

APOLLO

COMMERCIAL AIR TO WATER HEAT PUMP

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1. INTRODUCTION

The Apollo Commercial Air-to-Water Heat Pump is engineered for high-demand commercial applications where reliability, efficiency and year-round performance are critical. Designed to operate in extreme climates down to -31°F, the system delivers space heating, cooling, and domestic hot water (DHW) from a single integrated platform.

2. SAFETY INFORMATION AND PERSONNEL QUALIFICATIONS

All installation, maintenance, service, and repair activities on the Commercial Air-to-Water Heat Pump must be performed by qualified and competent personnel**.** These personnel must have appropriate technical training, certification, and practical experience in HVAC systems, refrigeration handling, and electrical safety.

Any work that may affect system safety or involves sealed or pressurized components shall only be carried out by authorized professionals**.**

2.1 Critical Operations Requiring Qualified Personnel

The following procedures involve safety risks and must only be performed by certified technicians:

- Opening or breaking into the refrigerant circuit
- Handling or replacing refrigerant
- Opening sealed components or enclosures
- Working on electrical control panels or high-voltage systems
- Servicing components within ventilated or non-ventilated housings

Failure to use properly qualified personnel may result in serious safety hazards, equipment damage, or system failure.

2.2 Competence of Service Personnel

For systems using flammable refrigerants, additional knowledge beyond standard HVAC practices is required. Service personnel must be specifically trained in handling such refrigerants in accordance with national regulations and safety standards.

Training must be provided by:

- Accredited national training organizations
- Certified manufacturers or authorized training bodies
- Personnel competence must be formally documented through certification.

2.3 Information and Training Requirements

Service personnel must be trained in the following areas:

- Flammable Refrigerant Safety
- Understanding the explosion risk associated with flammable refrigerants
- Awareness that improper handling can lead to fire or explosion hazards
- Potential Ignition Sources

Technicians must identify both obvious and hidden ignition sources, including:

- Open flames (lighters, torches)
- Electrical switches and relays
- Vacuum cleaners and motors
- Electric heaters and hot surfaces

3. TECHNICAL SPECIFICATIONS

COMMERCIAL AIR TO WATER HEAT PUMP

MODEL	AP-CHP50
RATED VOLTAGE/FREQUENCY	208V/480V/600V 3Ph 50Hz
RATED HEATING CAPACITY	600K BTU (50 T)
T) RATED COOLING CAPACITY	500K BTU (42 T)
INPUT POWER	47KW
CURRENT	92A
INPUT POWER	40KW
CURRENT	88A
HEATING MAX LOAD	50kW
COOLING MAX LOAD	43kW
TOTAL LOAD	134A
FAN MOTOR RATING LOAD	5.8A
COMPRESSOR ROTOR LOAD	128.2A
MCA	170A
MOP	305A
WATER VOLUME	158GPM
WATER CONNECTION	DN80
MAX.INPUT WATER TEMP	131°F
REFRIGERATE/PROPER INPUT	R32/4*6.5kg
NOISE	73dB(A)
OPERATION PRESSURE(LOW SIDE)	305PSIG
OPERATION PRESSURE(HIGH SIDE)	609PSIG
NET DIMENSION (L/W/H)	90 1/2" x 53 1/4" x 92 1/4"
NET WEIGHT	1250kg

4. KEY FEATURES

EVI (Enhanced Vapor Injection) Technology

Apollo heat pumps use advanced EVI technology to maintain strong heating performance in extreme low temperatures. This allows the unit to operate efficiently and reliably even down to -35°C, where conventional systems typically lose capacity.

Full DC Inverter Compressor Technology

Equipped with full DC inverter compressors, Apollo systems continuously adjust output based on real-time demand. This ensures precise temperature control, reduced energy consumption, and longer compressor life.

Extreme Low Ambient Operation

Specifically engineered for harsh climates, Apollo units deliver stable heating, cooling, and hot water performance even in severe winter conditions, making them ideal for critical commercial applications.

High COP Performance

Apollo heat pumps are designed to achieve high Coefficient of Performance (COP), delivering maximum output with minimal energy input. This results in significantly lower operating costs over the system lifecycle.

All-in-One Heating, Cooling and DHW Solution

Apollo provides a complete climate solution by integrating space heating, cooling, and domestic hot water into a single system, simplifying design and reducing installation complexity.

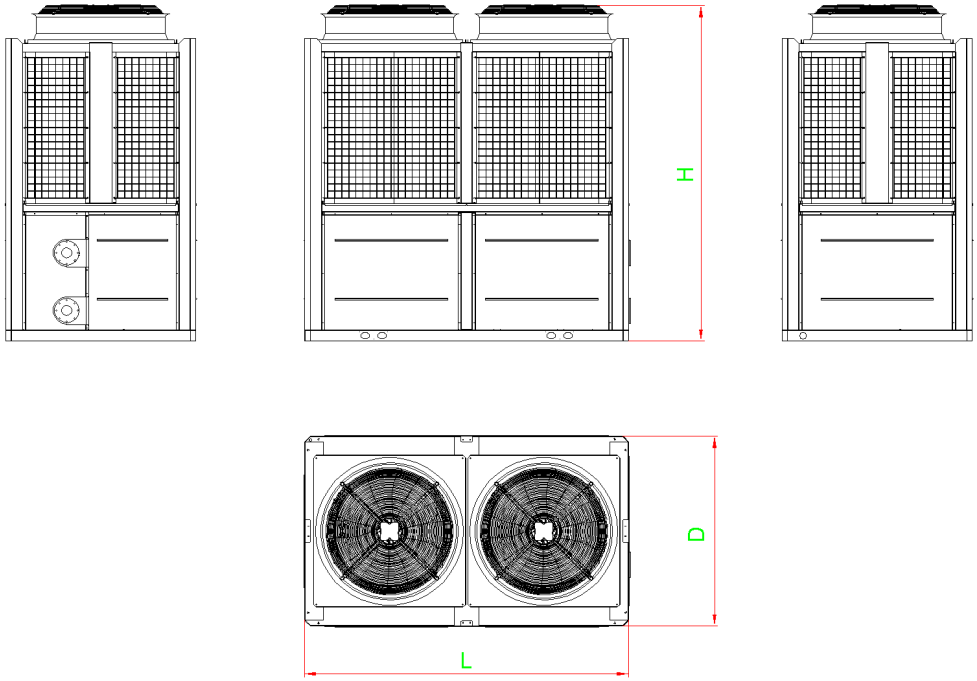
Optimized System Design

Apollo units feature an efficient refrigerant circuit and optimized internal components to ensure maximum heat transfer, reduced pressure losses, and improved overall system efficiency.

Commercial-Grade Reliability

Built with robust components and engineered for continuous operation, Apollo heat pumps are suitable for demanding environments such as hotels, hospitals, and industrial facilities.

5. APPEARANCE AND DIMENSION



Model / Size	AP-CHP50
L	90 1/2"
D	53 1/4"
H	92 1/4"

6. SAFETY PRECAUTIONS

In order to prevent damage to the personal property of the user and others, and to use the unit correctly and safely, please read the important contents in this instruction manual carefully. Fully understand the following content before reading the text and follow the following precautions.

- Appliances shall be installed in accordance with wiring specifications.
- Power connections must be installed in accordance with the national wiring specifications, and professional electrical personnel must be installed in accordance with the regulations of the local electric company. Electrical installation must comply with the relevant electrical standards.
- An all-pole disconnect safety device must be installed between the unit and the customer power supply. The fixed line must be equipped with an all-pole disconnect device with a minimum of 3mm contact spacing.
- If the cord is damaged, it must be replaced by the manufacturer or maintenance department or similar professional personnel to avoid danger.





6.1 Marking Description

Identification	The meaning of identification.
Warning	Mis-operation use may result in death or serious injury.
Warning	Mis-operation use may cause injury or material loss.

6.2 Icon Description

Icon	The meaning of an icon.
	Indicates forbidden. The forbidden space is in or near the icon with graphics or text.
	Forcible execution, the specific forcible content in or near the icon with graphics or text.
	Attention include warnings, which are shown in graphics or text in or near the icon.

6.3 Warning

Installation warning.	Entrust professional installation.	Entrust professional installation. Other personnel installation may cause incomplete installation, resulting in water leakage, electric shock or fire.
	Verify the ground cable.	Verify that the ground cable is properly grounded. If the grounding is not perfect, it may cause electric shock.
	Do not exceed the limit concentration measures	When installed in a small room, should be implemented, take certain measures to prevent refrigerant leakage once more than the limit depth caused by asphyxiation. Please consult dealers for specific measures.

Use warning	Stop	Do not stick fingers, sticks, etc. into the outlet or intake. Because the internal wind turbine is running at high speed, there is a possibility of injury.
	Cut off the manual source switch	When an anomaly occurs, the odor is burnt, should immediately cut off the manual power switch, stop operation and contact the dealer. If it continues to operate abnormally, it may cause electric shock or fire.

Move repair warning	Entrust	When the air conditioner needs to be moved and installed, please entrust dealers or professionals to implement. If the installation is not perfect, it may cause electric shock, fire, injury, water leakage and other accidents.
	Prohibited	Must not be reformed and repaired by oneself, otherwise easy to cause electric shock or fire.
	Entrust	If need to repair, please entrust dealers or professionals. If not repaired properly, it may cause electric shock, fire, injury, water leakage and other accidents.

Installation precautions	Confirm the installation site.	Do not install it in a place where combustible gas is easily leaked. If flammable gas leaks, it may cause a fire.
	Confirm the leakage protection switch.	Confirm that the leakage protection switch is installed, if the leakage protection switch is not installed, it may cause electric shock or fire.

