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Air conditioning solutions

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Air-cooled Inverter Modular Scroll

V-Series

Cooling & Heating

Johnson Controls - Hitachi Air Conditioning

ADDRESS
New Pier Takeshiba South Tower
1-16-1, Kaigan Minato-ku, Tokyo 105-0022, JAPAN
Tel: +81-3-6721-5567
www.jci-hitachi.com

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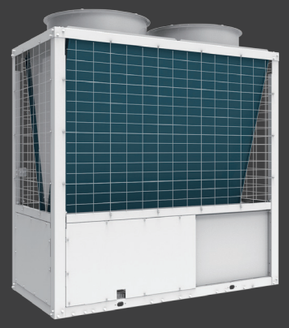
AVM-C-1811

PRODUCT BRIEF INTRODUCTION

Air-cooled scroll cooling only (heat pump) unit is a central air-conditioning product developed by our company for hotels, hospitals, cinemas, sports centres, recreation centers, commercial buildings, office buildings, industrial and mining enterprises, etc. It can be installed on the roof or outdoor courtyard, without special machine room and cooling tower. This product absorbs the essence of domestic and overseas similar products, focusing on the future of air-conditioning development and the demand of customers.



Stable and reliable

Performance stability, high-quality parts, multiple verification, multi-year experience inheritance and innovation

Flexible application

Flexible installation, flexible configuration and flexible operation

Superior performance

Far beyond the national level I energy efficiency

Intelligent control

New generation of micro-computer control platform, 16 modules combination easy access to building BAS system

Low-carbon environment protection

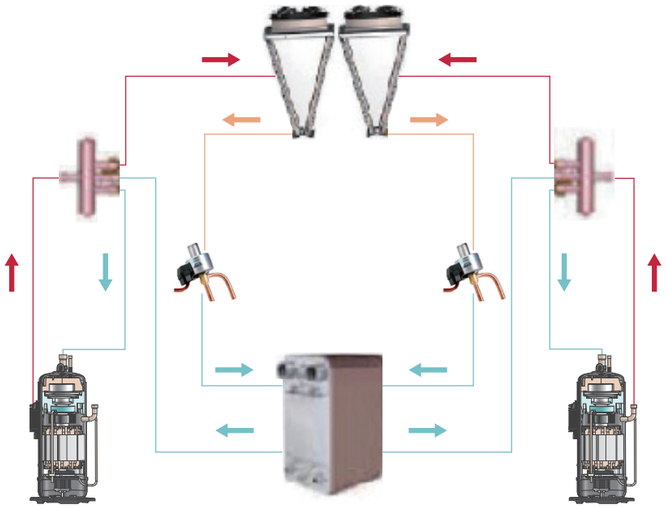
The environment-friendly refrigerant R410A is adopted for safety and environmental protection without phase-out period; use renewable air energy, to reduce carbon emission and protect atmospheric environment.

INDEX

FOCUS ON HIGH EFFICIENCY

High-efficiency independent refrigerant circuit

The independent circuit is designed, each compressor circuit works with the load to realize stable water temperature output;
Using high-efficiency plate heat exchanger to improve overall and partial load efficiency, optimize system efficiency.



FOCUS ON ENVIRONMENTAL PROTECTION

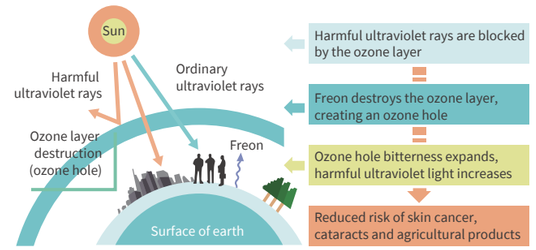
Focus on environmental protection

Adopt internationally recognized environmental-friendly refrigerant: R410A. It has the advantages of stable performance, no toxicity, no damage to the ozone layer, zero ODP (ozone depletion potential value);
Meeting the environmental protection requirements of "Montreal Protocol", and R410A is a long-term replacement of the refrigerant of R22;
Energy conservation and emission reduction, protecting the environment and responding to the national sustainable development strategy.

Protection of the ozone layercircuit

Adopt HFC410A refrigerants with damage coefficient of 0 for ozone layer

The damage to the stratosphere ozone layer will pose a major threat to the survival of humankind. Freon in the stratospheric ozone layer decomposes upon exposure to ultraviolet rays, releases chlorine atoms, and chlorine atoms bind with oxygen atoms in the ozone layer to destroy the ozone layer. In HFC410A, the ozone layer in the atmosphere will not be destroyed due to the absence of such chlorine atoms.



