High Efficiency And Energy Saving Series
- - - Modular Air-Cooled Inverter Scroll Chiller

Withair®
Premium manufacturer in HVACR products
for Heating,Cooling and Indoor Air Quality.

The Withair System

www.withair.cn

Withair offers a wide range of quality products and solutions to meet the needs of your projects

- Ongoing innovation with cutting-edge products
- Over 30 years of production experience
- Key parts are come from international first-class brands
- Guaranteed support and spare parts
- Support in design
- Documentation for incentives
- Five-year guarantee
- Free training course

The Withair System

Withair is the premium manufacturer in sustainable energy solutions supplying HVACR products & services for heating, cooling, hot water, indoor air quality, industrial refrigeration, and heat recovery that reflect today's demand for sustainable construction, comfortable indoor climate and industrial cooling & heating process application.

Withair specialises in innovative custom highly-configurable products designed to meet the your needs. We insure products are designed for long life by using highest quality materials, for all controls, safety, and components we only use top world-wide recognized brands. All products are rigorously tested before leaving us, going through many stages of quality control before being shipped.

Withair® has highly effective professional team to service customers

Known for their professionalism and personal integrity, Withair’s highly skilled engineers, technicians, electricians, stable manufacturing workers, strict quality controller, and quick-reaction & professional after-service staff utilize their multi-disciplinary expertise in the creation and production of every solution.

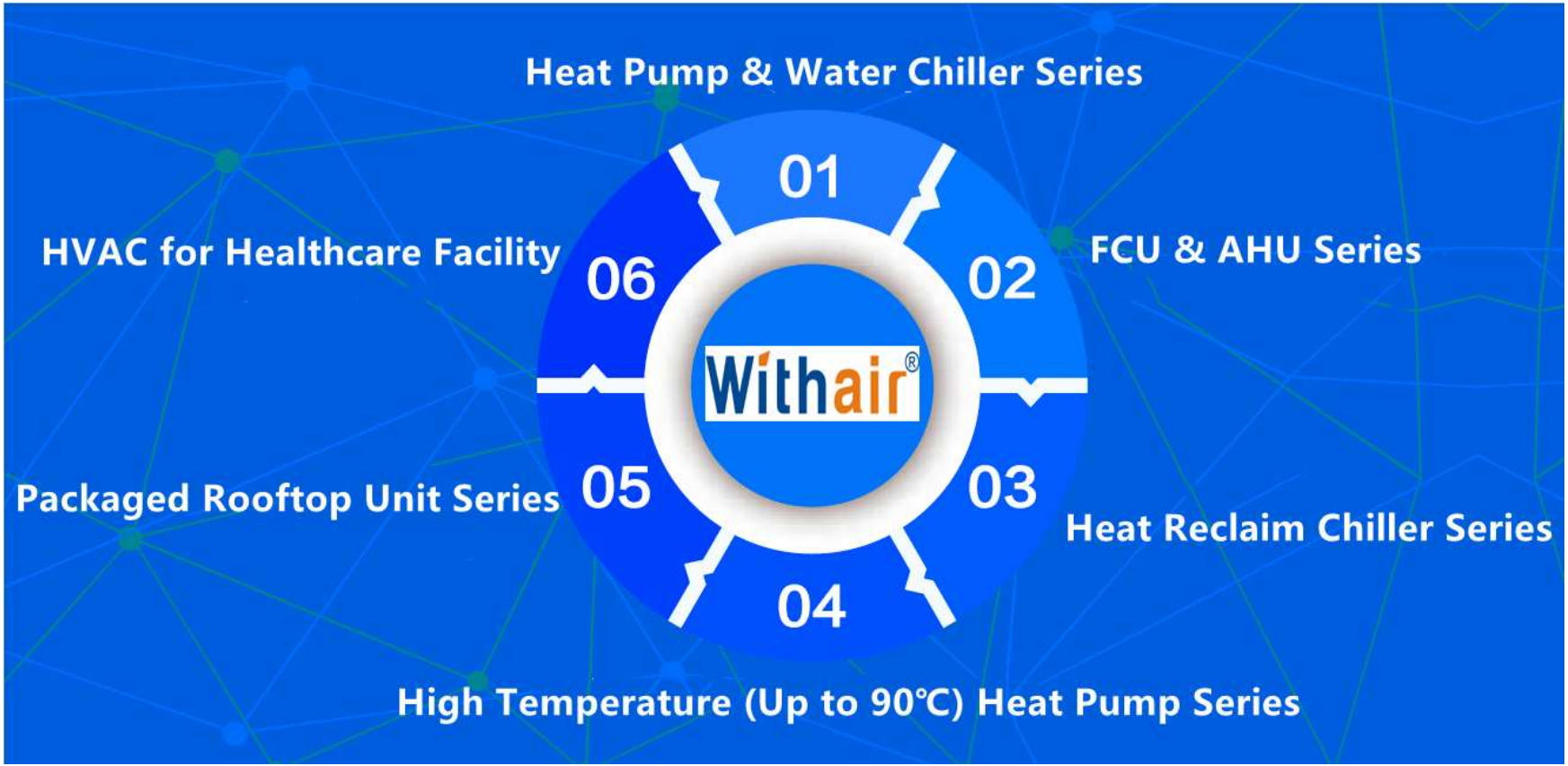
Close cooperation among Withair’s design, production and service teams - who are located under one roof and linked by advanced computerized systems - enables the Company to supply the widest possible range of products - from single units to very large quantities - while assuring rapid delivery and competitive pricing.

SIMIPLY THE BEST SOLUTION AND QUALITY PRODUCT

—— HVACR SYSTEMS

Low energy consumption systems
Use of clean energy
Use of environmentally-friendly cooling gases
ZERO direct CO2 emissions in the environment

Withair




The Withair System
你的家 你的生活
Your home,your life style!


We've a lot of solutions
to care "Construction"


We've a lot of solutions
to care "Hospitals"


We've a lot of solutions
to care "Industries"


The Withair System
Cooling
Heating
Fresh air
Purification
Humidification
We've a lot of solutions
for "Air Quality"

Some Production lines

HEAT PUMPS - CREATING A MORE COMFORTABLE & SUSTAINALE BUILDING ENVIRONMENT

By installing a Withair heat pump, you can reduce your energy consumption costs by up to 86% compared to direct electricity. Here we are using the nature's free and renewable energy sources, such as: outdoor air, geothermal energy, solar energy, that minimises your CO2 emissions and pollution free. You can also enjoy an environmentally friendly, renewable and free energy source. The high level of efficiency means that an investment in a heat pump pays for itself quickly and gives you a secure supply of heat, cool and hot water, suitable for different climate all over the world.

Withair the W01R series heat pumps involve a range of 282 models, with heating and cooling capacity among 2.6kW and 3,200kW, which allow to create "customized" solution, matching the different installations requests.

CHILLERS - MINIMIZE YOUR OPERATING COSTS

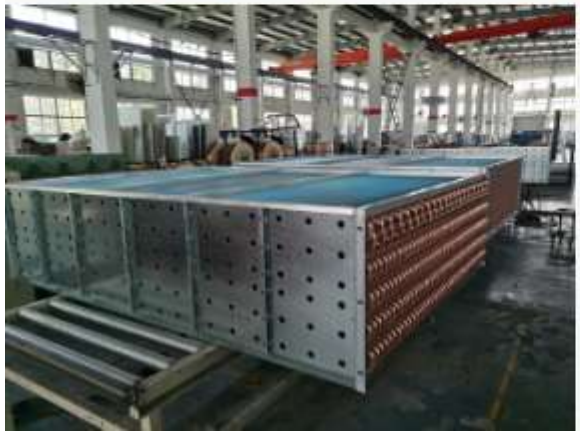
Withair chillers were developed based on decades of knowledge and rich experience, includes air-cooled chillers and water-cooled chillers, ranging in capacities from 2 to 3,000+ tons. Withair chillers are relied upon for both comfort and special process cooling applications in every corner of the world.

Withair chiller plays a critical role in creating the right environment to ensure the health, comfort and industrial production. Withair chillers not only serve HVACR systems and industry-type process cooling at factories that deliver the right temperature for the space, but they also help minimize operating costs with superior energy efficiency levels, low sound levels and with minimal environmental impact.

AIR SIDE PRODUCTS - MAXIMIZING HVACR SYSTEM PERFORMANCE

The Withair portfolio of fan coil unit, ventilation unit and air handling unit, air cooler solutions is designed to make installations faster and easier, offers temperature and humidity control, heat recovery, deodorization, air purification, and heat treatment, and to maximize HVACR system performance. Using advanced technology, such as: EC motor, single-zone,four-pipes, these systems quietly, temperature stability, reliably and efficiently deliver the comfort your building occupants need.

Withair offers a full range of air side products and systems to meet your performance requirements. From 200CFM to the highly flexible 60,000CFM with numerous custom options, to a compeletely custom, energy efficient, environmentally responsible system, Withair has the optimal solution for commercial, industrial and process applications.



INNOVATIVE PRODUCTS - THE MOST EFFICIENCY SOLUTION

Withair has developed different innovative products, e.g. Fresh Air Heat Pumps, Rooftop HVAC Unit(RTU), Make Up Air Unit(MUA), 100% Outdoor Air Unit(OAU), Clean Air Conditioning, Ultra-high Temperature Heat Pump, Hybrid Heat Pump, ..., these products meet the needs of different applications for heating & cooling and indoor air quality.

Whether you want to replace an existing air conditioning or heat pump – or reduce your energy costs with a Hybrid Heating and Cooling Solution – our products could be the creative solution you're looking for. By combining multiple types of energy into a single unit that sits outside your home, the only thing left inside is improved comfort.

Withair® devote to a variety of energy comprehensive utilization, optimize configuration of all kinds energy, complementary advantages, offer hybrid energy system integration solutions, and maximizes efficiency and energy savings.

Big Size Modular Air-Cooled Water Chiller & Heat Pump

DIRECTORY

PRODUCT NOMENCLATURE

□□—□□□□□□□

1 2 3 4 5 6 7 8 9

Digit 1. W: Withair brand
Digit 2. 01: series number
Digit 3. R1: air cooled heat pump, R2: water cooled heat pump, Rd: electric auxiliary type
Digit 4. Specification code
Digit 5. PH: partial heat recovery, TH: total heat recovery
YRC: Year-round cooling unit, E: EVI unit (extremely cold climate)
Digit 6. Fixed frequency compressor: default, I: inverter compressor, E: EVI compressor
Digit 7. R1: R410A, R2: R407C, R3: R134a, R22: default
Digit 8. X: design code
Digit 9. V1a: 220V/1Ph/50Hz, V1b: 220V/1Ph/60Hz, V1c: 115V/1Ph/60Hz
V2a: 380V/3Ph/50Hz, V2b: 380V/3Ph/60Hz, V2c: 230V/3Ph/60Hz
V3a: 440V/3Ph/60Hz, V2b: 575V/3Ph/60Hz

—— Product Description ——

Withair® Air-Cooled Water Chiller is a very intelligent chiller system with flexible capacity output. It could adjust heating capacity output automatically according to requirements. It is much more energy-saving with a long lifespan.

Withair® Air-Cooled Water Chiller is a kind of central air conditioner which adopts air as the cooling source and water as cooling medium. With rich experience in R&D, design and application, Withair® constantly lanuched new environment-friendly modular units, which improves the structures, systems and programs based on original products, and designs special series of comfortable and technological units. The environment-friendly modular unit has complete functions and various specifications, with basic modules of any combination available for different models. Withair® offer quiet, reliable, energy efficient equipment. These units incorporate high quality compressors, state-of-the-art coil design, and innovative packaging. As a sort of integrated equipment, it needs no cooling tower, cooling water pump, boiler and corresponding auxiliary parts, which makes the system more simple, saves installation space, convenient maintenance and energy saving, thus it is very suitable for areas that are short of water. several modules can be formed in to a air-cooled heat pump module unit by connecting each module's inlet & outlet pipeline in parallel. with a system without cooling water, with simple pipelines, moderate cost, short construction period, allowing staged investment, the whole unit consists of 1~16 modules and the maximum capacity is 9,040kW.

Withair® Air-Cooled Water Chiller can be widely applied to civilian projects and industrial projects, such as hotel, villa, restaurant, hospital, factory, etc. it is a wise choice for areas where water is insufficient or there are strict limits on noise level and surroundings. Each unit is verified for total unit performance before shipping to insure quality standards are inherent in every unit.

Unit adopts modular design, relatively independent modules units can be any combination and through microcomputer for centralized control, unit according to the change of load start-stop corresponding number of module unit to adjust the supply of cold (heat) capacity, to achieve the goal of high efficiency and energy saving. Units can effectively under the climatic conditions of heating at -20℃ and heat unit during normal operation the system is 3 times more than ordinary electric heater, winter climate is relatively low and no boiler or other heating conditions particularly applicable areas. with FCU, VAV and AHU and fresh air units, semi-central air conditioning system has the flexible layout, beautiful shape, saving space, convenient adjustment, low running noise, etc.

R410A Modular Air-cooled Inverter Scroll Chiller

Withair® a new generation of Modular Air-cooled Inverter Scroll Chiller is designed to meet demanding environmental requirements, both today and tomorrow. In an effort to reduce the energy consumed by cooling and heating, Withair ® has developed the Modular Inverter Scroll Chiller by leveraging the latest inverter compressor technology. Its exceptional efficiency at both full load and part load set new benchmarks for the industry, making the new inverter chiller stand out as the premium solution for small-to-medium size commercial and industrial applications.

