



ТЕХНИЧЕСКОЕ РУКОВОДСТВО ПО ПРОДАЖЕ

ДИАПАЗОН ПРОИЗВОДИТЕЛЬНОСТИ: 36~70кВт

ЭКСПЛУАТАЦИЯ В РЕЖИМЕ ОХЛАЖДЕНИЯ

-15 °С ~+50 °С

ЭКСПЛУАТАЦИЯ В РЕЖИМЕ НАГРЕВА

-20 °С ~ +40 °С



**ИНВЕРТОРНЫЙ ТЕПЛОВОЙ НАСОС/ЧИЛЛЕР**

# 1 Safety Notice

## Safety symbols

The following symbols are used in this document to alert the reader to potential of hazard.

	WARNING indicates a potentially hazardous situation which, if not avoided, could result in damage to the machine as well as death or serious injury.
	CAUTION identifies a hazard which could lead to minimal or moderate damage to the machine as well as death or serious injury.
	BAN indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	COMPLIANCE identifies a hazard which could lead death or serious injury as well as damage to the property.

# 2 Preface

Thank you for selecting Cooper&Hunter's A Series Inverter Modular Heat Pump. Please read this instruction manual carefully before installing and using the product and achieve operating effect, we hereby instruct as below:

The Manual is applied to A Series Inverter Modular Air-cooled Heat Pump, specifying operation safety requirements, basic principles and implementation approaches for construction fulfillment, construction debug, after-sale maintenance and repairs. All works must be performed in accordance with the relevant national (and local) safety requirements and the Manual, which if not abided, could result in potential damage to the air conditioner, and even serious injury or death.

# 3 Product Information

## 3.1 Introduction

### 3.1.1 Lineup

Series	Model	Cooling capacity	Heating capacity	Power supply	Refrigerant	Diagram
		( KW )	( KW )			
A series inverter modular air-cooled chiller (heat pump)	CH-HP36UIMNM	32	36	380—415VAC 3Ph 50Hz	R410A	
	CH-HP65UIMNM	60	65			
	CH-HP70UIMNM	65	70			

### 3.1.2 Model Number Nomenclature

CH	HP	36	U	I	M	N	M
1	2	3	4	5	6	7	8

No	Code description	Options
1	Cooper&Hunter	CH
2	Unit function	HP: heat pump
3	Rated cooling capacity	Rated cooling capacity = number (kW)
4	Cool and heat mode	U: Universal
5	Variable frequency	I: Inverter
6	Type	M: Monoblock
7	Refrigerant type	N: R410A
8	Power code	M: 380—415VAC 3Ph 50HZ

### 3.1.3 Product Features

The all-inverter modular air-cooled chillers work outstandingly by virtue of their major features stated below..

■ **Excellent compatibility :**

The all-inverter modular heat pumps can be constructed of multiple single units with the same or different structure or capability (36kW, 65kW, 70kW). For the 36kW unit, it has only one heating system; for the 65kW, 70kW units, they are of two independent systems. Up to 16 single units can be modularized, with heating capacity ranging from 36kW to 1120kW.

■ **Comfort and energy saving :**

The variable-frequency technology can quickly respond to load change and lead to decreased water temperature fluctuation and better comfort.

■ **Ultra-quiet :**

The high-efficiency and low-noise fan blades and motor as well as the optimized air passage can greatly lower operation noise of the unit. Besides, the quiet mode can provide the user a ultra-quiet environment.

■ **Powerful self-protection :**

It is equipped with the top-end microcomputer control system which is capable of providing well-rounded protection and self-diagnosis.

■ **High reliability :**

It is constructed of well-designed refrigeration parts and well-designed system, structure and electric control, adequately guaranteeing reliable operation

■ **Remote ON/OFF :**

The unit can be started or stopped by the ON/OFF key operation.

■ **Equilibrium running :**

It indicates each compressor will run alternately so as to extend their service life.

■ **Shiftwork of water pumps :**

Two water pumps can work alternately with equilibrium runtime so as to extend their service life and lower the maintenance difficulty.