Product complies with ROHS directive

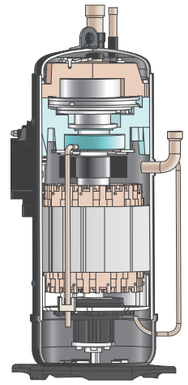
Ecological, environmental-friendly and harmless

The "Measures for the Management of Harmful Substances in Electrical and Electronic Products" was promulgated on January, 2016 and came into effect from July 01, 2016. The core content of the management method is to reduce and limit the use of harmful substances such as lead, cadmium, mercury, hexavalent chromium, polybrominated diphenyl, polybrominated diphenyl ether and the like in electrical and electronic products, so as to control and reduce the pollution caused to the environment after the electronic product is wasted, promote the clean production and comprehensive utilization of resources in the electrical and electronnic industry, encourage green consumption, and protect the environment and human health. As the management method restricts the use of six poisonous and harmful substances such as lead and mercury in electronic information products, they are similar to the Directive on Restricting Use of Certain Hamful substances in Electronic and Electrical Equipment issued by the European Union on February 13, 2003, so the industry will refer to the management method as the ROHS of China. The central air conditioning products of Hitachi cooler comply with the "Measures for the Management of Harmful Substances in Electrical and Electronic Products", and the green environmental protection will be posted on the central air conditioning unit from the beginning of the July 01.

Test Methods	RoHS Limit	Typical Test Method
Lead	1000ppm	Wet chemical treatment or X-ray fluorescence
Cadmium	1000ppm	Wet chemical treatment or X-ray fluorescence
Hexavalent chromium	1000ppm	Wet chemical treatment or X-ray fluorescence
Mercury	1000ppm	Wet chemical treatment or X-ray fluorescence
PBB/PBDE	1000ppm	GCMS, FTTR, or X-ray fluorescence

FOCUS ON QUALITY

High quality compressor



With nearly 40 years compressor design and production experience, high-efficiency variable-speed technology

R410A special full-sealed compressor, few parts, lowers vibration and noise;

Direct air suction, small suction preheating and higher volume efficiency;

New method and new materials (Nd-Fe-B magnet) are adopted to improve the efficiency of motor.

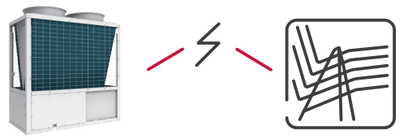
Multi-module free combination, more flexible application

With the design of the optimization module, the modules with different models realize the free combination to support 1-16 modules in parallel connection; the maximum cooling capacity is up to 2400KW, the maximum heating capacity is up to 2400KW, so that the requirements of various building loads can be met.

Opitonal

Low-frequency start-up, power grid impact small and safer

Each unit has multi-system design, the startup of the unit adopts low-frequency startup, the starting current of the unit is reduced, the impact on the power grid is reduced, and the safety of other power utilization equipment in the same area is ensured.



Ultra-strong compatibility, continuous operation

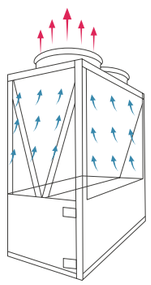
The master-slave module is free to switch, and when the main module fails, it does not affect the whole system operation which effectively solves the potential risk that the whole system paralysis when the main module fails. The system is independently designed and run for easy installation and maintenance.

FOCUS ON QUALITY

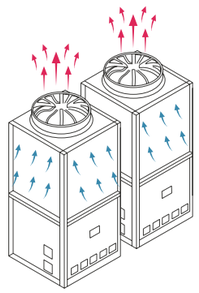
V shape heat exchanger with high strength and high efficiency

Adopt a new type of optimized design V-shaped fin heat exchanger, use CFD to simulate the wind field, and optimize the included angle of V, which is more consistent with the air-gas flow characteristic, the air flow structure is more uniform, the heat exchange is full, the efficiency is improved by 30%, meanwhile, the loss of compressor consumption is reduced.
The embedded triangular structure characteristic can effectively improve the overall structural strength of the equipment and avoid the risk of damage on the surface of the heat exchanger which guarantees the safety of transportation and installation process equipment.