Use Precautions	Check the installation table	When long-term use, to check whether the installation table is firm and intact. If the installation platform is damaged or unstable, the outdoor unit may fall, causing casualties.
	Cut off the manual power switch	When cleaning, you must stop running. Cut off the manual power switch. If you do not stop the operation, the internal wind wheel may run at high speed, which may cause injury.
	Prohibited	Do not use the appropriate fuse, If copper wire or iron wire is used, it may cause failure or fire..
	Prohibited	Do not use the appropriate fuse, If copper wire or iron wire is used, it may cause failure or fire..

7. INSTALLATION

7.1 Pre-Installation Inspection

Before unpacking the unit, a detailed inspection of the installation site must be carried out.

- The installation area shall be clean, dry and well-ventilated, free from dust, oil or construction debris that could affect equipment performance
- The floor or foundation must be structurally sound, capable of supporting the unit weight under operating conditions (including water-filled operation)
- The foundation surface must be perfectly level, with a tolerance typically not exceeding ±2 mm per meter
- The foundation must be complete and finished, with no cracks, voids or uneven sections
- Adequate space must be available for:
  - Equipment transportation and handling
  - Lifting and positioning
  - Future maintenance and servicing
- Proper drainage provisions must be considered to allow removal of condensate water and defrost water
- Environmental conditions must be suitable, avoiding:
  - Areas with corrosive gases
  - High dust concentration
  - Flood-prone locations
- Only after confirming that all conditions are compliant should the unit be unpacked.

7.2 Unpacking and Equipment Verification

After delivery and unpacking, the unit must be carefully checked:

- Remove packaging materials carefully to avoid damaging external panels or internal components
- Inspect the unit for any damage that may have occurred during transportation
- Verify all items against the packing list, including:
  - Main unit
  - Accessories and fittings
  - Fasteners and mounting components
  - Technical documentation
- Confirm that the nameplate is intact and clearly indicates:
  - Model number
  - Serial number
  - Electrical specifications
  - Refrigerant type and charge
- Ensure that all certificates and compliance documents are included
- If any damage, shortage, or discrepancy is found, installation must not proceed until the issue is resolved.

7.3 Appearance and Internal Inspection

A detailed inspection must be conducted before installation:

- Check the outer casing and panels for dents, scratches, or deformation
- Inspect all inspection doors and access panels to ensure proper sealing and alignment
- Verify that gaskets and sealing surfaces are intact and undamaged
- Open accessible panels (if permitted) and confirm:
  - Internal components are properly installed
  - No loose bolts, nuts, or fittings
  - Electrical wiring is secure
  - No foreign objects are present inside the unit
- Check key components such as:
  - Compressor mounting
  - Heat exchanger condition
  - Fan assembly alignment
- Any abnormalities must be corrected before installation.

7.4 Installation Procedure

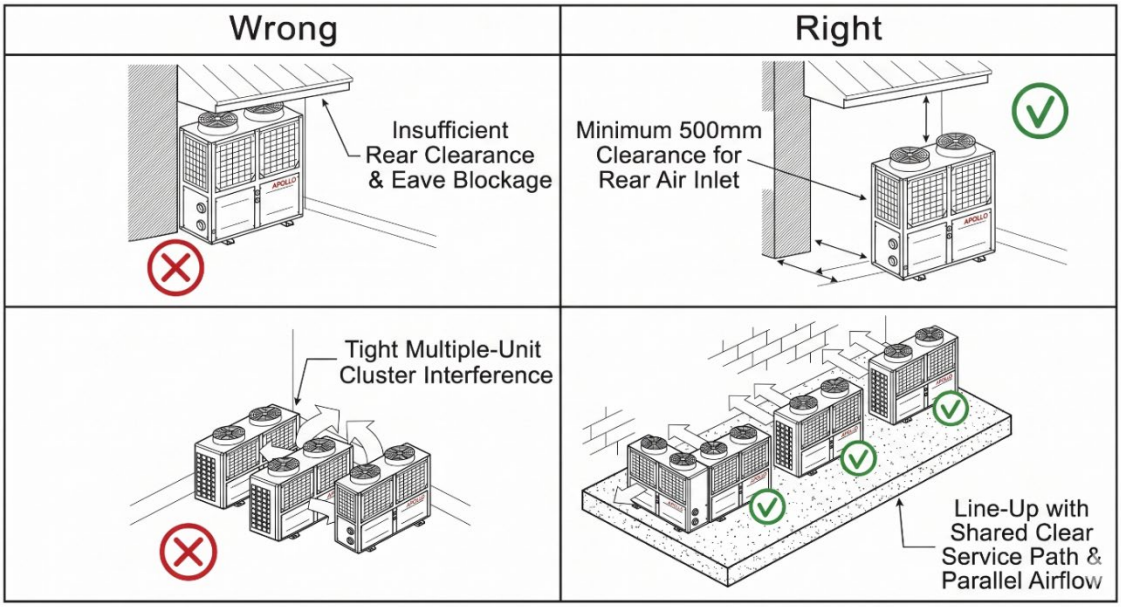
After completing all pre-installation checks and confirming that the site conditions are suitable, the unit shall be installed strictly in accordance with the following procedures. All installation work shall be carried out by qualified personnel using appropriate lifting tools and safety equipment.

7.4.1 Check Installation Space and Accessibility

Before positioning the unit, ensure that:

- There is sufficient space around the unit for installation, operation, inspection and maintenance
- The air inlet and air outlet are not obstructed by walls, structures or other equipment
- Adequate clearance is maintained to prevent airflow short-circuiting or recirculation
- Sufficient space is available for water piping, electrical wiring and control cable routing
- Access routes are available for future servicing and component replacement

The installation space must also allow safe removal of major components such as fans or coils when required.



Spacing and Airflow

7.4.2 Confirm Structural Strength and Load Capacity

Before placing the unit, confirm that:

- The installation base or supporting structure can fully support the operating weight of the unit, including water load and accessories
- The structure has sufficient rigidity to prevent vibration, deformation, or settlement during operation
- The foundation is designed in accordance with the unit load distribution requirements
- For suspended installations, the hanging structure must be professionally designed and independently verified for load safety

Failure to ensure proper structural support may result in equipment damage or safety hazards.

7.4.3 Floor-Mounted Installation Procedure

- For ground or rooftop floor installation, proceed as follows:
- Ensure the concrete foundation is fully cured, smooth, and level
- The foundation surface must be free from cracks, unevenness, or loose particles
- The base height should be designed to allow proper drainage of condensate water and defrost water

Installation steps:

1. Carefully move the unit to the installation position using appropriate lifting equipment
2. Place the unit gently on the foundation without impact or shock
3. Align the unit according to installation drawings and site reference lines

4. Use a precision level instrument to ensure the unit is perfectly horizontal in all directions
5. Install anti-vibration pads or rubber mounts between the unit and the foundation
6. Adjust leveling as required to ensure uniform contact and load distribution
7. Fix the unit securely to the foundation using anchor bolts or equivalent fastening devices
8. Tighten all fixing points evenly to avoid frame distortion

7.4.4 Hoisting (Suspended) Installation Procedure

For suspended installation using ceiling structures or steel frames:

- Ensure the hoisting structure is stable, rigid and independently load-bearing
- Confirm that all lifting points correspond to the designated lifting lugs on the unit
- Use steel wire ropes, chains or rods with sufficient load rating and safety factor

Installation steps:

1. Attach lifting equipment securely to the unit lifting points
2. Lift the unit slowly and ensure balanced vertical movement
3. Position the unit above the designed installation location
4. Gradually lower the unit into final position without impact
5. Install double nuts or locking devices at all suspension points
6. Adjust each suspension point to ensure the unit is perfectly level
7. Confirm that all hanging points carry equal and balanced load
8. Lock all fasteners securely after alignment is completed

Special attention must be given to prevent tilting, uneven stress, or structural deformation.

7.4.5 Leveling and Alignment

Proper leveling is essential for stable and efficient operation:

- Check horizontal and vertical alignment using a precision leveling instrument
- Ensure the unit is installed within allowable tolerance limits (typically minimal deviation only)
- Adjust using shims, leveling feet, or adjustable mounts if necessary
- Recheck alignment after tightening all bolts

Incorrect leveling may cause:

- Compressor imbalance and vibration
- Reduced heat exchange efficiency
- Improper condensate drainage
- Increased mechanical wear.

