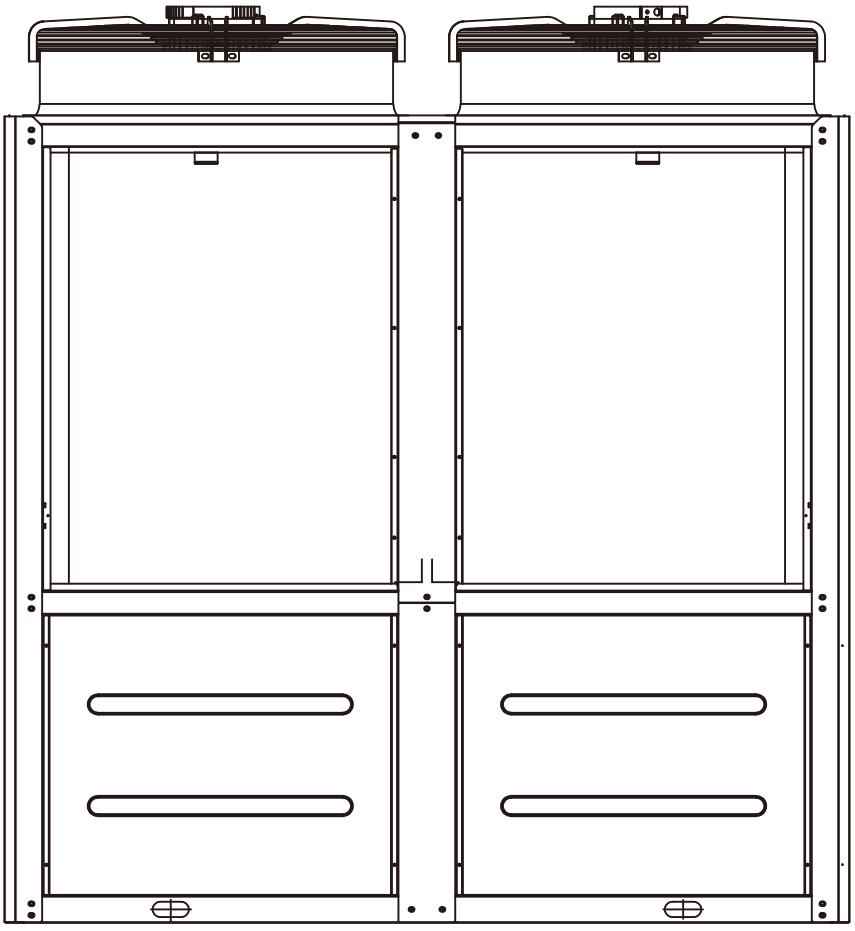
Modular Chiller Heat Pump

Installation and Operating Manual



Please read this equipment manual carefully before use and keep it properly.

CONTENTS

1. Product Introduction

1.1. Accessories

Attachment Name	Quantity
Y-type filter	1
Installation and operation manual	1
Wired controller	1
Wired controller manual	1

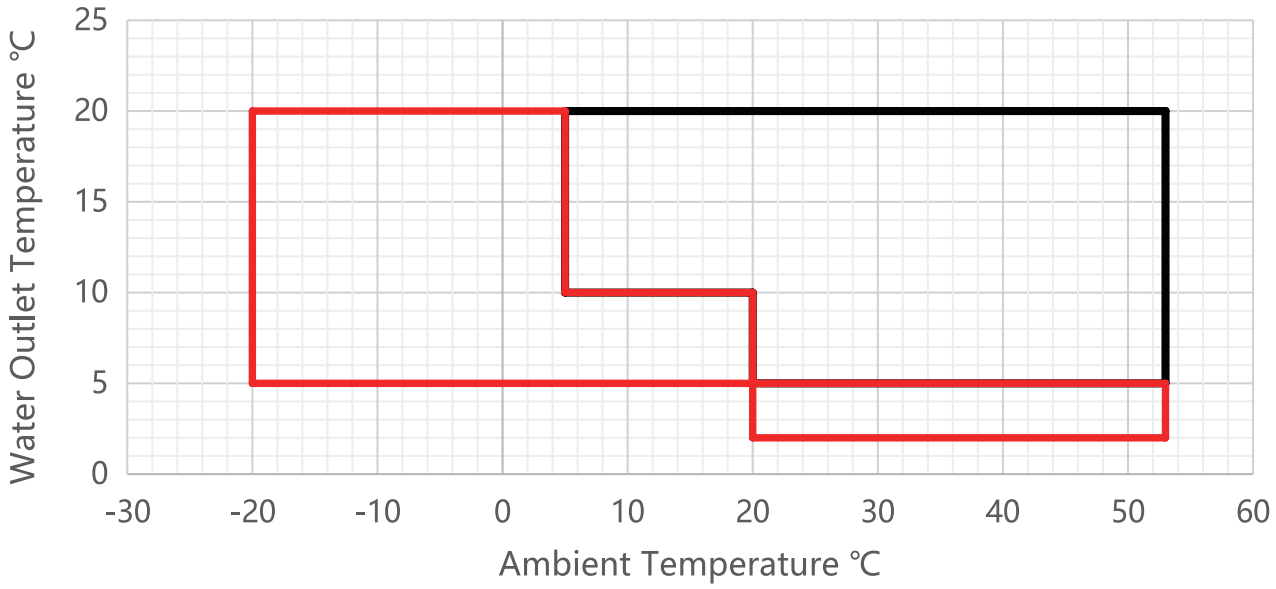
A set of modular chillers must be equipped with one set of wired controller components.

1.2. Operating Range

- The standard power supply voltage is 380-415 V, 3N ~50Hz.
- The unit must operate within the following temperature ranges.
- For units without hydro kit, the installation altitude shall not exceed 1,800 meters.
- For units with hydro kit, the installation altitude shall not exceed 1,000 meters.

1.2.1. Cooling

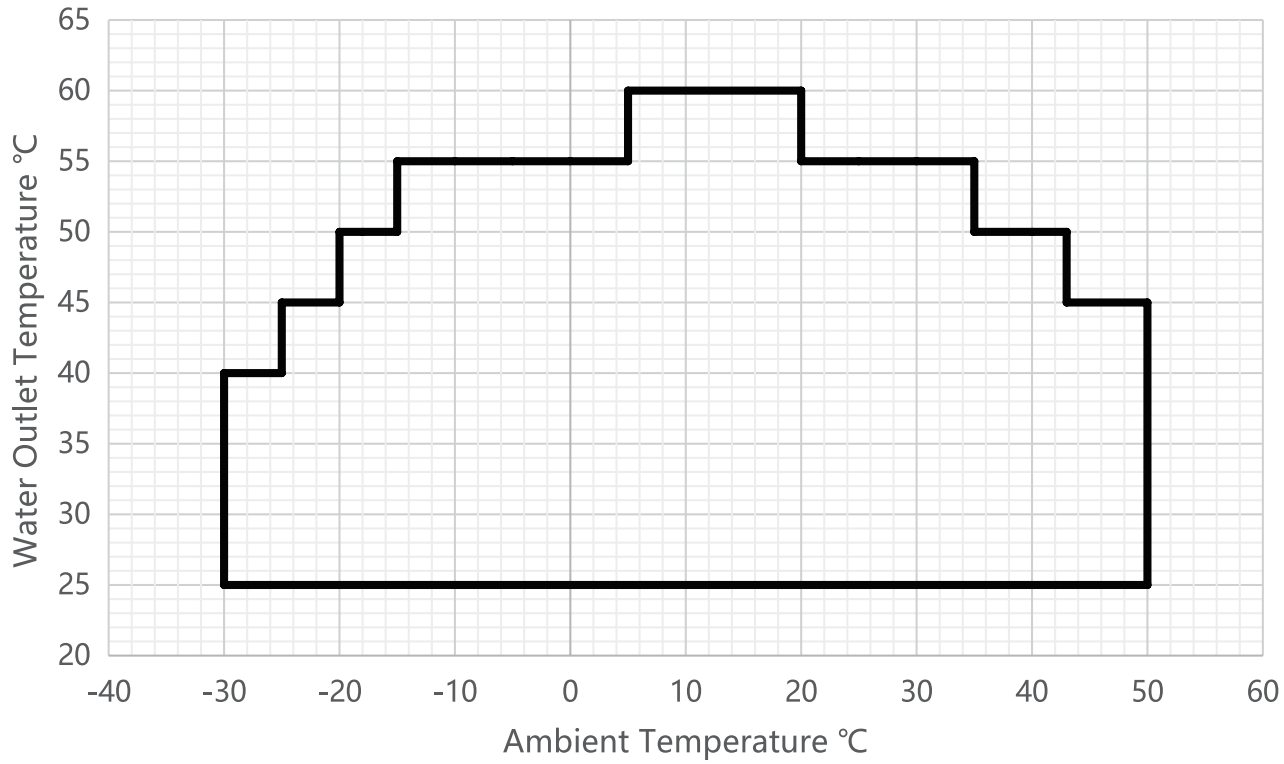
70kW, 70kW (With hydro kit),
140kW, 140kW (With hydro kit)



NOTES
1. The red zone indicates the low-temperature cooling operation range.
2. When the unit operates in the red zone, to ensure its operational stability, at least 30% antifreeze must be added to the water system.
3. When the unit operates in the red zone, the user must activate the [Antifreeze Function] to prevent equipment damage.

1.2.2. Heating

70kW, 70kW (With hydro kit)
140kW, 140kW (With hydro kit)



2. Safety Precautions

The precautions listed herein are categorized as follows and must be strictly followed.
Definitions of Danger, Warning, Caution, and Note Symbols.

INFORMATION
• Please read these instructions carefully before installation. Please keep this manual for future reference. Improper installation of equipment or accessories may result in electric shock, short circuits, leaks, fires, or other damage to the equipment. Only use accessories manufactured by the supplier that are specifically designed for the equipment, and ensure that installation is performed by qualified installers.
• All operations described in this manual must be performed by a licensed technician.
• Always wear personal protective equipment, such as gloves and safety glasses, when installing equipment or performing maintenance activities.
• For further assistance, please contact your dealer.

DANGER
This indicates an impending dangerous situation that, if not avoided, will result in death or serious injury.

WARNING
This indicates a potentially high-risk situation that, if not avoided, could lead to death or serious injury.

CAUTION
This indicates a potentially dangerous situation that, if not avoided, could result in minor or moderate injury. It is also used to warn of unsafe practices.

NOTE
Unexpected damage to equipment or property.

	**WARNING**	This symbol indicates that the equipment uses flammable refrigerants. If the refrigerant leaks and is exposed to an external ignition source, there is a risk of fire.
	**CAUTION**	This symbol indicates that the operation manual should be read carefully.
	**CAUTION**	This symbol indicates that maintenance personnel shall refer to the installation manual when operating this equipment.
	**CAUTION**	This symbol indicates that relevant information is available, such as the operation manual or the installation manual.

DANGER
• Turn off the power switch before touching any electrical terminal components.
• When the service panel is removed, the live parts are exposed and can be accidentally touched, so additional protective measures should be taken nearby.
• Never leave the equipment unattended when the service panel is removed during installation or maintenance. Do not touch the water pipes during or after operation, as this may cause burns. If you must operate the pipes, wait for them to cool to room temperature and always wear protective gloves. Do not touch any switches with wet fingers, as this may result in electric shock.
• Before touching any electrical components, turn off the power to the device and let it stand for at least 15 minutes.

WARNING
• Repair and maintenance shall be performed strictly in accordance with the equipment manufacturer’s recommendations.
• If assistance from other skilled personnel is required, such work shall be conducted under the supervision of individuals proficient in the handling of flammable refrigerants.
• Tear open and dispose of plastic bags appropriately to prevent children from choking on them during play.
• Handle nails, metal, or wooden components in the packaging with due care to avoid injury.
• Installation must be carried out by the dealer or qualified personnel in accordance with this manual. Do not attempt self-installation, as improper procedures may lead to water leaks, electric shock, or fire.

- Only use the specified accessories and parts for installation. Failure to do so may result in water leaks, electric shock, fire, or equipment damage.
- Install the equipment on a foundation capable of supporting its weight; insufficient load-bearing capacity may cause the equipment to topple, leading to potential injury.
- Perform the specified installation work with full consideration of strong winds, hurricanes, or earthquakes. Improper installation may result in equipment tipping.
- All electrical work shall be undertaken by qualified personnel in compliance with local laws and regulations.
- Ensure the manual switch is installed on a dedicated circuit. Inadequate power supply or improper electrical wiring may cause electric shock or fire.
- Installation of a ground fault circuit interrupter (GFCI) is mandatory in accordance with local laws and regulations. Failure to install a GFCI may result in electric shock or fire.
- Ensure all wiring connections are secure. Use the specified wire type and protect terminal connections/wires from water and other adverse external factors. Loose or incomplete connections may cause fire.
- When connecting the power supply, organize wiring to ensure secure installation of the front panel. Improper front panel installation may allow moisture to enter the electrical box, leading to terminal overheating, electrical leakage, or fire.
- After installation, verify that there are no refrigerant leaks.
- Never touch leaking refrigerant directly, as it may cause severe frostbite.
- Do not touch refrigerant pipes during or immediately after operation. Depending on refrigerant flow through the pipes, compressor, and other refrigeration cycle components, the pipes may be extremely hot or cold. Accidental contact may result in burns or frostbite. To avoid injury, shut down the unit and allow it to return to ambient temperature before contact. If contact is unavoidable, always wear protective gloves.
- Do not touch internal components (e.g., pumps, backup heaters) during operation or shortly after shutdown, as they may cause burns. To prevent injury, allow internal components to cool to ambient temperature first or wear protective gloves.
- Do not accelerate the defrosting process or clean the fins manually.
- Store the equipment in a location free of continuous ignition sources (e.g., open flames, operating gas appliances).
- Do not puncture or incinerate the equipment.
- Note that the refrigerant may be odorless.

Caution: Risk of fire

CAUTION

- The equipment must be grounded.
- The grounding resistance should comply with local laws and regulations.
- Do not connect the grounding wire to gas pipes, water pipes, lightning rods, or telephone grounding wires.
- Incomplete grounding may cause electric shock.
- The power cord should be installed at least 3.3 feet (1 meter) away from the television or radio to avoid interference or noise. (Depending on the characteristics of radio waves, a distance of 3.3 feet (1 meter) may not be enough to completely eliminate noise.)
- Never wash this device with water, as this may cause electric shock or fire. The installation of this device must comply with national wiring regulations, and the power cord must be replaced if it is damaged.
- Do not install equipment in the following locations:
  - In the presence of mineral oil mist, oil vapor, or steam, plastic parts may deteriorate, potentially leading to loosening or leaks.
  - In areas where corrosive gases (such as sulfurous acid) are produced. Corrosion of copper pipes or welded components can lead to refrigerant leaks.
  - In areas where electromagnetic waves are emitted. Electromagnetic waves can interfere with control systems and cause equipment malfunctions.
  - In places where flammable gases may leak, where carbon fiber or combustible dust is suspended in the air, or where volatile flammable materials (such as paint thinner or gasoline) are handled. These types of gases can cause fires.
  - In places where the air contains a high concentration of salt, such as near the sea.
  - In areas with large voltage fluctuations.
  - On a vehicle or ship.
  - In places where acidic or alkaline vapors are present.

  Children are not allowed to operate this machine. Cleaning and user maintenance should not be performed by unsupervised children.
- If the power cord is damaged, it must be replaced by the manufacturer, its service agent, or a person with similar qualifications to avoid danger.
- Do not dispose of this product as unsorted municipal waste. Such waste must be collected separately for special treatment. If this product is carelessly disposed of in landfills or dumps, hazardous substances may leak into groundwater and enter the food chain, potentially harming your health.
- Wiring must be performed by professional technicians in accordance with national wiring regulations and circuit diagrams.
- Before carrying out wiring and piping work, confirm the safety of the installation area (walls, floors, etc.) and ensure there are no hidden dangers such as water, electricity, and gas.
- Before installation, check whether the user's power supply meets the electrical installation requirements of the equipment (including reliable grounding, leakage, wire gauge, and electrical load). If the electrical installation requirements of the product are not met, installation of the product is prohibited.
- When installing multiple units, please ensure the load balance of the three-phase power supply and prevent multiple units from being assembled into the same phase of the three-phase power supply.
- The product should be securely installed, and reinforcement measures should be taken if necessary.

NOTES

Regarding Fluorinated Gases

- This unit contains fluorinated gases. Specific details on the type and quantity of such gases are provided on the relevant label affixed to the unit. National gas regulations must be strictly complied with.
- Installation, repair, and maintenance of this unit shall be conducted by certified technicians.
- Product disassembly and recycling must be performed by certified professionals.

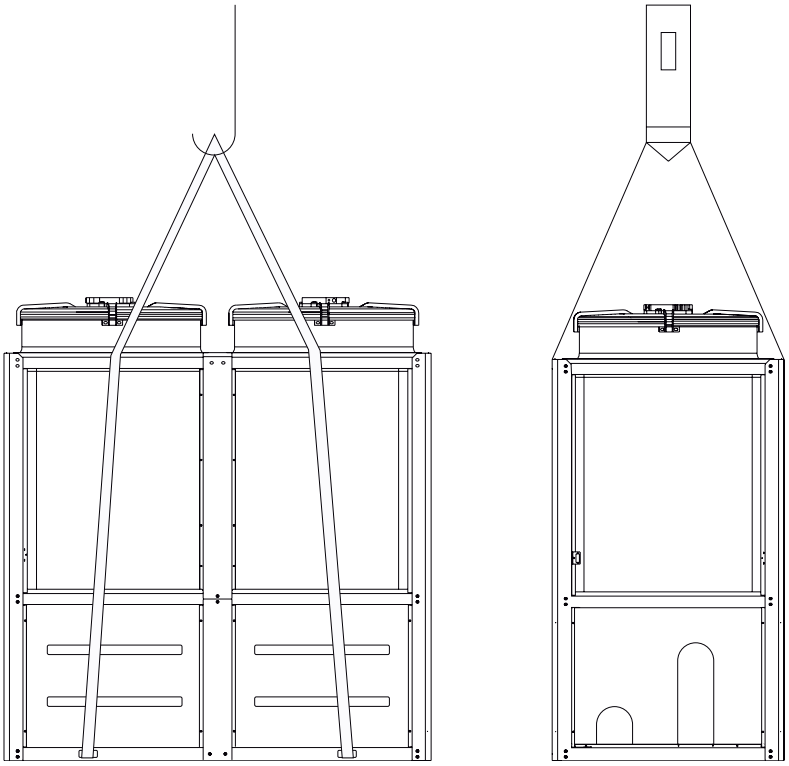
3. Pre-installation Preparation

3.1. Equipment Handling

1. During hoisting, use four steel cable slings of equal length. Utilize the dedicated hoisting holes on the equipment base and place shims at the contact points between the outer casing and the slings. The slings shall withstand a weight of at least three times the equipment's net weight. Verify that the hoisting hooks are securely fastened to the equipment.

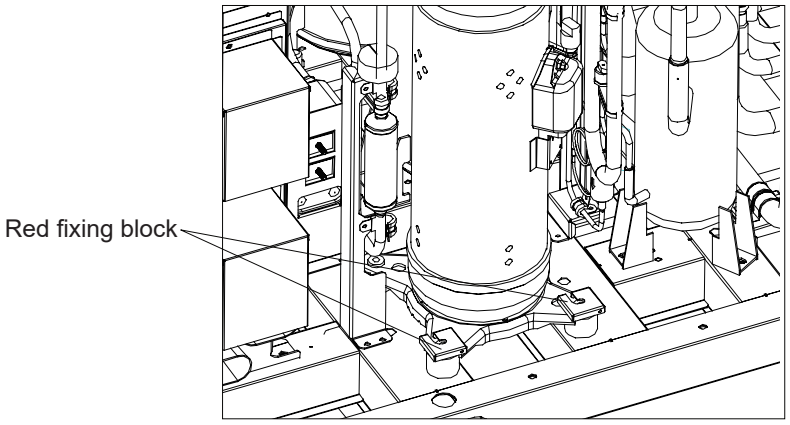
⚠ CAUTION
Never stand under the equipment during hoisting. Place cloth or cardboard between the equipment and the steel cables to prevent surface damage.

Maintain the equipment as level as possible during hoisting and movement; the maximum allowable tilt angle shall not exceed 15°.
Exercise extreme care during hoisting and apply force evenly to the equipment. Comply with the safety requirements specified for the construction site when hoisting or moving the equipment. A designated person shall direct the movement of the hoisted load, and appropriate warning measures shall be implemented to ensure the safety of personnel and machinery.
The following hoisting and handling diagrams are based on the equipment dimensions and are for reference only, as shown below.



Lifting of the unit

Additional restraint devices and fixing blocks may be installed during transportation, but must be completely removed prior to installation (see the diagram below).



Fixing block of the compressor

3.2. Important Information About Refrigerants

This product contains fluorinated gas and must not be released directly into the atmosphere.

