



## Johnson Controls - Hitachi Air Conditioning

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AVSY-C-2012

HITACHI

# Modular Air-cooled Inverter Scroll Chiller

## RC(H)UA-AVSY Series

Cooling & Heating





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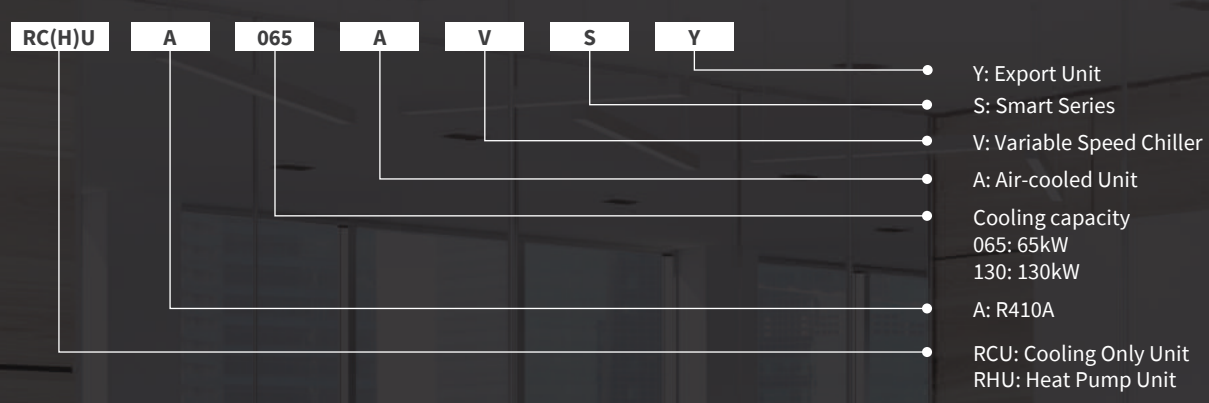
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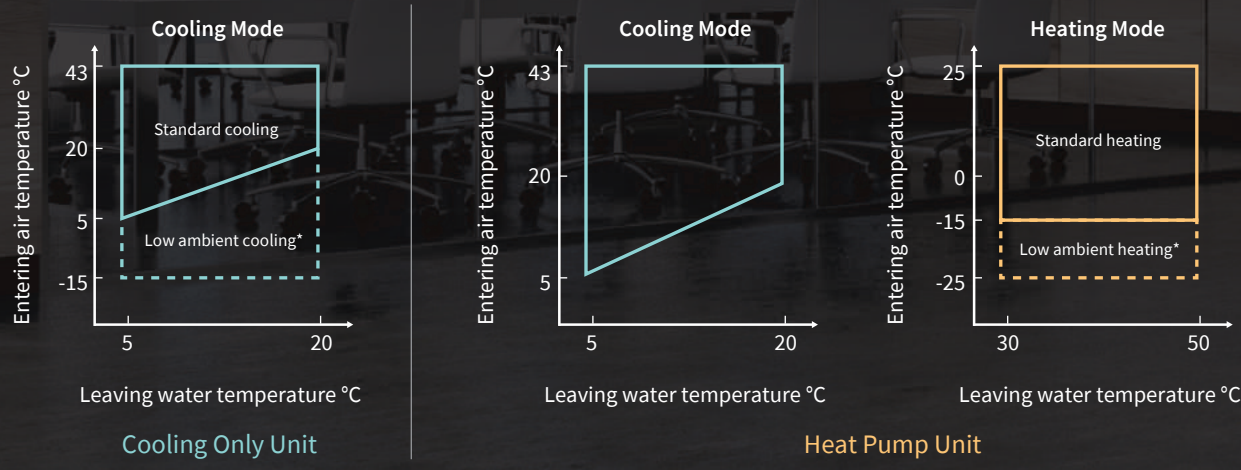
# Modular Design to Provide Optimized Building Solutions

Exceptional efficiency from a smaller  
footprint that permits flexible combinations

Footprint  
**-28%**



## Operating Range



\* Contact Hitachi office for low ambient cooling and heating.

## • Smaller Footprint

Footprint reduced by 28% when compared  
with previous model\*

\* AVMY series

Less space is required when combining  
several modular units

## • Quiet Operation

Runs quiet at both full load & partial load

Ultra-quiet operation mode is available  
as an option



RC(H)UA - AVSY Series  
Capacity: 65-2064kW

4 models. Can support up to 16 units per system.

Model	Cooling Capacity (kW)	Heating Capacity (kW)	Cooling COP	Heating COP	IPLV
RCUA065AVSY	64.5	-	3.0	-	6.06
RCUA130AVSY	129	-	3.0	-	
RHUA065AVSY	64.5	66	3.0	2.93	
RHUA130AVSY	129	132	3.0	2.93	

\* RC(H)UA150AVSY will be launched later.

\* Protection panel is standard. Protection grill is optional.