7.4.6 Fixing and Anti-Vibration Measures

After positioning and leveling:

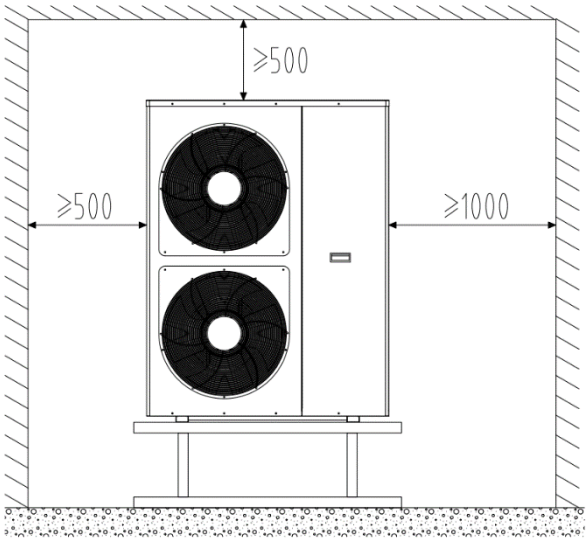
- Install all anchor bolts or fixing devices securely
- Tighten bolts gradually in a cross-pattern sequence to ensure even stress distribution
- Install anti-vibration pads or spring isolators as required
- Verify that the unit is stable and does not move under external force For

suspended units:

- Ensure all lock nuts are tightened properly
- Check that no swinging or oscillation occurs after installation

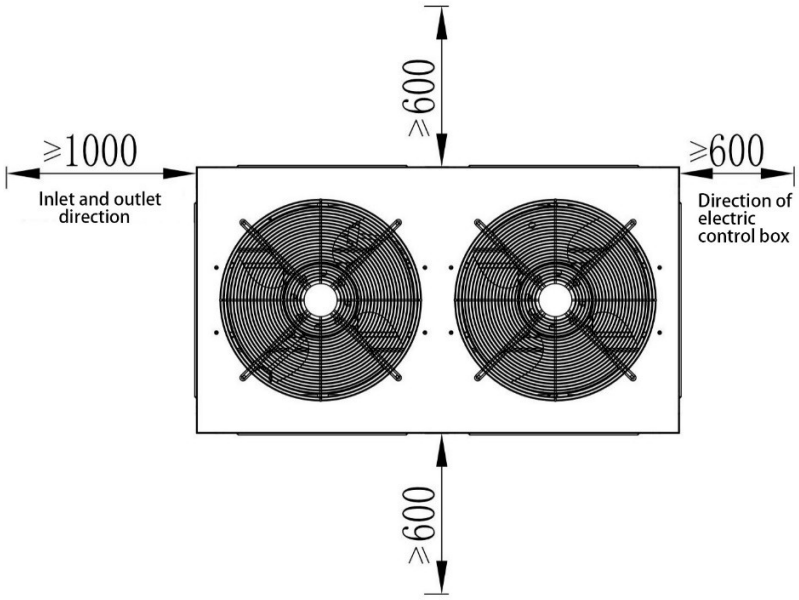
7.5 Unit Installation Space Requirements

The unit can be installed individually or in combination. When multiple units are installed, pay attention to their arrangement to ensure that the space around the unit does not affect the installation of return air, outlet air, system pipeline direction, and other equipment. The following arrangement is for reference only, the specific situation depends on the site.

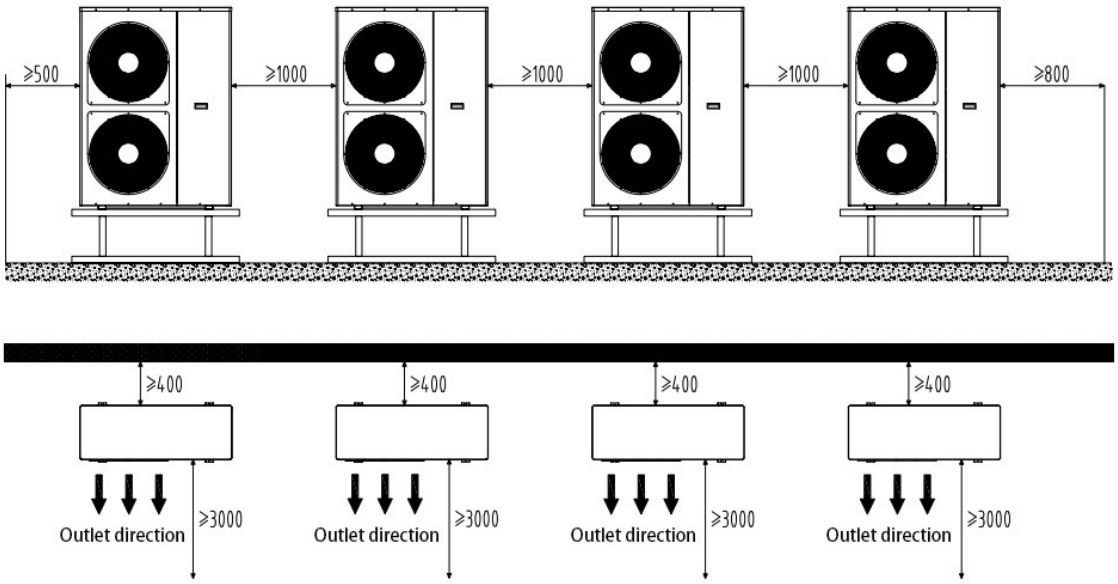


Installation space of a single unit: (Unit: mm)

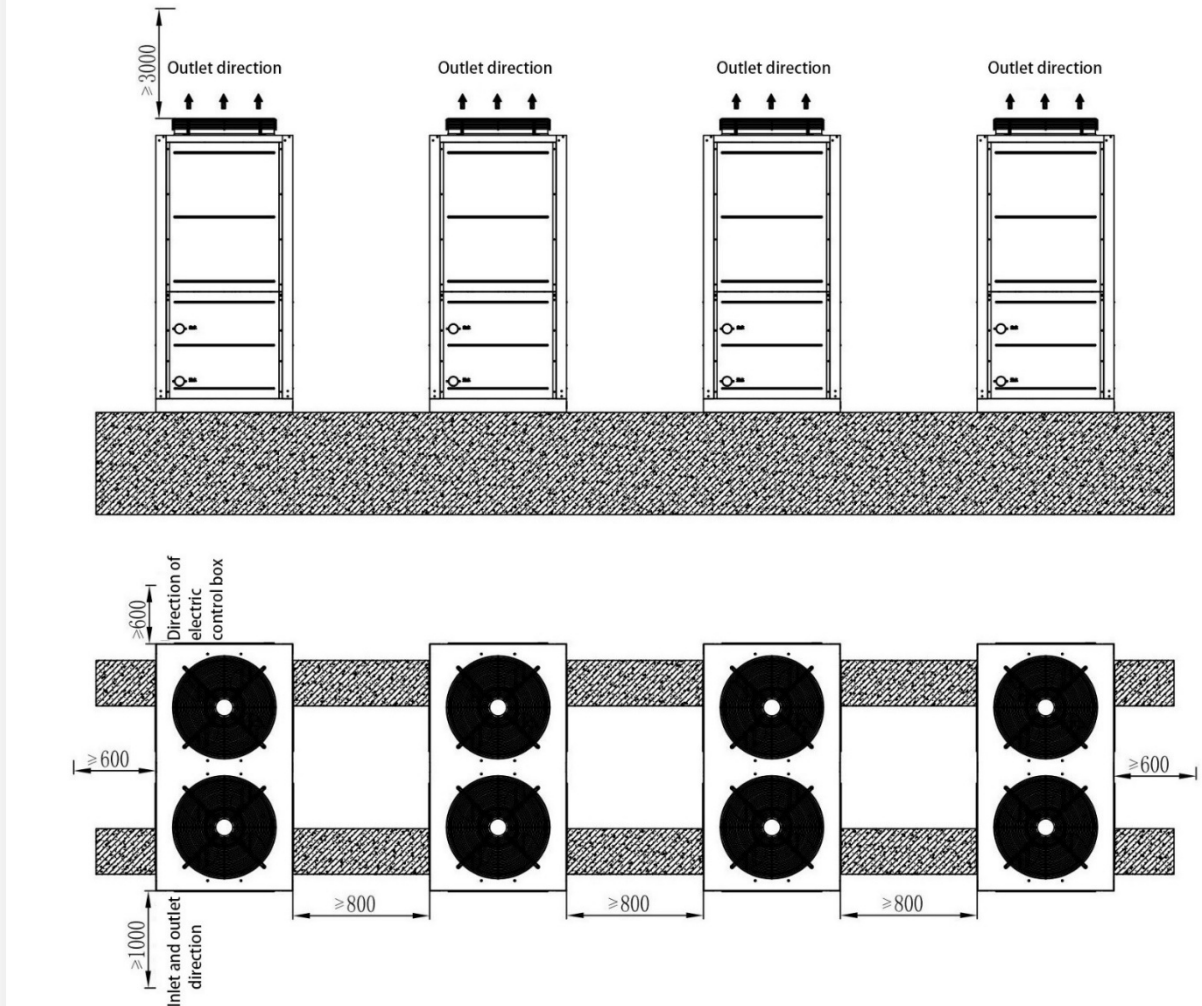
The side air outlet unit shall be no less than 300mm away from obstacles in the air inlet direction and no less than 3000mm away from obstacles in the air outlet direction.



The height of obstacles around the upper air outlet unit shall not be higher than half of the height of the equipment, and the distance from the obstacles in the air outlet direction shall not be less than 3000mm



Installation space for multiple units: (Unit: mm)


≥3000
Outlet direction
Outlet direction
Outlet direction
Outlet direction
≥600
Direction of electric control box
≥600
≥600
≥800
≥800
≥800
≥1000
Inlet and outlet direction

7.6 Installation Position of the Unit

The installation position of the Commercial Air-to-Water Heat Pump shall be carefully selected to ensure safe operation, stable performance, and long service life. Incorrect positioning may lead to reduced efficiency, abnormal noise, vibration, drainage problems or safety risks.

The support surface at the installation site must be level, rigid and structurally capable of bearing the full operating weight of the unit**,** including water load and accessories. The unit chassis must be properly supported during installation to ensure smooth condensate drainage and to prevent operational noise, air discharge, or condensate water from affecting surrounding areas or neighbouring spaces.

