直接安装于建筑物屋顶、裙楼屋面或室外其它地方，无需设备机房，节省室内建筑空间。
- ▲ 机组采用高效换热器，采用先进的户外型结构设计及系统匹配，机组体积小、重量轻、占地面积小。

9.维护管理方便快捷

- ▲ 机组安装灵活，既可现场控制也可远程或集中控制。
- ▲ 机组内部结构设计合理，其压缩机、制冷配件及电控系统均置于机组下部为开放式结构，维修空间大，人员进出方便，维护保养方便。

1.Wide range for choice

- ▲ As for cooling/heating capacity of this serial chiller, multi-specifications from 60KW to 1750KW are available.
- ▲ For each kind of chiller, both cooling only type and heat pump type can be available.
- ▲ Packaged type and modular type can be available.
- ▲ For each kind of chiller, two kinds of computer control can be available, that is, standard type and deluxe type.
- ▲ Functional components can be offered according to customer's special requirements like auxiliary electric-heater, internal pump, water flow switch and so on.
- ▲ Can undertake the non-standard products like low-water-temperature type glycol air cooled cold water chiller, air cooled compressed condenser and so on. As for the non-standard products, please consult us by telephone.

2.High efficiency, low running cost

Yatai air cooled cold/hot water chiller is equipped with international famous and high efficient components like half-closed screw compressor, condensate fan and other parts, designed optimally by latest AC and its control technology, made elaborately through sophisticated machineries and tested in Yatai national testing labs, only qualified can be delivered, thus guarantee energy saving and reliability of Yatai air cooled cold/hot water chiller, enhance the chiller's adaptability at any kind of bad working condition, reduce the chiller's energy attenuation when heating at low-temperature working condition in winter.

3.Complete safeguard

Many safeguards are equipped like temperature protection switch, over-load relay, high/low pressure safety switch, water flow switch, anti-frost switch, start delay and so on to guarantee the chiller runs safely and reliably and its operation and maintenance are easy.

4.Modular design

As for the multi-compressors type chiller, we design into modular type, thus enhances its universality and lets the transportation, installation, commission and maintenance be easier and reduces costs of lifting, installing and maintaining.

5.Low noise and silent running

- ▲ Equipped with latest half-closed screw compressor or wholly-closed scroll compressor, so it runs smoothly, low noise and little vibration.
- ▲ Equipped with famous brand condensate axis fan, its impeller and the external-rotor motor are integrated together, thus is compact and its aerodynamic properties is good and guarantee the fan can run high efficiently and silently.

6.Advanced controller, stable quality and reliable performance

- ▲ Equipped with advanced micro-computer controoler, displayed in Chinese and English, its operation interface is friendly and is manifest at a glance.
- ▲ High automaticity and complete functions like start/stop management, timing control, pump management, breakdown alarm and fault diagnosis automatically. Meanwhile, RS485/RS232 communication interface is available for centralized or remote monitoring.
- ▲ Equipped with world famous micro-computer and control elements, which is precision and reliable and quality is high. And increases the chiller reliability by making use of Yatai special software and program
- ▲ Micro-computer controller can defrost intelligently and avoid energy loss. It also has lots of features like fault diagnosis, energy control managements, anti-freeze monitoring, running mode but also has multi-safeguards like high/low pressure, anti-freeze, oil temperature, over load, phase order, water-lack and so on, thus guarantee chiller can run safely and reliably.
- 7.Compact and beautiful
 - ▲ Air cooled condenser is fixed like M-upside-down, thus increases its heat exchanging area and improves its air flow organization and reduces its size.
 - ▲ The layout of relative parts and pipeline is reasonable, thus make chiller be more beautiful and graceful.
 - ▲ Chiller house is painted by powder electrostatic, thus its colour is even and enduring. Customer can decide the house colour at will, stainless steel plate is available also.
- 8.Save indoor space
 - ▲ Chiller can be fixed on building rooftop or other outdoor ground, chiller room is unnecessary, thus can save indoor construction space.
- ▲ Equipped with high efficient heat exchanger, chiller adopts advanced outdoor structure and perfect arrangement, thus make it be small, light and its occupied floor area is small.
- 9.Maintenance and management are easy and convenient
 - ▲ Chiller installation is smart, not only realize field control but also remote or centralized.
 - ▲ Chiller internal parts arrangement is reasonable, its compressor, refrigeration parts and electric control system are all at the lower part and are open, thereby its maintenance space is enough.

产品主要器件

Main Components

1.翅片式风冷冷凝器

- ▲ 翅片式风冷冷凝器采用进口高纯度无缝铜管和优质铝翅片经机械胀管，铜管与铝翅片接合紧密，确保翅片式风冷冷凝器发挥出最佳换热效果。
- ▲ 翅片式风冷冷凝器采用倒“M”型布局，一方面提高空间利用率，增大了翅片式风冷冷凝器换热面积，另一方面改善风冷冷凝器气流组织，强化翅片式风冷冷凝器的换热能力，提高了机组的制冷、制热能力。
- ▲ 根据中国国情，针对室外粉尘大的实际情况，采取一些特殊的技术措施改进了翅片式风冷冷凝器的结构，减少了粉尘对翅片式风冷冷凝器换热的影响。

2.壳管式蒸发器

- ▲ 采用管壳式结构，外表采用最新阻燃、防水型的隔热材料保温，水侧工作压力可高达2.4MPa。
- ▲ 蒸发器内设PVC工程塑料挡水板，抗腐蚀能力强。冷冻水沿隔板上下迂回流动，以增加扰流效果提高蒸发器换热能力。蒸发器入口设置特殊设计冷媒均流装置使冷媒在各铜管内分布更为均匀，以提高整套蒸发器的热交换效率。
- ▲ 采用最新DAC波纹状内螺旋高效换热管，强化氟侧换热能力，提高传热系数，以确保机组良好的制冷、制热性能。

3.半封闭螺杆压缩机

机组采用进口半封闭双螺杆压缩机，该类型压缩机具有如下优势：

- ▲ 与活塞机相比，具有转速高，重量轻，体积小，占地面积小以及排气脉动低等一系列优点。
- ▲ 无往复质量惯性力，动力平衡性能好，运转平稳，机座振动小。
- ▲ 结构简单，机件数量少，易损件少。
- ▲ 采用滑阀调节，可实现能量25%~100%范围内四级或无级调节。
- ▲ 对湿行程不敏感，可采用喷油冷却，在相同压比下，排温比活塞式低得多，单级压比高。
- ▲ 稳定性：双螺杆压缩机中没有易损件，无故障运行时间可达4~8万小时。

4.全封闭涡旋式压缩机

YFM-60模块式系列机组选用进口全封闭涡旋式压缩机，能适应低温工况，在较大的温度范围内均可高效运行，系统回油效果好。

5.四通换向阀

亚太牌热泵型风冷冷(热)水机组采用大型单体四通换向阀，解决了其他四通换向阀在大型热泵型风冷冷(热)水机组运用中普遍存在的换向不灵、系统损失大的弊病。





6. 冷凝风机

- ▲ 采用知名品牌高效轴流风机，其外转子电机使用迷宫式密封方式，防护等级达到IP55，使用寿命长且安全可靠。
- ▲ 外转子电机和叶轮组成一个整体进行动、静平衡校正，其紧凑结构设计可确保风机在低噪声下高速运转。
- ▲ 风机叶轮具有空气动力特性，以降低风机噪声。



7. 制冷系统配件

机组所用制冷系统配件全部进口国外名牌厂家的产品，如可拆式干燥过滤器、供液电磁阀，平衡式热力膨胀阀、截止阀、视镜高、低压力控制器、排气温度控制器等均采用世界一流的名牌厂家的产品，确保机组具有较高的性能水平。

8. 微电脑控制器

- ▲ 采用知名品牌的宽温型电器元件，微电脑控制器在 $-10^{\circ}\text{C} \sim 70^{\circ}\text{C}$ 环境温度下能稳定、可靠运行，其CPU芯片更能耐 -40°C 低温环境，以适应热泵机组露天恶劣气候条件。
- ▲ 具有完善的自动控制功能和很强的抗干扰能力，同时还具备多重保护功能。
- ▲ 具备RS-232，RS-485标准通讯接口各一个，能实现本地PC机监控（1000米以内）或通过MODEM实现远程监控。



1. Fin type air cooled condenser

▲ Adopted imported high-purity seamless copper pipe and fine aluminum fin, the copper pipe and the fin can be joined together by expanding the copper pipe mechanically to guarantee heat exchange of the air cooled condenser is wonderful.

▲ Fin type air cooled condenser is fixed like M-upside-down, thus increases the space utilization, and not only increases its heat exchanging area but also improves its air flow organization and enhances chiller cooling and heating capacities.

▲ In view of the existing Chinese situation of more outdoor dust, adopts some special technologies and has improved the fin type air cooled condenser structure, thereby reduce the influence on heat exchanger from the dust.

2. Shell-tube type evaporator

▲ Adopts shell-tube structure, its appearance is wrapped with latest flame-retarded, water-proof insulation material. The running pressure at water side can reach upto 2.4MPa.

▲ Equipped with PVC engineering plastic eliminator inside the evaporator, so its corrosion resistance is good. Chilled water flow a detour along with the spacer to increase vortexes and the evaporator's heat exchange capacity. Equipped with specially designed medium equalization device at evaporator input, thus make medium be distributed in copper pipe more even and increase the evaporator's heat exchange capacity.

▲ Adopts latest DAC corrugated female thread heat exchange pipe, enhanced heat exchange capacity at refrigerant side and increased coefficient of heat transmission to guarantee chiller's cooling/heating capacity is good.

3. Half-closed screw compressor

Adopts imported half-closed double screws compressor, it has the following features:

▲ Have lots of features compared with piston type like high speed, light, small size, low air exhaust pulsation and so on.

▲ No reciprocating mass inertial force, dynamic balance is good, so it runs smoothly and its base vibration is little.

▲ Simple structure, less components and wearing parts.

▲ Adjusted by slide-valve, so can realize 4 steps or stepless regulation from 25% to 100% energy range.

▲ Un-sensible to wet stroke, can adopt oil-spraying for cooling. The exhaust temperature is much lower than that of piston type at the same pressure ratio, single-stage pressure ratio is high.

Stability: Double screw compressor has no wearing part, it can run trouble-free for 40-48 thousands of hours.

4. Wholly-closed scroll compressor

YFM-60 modular serial chiller is equipped with imported wholly-closed scroll compressor, it can run at low temperature condition and can run high efficiently at a wide temperature range, and the system oil return effect is good.

5. 4-ways reversing valve

Yatai heat pump type air cooled cold/hot water chiller is equipped with Independent single 4-ways reversing valve, and solved the problem of un-sensible reversing and big loss of other brand's valves when used at large-sized heat pump type air cooled chillers.

6. Condensate fan

▲ Adopts famous high efficient axis fan, its external rotor motor adopts labyrinth sealing type, its protection class is upto IP55, its serving life is long and safe.