- Refrigerant type: R32
- Global warming potential: 675
- GWP: Global Warming Potential

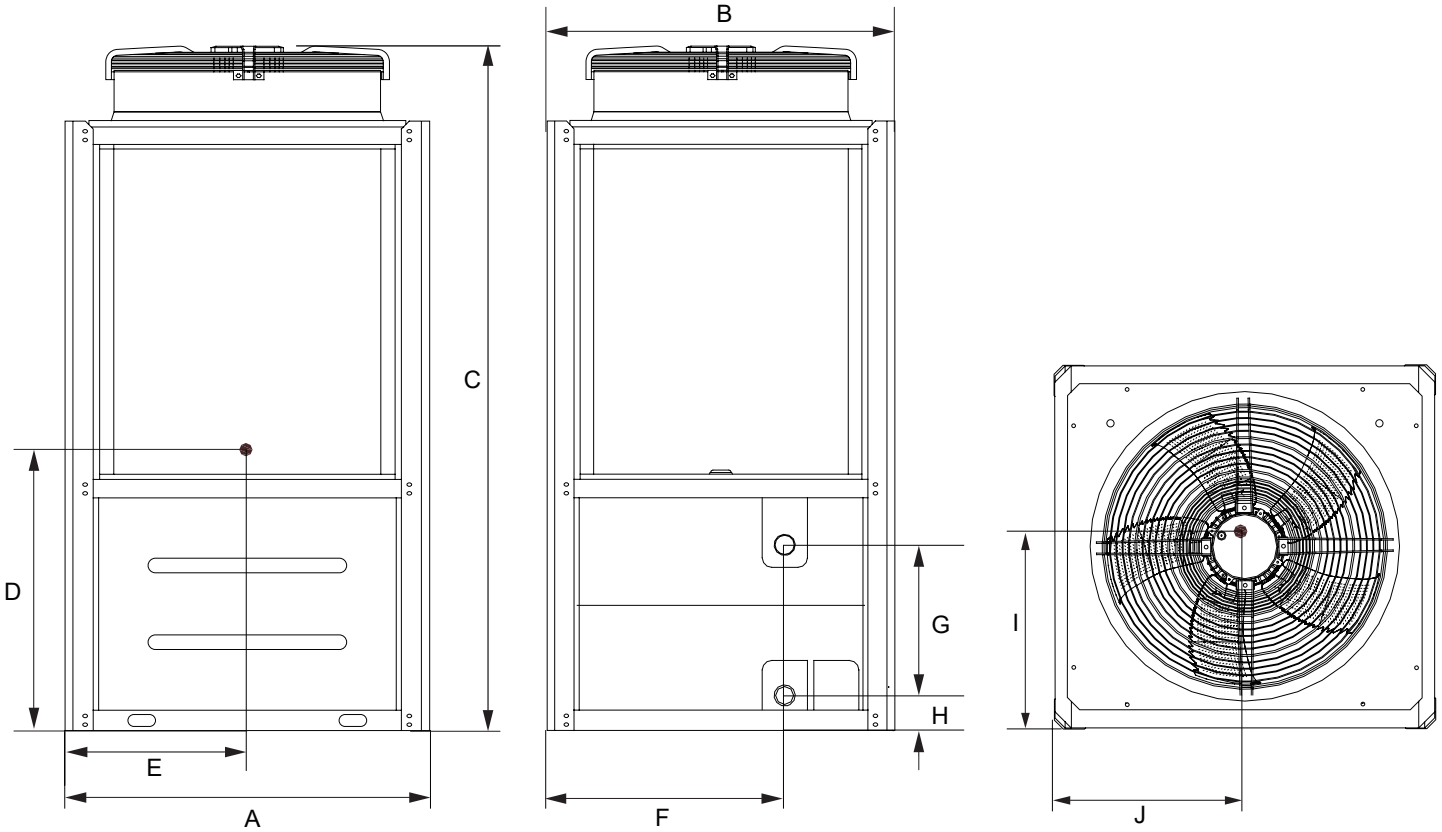
The refrigerant volume is marked on the equipment nameplate.

Model	The Volume Of Refrigerant Charged At The Time Of Manufacture	
	Refrigerant/kg	Carbon Dioxide Equivalent (tons)
70kW	8.5	5.74
70kW (With hydro kit)	8.5	5.74
140kW	7.8×2	10.53
140kW (With hydro kit)	7.8×2	10.53

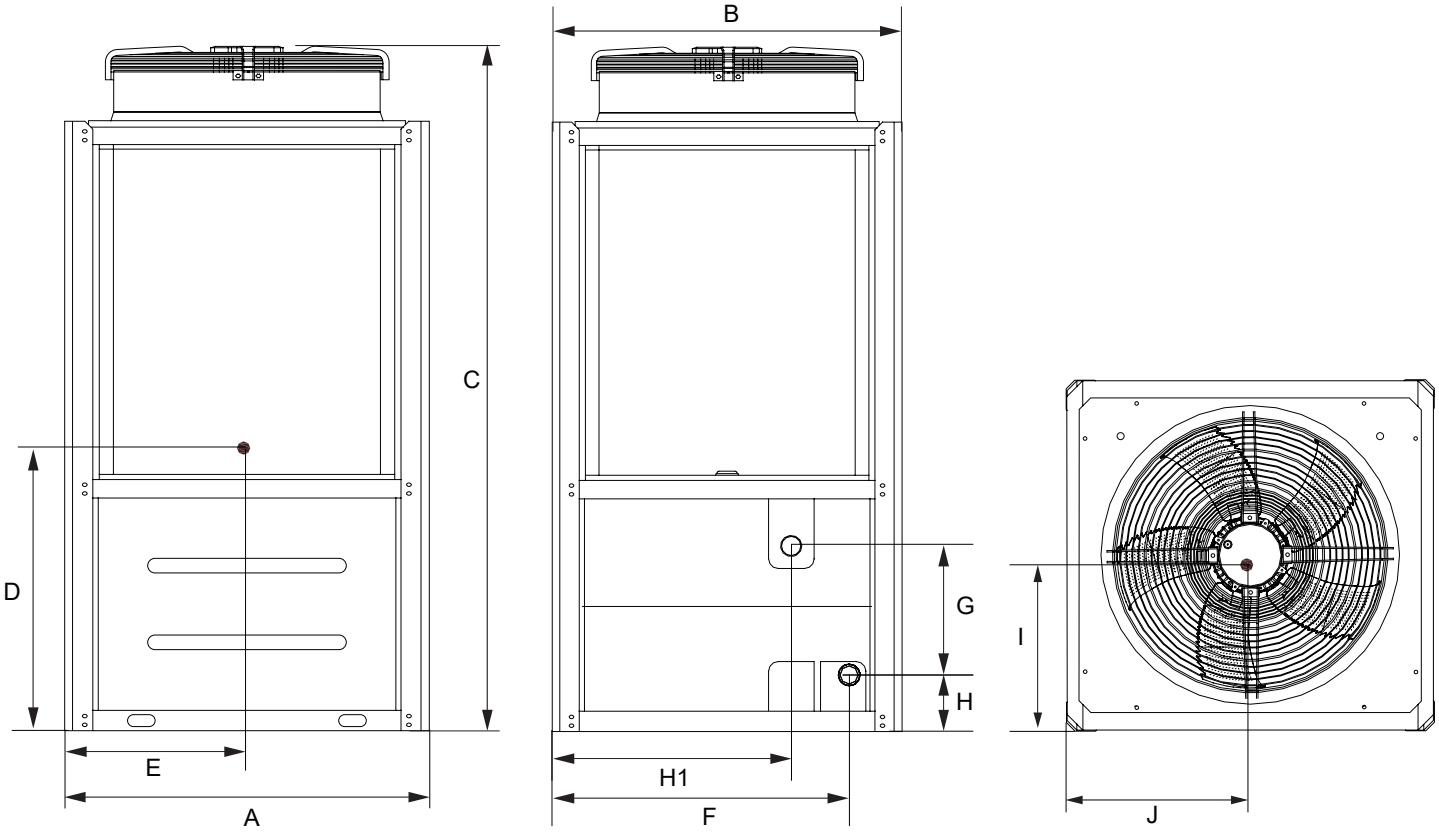
4. Installation Precautions

4.1. Dimensions

70kW:



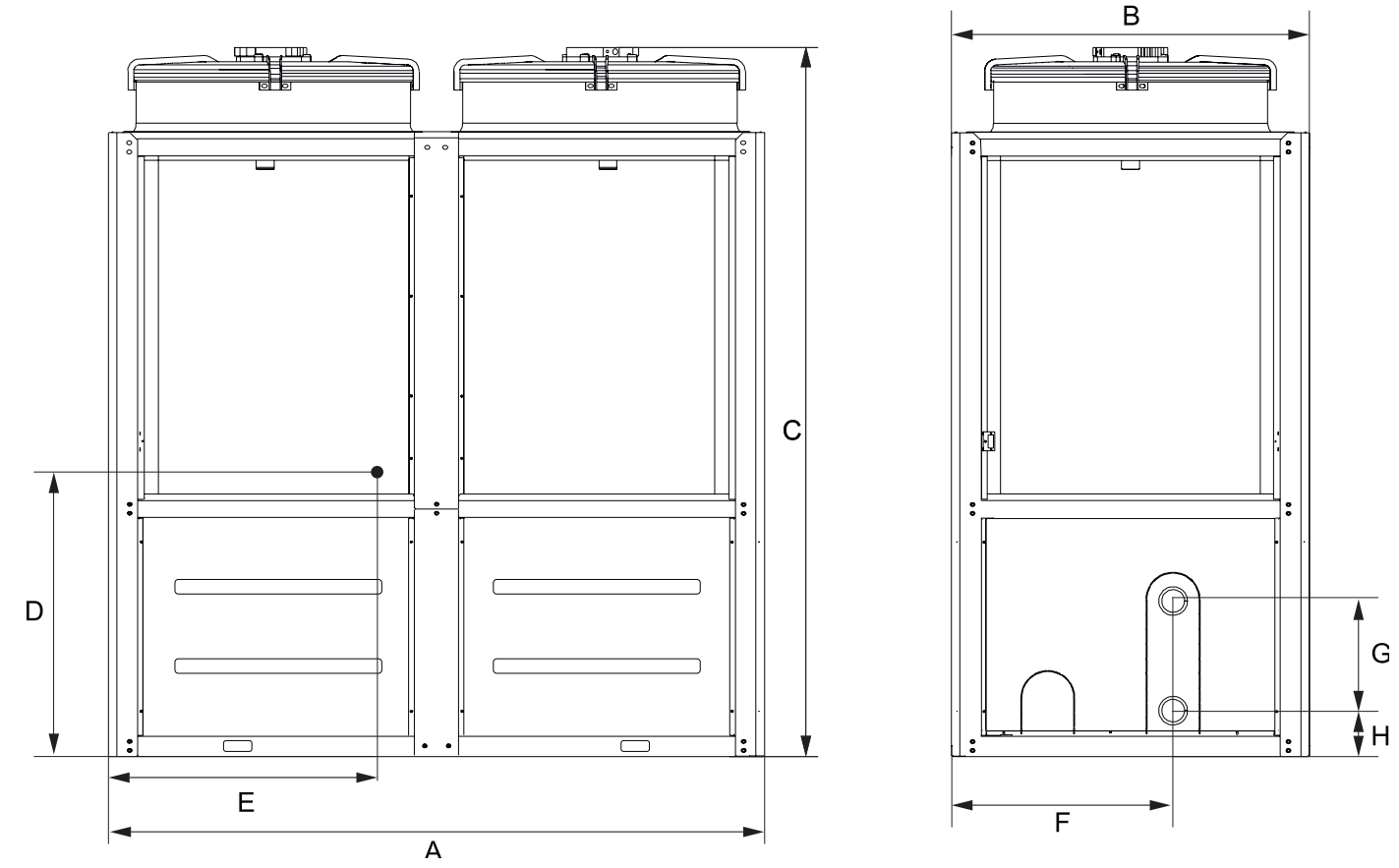
70kW (With hydro kit):

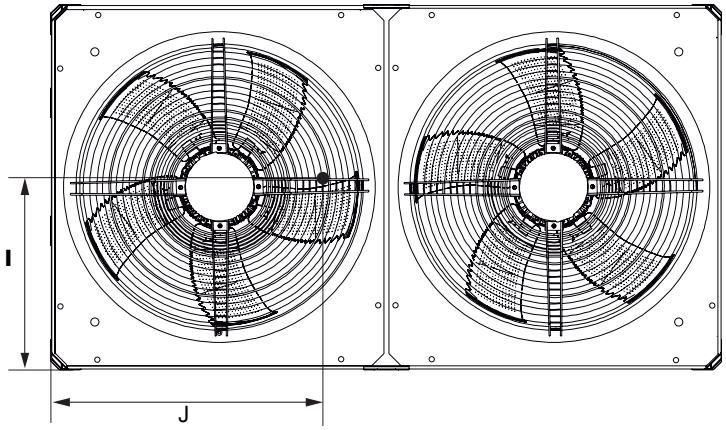


Unit: mm

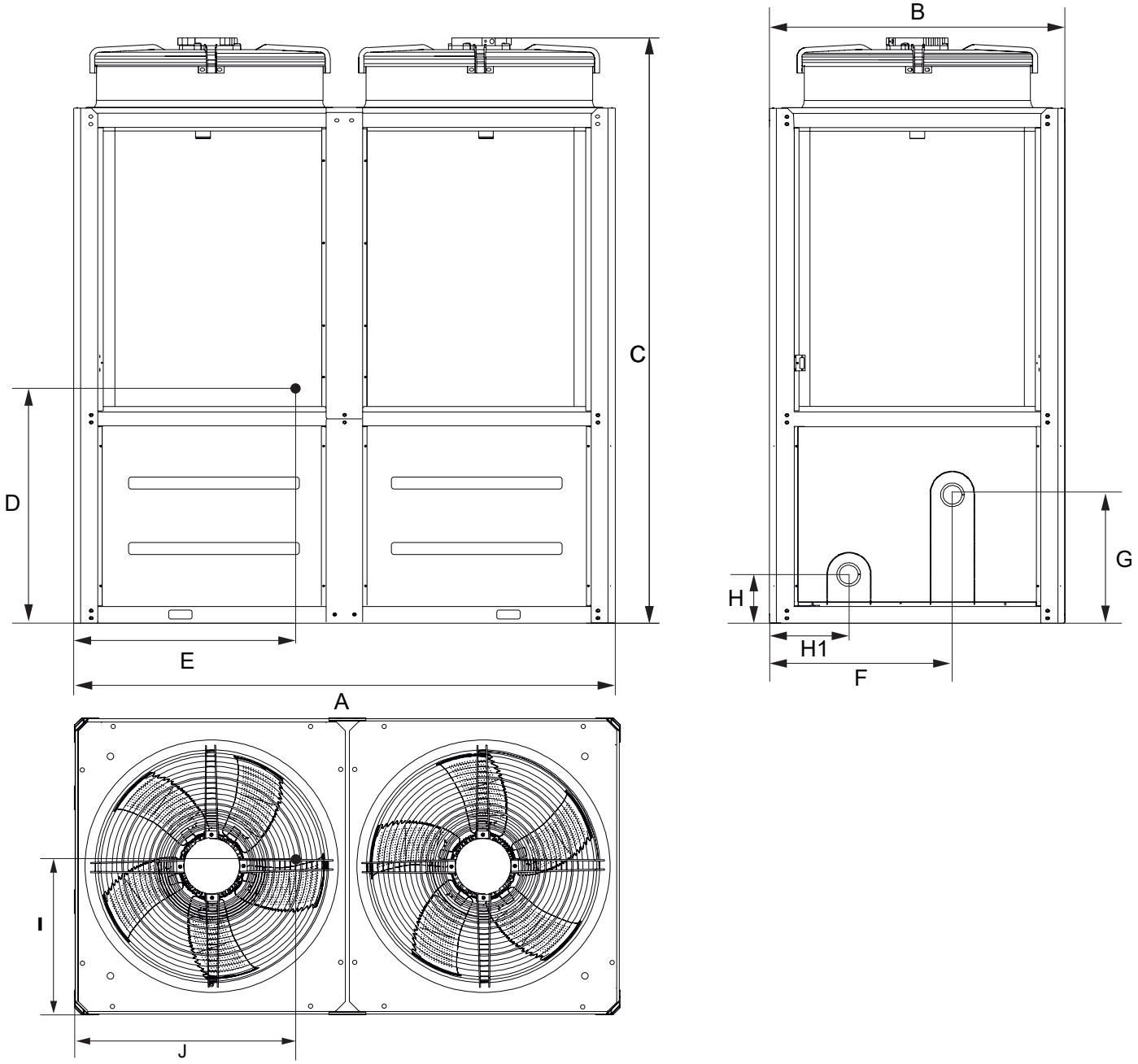
Model	A	B	C	D	E	F	G	H	H1	I	J
70kW	1260	1200	2385	970	625	820	520	120	/	650	625
70kW (With hydro kit)	1260	1200	2385	970	625	1018	447	192	820	570	625

140kW:





140kW (With hydro kit):



Unit: mm

Model	A	B	C	D	E	F	G	H	H1	I	J
140kW	2200	1200	2385	970	810	743	369	154	/	570	810
140kW (With hydro kit)	2200	1200	2385	970	980	743	523	192	323	570	980

NOTE

After installing the spring damper, the overall height of the unit will increase by approximately 135 mm.

4.2. Location

1. The equipment may be installed at a suitable ground or roof location, with adequate ventilation guaranteed.
2. Do not install the device in noise and vibration-sensitive environments.
3. During installation, take measures to avoid direct sunlight exposure and keep the equipment away from boiler pipes and corrosive surroundings that may damage condenser coils and copper pipes.
4. Implement protective measures near the device, such as installing a fence.
5. It is recommended to mount the equipment on a foundation at least 500 mm above the ground. If a floor drain is required, ensure the ground is free of standing water.
6. For ground installation, place the equipment's steel base on a concrete foundation deeply embedded in solid soil. Maintain a safe distance between the mounting base and buildings to minimize the impact of equipment noise and vibration. Secure the equipment to the base using the pre-drilled mounting holes.
7. For roof installation, verify that the roof has sufficient load-bearing capacity to support the equipment's weight and the weight of maintenance personnel. Mount the equipment on concrete or channel steel frames (consistent with ground installation specifications). The load-bearing channel steel must align with the shock absorber's mounting holes and have a width sufficient to accommodate the shock absorber.
8. For other special installation requirements, consult a building contractor, architect, or other qualified professionals.

NOTE

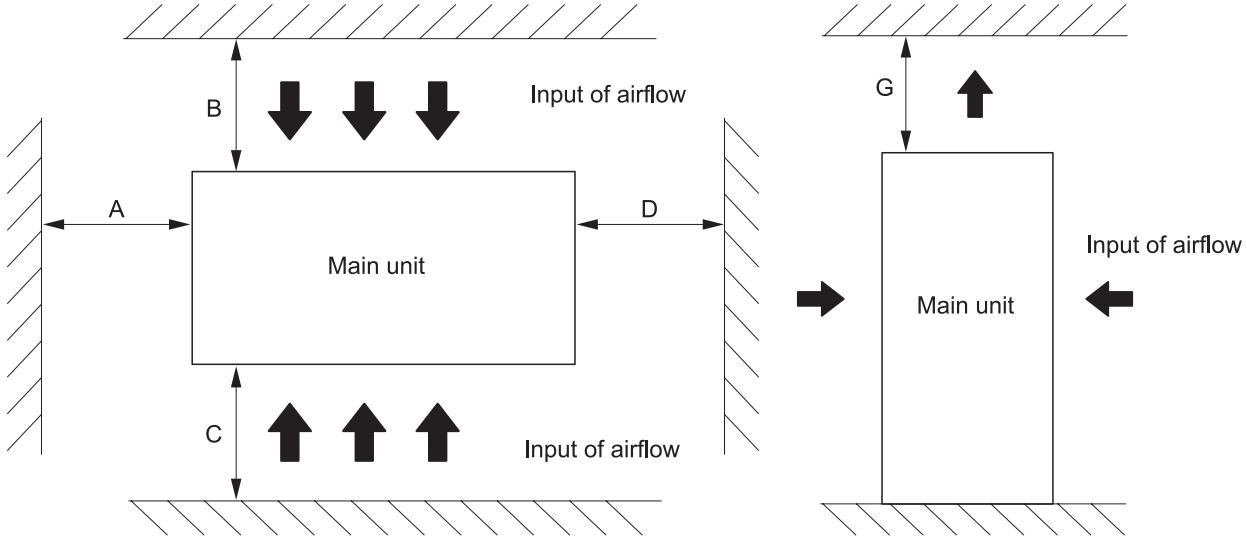
The installation location of the selected equipment shall facilitate the connection of water pipes and electrical wires, and the equipment's noise and exhaust airflow shall not affect the surrounding environment.