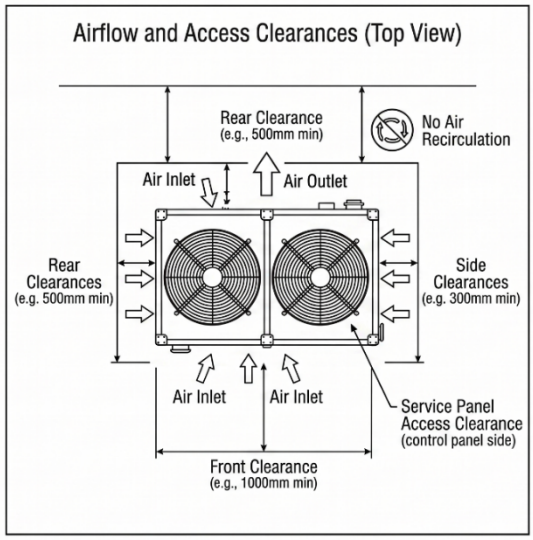
The unit shall not be installed in locations where it may be exposed to corrosive gases, heavy dust, salt-laden air, or environments containing flammable and explosive materials. Such conditions will accelerate corrosion, reduce component life and may create serious safety hazards.

The installation area must be well ventilated and both air inlet and outlet paths must remain completely unobstructed. It is strictly required that the air discharged from the unit is not drawn back into the air intake, and that airflow from adjacent units or equipment does not interfere with system operation. No obstacles shall be present in the suction or discharge airflow zones.

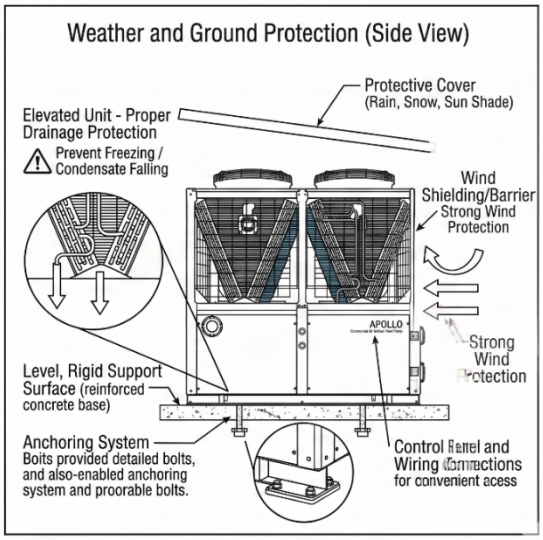
The unit shall not be installed in locations exposed to strong winds, typhoons or extreme weather conditions without proper protective measures. Where such risks exist, appropriate precautions such as wind shielding, anchoring reinforcement and anti-tilt support structures must be implemented. If required, additional protective structures such as rain covers, snow shields or sun shading devices may be installed to improve operational stability and protect the unit from environmental exposure.

The installation location must allow convenient access for piping connections, electrical wiring and control cable routing, and must also provide sufficient clearance for routine inspection, maintenance and future servicing operations**.** Restricted access areas are not acceptable.

For wall-mounted or elevated installations, proper drainage protection measures must be implemented. This is to prevent condensate or defrost water from falling or freezing during low-temperature conditions in winter, which may cause safety hazards or structural damage.



Airflow and Access Clearances (Top View)



Weather and Ground Protection (Side View)

Note: The unit must be installed on a level, solid, and well-ventilated surface with sufficient load-bearing capacity. Airflow must remain completely unobstructed, and discharged air must not recirculate back into the unit.

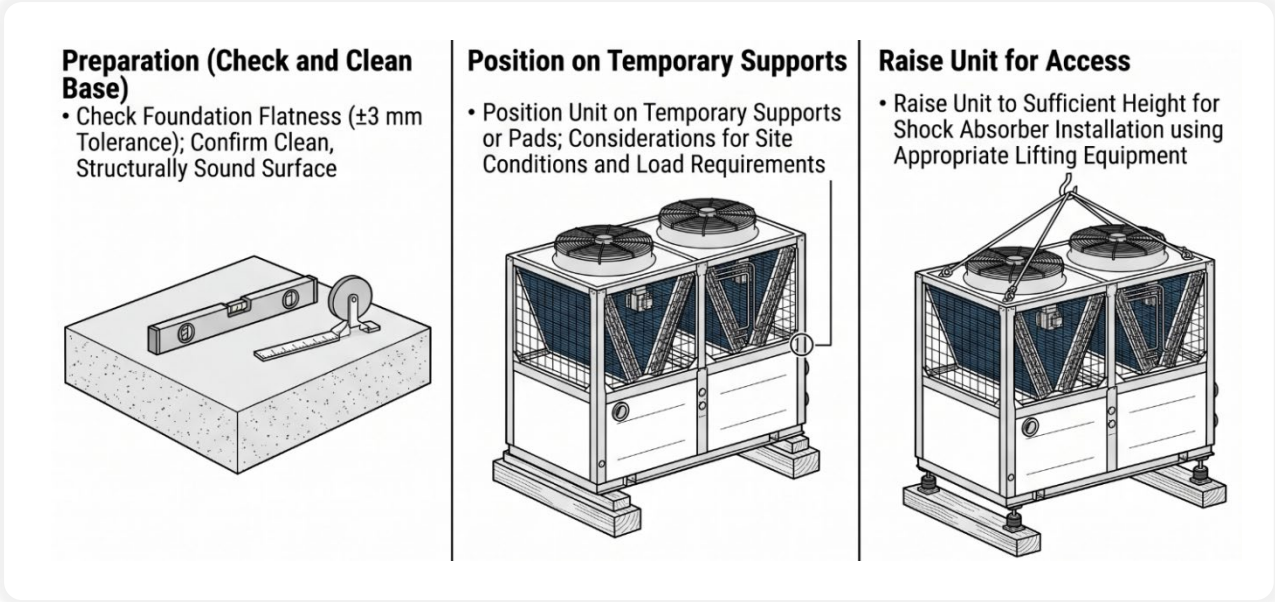
7.7 Units Without Shock Absorbers

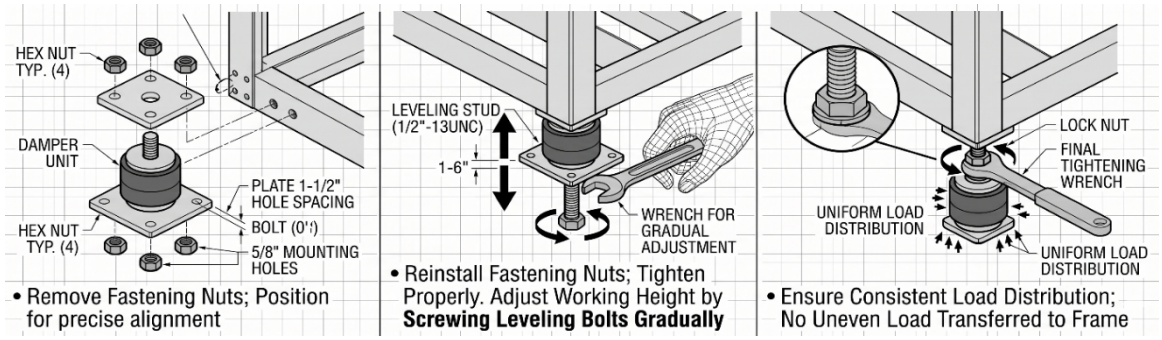
For units that are not supplied with built-in vibration dampers, suitable shock absorption devices must be selected and installed based on site conditions and load requirements.

Installation Procedure:

1. Ensure that the flatness of the concrete foundation is within ±3 mm tolerance, and confirm that the surface is clean and structurally sound
2. Carefully position the unit on temporary supports or pads
3. Raise the unit to a height sufficient for installation of the shock absorption devices using appropriate lifting equipment
4. Remove the fastening nuts from the shock absorber assemblies
5. Position the unit so that the shock absorber fixing bolt holes align precisely with the base mounting holes
6. Reinstall the shock absorber fastening nuts into the frame fixing points and tighten them properly
7. Adjust the working height of each shock absorber by screwing in the leveling bolts gradually
8. Tighten all nuts in a uniform circular sequence, ensuring that deformation and load distribution remain consistent across all vibration mounts
9. Once the correct working height and balance are achieved, fully tighten the lock nuts to secure the system in place

Proper adjustment ensures that all shock absorbers operate uniformly and that no uneven load is transferred to the unit frame.