### 3.1.4 Nominal Operating Conditions

Item	Water side		Air side	
	Water flow m <sup>3</sup> / ( h·kW )	Outlet temperature ( °C )	Dry bulb temperature ( °C )	Wet bulb temperature ( °C )
Cooling	0.172	7	35	—
Heat pump		35	7	6

### 3.1.5 Operation Range

Please run the unit under the specified operation range as shown in the table below:

■ **R410A Series**

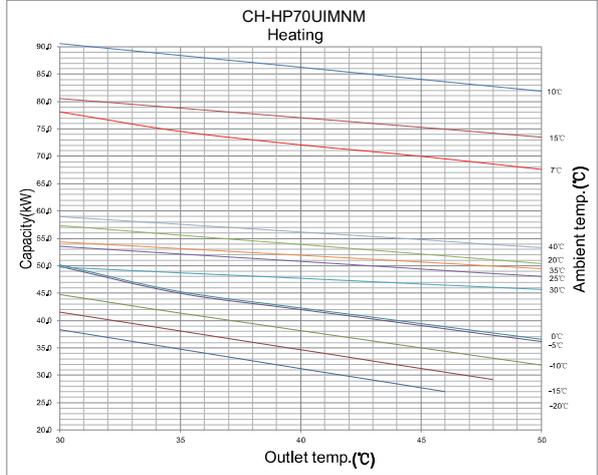
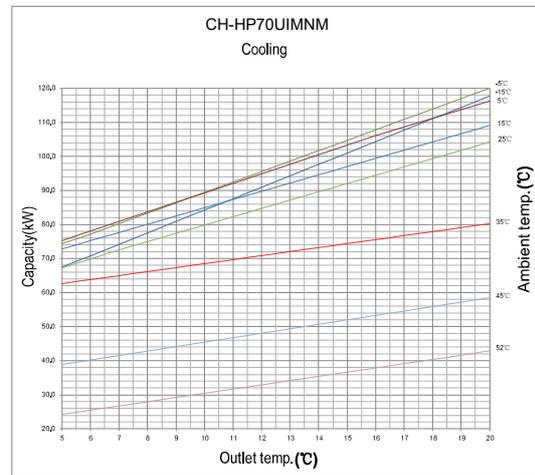
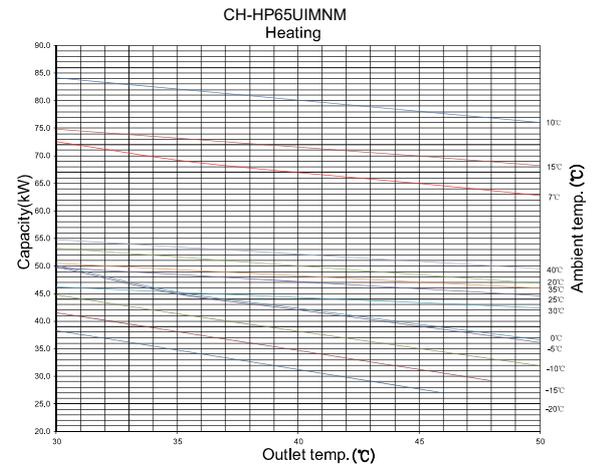
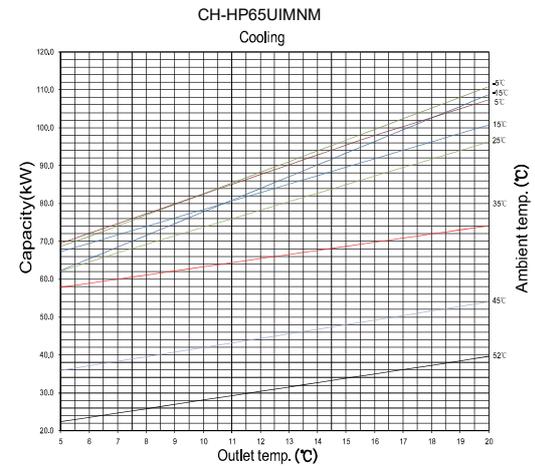
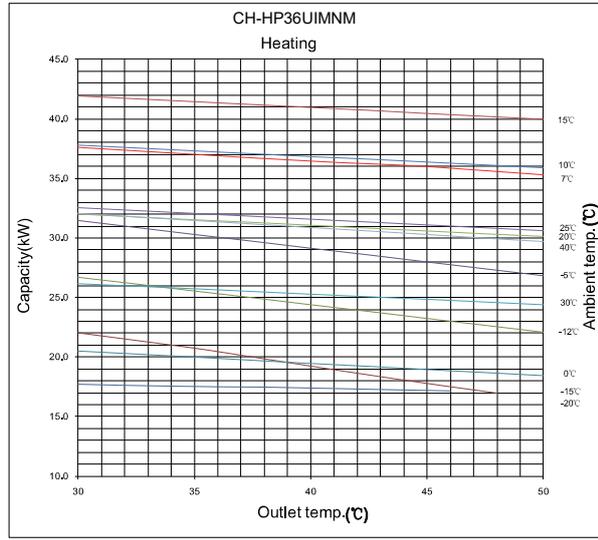
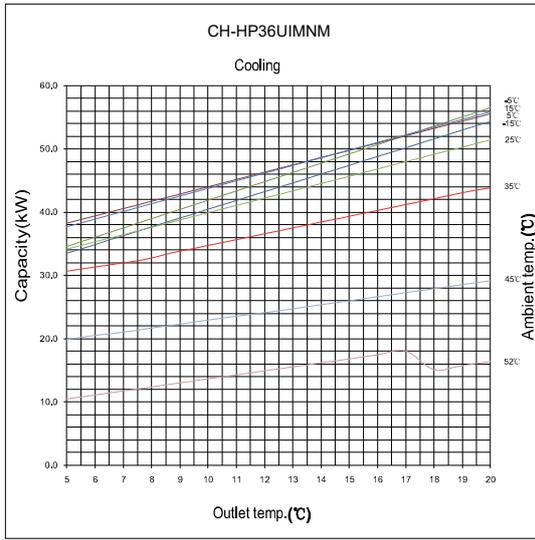
Item	Water Side		Air Side
	Leaving Water Temperature ( °C )	Water Temperature Difference ( °C )	Ambient DB Temperature ( °C )
Cooling	5 ~ 20	2.5 ~ 6	-15 ~ 52
Heating	35 ~ 50	2.5 ~ 6	-20 ~ 40