# PRODUCT FEATURES

## Superior Performance



**COP up to 3.0**  
**IPLV 6.06**

**Precise Capacity Control**

### High-quality components makes AVSY series have high efficiency

- HITACHI DC Inverter Scroll Compressor
- “U Shape” Air Heater Exchanger
- Brazed Plate Heat Exchanger Water-side heat exchanger
- High Precision Electronic Expansion Valve
- Intelligent VFD Control logic
- High Efficiency Fan System
- Hydrophilic Fin

### Hitachi DC Inverter Compressor

- 40 years of experience in scroll compressor design and production
- Features the latest technology for exceptional performance all year round
- Delivers stepless capacity control from 25% to 100%, allowing precise capacity matching for building loads and reducing the unit's power input

#### New Asymmetric Wrap

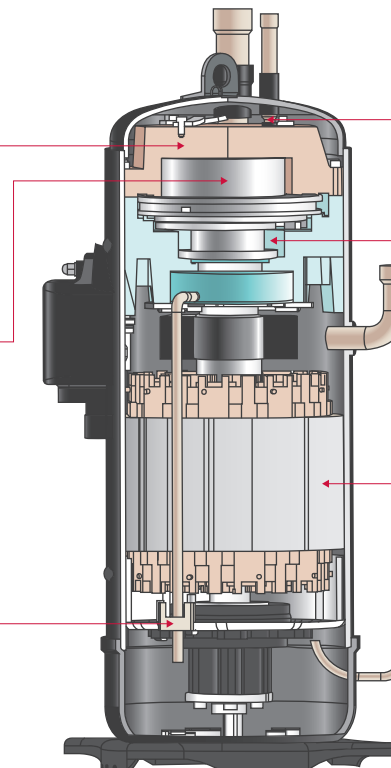
Optimized by reducing leakage and invalid suction superheat

#### 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

### Air-side Heat Exchanger

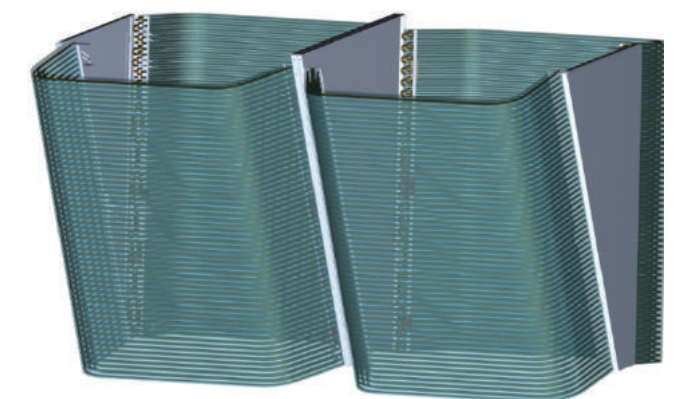
#### U Shape heat exchanger

- **Compact unit structure reducing the footprint further**  
The footprint is **28%** smaller than previous models\*. (130kw).  
\* AVMY series

- **Enhanced efficiency**  
Ensure enhanced heat transfer via multi-way air inlet design. Internal thread copper tube increases internal turbulence and heat transfer area.



- **Equipped with drain pan**  
A drain pan is set at the bottom of the heat exchanger to facilitate drainage.



**U shape Coil Design**



# PRODUCT FEATURES

## Precise capacity control

- **Quick reaction and wider adjustment range**
- **Electronic Expansion Device**  
Precise 500 steps flow resolution  
Adjust the volume of refrigerant accurately and allow dynamic super heating exchange to ensure steady operation.



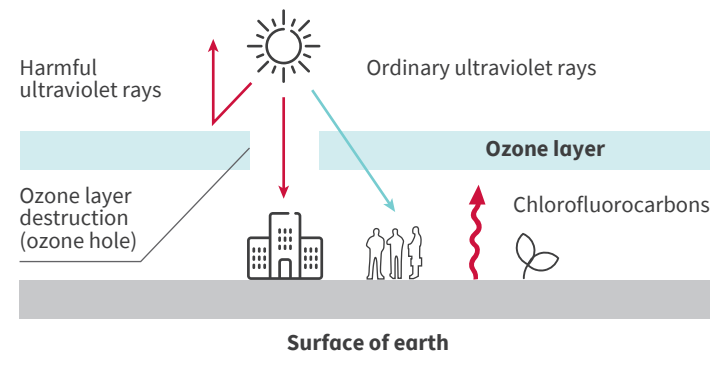
## Control algorithm drives high part load efficiency

- 25%-100% Stepless Capacity Control by VFD technology
- Reduce power consumption by up to 30% compared to traditional fixed units
- Ensure stable water temperature, providing great comfort to users

## Lower Environmental Impact

### R410A refrigerant

- Stable, non-toxic, 0 ozone depletion potential
- Substitute for R22 refrigerant
- High-density refrigerant, less refrigerant is needed
- Energy conservation, emission reduction, environmental protection



## Great Flexibility

### Flexible combination

- Flexible model connection (65/130kW)
- Support up to 16 units per system ranging from 65-2064kw, easy for system capacity extension
- Easy to re-size system by adding or removing modules

## Easy installation and maintenance

### Simple A/C System

- Simple installation:  
no cooling tower, condensing pump or piping
- Saving installation space:  
no chiller plant room or condenser side piping

### Easy to transport

- Small size / weight per module, easy to ship, lift and store
- Can be transported independently without large lifting equipment

### Easy maintenance

- Non-stop service  
Failed unit could be disconnected without system operation interruption
- Standardized design  
Allow quick delivery and replacement of failed units

## Robust Reliability and Operating Safety

### Multiple system protection functions to ensure reliable operation



### Modular provides excellent system redundancy

- Free switching master/slave unit to reduce failure of the unit.
- Function independently of each other. When a unit is down, another standby module will run as backup. While one unit is being serviced, the others still run as normal without impacting on operational capabilities.
- Modularized manufacturing and standardized components ensures easy replacement.