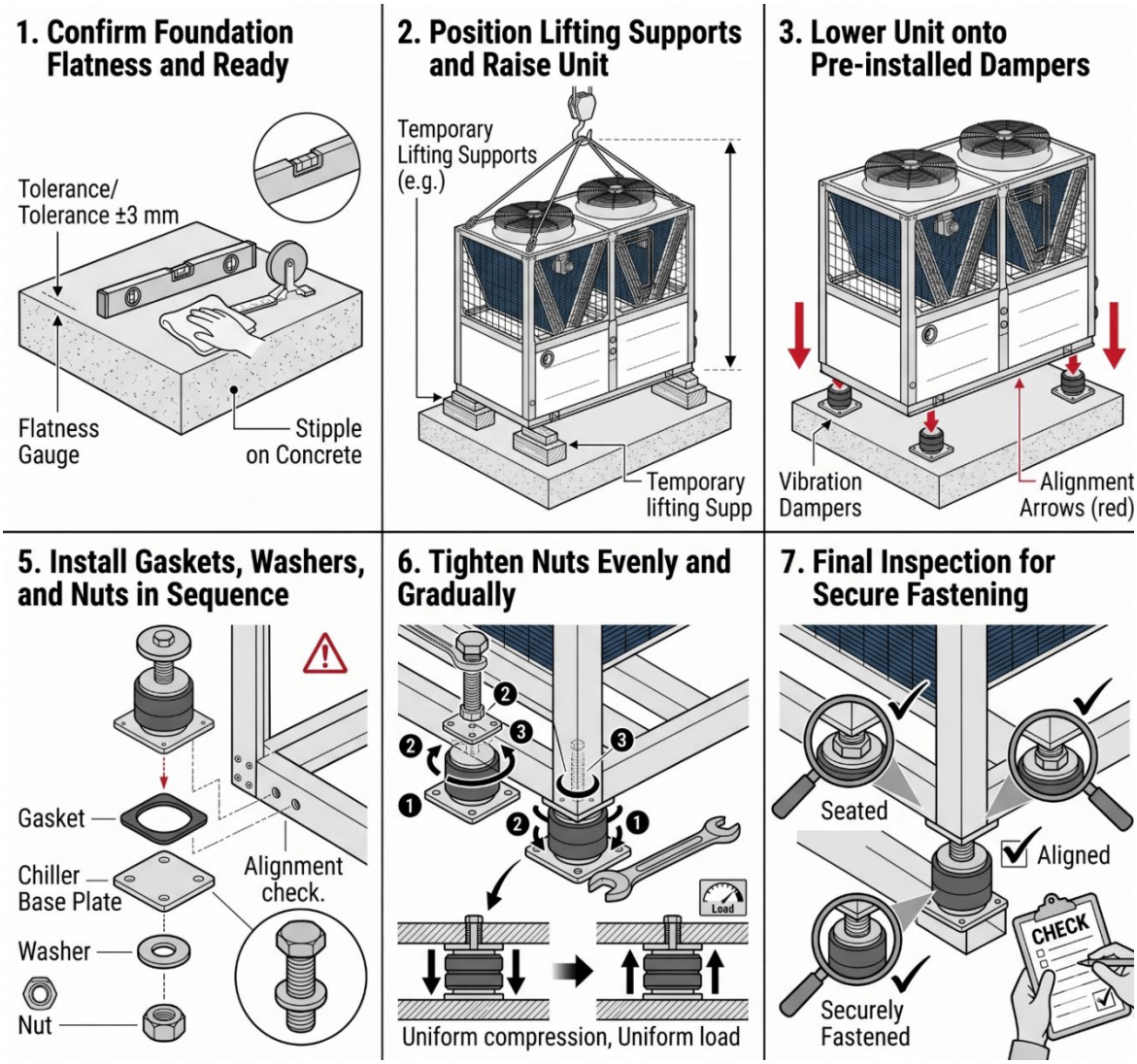
Note: The concrete foundation must maintain a flatness tolerance within ±3 mm, and shock absorbers must be installed with precise alignment to the unit base.

7.8 Units with Vibration Dampers

For units supplied with integrated or dedicated vibration damping devices, installation must follow the prescribed method to ensure correct performance.

Installation Procedure:

1. Confirm that the **concrete foundation flatness is within ±3 mm tolerance**, and ensure the surface is clean and ready for installation
2. Position temporary lifting supports and raise the unit to the required installation height
3. Carefully lower the unit onto the pre-installed vibration dampers, ensuring proper alignment
4. Align the fixing bolt holes of the shock absorbers with the corresponding mounting holes on the unit base
5. Install the provided **gaskets, washers, and nuts in the correct sequence**
6. Tighten all nuts evenly and gradually to ensure uniform load distribution across all damping points
7. Perform a final inspection to confirm that all vibration isolators are correctly seated, aligned, and securely fastened.



Note: Even when factory-supplied vibration dampers are used, the installation surface must remain level within ±3 mm tolerance. All mounting holes must align correctly without force, and all fastening components must be installed in the correct sequence.

8. CONNECTION OF WATER PIPES

After the unit has been properly fixed and positioned, the inlet and outlet water pipes shall be connected in accordance with the following detailed requirements. All piping work must ensure cleanliness, proper flow, mechanical stability and ease of maintenance.

8.1 System Requirements

- Select the pipe diameter strictly according to the nominal connection size of the unit to ensure correct flow rate and system performance
- Design the piping layout to minimize resistance, avoiding unnecessary bends, long routes and sudden diameter changes

- Ensure the entire water system is clean, internally smooth, and free from rust, welding slag, dirt or foreign particles
- The distribution piping system must be tested independently (pressure/leak test) before connection to the unit
- After testing, confirm that the entire system is completely leak-free before proceeding with insulation.

8.2 Cleanliness and Contamination Prevention

- During installation, prevent any debris, dust, or foreign material from entering the piping system
- Keep pipe openings sealed or covered when not in use
- Flush the piping system thoroughly before final connection to remove contaminants
- Ensure no residual materials remain that could cause blockage or damage to the heat exchanger.

8.3 Insulation and Operating Conditions

- All inlet and outlet water pipes connected to the unit must be properly insulated
- Insulation must be applied after leak testing and system verification
- Ensure the piping system is always completely filled with water during operation
- Prevent formation of air pockets or air locks, which may affect system performance and heat transfer
- In low-temperature environments, ensure insulation prevents freezing and heat loss .

8.4 Circulating Pump and Flow Control

- The circulating water pump must be installed with a dedicated starter and control system
- The pump operation must be interlocked with the unit control system to ensure synchronized operation
- The pump must provide stable and sufficient flow directly into the water side heat exchanger
- Incorrect pump installation may result in insufficient flow, reduced efficiency, or system alarms.

8.5 Mechanical Installation and Support

- All piping and fittings must be equipped with independent supports
- The unit must not bear any mechanical load from the piping system
- Improper support may cause:
  - Stress on heat exchanger connections
  - Leakage or damage
  - Misalignment of piping.

8.6 Filtration Requirement

- Install a water filter (strainer) with a minimum of 40 mesh per inch at the inlet of the water side heat exchanger
- The filter must be installed in an accessible position for cleaning and maintenance
- The filter must also be insulated where required
- Regular cleaning of the filter is essential to prevent flow restriction and heat exchanger blockage.

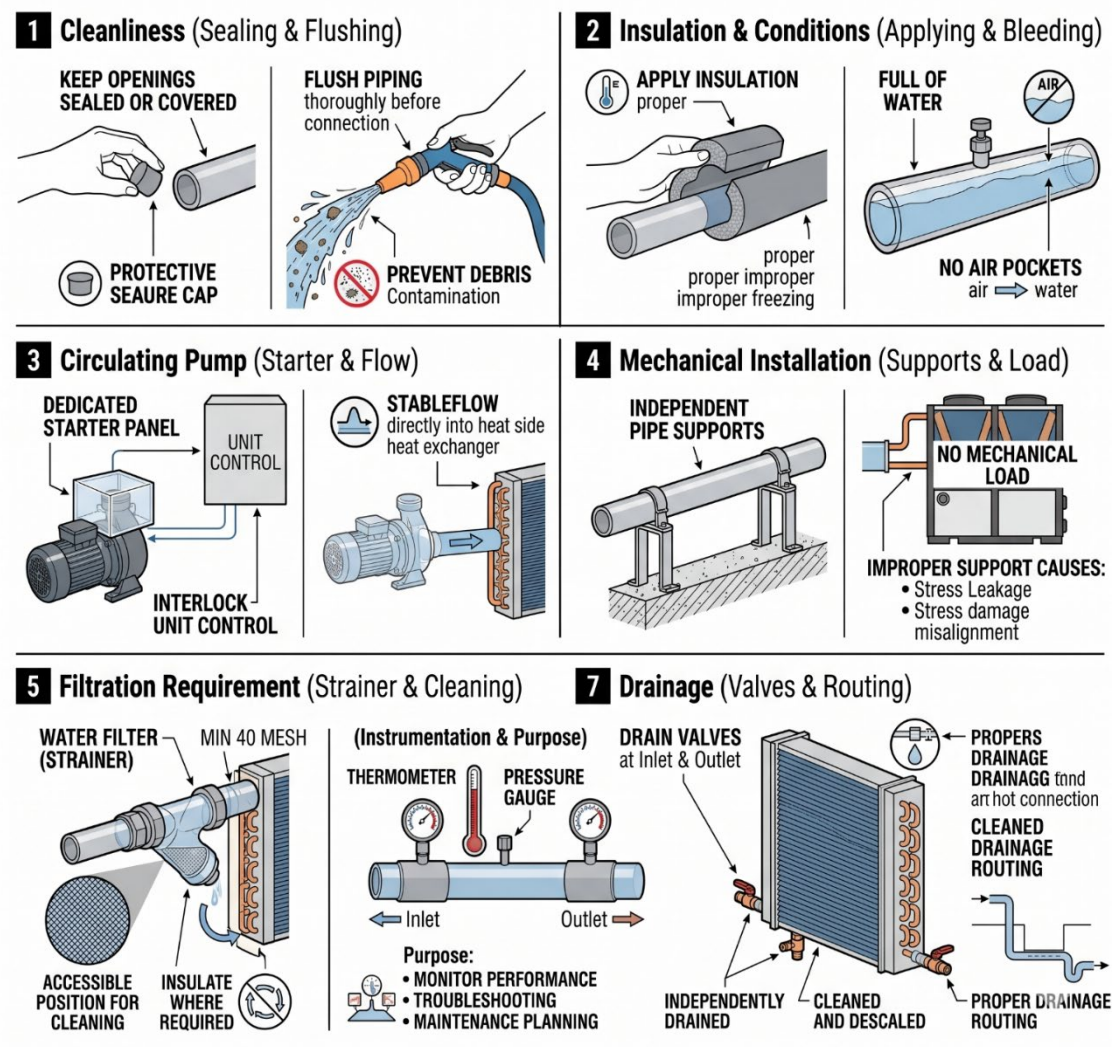
8.7 Monitoring and Instrumentation

- Install thermometers at both inlet and outlet pipes to monitor water temperature
- Install pressure gauges at both inlet and outlet to monitor system pressure and flow conditions
- These instruments are essential for:
  - System performance monitoring
  - Troubleshooting
  - Maintenance planning.