maximum and minimum entering water pressures:

Item	Minimum entering water pressures	Maximum entering water pressures
Cooling	0.06MPa	1.6MPa
Heating		

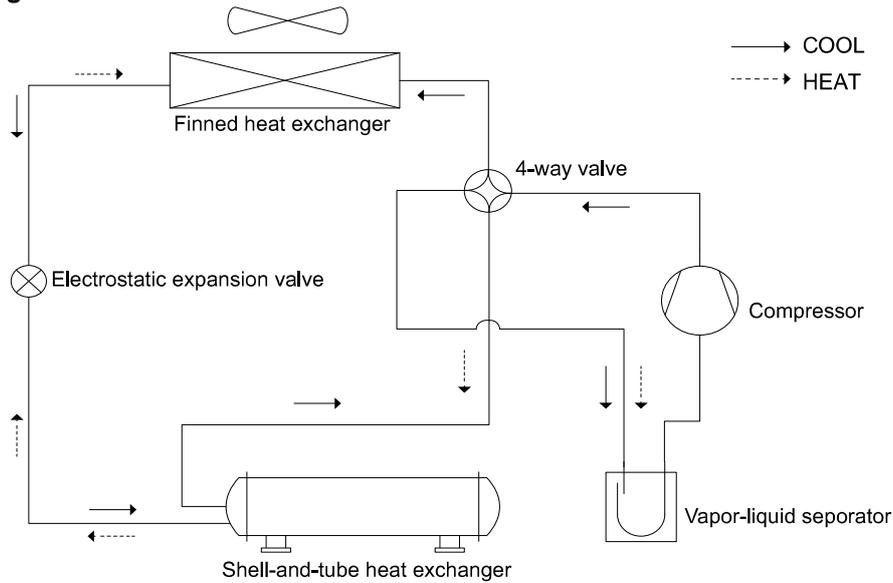
## 3.2 Unit Performance Curves

Here are curves indicating the unit performances in cooling and heating states.



### 3.3 Working Principle

#### 3.3.1 Principle Diagrams



### 3.4 Technical Parameters List

#### 3.4.1 Electrical Parameters

Electrical parameters table

Unit	Power supply	Compressor	MRC	NRC	Fan	NRC
		Quantity	(A)	(A)	Quantity	(A)
CH-HP36UIMNM	380V~415VAC 3Ph 50Hz	1	30	17.5	2	0.7
CH-HP65UIMNM	380V ~ 415VAC 3Ph 50Hz	2	30	17.5	2	1.28
CH-HP70UIMNM	380V ~ 415VAC 3Ph 50Hz	2	30	17.5	2	1.28

**Notes:**

(1)MRC: Maximum Running Current (A)

(2)NRC: Nominal Running Current (A)