▲ External rotor motor and impeller are integrated into one body to correct the dynamic-static balance. Its compact structure can guarantee the fan runs at high speed and low noise.

▲ Fan impeller has aerodynamic properties, thus can reduce fan noise.

7. Refrigeration parts

All refrigeration parts equipped with chiller are imported from oversea like dismountable dry filter, liquid-supply solenoid, balanced thermal expansion valve, check valve, liquid level view, high/low pressure controller, exhaust temperature controller, thus guarantee our chiller's performance is high.

8. Micro-computer controller

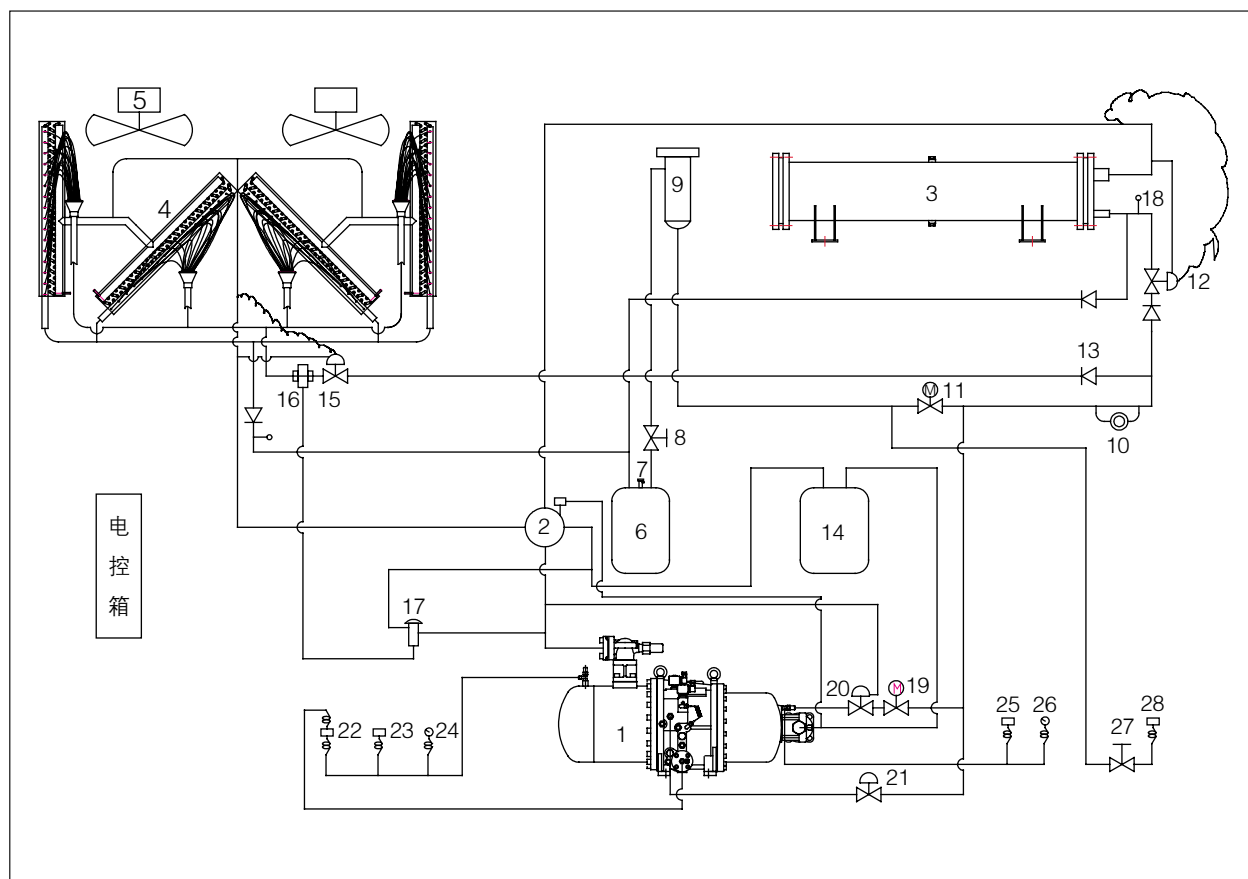
▲ Adopts famous wide-temperature-range type of electric elements, the micro-computer controller can run stably and reliably at $-10^{\circ}\text{C} \sim 70^{\circ}\text{C}$. Its CPU can run at -40°C to make sure chiller can run at bad and outdoor working condition.

▲ Has perfect auto-control and anti-interference capabilities, meanwhile, has multi-protection functions.

▲ Equipped with one RS-232 port and one RS-485 port, can realize field PC monitoring (within 1000m) or remote monitoring by MODEM.

风冷冷(热)水机组系统原理图

Schematic Diagram of Air Cooled Cold/hot Water Chiller



- | | | | | |
|---------------|-----------|----------|----------|---------------|
| 1、螺杆压缩机 | 2、四通换向阀 | 3、干式蒸发器 | 4、翅片冷凝器 | 5、冷凝风机 |
| 6、储液器 | 7、安全阀 | 8、截止阀 | 9、干燥过滤器 | 10、视镜 |
| 11、电磁阀 | 12、制冷膨胀阀 | 13、单向阀 | 14、汽液分离器 | 15、制热膨胀阀 |
| 16、气液混合头 | 17、热气旁通阀 | 18、针阀 | 19、喷液电磁阀 | 20、喷液节流装置 (a) |
| 21、喷液节流装置 (b) | 22、油压差控制器 | 23、高压压控器 | 24、高压氟表 | 25、低压压控器 |
| 26、低压氟表 | 27、直通截止阀 | 28、冷凝压控器 | | |
-
- | | | | | |
|------------------------------------|-----------------------------------|-----------------------------------|------------------------------------|-----------------------------------|
| 1、Screw compressor | 2、4-ways reversing valve | 3、Dry filter | 4、Fin type condenser | 5、Condensate fan |
| 6、Liquid collector | 7、Safety valve | 8、Check valve | 9、Dry filter | 10、Liquid level view |
| 11、Solenoid valve | 12、Cooling expansion valve | 13、One way valve | 14、Gas liquid separator | 15、Heating expansion valve |
| 16、Gas liquid mixer | 17、Hot gas by-pass valve | 18、Liquid spreader solenoid | 19、Liquid spreader expansion valve | 20、High pressure controller |
| 21、High pressure refrigerant gauge | 22、Low pressure controller | 23、Low pressure refrigerant gauge | 24、Through check valve | 25、Condensate pressure controller |
| 26、Needle valve | 27、Straight-through shutoff valve | 28、Condensate pressure controller | | |



水冷冷水机组
Water-cooling chiller system



地下环路式（地埋管）水源热泵机组
Underground water circuit (embedded pipeline) water source heat pump units



地下水式水源热泵
Underground water circulating type Water source heat pump



风冷冷(热)水机组
Air Cooled Cold/hot Water Chiller



超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Cold/hot Water Chiller

风冷冷（热）水机组主要性能参数表

Standard Performance Table of Air Cooled Cold/hot Water Chiller

模块式风冷冷（热）水机组主要性能参数表

Standard performance table of modular air cooled cold/hot water chiller

项目 Item			YFM-U-(R)-							
名称 Name		单位	60	120	180	240	300	360	420	480
制冷 Cooling	制冷量 Cooling capacity	kW	68	136	204	272	340	408	476	544
	能效比 Energy efficiency ratio	W/W	3.16							
制热 (单冷无此项) Except cooling only type)	制热量 Heating capacity	kW	70	140	210	280	349	419	489	559
	能效比 Energy efficiency ratio	W/W	3.25							
压缩机 Compressor	型式 Type		进口全封闭涡旋式压缩机 Imported wholly-closed scroll							
	功率 Power	kW	10.2×2	10.2×4	10.2×6	10.2×8	10.2×10	10.2×12	10.2×14	10.2×16
冷凝风机 Condensate fan	功率 Power	kW	0.55×2	0.55×4	0.55×6	0.55×8	0.55×10	0.55×12	0.55×14	0.55×16
	转速 Speed	r.p.m	725							
蒸发器 Evaporator	水流量 Water flow rate	m³/h	12	23	35	47	58	70	82	93
	阻力 Resistance	kPa	43~44							
	进出管径 Pipe diameter input/output	DN(mm)	50							
制冷剂 Evaporator	种类 Species		R22							
	充注量 Incharged	kg	18	36	54	72	90	108	126	144
噪音 Noise	普通型 Ordinary type	dB(A)	61	62	63	65	65	66	67	67
外形尺寸 Outline size	长 L	mm	1056	2460	3830	5200	6570	7940	9310	10680
	宽 W	mm	2110	2110	2110	2110	2110	2110	2110	2110
	高 H	mm	1830	1830	1830	1830	1830	1830	1830	1830
总电源 Main power supply			3 φ ~380V~50Hz							
总功率 Total power		kW	21.5	43	64.5	86	107.5	129	150.5	172
重量 Weight		kg	800	1600	2400	3200	4000	4800	5600	6400

注：1. 机组制冷量及压缩机的消耗功率标定工况：室外环境干球温度35℃；蒸发器进水温度12℃，出水温度7℃。

2. 机组制热量及压缩机的消耗功率标定工况：室外环境干球温度7℃，湿球温度6℃；冷凝器进水温度40℃，出水温度45℃。

3. 我公司可按用户要求设计相应的非标机型。

4. 所有机型可进行模块化组合，并可根据用户需要提供其他环保制冷剂系列产品。

Note: 1. Calibration working condition of chiller cooling capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 35℃; Water temperature at evaporator input is 12℃, at output is 7℃.

2. Calibration working condition of chiller heating capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 7℃, wet-bulb temperature is 6℃; Water temperature at condenser input is 40℃, at output is 45℃.

3. Our company can design non-standard chillers according to customer requirements.

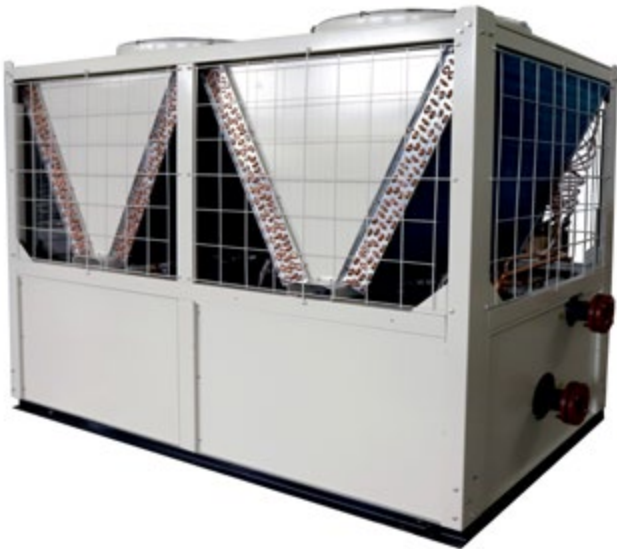
4. All kinds of chillers can be combined modular by modular, and can produce other environment-friendly refrigerant chillers according to customer requirements.