WARNING

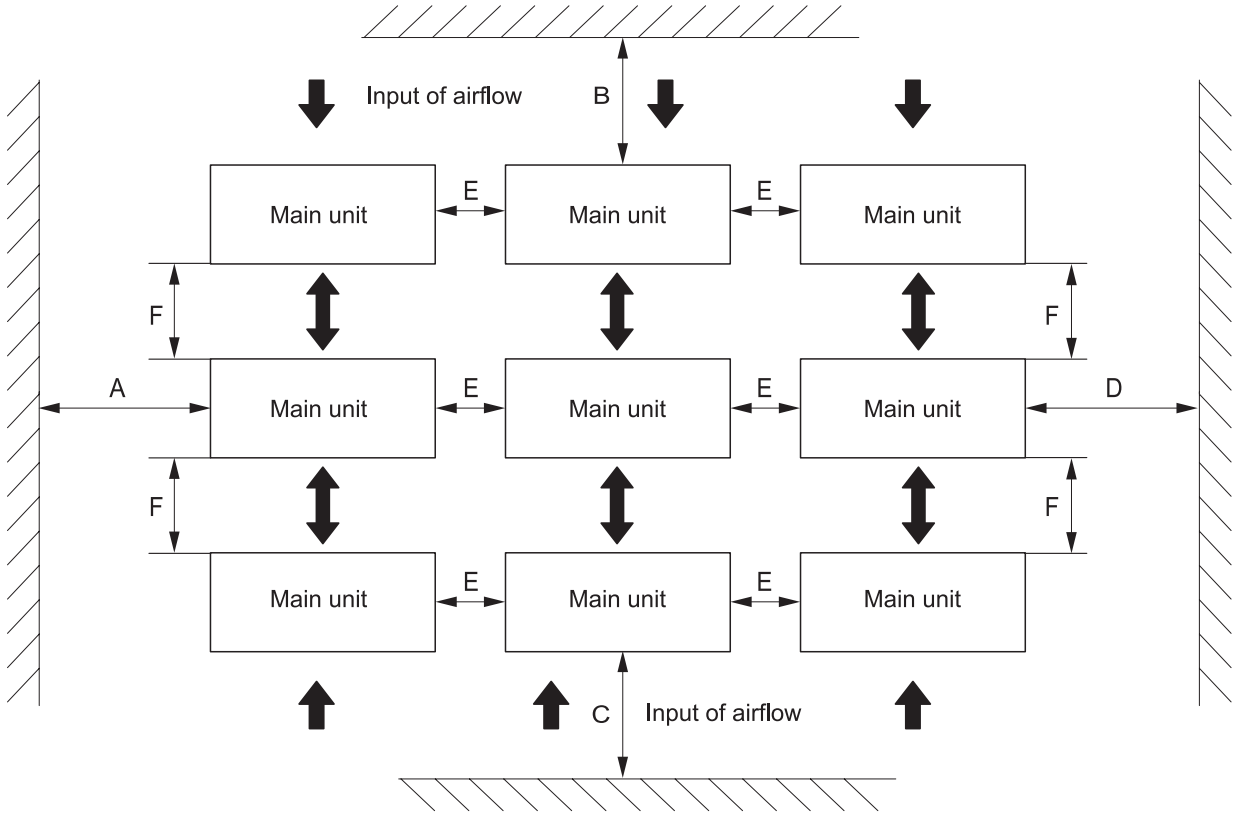
- This device contains flammable refrigerant and should be installed in a well-ventilated area. The device must be installed outdoors, never indoors, and must be protected from use by small animals as a shelter.
- Contact with electrical components by small animals may cause equipment malfunction, smoke, or fire. Please instruct customers to keep the area around the equipment clean.
- This equipment is not suitable for environments where explosions may occur.

4.3. Space Requirements

1. To ensure sufficient air intake for the finned tube heat exchanger, the impact of surrounding tall buildings on the unit-generated downdraft shall be taken into account during installation.
2. When the unit is installed in an exposed area with high air velocity (e.g., a roof), protective measures (such as installing barriers or louvers) may be adopted to prevent turbulence from interfering with the unit's air intake. If a sunken barrier is installed, its height must not exceed that of the unit itself; if louvers are used, the total static pressure loss must be ensured to be less than the fan's external static pressure.
3. For units required to operate in winter in snow-prone areas, the height of the mounting base shall be higher than the local historical maximum snow depth and no less than 0.5 meters to prevent snow burial.



Installation space for a single unit



Installation space for cascade system

Unit: mm

Installation Space			
A	≥1000	E	≥ 600
B	≥1000	F	≥ 600
C	≥1000	G	≥3500
D	≥1000	/	/

NOTE

If the number of units at the same installation site exceeds 16, please contact the manufacturer's technical support department for confirmation.

4.4. Foundation

4.4.1. Basic Structure

The foundation design of chiller shall comply with the following requirements:

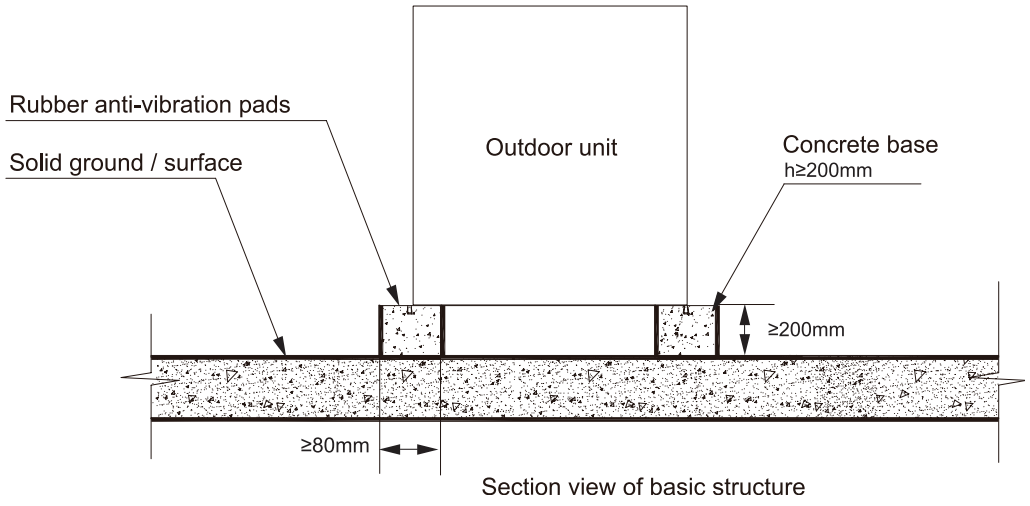
1. Strength And Vibration Reduction:
The foundation shall be robust to prevent excessive unit vibration and noise. The unit shall be installed on compacted ground or a structure with sufficient load-bearing capacity to satisfy weight-support requirements.

2. Installation Height:
The foundation height is recommended to be no less than 500mm to provide sufficient space for piping installation. The height shall also be adjusted based on local snow depth.

3. Material Selection:
Either a steel structure base or a concrete foundation may be adopted.

4. Concrete Construction Specifications:
A typical concrete foundation design is illustrated in figure below. The recommended concrete mix ratio is 1:2:4 (cement: sand: crushed stone), with steel reinforcement required. The foundation edges shall be chamfered.

5. Levelness And Support:
The foundation surface shall be maintained level to ensure effective and uniform support for all load-bearing points of the unit.

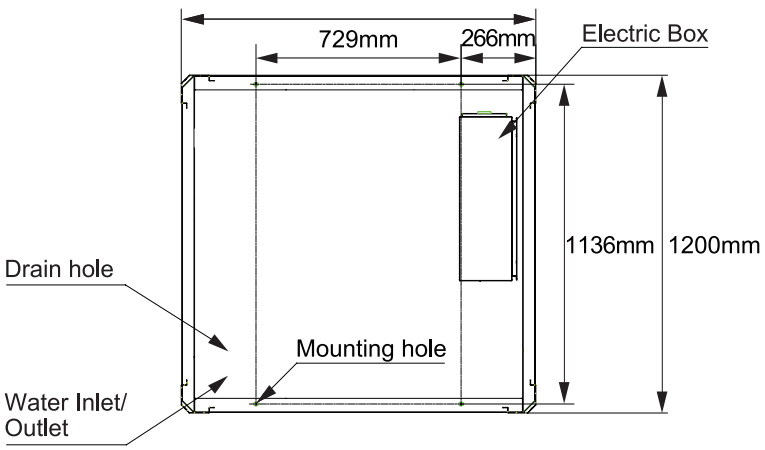


Section view of basic structure

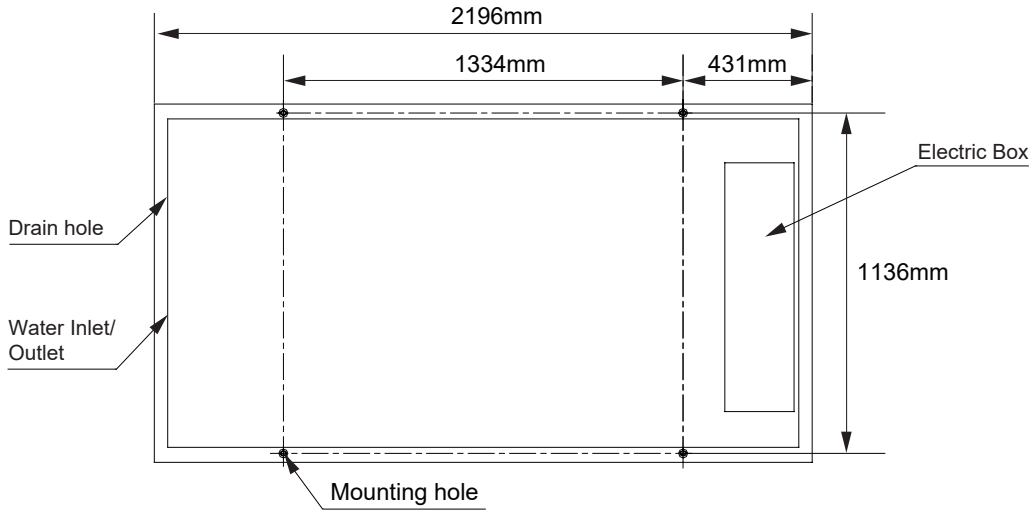
4.4.2. Foundation Diagram

1. If the unit is installed at an excessively high height that causes operational inconvenience, a suitable operating platform or scaffolding shall be constructed around the unit.
2. The operating platform must be capable of stably supporting the weight of maintenance personnel and their tools.
3. It is strictly prohibited to embed the unit's bottom frame in the concrete foundation.
4. Drainage ditches must be provided to discharge condensate water generated during heating mode. Ensure the drainage flows away from sidewalks and driveways to prevent safety hazards caused by water accumulation and freezing in winter.

70kW, 70kW (With hydro kit):



140kW, 140kW (With hydro kit):



4.5. Damping Device

4.5.1. Installation Requirements

1. Installation Method:
Vibration damping devices shall be installed between the unit and the foundation. Utilize the four reserved U-shaped mounting holes (12 mm×18 mm) on the base steel frame, together with spring vibration dampers, to secure and fasten the unit.

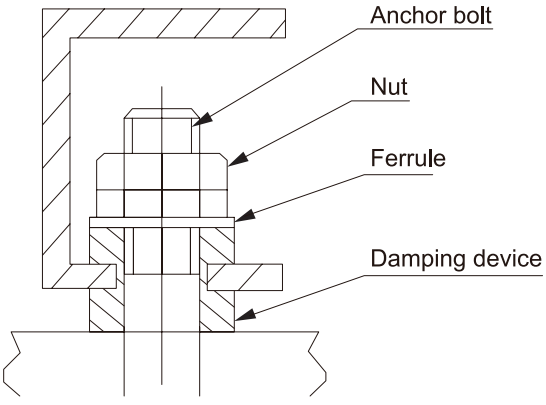
2. Dimension Reference:
For details on the spacing of the mounting holes, refer to [Top view of basic structure] the schematic diagram of unit installation dimensions.

3. Supply Specification:
Vibration dampers shall be provided by the user (not included in the unit's delivery package) and selected in accordance with relevant specifications.

4. Special Scenarios:
When the unit is installed on the roof of a high-rise building or in areas with strict noise and vibration control requirements, consult with professionals prior to selecting vibration dampers.

4.5.2. Installation Steps

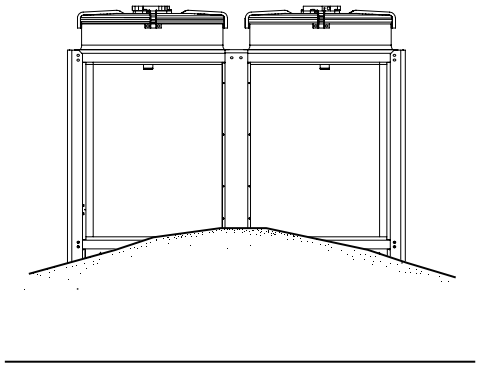
Step 1: Inspect the flatness of the concrete foundation to ensure the deviation is within ±3mm, then place the unit on a temporary pad.
Step 2: Lift (or raise) the unit to a height suitable for vibration damper installation.
Step 3: Remove the retaining nuts from the vibration dampers. Place the unit on the dampers, aligning the retaining bolt holes of the dampers with the mounting holes on the unit base.
Step 4: Reinstall the fixing nuts into the mounting holes of the unit base and tighten them securely to the vibration dampers.
Step 5: Adjust the working height of the vibration damper bases by rotating the leveling bolts. Rotate each bolt one full rotation per adjustment cycle to ensure consistent height adjustment across all dampers (to prevent uneven loading).
Step 6: Once the correct working height is achieved, tighten the locking bolts for final securing.



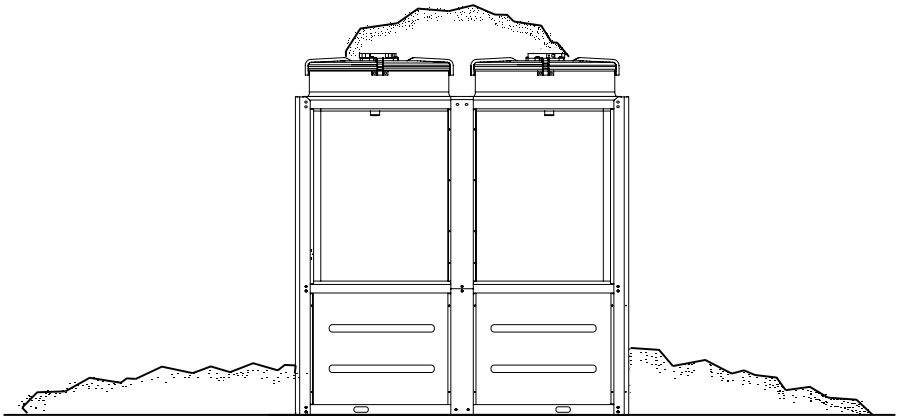
Installation of the damper

4.6. Snow And Strong Wind Protection Devices

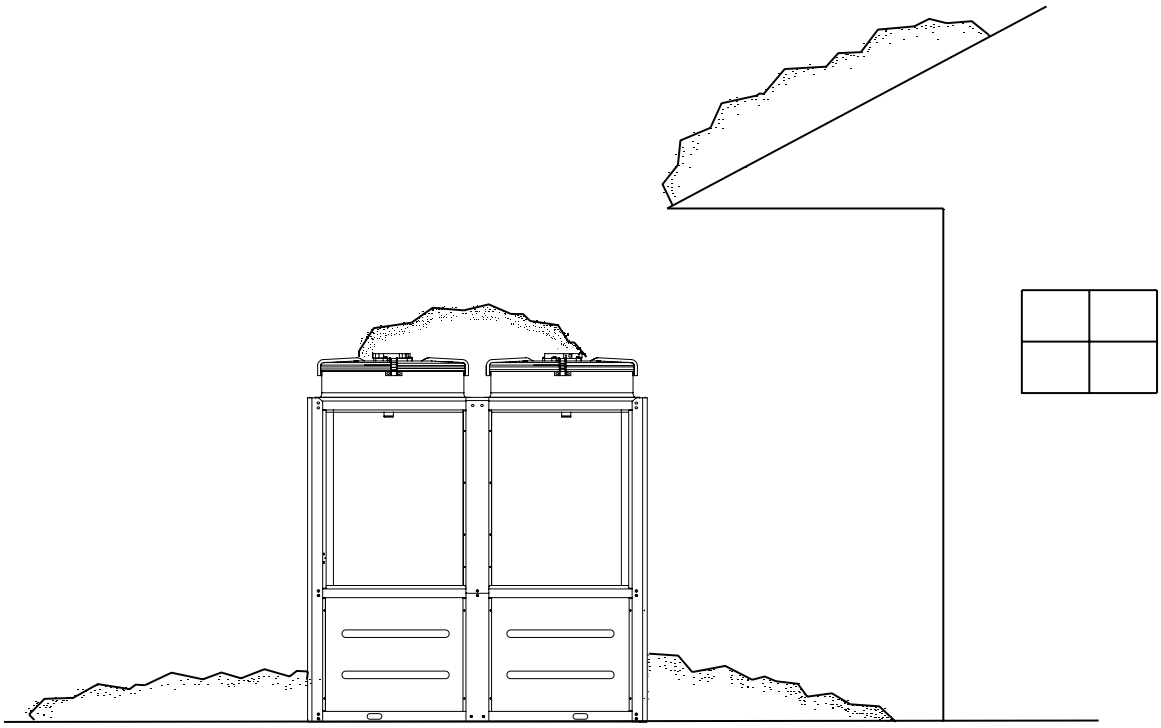
When installing chillers in snowy areas, adequate snow protection measures must be implemented to ensure reliable equipment operation. Otherwise, snow accumulation may block airflow (e.g., clog air ducts), which could lead to equipment malfunctions.



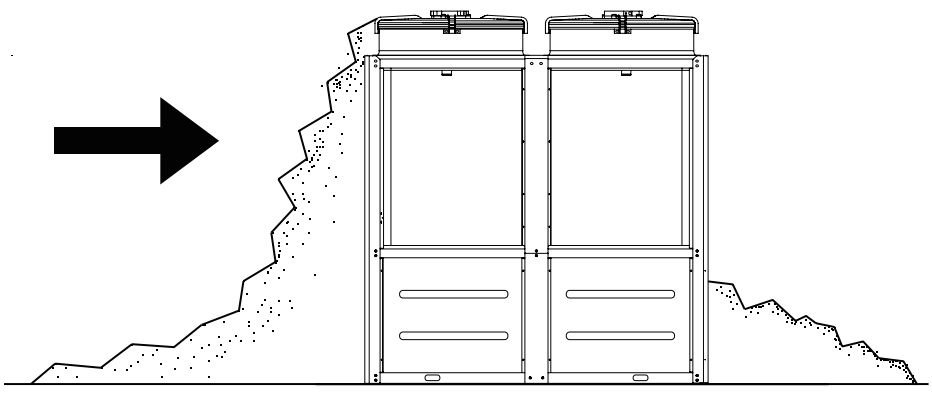
Buried by snow



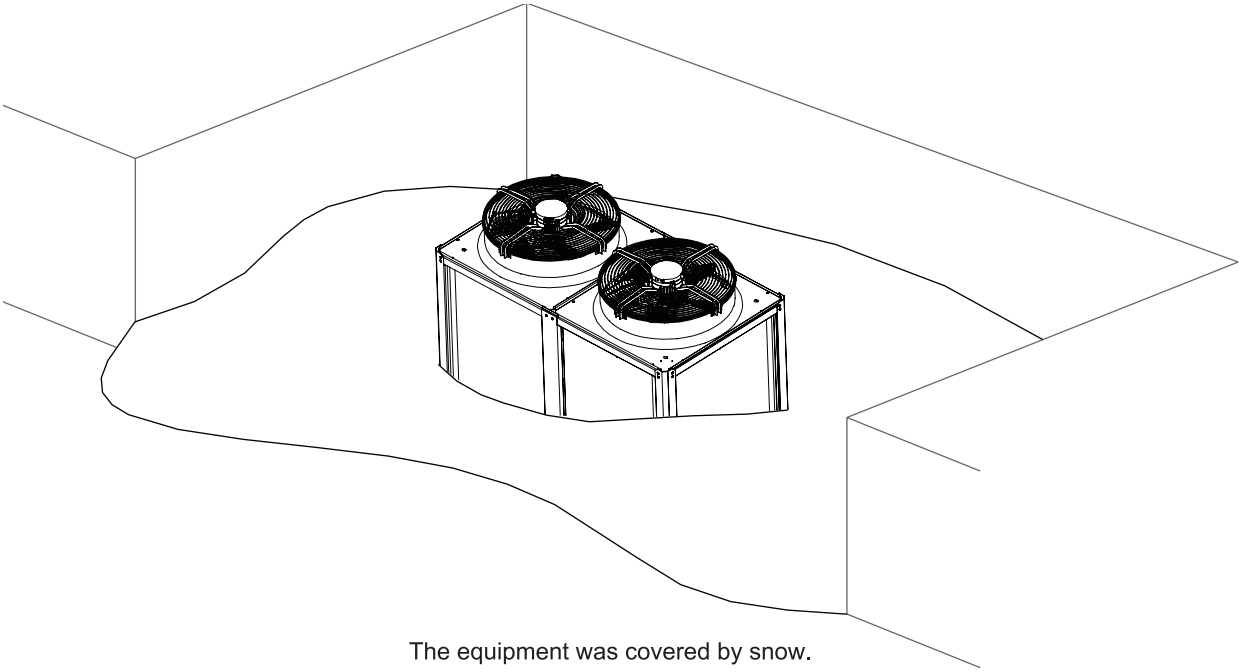
Snow-covered roof



Snow-covered roof



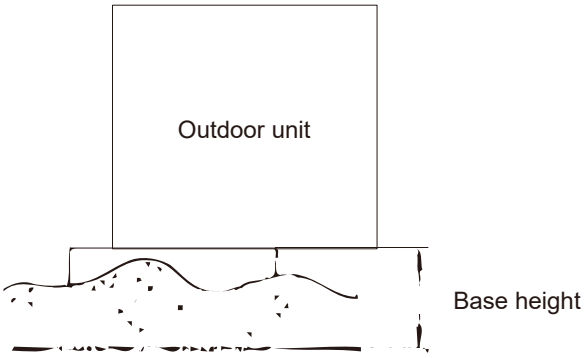
The air inlet is blocked by snow.