SUPERIOR PERFORMANCE
EER up to 3.40, IPLV 6.5
Stable power factor 0.95
±0.5°C Temp Control

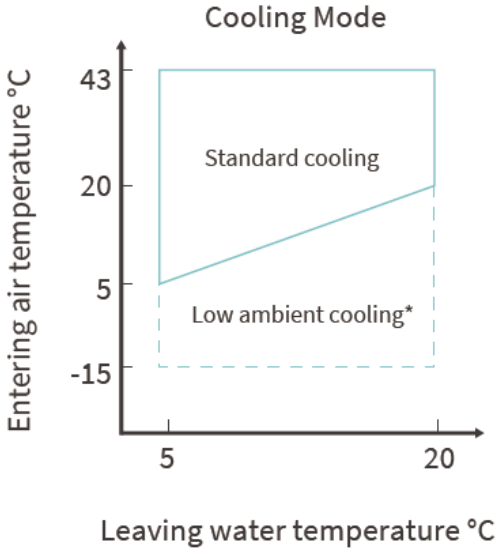
QUIET OPERATION
Inverter Technology
Down to 68dBA at full load
Extra - 5dBA at part load

GREAT FLEXIBILITY
Easy Installation
Easy Layout
Easy Operation
Easy Maintenance

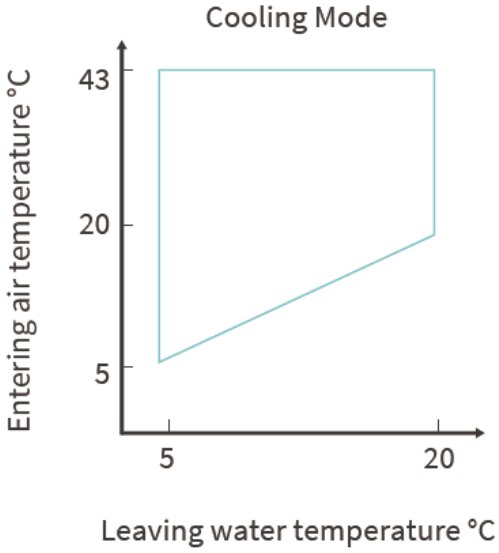
INTELLIGENT CONTROL
5.5” touch screen display
6 steps VFD control
10+ control protection

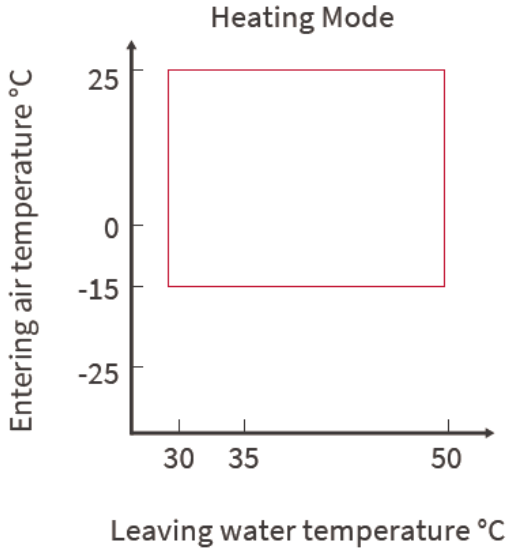
ROBUST RELIABILITY
High Quality Compressor
Low Inrush Current
Superior redundancy

OPERATING RANGE



Cooling Only Unit





Heat Pump Unit

ADVANTAGES

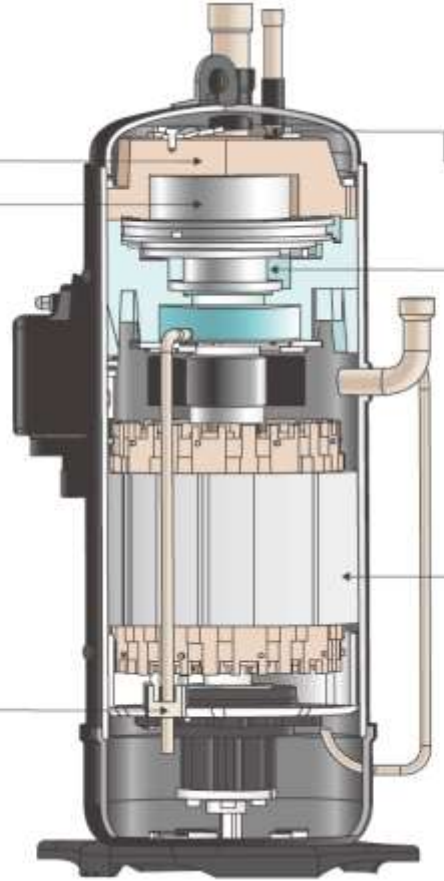
A. SUPERIOR PERFORMANCE

As a HVAC system can use 40-45% of a building's annual energy consumption, choosing the right chiller can significantly reduce energy cost and help users save their operational budgets. Thanks to Hitachi's latest inverter compressor technology, the new generation of inverter chiller provides best-in class efficiency. Its full load efficiency goes up to 3.28, which far exceeds the ASHRAE90.1 building energy standard. Meanwhile, its part load efficiency is as high as 6.0, which adds up to an average annual energy savings of 15- 25%, compared to traditional air-cooled chillers.

DC Inverter Scroll Compressor

Withair has accumulated rich experience in the design and production of leading scroll compressors, especially in the field of HVAC applications. The new generation of DC inverter chiller uses the proven design of the direct current (DC) inverter compressor, which embraces all of the design features driven for exceptional efficiency all year around. The inverter compressors deliver stepless capacity control from 25% to 100%, allowing precise capacity matching for building loads and reducing unit power input, thus providing significant energy consumption savings for the customer.

DC INVERTER SCROLL COMPRESSOR



New Asymmetric Wrap

Optimized by reducing leakage and invalid suction superheat

Non-Contact Seal Design

Oil film seal formed by lubricating oil to diminish friction for higher efficiency and reliability

Internal Oil Circulation

Reduce over-heat losses and oil discharge rate to improve efficiency and reliability

Relieve Valve

More adaptive to variable pressure ration conditions, drive calibrated for higher partial load efficiency

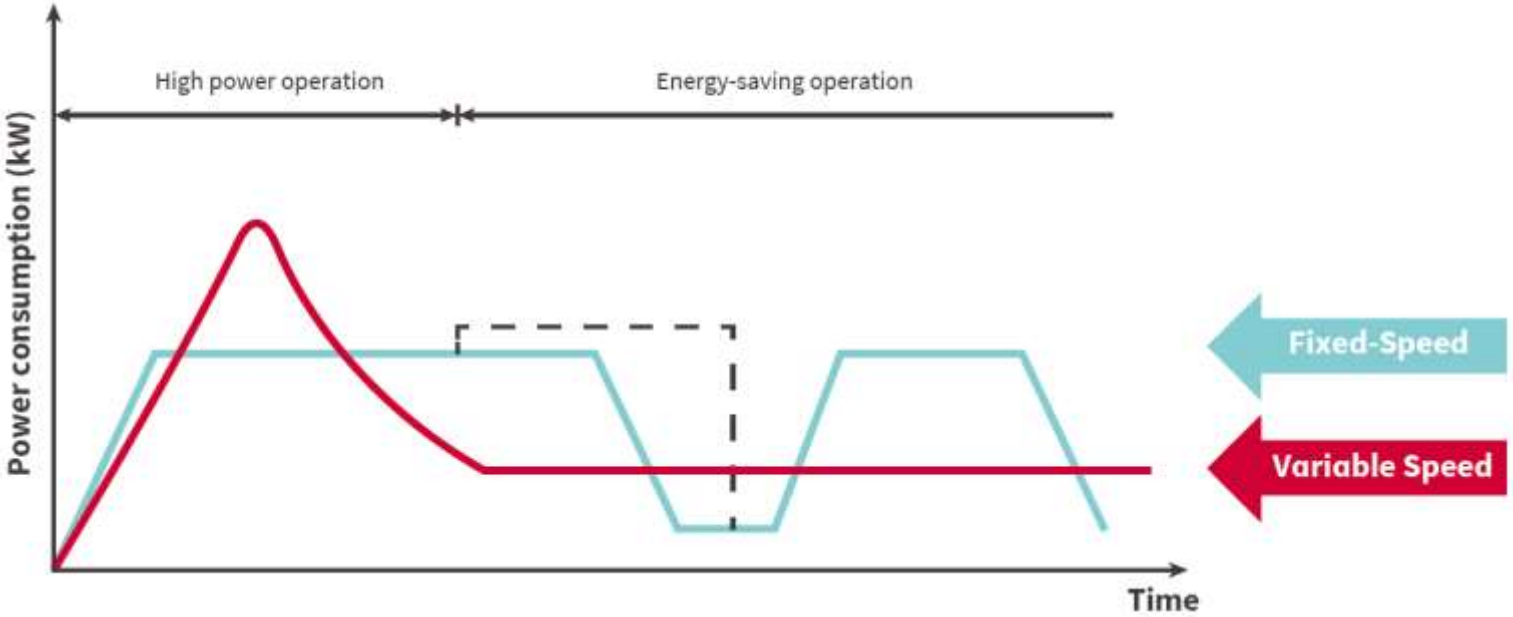
Mid-Pressure Server

Dynamically adjusts mid-pressure according to operation pressure, ensures axial flexibility and optimizes fixed scroll engagement for higher performance

Concentrated Motor

Concentrated winding offers lower height and less copper loss, be more adaptive to part load condition

Energy Saving At Low Load



Fix Speed: ON/OFF Capacity Control
Variable Speed: Stepless Capacity control

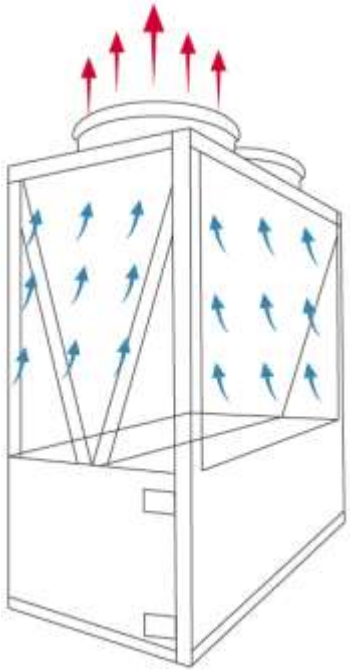
The Variable Speed Driver

The variable speed driver make the utilization of electrical power more efficient, typically it is measured as power factor. The inverter chiller offers an outstanding power factor, as high as 95%. The customer does not need to pay the premium for the additional power factor correction solution to meet minimum utility requirements.

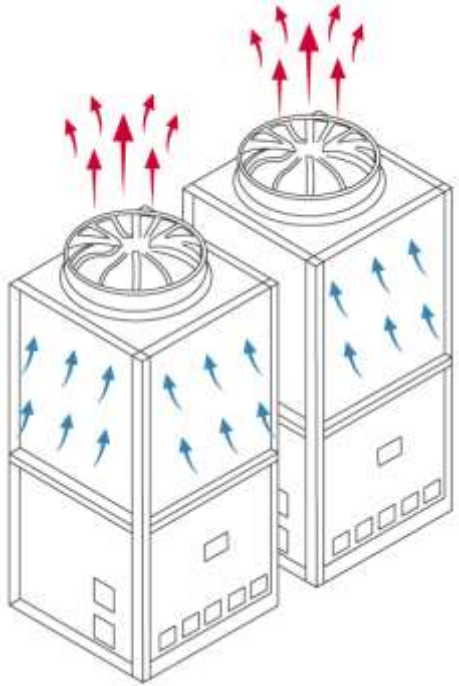
Air Side Heat Exchanger

Air side heat exchanger adopts a coils design in a V shape with open angle, which is optimized by CFD tools for air flow distribution simulation. The design ensures a uniform heat transfer with 30% efficiency improvement. Meanwhile the V shape structure effectively enhances the unit's structural strength and limits the risk of coil surface damage during the transportation and installation process.

Uniform hear transfer with V shape coil design



VS



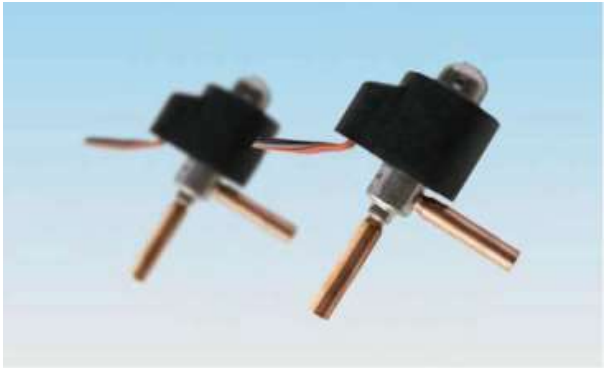
Poor heat transfer at the bottom of coil

EC Fan With Stepless Speed Regulation

The condensate fan employs the EC motor of which the speed is variable between 20%~100% to ensure that condensing pressure is within the range of safe operation under all conditions for longer service life.

Electronic Expansion Device

Electronic expansion device allows dynamic super heating control, which maximizes the utilization of evaporator heat exchange, thus resulting in more efficient full load and part load operation.



B. GREAT FLEXIBILITY

Thanks to its modular design type, the inverter chiller offers superior flexibility throughout the product's life cycle. From design engineer to installer, mechanical and electrical contactor, from end user to service people, almost every stakeholder will get substantial benefits from V series due to its great features in flexibility and practicality, making life easy and simple.

Easy shipment & installation
- The modular design allows easy storage; each module can be transported individually, which enhances mobility and allows convenient installation.
- The system can be expanded by adding modules, which allows multi-phase investment according to each building's load.
- A quick lead time due to standardized modular design.