模块式风冷冷热水机组主要性能参数表
Standard performance table of modular air cooled cold/hot water chiller

项目 Item			YFM-W- (R) - ()		
名称 Name		单位 Name	90	130	130D
制冷 Cooling	制冷量 Cooling capacity	kW	102	136	136
	能效比 Energy efficiency ratio	W/W	3.16		
制热 heating	制热量 Heating capacity	kW	105	140	140
	能效比 Energy efficiency ratio	W/W	3.25		
压缩机 Compressor	型式 Type		进口全封闭涡旋式压缩机 Imported wholly-closed scroll		
	功率 Power	kW	10.2 × 3	10.2 × 4	10.2 × 4
冷凝风机 Condensate fan	功率 Power	kW	0.55+1.1	1.1 × 2	1.1 × 2
	转速 Speed	r.p.m	725		
蒸发器 Evaporator	水流量 Water flow rate	m³/h	18	24	24
	阻力 Resistance	kPa	43~44		
	进出管径 Pipe diameter input/output	DN(mm)	65		
制冷剂 Evaporator	种类 Species		R22/R410A		
	充注量 Incharged	kg	27	36	36
噪音 Noise	普通型 Ordinary type	dB(A)	61	62	62
外形尺寸 Outline size	长 L	mm	2207		
	宽 W	mm	1360		
	高 H	mm	1873		
总电源 Main power supply			3 φ ~380V~50Hz		
总功率 Total power		kW	32.3	43	43
重量 Total power		kg	1200	1600	1700

注：1. 机组制冷量及压缩机的消耗功率标定工况：室外环境干球温度 35℃；蒸发器进水温度12℃，出水温度7℃。
2. 机组制热量及压缩机的消耗功率标定工况：室外环境干球温度 7℃，湿球温度6℃；冷凝器进水温度40℃，出水温度45℃。
3. 我公司可按用户要求设计相应的非标机型。
4. 所有机型可进行模块化组合，并可根据用户需要提供其他环保制冷剂系列产品。

Note: 1. Unit refrigeration cold and compressor consumed power calibration condition: outdoor environment dry bulb temperature 35 °C; Evaporator inlet temperature 12 °C, out of the water temperature 7 °C.
2. The heat and the consumed power of compressor unit system calibration condition: outdoor dry bulb temperature 7 °C, environment wet bulb temperature 6 °C; Condenser water inlet temperature 40 °C, the temperature 45 °C.
3. Our company can design corresponding non-standard models according to user requirements.
4. All models can be modular combination, and according to user needs to provide other environmental refrigerant series products.





模块式风冷冷（热）水机组主要性能参数表

Standard performance table of modular air cooled cold/hot water chiller

项目 Item			YFM-U-(R)-()C							
名称 Name		单位	60	120	180	240	300	360	420	480
制冷 Cooling	制冷量 Cooling capacity	kW	65	130	195	260	325	390	455	520
	能效比 Energy efficiency ratio	W/W	3.01							
制热 (单冷无此项) Except cooling only type)	制热量 Heating capacity	kW	67	134	201	268	335	402	469	536
	能效比 Energy efficiency ratio	W/W	3.1							
压缩机 Compressor	型式 Type		进口全封闭涡旋式压缩机 Imported wholly-closed scroll							
	功率 Power	kW	9.7×2	9.7×4	9.7×6	9.7×8	9.7×10	9.7×12	9.7×14	9.7×16
冷凝风机 Condensate fan	功率 Power	kW	1.1×2	1.1×4	1.1×6	1.1×8	1.1×10	1.1×12	1.1×14	1.1×16
	转速 Speed	r.p.m	725							
蒸发器 Evaporator	水流量 Water flow rate	m³/h	11	22	34	45	56	67	78	89
	阻力 Resistance	kPa	43~44							
	进出管径 Pipe diameter input/output	DN(mm)	50							
制冷剂 Evaporator	种类 Species		R407C							
	充注量 Incharged	kg	22	44	66	88	110	132	154	176
噪音 Noise	普通型 Ordinary type	dB(A)	61	62	63	65	65	66	67	67
外形尺寸 Outline size	长 L	mm	1056	2427	3798	5169	6540	7911	9282	10653
	宽 W	mm	2475	2475	2475	2475	2475	2475	2475	2475
	高 H	mm	2000	2000	2000	2000	2000	2000	2000	2000
总电源 Main power supply			3 φ ~380V~50Hz							
总功率 Total power		kW	21.6	43.2	64.8	86.4	108	129.6	151.2	172.8
重量 Weight		kg	900	1800	2700	3600	4500	5400	6300	7200

注：1. 机组制冷量及压缩机的消耗功率标定工况：室外环境干球温度35℃；蒸发器进水温度12℃，出水温度7℃。

2. 机组制热量及压缩机的消耗功率标定工况：室外环境干球温度7℃，湿球温度6℃；冷凝器进水温度40℃，出水温度45℃。

3. 我公司可按用户要求设计相应的非标机型。

4. 所有机型可进行模块化组合，并可根据用户需要提供其他环保制冷剂系列产品。

Note: 1. Calibration working condition of chiller cooling capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 35℃; Water temperature at evaporator input is 12℃, at output is 7℃.

2. Calibration working condition of chiller heating capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 7℃, wet-bulb temperature is 6℃; Water temperature at condenser input is 40℃, at output is 45℃.

3. Our company can design non-standard chillers according to customer requirements.

4. All kinds of chillers can be combined modular by modular, and can produce other environment-friendly refrigerant chillers according to customer requirements.



模块式风冷冷(热)水机组主要性能参数表

Standard performance table of modular air cooled cold/hot water chiller

项目 Item			YFM-V-(R)-()-A							
名称 Name		单位	60	120	180	240	300	360	420	480
制冷 Cooling	制冷量 Cooling capacity	kW	68	136	204	272	340	408	476	544
	能效比 Energy efficiency ratio	W/W	3.01							
制热 (单冷无此项) Except cooling only type)	制热量 Heating capacity	kW	70	140	210	280	350	420	490	560
	能效比 Energy efficiency ratio	W/W	3.1							
压缩机 Compressor	型式 Type		进口全封闭涡旋式压缩机 Imported wholly-closed scroll							
	功率 Power	kW	9.7×2	9.7×4	9.7×6	9.7×8	9.7×10	9.7×12	9.7×14	9.7×16
冷凝风机 Condensate fan	功率 Power	kW	1.1×2	1.1×4	1.1×6	1.1×8	1.1×10	1.1×12	1.1×14	1.1×16
	转速 Speed	r.p.m	725							
蒸发器 Evaporator	水流量 Water flow rate	m ³ /h	11	22	34	45	56	67	78	89
	阻力 Resistance	kPa	43~44							
	进出管径 Pipe diameter input/output	DN(mm)	50							
制冷剂 Evaporator	种类 Species		R410A							
	充注量 Incharged	kg	22	44	66	88	110	132	154	176
噪音 Noise	普通型 Ordinary type	dB(A)	61	62	63	65	65	66	67	67
外形尺寸 Outline size	长 L	mm	1200	2748	4296	5844	7392	8940	10488	12036
	宽 W	mm	2356	2356	2356	2356	2356	2356	2356	2356
	高 H	mm	1970	1970	1970	1970	1970	1970	1970	1970
总电源 Main power supply			3φ~380V~50Hz							
总功率 Total power		kW	21.6	43.2	64.8	86.4	108	129.6	151.2	172.8
重量 Weight		kg	800	1600	2400	3200	4000	4800	5600	6400

- 注: 1. 机组制冷量及压缩机的消耗功率标定工况: 室外环境干球温度35℃; 蒸发器进水温度12℃, 出水温度7℃。
 2. 机组制热量及压缩机的消耗功率标定工况: 室外环境干球温度7℃, 湿球温度6℃; 冷凝器进水温度40℃, 出水温度45℃。
 3. 我公司可按用户要求设计相应的非标机型。
 4. 所有机型可进行模块化组合, 并可根据用户需要提供其他环保制冷剂系列产品。

Note: 1. Calibration working condition of chiller cooling capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 35℃; Water temperature at evaporator input is 12℃, at output is 7℃.
 2. Calibration working condition of chiller heating capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 7℃, wet-bulb temperature is 6℃; Water temperature at condenser input is 40℃, at output is 45℃.
 3. Our company can design non-standard chillers according to customer requirements.
 4. All kinds of chillers can be combined modular by modular, and can produce other environment-friendly refrigerant chillers according to customer requirements.



水冷冷水机组
Water-cooling chiller system



地下环路式（地理管）水源热泵机组
Underground water circulant (embedded pipeline) water source heat pump units



地下水式水源热泵
Underground water circulating type Water source heat pump



风冷冷(热)水机组
Air Cooled Coldshot Water Chiller



超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Coldshot Water Chiller

整体式风冷冷（热）水机组主要性能参数表1

Standard performance table 1 of packaged air cooled cold/hot water chiller

项目 Item			LSBLG(R) F-()Z							
名称 Name		单位 Name	150	180	220	250	280	350	380	420
制冷 Cooling	制冷量 Cooling capacity	kW	151	183	218	254	283	351	388	424
	能效比 Energy efficiency ratio	W/W	3.08	3.05	3.07	3.1	3.08	3.05	3.08	3.05
制热 (单冷型无此项) Heating (Except cooling only type)	制热量 Heating capacity	kW	157	192	227	262	294	368	403	445
	能效比 Energy efficiency ratio	W/W	3.18	3.15	3.17	3.2	3.18	3.15	3.18	3.15
压缩机 Compressor	型式 Type		进口半封闭双螺杆压缩机 Imported half-closed double screw							
	功率 Power	kW	56.7	64.7	73.9	88.4	99	56.7×2	60.7×2	64.7×2
冷凝风机 Condensate fan	功率 Power	kW	1.3×4	1.3×4	1.3×6	1.3×6	1.5×6	1.5×8	2.2×8	2.2×8
	转速 Speed	r.p.m	930	930	930	930	930	930	930	975
蒸发器 Evaporator	水流量 Water flow rate	m³/h	26	31	37	44	49	60	67	73
	阻力 Resistance	kPa	45~50					45~65		
	进出管径 Pipe diameter input/output	DN(mm)	100	100	100	125	125	125	125	125
制冷剂 Evaporator	种类 Species		R22							
	充注量 Incharged	kg	43	51	63	71	80	100	110	60×2
噪音 Noise	普通型 Ordinary type	dB(A)	67	67.5	68	69	70.5	71	72.5	73
外形尺寸 Outline size	长 L	mm	2302	2650	3023	3480	3480	3880	4176	5800
	宽 W	mm	2170	2170	2170	2170	2170	2170	2170	2170
	高 H	mm	2307	2307	2307	2307	2500	2500	2500	2500
总电源 Main power supply			3φ~380V~50Hz							
总功率 Total power		kW	49	60	71	82	92	115	126	139
重量 Total power		kg	2250	2400	2570	2950	3320	4500	4750	4920

注：1. 机组制冷量及压缩机的消耗功率标定工况：室外环境干球温度35℃；蒸发器进水温度12℃，出水温度7℃。

2. 机组制热量及压缩机的消耗功率标定工况：室外环境干球温度7℃，湿球温度6℃；冷凝器进水温度40℃，出水温度45℃。

3. 我公司可按用户要求设计相应的非标机型。

4. 所有机型可进行模块化组合。

Note: 1. Calibration working condition of chiller cooling capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 35℃; Water temperature at evaporator input is 12℃, at output is 7℃.