### Smart defrost/Manual defrost

- Smart defrosting function according to the unit's conditions. Avoids unnecessary defrosting operation or inadequate defrosting.
- Manual defrosting to remove ice layer under harsh environmental condition.

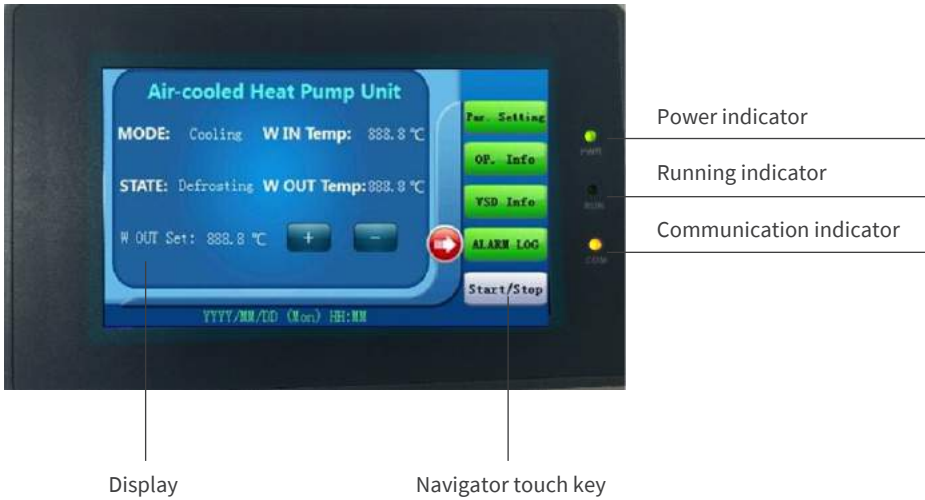
### Trouble-Free Start-up

- The compressor starts at low frequency and gradually increases to full speed
- Low start current helps extend the life of the motor

# PRODUCT FEATURES

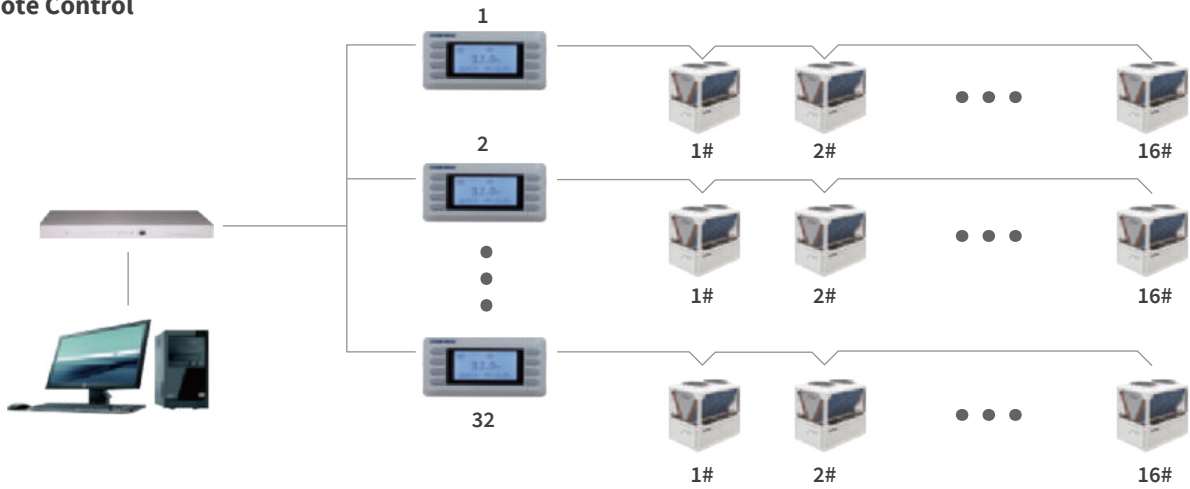
## Intelligent Control

### Central Controller (Optional)



- **4.3"** colorful touch screen with user-friendly interface
- Preset on-off function allows unmanned management
- Free switching master/slave units to reduce the risk of failure

### Remote Control



- Standard RS-485 communication interface with built-in Modbus communication protocol

#### \*Ordering notice

- Order controller separately per project needs
- One temperature sensor provided to customer (for data reading only)

### Optimized Control Logic

- Automatically adjusts number of units operating as per operating frequency
- By optimizing operating frequency and controlling steps keeps units running under partial load conditions to improve efficiency
- Flexible operating frequency and control steps enable the unit working efficiently