#### 3.4.2 Performance Parameters Table

Model		CH-HP36UIMNM	CH-HP65UIMNM	CH-HP70UIMNM
Cooling capacity	kW	32	60	65
Heating capacity	kW	36	65	70
Rated cooling power	kW	12.4	21.9	24.8
Rated heating power	kW	10.8	20.2	21.9
Noise	dB(A )	62	68	68
Power supply		380—415V 3N ~ 50Hz		
Operation control		The microcomputer implementing fully automatic control, displaying the operation state and giving an alarm		
Safety controls		High-pressure and low-pressure safety cut-out, high-discharge temperature cut-out, antifreeze control, overflow control, phase safety device, water flow safety control, pressure sensor cut-out, temperature sensor cut-out, four-way valve safety control, compressor overheat control		
Compressor	Type	Fully enclosed rotor-type compressor		
	Quantity	1	2	2
	Starting mode	With variable frequency		
Water-side heat exchanger		High-efficiency shell and tube heat exchanger		
Water flow volume	wm <sup>3</sup> /h	5.5	10.32	11.18

	Water resistance	kPa	75	55	60
	The highest bearing pressure	MPa	4.6		
	Connection method		By external threads		
	Connection Thread	-	G1 1/2 external thread	G2 External thread	G2 External thread
Air	Air-side heat exchanger		High-efficiency finned coil heat exchanger		
	Rated power of fan	W	750×2	750×2	750×2
	Airflow volume	m <sup>3</sup> /h	1.26×10 <sup>4</sup>	2.4×10 <sup>4</sup>	2.4×10 <sup>4</sup>
Outline dimension	Width	mm	1340	2200	2200
	Depth	mm	845	965	965
	Height	mm	1605	1675	1675
Wet weight		kg	400	689	689
Operating weight		kg	440	758	758

### 3.5 Scope of Supply

Item	Heat pump
Modules	S
Three-wire control lines (8m)	S
Accessories for the unit XE73-25/G	S (Additionally purchased)
Electric control cabinet	O
Auxiliary electric heater	O
Power lines	O
Control lines	O
Connecting hose	O
Thermometer	O
Pressure gauge	O

S= standard O= user prepared P= Optional

### 3.6 Selection Statement

#### 3.6.1 Selection Procedures

Calculate the load for each separate area (cooling load and fresh air load)→Select the terminal unit→Select the main unit→Check the cooling load→Make a confirmation

##### 3.6.1.1 Load Estimate

##### 3.6.1.1.1 Cooling and Heating Load

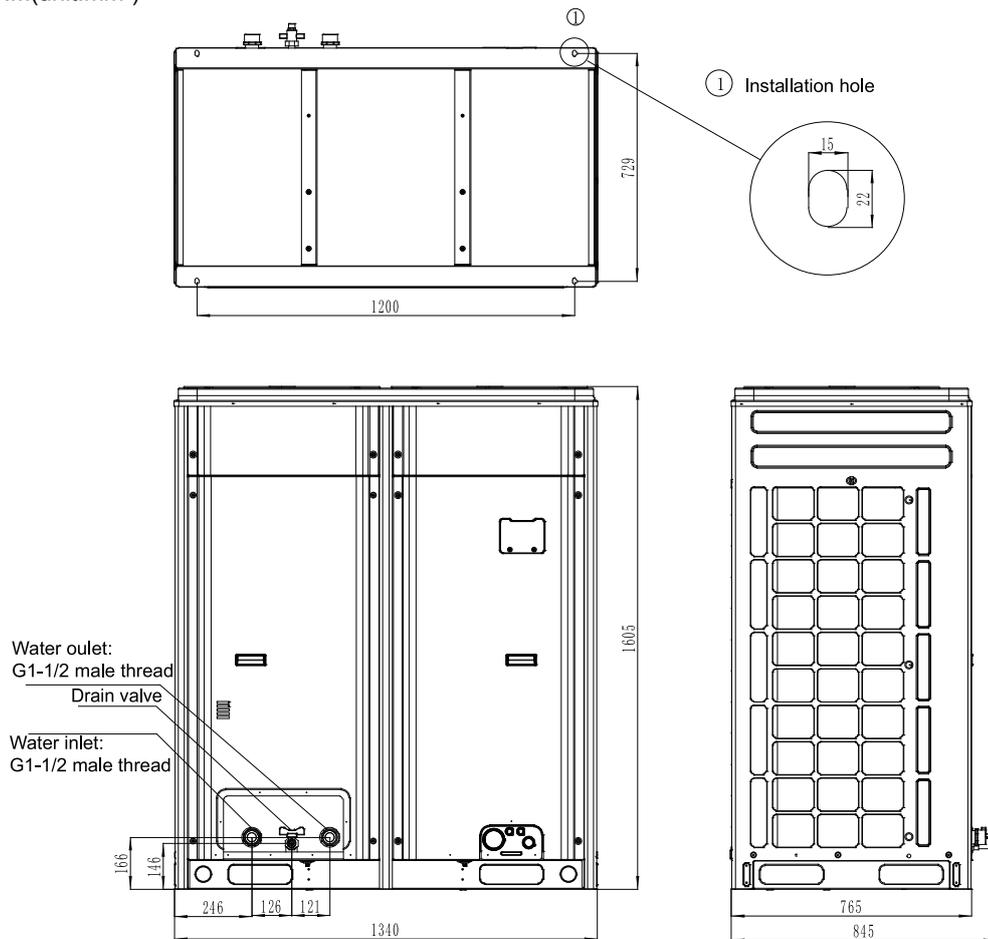
Table 3.6.1 Cooling Load per Unit of Air Conditioning Area