2. Calibration working condition of chiller heating capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 7℃, wet-bulb temperature is 6℃; Water temperature at condenser input is 40℃, at output is 45℃.

3. Our company can design non-standard chillers according to customer requirements.

4. All kinds of chillers can be combined modular by modular.



整体式风冷冷(热)水机组主要性能参数表1

Standard performance table 1 of packaged air cooled cold/hot water chiller

项目 Item			LSBLG(R) F-()Z								
名称 Name		单位 Name	450	500	560	700	840	900	1000	1120	1400
制冷 Cooling	制冷量 Cooling capacity	kW	454	502	564	705	848	908	1004	1128	1410
	能效比 Energy efficiency ratio	W/W	3.07	3.1	3.08	3.05	3.05	3.07	3.1	3.08	3.05
制热 (单冷型无此项) Heating (Except cooling only type)	制热量 Heating capacity	kW	474	518	586	739	890	948	1036	1172	1478
	能效比 Energy efficiency ratio	W/W	3.17	3.2	3.18	3.15	3.15	3.17	3.2	3.18	3.15
压缩机 Compressor	型式 Type		进口半封闭双螺杆压缩机 Imported half-closed double screw								
	功率 Power	kW	65.3×2	69.3×2	77.8×2	81.8×2	64.7×4	65.3×4	69.3×4	77.8×4	81.8×4
冷凝风机 Condensate fan	功率 Power	kW	1.3×12	1.3×12	1.5×12	1.5×16	2.2×16	1.3×24	1.3×24	1.5×24	1.5×32
	转速 Speed	r.p.m	930	975	930	930	975	930	975	930	930
蒸发器 Evaporator	水流量 Water flow rate	m³/h	78	86	97	121	146	156	172	194	242
	阻力 Resistance	kPa	45~65			45~65					
	进出管径 Pipe diameter input/output	DN(mm)	125	125	150	150	125	125	125	150	150
制冷剂 Evaporator	种类 Species		R22								
	充注量 Incharged	kg	63×2	71×2	80×2	99×2	60×4	63×4	71×4	80×4	99×4
噪音 Noise	普通型 Ordinary type	dB(A)	73.5	75	77	78.5	72.5	73.5	75	77	78.5
外形尺寸 Outline size	长 L	mm	5800	6800	6800	7400	12200	12200	14200	14200	15400
	宽 W	mm	2170	2170	2170	2170	2170	2170	2170	2170	2170
	高 H	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500
总电源 Main power supply			3φ~380V~50Hz								
总功率 Total power		kW	148	162	183	231	278	296	324	366	462
重量 Total power		kg	4920	4970	5670	5720	9840	9840	9940	11340	11440

注: 1. 机组制冷量及压缩机的消耗功率标定工况: 室外环境干球温度35℃; 蒸发器进水温度12℃, 出水温度7℃。

2. 机组制热量及压缩机的消耗功率标定工况: 室外环境干球温度7℃, 湿球温度6℃; 冷凝器进水温度40℃, 出水温度45℃。

3. 我公司可按用户要求设计相应的非标机型。

4. 所有机型可进行模块化组合。

Note: 1. Calibration working condition of chiller cooling capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 35℃; Water temperature at evaporator input is 12℃, at output is 7℃.

2. Calibration working condition of chiller heating capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 7℃, wet-bulb temperature is 6℃; Water temperature at condenser input is 40℃, at output is 45℃.

3. Our company can design non-standard chillers according to customer requirements.

4. All kinds of chillers can be combined modular by modular.



水冷冷水机组
Water-cooling chiller system



地下环路式（地埋管）水源热泵机组
Underground water circuit (embedded pipeline) water source heat pump units



地下式水式水源热泵
Underground water circulating type Water source heat pump



风冷冷(热)水机组
Air Cooled Cold/hot Water Chiller



超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Cold/hot Water Chiller

整体式风冷冷（热）水机组主要性能参数表2

Standard performance table 2 of packaged air cooled cold/hot water chiller

项目 Item			LSBLG(R) F- () ZA								
名称 Name		单位 Name	150	180	220	250	280	300	350	400	440
制冷 Cooling	制冷量 Cooling capacity	kW	153	184	225	255	285	315	356	415	450
	能效比 Energy efficiency ratio	W/W	3.19	3.08	3.02	3.08	3.08	3.03	3.07	3.01	3.03
制热 (单冷型无此项) Heating (Except cooling only type)	制热量 Heating capacity	kW	156	190	233	263	294	326	368	430	463
	能效比 Energy efficiency ratio	W/W	3.25	3.18	3.12	3.18	3.18	3.13	3.17	3.12	3.12
压缩机 Compressor	型式 Type		进口半封闭双螺杆压缩机 Imported half-closed double screw								
	功率 Power	kW	42.8	53.5	67.6	74.9	83.5	92.1	98.4	60.2×2	67.6×2
冷凝风机 Condensate fan	功率 Power	kW	1.3×4	1.3×4	1.3×6	1.3×6	1.5×6	1.5×8	2.2×8	2.2×8	1.3×12
	转速 Speed	r.p.m	930	930	930	930	930	930	930	975	930
蒸发器 Evaporator	水流量 Water flow rate	m ³ /h	26	32	39	44	49	54	61	71	77
	阻力 Resistance	kPa	45~50					45~65			
	进出管径 Pipe diameter input/output	DN(mm)	100	100	100	125	125	125	125	125	125
制冷剂 Evaporator	种类 Species		R134a								
	充注量 Incharged	kg	43	51	63	71	80	86	100	57×2	63×2
噪音 Noise	普通型 Ordinary type	dB(A)	67	67.5	68	69	70.5	71	72.5	73	73.5
外形尺寸 Outline size	长 L	mm	2650	3023	3480	3480	3880	4176	5800	5800	6800
	宽 W	mm	2170	2170	2170	2170	2170	2170	2170	2170	2170
	高 H	mm	2307	2307	2307	2500	2500	2500	2500	2500	2500
总电源 Main power supply			3φ~380V~50Hz								
总功率 Total power		kW	48	59.7	74.6	82.7	92.5	104.1	116	137.9	148.5
重量 Total power		kg	2700	2880	3084	3540	3984	5400	5700	5904	5904

注：1. 机组制冷量及压缩机的消耗功率标定工况：室外环境干球温度35℃；蒸发器进水温度12℃，出水温度7℃。

2. 机组制热量及压缩机的消耗功率标定工况：室外环境干球温度7℃，湿球温度6℃；冷凝器进水温度40℃，出水温度45℃。

3. 我公司可按用户要求设计相应的非标机型。

4. 所有机型可进行模块化组合。

Note: 1. Calibration working condition of chiller cooling capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 35℃; Water temperature at evaporator input is 12℃, at output is 7℃.

2. Calibration working condition of chiller heating capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 7℃, wet-bulb temperature is 6℃; Water temperature at condenser input is 40℃, at output is 45℃.

3. Our company can design non-standard chillers according to customer requirements.

4. All kinds of chillers can be combined modular by modular.



整体式风冷冷(热)水机组主要性能参数表2

Standard performance table 2 of packaged air cooled cold/hot water chiller

项目 Item			LSBLG(R) F- () ZA									
名称 Name		单位 Name	500	560	600	700	800	880	1000	1120	1200	1400
制冷 Cooling	制冷量 Cooling capacity	kW	510	570	599	712	830	900	1020	1140	1198	1424
	能效比 Energy efficiency ratio	W/W	3.08	3.12	3.05	3.16	3.01	3.03	3.08	3.12	3.05	3.16
制热 (单冷型无此项) Heating (Except cooling only type)	制热量 Heating capacity	kW	526	580	615	713	860	926	1052	1160	1230	1426
	能效比 Energy efficiency ratio	W/W	3.18	3.18	3.13	3.17	3.12	3.12	3.18	3.18	3.13	3.17
压缩机 Compressor	型式 Type		进口半封闭双螺杆压缩机 Imported half-closed double screw									
	功率 Power	kW	74.9×2	83.5×2	92.1×2	98.4×2	60.2×4	67.6×4	74.9×4	83.5×4	92.1×4	98.4×4
冷凝风机 Condensate fan	功率 Power	kW	1.3×12	1.5×12	1.5×16	2.2×16	2.2×16	1.3×24	1.3×24	1.5×24	1.5×32	2.2×32
	转速 Speed	r.p.m	975	930	930	975	975	930	975	930	930	975
蒸发器 Evaporator	水流量 Water flow rate	m ³ /h	88	98	103	122	142	154	176	196	206	144
	阻力 Resistance	kPa	45~65									
	进出管径 Pipe diameter input/output	DN(mm)	125	150	150	150	125	125	125	150	150	150
制冷剂 Evaporator	种类 Species		R134a									
	充注量 Incharged	kg	71×2	80×2	86×2	100× 2	57×4	63×4	71×4	80×4	86×4	100× 4
噪音 Noise	普通型 Ordinary type	dB(A)	75	77	78.5	79	73	73.5	75	77	78.5	79
外形尺寸 Outline size	长 L	mm	6800	7400	8352	9000	12200	14200	14200	15400	17304	18600
	宽 W	mm	2170	2170	2170	2170	2170	2170	2170	2170	2170	2170
	高 H	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
总电源 Main power supply			3φ~380V~50Hz									
总功率 Total power		kW	165.5	182.5	196.5	225	275.8	297	330.4	365	393	450
重量 Total power		kg	5964	6804	6864	6720	11808	11808	11928	13608	13728	13440

注: 1. 机组制冷量及压缩机的消耗功率标定工况: 室外环境干球温度35℃; 蒸发器进水温度12℃, 出水温度7℃。

2. 机组制热量及压缩机的消耗功率标定工况: 室外环境干球温度7℃, 湿球温度6℃; 冷凝器进水温度40℃, 出水温度45℃。

3. 我公司可按用户要求设计相应的非标机型。

4. 所有机型可进行模块化组合。

Note: 1. Calibration working condition of chiller cooling capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 35℃; Water temperature at evaporator input is 12℃, at output is 7℃.

2. Calibration working condition of chiller heating capacity and compressor consumed power is: Outdoor environment dry-bulb temperature is 7℃, wet-bulb temperature is 6℃; Water temperature at condenser input is 40℃, at output is 45℃.