#### 1 Unit Level

#### 6 Steps

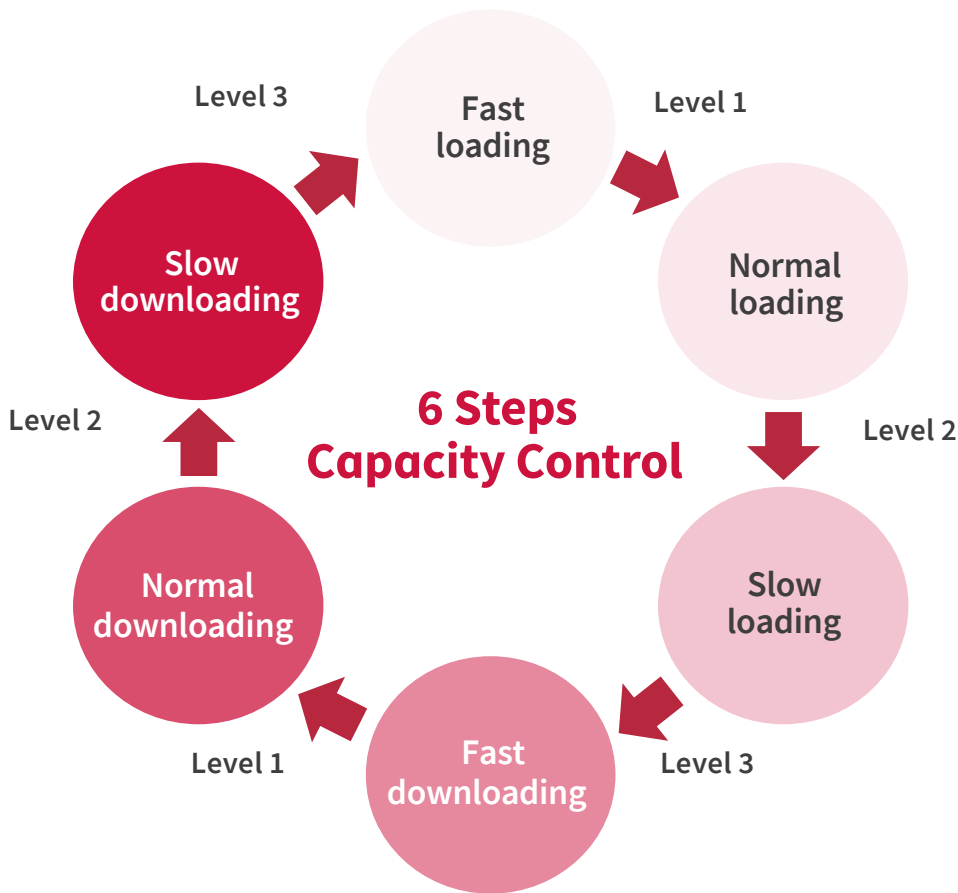
Ensure precise capacity output matches the building load according to the difference between actual water temperature and targeted water temperature.

#### 3 Speed

Ensures optimal response speed for the building's load change, delivering precise and stable water temperature.  
Minimum speed to start up the compressor.  
Maximum speed to defrost.

#### 25-100% capacity range

Inverter compressor allows seamless speed control  
(Vs. 0-25%-50%-100% of fix speed)