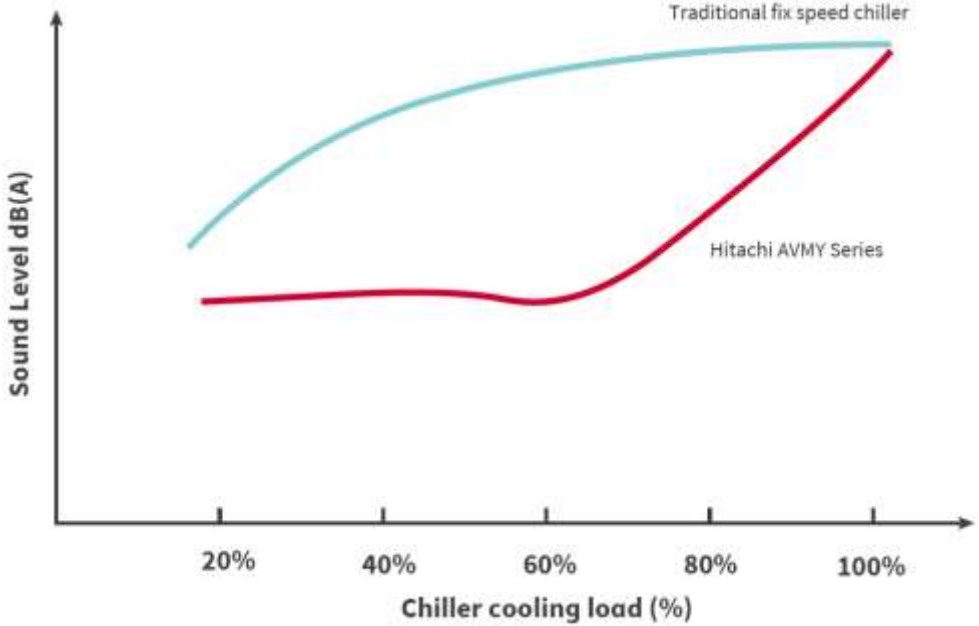
Easy layout
- A compact structure saves layout footprint on-site.
- Single modules can be arranged flexibly according to site layout.

Easy operation
- Systematic factory run tests before shipment ensure a trouble free start-up.
- Great system redundancy – if unexpected faults occur in one module, the remaining modules will operate as backup.

Easy maintenance
- When one module is being serviced, the system can still keep in operation, which can minimize downtime for the customer.
- A standardized design for each module ensures availability of parts and a quick response time for replacement.

C. QUIET OPERATION

Nowadays, modern cities demand more stringent sound level requirements than years before. In the real world, chillers run 99% of the time in off-design conditions – thus the sound performance at partial load really counts. The traditional fixed speed chillers address limited reduction in sound level at partial load. While for the DC inverter chiller & heat pump, thanks to the inverter technology, the compressor frequency can be lower down and result in a significant sound reduction, in most case, the expensive sound enclosure are not necessary.



D. ROBUST RELIABILITY

Withair is recognized as the market leader for its outstanding reliability. This reputation is built on years of repeated iteration, improvement and research and the highest level of engineering and design development.

DC Inverter Compressor
Withair has built its great reputation for delivering superior products, resulting from years of research and thousands of test hours, including extensive testing under extraordinarily severe operating conditions. The DC inverter chiller & heat pump adopts the latest generation scroll compressor which embraces all the design features that made Withair product such a success in HVAC application.

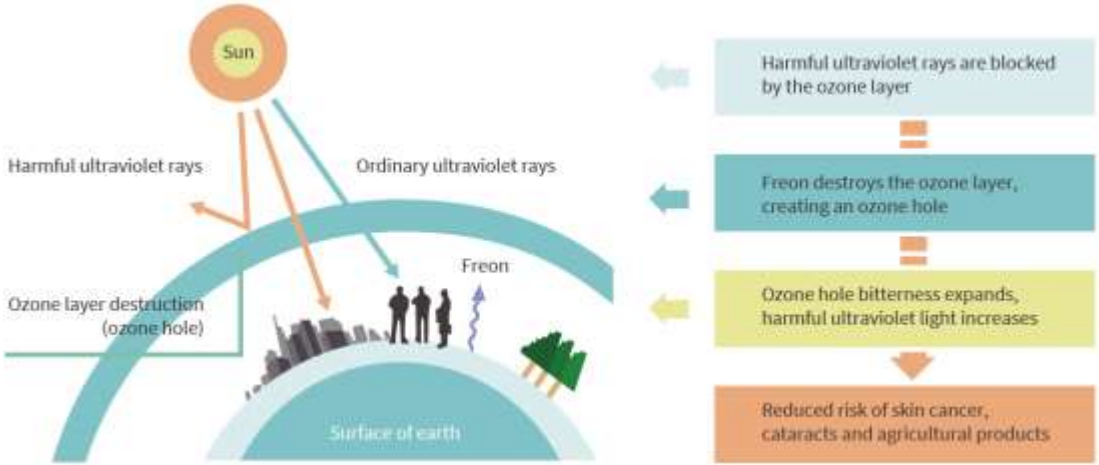
Low Inrush Current
As DC inverter chiller & heat pump contains variable speed drive for compressors, this avoids shocks to the motors and drives from sudden current surges during start-up. Starting the compressor at low frequency and bringing it up to full speed gradually will reduce stresses. As a result, the low current will bring less heat and help to extend the lifecycle of the motor. Meanwhile, the electronics can be planned based on minimum current capacity, which can reduce the extent of the wiring.

Trouble-Free Start-Up
All DC inverter chillers & heat pumps are given a complete functional test at the factory. This test program checks the sensors, wiring, electrical components and fans. In addition, each compressor is test-run to verify function and performance, ensuring that the chiller arrives at the job site fully tested and ready for operation.

E. ENVIRONMENTAL BENEFITS

The new generation of DC inverter chiller & heat pump is designed for sustainability. To reduce the direct environmental impact, it employs R410a refrigerant with zero ozone depletion potential (ODP), which is recognized as reliable replacement of R22. Meanwhile Withair's strict manufacturing process and factory tests before shipment ensure a leak-resistant refrigerant system.

Besides, the DC inverter chiller & heat pump makes the customer facility more sustainable in an invisible way: The chiller's exceptional all year round performance allows the less power consumption with reduced the power plant CO2 emission, which accounts for 80% of global warming potential (GWP) associated with chillers.



F. SMART CONTROL

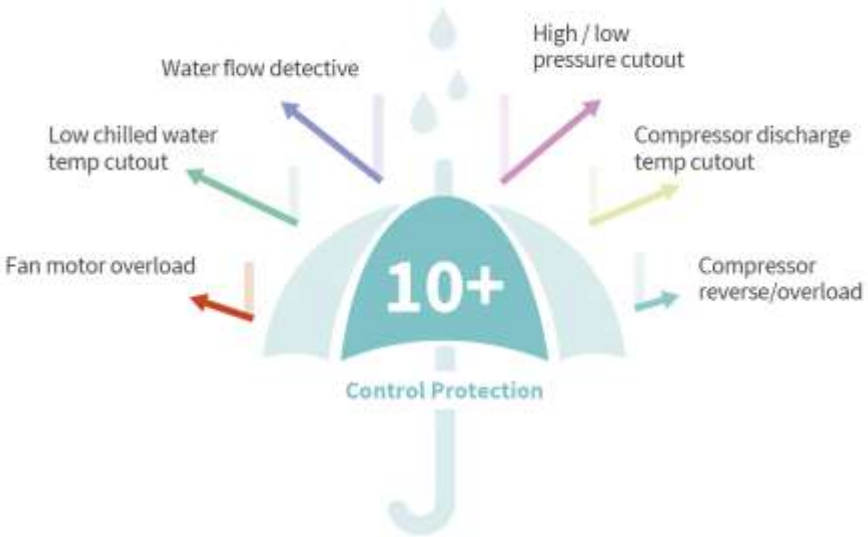
Auto-adaptive control combines intelligence with operating simplicity. The control constantly monitors all machine parameters and precisely manages the operation of compressors, expansion devices and fans for maximum energy efficiency.

User-friendly interface

- The standard system controller display features a 4.3” colored touch-screen, allowing access to all operational inputs and outputs.
- Units use intuitive tree-structure menus, permitting quick and easy access to available chiller data, including operating parameters of each master and slave unit: operating mode, water temperatures and set points, outdoor air temperature, set point, compressors operating status and running hours, refrigerant system parameters, etc.

Advanced control function

- The system controller can support up to 16 modules in one system, which can offer a wide system capacity range and give flexibility for capacity extension.
- Unit basic control function including: Unit ON/OFF, user safety interlock, water pump control, operation indication, circuit alarm and alert etc.
- Time of day scheduling allows the customer to perform simple chiller scheduling without the need for an entire automation system for the building. For example, the user can easily specify start up and shut down times in a 7 day time period.
- Free switching between master and slave units to effectively improve system reliability in case a master unit experiences a problem.



Alarm and diagnostic

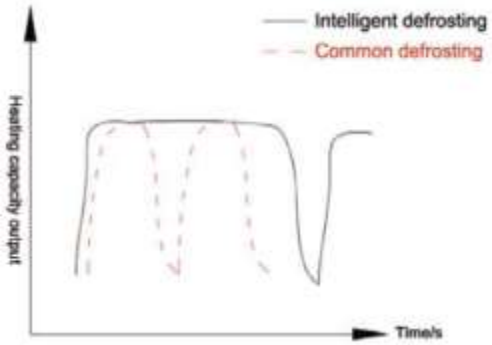
- Real time monitoring of the system parameters to ensure the chiller system has a safe and stable operation. The system provides more than 10 units control protection, such as water flow detective, water temperature out of range protection, refrigerant high/ low pressure cutout, compressor reverse/overload, motor overload, anti-freeze protection, etc. The diagnostic history records can be easily visited via the system controller.

Remote control / communication

- Stand-alone controls: the unit control system is equipped with remote start and stop contacts, and users can apply remote switch control according to needs.
- Building automation system (BAS) controls: unit have standard RS-485 communication interface with built-in Modbus communication protocol, which allows networked group control via system integration with BAS.

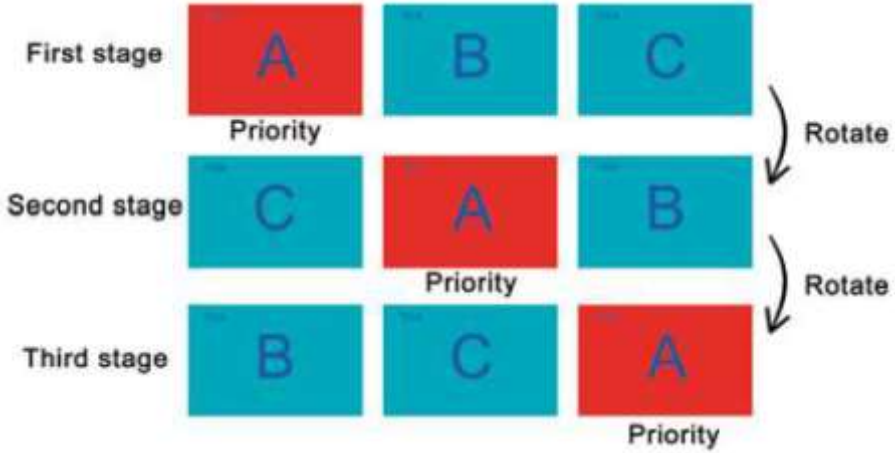
—— Intelligent Defrosting Technology, Non-stop When Defrosting ——

The unit control system can determine whether defrosting is necessary according to the ambient temperature in heating mode, evaporating temperature and running time; when defrosting conditions are met, the unit will automatically activate the defrosting program to complete defrosting within a short time and provide heating operation efficiency up to over 90% , ensuring the optimum heating capacity and high COP.



—— Free Master Module Design ——

Any single unit can operate as the master once connected with the wired controller. It overcomes the problem that the whole system would fail to work properly when the fixed master unit malfunctions.

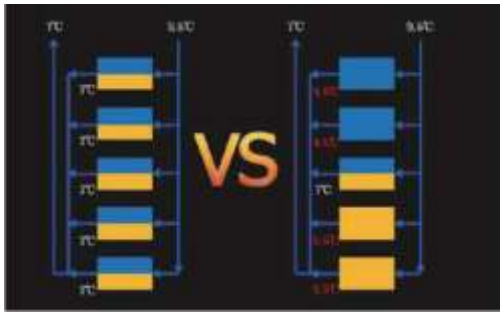


—— Intelligent Air Volume Management ——

The shared duct system is adopted to greatly expand the operating range. The single-module unit can automatically increase or reduce fans based on the ambient temperature to achieve optimal matching between air volume and load and deliver outstanding performance.

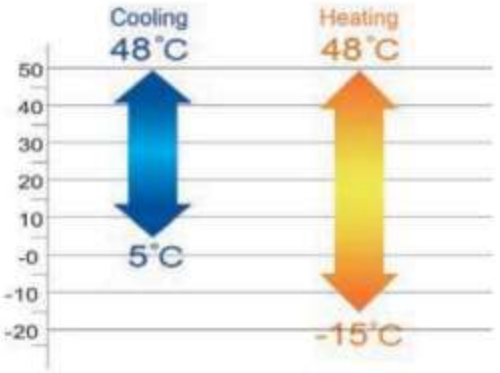
—— Intelligent Energy Management Technology ——

The Unique intelligent energy regulation technology in multi-module combination ensures that each module loads or unloads a refrigerant circuit before loading or unloading other refrigerant circuits in the single module, thereby providing higher efficiency, stability and IPLV.



—— Widely Operation Range ——

Low temperature cooling
5°C ~ 48°C
High temperature heating
-15°C ~ 48°C

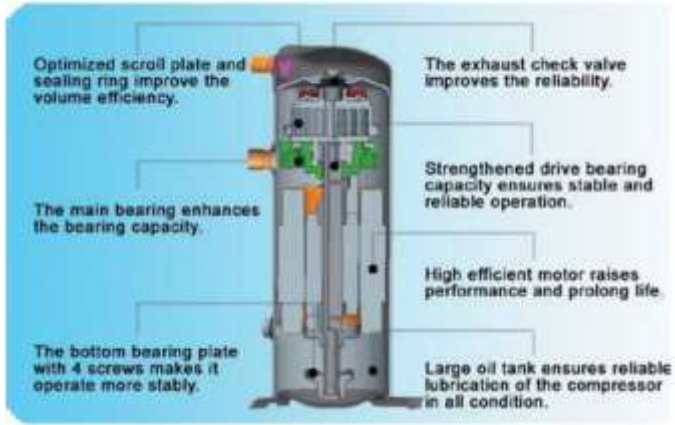


—— Compact Design And Smaller Footprint ——

Unique and compact structure results in small size and occupied area, significant reductions in installation space and cost; the unit is compact and easy to install. A 136kW unit covers floor space of only 2.4m2, a 50% reduction compared to its equivalents.