3. Our company can design non-standard chillers according to customer requirements.

4. All kinds of chillers can be combined modular by modular.



水冷冷水机组
Water-cooling chiller system



地下环路式（地埋管）水源热泵机组
Underground water circuit (embedded pipeline) water source heat pump units



地下水式水源热泵
Underground water circulating type Water source heat pump



风冷冷(热)水机组
Air Cooled Cold/hot Water Chiller



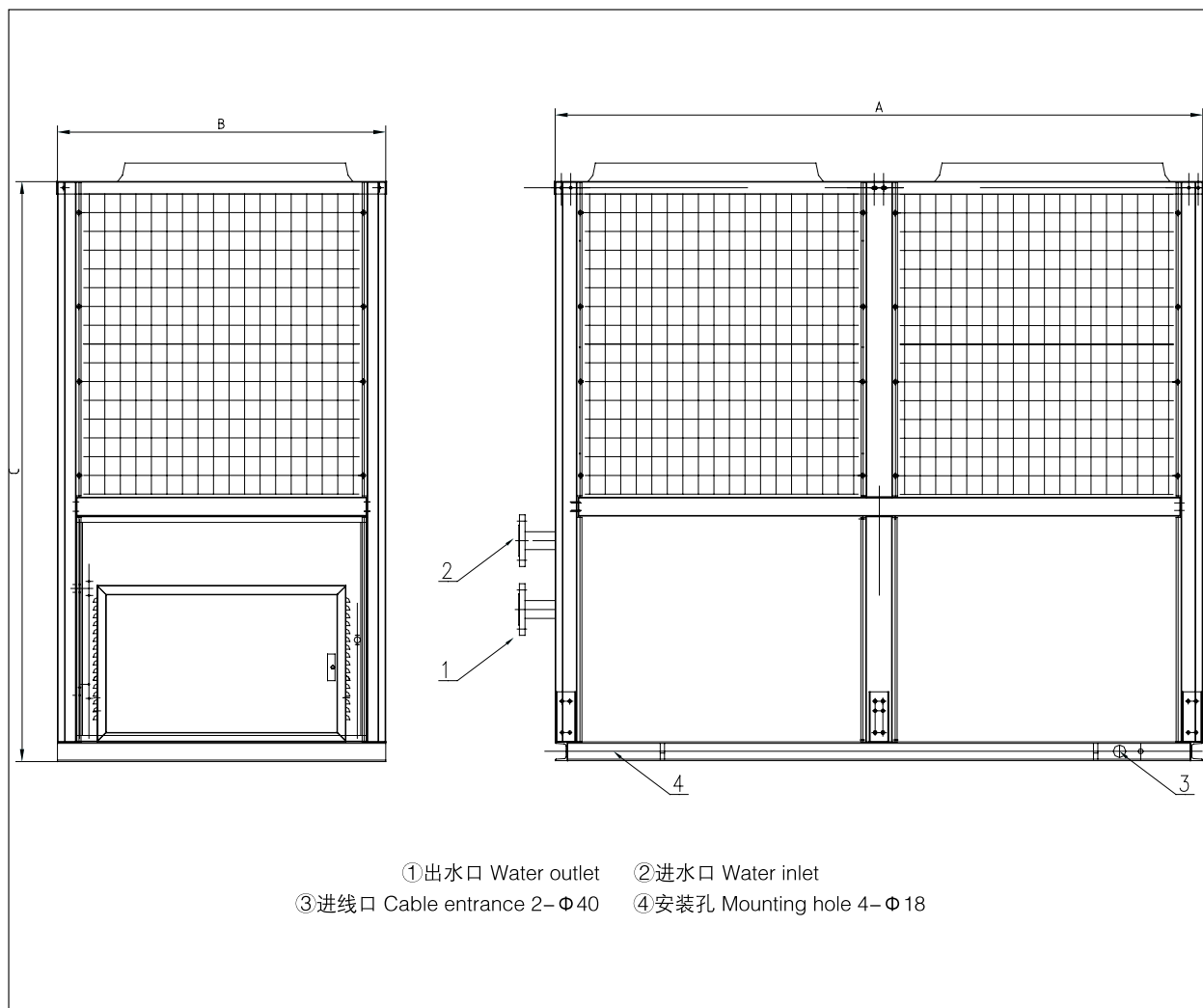
超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Cold/hot Water Chiller

风冷冷（热）水机组外形尺寸示意图

Outline Dimensional Drawings of Air Cooled Cold/hot Water Chiller

模块式风冷冷（热）水机组

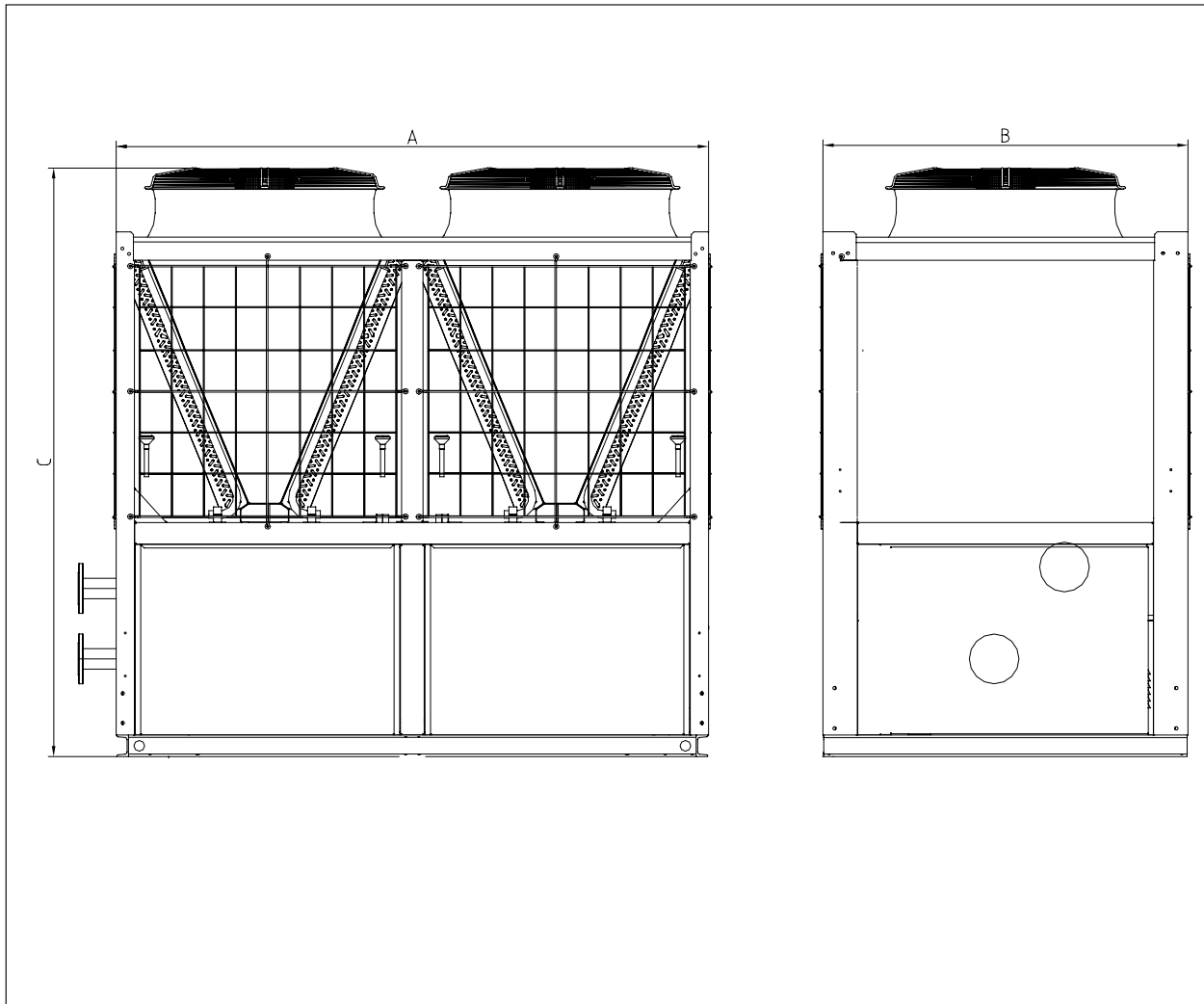
Modular air cooled cold/hot water chiller



型号 Model	单位 Unit	A	B	C
YFM-U-(R)-60	mm	2110	1056	1830
YFM-V-60	mm	2110	1056	1830
YFM-U-(R)-60C	mm	2475	1056	2000
YFM-V-60C	mm	2475	1056	2000
YFM-V-(R)-60A	mm	2356	1200	1970

整体式风冷冷(热)水机组

Packaged air cooled cold/hot water chiller



型号 Model	单位 Unit	A	B	C
YFM-W-R-90	mm	2207	1360	1950
YFM-W-R-130	mm	2207	1360	1950
YFM-W-R-90A	mm	2207	1500	1950
YFM-W-R-130A	mm	2207	1500	1950



水冷冷水机组
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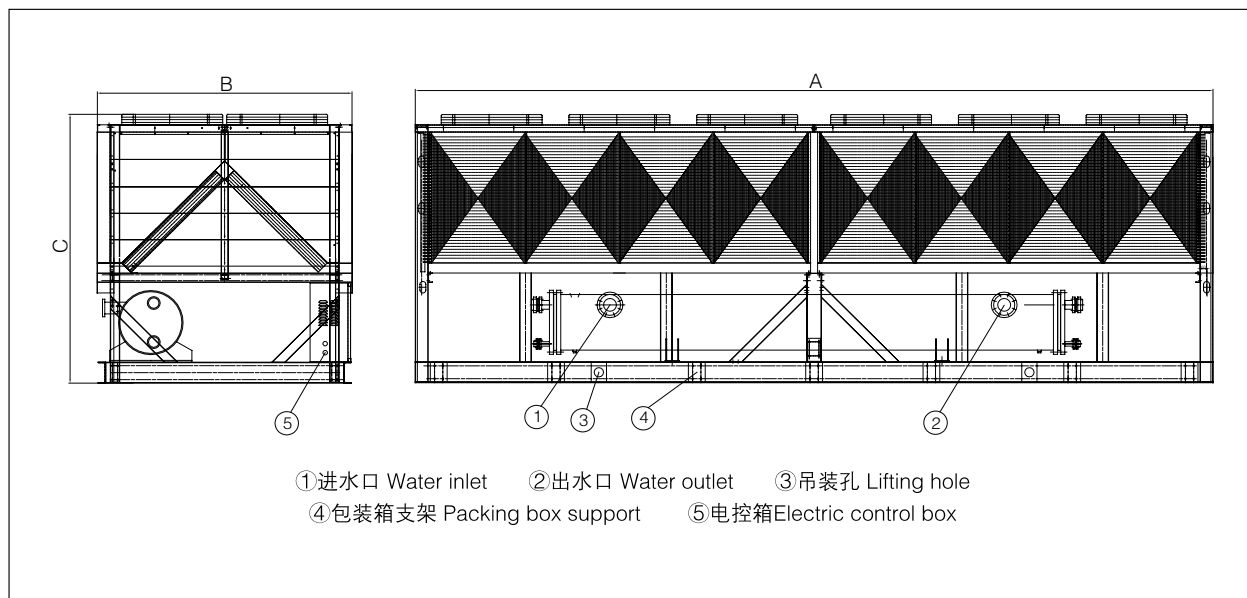
风冷冷(热)水机组
Air Cooled Cold/hot Water Chiller