8.8 Drainage and Maintenance Provisions

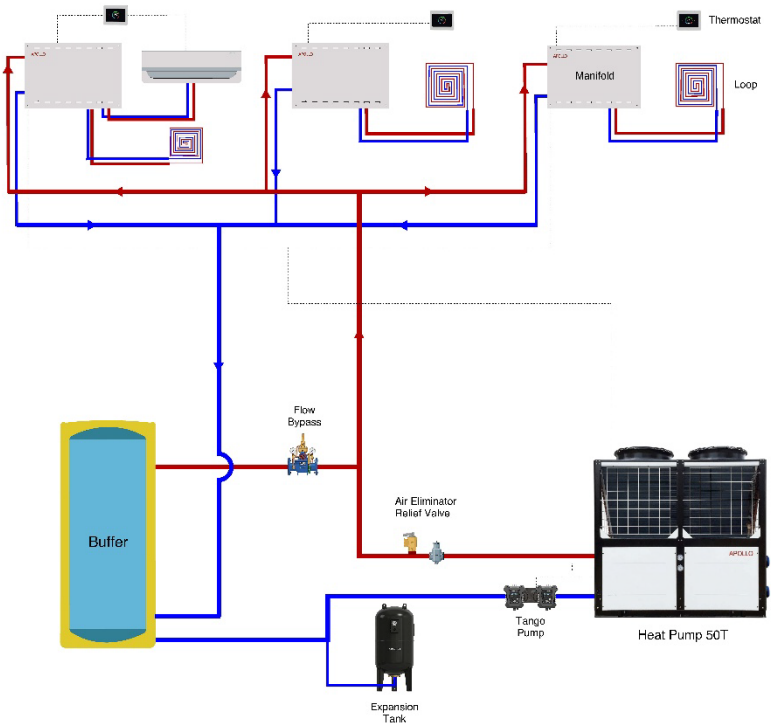
- Install drain valves at both inlet and outlet of the heat exchanger
- Drain valves must allow the heat exchanger to be:
  - Independently drained
  - Cleaned and descaled
  - Serviced without affecting the entire system
- Ensure proper routing of drainage to avoid water accumulation or damage.

Note: Proper piping design, cleanliness, insulation and mechanical support are critical to system performance. Failure to follow these requirements may result in reduced efficiency, blockage, vibration, heat exchanger damage or complete system failure.



9. INSTALLATION SCHEMATICS

Apollo Heat Pump + Manifolds + Buffer Loop



Material List:

Apollo Heat Pump 50 Ton

Apollo Pressure Relief Valve

Apollo Air Eliminator 3"

Apollo Flow Bypass Valve 3"

Apollo Manifold Station x3
(12 loops)

Apollo Wall FCU 1.5 ton x2

BF80 (Custom)

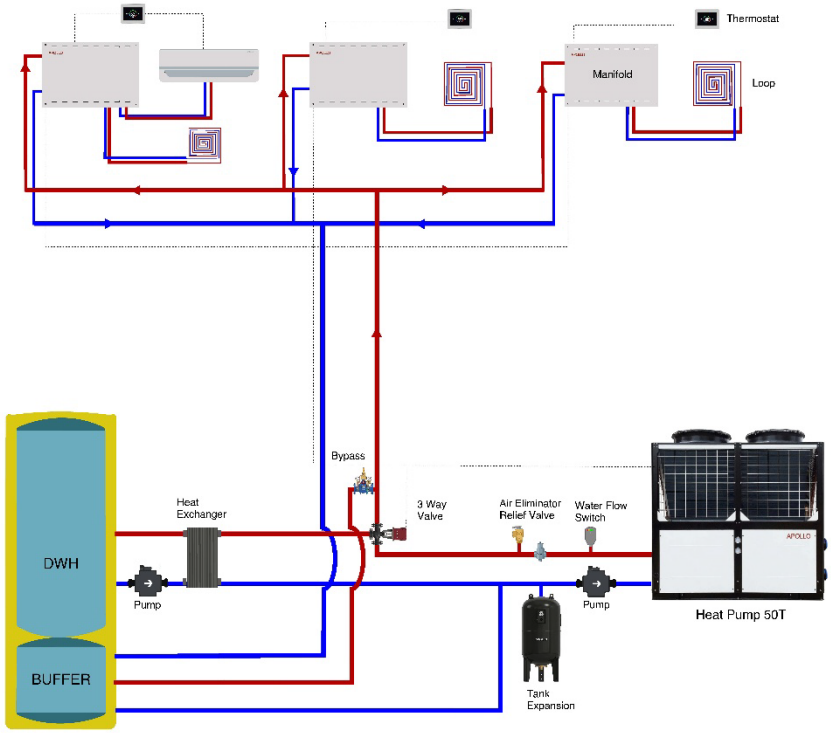
Apollo FCU Thermostat 24V x 2

Apollo Radiant Thermostat 24V x 7

Pump High Efficiency 3" - 150F VFD
Tango Pump 220V

Apollo Commercial Expansion
Tank - 40Gal

Apollo Heat Pump + DWH + Manifolds + Buffer Loop



Material List:

Apollo Heat Pump 50 Ton

APOLLO Thermal Flow Switch

APOLLO Pressure Relief Valve 3/4"

APOLLO Air Eliminator 3"

APOLLO Flow Bypass Valve 3"

Apollo Manifold Station x6
(12 loops)

Apollo Wall FCU 1.5 ton x2

APOLLO DHW250 MAX
(DHW: 220 & BF: 30)