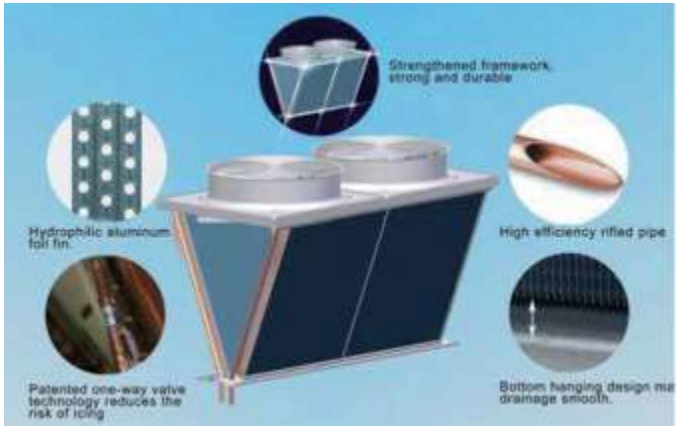
—— Reliable Hermetic Scroll Compressor ——

Unit adopt reliable hermetic scroll compressor, which is high efficient, energy saving and operates stably, with low noise, slight vibration and long service life.



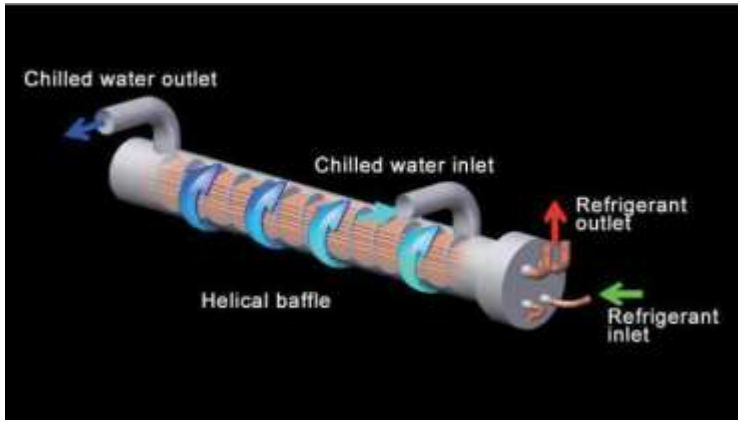
—— V-Shaped Condenser ——

The V-shaped condenser has used condenser has used an integral reinforcing metal frame, internal thread and tripe anti-frosting features (patented design of open-window hydrophilic aluminum foil + bottom elevated + one-way valve), providing higher structural stability and corrosion resistance; with heat exchange efficiency improved through full use of heat exchange area, low tendency to dust accumulation and frosting in winter, low loss of pressure, smoother drainage and higher reliability.



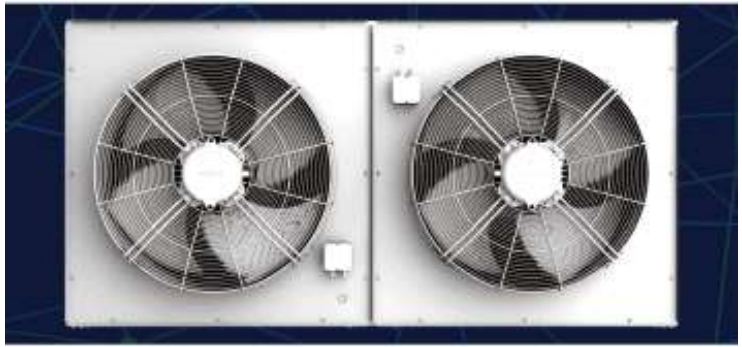
—— Efficient Shell And Tube Heat Exchanger ——

The waterside efficient shell and internal thread heat exchanger is of helical baffle type, with better heat transfer performance and higher resistance to freezing than plate heat exchanger, lower water resistance and lower requirements for water quality.



—— Saw-shaped Condenser Fan Blades ——

Compared to plastic impellers, the saw-shaped condenser fan blade provide large air volume, high durability and high air supply efficiency with low noise.



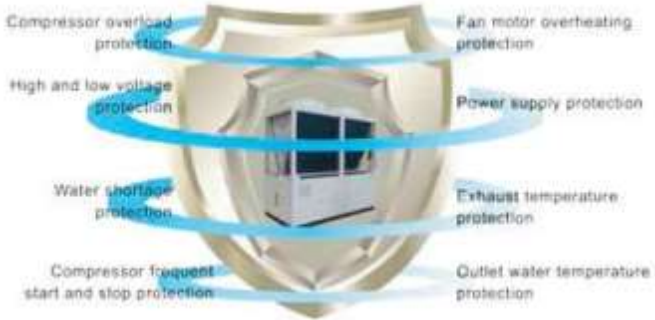
—— In House Engineered Microprocessor Control ——

The Withair control panel is fully upgraded based on origin control panels with years of experience in R&D and design, which combines more functions including phase sequence detection, current detection, RS-485 communication interface, delivering stronger performance, utility, standardization, convenience and universality. The USB interface is so provided to facilitate later-stage maintenance and upgrade of control function. The panel is supplemented by Withair developed control program which offers full operation control and multiple safety protection functions.

—— Multiple Protection Functions, Providing Safety And Reliable ——

The unit has multiple safety protection functions which ensure safety and stable operation of the unit and systems.

The water flow switch and multiple anti-freezing program designs protect the unit and systems in an all-round way.



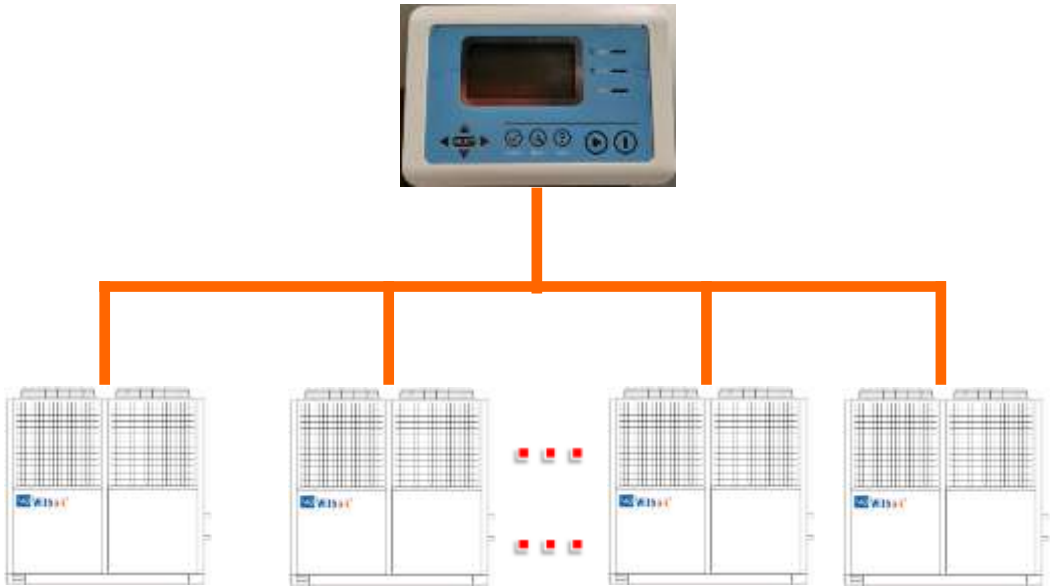
—— Super Protection Function To Ensure The Safety Of System Operation ——

The unit is equipped with a fully functional protection module, with the industry‘s most complete 13 kinds of safety protection functions and powerful fault diagnosis function as follows:

Power phase loss, reverse phase protection;
Current overload protection;
Insufficient water flow protection;
Frost protection;
Pump overload protection;
Water pump linkage protection;
Fan motor overload protection;
Compressor exhaust pressure is too high protection;
Compressor return air pressure is too low protection;
Compressor exhaust temperature is too high protection;
Compressor intelligent scroll temperature protection;
Cooling operation cooling water temperature is too low protection;
Overheating protection of cooling water temperature in heating operation;

—— New Touch-wire Controller, Easy To Control The System ——

A set of wire controller can meet up to 16 modules parallel at the same time to achieve centralized control, and users can know the operation and fault state of the unit through the wire controller in time.



—— Ultra-low Temperature And Wide Temperature Working Conditions Operation ——

The reliable operating range of Withair series module unit is -26℃~48℃, when ambient temperature at -26℃, unit still can be strong heating, which can realize the stable operation under the wide temperature range of -26℃~48℃.

—— The Key Advantages Include ——

- ECO friendly refrigerant R410a, R407c.
- Flexible configurations with top or side piping and front or side control box.
- Large panels for accessibility to compressor and controls sections
- Plate type, coaxial tube-in-tube heat exchanger for high performance, reliability, and resistance to freezing.
- Multi-function: provide cooling only, cooling with hot water, heating only and heating with hot water, hot water, total heat recovery, partial heat recovery for domestic hot water heating (55℃).
- Unit choose efficient rotary or scroll compressor, the use of high efficient heat exchanger technology processing, condensation temperature greatly reduced.
- When multiple units were combined into a system, because each unit can be individually ON/OFF; wide range of system energy regulation and running costs fell by more 40%.
- Unique compressor anti-vibration technology (patent ZL 2020 2 0246589.1) and sound attenuation material ensure ultra-quiet performance.
- Advanced microcomputer automatic control system, with protection of high and low pressure, overload, low voltage, phase lack, and low temperature etc., with terminal for the external pumps, and displays and alarms malfunction.
- Running ambient range from -20℃ to 50℃.
- Built-in hydraulic module for option.

—— The Key Advantages Include ——

- Multi-system design and wear-and-tear management technology reduces electric impulse and extend service life.
- Modular network function: unit control system is equipped with the network communication, the user can control operating units quantity according to the actual use load, make user side water system utilities, to realize the automatic device management automation and energy management.
- Smart microchip control and large LCD user interface, capable of one-key startup.
- Automatic intelligent reset. Unit shall automatically restart 5 minutes after shutdown if the fault has cleared. Should a fault occur 3 times sequentially, then lockout will occur.
- Humanized design, widened application scope: the unit's temperature settings for room, hot water, water intake/outlet, freeze protection, and compressor exhaust can be adjusted on-site according to environmental conditions.
- Communication adapter connection the unit to BMS(Building Management System) is an optional accessory, please get in touch with us or our distributor if required.
- Unit with multi-protection to guarantee the unit running stability and security, such as: high/low voltage, low oil level protection, exhaust temperature, antifreeze, power lack/reverse phase, water system cut off. operating condition with small change range stable operation, safe, reliable and long service life.
- Easy installation, simple water piping system configuration, you can make design partition and divide second installation.

—— The Key Advantages Include ——

- **Quality components selection**
  Compressors and refrigeration accessories (such as dry filter, thermal expansion valve, liquid supply solenoid, liquid level mirror, high/low pressure control devices) all chosen world-renowned brand products to ensure that the unit reached an excellent level of performance. Using the most advanced DAE / DAC efficient heat transfer pipe, heat transfer surface with internal ribbed tube makes the heat transfer coefficient substantially increased; the heat exchanger unique structural design, the best way of copper tube layout and precision of refrigerant control technology, greatly improved the efficiency of heat transfer.
- Perfect control
  1) Computerized control with standby manual operation system
  2) Compressor Operation timing
  3) Compressor automatic start-up sequence,
  4) Alarm signals
  5) Alarm reset
  6) Water temperature control
  7) Manual reset high pressure switch, Automatic reset low pressure switch
- Equipped self-diagnosis function, and automatically eliminate software problem

—— The Key Advantages Include ——

● Protections that ensure its safe and stable operation:
1) Reverse phase
2) Lack phase
3) High/low pressure
4) Gas discharge
5) Outlet water temperature too low (high)
6) Water stopped
7) Antifreeze
8) Compressor overheat etc.

● All the components covered with casing, keeps damages to cooling and electrical system away.

● Small size, light weight, easy for installation, transfer and maintenance, can be put into use just make water pipes and the power supply cable be connected at the site.

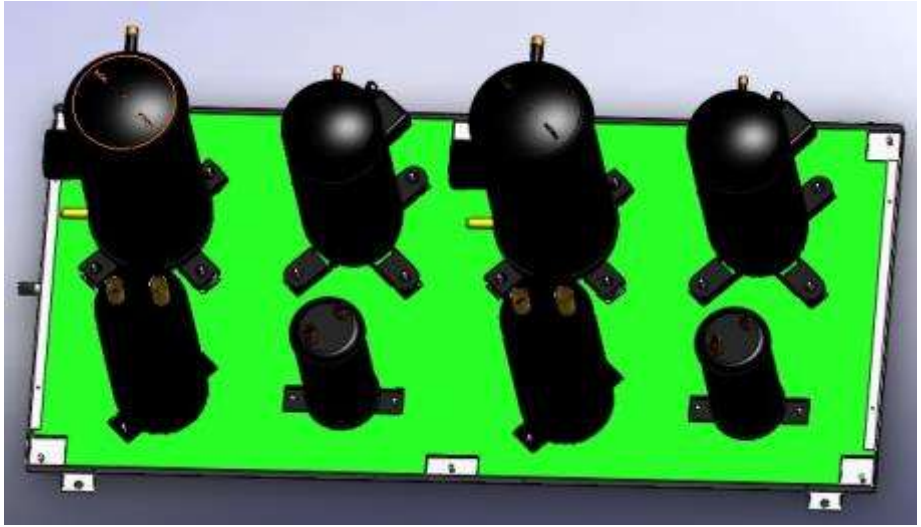
● EVI compressor as option. EVI compressor-enhanced vapor injection, Vapor-injected method can effectively improve heat capacity, prevent higher discharge temperature of compressor and guarantee operating stability of unit at low temperature).