Construction category	Room Type	Cooling load ( W/ m <sup>2</sup> )	Construction category	Room Type	Cooling load ( W/m <sup>2</sup> )
Hotel	Hotel, all	70 ~ 95	Hospital	Hospital, all	105 ~ 130
	Guest room	70 ~ 100		VIP ward	80 ~ 120
	Pub, cafe	80 ~ 120		Average ward	70 ~ 110
	West restaurant	100 ~ 160		Rooms for diagnosis, treatment and, injection	75 ~ 140
	Chinese restaurant, banquet hall	150 ~ 250		X-ray, CT and MRT Room	90 ~ 120
	Store	80 ~ 110		operation and delivery room	100 ~ 150
	Lounge	80 ~ 100		Clean operating room	180 ~ 380
	Atrium	100 ~ 180	Service hall	70 ~ 120	
	Small meeting room (smoking area)	140 ~ 250	Department store	First floor/ground floor	160 ~ 280

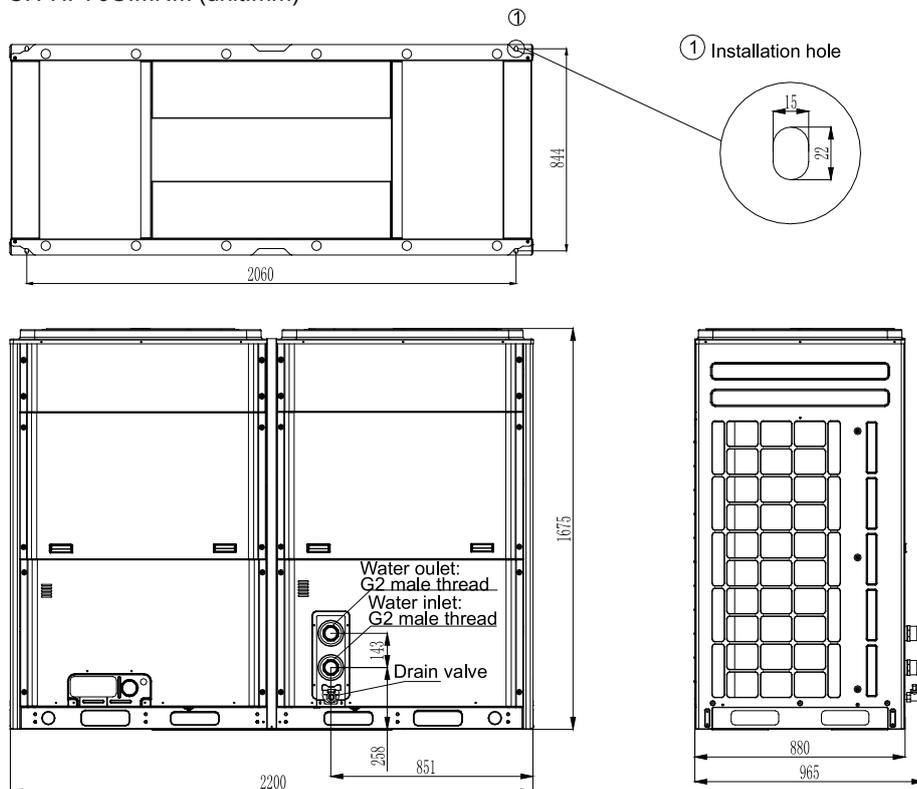
## 4 Installation Instructions

### 4.1 Outline Dimensions

(1)CH-HP36UIMNM(unit:mm )



(2)CH-HP65UIMNM, CH-HP70UIMNM (unit:mm)



### 4.2 Precautions for Installation

(1) Pipelines and electric lines should be correctly connected.