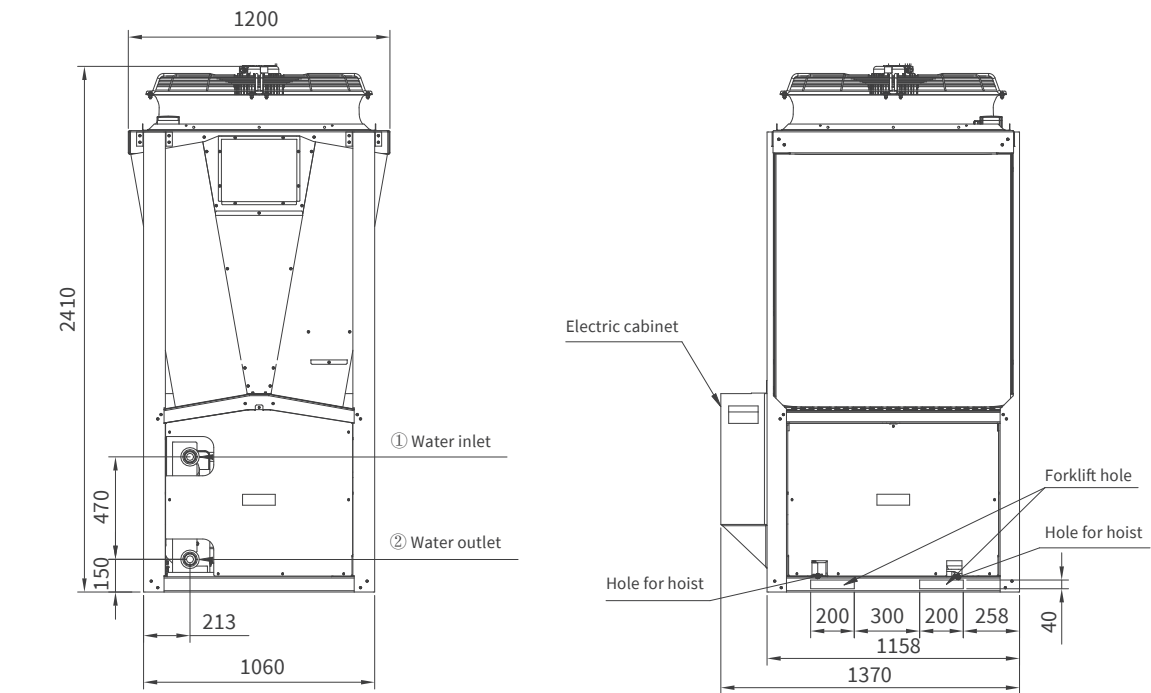
# SPECIFICATIONS

Model		RCUA065AVSY		RCUA130AVSY		RHUA065AVSY		RHUA130AVSY	
Nominal Cooling Capacity		kW	64.5		129		64.5		129
Power Input (cooling)		kW	21.5		43		21.5		43
COP (cooling)		kW/kW	3.0		3.0		3.0		3.0
Nominal Heating Capacity		kW	—		—		66		132
Power Input (heating)		kW	—		—		22.5		45
COP (cooling)		kW/kW	—		—		2.93		2.93
IPLV		kW/kW	6.06		6.06		6.06		6.06
Refrigerant		—	R410A						
Flow Control		—	Electronic expansion valve						
Circuit No.		—	1		2		1		2
Compressor Capacity Control		%	25~100		25~100		25~100		25~100
Noise		dB	68		71		68		71
Compressor	Type	—	Variable speed scroll compressor						
	Quantity	Set	2		4		2		4
Water-side heat exchanger	Type	—	Plate heat exchanger						
	Water flow rate (cooling)	m³/h	10.08		20.16		10.08		20.16
	Pressure Drop	kPa	44.7		32.5		44.7		32.5
	Water Connection	—	DN50 clamp		DN65 clamp		DN50 clamp		DN65 clamp
	Max. water-side operating pressure	Mpa	1.0		1.0		1.0		1.0
Air-side heat exchanger	Type	—	Grooved copper tubes and aluminum fins						
	Fan Power	kW	1.65		3.3		1.65		3.3
	Quantity	—	1		2		1		2
	Air flow rate	m³/h	21,500		43,000		21,500		43,000
Dimension	Length	mm	1,370		2,438		1,370		2,438
	Width	mm	1,200		1,200		1,200		1,200
	Height	mm	2,410		2,410		2,410		2,410
Net Weight		kg	485		910		545		1,030

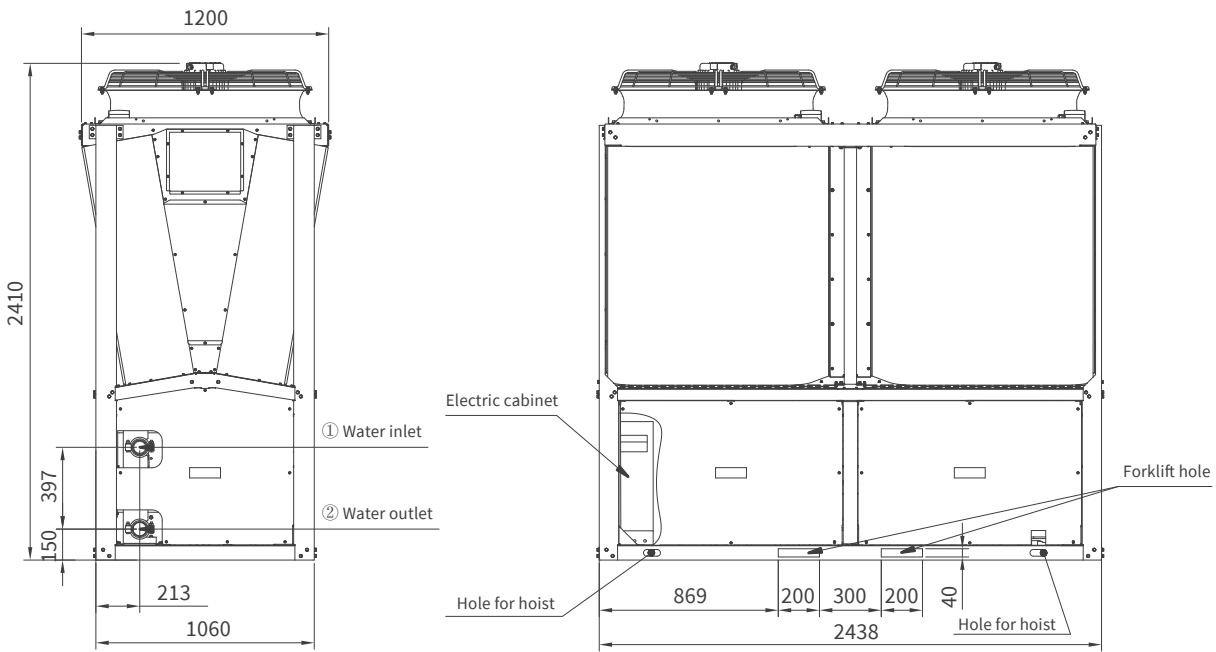
Notes:  
1. Nominal cooling mode: water heat exchanger entering/leaving water temperature 12.2/6.7°C, outdoor air temperature 35°C.  
2. Nominal heating mode: water heat exchanger entering/leaving water temperature 40/45°C, outdoor air temperature 7°C.  
3. Water-side heat exchanger fouling factor 0.018m2K/kW.  
4. Main power supply: 380V-3Ph-50Hz/415V-3Ph-50Hz/380V-3Ph-60Hz.