The equipment was covered by snow.

4.6.1. Snow Accumulation Prevention Measures

1. The height of the installation foundation shall be no less than the estimated local snow depth. (This is to prevent the unit base from being buried by snow.)
2. Thoroughly inspect the installation site to verify the availability of lightning protection and snow protection measures; it is strictly prohibited to install the equipment under awnings (or building eaves), under trees, or in snow-prone areas.



Snowproof foundation height

4.6.2. Snowproof Foundation Height Outdoor Unit Base Height

1. Snowproof Foundation Height Outdoor Unit Base Height

To ensure sufficient airflow for the normal operation of the air-cooled chiller, the airflow resistance (pressure drop) of the snow cover shall be controlled during design. The resistance generated by the snow cover shall be at least 1 mmH2O less than the unit's allowable external static pressure (i.e., a margin of approximately 10 Pa shall be reserved).

2. Structural Strength Requirement

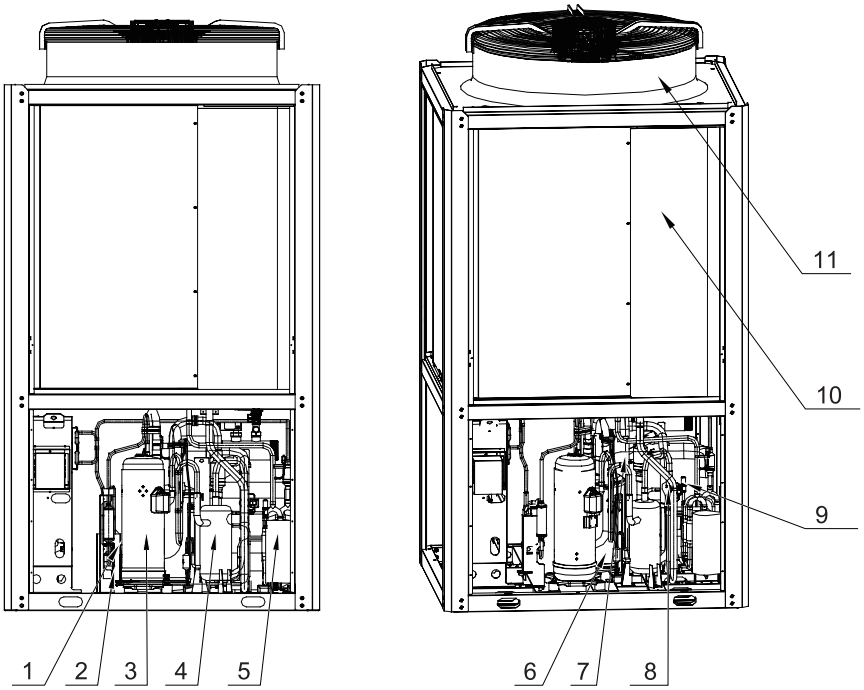
The snow cover shall possess adequate structural strength to resist snow loads (snow weight) and wind pressure from strong winds or typhoons.

3. Airflow Short-circuit Prevention

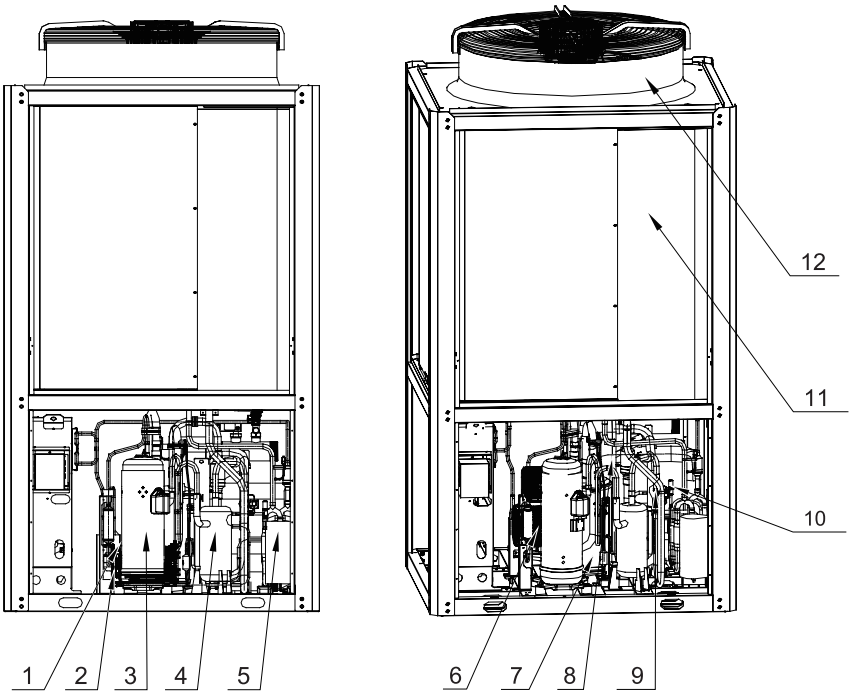
The snow cover design shall prevent airflow short-circuits, particularly between the unit's exhaust and intake air (i.e., preventing the re-inhalation of exhaust airflow).

5. Equipment Overview

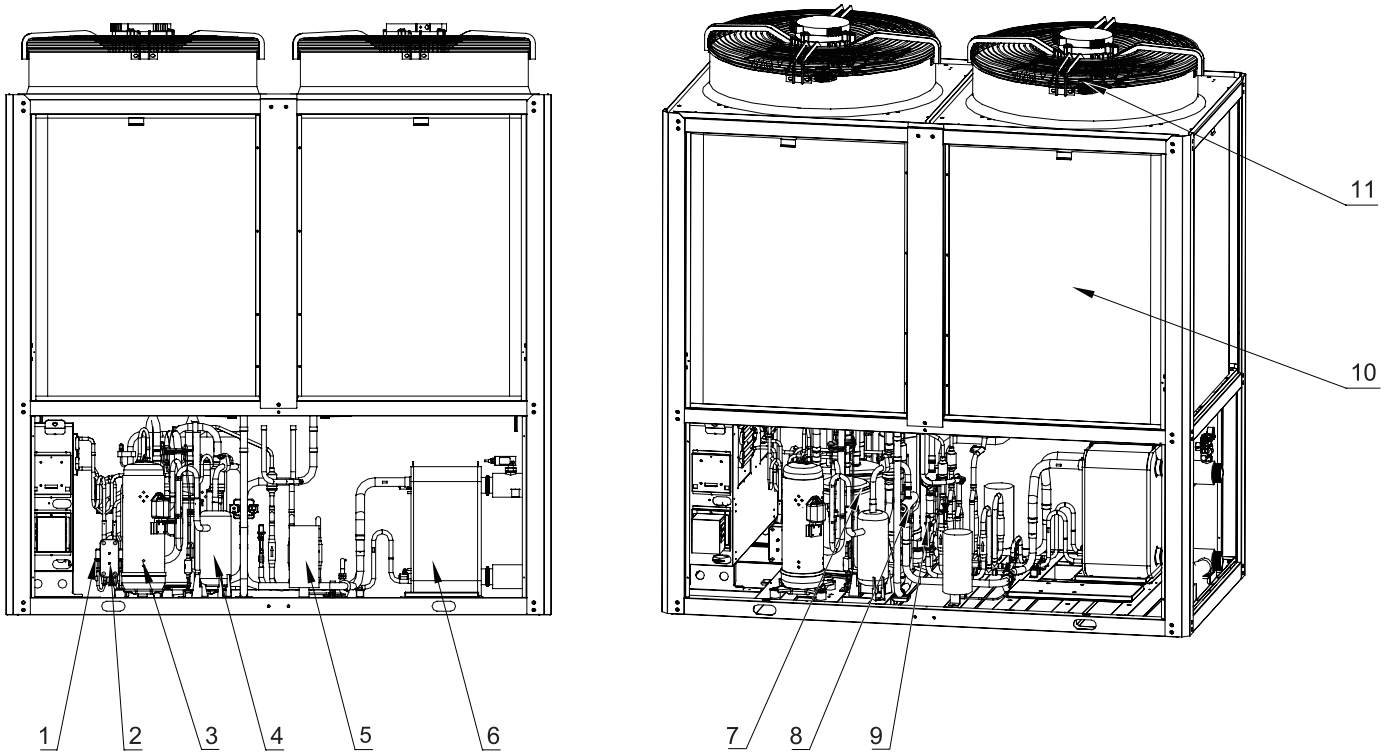
5.1. Main Components



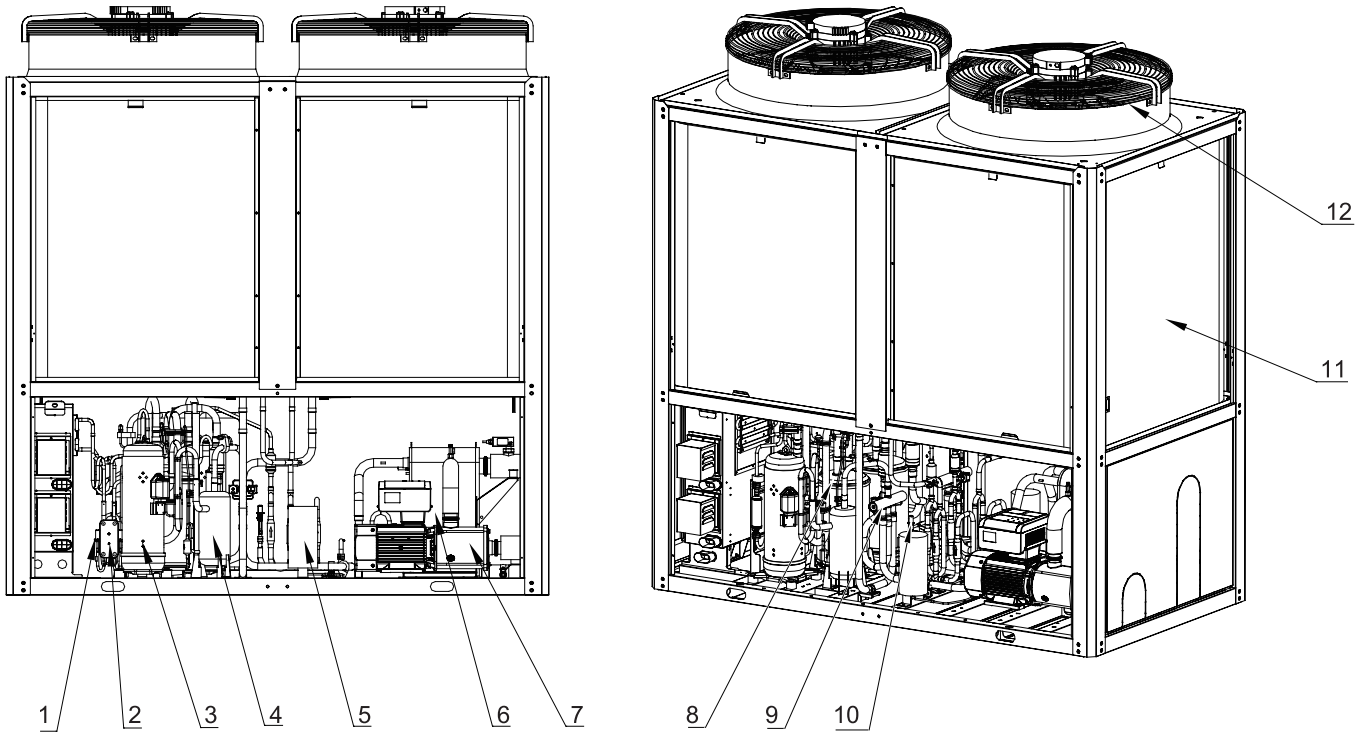
MODEL: 70kW			
No.	**Name**	**No.**	**Name**
1	Auxiliary Electronic Expansion Valve	7	Plate Heat Exchanger
2	Economizer	8	Four-Way Valve Assembly
3	Compressor	9	Main Electronic Expansion Valve
4	Oil Separator	10	Condenser Components
5	Liquid Receiver	11	DC Fan Motor
6	Gas-Liquid Separator		



MODEL: 70kW (With hydro kit)			
No.	**Name**	**No.**	**Name**
1	Auxiliary Electronic Expansion Valve	7	Gas-Liquid Separator
2	Economizer	8	Plate Heat Exchanger
3	Compressor	9	Four-Way Valve Assembly
4	Oil Separator	10	Main Electronic Expansion Valve
5	Liquid Receiver	11	Condenser Components
6	Water Pump	12	DC Fan Motor



MODEL: 140kW			
No.	**Name**	**No.**	**Name**
1	Auxiliary Electronic Expansion Valve	7	Gas-Liquid Separator
2	Economizer	8	Four-Way Valve Assembly
3	Compressor	9	Main Electronic Expansion Valve
4	Oil Separator	10	Condenser Components
5	Liquid Receiver	11	DC Fan Motor
6	Plate Heat Exchanger		

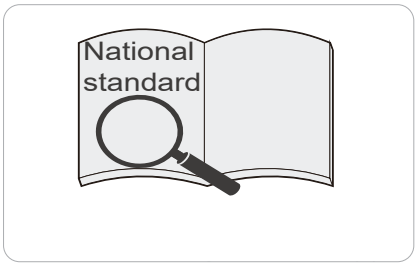


MODEL: 140kW (With hydro kit)			
No.	**Name**	**No.**	**Name**
1	Auxiliary Electronic Expansion Valve	7	Water Pump
2	Economizer	8	Gas-Liquid Separator
3	Compressor	9	Four-Way Valve Assembly
4	Oil Separator	10	Main Electronic Expansion Valve
5	Liquid Receiver	11	Condenser Components
6	Plate Heat Exchanger	12	DC Fan Motor

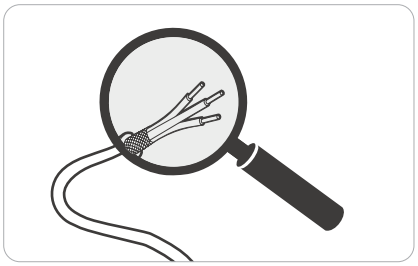
5.2. Electrical Wiring

5.2.1. Safety Precautions

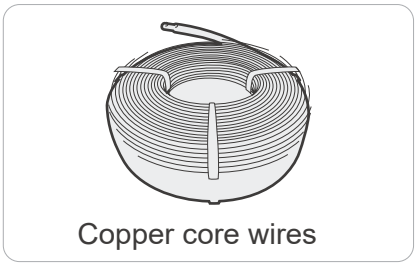
1. The selection of on-site wiring, components, and materials must comply with local and national laws, regulations, and relevant electrical standards.



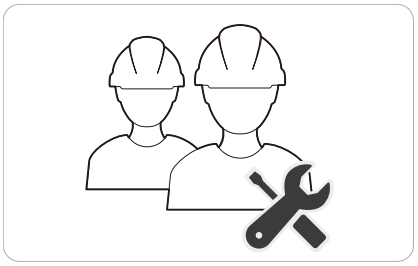
2. It is recommended to use 3-core shielded cables for the unit to minimize interference. Unshielded multi-core cables are strictly prohibited.



3. Copper-core wires must be used exclusively.



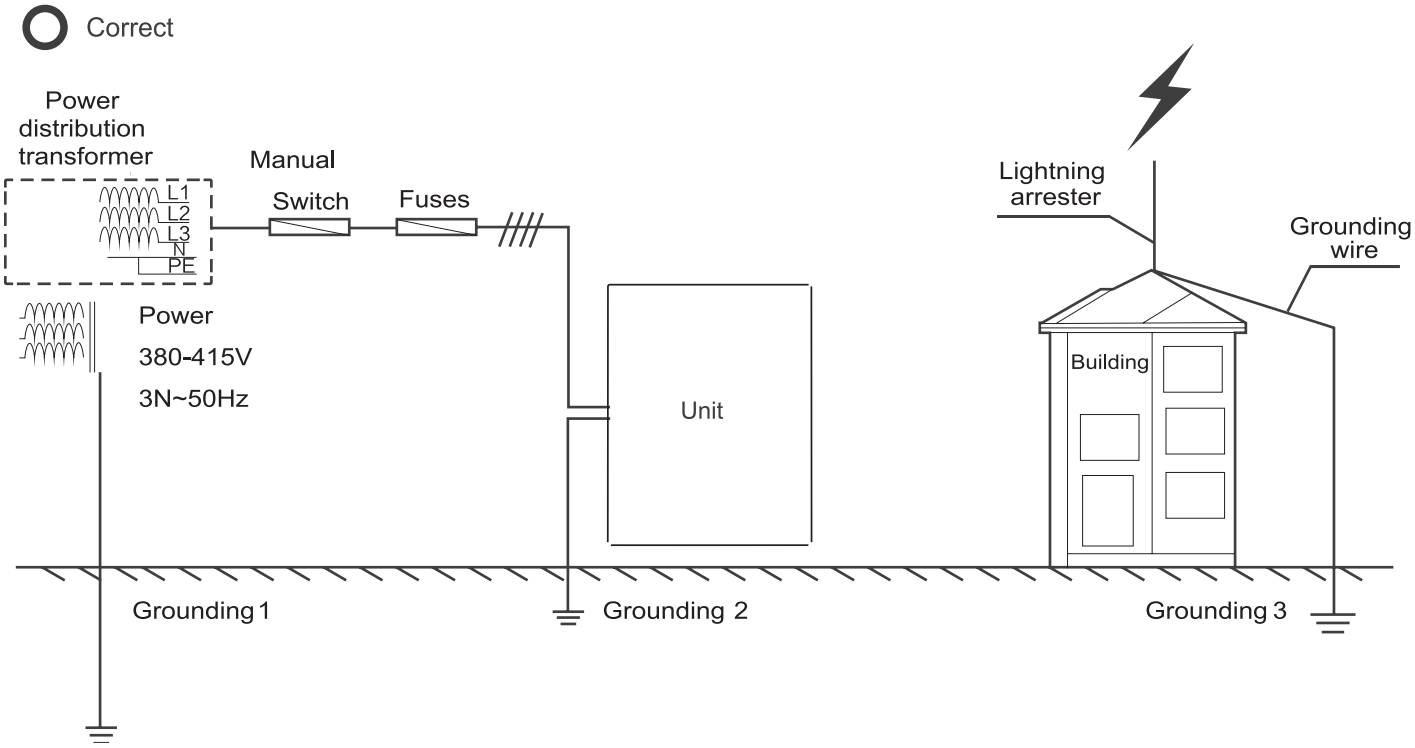
4. Power supply wiring work must be performed by qualified electricians.