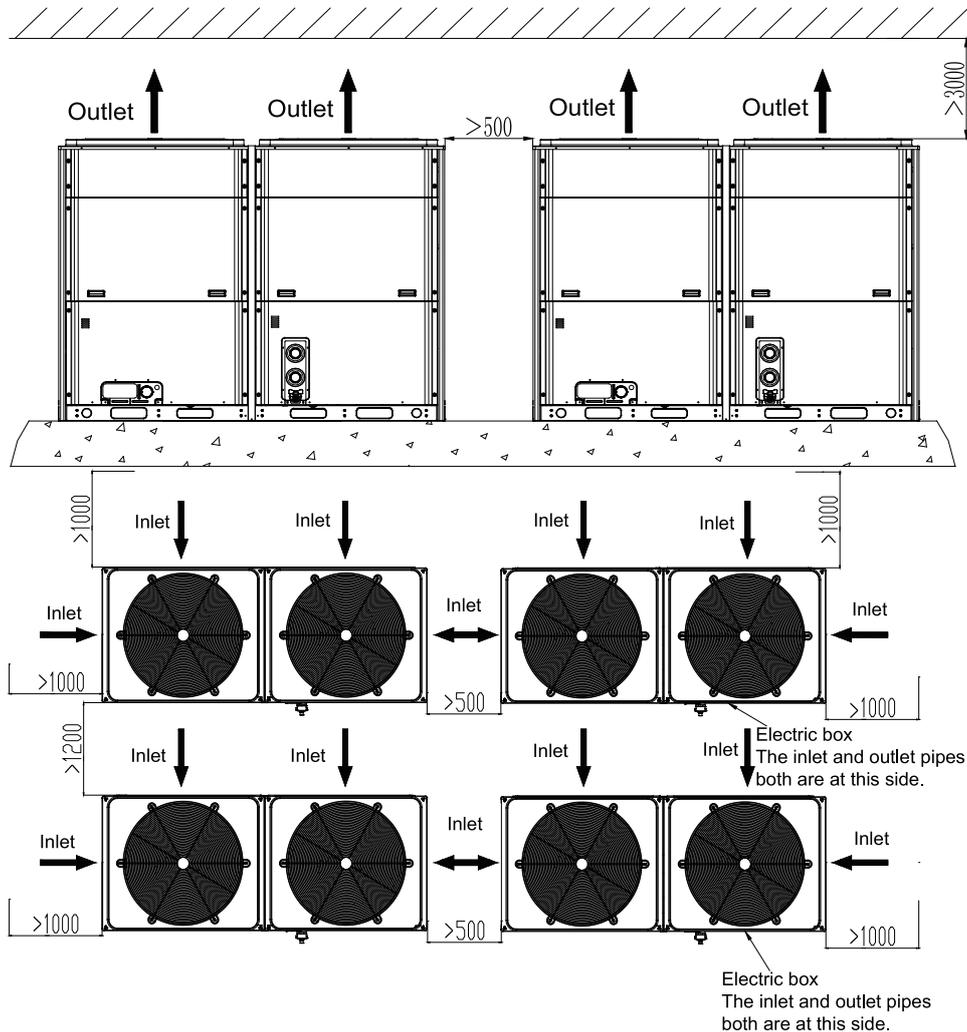
- (2) Rubber pads and rubber flexible connectors should be used during installation for noise and vibration reduction.
- (3) Under subzero climate, when the heat pump runs for cooling, anti-freeze liquid is required.
- (4) Dedicated lugs should be used for lifting. During lifting, proper protection should be taken so as to avoid pipelines from being damaged.

### 4.3 Installation Environment

- (1) The unit should not be installed within 25m of the residence; otherwise a sound insulating wall should be set up.
- (2) When the unit is to be installed at the roof, the foundation should be located at the heel posts. If the floor is quite thin, or there is VIP rooms under the floor, the spring damper is required.
- (3) Fire, inflammably, corrosive gas and waste gas should be avoided around the unit. Also, the unit cannot be installed around the chimney and discharge fan.
- (4) Ventilation should be in good condition and no air flow would be trapped.