It fits the air flow with smooth airflow, uniform heat exchange and high heat exchange efficiency



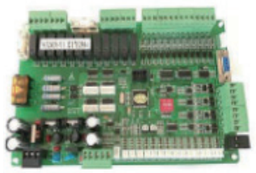
VS

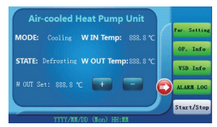


The bottom heat exchanger is large in size with non-uniform in air inlet, low in utilization rate and affecting heat exchange effect.

Micro-computer Precise Control

The unit adopts a microcomputer control system, a color text display and a friendly man-machine interaction page. It contains multi-level password protection erroneous operation from affecting the operation of the system. The control system has the function of self-starting electricity, and the timing start-stop function is optional, so that the unattended schedule management function can be realized on the customer's site.





The product is constantly improving and innovating, the pictures are for reference only, and in kind shall prevail.

Internal thread copper pipe

The wind-side heat exchanger adopts advanced trapezoidal internal threaded cooper tube design and the internal threaded copper tube not only increases the effective heat exchange area of the system, but also enhances the disturbance of the refrigerant, and the heat exchange efficiency is more than 30% higher than that of the common heat exchanger tube.

Internal thread copper tube

VS

Common copper tube

Multiple protection, stable operation

More than 10 kinds of safety protection functions to ensure safety and stable operation.
- Anti-freezing protection
- Power supply phase sequence protection
- Compressor exhaust temperature protection
- High and low voltage protection
- Overload protection of blower fan
compressor overload protection

Simple expansion, small initial investment and convenient maintenance

Investment: the system expands conveniently, and can be invested in stages according to the schedule.

Transportation: Small volume, high strength, independent transportation, no need for large-scale hoisting equipment.

Installation: It is only required to be installed in a well-ventilated area without the need of machine room and cooling tower. When multiple modules are combined, the installation space is flexible, and when the installation space is abundant, the appropriate distance can be ensured the basic maintenance space.

Maintenance: The relatively independent system design between modules is easy to maintain.

Higher supercooling and higher efficiency

The air side heat exchanger adopts the design of a counter-current multi-row pipe. The air flows on the heat exchanger for a long time, and the heat exchange capacity is large. It achieves greater supercooling and the performance of the unit is more reliable.

High-precision electronic expansion valve

The electronic expansion valve is used as the control part of the refrigerant, and the air suction superheat degree is adopted for accurate throttling control, and the heat can be dynamically adjusted according to the quick action speed. In the full working condition range, the operation is balanced, the variable environmental factors are affected to the lowest, and the unit is always in the optimal operating state of temperature and corresponding pressure.

FOCUS ON CONVENIENCE

Easy to operate

The control system adopts the high-speed embedded microprocessor and the performance is much higher than that used in the industry. 485 communication transmission technologies are adopted, which can realize long-distance data transmission;
4.3"color touch screen, providing various parameter setting and inquiring functions of the unit, friendly man-machine interface; remote control on-off, timing on-off function in 3 time period for 7 days.

Convenient installation

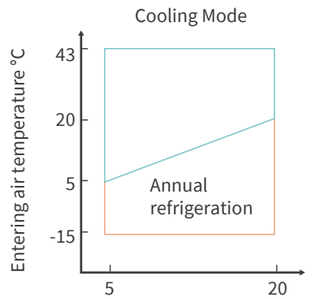
The modular design, lightweight and compact structure, no need large-scale lifting equipment during installation and transportation.
No need special machine room, the installation position of cooling tower and cooling water pump are flexible; when multiple equipment is installed, they can be stitching in length or width direction;

Nomenclature

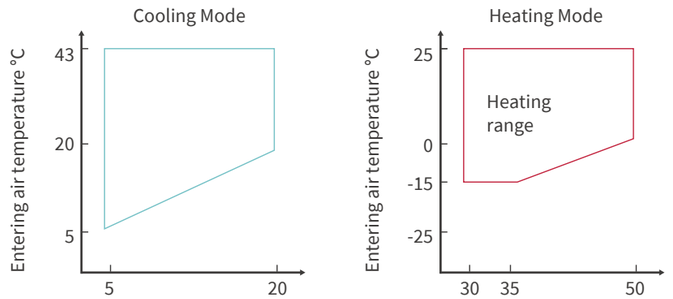
RHU | A | *** | A | V | M | Y

- Y: Export Unit
- M: Modular
- V: Variable Speed Chiller
- A: Air-cooled Unit
- ***: Cooling Capacity (kW)
- A: R410A
- RHU: Heat Pump Unit
- RCU: Cooling Only Unit