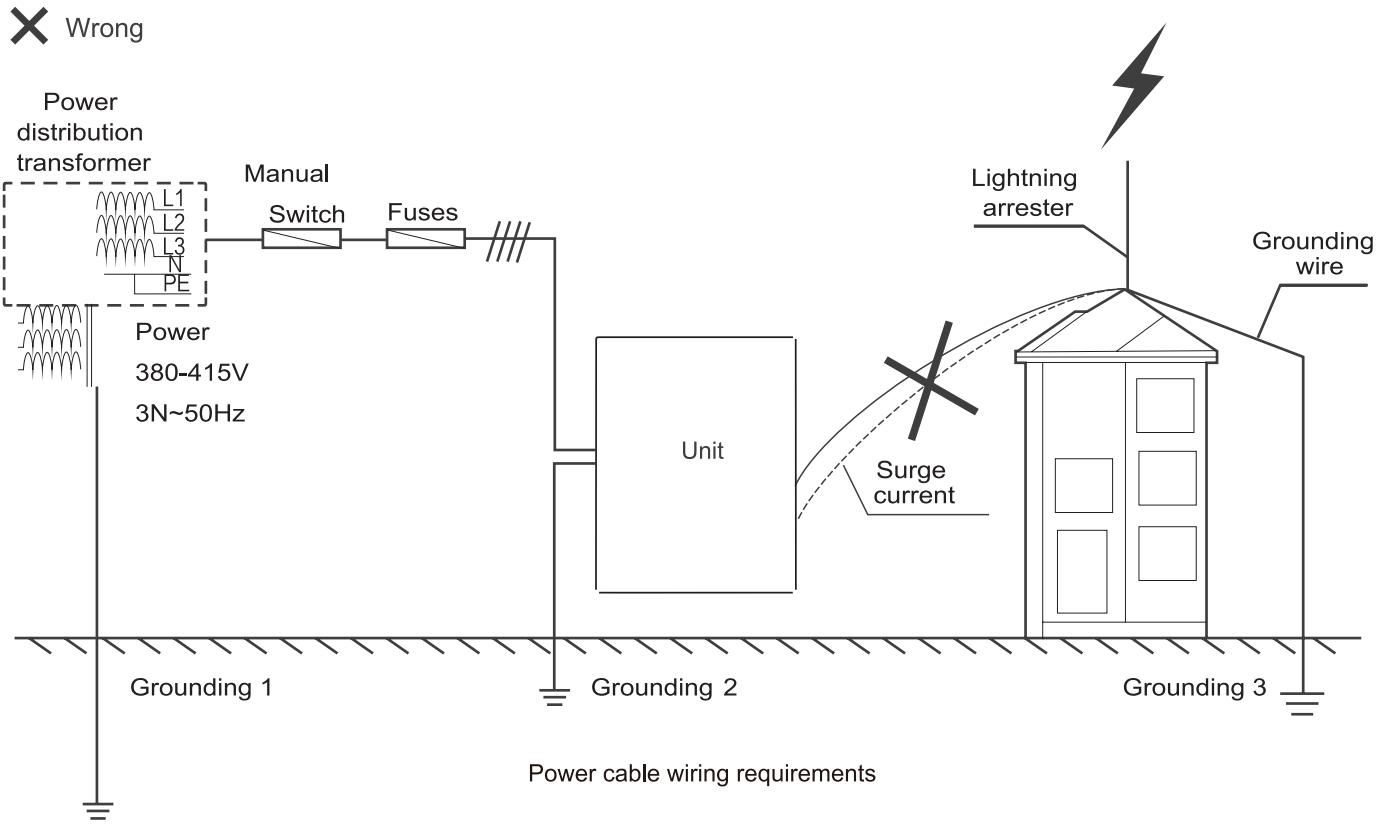


5.2.2. Safety Requirements

CAUTION
1. Power Supply Requirements: The unit shall use a dedicated power supply, and the supply voltage must comply with the unit's rated voltage specifications.
2. Professional Construction: Electrical wiring work shall be strictly performed by professional technicians in accordance with the markings on the circuit diagram.
3. Wiring Specifications: - The power cord and grounding wire shall be connected to the corresponding terminals. - Specialized tools must be used to crimp and secure the wires. - Terminals shall be firmly fastened and inspected regularly to prevent accidents caused by loosening. - The power cord shall be of type H07RN-F (heavy-duty rubber cable).
4. Accessory Usage: Only electrical components specified by our company shall be used. For installation and technical services, contact the manufacturer or authorized distributor. Wiring that does not comply with electrical installation specifications may result in serious consequences such as controller malfunctions or electric shock.
5. Safety Devices: - Circuit disconnect devices (e.g., air switches) with a minimum contact spacing of 3mm shall be installed in fixed power distribution lines. - Residual current protection devices shall be configured in accordance with the requirements of national electrical equipment technical standards.
6. Inspection And Maintenance: - After completing all wiring work, a thorough inspection must be conducted before powering on the unit. - Carefully read the labels and instructions on the electrical control box. - Users are strictly prohibited from repairing the controller without authorization. Improper operation may lead to serious consequences such as electric shock or controller damage. For repairs, contact a professional service center.

5.2.3. Power Cable Wiring Requirements

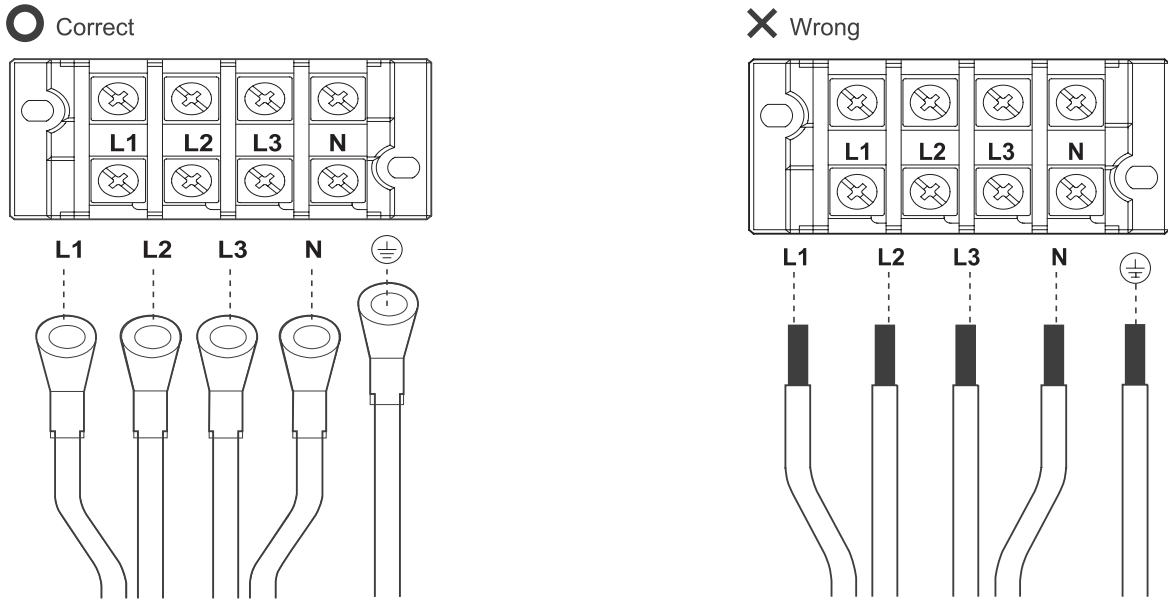




Power cable wiring requirements

NOTE

Connecting the surge arrester's grounding wire to the unit casing is strictly prohibited. The surge arrester's grounding wire must be configured separately from the power supply grounding wire.



Power cord connection requirements

NOTE

When connecting the power cord, a round (ring-shaped) terminal matching the specifications shall be selected.

5.2.4. Power Supply Specifications

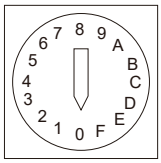
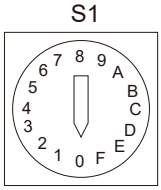
Model	Power Supply	MIC (A)	Minimum Cross-Sectional Area Of Power Cord (mm²)			Circuit Breaker (A)
			L1/L2/L3	N	PE	
70kW	380-415V /3N~50Hz	53	25	16	16	100
70kW (With hydro kit)		58	25	16	16	100
140kW	380-415V /3N~50Hz	105	50	25	25	160
140kW (With hydro kit)		113	50	25	25	160

MIC-Maximum input current
L1/L2/L3-Phase Line
N-Neutral wire
PE-Ground wire

NOTE

The power cord gauge and length specified in the table above are determined based on a voltage drop not exceeding 2% at the power connection point. If the actual wiring length exceeds the values stated in the table, or if the voltage drop exceeds this limit, a power cord with a larger gauge (i.e., thicker cross-sectional area) shall be selected in accordance with relevant regulations.

5.2.5. DIP Switch Definition

DIP switch		ON=1	OFF=0	Default
SW7 ON OFF 1 2 3 4	1	Reserved	Reserved	OFF
	2	Reserved	Reserved	OFF
	3	Reserved	Reserved	OFF
	4	With Hydro Kit	Without Hydro Kit	OFF
SW8 ON OFF 1 2 3 4	1	Reserved	Reserved	OFF
	2	Reserved	Reserved	OFF
	3	Reserved	Reserved	OFF
	4	Reserved	Reserved	OFF
SW4 ON OFF 1 2 3 4	1	Table Model Selection DIP Switch Table		
	2			
	3			
	4			
SW1 ON OFF 1 2 3 4	1	Normal temperature models	Low temperature models	Low temperature models
	2	Reserved	Reserved	OFF
	3	Reserved	Reserved	OFF
	4	System No. 2	System No. 1	/
S2 	Reserved	Reserved		Reserved
S1 	All	Cascaded address codes 0~F Note: Address code 0 refers to machine 0#. Within 0#, system 1 is the master, and the others are slaves.		0

Model Selection DIP Switch Table					
Serial Number	**SW4-1**	**SW4-2**	**SW4-3**	**SW4-4**	**Model Selection**
1	OFF	ON	OFF	OFF	70kW
2	ON	ON	ON	OFF	140kW

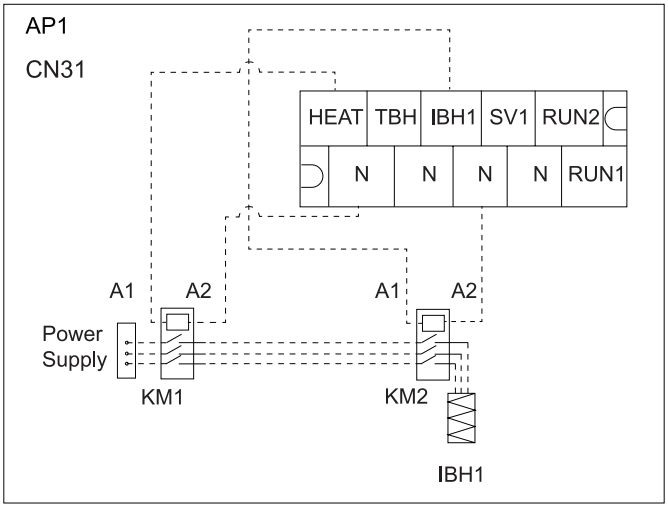
Cascade Address Table			
DIP Switch	**Position**	**Model**	**Default**
S1	0	Master	0
	1	Slave 1#	
	2	Slave 2#	
	3	Slave 3#	
	4	Slave 4#	
	5	Slave 5#	
	6	Slave 6#	
	7	Slave 7#	
	8	Slave 8#	
	9	Slave 9#	
	A	Slave 10#	
	B	Slave 11#	
	C	Slave 12#	
	D	Slave 13#	
	E	Slave 14#	
	F	Slave 15#	

5.2.6. Auxiliary Electric Heater Connection

5.2.6.1. Control Signal

The [HEAT] and [IBH1] signals (AC 230V) are dedicated to controlling the start/stop operation of the auxiliary electric heater.

1. The [HEAT] signal controls the first-stage power supply by energizing ac contactor KM1, which acts as the upstream connection between the power source and contactor KM2.
2. The [IBH1] signal controls the second-stage power supply by energizing ac contactor KM2, which acts as the downstream connection between KM1 and the auxiliary electric heater.

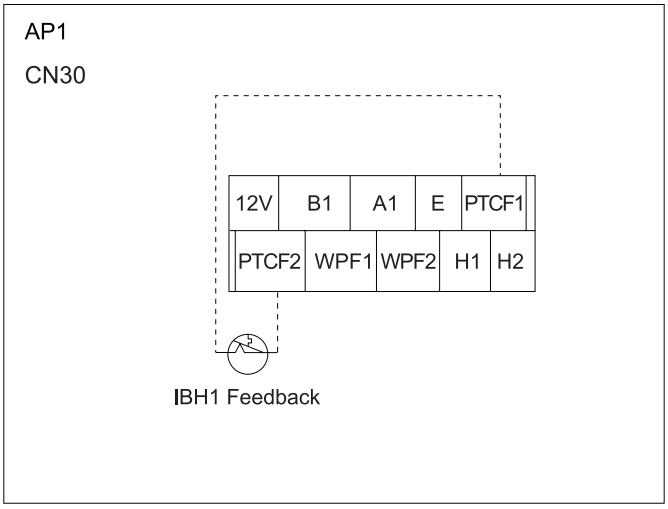


NOTE

The power supply for the auxiliary electric heater must be routed through an ac contactor and shall not be connected directly to AP1; failure to comply may result in damage to the main board.

5.2.6.2. Feedback Signal

[PTCF1] and [PTCF2] is the feedback signal (DC 12V) for the auxiliary electric heater. It must be used in conjunction with the auxiliary electric heater thermostat and is Normally Closed (NC) by default.



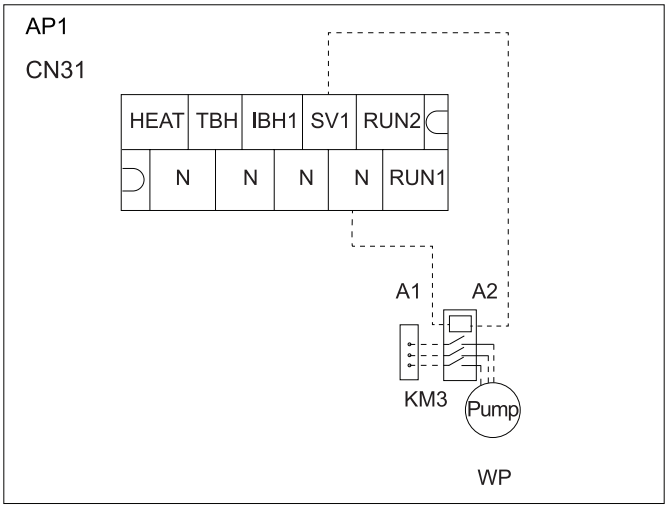
NOTE

If no feedback signal is available for the auxiliary electric heater in the installation, terminals PTCF1 and PTCF2 must be short-circuited.

5.2.7. External Water Pump Connection

5.2.7.1. Control Signal

[SV1] is the control signal (AC 230V) for the external water pump, used to control its start/stop operation.



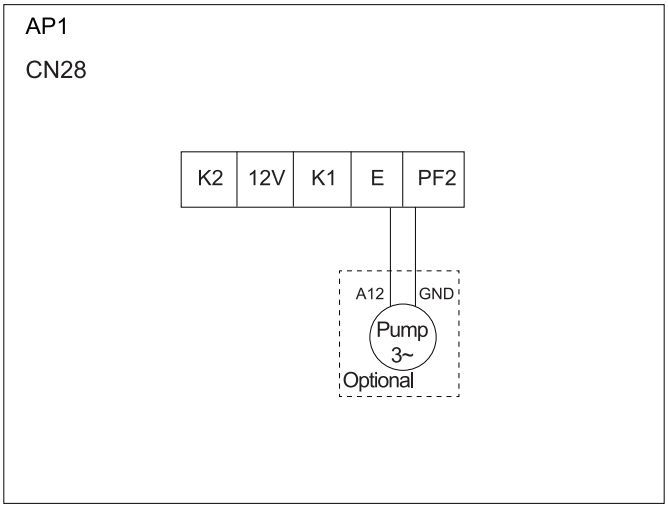
NOTE

The power supply for the external water pump must be routed through an AC contactor. It shall not be connected directly to AP1, as this will cause damage to the main board.

5.2.8. Internal Water Pump Connection

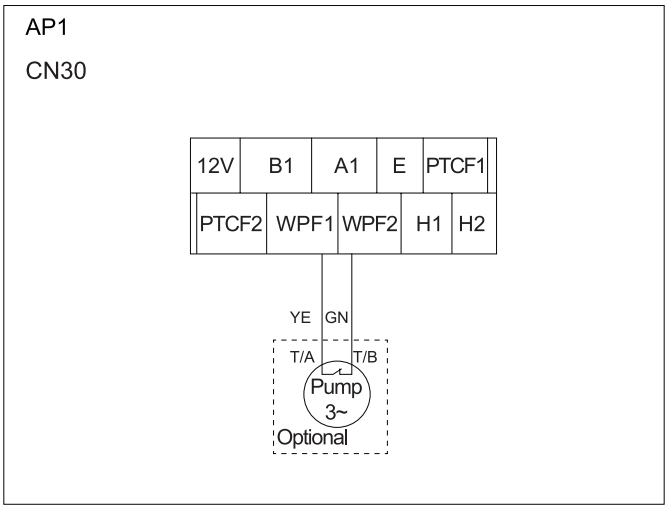
5.2.8.1. Control Signal

[PF2] is the control signal (DC 0-10V) for the internal water pump, used to regulate the pump speed.

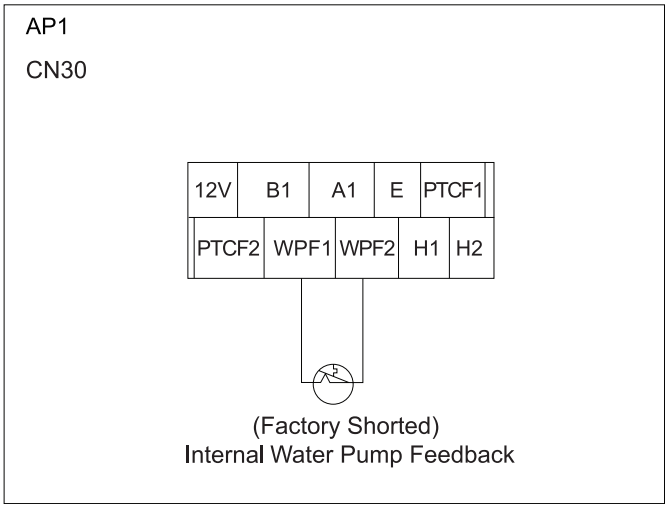


5.2.8.2. Feedback Signal

[WPF1] and [WPF2] are the feedback signals (DC 12V) for the internal water pump.
For the model with the Hydro kit, the water pump connections are pre-configured at the factory as illustrated in the diagram below. No on-site wiring is required during installation.



For the model without the Hydro kit, WPF1 and WPF2 are short-circuited at the factory.

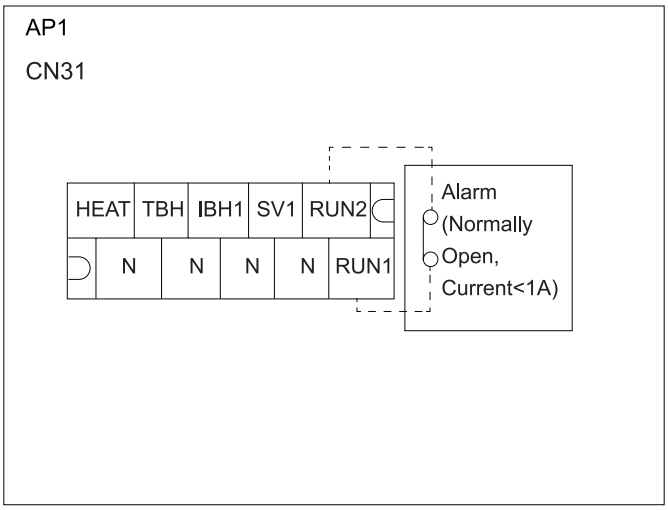


NOTE

If the water pump installed on-site provides a feedback signal, wiring should be performed in accordance with the schematic diagram above.

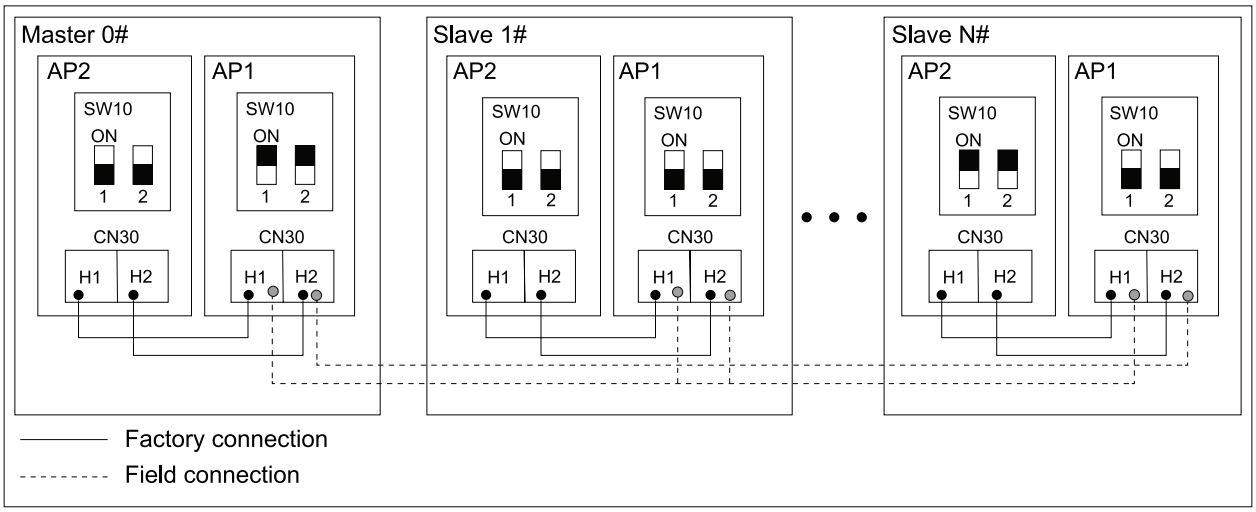
5.2.9. Alarm Connection

[RUN1] and [RUN2] are alarm signals utilizing dry contacts, configured as Normally Open (NO) by default.
1. The unit will continue normal operation when an open signal is received.
2. The unit will stop operation when a closed signal is received.