—— Features ——

- **STRUCTURE**
  Panels and frame are made from galvanized steel protected with polyester powder painting to ensure total resistance to atmospheric agents.
- **HERMETIC SCROLL COMPRESSORS**
  Single phase type and 3-phase scroll type compressors, with built-in thermal overload cut-out and crankcase heater, mounted on rubber vibration dampers.
- **EVAPORATOR & CONDENSER**
  High efficiency plate type heat exchanger, tube in tube heat exchanger, shell and tube heat exchanger, factory-insulated with flexible close cell material.
- **REFRIGERANT CIRCUIT**
  Copper tube connection with charge valves, filter, thermostatic expansion valve, gas-liquid separator, high pressure switch and low pressure switch. The heat pump units are complete also with 4-way valve and one way valve.
- **HYDRAULIC CIRCUIT**
  No build in water circuit as standard.
- **ELECTRIC PANEL**
  Consists of: Compressor contactor, Compressor protection breaker, Microprocessor with function display.
- **OPTIONAL PARTS**
  Source side water flow switch, source side water pump, & user side water flow switch, user side water pump, hot water pump
  Expansion tank
  Metallic filter for the water circuit
  Build in water circuit
  Modular type
  Heat recovery for domestic hot water (55℃)

High efficiency scroll compressor

The most advanced enclosed scroll compressor, high efficiency, low noise, low tremble and high coefficient.



Multi-system and Modular combination of compressors maximally reduce energy consumption

High efficiency condenser

➢ ***High-efficiency Seamless inner groove copper tube.***

➢ ***Mechanically expanded onto the die formed aluminum fin.***

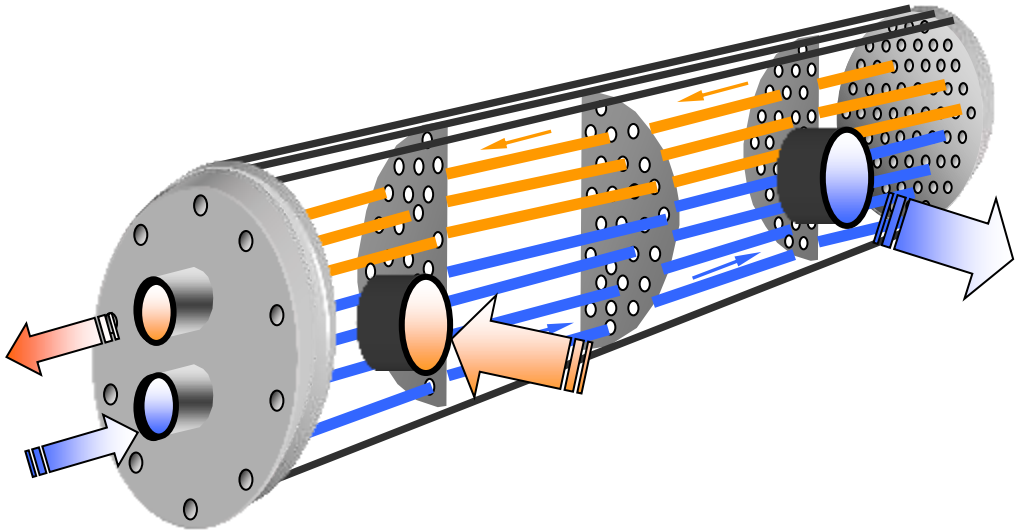
➢ ***Units adopt hydrophilic and antiseptic aluminum foil, could adapt wicked weather conditions***

Units adopt “V” type lateral heat exchanger and unique patent protection(Patent No. ZL 2010 2 0243062.2) technology of heat exchanger, realize high heat transfer efficiency and the whole heat exchange rate is higher than common heat exchanger by 30%.

High Efficiency Evaporator

Water side heat-exchanger

- *Shell and tube type, copper tube*
- *DX without any oil return problem*
- *Internally-finned copper tubes*
- *20 mm insulation cotton*



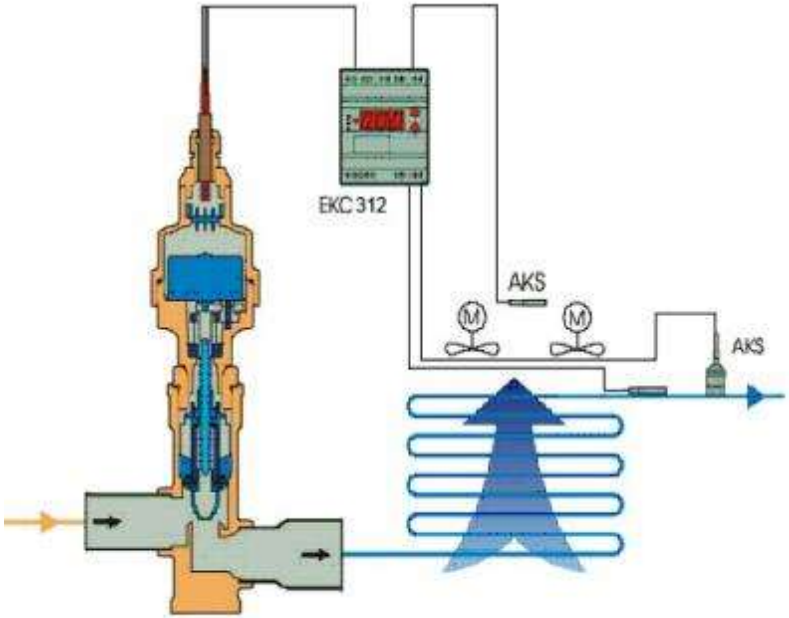
Fan Motor

- *Big airflow and static pressure.*
- *Static and dynamic balanced fan with low noise and vibration.*
- *High efficiency fan motor. Direct drive type，6-pole, 3-phase, Class-“F” insulation and IP54 protection.*

Refrigerant flow control

- *Electronic-expansion valve*
- *High precise control*
- *Real PID modulation*

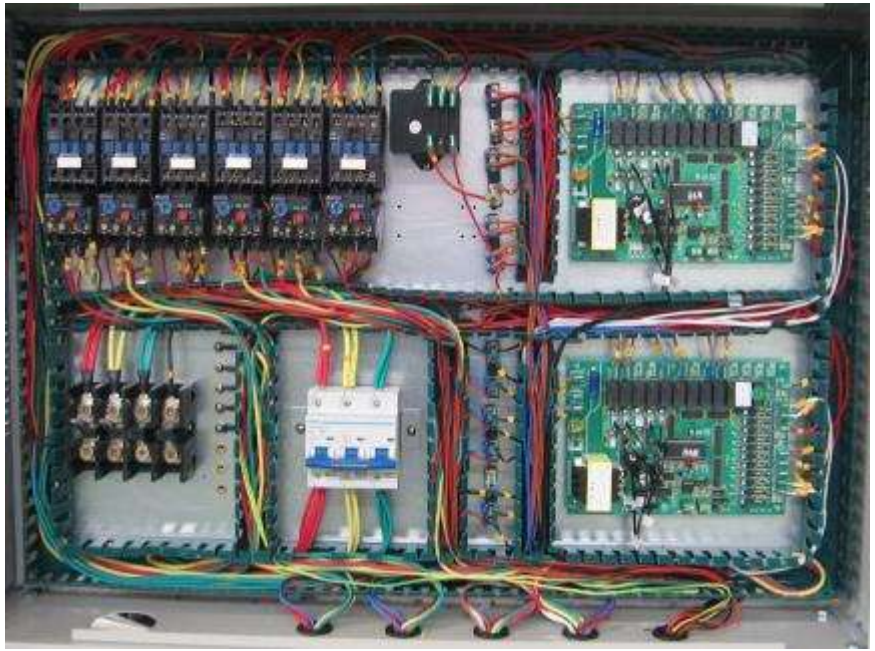
（PID Means Proportion Integration Differentiation）



Electrical control system

Units adopt microcomputer automatic control, LCD working platform, more convenient and reliable operation.

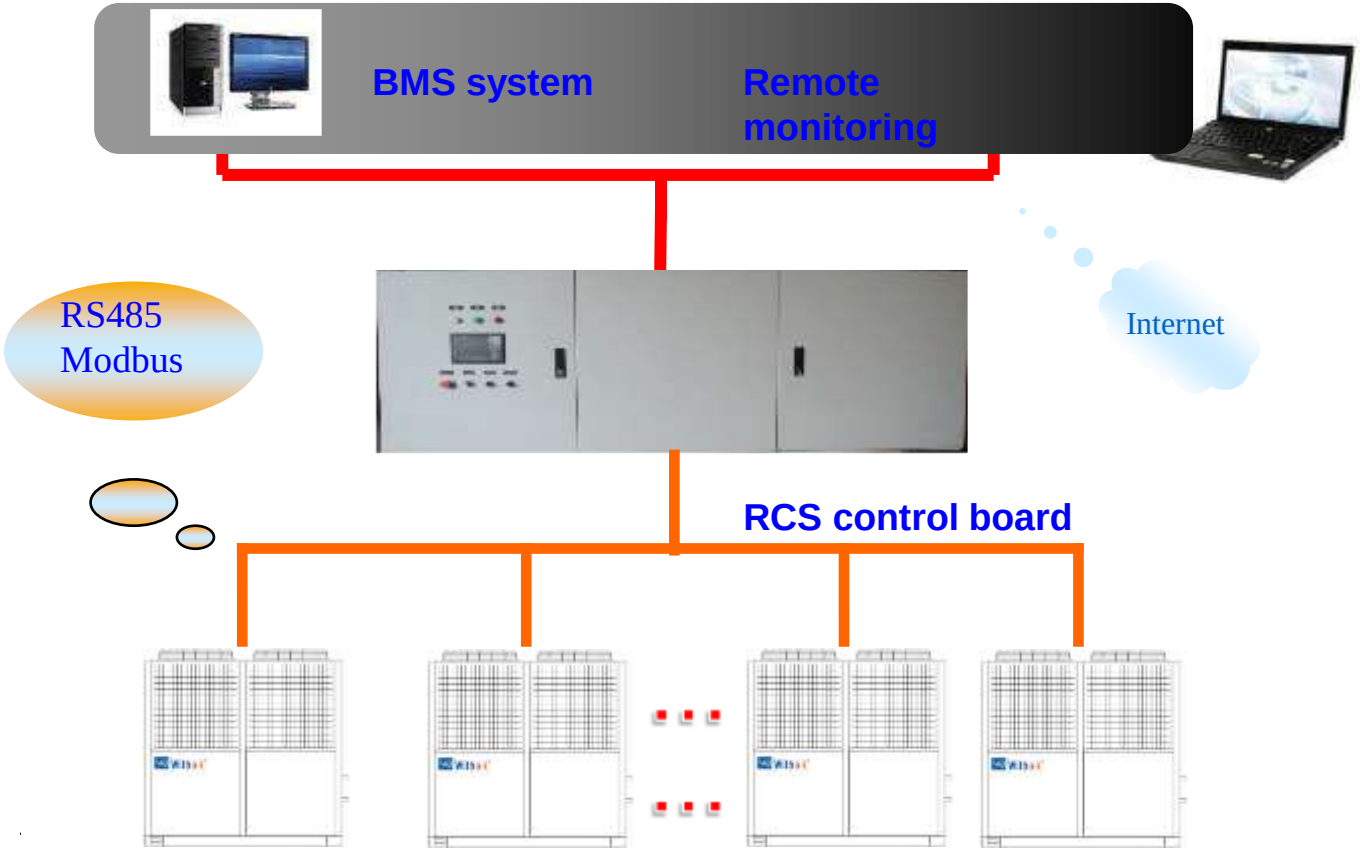
Electrical control system



Units adopt microcomputer automatic control, LCD working platform, more convenient and reliable operation.

—— LCD Controller Display ——

—— Remote Monitoring ——



—— Modular Networking ——

Units adopt modular networking technology, modular units could be increased or decreased according to practical load, convenient and fast for combination.

—— Independent Refrigerant System ——

Each refrigeration system of the units is independent from each other, we could respectively test and repair one modular unit, or one system in it without impacting performance of the whole units, convenient to repair and maintain.

—— Heat Recovery ——

Units have heat recovery function, could freely supply hot water use.

—— Protection Items ——

Water flow cutout	*Power Fault protection*
Anti-freeze protection	*Contactor Fault protection*
High-pressure alarm	*Discharge temperature too high*
Low-pressure alarm	*Fin temperature too high*
Compressor Inside Protection	*Water Inlet/outlet temperature sensor*
Oil level protection	*Ambient temperature sensor open/short circuit*
Oil pressure differential protection	*Coil temperature sensor open/short circuit*
Compressor overload protection	*Discharge temperature sensor open/short circuit*
Fan overload protection	*- - -*

—— Main Components ——

The main components of Withair heat pump & chiller are all selected famous brand products with excellent performance, so that the performance and reliability of the whole units are strongly guaranteed.