Operating Range



Cooling Only Unit



Heat Pump Unit

FOCUS ON CONVENIENCE

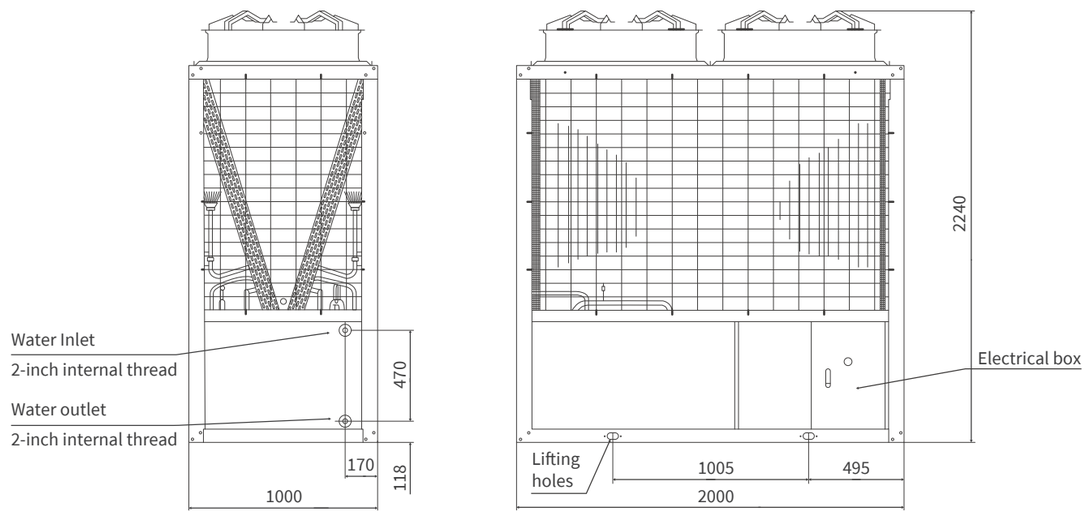
Performance Data

Model			RC(H)UA065AVMY	RC(H)UA130AVMY	RC(H)UA150AVMY
Nominal cooling capacity		kW	65	130	150
Power Input (cooling)		kW	19.2	38.5	47.2
Nominal heating capacity		kW	68	136	150
Power Input (heating)		kW	21.4	42.8	47.2
Refrigerant		—	R410A		
Flow control		—	Electronic expansion valve		
Circuit No.		—	2	4	4
Compressor	Type	—	Variable speed scroll compressor		
	Quantity	set	2	4	4
Compressor capacity control		%	100-25	100-25	100-25
Water side heat exchanger	Type	—	Brazed plate heat exchanger		
	Water flow rate	m^3/h	11.18	22.36	25.80
	Pressure drop	KPa	55	55	68
	Water connection	—	2-inch internal thread	DN65 flange	DN65 flange
	Max. water-side operating pressure	Mpa	1.0	1.0	1.0
Air side heat exchanger	Type	-	Grooved copper tubes and aluminum fins		
	Fan power	kW	1.5	3.0	3.0
	Quantity	—	2	4	4
	Air flow rate	m^3/h	28600	57200	57200
Overall dimension	Length	mm	2000	2063	2063
	Width	mm	1000	2000	2000
	Height	mm	2240	2240	2240
Net weight	Cooling Only type	kg	490	954	974
	Heat Pump type	kg	538	1050	1070