5.2.10. Cascade Connection

H1 and H2 are cascade communication signals (A/B). The cascade system must be wired in accordance with the schematic diagram below.

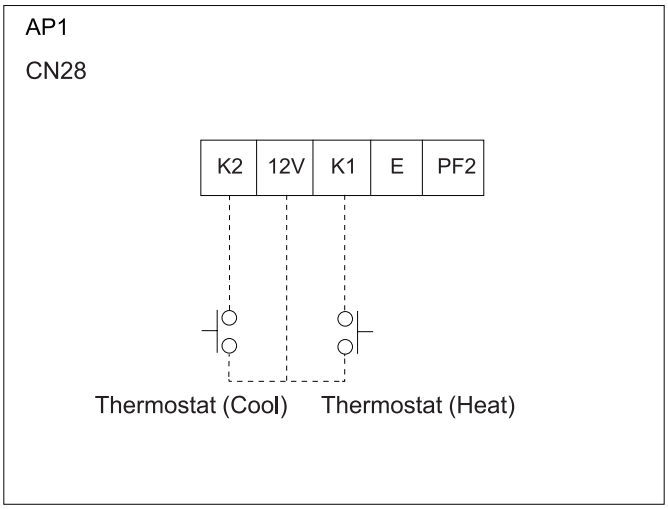


NOTES
When installing cascade system, the following points shall be noted:
• Each unit's address code shall be unique and shall not be duplicated.
• The master unit shall be connected to a wired controller.
• The unit shall only be started via the wired controller after all address codes have been configured and the aforementioned requirements have been verified.
• The length of the power cord connecting the wired controller to the unit shall be less than 100 meters.
• Shielded twisted pair (STP) or unshielded twisted pair (UTP) is preferred for cascade communication cables
• Set SW10 at terminal AP1 of the Master unit to the OFF position.
• Set SW10 at terminal AP2 of the last Slave unit to the OFF position.
• For all remaining units, ensure SW10 at both terminals AP1 and AP2 are set to the ON position.

5.2.11. Thermostat Connection

K1 and K2 are Room Thermostat signals (Wet Contact), configured as Normally Open (NO) by default.

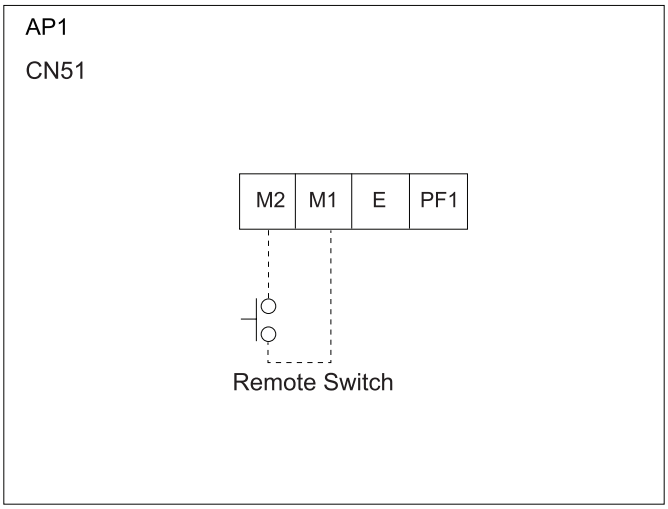
1. Upon receiving a [Cool] signal, the unit will operate in Cooling Mode.
2. Upon receiving a [Heat] signal, the unit will operate in Heating Mode.
3. Upon receiving both [Cool] and [Heat] signals simultaneously, the unit will operate in Heating Mode.
4. When no [Cool] or [Heat] signal is received, the unit will enter the Off state.



5.2.12. Remote Control Connection

M1 and M2 are remote switch signals (Dry Contact), configured as Normally Open (NO) by default.

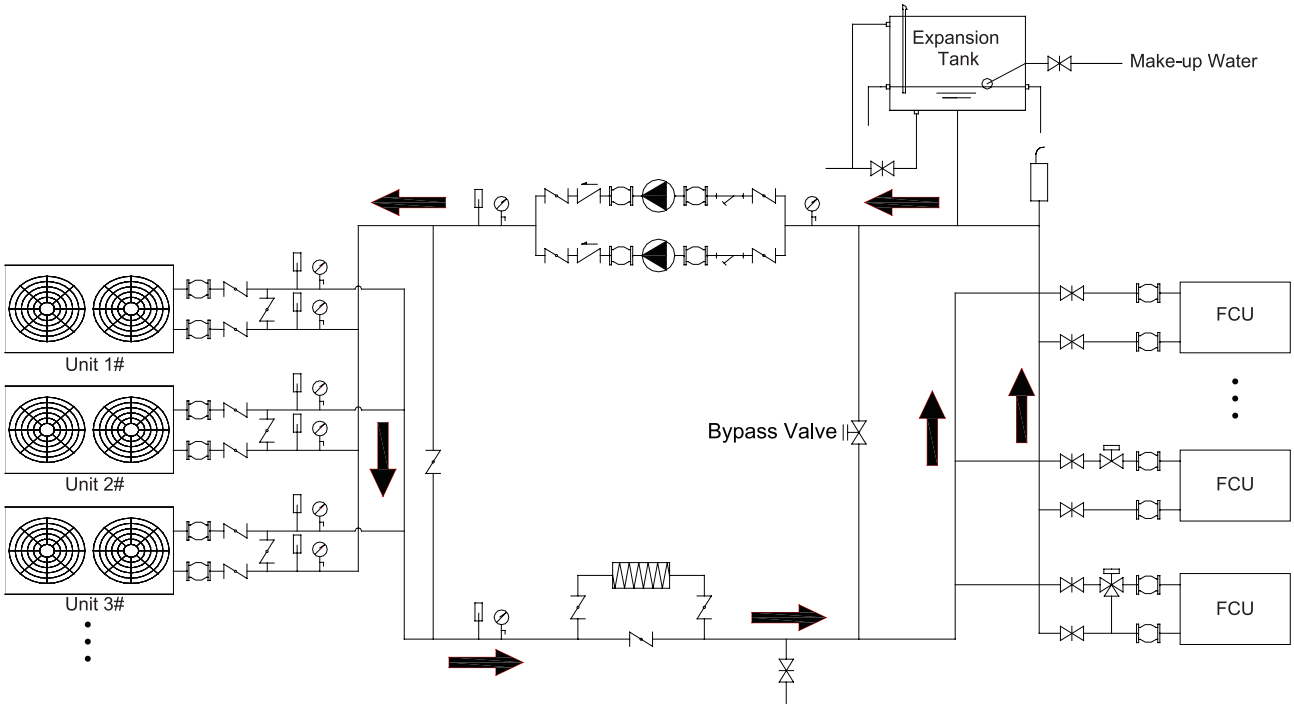
1. When a Closed signal is received, the unit will enter the ON state and operate intelligently according to the user-defined mode and target temperature.
2. When an Open signal is received, the unit will enter the OFF state.



5.3. Water System Installation

5.3.1. Water System Diagram

The diagram below illustrates a standard modular chiller water system.



Piping system connection diagram

Symbol	Name	Symbol	Name	Symbol	Name
	Stop Valve		Pressure Gauge		Gate Valve
	Flexible Joint		Y-type Filter		Thermometer
	Circulating Water Pump		Check Valve		Automatic Air Vent Valve
	Electric 2-Way Valve		Electric 3-Way Valve		Auxiliary Electric Heater

NOTES

- The configuration ratio of two-way valves shall not exceed 50%. (Note: This requires reserving at least 50% of three-way valves or normally open passages to ensure the system's minimum water flow rate.)
- An inlet filter must be installed at the water inlet of each unit. Use the 40-mesh filter provided with the product accessories exclusively.
- The unit is factory-equipped with a flow switch as standard. Short-circuiting the flow switch is strictly prohibited.
- The wired controller and auxiliary electric heater shall be connected to the master unit.
- The water pump must be interlocked with the unit.

5.3.2. Basic Requirements

NOTE

Chilled water pipes shall only be laid after the equipment is in position.
When connecting water pipes, relevant installation specifications shall be complied with.
Pipes shall be free of impurities, and all chilled water pipes must adhere to local plumbing regulations and codes.

NOTES

Specific Connection Requirements:

1. All water pipes shall be thoroughly flushed before equipment commissioning to ensure the absence of impurities. Under no circumstances shall impurities be flushed into or enter the heat exchanger.
2. The water shall enter the heat exchanger through the designated inlet; otherwise, equipment performance will be impaired.
3. An automatic make-up water pump shall be installed in the water piping system. This pump will directly pressurize and supply water to the water system.
4. Pipes and their ports shall be independently supported and shall not be supported by the unit itself.
5. The heat exchanger's piping and ports shall be easily detachable to facilitate the operation, cleaning, and inspection of the evaporator piping.
6. A filter with a mesh size of no less than 40 meshes per inch shall be installed in the water inlet pipe of the plate heat exchanger. This filter shall be mounted as close as practicable to the water inlet and shall be insulated.
7. Bypass pipes and bypass valves shall be installed in conjunction with the heat exchanger to facilitate the cleaning of the heat exchanger's external water system. Additionally, shutting off the heat exchanger's water system during maintenance shall not affect the operation of other units.
8. Flexible connectors shall be used between the heat exchanger interface and on-site piping to minimize vibration transmission to the building.
9. For ease of maintenance, the inlet and outlet pipes shall be fitted with thermometers or pressure gauges, which shall be provided by the user.
10. All low points of the water system shall be fitted with drain valves to completely drain water from the evaporator and the system. All high points shall be equipped with automatic air vents to facilitate air release from the pipes. Air vents and drain valves shall not be insulated for ease of maintenance.
11. All water pipes in the system susceptible to freezing shall be insulated, including the heat exchanger's inlet pipes and flanges.
12. Outdoor water pipes shall be insulated with auxiliary heating cables. The insulation material shall be PE, EPDM, or similar, with a thickness of no less than 20mm, to prevent pipe freezing and cracking at low temperatures. The heating cable power supply shall be equipped with an independent fuse.

WARNING

- For piping incorporating filters and heat exchangers, welding slag or debris may damage the heat exchangers and water pipes.
- Installers or users shall guarantee the quality of water and eliminate welding slag, mineral salts, and air from the water system. These substances can cause oxidation and corrosion of the steel components inside the heat exchanger.
- When the ambient temperature is below 2°C and the unit will not be in use for an extended period, the water inside the unit shall be drained. If the water is not drained during winter, the unit's power supply must not be disconnected. The fan coil units in the water system shall be equipped with three-way valves to ensure the smooth operation of the water pump when the antifreeze mode is activated in winter.

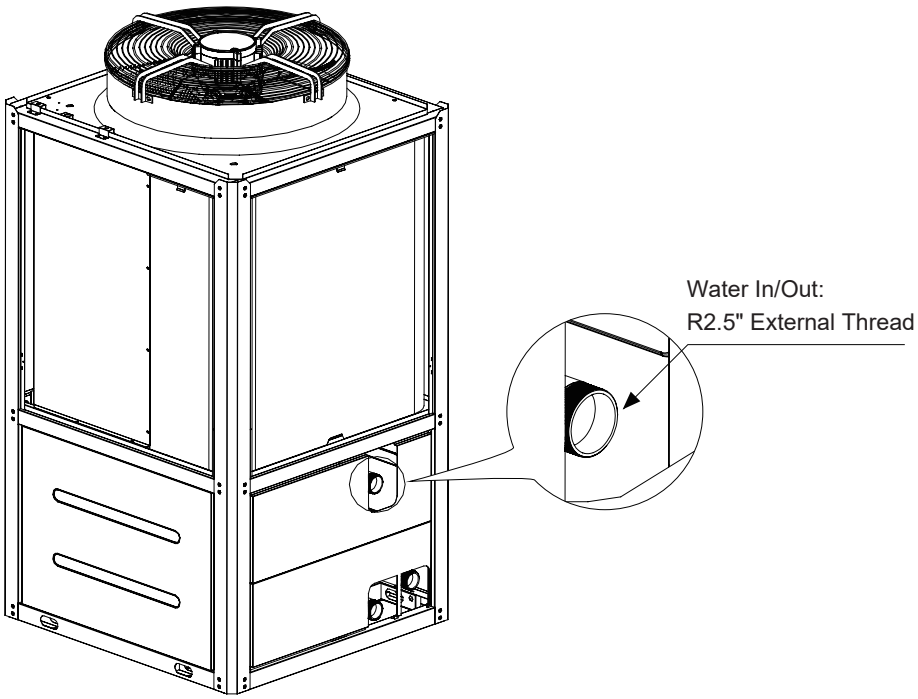
5.3.3. Pipe Connection

5.3.3.3. Single Unit

The installation and connection of the inlet and outlet water pipes are shown in the figure below.

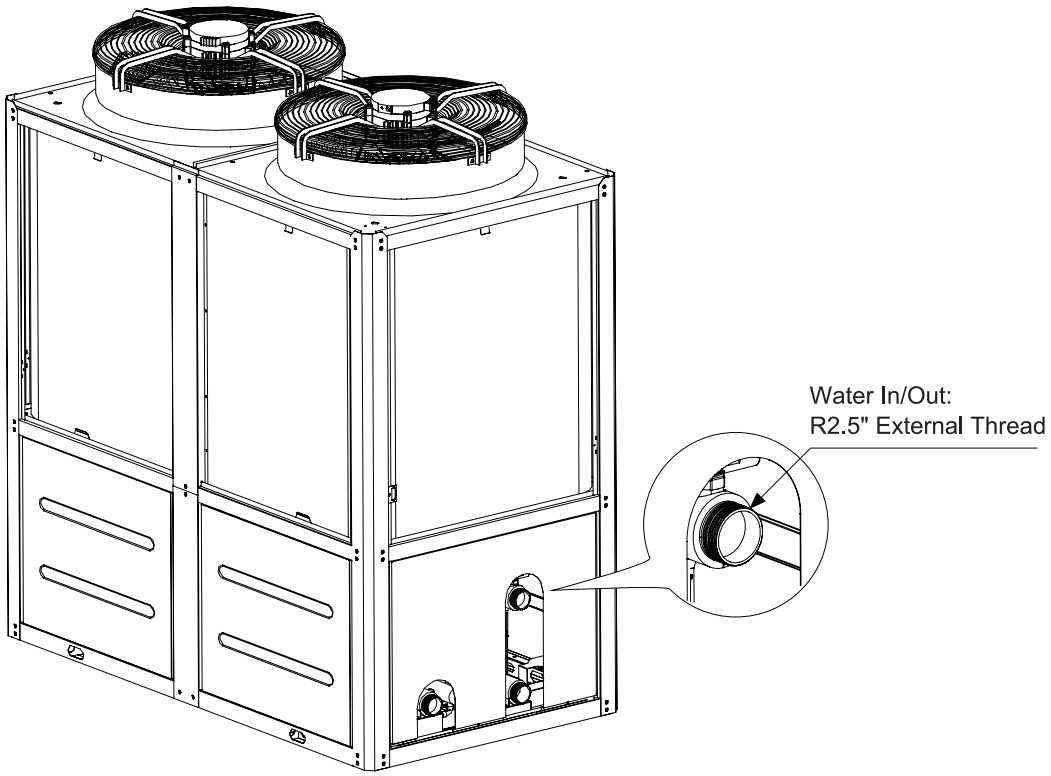
Model	Water Pipe Connection	Water Pipe Size
70kW	R2.5" External Thread Connection	DN65
70kW (With hydro kit)	R2.5" External Thread Connection	DN65
140kW	R2.5" External Thread Connection	DN65
140kW (With hydro kit)	R2.5" External Thread Connection	DN65

70kW, 70kW (With hydro kit):



Piping connection diagram

140kW, 140kW (With hydro kit):

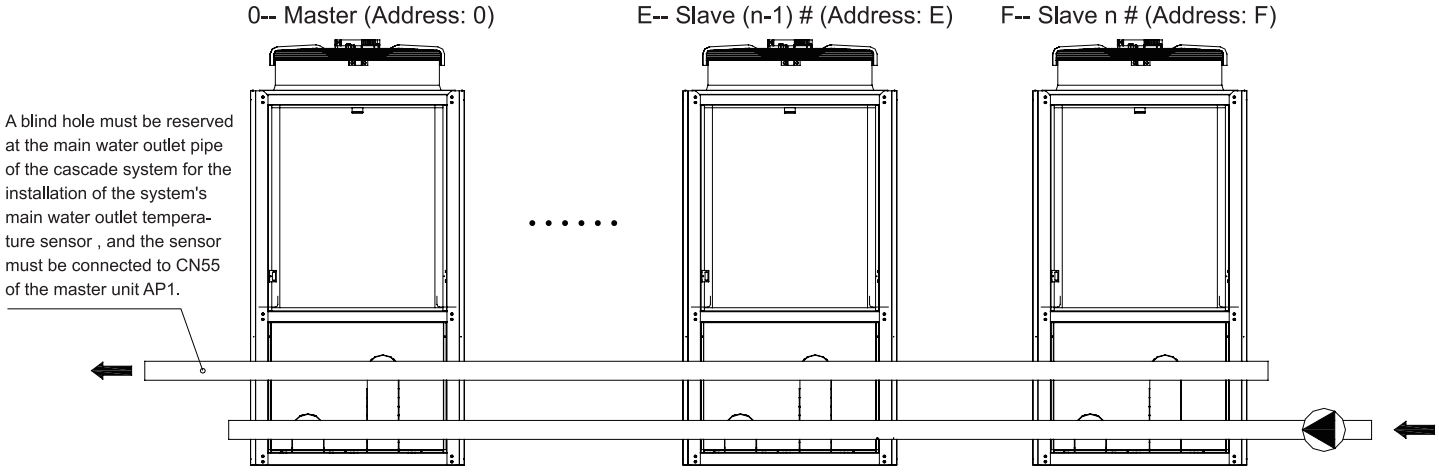


Piping connection diagram

5.3.3.4. Cascade System

The installation of cascade system involves special design of the unit, therefore the following relevant explanations are given.

1. Installation Method



Cascade system piping connection diagram (no more than 16 modules)

2. Selection Of Main Water Pipe Diameter

Heating Capacity	Diameter (nominal) Of Main Water Inlet And Outlet Pipes
25≤Q≤50	DN40
50≤Q≤80	DN50
80≤Q≤130	DN65
130≤Q≤210	DN80
210≤Q≤325	DN100
325≤Q≤510	DN125
510≤Q≤740	DN150
740≤Q≤1300	DN200
1300≤Q≤2080	DN250

5.3.4. Design Of The Water Storage Tank

Q denotes cooling capacity, with the unit of kW.
G denotes the minimum water flow rate, with the unit of L.

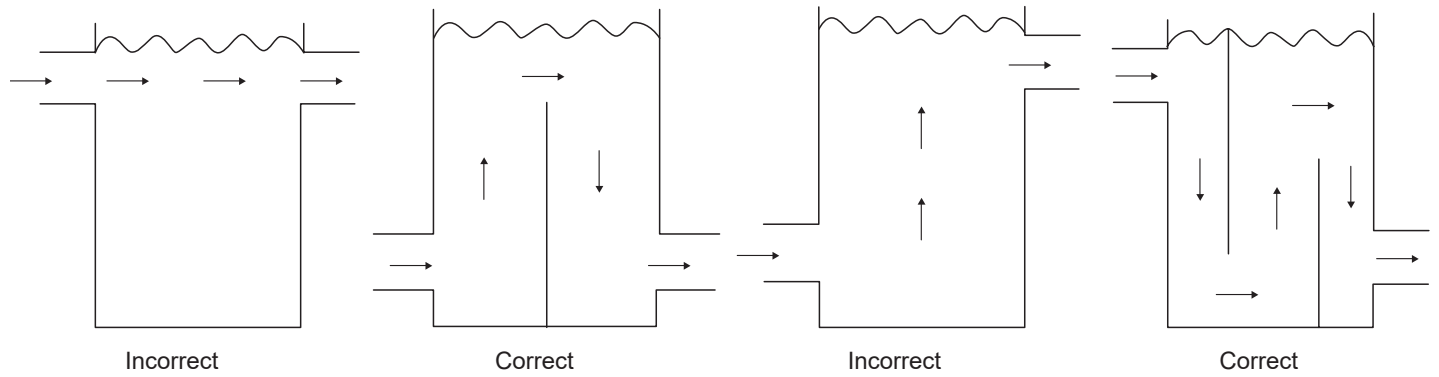
1. Comfort Cooling

G = P×3.5L

2. Process Cooling

G = P×7.4L

In some cases (especially during the heating process), in order to meet the system's water production requirements, a water tank with a shut-off baffle must be installed on the system to prevent water short circuits. See the following solution for details:



Design of the storage tank

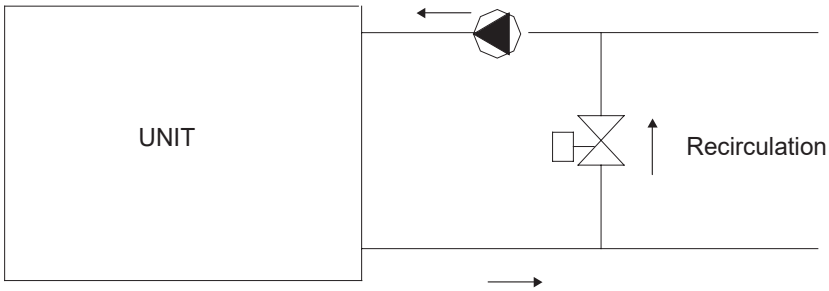
5.3.5. Water Flow Rate

If the system flow rate is lower than the unit's minimum flow rate or higher than the maximum, the unit may malfunction.