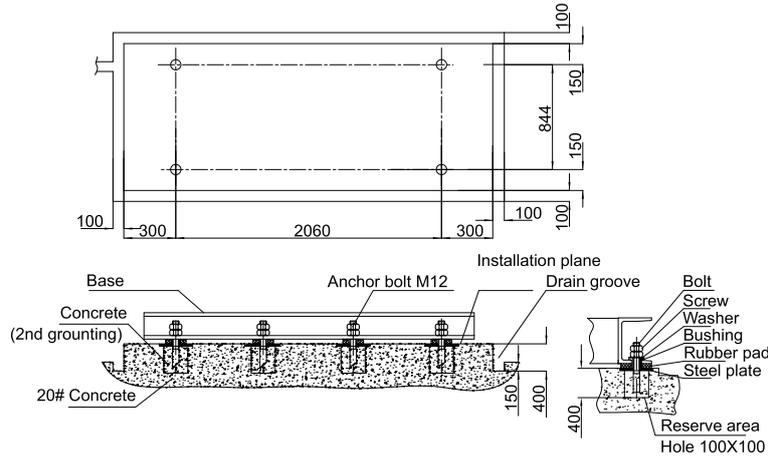
### 4.4 Installation and Service Space

The interval between each single unit should be larger than 0.5m so that there is enough space for entering air and maintenance. The distance between the unit and any barrier should be or larger than 1m so as to keep good ventilation around the unit. If possible, a suncover can be set up 3m ahead of the unit.



### 4.5 Installation Foundation

- (1) The installation foundation should be designed by qualified designers.
- (2) The foundation should be made of cement or steel structure and be capable of supporting the weight of the unit. Additionally, the upper surface should be kept level. It would be better to keep drain grooves around the foundation.
- (3) The installation should be secure enough, and its surface should be smooth.



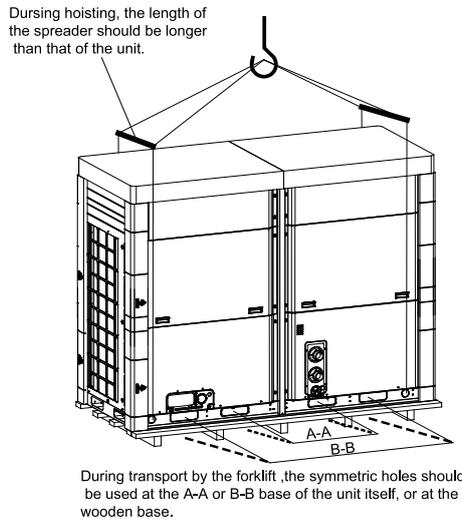
### 4.6 Handling and Lifting

Handling and lifting of the main unit should be performed by a qualified installation team. During lifting, the main unit should be kept stable both horizontally and vertically.

#### 4.6.1 Handling and Lifting

Each unit will undergo a series of strict factory inspections and tests to guarantee the expected performance and quality. However, special attention should be paid during handling and shipping to prevent the control system and the piping system from being damaged.

The unit should be moved by the forklift or hoisting machine. During lifting, the canvas lifting or steel ropes in use should be of enough strength and go through the based and then bundled tightly. The unit should be lifted stably from four corners. Meanwhile, be sure there should be protective pads to prevent lifting ropes contacting with the unit. The inclination angle during lifting should be less than 15 degree. The unit should be moved softly and severe collision and forced drag are not allowed. Please do lifting as shown in the figure below for units with similar structure.



#### 4.6.2 Placement of the Main Unit

- (1) Place the unit on the foundation.
- (2) There should be no clearance between the foundation and the baseboard of the unit.
- (3) Lift the unit, put the rubber pad on the foundation and then place the unit on the rubber pad.

After that, be sure the horizontal slope of the unit can't exceed 1/1000. If so, take an adjustment by stuffing spacers into the clearance between the foundation and the baseboard of the unit until the slope is satisfactory.