超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Cold/hot Water Chiller

风冷冷（热）水机组外形示意图（双系统）

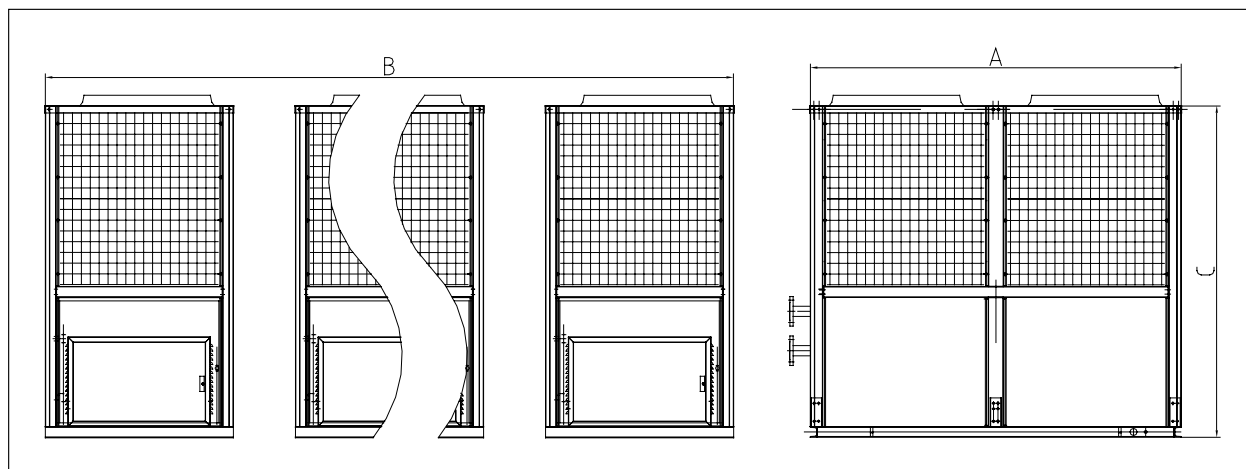
Outline Schematic Plan of Air Cooled Cold/hot Water Chiller (Double systems)



	型号 Model	单位 Unit	A	B	C
	LSBLG(R)F-180Z	mm	2650	2170	2307
常规制冷剂 Ordinary refrigerant	LSBLG(R)F-280Z	mm	3480	2170	2500
	LSBLG(R)F-350Z	mm	3880	2170	2500
	LSBLG(R)F-380Z	mm	4176	2170	2500
	LSBLG(R)F-420Z	mm	5800	2170	2500
	LSBLG(R)F-450Z	mm	5800	2170	2500
	LSBLG(R)F-500Z	mm	6800	2170	2500
	LSBLG(R)F-560Z	mm	6800	2170	2500
	LSBLG(R)F-700Z	mm	7400	2170	2500
环保制冷剂 Environment friendly refrigerant	LSBLG(R)F-180ZA	mm	3023	2170	2307
	LSBLG(R)F-280ZA	mm	3880	2170	2500
	LSBLG(R)F-440ZA	mm	6800	2170	2500
	LSBLG(R)F-500ZA	mm	6800	2170	2500
	LSBLG(R)F-560ZA	mm	7400	2170	2500
	LSBLG(R)F-600ZA	mm	8352	2170	2500
	LSBLG(R)F-700ZA	mm	9000	2170	2500

YFM-60系列风冷冷(热)水机组组合外形尺寸图

Outline dimensional drawings of combined YFM-60 serial air cooled cold/hot water chiller


常规制冷剂系列
Ordinary refrigerant

项目 Item	单位 Unit	YFM-U-(R)-60 YFM-V-60	YFM-U-(R)-120 YFM-V-120	YFM-U-(R)-180 YFM-V-180	YFM-U-(R)-240 YFM-V-240	YFM-U-(R)-300 YFM-V-300	YFM-U-(R)-360 YFM-V-360	YFM-U-(R)-420 YFM-V-420	YFM-U-(R)-480 YFM-V-480
A	mm	2110	2110	2110	2110	2110	2110	2110	2110
B	mm	1056	2460	3830	5200	6570	7940	9310	10680
C	mm	1830	1830	1830	1830	1830	1830	1830	1830

环保制冷剂系列
Environment friendly refrigerant

项目 Item	单位 Unit	YFM-U-(R)-60C YFM-V-60C	YFM-U-(R)-120 C YFM-V-120C	YFM-U-(R)-180C YFM-V-180C	YFM-U-(R)-240 C YFM-V-240C	YFM-U-(R)-300 C YFM-V-300 C	YFM-U-(R)-360C YFM-V-360C	YFM-U-(R)-420C YFM-V-420C	YFM-U-(R)-480C YFM-V-480C
A	mm	2475	2475	2475	2475	2475	2475	2475	2475
B	mm	1056	2460	3830	5200	6570	7940	9310	10680
C	mm	2000	2000	2000	2000	2000	2000	2000	2000

环保制冷剂系列
Environment friendly refrigerant

项目 Item	单位 Unit	YFM-V-(R)-60A	YFM-V-(R)-60A	YFM-V-(R)-60A	YFM-V-(R)-60A	YFM-V-(R)-60A	YFM-V-(R)-60A	YFM-V-(R)-60A	YFM-V-(R)-60A
A	mm	2356	2356	2356	2356	2356	2356	2356	2356
B	mm	1200	2748	4296	5844	7392	8940	10488	12036
C	mm	1970	1970	1970	1970	1970	1970	1970	1970



水冷冷水机组
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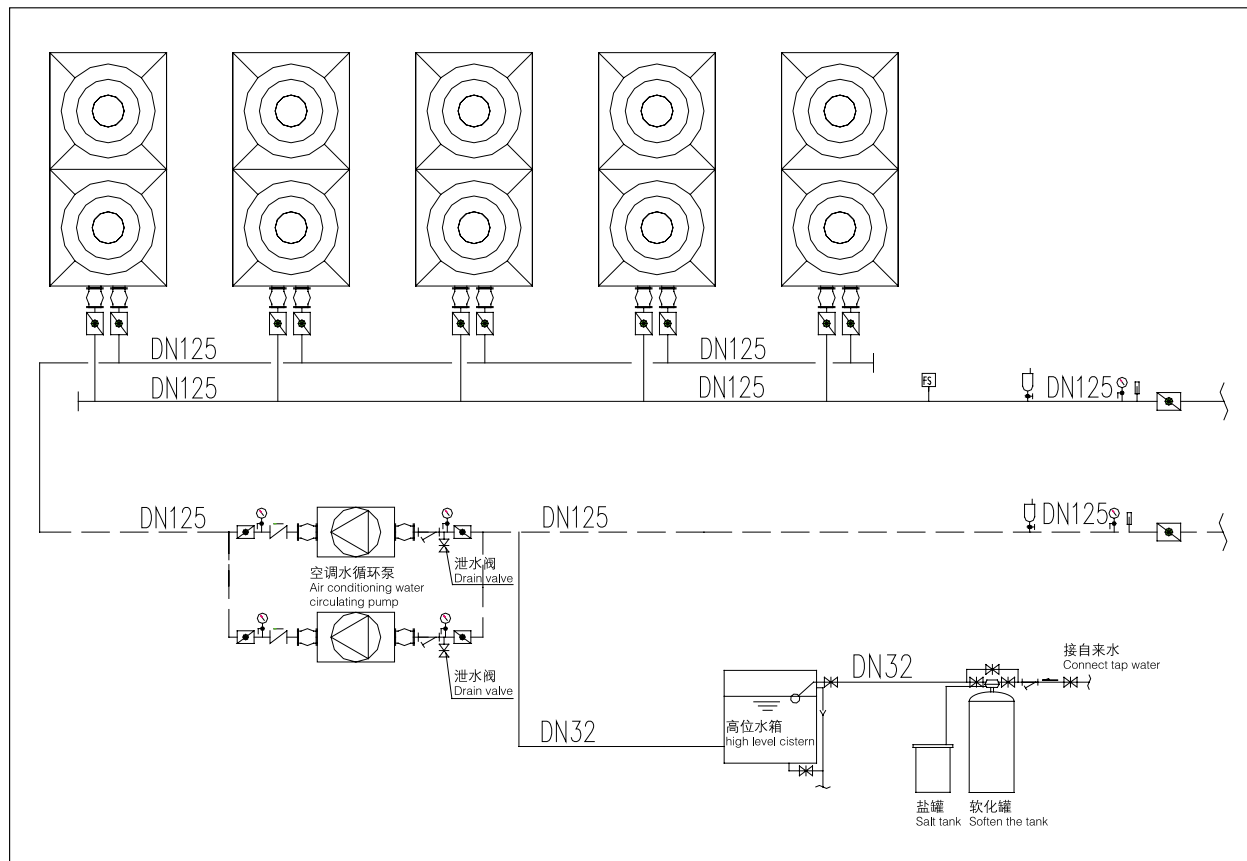
超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Cold/hot Water Chiller

接线方式及管道

Wiring and pipeline

模块式风冷冷（热）水机组是以YFM-V(U)-(R)-60为基本模块单元组合而成，在实际工程中可以用以下两种连接方式：

Modular air cooled cold/hot water chiller is combined based on YFM-V(U)-(R)-60. In actual projects, there are two kinds of method to combine them together just as the following:



符号 Sign	名称 name
	冷冻水供水管 Chilled water supply pipe
	冷冻水回水管 Refrigerated water return pipe
	浮球阀 Floating ball valve
	水流开关 Flow switch
	蝶阀 Butterfly valve
	橡胶软接头 Rubber soft joint
	止回阀 The check valve
	自动排气阀 Automatic exhaust valve

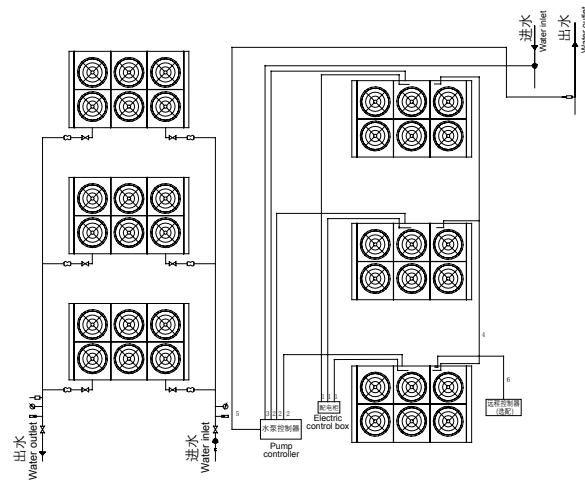
符号 Sign	名称 name
	Y型过滤器 Y-type filter
	电动压差旁通阀 Electric differential pressure bypass valve
	闸阀 Gate valves
	压力表 Pressure gauge
	蝶阀 Butterfly valve
	温度计 Thermometer
	温度传感器 Temperature sensor