Apollo FCU Thermostat 120V x 2

Apollo Radiant Thermostat 24V x N

Pump High Efficiency 3" - 150F VFD
Tango Pump3" 220V

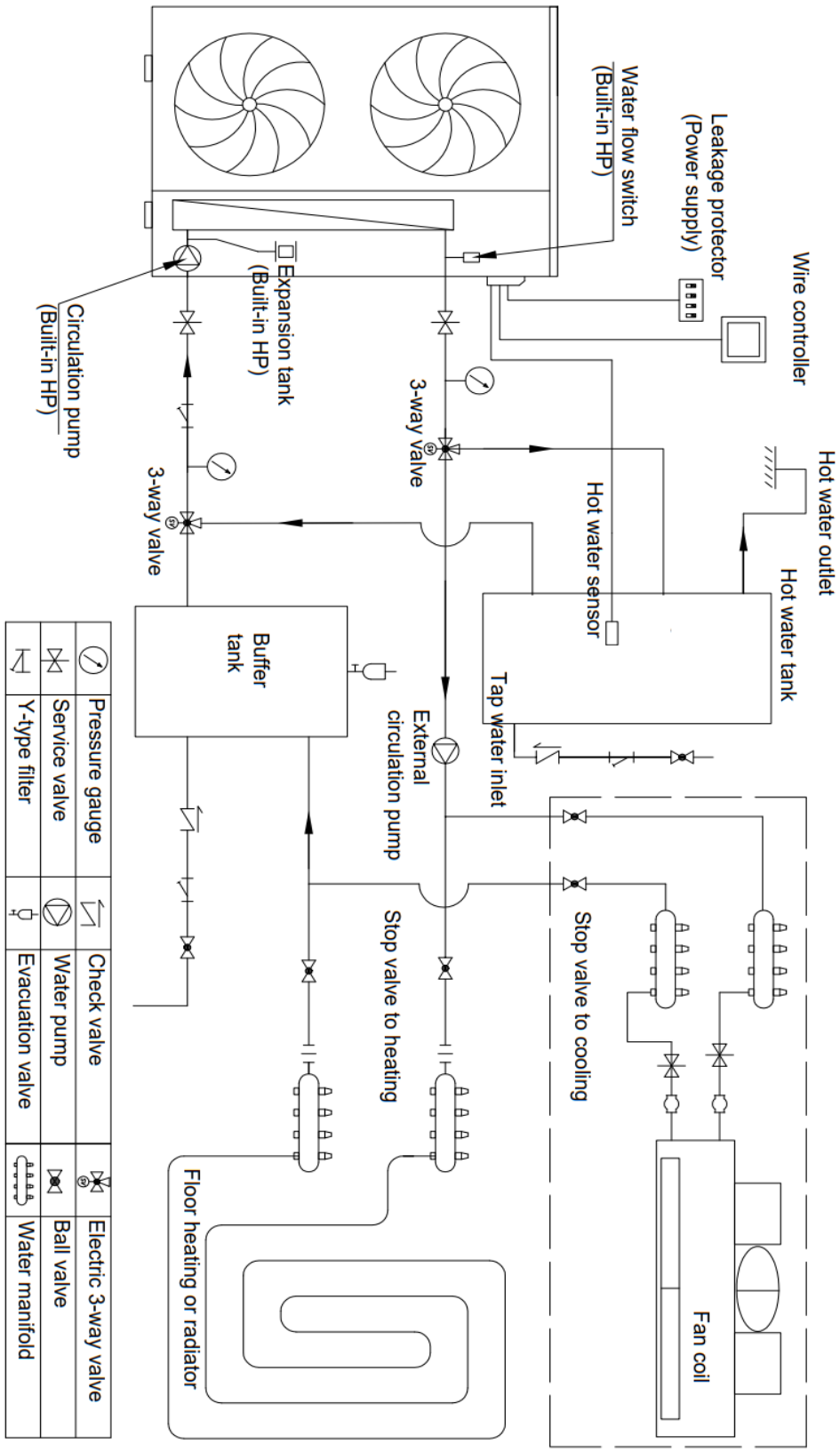
Pump High Efficiency 2" 220V

Apollo Motorized 3-Way Valve 3" 220V

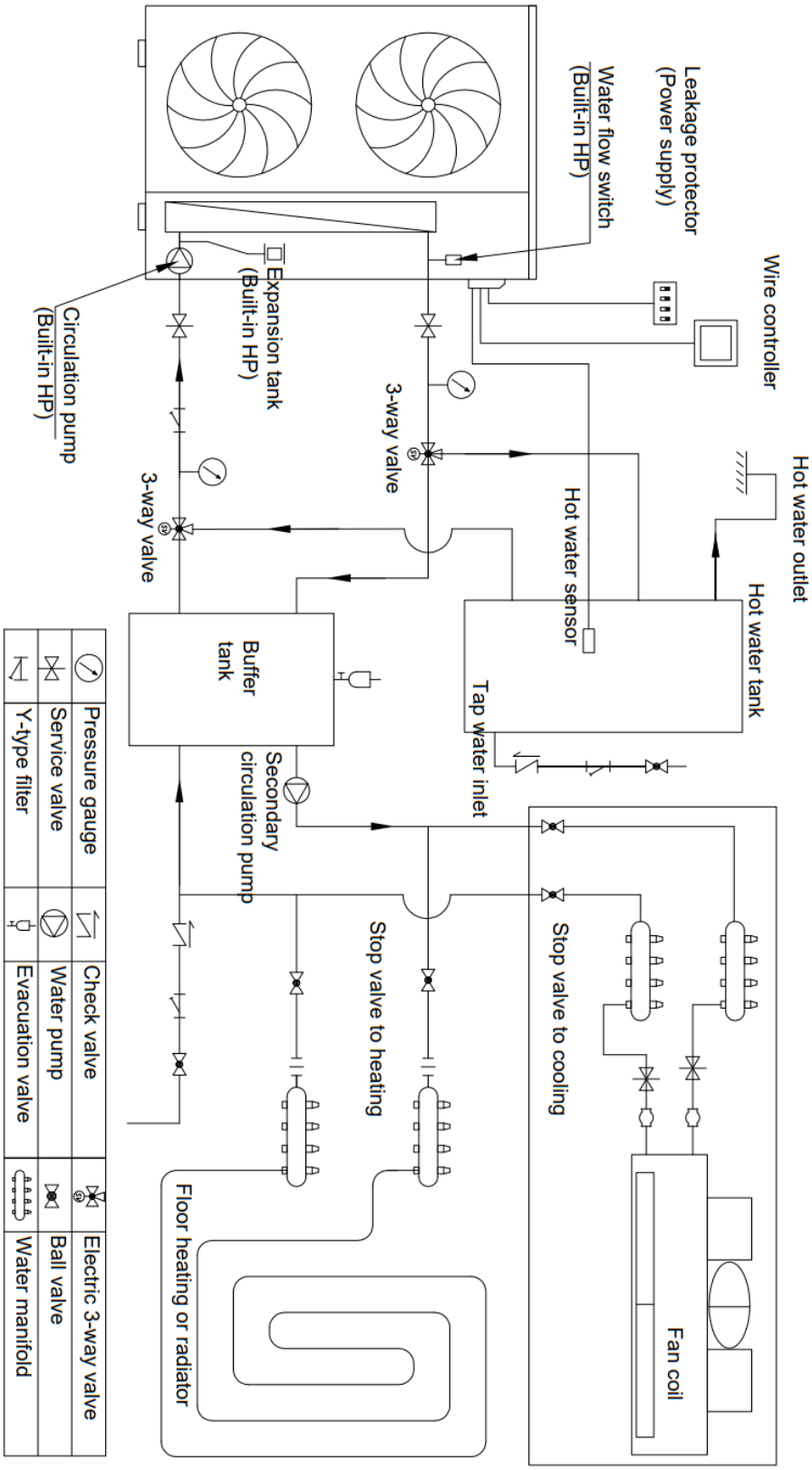
Brazed Plate Heat Exchanger
Size:12x31" & Plate: 100

APOLLO Commercial Expansion
Tank - 40Gal

Option 1 : Primary pump System



Option 2: Secondary Pump System (*Recommend*)



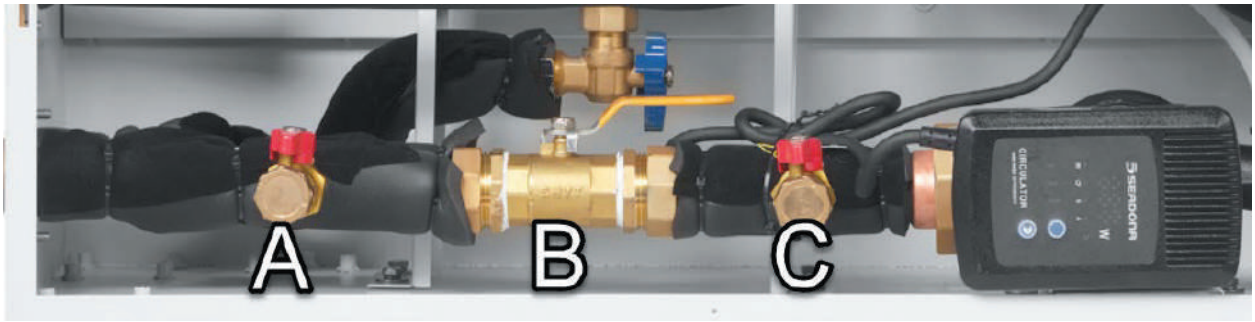
Startup

Commissioning and Startup

WARNING MUST FILL WITH EXACTLY 35% PROPYLENE GLYCOL. NON-COMPLIANCE WILL VOID THE WARRANTY

Glycol Filling Procedure

1. Close valve B ; Open valve A & B
2. Pump the glycol in C and purge air from A using a pail
3. When all air bubbles are removed close valve A and pressurize to 25psi
4. Close valve C and Open B
5. If the system loses pressure, repressurize pumping glycol in valve C.



TO CONSIDER:

- Mix propylene glycol to water as shown in the chart.
- Any installation should have the following pieces:
  - Pump
  - Expansion Tank
  - Relief Valve 75 PSI
  - Air Vent
- System Pressure range needs to be between 15 - 50 PSI.
- A flow bypass valve is needed if all zones are close, the main installation should allow a continuous flow to the unit.
- The main controller operates the heat pump and the usage of thermostats is needed to control the load separately if having multiple zones.
- If planning to use Eco-Mode, make sure general parameters are correct and proceed to enable Eco-Mode.

WARNING: NON-COMPLIANCE WILL VOID THE WARRANTY

Pumpability Chart of Propylene Glycol Mix	
Glycol % /Water%	Region coldest days
35 /65	-10° F (-23°C)
50 / 50	-35° F (-37°C)

IF USING HEAT PUMP STATION:

- Follow the wiring diagram for connecting correctly to the main unit.
- Units should share the same polarity from the main breaker.
- Keep unused ports closed.
- Differential pressure valve water outlet should be used to allow continuous flow to the unit.

5.1.1.Preparation Before Startup

5.1.1.1 Checking-up of the Air Source Heat Pump unit.

A. Check to assure that the appearance of the unit and the inner pipe system are not damaged in the transportation process.

B. Check if there is air in the water pipes of the unit. If yes, please remove all the air through the vent valve on the water tubes and vent valves on the water pump.

C. Check to assure that the blades of the fan do not touch the fixed panel or the protection net of the fan.

5.1.1.2 Checking the electric supply system.

A. Check if the power supply source accords with the power source required in this manual and the nameplate on the unit.
B. Check if all the electric power supply and control lines are connected properly and confirm that the lines are connected according to the diagram and the grounding is reliable and the heads of all the lines are firm enough.

5.1.1.3 Check the pipeline system

A. Confirm that the system pipe, manometer, valves, and other instruments are correctly installed.
B. Confirm that the valves in the system are open or closed properly.
C. Check if the insulation system is in a good condition.

5.1.2 Commissioning

5.1.2.1 The test running of the unit must be operated by a plumber or a HVAC technician.

5.1.2.2 After taking full examination of the whole system, if all parts are confirmed to be according to installation requirements, test running of the entire unit can be done.

5.1.2.3 The unit will turn on automatically 1 minute later after connecting to the electric source and turning on the Heat Pump.

5.1.2.4 Check if the unit is running in accord with the requirements. Users can use the Air Source Heat Pump after Startup for at least 2 hours.

5.2 Qualified installer trial run

Pre-start-up checks:

1. Check the entire pipe system. Ensure the water volume in the system is full and the air is completely exhausted. Check that the water valves are open throughout the system.
2. Check integrity of the piping insulation.
3. Check the power supply and distribution system. Verify that the power supply voltage is normal and that the power distribution accessory screws are tight. Make sure the power supply complies with the wiring diagram and outdoor unit specifications and that the wiring is properly grounded.
4. Check the Heat Pump and make sure all screws are tight.

Trial operation

1. Press the on/off button on the controller. The water pump and fan should start immediately, and the compressor should start shortly after. Observe and determine if there is any abnormal sound during operation. Stop to check the unit if there is abnormal sound. The outdoor unit should continue to run only when there is no abnormal sound.
2. Check whether the system pressure is normal at around 20psi.
3. Check whether the input power and current of the unit are within the parameters set out in this manual. If not, stop the outdoor unit and check it.
4. Observe whether the outlet water temperature is normal.

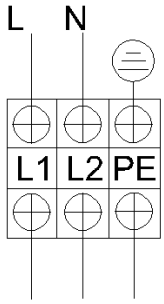
It is recommended to leave the parameters of the controller to the default preset from factory. It is not necessary to alter these settings unless there is a specific need to do so.