## 5 Piping and Insulation

### 5.1 Installation of the Water System

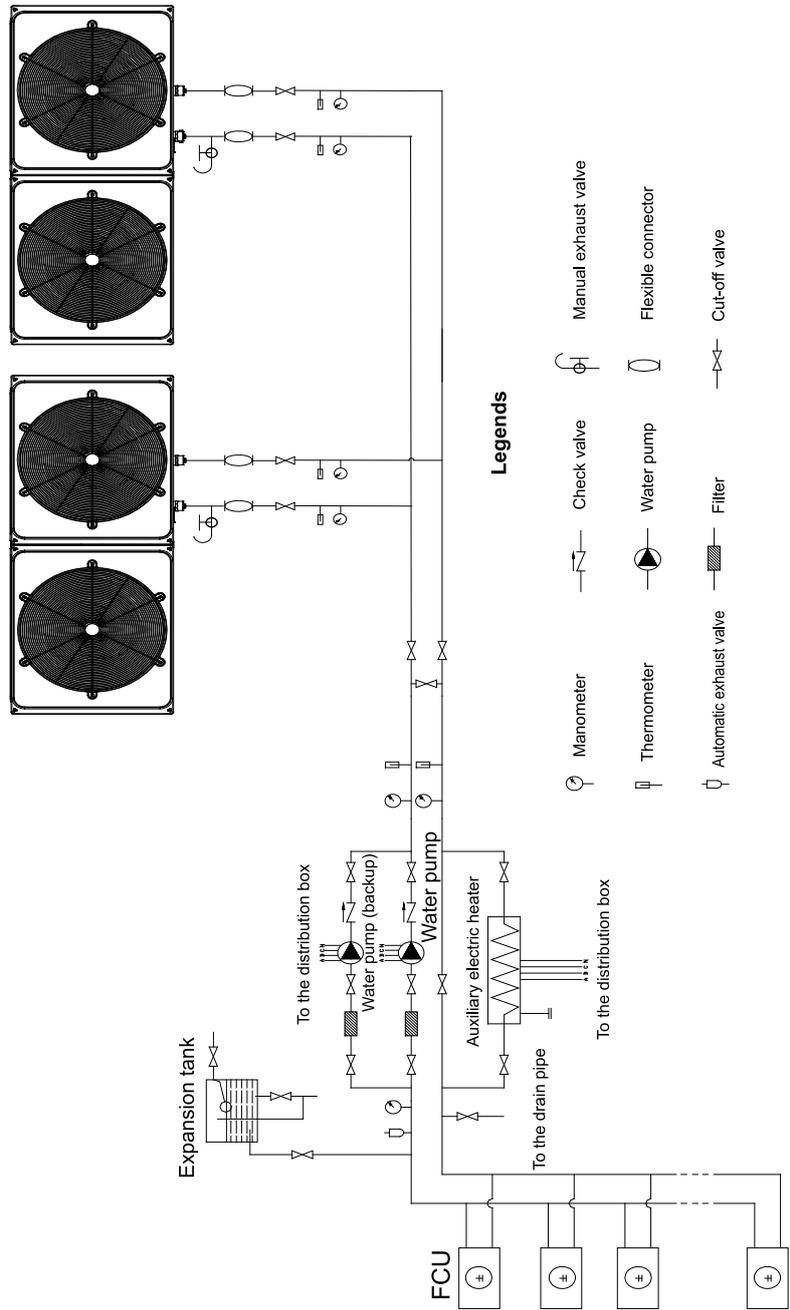
■ Considerations stated below shall be taken carefully for the water system.

- (1) Each water inlet and outlet should be labeled properly to avoid misconnection.
- (2) A flexible connector should be used at the chilled water outlet to reduce vibration transmission.
- (3) A manometer, a thermometer and a gate valve shall be installed at the chilled water inlet /outlet. Moreover, a drain valve shall be installed at the outlet and an air release valve shall be installed at the inlet. At the highest point of the water system, another release valve shall be installed, while at the lowest point of the water system, another drain valve shall be installed to facilitate drainage.
- (4) The water inlet/outlet pipe should be tightly insulated to reduce heat loss and dewing. When pipes are exposed under 0°C, a electric heater shall be installed.
- (5) There surely be some foreign matters in the water system which would generate scale on the surface of the heat exchanger, so a filter shall be installed upstream of the water pump.
- (6) The unit shall be bypassed during flushing to prevent drain out from entering the system.
- (7) Under ultra-low temperature in winter, shutdown at night will cause the evaporator and pipeline frozen up, so it is highly recommended to add alcohol and propanol mixture in chilled water. Do not cut off the power supply when the unit is turned off, otherwise the freeze protection does not work. Alternatively, cut off the power supply and drain the water system thoroughly.
- (8) When the unit runs under the low load requirement, in order to avoid low load protection which would affect the service life of the unit, make sure the water capacity is more than 1/6 of total rated flow rate per hour of each module (for instance, for some project with four modularized LSQWRF60VM/Na-M units, if the rated water flow of each unit is 10.3m<sup>3</sup>/h, then the required capacity of the whole project should be larger than  $10.3 \times 4 \times 1/6 = 6.87 \text{m}^3/\text{h}$ ). When the water course is quite short, a water tank is required; otherwise the service life of the unit would be affected.

#### △NOTE

Never use salt mixture to prevent the unit from being corroded.

■ How to install the water system



■ How to drain the water system :

- (1) Loosen screws around the panel and then take down it.
- (2) Remove anticlockwise the blind plug located at the bottom of the heat exchanger to let the chilled water flow out, after that, tighten the blind plug and reinstall the panel. (- Note: place the drainage equipment beneath the drain pipe to prevent pollution caused by the drain water.