Some main components is as follows:

1. Compressors

Strong cooperation and creating high quality

2. Refrigerant accessories

3.Electric parts

Specifications (DC Inverter Version , Standard Single Modular Unit)

Model No.			W02C1-72I	W02C1-140I	W02C1-160I
Cooling mode	Nominal cooling capacity	kW	72.3	140.7	160.6
		US.RT	20.6	40	45.7
	Input power	kW	21.2	41.5	47.24
	Input current	A	37.5	51.6	56.2
	EER	kW/kW	3.41	3.39	3.40
	Cooling capacity range	kW	25~82	38~158	45~179
	Input power range	kW	8.5~25.2	12.6~59	14.5~61.2
	EER range	kW/kW	2.2~4.2	2.3~4.3	2.3~4.2
Circuit No.			2	4	4
Compressor	Type		DC inverter compressor / Variable speed scroll compressor		
	Quantity		2	4	4
	Capacity control		100~25	100~12.5	100~12.5
Water side heat exchanger	Type		High efficiency shell & tube heat exchanger		
	Water flow rate	m^3/h	11.9	23.4	27.5
	Pressure drop	kPa	≤55	≤60	≤70
	Water connection	Inch	2″	4″	4″
	Max. operating pressure	Mpa	1.0	1.0	1.0
Air side heat exchanger	Type		High efficiency grooved copper tubes & aluminum fins heat exchanger		
	Air flow rate	m^3/h	25,500	48,000	48,000
	Fan motor type		High efficiency and energy saving axial flow fan (EC motor)		
	Fan motor power	kW	1.5	3.0	3.0
	Quantity		2	4	4
Power supply		V/Ph/Hz	380~415V/3P/50Hz (208V380V/460V/575V/3Ph/60Hz as option)		
Refrigerant			R410A		
Flow control			Electronic expansion valve		
Controller system			Inverter controller		
Pressure device			Built-in high and low pressure sensor		
Hot water temperature range in heating		℃	30℃~50℃		
Cold water temperature range in cooling		℃	5℃~20℃		
Working ambient temperature		℃	-26℃~50℃		
Safe protection devices			High/low pressure switch, overload protection, counter clockwise and short phase protection (power phases sequence protection),lack water(water-flow switch),anti-freezing protection, etc.		
Noise level		dB(A)	62	65	68
Overall dimension	Length*Width*Height	mm	2400 * 1150 * 2300	2400*2250*2300	2400*2250*2300
Net weight		kg	1210	1880	2250

Performance Parameter Correction Coefficient Table in Different Conditions

Cooling capacity

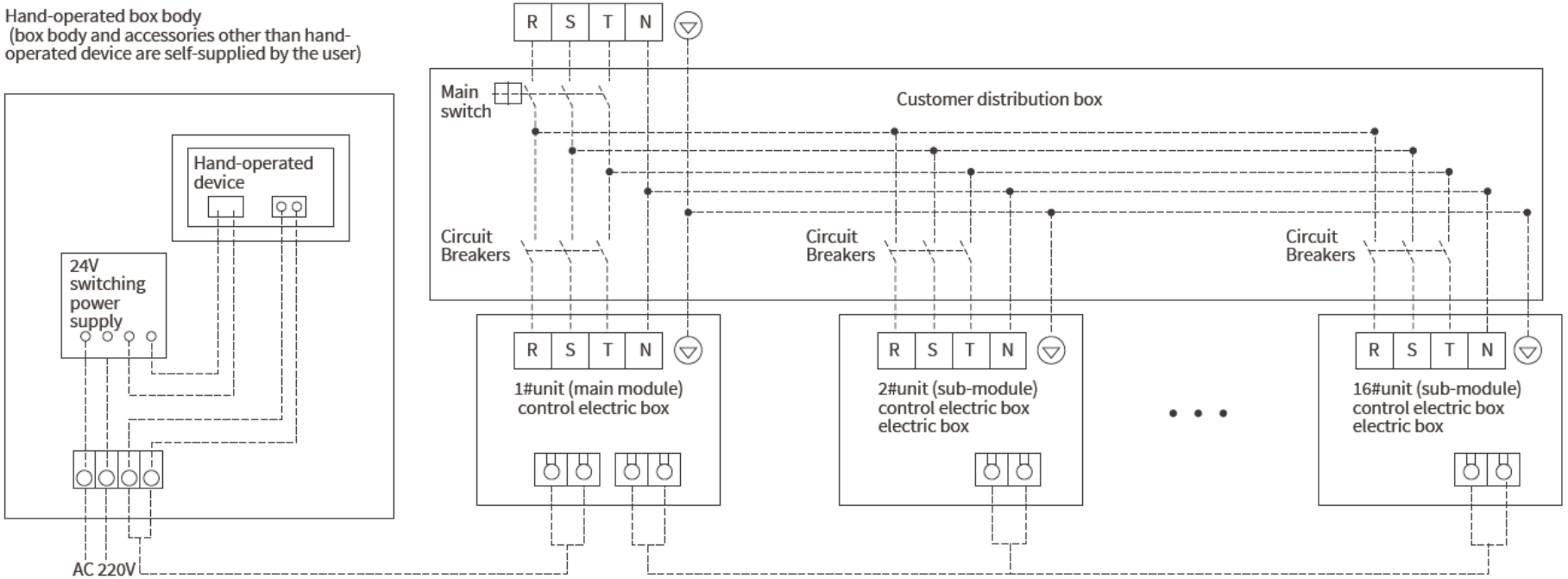
LWT (℃)	Ambient temperature (℃)											
	20		25		30		35		40		45	
	Cooling capacity	Input power	Cooling capacity	Input power	Cooling capacity	Input power	Cooling capacity	Input power	Cooling capacity	Input power	Cooling capacity	Input power
5	1.07	0.74	1.02	0.81	0.98	0.89	0.94	0.99	0.90	1.06	0.85	1.19
7	1.14	0.76	1.08	0.82	1.04	0.90	1.00	1.00	0.96	1.09	0.92	1.20
9	1.20	0.78	1.15	0.84	1.11	0.92	1.07	1.02	1.03	1.10	0.98	1.23
12	1.29	0.80	1.26	0.86	1.21	0.94	1.16	1.03	1.12	1.12	1.08	1.25
15	1.39	0.82	1.35	0.88	1.30	0.95	1.26	1.05	1.22	1.16	1.18	1.27
Note: LWT - leaving water temperature, EWT - entering water temperature												

—— Operating Conditions ——

Notes:
1. Nominal cooling operating conditions: entering chilled water temperature 12℃, leaving temperature 7℃; outdoor dry bulb temperature 35℃,wet bulb temperature 24℃.
2. The controllers need to ordered separately, including wire controller, communication line, IOM, temperature sensor and water flow switch.
3. These parameter were tested according to pure water, not include anti-freezing liquid and water pump power.
4. In actual use, the cooling/heating loss should be considered after the installation of the system piping, pumps, valve, dirt, etc. about 6%.
5. For other working conditions or capacity parameters, please contact Withair for cooling ambient condition under 5℃.
6. There will be no further notice if the parameters changes due to product optimization.
7. The units of the same model or different models can be combined freely. Each system can combine up to 16 modules.
8. Manufacturer reserves the right to make changes to above specifications without prior notice, please refer to the factory configuration when purchasing.

Conditions	Water side				Air side	
	Nominal operating condition		Operating range		Nominal operating condition	Operating range
	EWT (℃)	LWT (℃)	EWT (℃)	LWT (℃)	Dry bulb temperature (℃)	Dry bulb temperature of outdoor (℃)
Cooling	12	7	5 ~ 15	2.5 ~ 8	35	12 ~ 50
Note: LWT - leaving water temperature, EWT - entering water temperature						

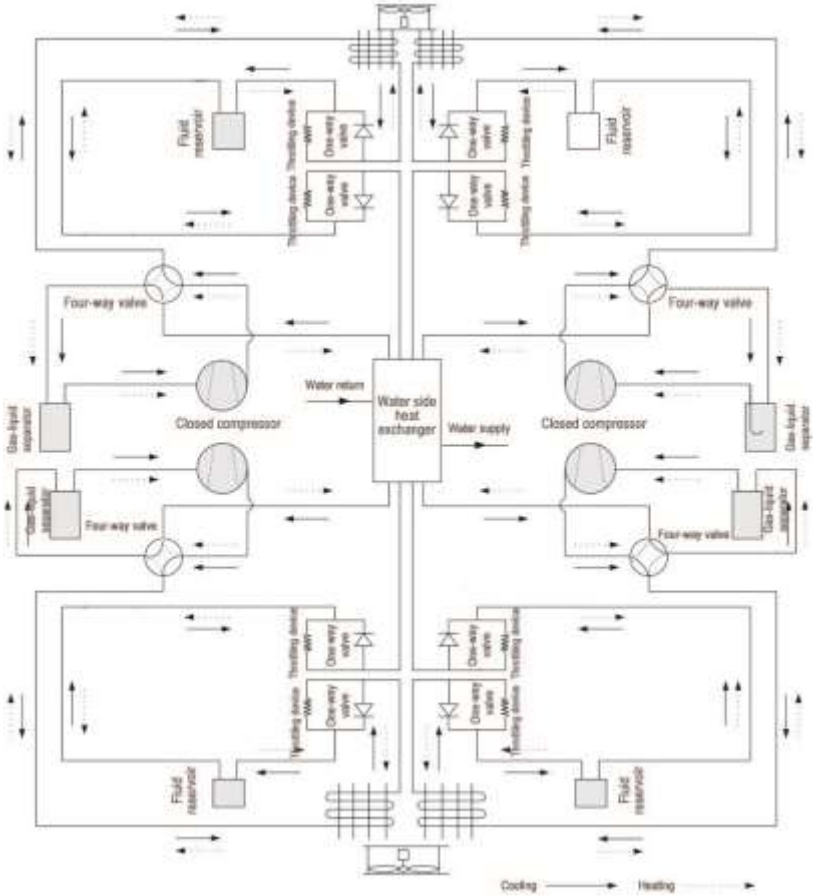
—— Electric Diagram ——



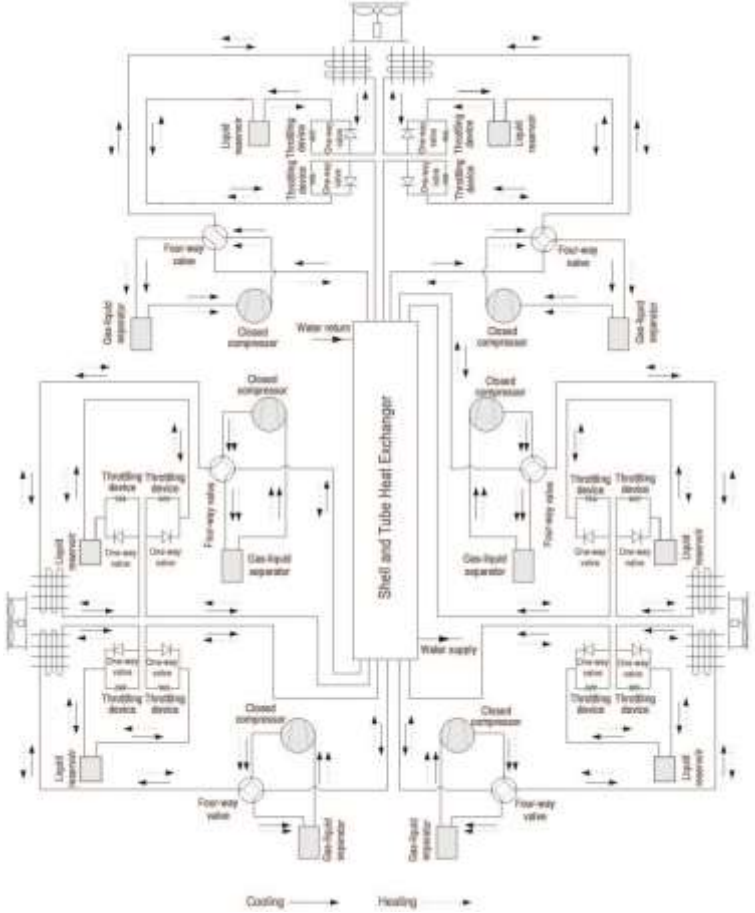
Note:

1. Wires between chiller units should be prepared by the user.
2. Communication lines must use shielded twisted pairs that are forbidden to mix with strong electricity.
3. The hand-operated device is an optional item with a 3 m communication line, and the communication line between the host and the hand-operated device is provided by the user.
4. It is suggested that the hand-operated device is installed in the box body separately, and the box body, the terminal and the switch power supply are provided by the user.

—— System Schematic Diagram ——



Four Compressors System



Six Compressors System

—— Power Connection ——

1) Wire selection and connection should be carried out strictly according to requirement.
2) Should have earthing well done, no earthing to gas pipe, water pipe, telephone line, to avoid electric shock caused by improper earthing.
3) Ensure the phase sequence is correct, to avoid not running.

Maintenance

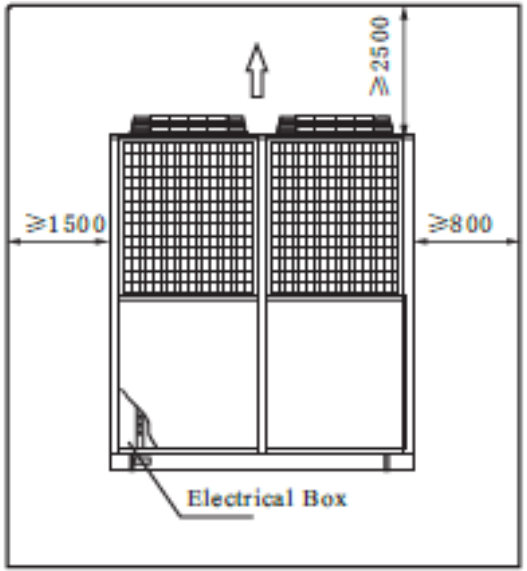
1) The qualified technician is required for the maintenance; all the protection devices and controller must be checked before restart.
2) Regular and correct maintenance is required for stability and good performance. Chilled and cooling water must be complete drained when long time no use to avoid possible freezing.

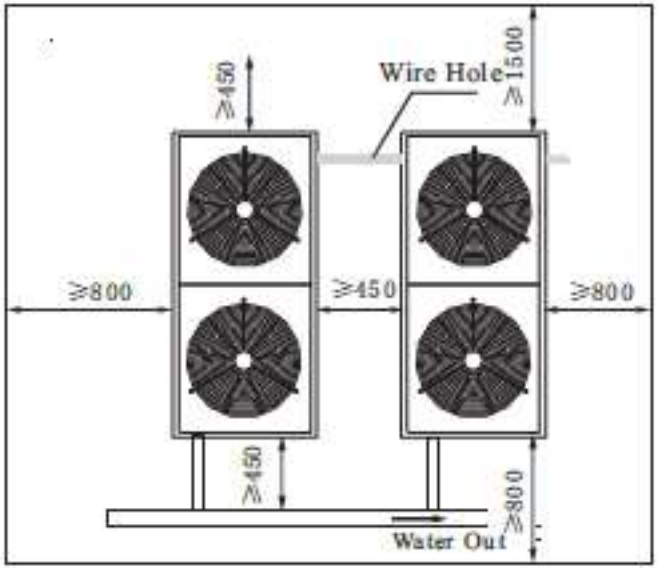
7. Notice

1) Antifreeze should be added in chilled water if water temperature set below zero or near zero.
2) Clean water system regularly.
3) Pay attention to antifreeze when ambient temp. is around 0℃ in winter.
4) Antifreeze or other antifreeze measure must be used in bad ambient(under 0℃ outdoor).