整体式风冷冷(热)水机组的连接方式及管道安装于实际工程中可以用以下两种方式:

There are two kinds of connection method of packaged air cooled cold/hot water chiller and its pipeline in actual projects :

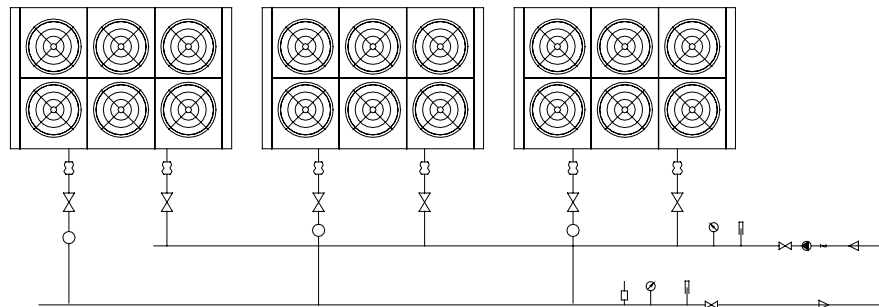
方式一:

Method 1



方式二:

Method 2



符号 Sign	安装建议 Installation suggestion	线号 Canle No.	用途 Application
	水泵安装于进水管 Pump fixed in water entering pipeline	1	机组供电电源线 Power supply cable
	水过滤器安装于水泵前 Water filter fixed ahead of pump	2	模块机组通讯线 Communication cable for modular chiller
	截止阀 Check valve	3	水流开关控制线 Control cable for water flow switch
	温度计0~100℃量程 Thermal meter 1~100℃	4	机组远程控制连接线 Cable for remote control
	压力表0.1~1.0MPa量程 Pressure gauge 0.1~1.0Mpa	5	水泵电源线 Pump power supply cable
	水流开关, 安装于水平直线管线, 距弯头阀门5倍管径距离 Water flow switch fixed at 5 times of pipe diameter distance from elbow valve	6	到机组配电柜电缆 Cable connected with electric control box
	软接头 Soft jointer		



水冷冷水机组
Water-cooling chiller system



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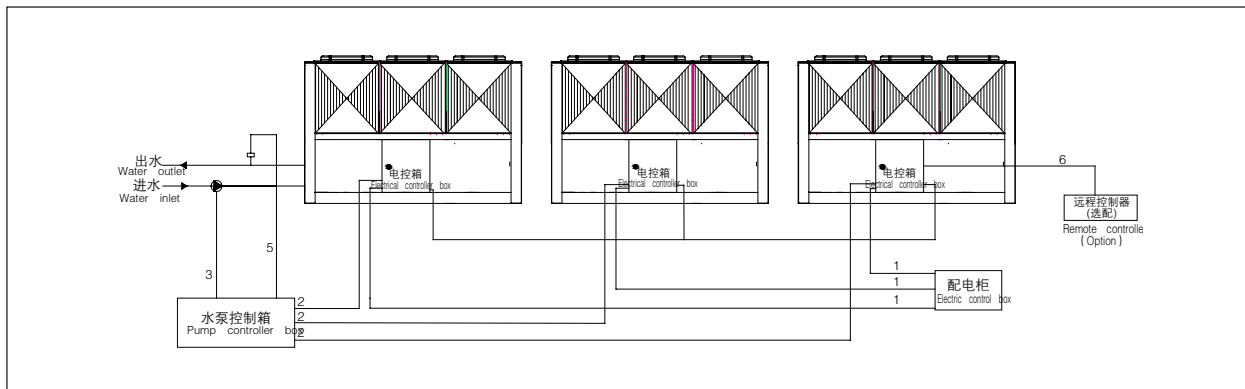
地下水式水源热泵
Underground water circulating type Water source heat pump



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Air Cooled Cold/Hot Water Chiller



超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Cold/Hot Water Chiller



注：建设单位须将全部电缆电线敷设到 机组电气箱,并做出线头标识符号。水泵控制箱与配电柜用户自备。

Note: Construction company should pave all cables to chiller electric control box and mark signs. Pump control box and electric cabinet should be offered by customer.

线号 Cable No.	用途 Application
1	机组供电电源线 Power supply cable
2	模块机组通讯线 Communication cable for modular chiller
3	水流开关控制线 Control cable for water flow switch
4	机组远程控制连接线 Cable for remote control
5	水泵电源线 Pump power supply cable
6	到机组配电柜电缆 Cable connected with electric control box

辅助加热器的选择

Option of Auxiliary Electric-heater

1.概述

风冷热泵机组的供热能力与室外环境温度有着密切的关系。当冬季室外环境温度降低时，风冷热泵机组的制热能力也随之降低，而此时空调房间的需热量却增加，这样就可能造成空调系统供热量不足，影响空调房间的舒适性。当室外环境温度低于-5℃时，由于室外环境温度与机组制热标定工况（7℃）偏差较大，此时风冷热泵机组由于能量衰减，其所能提供的制热量就不能满足空调房间的需要；如果选用辅助加热器，就能弥补供热量的不足。

另一方面，由于冬季水温降低，风冷热泵机组开机时循环水系统的水温过低（ $\leq 4^{\circ}\text{C}$ ），这样会导致机组开机困难；即使机组勉强启动，在机组进入正常工作状态前，压缩机经过一段较长时间恶劣工况运行，将导致压缩机产生液击和跑油从而造成润滑不足等危险情况，这会大大降低机组的使用寿命。如果配备了辅助加热器，就能对循环水系统进行预加热，维持循环水系统正常水温，确保机组在低温环境工况下正常启动，投入运行。

2.辅助加热器的作用

本公司采用的辅助加热器为电加热形式，冬季作为辅助供热设施，可与主机微电脑控制器联锁控制，运行安全可靠，其主要功能和作用有：

- ▲ 自动补偿低温环境下风冷热泵机组的供热不足。
- ▲ 作为循环水系统的预热措施，使循环水系统开机前达到水温要求，确保机组正常开机，防止开机时因水温过低产生压缩机液击和跑油。
- ▲ 作为循环水系统停机时的防冻措施，维持水系统水温 $\geq 3^{\circ}\text{C}$ 。通过机组微电脑控制器对循环水温度的监测，利用辅助加热器来维持循环水正常水温，保护循环水系统；防止循环水系统在冬季夜间设备停机期间因气温过低产生循环水系统结冰的不良现象。

3.辅助加热器的特点

- ▲ 自动控制加热器工作：辅助加热器一般采用二级或三级温度控制，只要按《机组使用说明书》中所提供的电路图接线就能与主机联锁工作，自动地发挥其辅助加热器的功能。

- ▲ 缺水保护功能：循环水管道中装有水流开关，只有在水路通畅时辅助加热器才投入工作，排除了系统缺水时电热管被烧毁的可能。
- ▲ 循环水系统防水保护措施：机组冬季停机时，可做循环水系统防冻保护措施。
- ▲ 开机时循环水系统预热措施：防止开机时因水温低而导致压缩机产生液击和跑油从而造成润滑不足等危险情况，损伤设备。
- ▲ 体积小、安装简便、运行费用低、管理方便，与采用小型锅炉等其他设备相比，在安装、操作、维护保养、运行费用等方面有明显的优越性。

1.Summary

Heat capacity of air cooled heat pump has a close relationship with outdoor environment temperature. When outdoor environment temperature in winter dropping, the heating capacity of air cooled heat pump will drop too, however the calorific requirements in the air conditioning room will increase, in this case the heat capacity of the air conditioning system will be insufficient and influence the comfortableness. If outdoor environment temperature is below -5°C , due to the difference between outdoor environment temperature and nominal working temperature, 7°C , is too large, at this time the chiller heating capacity will not meet the air conditioning room requirements for the chiller's energy attenuation. If adding auxiliary heater, by this way can make up for the heating loss.

In addition, due to circulation water temperature is too lower, $\leq 4^{\circ}\text{C}$, in winter, starting chiller is difficult. Even though it starts, its compressor will run a long time at bad working condition until being at normal running mode, thus liquid hammer or oil leakage would happened and short compressor's service life. If equipped with auxiliary heater, which will pre-heat the circulation water and keep its temperature at normal and guarantee chiller runs normally at lower temperature condition.

2.Role of the auxiliary electric-heater

The heater adopted by our company is electric one, plays support heating role in winter. It can link with chiller's PLC to make it run reliably. Its main functions are as following:

▲ Make up the heating loss of the air cooled heat pump automatically.

▲ As pre-heating device for circulation water, it can make the circulation water temperature reach up the demands before starting chiller, and make sure the chiller starts normally and in case liquid hammer and oil leakage would happened in compressor for water temperature is too low.

▲ As a anti-freeze device for circulation water system when chiller dead, and keep the water temperature be at $\geq 3^{\circ}\text{C}$. Chiller PLC will monitor circulation water temperature, auxiliary heater will keep water temperature at normal range to protect the water system, and in case the system would form ice during the winter night when chiller dead.

3.Features of auxiliary heater

▲ Control the auxiliary heater running automatically: The auxiliary heater is controlled by 2 steps or 3 steps of temperature, as long as wiring according to the electrical diagram of "chiller instruction manual", it will link with the PLC and use it to its full capability.

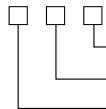
▲ Water-lack protection: Water flow switch is fixed in water circulation, only if water circulation is good can the heater run, thus keep electric heating pipes from burning if water lack.

▲ Anti-freeze function: It can serve as anti-freeze measure when dead in winter.

▲ Pre-heating function: Keep compressor from liquid hammering or oil leaking when starting the chiller if water temperature is too low.

▲ Small, easy installation, cheap running cost, convenient management. Has many feature compared with small-sized boiler.