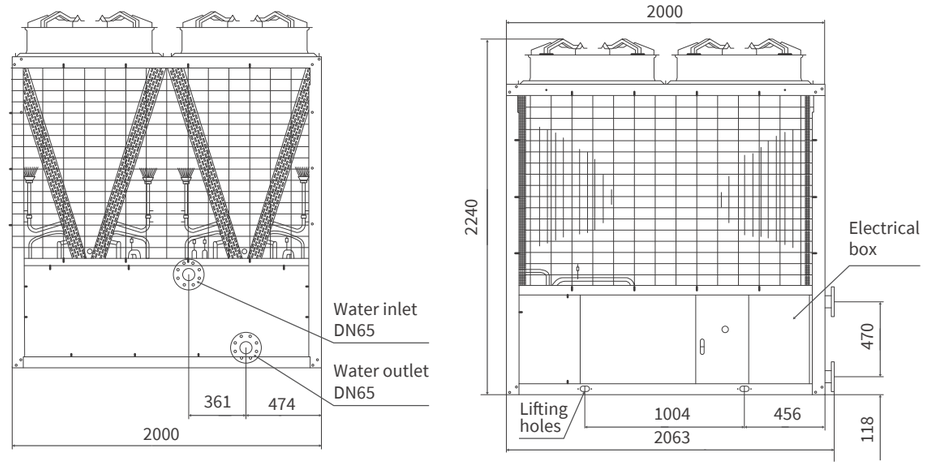
Notes:
1. The performance data is rated According to AHRI Standard 550/590
2. Nominal cooling mode- evaporator entering/leaving water temperature 12/7°C. outside air temperature 35°C;
3. Nominal heating mode-water heat exchange entering/leaving water temperature 40/45°C. outside air temperature 7°C;
4. Water heat exchanger fouling factor 0.018m2k/kw
5. Customer side flange and thead pipe is not provided with the unit
6. Main power supply: 380V-3Ph-50H

Dimensions

RC[H]UA065AVMY

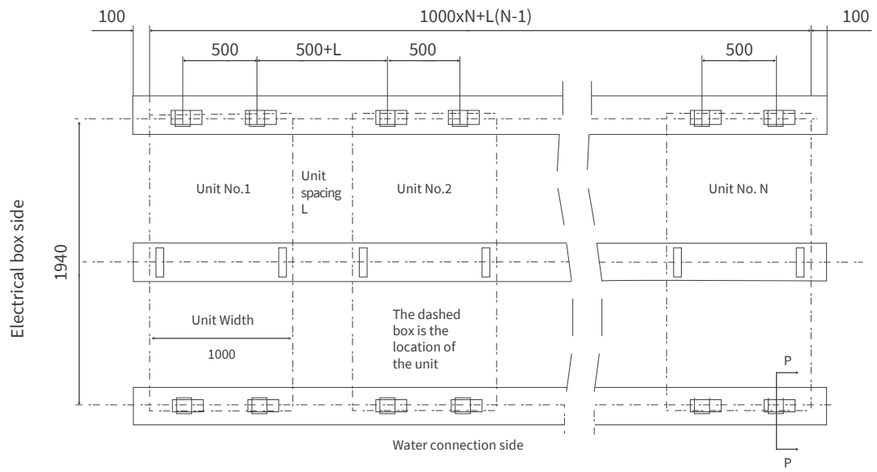


RC[H]UA130AVMY/RC[H]UA150AVMY

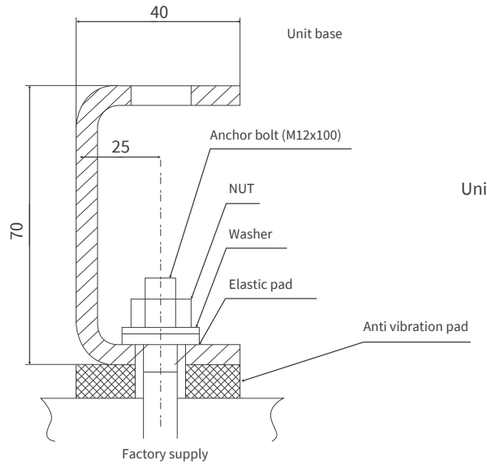


FOCUS ON CONVENIENCE

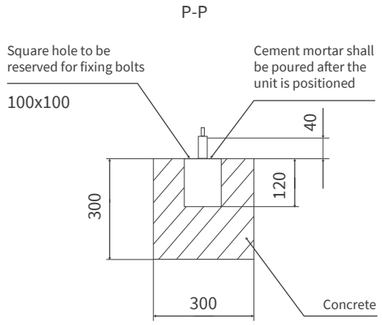
RC (H) UA065AVMY Foundation Drawing



Detailed drawing of foundation installation (not to scale)