# DIMENSIONS

## RC(H)UA065AVSY

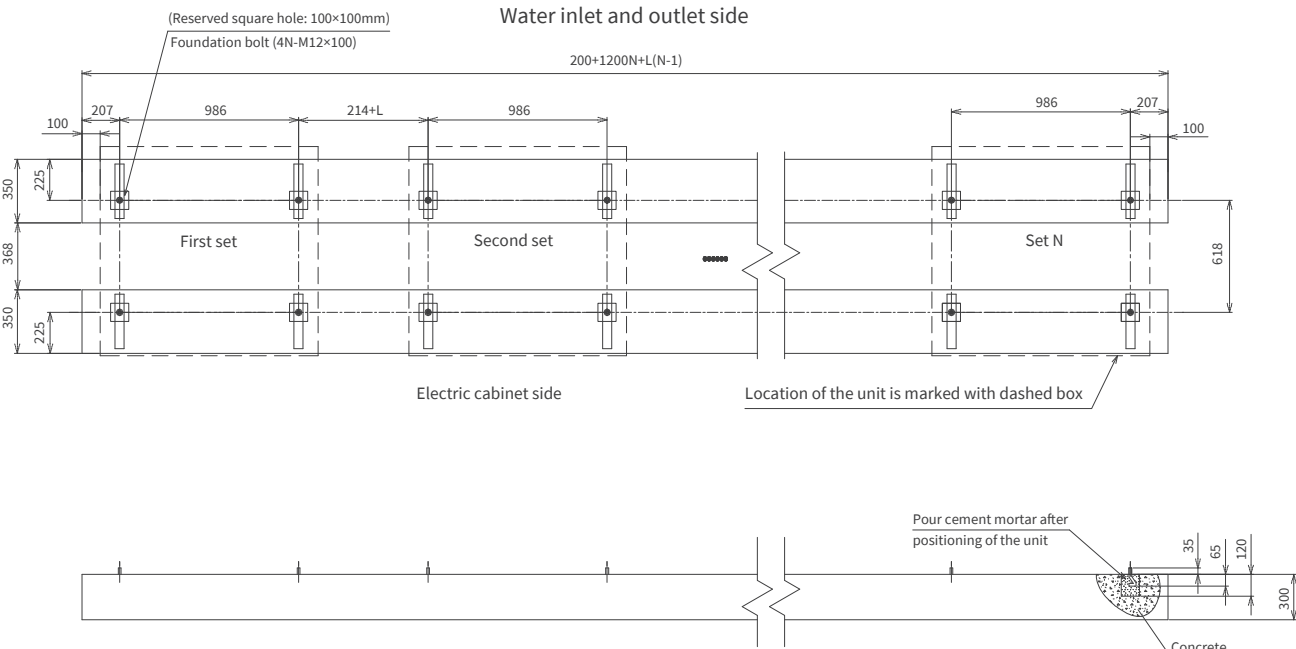


## RC(H)UA130AVSY

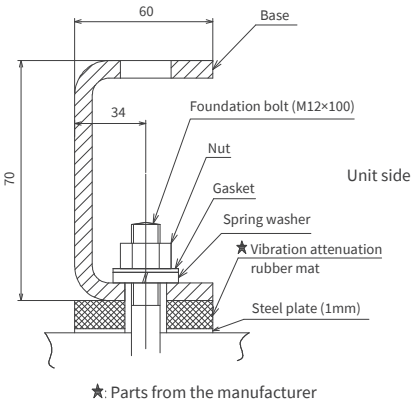


# FOUNDATION DRAWINGS

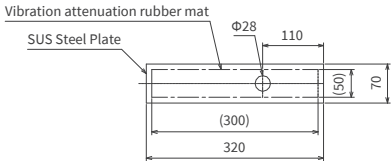
## RC(H)UA065AVSY



Foundation installation detail drawing (not to scale)