Model	Water Flow Rate (m^3/h)	
	Minimum Value	Maximum Value
70kW	6	15
70kW (With hydro kit)		
140kW	14	28
140kW (With hydro kit)		

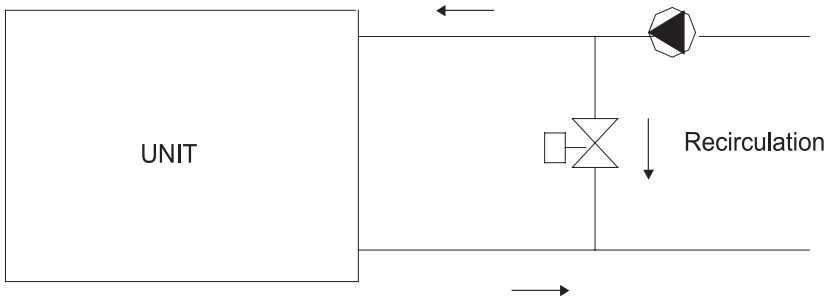
1. Minimum Water Flow

If the minimum chilled water flow rate does not meet the requirements, the following rectification can be carried out.



2. Maximum Water Flow Rate

If the system flow exceeds the maximum unit flow, the following rectification can be carried out.



5.3.6. Water Pumps

5.3.6.1. Selection

The rated flow rate of the selected water pump must not be less than the unit's rated flow rate. For cascade system, the pump's rated flow rate shall be no less than the sum of the rated flow rates of all units.

Select The Pump Head

H=h1+h2+h3+h4

H: Pump head.

h1: Water resistance of the unit

h2: Water resistance of the water pump.

h3: Friction resistance along the most unfavorable flow path

Include:

Pipeline resistance, resistance of different valves, hose resistance, resistance of pipe bends or tees, and filter resistance.

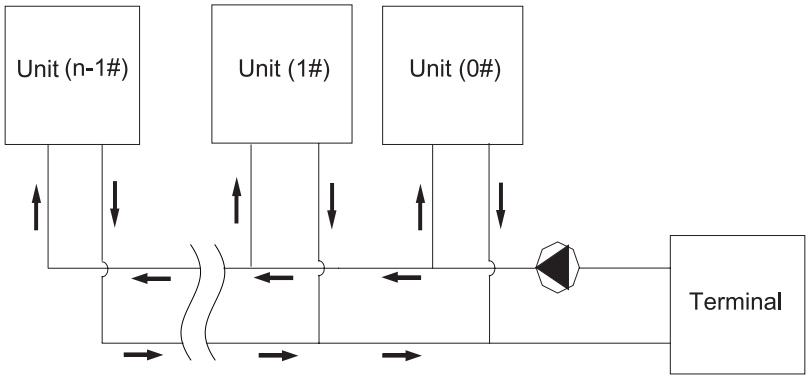
h4: Maximum Terminal Resistance.

5.3.6.2. Installation

1. The water pump shall be installed on the inlet pipe, and flexible connectors must be fitted on both sides to prevent vibration transmission.
2. It is recommended that the system be equipped with a standby water pump.
3. Only the master unit is provided with a water pump output signal, while the slave unit has no such signal.
4. When multiple pumps are installed or the unit is equipped with its own water pump, a check valve must be installed on the outlet pipe of each unit.

5.3.6.2.1. Single Water Pump

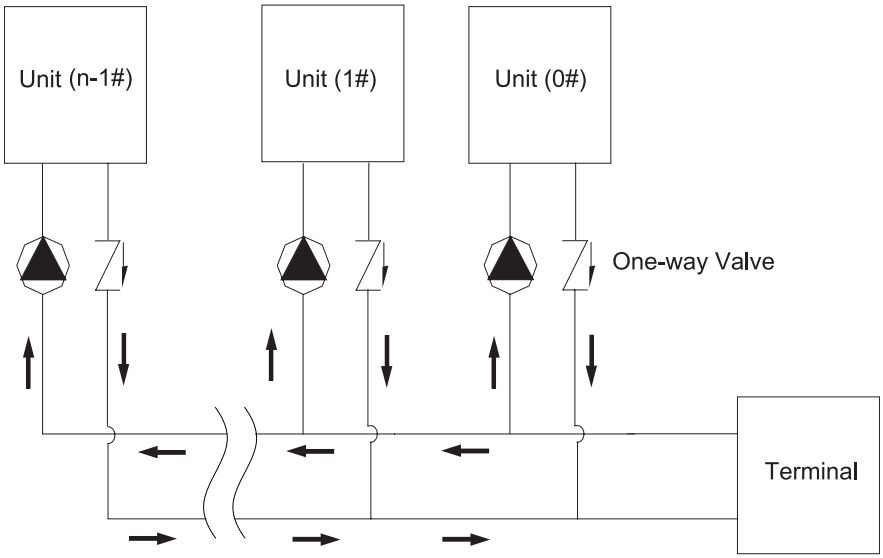
When installing a single water pump, the water system does not require a check valve, as shown in the figure below.



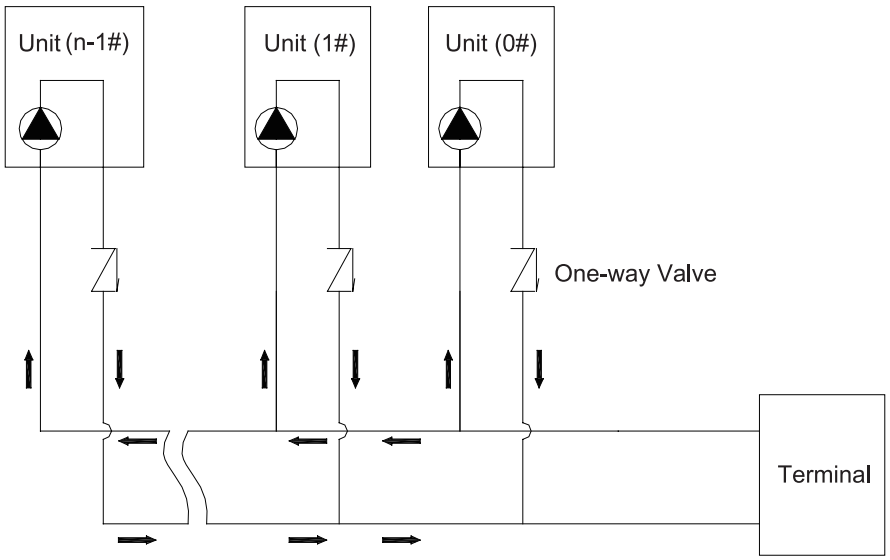
Single water pump connection

5.3.6.2.2. Multiple Water Pumps

When installing multiple pumps or when the unit has its own water pump, a one-way valve must be installed on the outlet pipe of each unit, as shown in the figure below.



Multiple water pump connection (Without internal water pump)



Multiple water pump connection (With internal water pump)

When installing a single water pump, only the main unit needs to be wired; the slave unit does not require wiring.

5.3.7. Water Quality

When well water or river water is used as chilled water, it may produce a large amount of sediment, such as scale and sand. Therefore, well water or river water must be filtered and softened by a water softening device before being injected into the water system. If sand and clay settle in the evaporator, it may block the circulation of chilled water, causing the evaporator to freeze; if the hardness of the chilled water is too high, scale is prone to occur, and the equipment may be corroded. Therefore, the quality of the chilled water should be analyzed before use, such as pH value, conductivity, chloride ion concentration, and sulfur ion concentration. The water quality standards are as follows:

pH (25°C)	6.5-8.0	**Cl^- (mg/L)**	<50
Conductivity (25°C) (μS/cm)	<250	**SO_4^{2-} (mg/L)**	<50
Fe (mg/L)	<0.3	**Total Alkalinity- ($CaCO_3$) (mg/L)**	<50
Total Hardness ($CaCO_3$) (mg/L)	<50	**SiO_2 (mg/L)**	<30

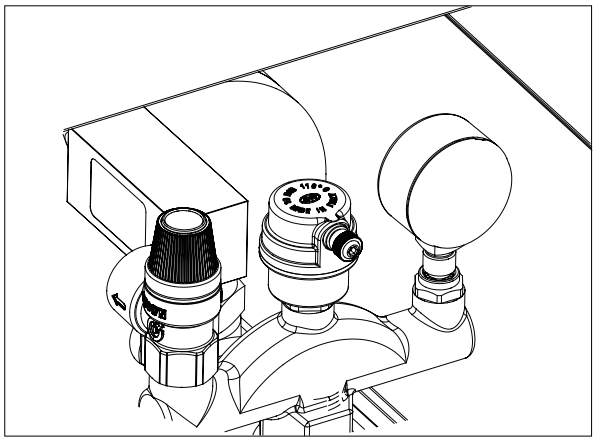
6. Startup And Configuration

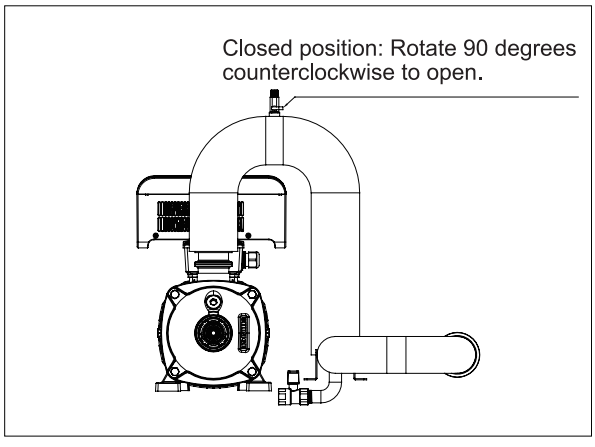
6.1. Precautions Before Start-up

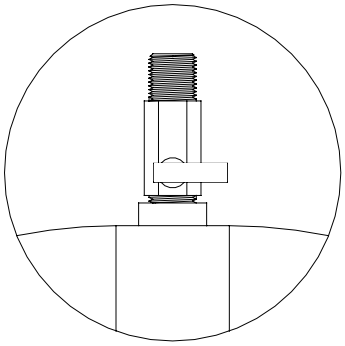
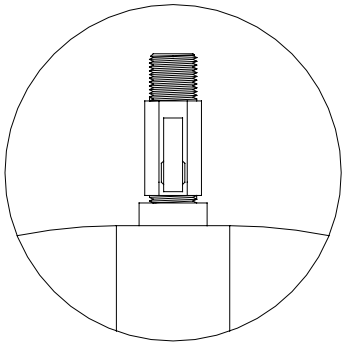
1. After flushing the water system pipes repeatedly, ensure the water quality meets the specified requirements. After the system is refilled with water, it must be drained completely. Upon starting the water pump, the outlet pressure shall be guaranteed to comply with the requirements.
2. The equipment must be powered on 12 hours in advance, and the crankcase electric heating belt shall be activated to preheat the compressor. Insufficient preheating may damage the compressor.
3. Controller Settings: Detailed instructions for controller configuration refer to the manual, including basic settings such as cooling/heating modes and pump modes. Parameters shall generally be set based on standard operating conditions, and extreme operating conditions shall be avoided as much as possible.
4. Adjust the water pump or equipment inlet valve to ensure the water flow rate of each device reaches or exceeds the specified minimum value.
5. Units with built-in water pumps shall not be operated without water.
6. In a closed system, the water circuit must be vented before the water pump is put into use. Due to the complex piping and numerous air collection points of closed systems, insufficient liquid filling is prone to occur. Insufficient liquid filling will result in air retention in the system; if the water pump is started under this condition, it will operate in a non-full-liquid state, which may easily lead to pump burnout.

NOTES

For the built-in water pump model:
During water filling of the water system, please open the black plastic cover on the automatic air release valve, rotate it 1.5 to 2 turns counterclockwise to release air from the water circuit system, and simultaneously open the manual air release valve at the top of the pump pipeline for manual air release.
When the water circuit system is in operation, open the black plastic cover on the automatic air release valve located at the top of the equipment. Rotate it 1.5 to 2 turns counterclockwise to release air from the water circuit system.
To prevent air from entering the water system, the pressure of the water system is recommended to be maintained at 0.1~0.15 bar.
After the air release operation of the water system is completed, the manual air release valve must be closed to prevent water leakage from the water system.





	
Closed state	Opened state

6.2. Start-up Preheating

During the initial heating season or when the water temperature is low, the water shall be heated gradually. Failure to do so may result in cracks in the concrete floor due to sudden temperature changes. Contact the building contractor responsible for concrete placement for more detailed instructions.

6.3. Inspection Checklist

Inspection Items	Describe	Yes	No
Does the installation location meet the requirements?	The unit is fixedly installed on a horizontal base.		
	The ventilation space of the air-side heat exchanger meets the requirements.		
	The maintenance space meets the requirements.		
	Noise and vibration levels meet requirements.		
	The solar radiation protection and rain and snow protection measures meet the requirements.		
Does the water system meet the requirements?	Pipe diameter meets requirements.		
	Pipe length meets requirements.		
	Drainage meets requirements.		
	Water quality control meets requirements.		
	The hose connections meet the requirements.		
	Pressure control meets requirements.		
	Insulation meets requirements.		
	Cable specifications meet requirements.		
	The switching capacity meets the requirements.		
	The fuse capacity meets the requirements.		
	Voltage and frequency meet requirements		
Does the electrical wiring system meet the requirements?	The wires are tightly connected.		
	The operation control device meets the requirements.		
	Safety devices meet requirements.		
	The linkage control meets the requirements.		
	The phase sequence of the power supply meets the requirements.		

6.4. Trial Running

1. Connect the power supply and check whether the equipment displays a fault code. If a fault occurs, troubleshoot it first, then start the equipment in accordance with the operating procedures specified in the "TRIAL RUNNING".
2. Conduct a 30-minute trial run. Once the inlet and outlet water temperatures have stabilized, adjust the water flow rate to the nominal value to ensure the equipment operates normally.
3. After the equipment is shut down, it shall only be restarted and put into operation after a 10-minute interval to avoid frequent startups. Finally, verify whether the equipment meets the specified requirements with reference to the aforementioned table.

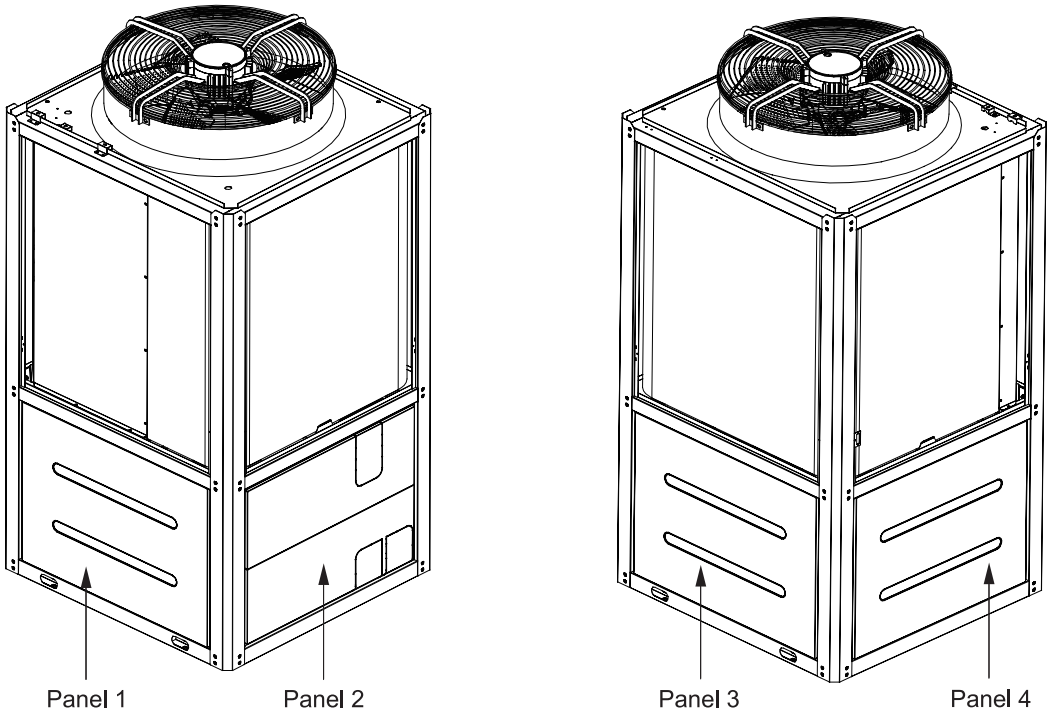
NOTES
• The unit controls the start and stop of the water pumps; therefore, the operation of the water pumps shall not be controlled by the unit during water system flushing.
• The unit shall not be started if the air release operation of the water system has not been completed.
• The unit shall not be restarted within 10 minutes after shutdown during the trial operation.
• The unit's power supply shall not be disconnected during long-term operation; otherwise, the compressor may be damaged due to failure to preheat.
• If the unit is out of service for an extended period and the power supply needs to be cut off, the power shall be turned on 12 hours prior to restarting the unit to preheat the compressor, water pump, and plate heat exchanger.

7. Maintenance

7.1. Maintenance Access

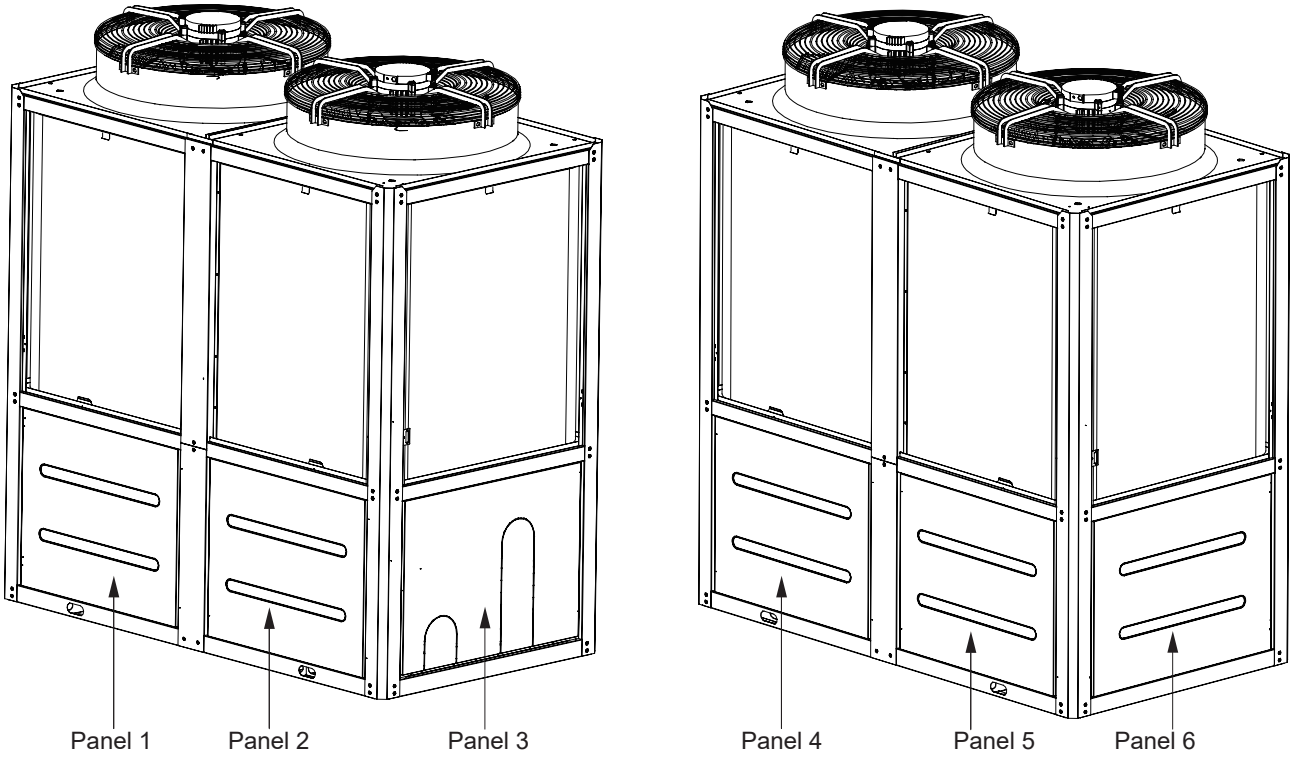
Removal of the panels allows maintenance personnel to easily access and inspect the unit's internal components.