Unit side

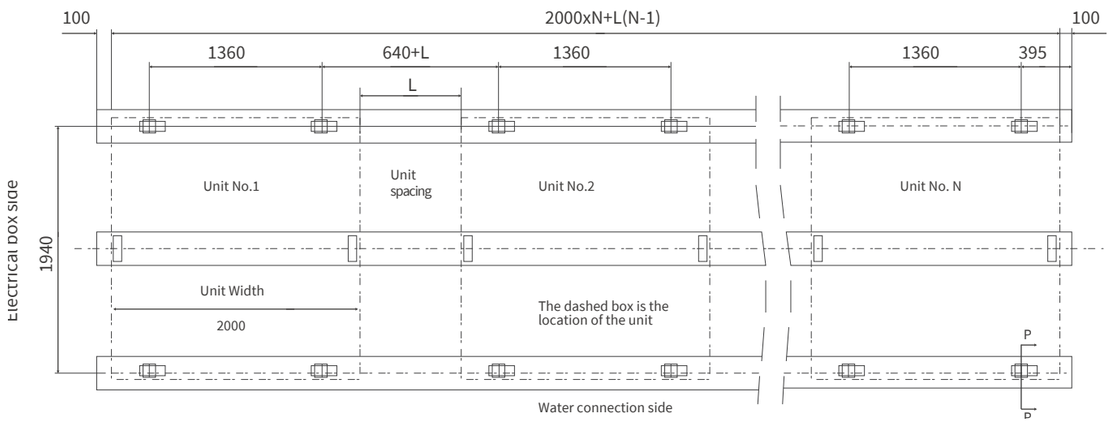


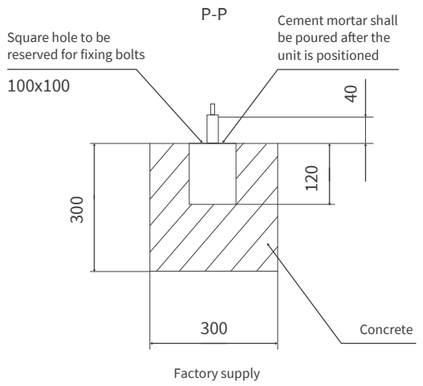
Applicable models

Heat Pump Unit	Cooling Only Unit
RHUA065AVMY	RCUA065AVMY

Technical requirements:
1. The anti-vibration pads shall be installed between the unit base and basement per drawing, 6 sets of pad per unit.
2. L is the minimum spacing between two modular chiller in a row, and L is ≥ 500mm.
3. For multiple rows of installation, the minimum spacing between adjacent two rows is 1500mm
4. The installation basement shall be concrete structure or channel steel frame that is strong enough to support unit operating weight.
5. The unit design for low-vibration, but it is possible to generate vibration when the installation basement is poor. Please install anti-vibration table or strengthen the installation basement strength.
6. Water may be accumulated under conditions such as rain or defrost, so the foundation shall be flat with drainage holes to drain water in a timely manner
7. Please use the hose pipe when connecting the units

RC[H]UA130AVMY/RC[H]UA150AVMY





Applicable models

Heat Pump Unit	Cooling Only Unit
RHUA130AVMY	RCUA130AVMY
RHUA150AVMY	RCUA150AVMY

Technical requirements:
1.The anti-vibration pad is provided with the unit. The anti-vibration pad shall be arranged according to the drawing shown in the drawing, i. e. 6 sets of pad per unit.
2.N is the total number of modular units installed in the same row, L is the minimum spacing between sets, and L is ≥ 800mm.
3.If multiple lines of installation are required, the minimum spacing between adjacent two rows is 1500mm.
4.The unit is a low-vibration unit, but it is also possible to generate vibration when the installation facility is poor. Please install the anti-vibration table or strengthen the installation facility strength.
5.In principle, the foundation shall be integrated with the floor. In other cases, in addition to calculating the vibration resistance of the unit installation, the vibration resistance of the unit+foundation shall be calculated, so as to confirm the strength situation in the case of tilting or moving.
6.Water may be accumulated under conditions such as rain or defrost, so the foundation shall be flat and the floor shall be provided with drainage holes to drain water in a timely manner
7.Please use the hose when connecting to the water pipe.