Steel Plate Dimensional Drawing (Not to Scale)  
Field Supplied

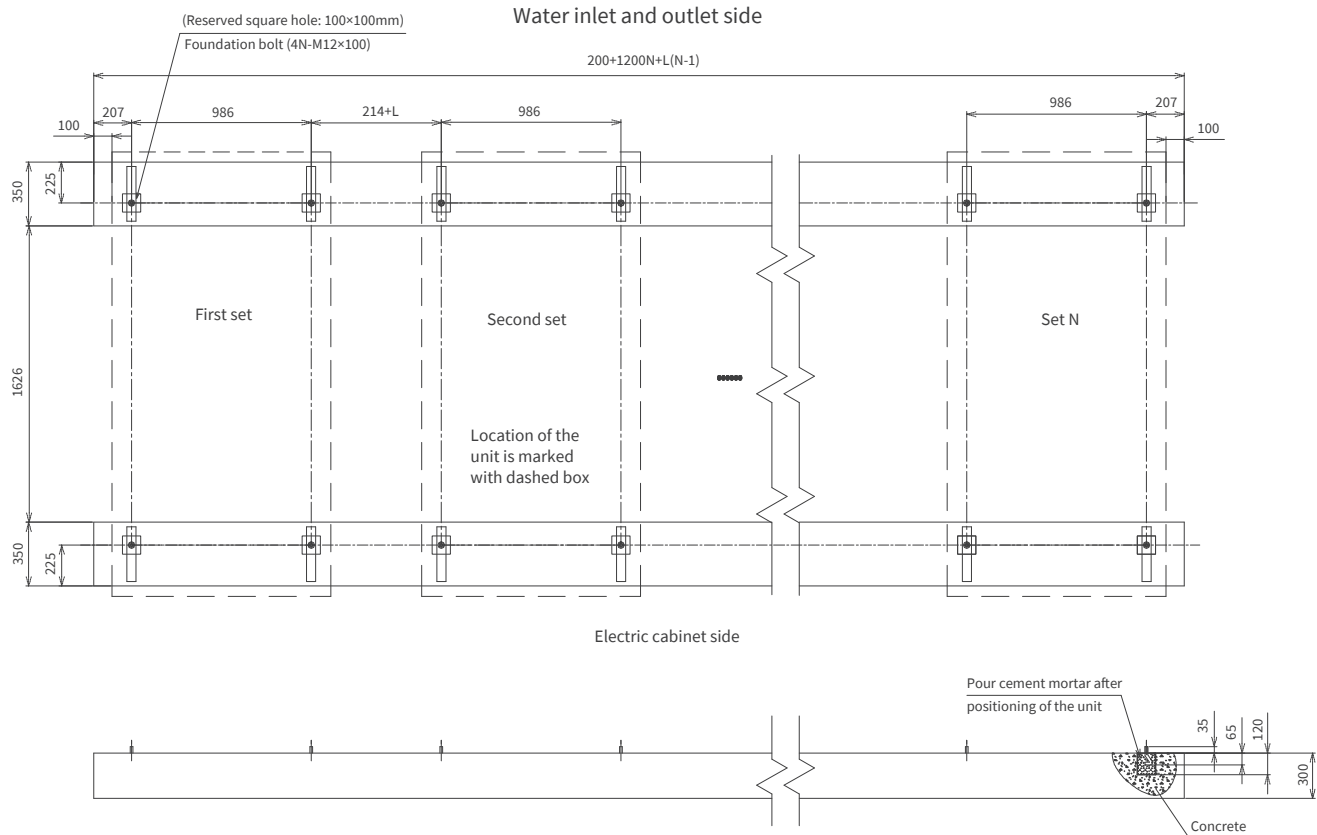


### Applicable models

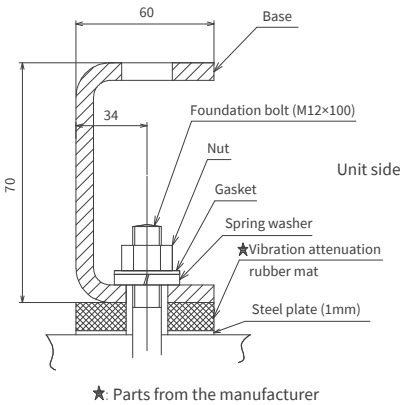
Heat Pump Unit	Water Chiller
RHUA065AVSY	RCUA065AVSY

- Technical requirements:
1. The steel plate for foundation installation shall be provided by the user. For detailed specifications, please refer to the detailed size drawing of the steel plate.
  2. Vibration attenuation rubber mats are provided with the machine and should be arranged in the manner as shown in the figure, i.e. 4 rubber mats for each unit.
  3. N refers to the total number of modular units installed in the same line, and L is the minimum space between units installed, and L ≥ 500mm.
  4. If the units are to be installed in multiple lines, the minimum space between two adjacent lines should be 1500mm.
  5. The unit will generate low vibration. However, poor installation may result in vibration. Please install vibration isolation table or enhance the strength of the installation.
  6. In principle, the foundation should form an integral part of the floor. Otherwise, in addition to calculation of the shock resistant degree of installation, it is also required to calculate the shock resistance of the unit + foundation so as to determine the strength during topping or movement.
  7. In the case of rainfall or defrosting, water may accumulate, so the foundation should be flat and the floor should have drain holes to drain the water in time.
  8. Use a hose when connecting the water pipe.

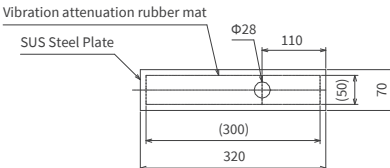
## RC(H)UA130AVSY



Foundation installation detail drawing (not to scale)



Steel Plate Dimensional Drawing (Not to Scale)  
Field Supplied



### Applicable models

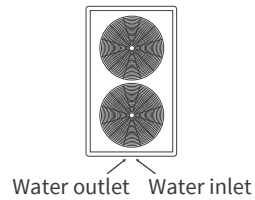
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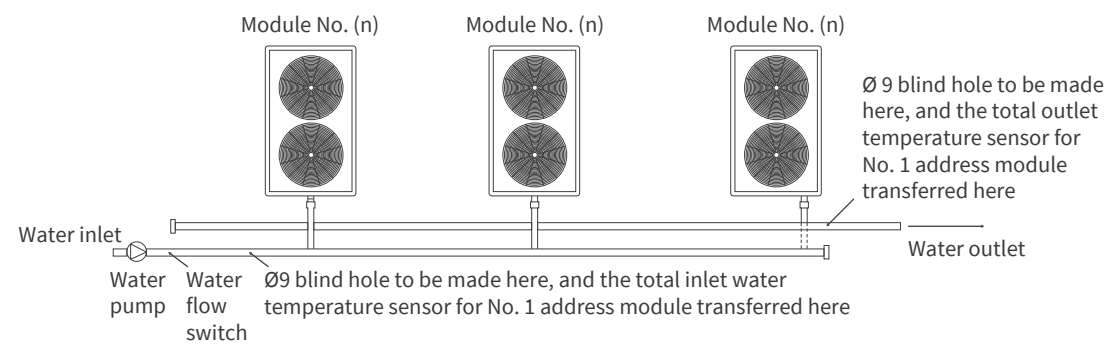