—— Installation Spaces ——

☆ Installation location



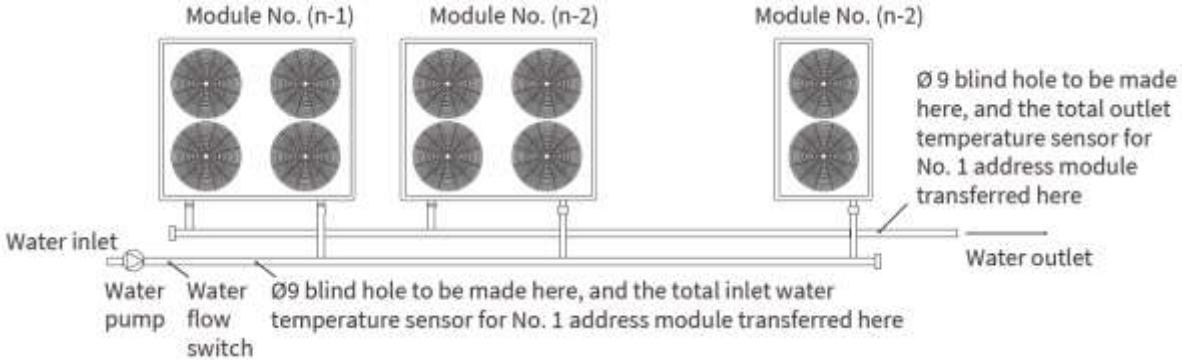


A).Near to in the indoor terminal, reducing water system resistance losses.
B).Near to the power and convenient for wiring connection.
C). Near to the water source and convenient for installation.
D). Strong enough to support unit weight and running vibration.
E). Enough space in order to install, repair, maintenance.
F). Water source not near to the dirty and corrosive fluid, keep pure water, water chlorinity does not exceed 25ppm

—— Pipe Connection Diagram ——

☆ Single modular

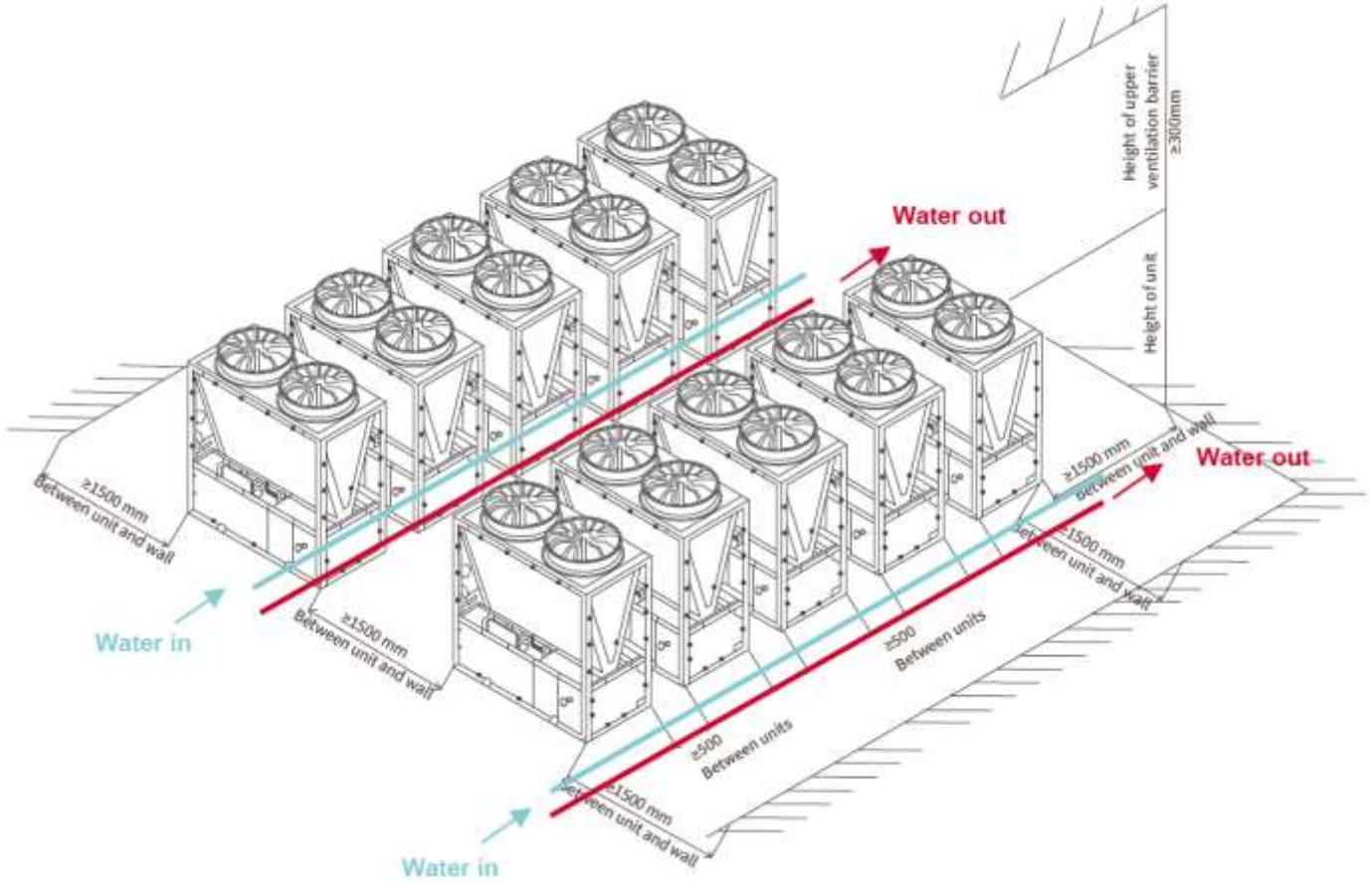
☆ Multi-modulars combination (up to 16nos can combine freely)



Notes:

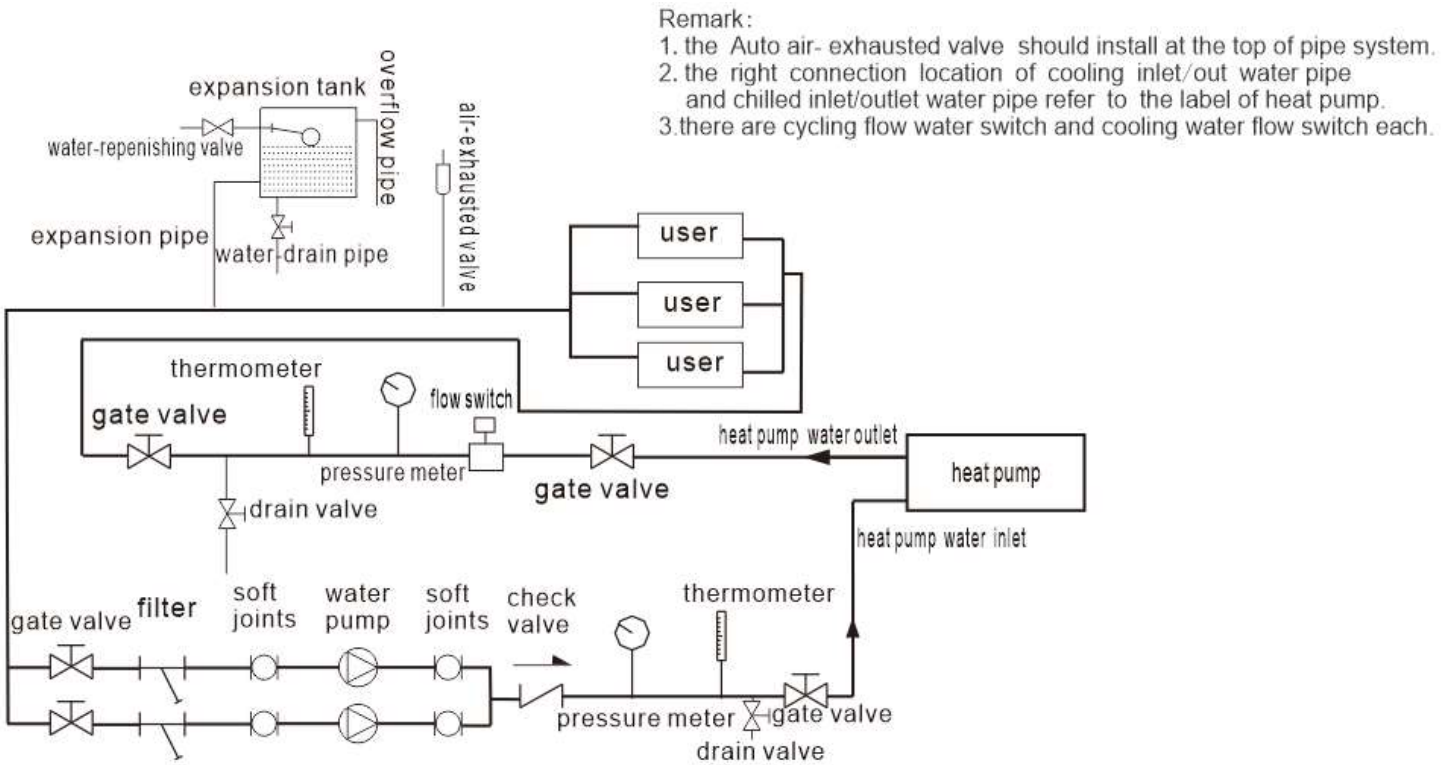
1. The unit shall supply the water inlet and outlet temperature sensor, and the user shall arrange them according to the on-site condition.
2. The corresponding water flow switch is not supplied, and shall be provided by the user.

—— Site Installation Schematic ——

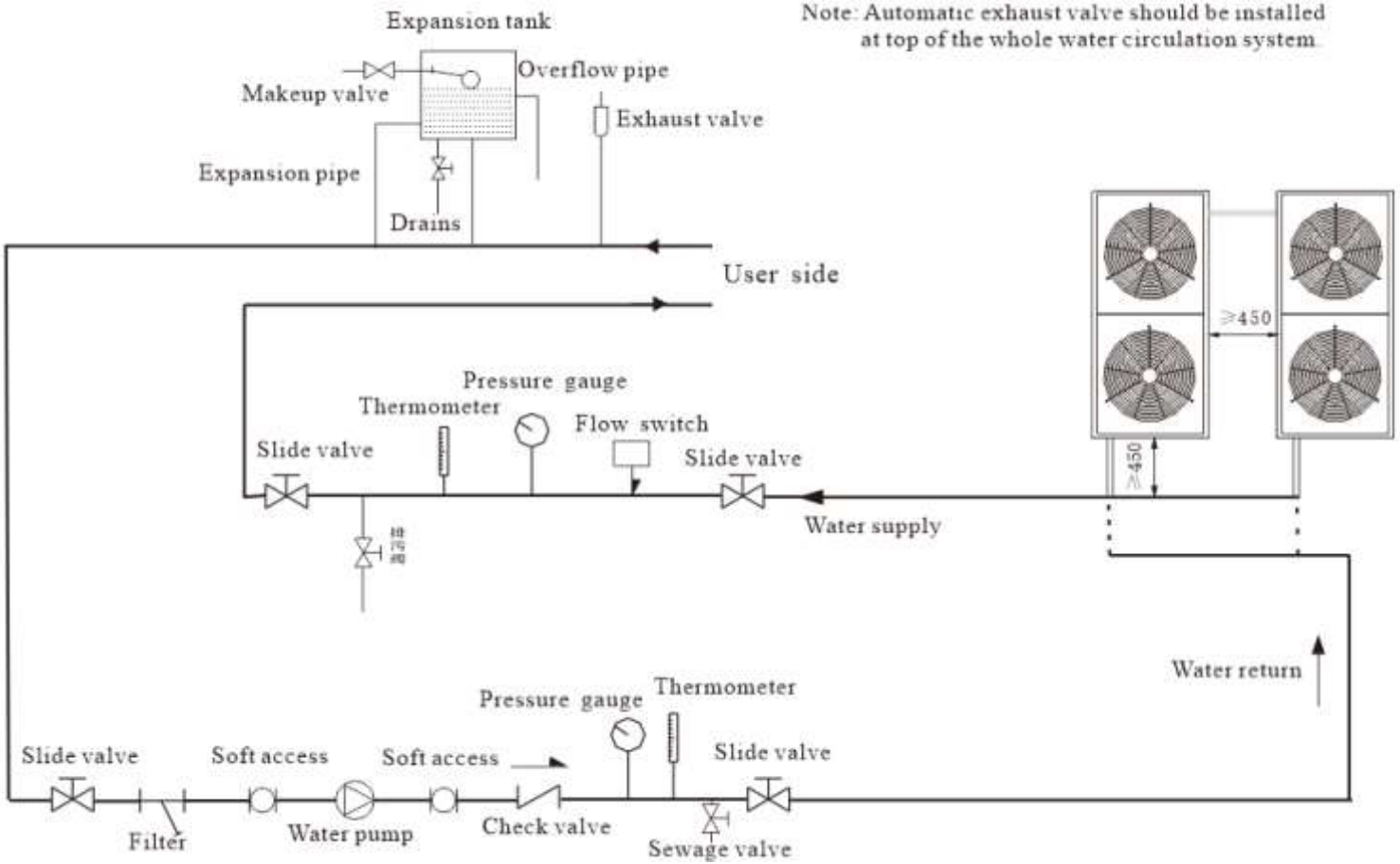


—— Water System Installation I ——

☆ Water system illustration for user side



—— Water System Installation II ——



Assembly and Test
The unit shall be completely factory assembled, pre-charged and wired. Complete unit must be test operated at factory prior to shipment.

Refrigerant System
Each refrigerant circuit shall include a high-efficiency scroll compressor, high pressure control, low pressure control, TXV, and refrigerant pressure gauge connections.