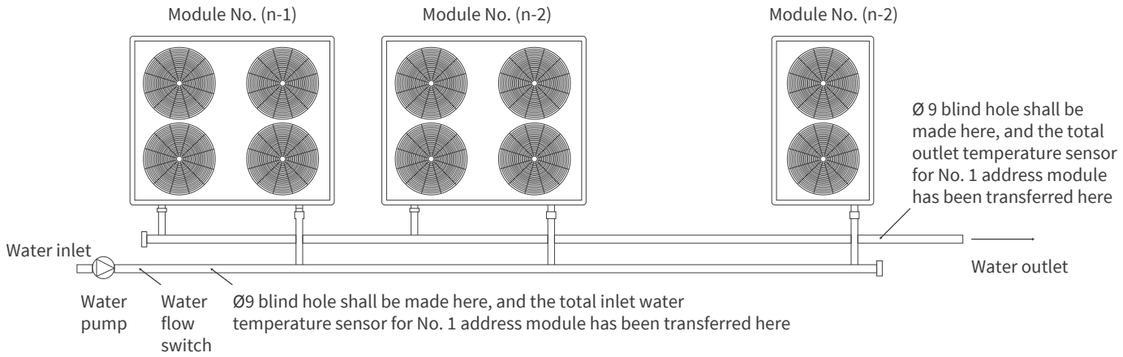
FOCUS ON CONVENIENCE

Installation Requirements

Pipe connection diagram

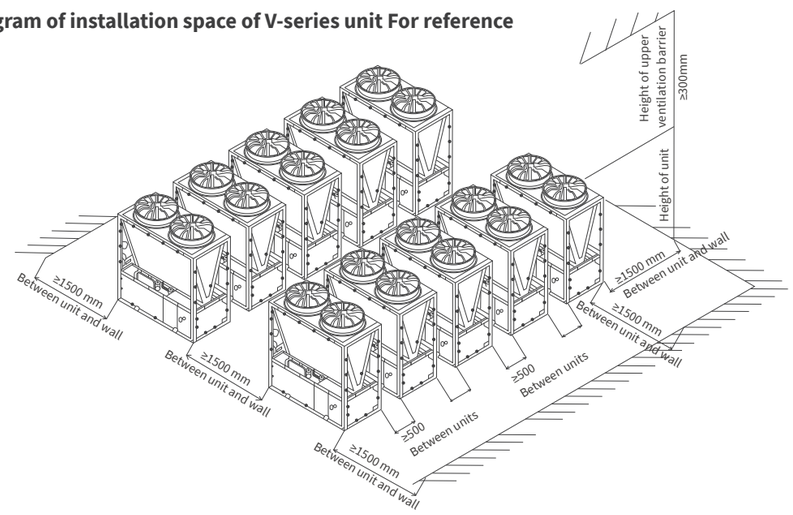
Single modular

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

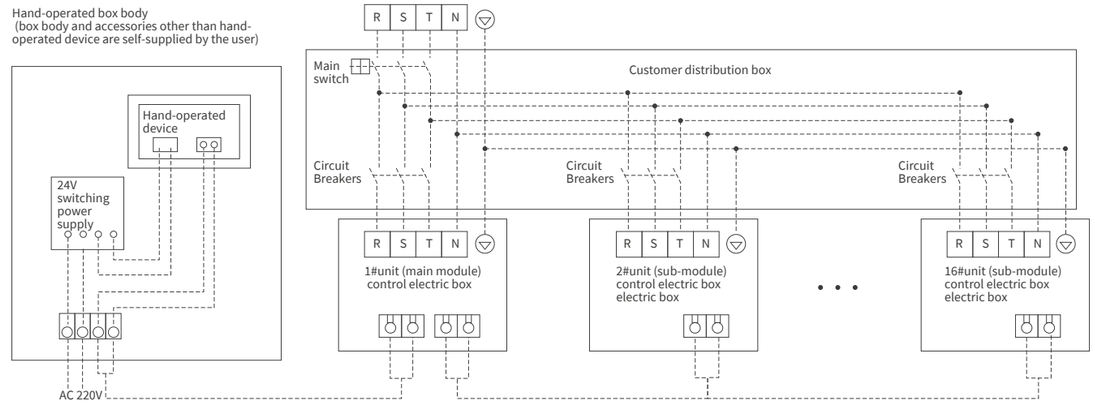


Note
1.The unit shall supply the water inlet and outlet temperature sensor, and the user shall arrange them according to the on-site condition.
2.The corresponding water flow switch is not supplied, and shall be provided by the user.

Schematic diagram of installation space of V-series unit For reference



Wiring 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 termianl and the switch power supply are provided by the user.

Precautions for use of the unit

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 every waterway part has no leakage phenomenon, and the heat preservation is good; the flow rate and head of the water pump meet the 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. ;

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 24 hours 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.