70kW, 70kW (With hydro kit):



1. Removal of Panels 1 enables inspection of the compressor.
2. Removal of Panels 2/3 enables inspection of the water pipes and water-side heat exchanger.
3. Removal of Panel 4 enables inspection of the electrical components.

140kW, 140kW (With hydro kit):



1. Removal of Panels 2/3/4 enables inspection of the water pipes and water-side heat exchanger.
2. Removal of Panel 6 enables inspection of the electrical components.
3. Removal of Panels 1/5 enables inspection of the compressor.

7.2. Fault & Codes

CAUTION

Master unit protection:
When the master unit triggers protection (such as anti-freeze, high-pressure protection, etc), only the master unit stops running, while other units continue to operate.
Note: This means that the main unit's controller is still working, only its own compressor and other components have stopped, thus it can still control the slave units.
Slave unit protection:
When the slave unit triggers the protection, only that unit stops operating and does not affect the normal operation of other units.

When the machine malfunctions, fault protection codes will be displayed on both the wired controller and the mainboard. The displayed codes are shown in the table below.

Code	Content
bU	Cooling Fan Failure
d2	Water Inlet Temperature Sensor Failure
d3	Water Outlet Temperature Sensor Failure
d4	Refrigerant Gas Pipe Temperature Sensor Failure
d5	Refrigerant Liquid Pipe Temperature Sensor Failure
d6	System Total Water Outlet Temperature Sensor Failure
dL	E-Box Ambient Temperature Sensor Failure
dn	Water Tank Temperature Sensor Failure
E0	IDU&ODU Communication Failure
E3	Coil Temperature Sensor Failure
E5	Dial Abnormality
E7	Ambient Temperature Sensor Failure

E8	Discharge Temperature Sensor Failure
Eb	Main Board & Wire Controller Communication Failure
EC	Module Communication Failure
Ed	IDU PCB EEPROM Failure
EE	ODU PCB EEPROM Failure
EF	DC Fan Failure
EH	Suction Sensor Failure
EL	Economizer Outlet Temperature Sensor Failure
EN	Cascade Module Communication Failure
Et	Economizer Inlet Temperature Sensor Failure
Ey	Subcooling Outlet Temperature Sensor Failure
F3	Coil Temperature Sensor Failure Protection
F6	Compressor Phase Protection
F7	Module Temperature Protection
F8	4-way Valve Reversal Protection
FA	Compressor Phase Current Protection
H1	High Pressure Protection
H2	Low Pressure Protection
H3	High Pressure Sensor Failure
H4	Low Pressure Sensor Failure
Jt	Lack Of Phase Protection
L2	Water Temperature Difference Abnormality
L3	Too Low Water Outlet Temperature
L4	Too High Water Outlet Temperature
L5	Too Low Water Inlet Temperature
L6	Too High Water Inlet Temperature
L8	Insufficient Water Flow Protection
Lb	E-heater Feedback Abnormality
LP	AC Pump Overload Protection
P0	IPM Module Protection
P1	Over-voltage Protection
P2	Over-current Protection
P4	Too High Discharge Temp Protection
P5	Anti-freeze Protection (Cooling)
P6	Overheat Protection (Cooling)
P7	Overheat Protection (Heating)
P8	Ambient Temperature Abnormal Protection

7.3. Maintenance Cycle

Prior to the commencement of each summer cooling and winter heating cycle, it is advisable to consult the local customer service center for professional inspection and maintenance of the equipment. This proactive measure helps prevent heat pump malfunctions.

7.4. Maintenance Of Key Components

1. During equipment operation, closely monitor the discharge and suction pressures. In case of any abnormalities, the faults must be rectified before resuming operation.
2. Conduct regular inspections of electrical connections to detect looseness or poor contact at junctions caused by oxidation, scale accumulation, or other factors.
3. Periodically verify the operating voltage, current, and three-phase balance rate to ensure compliance with specified requirements.
4. Routinely check the reliability of electrical components. Damaged or malfunctioning parts should be replaced without delay.

7.5. Descaling

Limescale accumulates on the heat exchange surfaces of the water-side heat exchanger. Excessive buildup of such substances on the heat transfer surfaces can deteriorate heat transfer efficiency, resulting in increased power consumption and abnormally high discharge pressure (or abnormally low suction pressure). Organic acids (e.g., formic acid, citric acid, acetic acid) are applicable for descaling. However, cleaning agents containing fluoroacetic acid or fluorides are strictly prohibited. The water-side heat exchanger is made of stainless steel, which is highly prone to corrosion by such agents and may lead to refrigerant leakage. The following precautions shall be observed during cleaning and descaling:

1. Descaling of the water-side heat exchanger must be performed by professionals. Please contact your local customer service center.
2. After cleaning with detergents, the pipes and heat exchanger shall be thoroughly rinsed with clean water.
3. When using cleaning agents, adjust the concentration, cleaning duration, and cleaning temperature based on the scale accumulation level.
4. The waste liquid discharged after cleaning must be neutralized. Please contact the relevant professional company for proper disposal.
5. Protective equipment (e.g., goggles, gloves, masks) must be worn during the cleaning process to avoid inhaling or contacting the cleaning agents.

7.6. Shutdown

When a prolonged shutdown is required, clean and dry the internal and external surfaces of the equipment, and cover it with dust-proof covers. Open the drain valve to drain all residual water from the water system, so as to prevent freezing or corrosion of the heat exchanger. It is recommended to add antifreeze to the piping.

7.7. Replacement Of Parts

Parts to be replaced must be supplied by our company. Parts of different specifications shall not be used for replacement.

7.8. Start-up After Prolonged Inactivity

1. Thoroughly inspect and clean the equipment.
2. Clean the water piping system.
3. Inspect water circuit equipment such as water pumps and control valves.
4. Check all wire connections.
5. Allow the equipment to stand by for more than 12 hours before start-up.

7.9. Refrigeration System

Determine whether refrigerant needs to be added by checking the suction and discharge pressures, and simultaneously inspect for leaks. If leaks are detected or refrigeration system components require replacement, an airtightness test must be conducted. After adding refrigerant, different measures shall be adopted for the following two scenarios:

1. Refrigerant Refill

1) A leak detection test must be performed on the nitrogen used for system pressurization.
2) If welding is required, all gases in the system must be purged with nitrogen prior to welding.
3) Before injecting refrigerant, the entire refrigeration system must be completely dry and maintained in a full vacuum state.
4) Connect the vacuum evacuation pipe to the low-pressure side refrigerant charging port, and use a vacuum pump to evacuate air from the system piping. The evacuation time shall exceed 3 hours, and confirm that the pressure gauge reading falls within the specified range.
5) Once the vacuum level reaches the predetermined value, inject refrigerant into the refrigeration system using a refrigerant cylinder in accordance with the refrigerant quantity specified on the nameplate.
6) Refrigerant must be injected from the low-pressure side of the system.
7) The injection quantity of refrigerant is affected by ambient temperature. If the required quantity is not achieved but injection cannot be continued, circulate the cooling water and start the unit to complete the injection. If necessary, the low-pressure switch may be temporarily short-circuited.

2. Refrigerant Replenishment

1) Connect the refrigerant cylinder to the low-pressure side refrigerant charging port, and install a pressure gauge on the low-pressure side.
2) Start the water pump for water circulation and activate the equipment. If necessary, short-circuit the low-pressure control switch.
3) Slowly inject refrigerant into the system while monitoring the suction and discharge pressures.

WARNING

During leak detection and airtightness testing, never inject oxygen, acetylene, or other flammable or toxic gases into the refrigeration system; only pressurized nitrogen or refrigerant should be used.

7.10. Compressor Disassembly

If the compressor requires disassembly, the following procedures shall be followed:

1. Disconnect the equipment from the power supply.
2. Disconnect the compressor's power cord.
3. Remove the compressor's exhaust pipe, suction pipe, and enthalpy-increasing pipe.
4. Remove the compressor's fastening screws.
5. Detach the compressor.

7.11. Auxiliary Electric Heater

When the ambient temperature is below 2°C, the equipment's heating efficiency will decrease as the outdoor temperature drops. To ensure the heat pump operates stably in relatively cold regions and compensate for partial heat loss caused by defrosting, users may consider adopting water-assisted electric heating if the minimum ambient temperature in their area is below 0°C in winter.

7.12. System Antifreeze

1. If the water-side heat exchanger freeze, it may lead to serious damage and leakage. Such damage caused by freezing is not covered under the warranty, so antifreeze measures must be taken seriously.
2. For equipment shut down due to power failure and placed in an outdoor environment with a temperature below 5°C, the water in the water system should be completely drained.
3. During maintenance, if refrigerant is injected into the unit or drained for maintenance purposes, the water-side heat exchanger may freeze and crack. Freezing and cracking are likely to occur when the refrigerant pressure is below 0.4 MPa. Therefore, it is crucial to ensure that the water in the water-side heat exchanger either remains flowing or is fully drained.

7.13. Disposal Guideline

This appliance contains refrigerant and other potentially hazardous materials. When disposing of this appliance, the law requires special collection and treatment. DO NOT dispose of this product as household waste or unsorted municipal waste.

When disposing of this appliance, you have the following options:

- Dispose of the appliance at designated municipal electronic waste collection facility.
- When buying a new appliance, the retailer will take back the old appliance free of charge.
- The manufacturer will also take back the old appliance free of charge.
- Sell the appliance to certified scrap metal dealers.
- Disposing of this appliance in the forest or other natural surroundings endangers your health and is bad for the environment. Hazardous substances may leak into the ground water and enter the food chain.

8. Technical Specifications

Model			70kW	70kW (With hydro kit)
Power Supply		V/Ph/Hz	380-415/3/50	380-415/3/50
Refrigerant	Type	/	R32	R32
	Charge	kg	8.5	8.5
Heating (A7W35)	Capacity	kW	66.50	65.50
	Rated Input	kW	16.71	17.33
	COP	W/W	3.98	3.78
Heating (A7W45)	Capacity	kW	67.00	65.20
	Rated Input	kW	20.00	21.03
	COP	W/W	3.35	3.10
Heating (A7W55)	Capacity	kW	66.20	65.20
	Rated Input	kW	22.67	23.12
	COP	W/W	2.92	2.82
Cooling (A35W7)	Capacity	kW	65.50	65.10
	Rated Input	kW	24.90	25.73
	EER	W/W	2.63	2.53
SCOP(35°C)		W/W	4.65	4.60
SCOP(55°C)		W/W	3.45	3.40
SEER		W/W	4.70	4.60
Seasonal Space Heating Energy Efficiency Class	LWT At 35ºC	/	A+++	A+++
	LWT At 55ºC	/	A++	A++
Sound Pressure Level		dB(A)	68.0	69.0
Sound Power Level		dB(A)	84.0	85.0
Maximum Input Power		kW	32.2	34.0
Maximum Input Current		A	53.0	58.0
Compressor	Type	/	EVI Scroll	EVI Scroll
	Control	/	Inverter	Inverter
	Quantity	/	1	1
Fan	Type	/	Axial	Axial
	Quantity	/	1	1
Condenser	Type	/	Finned Tube	Finned Tube
	Color Of Heat Exchanger	/	Golden	Golden
Water Side Heat Exchanger	Types		Plate Heat Exchanger	Plate Heat Exchanger
	Water Flow Rate (Cooling)	m³/h	11.27	11.20
	Water Flow Rate (Heating)	m³/h	11.52	11.21
Throttle Type		/	EEV	EEV
Water Pump	Type	/	/	Centrifugal
	Control	/	/	Inverter
Water Pipe	Connection	/	R2-1/2" External Thread	R2-1/2" External Thread
	Size	/	DN65	DN65
Water Pressure Drop		kPa	46	/
External Static Pressure		kPa	/	225
Dimensions	Net (W×D×H)	mm	1260×1200×2385	1260×1200×2385
	Packing(W×D×H)	mm	1290×1230×2525	1290×1230×2525

Model			70kW	70kW (With hydro kit)
Weight	Net	kg	385	415
	Gross	kg	405	435
	Operating	kg	420	455
Operation Range	Cooling	°C	-20~53	-20~53
	Heating	°C	-30~50	-30~50
Water Temperature Range	Cooling	°C	5~20	5~20
	Heating	°C	25~60	25~60
Loading quantity	20GP	Sets	0	0
	40GP	Sets	0	0
	40HQ	Sets	9	9

Model			140kW	140kW (With hydro kit)
Power Supply		V/Ph/Hz	380-415/3/50	380-415/3/50
Refrigerant	Type	/	R32	R32
	Charge	kg	7.8×2	7.8×2
Heating (A7W35)	Capacity	kW	135.00	135.00
	Rated Input	kW	40.30	42.19
	COP	W/W	3.35	3.20
Heating (A7W45)	Capacity	kW	140.00	140.00
	Rated Input	kW	44.44	46.67
	COP	W/W	3.15	3.00
Heating (A7W55)	Capacity	kW	135.00	135.00
	Rated Input	kW	50.94	54.00
	COP	W/W	2.65	2.50
Cooling (A35W7)	Capacity	kW	135.00	133.00
	Rated Input	kW	51.72	53.20
	EER	W/W	2.61	2.50
SCOP(35°C)		W/W	4.26	4.15
SCOP(55°C)		W/W	3.30	3.22
SEER		W/W	4.56	4.30
Seasonal Space Heating Energy Efficiency Class	LWT At 35ºC	/	A++	A++
	LWT At 55ºC	/	A++	A++
Sound Pressure Level		dB(A)	73.0	74.0
Sound Power Level		dB(A)	89.0	90.0
Maximum Input Power		kW	63.0	67.0
Maximum Input Current		A	105.0	113.0
Compressor	Type	/	EVI Scroll	EVI Scroll
	Control	/	Inverter	Inverter
	Quantity	/	2	2
Fan	Type	/	Axial	Axial
	Quantity	/	2	2
Condenser	Type	/	Finned Tube	Finned Tube
	Color Of Heat Exchanger	/	Golden	Golden
Water Side Heat Exchanger	Types		Plate Heat Exchanger	Plate Heat Exchanger
	Water Flow Rate (Cooling)	m³/h	23.22	22.88
	Water Flow Rate (Heating)	m³/h	24.08	24.08
Throttle Type		/	EEV	EEV
Water Pump	Type	/	/	Centrifugal
	Control	/	/	Inverter
Water Pipe	Connection	/	R2-1/2" External Thread	R2-1/2" External Thread
	Size	/	DN65	DN65
Water Pressure Drop		kPa	53	/
External Static Pressure		kPa	/	340
Dimensions	Net (W×D×H)	mm	2200×1200×2385	2200×1200×2385
	Packing(W×D×H)	mm	2230×1230×2525	2230×1230×2525

Model			140kW	140kW (With hydro kit)
Weight	Net	kg	665	705
	Gross	kg	705	745
	Operating	kg	735	785
Operation Range	Cooling	°C	-20~53	-20~53
	Heating	°C	-30~50	-30~50
Water Temperature Range	Cooling	°C	5~20	5~20
	Heating	°C	25~60	25~60
Loading quantity	20GP	Sets	0	0
	40GP	Sets	0	0
	40HQ	Sets	9	9

9. Information Services

1. Area Inspection

Prior to operations on systems containing flammable refrigerants, a safety inspection must be conducted to minimize the explosion risk.

2. Operational Procedures

All work shall be performed in accordance with controlled operational procedures to reduce fire and explosion hazards during operations.

3. Work Area

All maintenance personnel and other on-site personnel must receive training related to the nature of the work.

1) Avoid working in enclosed spaces.

2) The work area shall be isolated, and flammable materials shall be controlled to ensure environmental safety.

4. Refrigerant Presence Check

1) Inspect the area with a refrigerant detector before and during operations.

2) Ensure the leak detection equipment is suitable for flammable refrigerants, i.e., it has safety features such as spark-free operation and reliable sealing.

5. Availability Of Fire-Fighting Equipment

1) If heating operations are required on refrigeration equipment or its associated components, appropriate fire-fighting equipment must be readily accessible.

2) Dry powder or carbon dioxide fire extinguishers shall be available near the charging area.

6. Explosion-Proof Requirements

If work involves exposing piping systems that contain or previously contained flammable refrigerants, the use of equipment or actions that violate explosion-proof standards is strictly prohibited. Before commencing work, survey the area surrounding the equipment to eliminate flammable hazards and explosion risks, and post "No Smoking" signs.

7. Ventilation Requirements

Ensure adequate ventilation when releasing refrigerant or performing hot work, and maintain continuous ventilation throughout the operation.

8. Refrigeration Equipment Inspection

1) When replacing electrical components, use parts that meet the specified specifications and strictly follow the manufacturer’s maintenance and service guidelines. Consult the manufacturer’s technical department for clarification if in doubt.

2) The refrigerant charge quantity shall match the size of the room where refrigerant components are installed.

3) Verify that ventilation equipment and air outlets are functioning normally and are unobstructed.

4) If a secondary water system is used, check for refrigerant presence in the system.

5) Install refrigeration pipes or components away from corrosive substances, unless the components are corrosion-resistant or have anti-corrosion treatment.

9. Electrical Equipment Inspection

Maintenance of electrical components shall include pre-operational safety checks and component inspection procedures. Immediately disconnect the power supply if a safety-endangering fault is detected. If the fault cannot be repaired promptly but operation is necessary, implement appropriate temporary measures and notify the equipment responsible party to ensure full information disclosure.

Preliminary Safety Checks Include:

1) Safely discharge capacitors to prevent sparks.

2) Ensure no live electrical components or exposed wiring during refrigerant charging, recovery, or evacuation.

3) Maintain continuous grounding connection.

10. Sealing Component Repair

Before disassembling parts such as sealing caps during maintenance, disconnect the equipment from the power supply. If power supply must be maintained during maintenance, install residual current devices (RCDs) at critical locations.

NOTES
• Modifications to the equipment casing are prohibited, as this will affect the protection rating.
• Prohibited modifications include but are not limited to damaged cables, excessive electrical connection points, non-original-specification terminals, and damaged seals.
• The use of silicone sealant may impair the effectiveness of certain leak detection equipment.

11. Wiring Inspection

Inspect cables for wear, corrosion, excessive stress, vibration, sharp edge contact, or other adverse environmental impacts. Consider the effects of aging and continuous vibration from components such as compressors or fans during inspection.

12. Flammable Refrigerant Detection

Under no circumstances use an ignition source to detect refrigerant leaks.

13. Leak Detection Methods

1) For systems with flammable refrigerants, use electronic leak detectors. Note that their sensitivity may be insufficient and recalibration may be required (calibrate detectors in a refrigerant-free environment).
2) Ensure the detector's protection rating meets explosion-proof requirements and is compatible with the refrigerant.
3) Set the leak detector to measure a percentage of the refrigerant's lower flammable limit (LFL). Calibrate according to the specific refrigerant and confirm the appropriate gas percentage (maximum 25%).
4) Refrigerant leak detection fluid is suitable for most refrigerants, but avoid chlorine-containing cleaning agents-chlorine may react with the refrigerant and cause copper pipe corrosion.
5) If a leak is suspected, immediately remove or extinguish all exposed ignition sources.
6) If a leak is confirmed and brazing is required, recover all refrigerant from the system or isolate it (via valve closure) to a container away from the leak site.
7) Introduce oxygen-free nitrogen before and after the brazing process.

14. Refrigerant Recovery And Evacuation

Follow proper procedures for refrigerant system maintenance, including the following steps:

1) Recover refrigerant.
2) Inject inert gas into the electrical box.
3) Evacuate the system.
4) Reintroduce inert gas into the refrigeration system.
5) Perform brazing operations.

15. Charging Procedure

In addition to standard charging procedures, comply with the following requirements:

1) Ensure charging equipment prevents cross-contamination from mixing different refrigerants. Use the shortest possible hoses/lines to minimize refrigerant retention.
2) Store gas cylinders in an upright position.
3) Ground the refrigeration system before charging refrigerant.
4) Label the system after charging (or if charging is incomplete).
5) Avoid refrigerant overcharging in the refrigeration system.

16. Refrigerant Recycling

1) When removing refrigerant from a system (for maintenance or disposal), ensure complete and safe recovery.
2) Use cylinders designated and properly labeled for the specific refrigerant during recovery. Equip cylinders with fully functional pressure reducing valves and phase-locking valves.
3) Ensure recycling equipment is in good working condition, accompanied by an operational manual suitable for flammable refrigerant recycling, and equipped with a calibrated weighing scale. Use hoses with leak-free disconnectors in good condition. Before using the refrigerant recovery machine, verify it is fully operational and meets explosion-proof requirements to prevent explosions in case of refrigerant leaks.
4) Return recycled refrigerant to the supplier in appropriate recycling containers with corresponding material transfer instructions. Never mix different refrigerants in a single recycling container.

17. Equipment Transportation, Labeling, And Storage

1) Comply with transportation regulations when transporting equipment containing flammable refrigerants.
2) Label the equipment in accordance with local regulations.
3) Dispose of equipment using flammable refrigerants in compliance with national regulations.
4) Store the equipment as per the manufacturer's instructions.
5) Ensure mechanical damage to packaged equipment does not cause refrigerant leakage.
6) Adhere to local regulations regarding the maximum number of equipment units stored together.