Electrical
The unit shall have 24-volt electromechanical controls and include compressor contactors, 24-volt transformer, terminal strip, compressor staggered start, fault lockout circuit, compressor anti-short cycle, low pressure switch by-pass timer, LED for compressor ON/OFF and fault status, and the necessary relays for compressor and reversing valve operation.
The reversing valve is energized in the cooling mode.

1. The preparation

1) After arriving the installation site, check all the items of the unit carefully according to the packing list if there are damage, lack of parts or damage during transport, notify the sales department.
2) The user must provide a rigid nondeforming foundation or concrete footings, based on the size of the unit four positioning hole; the foundation of the unit can also be framework structure, framework should be placed on main beam or column, and be capable of bearing the weight 150% heavier than the unit. The horizontal level should have no slope.
3) For easy handling, users should use the crane, the machine should properly protected by soft material on the point of force applied, and also be in balanced status during handling to avoid possible damage.
4) Choose the Installation Place
Units can be installed indoor or outdoor, should consider the following factors:
a) Installation place should be capable of bearing the weight 150% heavier than the unit. The horizontal level should have no slope.
b) Should keep enough space surrounding and on the top of the machine for access of maintenance.
c) Should have drain in the surrounding of the machine for release the water for seasonal stop of machine.
5) Foundation reference
Note: a) The foundation should be concreted structure or frame of steel, with a plane surface
b) 10-20mm isolator for shock absorption should be placed between the unit and foundation.
c) Foundation design can based on the machine net weight.
d) Fix the unit with φ16 foundation bolt
e) foundation diagram

2. Precautions for startup and commissioning

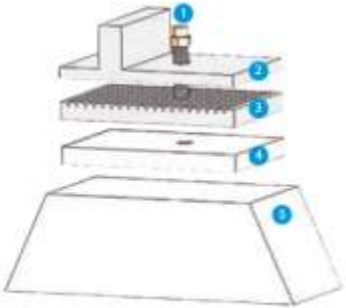
- Confirm that the installation foundation of the unit is firm, the drainage of the on-site unit is smooth, and the on-site heat exchange ventilation effect is good;
- Check that each water carrying section has no leakage, and the heat preservation is good; check that the flow rate and head of the water pump meet engineering requirements;
- Check the phase sequence of the power supply, the power supply voltage is in the correct state, and the power line diameter can meet the maximum power load of the unit;
- After ensuring that the above items are correct, the first start-up of the unit needs to be 12 hours ahead of schedule, to prepare for the unit preheating;
- After ensuring that the unit is powered on for more than 12 hours, turn on the circulating water pump to drain the air-conditioning water system, and then restart the unit after the drain is finished;
- Check and record the measured data of the unit, including current, voltage, suction pressure, inlet and outlet temperature, fin temperature, suction and exhaust temperature, compressor running quantity, etc.

3. Precautions for maintenance

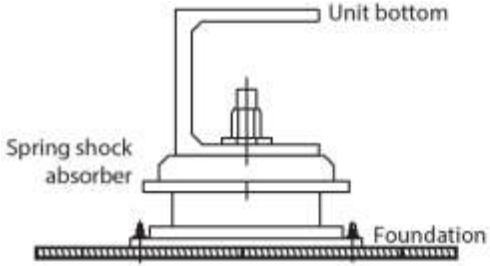
- For the water system, the customer is advised to check every half month;
- When the first use during season change each year, the unit must be electrified and preheated for 24h before the unit is switched on;
- If the unit is not used for a long time, it is important to drain water in the unit and pipe;
- After the unit is stopped for short-term in winter, the main controller and the unit shall maintain communication and must not be powered off. If the ambient temperature is too low, a water pump can be manually started to prevent the water pipe or unit from freezing;
- The main switch shall not operate frequently, and shall not exceed twelve times per hour, and the electric cabinet shall be protected from moisture;
- Always maintain a good heat exchange environment around the unit, the unit exhaust shall not be short-circuited with the unit return air, and the air side heat exchanger shall periodically clean and remove dust;
- The water system shall be keep water quality clean and the water filter shall be cleaned regularly;
- Special personnel shall be provided for maintenance and records.

—— Installation Requirements ——

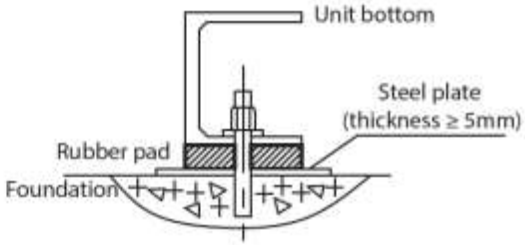
(1) Be sure to take the base preparation and structure into consideration seriously during installation, particularly on rooftop installations in order to avoid noise and vibration. Consulting the building designer before conducting installation is recommended.
(2) A drainage ditch should surround the base to ensure dewatering occurs
(3) Anti-vibration pad is to be placed between the base frame and foundation in order to avoid vibrations and unnecessary noise, and make sure the unit is horizontal during installation.
(4) The maximum altitude difference (levelness) should be within 3mm for the chiller base.
(5) The base should be raised by 100mm.
(6) The installation base of the unit must be concrete or steel structure, which can bear the running weight of the machine. The top should be horizontal. It is ideal to prepare a drainage ditch around installation base.
(7) Put the steel plate and anti-vibration pad in the correct position. Finish the installation of the unit and the foundation bolt before secondary concreting. The foundation bolt should protrude 100mm.
(8) Spring isolators are specified on the sales order as an option.



Typical Isolation structure



Spring isolator

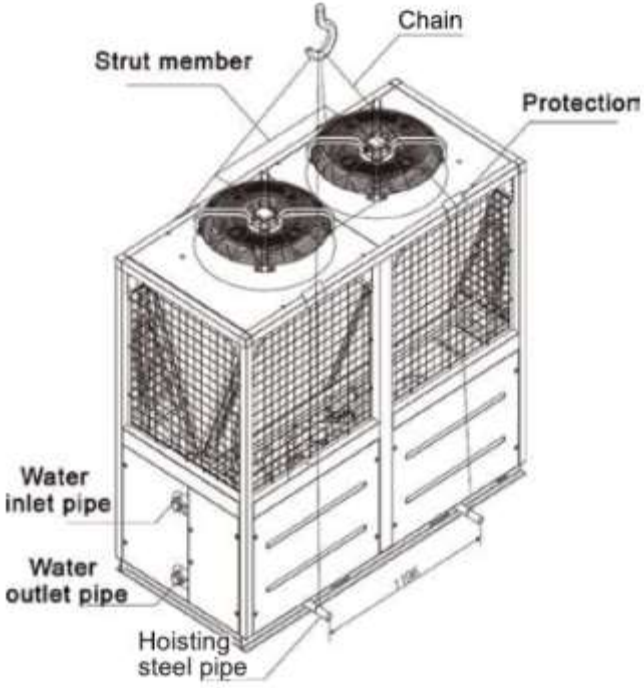


Rubber pad

Unit Hoisting

* Keep the package well from the factory to the job site;
* Be careful when carrying the units to ensure the body vertical;
* When lifting the unit, avoid it from hitting other objects to avoid sliding. At the same time the staff should avoid standing below or near the bottom of the unit to ensure safety;
* In order to prevent scratches or deformation of appearance, cable section shall be placed in contact with the unit's protective pads, while support should be added between the ropes prevent damage machinery by ropes.
* See the parameter table for the reference weight of the hoisting steel pipe, steel rope and lifting locomotive.
* The hoisting steel pipe, steel rope and lifting locomotive reference weight see unit parameter table. Protect the inlet and outlet water pipe of the unit to avoid collision during the hoisting process.

Example lifting schematic



—— Projects Solutions ——

● Solution for Hotel : Heat Recovery Air-cooled Heat Pump + FCU + Floor Heating + Fresh Air Unit + Heat Pump Water Heater

System Introduction:
In addition to reliably guaranteeing the use of air conditioners, this system can also guarantee 24/7 hot water supply; in the cooling season, users can get free hot water while using air conditioners for cooling; the cooling water system is omitted, and low the initial investment. ; Dual-purpose cooling and heating, no additional heating system is required; different air handling equipment can be configured according to the needs of different functions, such as fan coil units, variable air volume units, fresh air units, air handling units, etc.; modular configuration of the unit, it can realize non-stop maintenance; intelligent control, realizing quasi-linear energy adjustment with load changes, the system does not need a dedicated machine room, so it can release the effective space of the building and realize its economic value.

Projects Solutions

- Solution for Office Building: Air-cooled Heat Pump + Fan Coil Unit + Fresh Air Unit

System Introduction:
In addition to the reliable protection of the air conditioner, the system eliminates the need for a cooling water system and has a small initial investment; it is dual-purpose for cooling and heating, without the need for additional heating systems; it can be equipped with different air handling equipment, such as fan disks, according to the needs of different functions Tubes, variable air volume units, fresh air units, combined air handlers; the modular configuration of the main engine can realize non-stop maintenance; intelligent control realizes quasi-linear energy adjustment with load changes, so that the system always maintains the highest operating efficiency. The annual operating costs are low. The system does not require a dedicated computer room, so it can release the effective space of the building and realize its economic value.

—— Projects Solutions ——

● Solution for Shopping Mall : Air-cooled Heat Pump + Air handling Unit + Fresh Air Unit + Variable Air Volume Unit

System Introduction:
According to the characteristics of large flow of people and high demand for air volume in commercial places, the system adopts variable air volume units with large air volume and air handling unit and modular units configuration, which can realize non-stop maintenance; eliminates the need for cooling water system, and has a small initial investment; dual use of cooling and heating , No need to configure the heating system separately; in addition to ensuring the reliable operation of the system, intelligent control realizes quasi-linear energy adjustment with load changes. It can be easily switched to the mode of fresh air during the transition season, so that the system always maintains the highest operating efficiency. The annual operating costs are low. The system does not require a dedicated computer room, so it can release the effective space of the building and realize its economic value.

Projects Solutions

- Solution for Amusement Building : Air-cooled Heat Pump + FCU + AHU + Fresh Air Unit + Heat Pump Water Heater

System Introduction:
In addition to reliably ensuring the use of air conditioners, the system can also guarantee 24 hours of hot water supply for 365 days; the cooling water system is omitted, and the initial investment is small; the heating and cooling systems are dual-purpose, without the need for additional heating systems; the modular units configuration can be realized. The system capacity can also be increased at any time according to the operating conditions if the maintenance is disabled; intelligent control realizes quasi-linear energy adjustment with load changes. The system does not require a dedicated computer room, so it can release the effective space of the building and realize its economic value.

—— Delivery & Packaging ——

- 100% test before delivering products & services.
- Products catalogue, installation & operation manual will be sent together.
- Tracking number will be sent to customer as soon as we ship the products.
- Item shipped in 35~45 working days against payment depends on the quantity.
- Four steps of packages, plastic film, foam, carton and plywood for stable transportation.
- Ocean shipping, railway shipment and air transportation are acceptable according to customer demand.

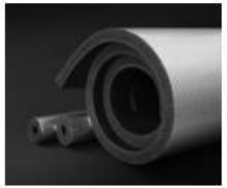
—— You May Like ——

Air Cooled Heat Pump +

Fan Coil Unit +

Variable Air Volume Unit +

Air Handling Unit +



Insulation materials +

Thermostat

—— Technical Support ——

Withair's rich experienced engineering team provides good support for any questions concerning the products and installation before, during and after products are sold.

● **Before Selling**

Set up customers file and arrange professional sales engineers to introduce company products and services to customers in details. If customers are interested in our products, we will send professional technicians to survey the installation environment and provide solutions according to different customers' requirements.

● **During Selling**

Machine installed and tested by QA engineers. Ensure all the products we provide are qualified and new. Construct and install the heat pump according to national relevant policies strictly and ensure high quality delivery on time. Test and debug the units strictly to ensure the safety and stability. During the delivery, provide comprehensive and professional technical training on instructions and maintenance to customers.

● **After Selling**

We promise to offer free consulting call in 7×24 hours mode to solve the problems found in practice. The service number: +8616651688268. Withair offers Five-year guarantee. Within 18 months since the delivery date, if the product has any failure under normal usage, Withair will provide free assembly parts. After the expiration of the warranty period, we will continue to provide lifelong maintenance services, with just a small amount of charges.

—— Physical Design, Online Production, Test, Package, Shipment and Installation ——

With perfect manufacturing process, Withair care every detail on what you need !





- **Super Low Noise:** Equipped strong pads for compressor to avoid vibration
- **Anti-corrosion:** Aluminum edging
- **Excellent Welding Guarantee No Leakage:** Four-way valve welding protection
- **Energy Saving:** 30mm thickness for insulation to prevent energy lost
- **Reliability of the Connection:** Adopt automatic stamping machine

—— Physical Design, Online Production, Test, Package, Shipment and Installation ——

—— Physical Design, Online Production, Test, Package, Shipment and Installation ——

—— Physical Design, Online Production, Test, Package, Shipment and Installation ——

—— Physical Design, Online Production, Test, Package, Shipment and Installation ——







—— Physical Design, Online Production, Test, Package, Shipment and Installation ——






—— Physical Design, Online Production, Test, Package, Shipment and Installation ——

—— Physical Design, Online Production, Test, Package, Shipment and Installation ——

—— Physical Design, Online Production, Test, Package, Shipment and Installation ——

—— Some Certificates ——

Feel free to contact us to receive further information about our products and energy solutions.

Notes:

Withair®, Your Reliable Partner For Successful Business !

The technical data in this document are not binding.
Withair reserves the right to introduce at any time whatever modifications deemed necessary for improving the product.

Withair Group (China) Limited
Withair (Nanjing) Industries Co.,Ltd
Factory A: No.6 Lukou Chuangzhi Industrial Park, Nanjing,China,211113
Factory B: No.9 Dongshan Bridge Industrial Park, Nanjing,China,211153
Tel: +86 25 86696286 & 16651688268 Mob: +86 139 159 28183(WhatsApp)
E-mail: info@withair.cn & withairgroup@gmail.com
Website: www.withair.cn

Mobile Web

Official Wechat