4.辅助加热器型号的含义

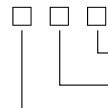


用数字表示加热器的总功率 数值：单位为 KW

加热方式：“D”表示电加热

辅助加热器符号：用“FR”表示

4.Nomenclature of the auxiliary electric-heater



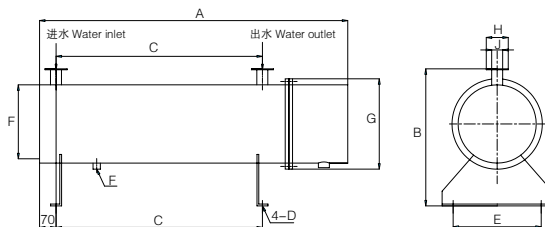
Total power is marked by digit Numeric value Unit is kW

Heating mode: "D" Means heating by electric

Symbol of subsidiary heater: Means "FR"

5. 辅助电加热器的规格安装尺寸

5.Specification and size of the auxiliary heater



加热器型号 Heater model	加热器功率 Heater power	适应机型 Corresponding chiller	安装尺寸 (mm) Installation size (mm)									折流板数 Baffle board No.	U型电热管 shaped heating pipe
	kW	kW	A	B	C	D	E	F	G	H	J		
FRD27	27	90	1280	380	600	Φ 16	140	Φ 203 × 8	Φ 280	180	G3"	5	6
FRD42	42	120	1180	425	700	Φ 16	150	Φ 219 × 8	Φ 335	180	G3"	5	12
FRD45	45	140	1180	425	700	Φ 16	150	Φ 219 × 8	Φ 335	180	G3"	5	12
FRD60	60	190	1380	450	900	Φ 18	180	Φ 245 × 10	Φ 390	220	G4"	5	12
FRD72	72	240	1230	478	1000	Φ 18	200	Φ 273 × 10	Φ 390	240	G5"	5	18
FRD90	90	290	1380	530	1050	Φ 18	260	Φ 325 × 10	Φ 440	240	G6"	5	18
FRD108	108	330	1550	530	1050	Φ 18	260	Φ 325 × 10	Φ 440	240	G6"	5	18
FRD120	120	380	1680	596	1175	Φ 18	310	Φ 426 × 10	Φ 492	240	G6"	5	18
FRD144	144	430—580	2000	605	1495	Φ 18	360	Φ 426 × 10	Φ 540	240	G7"	7	18
FRD180	180	630—680	1700	650	1195	Φ 18	420	Φ 480 × 10	Φ 598	280	G8"	7	27
FRD200	200	720—760	2000	650	1495	Φ 18	420	Φ 480 × 10	Φ 598	280	G8"	7	27



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超低温风冷冷（热）水机组
Ultra-low Temperature Air Cooled Cold/hot Water Chiller

6.辅助电加热器选用参考表

6.Reference table for choosing auxiliary heater

室外温度 Outdoor T.	8	6	4	2	0	-2	-4	-6	-8	-10
室内设计温度 Indoor wanted T.	20 ± 1					0.2	0.23	0.34		
18 ± 1							0.2	0.23	0.34	
16 ± 1							0.2	0.23	0.34	
14 ± 1								0.2	0.23	0.24

选用说明：

- ▲ 从能量平衡的角度上看，表中左边空白区间表示无需使用辅助加热器，表中右边阴影区间为室内温度不保证区，机组能正常运行，但为保证机组启动顺利以提高主机使用寿命，建议室外温度低于2℃时，配备辅助加热器，确保机组低水温状态启动。
- ▲ 选配辅助加热器时，规格不可以小于机组制热量的20%，否则在环境温度较低时，水系统的热损失可能会大到足以抵消加热器之热量的程度，导致加热器达不到预热水系统的作用。
- ▲ 上表为每KW制冷量在相应室外温度条件下需选配的辅助加热器容量。例如对LSBLGRF-90Z机组，在室外温度-4℃，室内温度为18℃时，需选配的辅助加热器容量： $90 \times 0.2 = 18$ ，即约18KW的辅助加热量。

Explanation

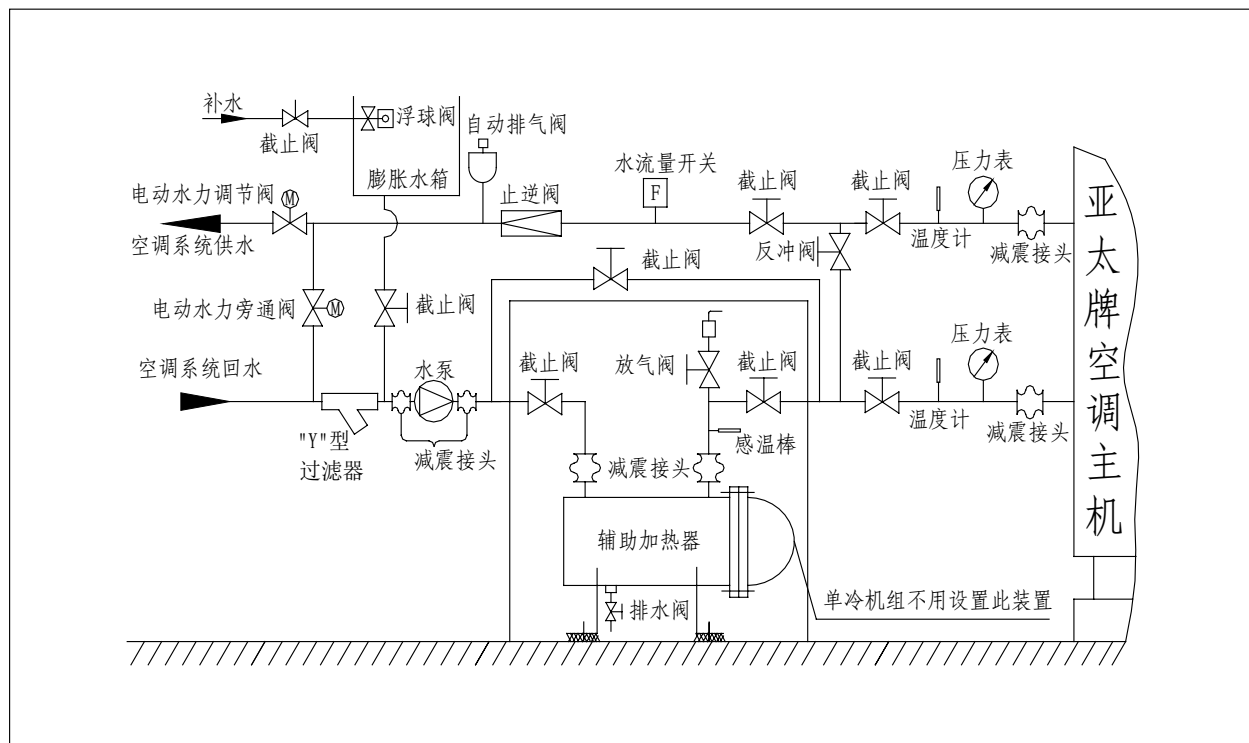
▲ From perspectives of energy equilibrium, the blank intervals on left table means auxiliary heater is unnecessary. The shadow intervals on right table is un-guaranteed area of indoor room temperature, and chiller can run normally, however we suggest auxiliary heater should be necessary if outdoor temperature is less than 2℃ to guarantee the chiller can start at water low temperature condition.

▲ When choosing auxiliary heater, its specification should not be less than 20% of chiller heating capacity, or else the heat loss of the water system may be large enough to counteract the heat generated from the heater and lead to the auxiliary heater can not play its role at lower outdoor temperature condition.

▲ On the above table, display heater heating capacity of per KW cooling capacity at its corresponding outdoor temperatures. For example, the LSBLGRF-90Z chiller, if the outdoor temperature is -4℃, indoor temperature is 18℃, the auxiliary heater heating capacity which you should need is: $90 \times 0.2 = 18$, that is, auxiliary heating capacity is about 18kW.

7.电加热器的水系统配置

7.Water system arrangement of electric heater





- ▲ 辅助加热器及控制箱最好能采取防雨防雪措施，水系统管道需进行妥善保温，以实现辅助加热的功能，避免热量损失。
- ▲ 辅助加热器入口需设过滤器，并定时进行清洗以免各种异物割破或阻塞电热管、造成电热管短路而被烧毁等严重现象发生。
- ▲ 控制箱宜装在辅助加热器出水口，使温度开关感温棒方便的插在感温棒座内。
- ▲ 冬季制热前需先加水排气，确保水路畅通。同时还应检查所有接线端子是否稳妥牢固，加热器绝缘性能需在 $5M\Omega$ 以上才可使用。
- ▲ 制热时A、B打开，C关闭；制冷时C打开，A、B关闭。
- ▲ 夏季使用后宜关闭蝶阀A、B，打开排水阀D，放净辅助电加热内积水。最好取出法兰盖，对电热管进行必要的检查和清理。

- ▲ Anti-rain and anti snow measures should be taken on auxiliary heater and control box, insulation should be wrapped on water circulation pipeline to keep heat from losing.
- ▲ Filter should be equipped at auxiliary heater inlet, and clean it regularly in case every foreign article would damage or block the electric heating pipes or accident like short-circuit or burn-out would happened.
- ▲ Control box should be fixed at water outlet of auxiliary heater, thus the temperature switch sensor can be easy to insert its socket.
- ▲ Should charge water and escape air before heating in winter to guarantee water circuit is smooth. Meanwhile, check all electric terminals whether firm or not. Insulation property of heater should be more than $5M\Omega$.
- ▲ When heating, turn on A and B, turn off C; When cooling, turn on C, turn off A and B.
- ▲ Should turn off butterfly gates A and B after dead in summer and turn on drainage valve D to drain off all the water inside the electric heater. It's better to fetch flange cover to clean and check the electric heating pipes.

产品设计、检验、制造标准

Standards of Design, Test and Making

- GB/T18430.1-2007 《工业或商业用及类似用途的冷水（热泵）机组》
- JB/T8654-1997 《容积式和离心式冷水（热泵）机组安全要求》
- GB/T10870-2001 《容积式和离心式冷水（热泵）机组性能试验方法》
- JB/T6906-1993 《喷油螺杆式单级制冷压缩机》
- JB/T4750-2003 《制冷装置用压力容器》
- JB/T6411-1992 《暖通、空调用轴流通风机》
- JB/T7659.4-1995 《氟利昂制冷装置用干式蒸发器》
- JB/T7659.5-1995 《氟利昂制冷装置用翅片式换热器》

- GB/T18430.1-2007 《Chiller (heat pump) applied to industry or commercial and similar fields》
- JB/T8654-1997 《Security requirements on positive displacement and centrifugal chiller (heat pump)》
- GB/T10870-2001 《Performance test methods of positive displacement and centrifugal chiller (heat pump)》
- JB/T6906-1993 《Oil-spreader screw type single-stage cooling compressor》
- JB/T4750-2003 《Pressure vessel applied to refrigeration devices》
- JB/T6411-1992 《Axle fan applied to heating, ventilation and air conditioning》
- JB/T7659.4-1995 《Dry type evaporator applied to freon refrigeration devices》
- JB/T7659.5-1995 《Fin shaped heat exchanger applied to freon refrigeration devices》



水冷冷水机组
Water-cooling chiller system



地下环路式(地埋管)水源热泵机组
Underground water circuit (embedded pipeline) water source heat pump units



地下水式水源热泵
Underground water circulating type Water source heat pump



风冷冷(热)水机组
Air Cooled Cold/hot Water Chiller



超低温风冷冷(热)水机组
Ultra-low Temperature Air Cooled Cold/hot Water Chiller



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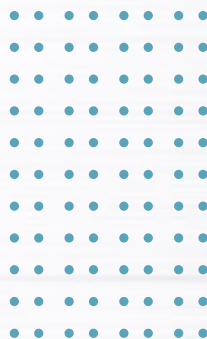


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