## Pipe Connection Diagram

### Single modular



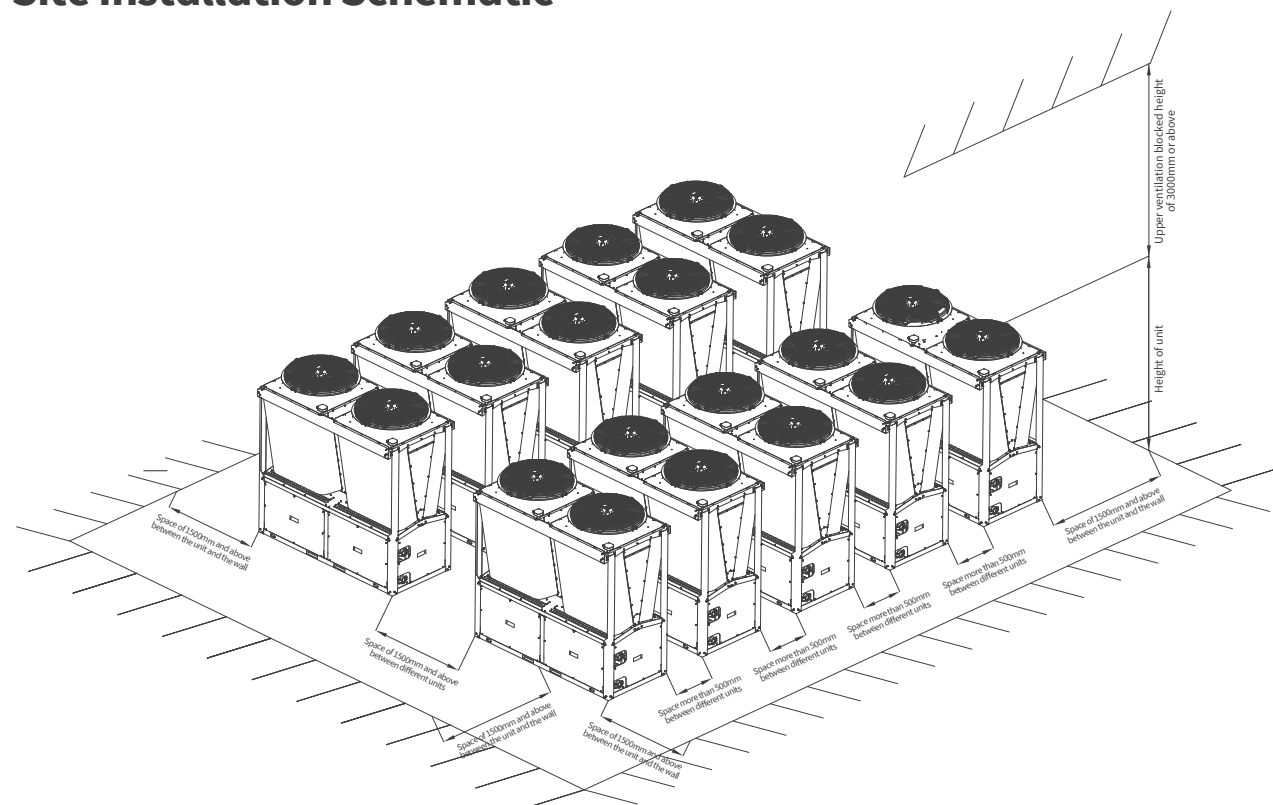
**Multi-modulars combination (up to 16nos can combine freely)**



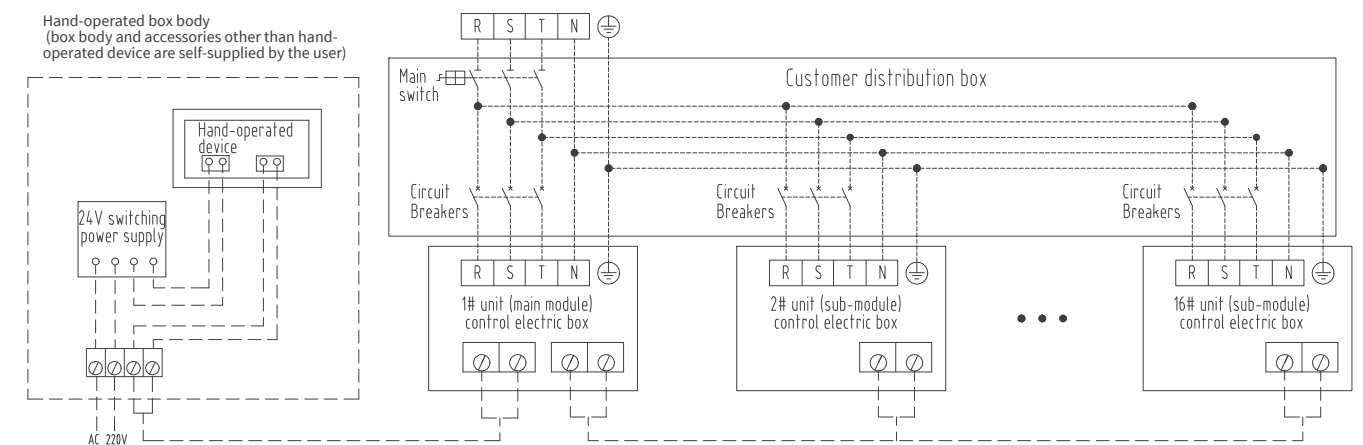
Note

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.

## Site Installation Schematic



## 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 terminal and the switch power supply are provided by the user.

### Optional Attributes / Accessories

- Heat recovery / Partial heat recovery ( $\geq 15\%$ )
- Low ambient cooling/ heating
- Low ambient heat pump ( ambient air down to  $-25^{\circ}\text{C}$  )
- Ultra-quiet operation model
- Protection grill of air-side heat exchanger
- Central controller