POWER DISTRIBUTION REFERENCE TABLE

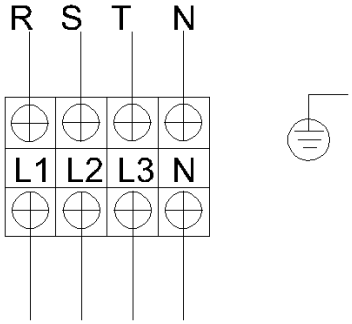
Maximum operating current of unit nameplate (A)	Power supply live wire (mm^2)	Power supply neutral wire (mm^2)	Power supply ground (mm^2)	Circuit Breaker (A)
I＜10	1.5	1.5	1.5	20
10≤ I＜16	2.5	2.5	2.5	32
16≤ I＜25	4	4	4	40
25≤ I＜32	6	6	6	50
32≤ I＜40	10	10	10	63
40≤ I＜63	16	16	10	80
63≤ I＜75	25	25	16	100
75≤ I＜90	25	25	16	125
90≤ I＜120	35	35	25	160
120≤ I＜145	50	50	35	225
145≤ I＜185	70	70	50	250

12. UNIT WIRING PRECAUTIONS

- All electrical connections must be carried out carefully to ensure safe operation and reliable performance of the Commercial Air-to-Water Heat Pump. Only qualified personnel should perform wiring work, and all connections must follow the unit wiring diagram.
- Connect the main power cable directly to the main power terminals inside the unit electrical control box, ensuring all terminals are securely tightened
- Connect the control wiring from the control panel correctly to the designated terminals or connectors on the main control module
- Ensure the unit is properly and reliably grounded; operation without grounding is strictly prohibited
- If the unit is equipped with auxiliary electric heating, connect the power supply and control signal wiring according to the provided diagram
- For outdoor installation, use power cables suitable for external conditions, such as weather-resistant and durable insulated cables (e.g., neoprene sheathed cables or equivalent standard)
- Ensure all cables are properly routed and protected against mechanical damage, moisture, and environmental exposure
- Install an all-pole disconnect switch in the power supply line, with a contact separation of at least 4 mm, to ensure safe isolation during maintenance.



Customer power input cable
220~240V/60Hz



Customer power input cable
380V/3Ph/60Hz

Note: Incorrect wiring, lack of grounding or premature energizing of the system may result in serious equipment damage, system malfunction or personal injury. All wiring must be checked and verified before powering the unit.



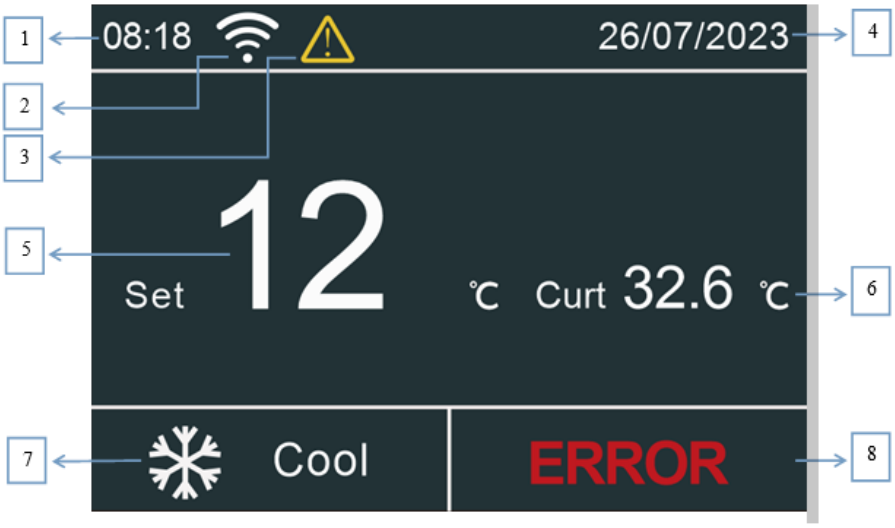
13. OPERATION INSTRUCTION OF WIRE CONTROLLER



13.1 Key Function

Key icon		Function
	Represents the on-off key, to turn the machine on and off.	On-off
	Query key, for query group status. Note: The return key is used in the sub-interface.	Query Return
	Indicates the upward icon, which allows to turn pages upward and add parameters	Upward
	Indicates the downward icon, which allows to scroll down and reduce parameters	Downward
	Indicates the setting icon. The parameter setting directory page is displayed. Note: Confirm, enter or set the key in the sub-interface.	Setting Confirm Enter
	Represents the mode key icon, to set the machine running mode. Note: As a check key in the sub-interface.	Model Check

13.2 Main interface

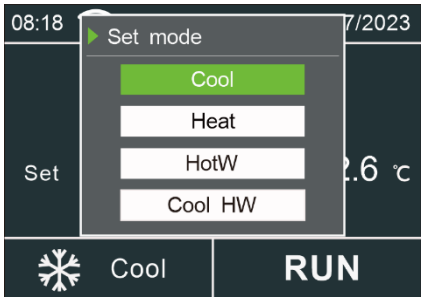


No.	Meaning	Name
1	Indicates the system time (hour: minute).	System time
2	Indicates the strength of the WIFI signal. Display only when the device has this function.	WIFI signal
3	When heat pump have error, this icon will appear and flash	Error icon
4	Represents the system date.	system date
5	Indicates the set temperature of the device in the current operating mode.	Set temperature
6	Indicates the current operating water temperature of the device.	Water temperature
7	Indicates the current running mode of the device.	Running mode
8	Indicates the current status of the device.	Current status

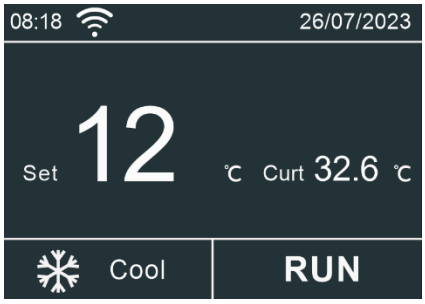
1. MODE SELECTION



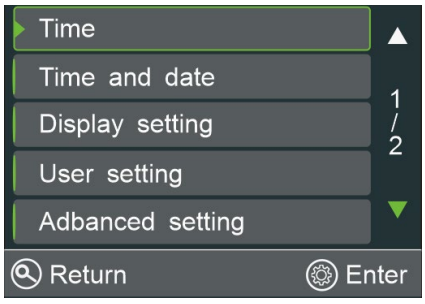
- On the main interface, press the "Model" button to enter the model selection interface.

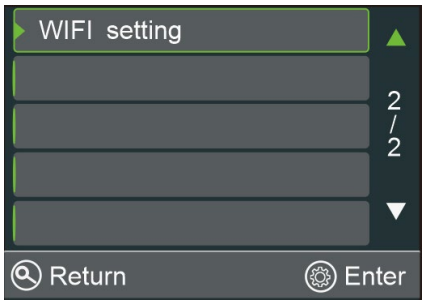


- On this interface, press the "Up" or "Down" button to select the Cool /heat/HotW/Cool HW/Heat HW modes.
- After confirming the model, press the "Confirm" or "Return" button to return to the main interface



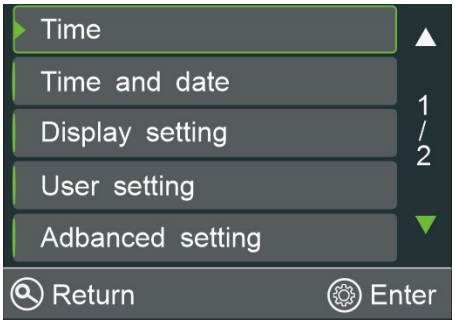
- On the main interface, press [Settings] to enter the parameter setting directory screen



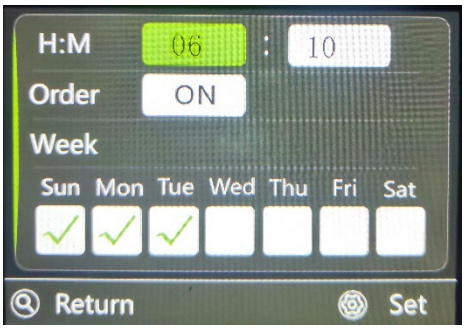


- On the interface, press the "Up" or "Down" button to select the parameters to be set;
- Press the "Enter" button to enter the corresponding setting parameters;
- Press [Back] to return to the main interface;
- Timing Settings: You can set the timing of the device on or off on this screen.
- Time and date: Set the date and time of the system on this screen.
- Display Settings: You can modify the display parameters of the wire controller on this screen.
- User Setting: allows you to set various device parameters on this screen. A user password is required to access the screen.
- Advanced Setting: This option is the option of the device manufacturer.
- WIFI Setting: This is a WIFI connection option.

2. TIMING SWITCH SETTING

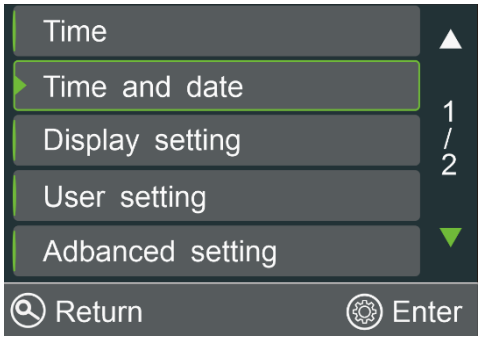


- On the Parameter Setting directory screen, press the [Up] or [Down] button, select Timing Settings, and press the [Enter] button to enter the Timing Settings screen.
- To enter the interface of timing setting, press the "Up" or "Down" button to select the "Time", "Command" and "Week" to be timed (for the selected parameter, the background color will turn green, press "Setting", and then press the "up" or "down" button to adjust the value).

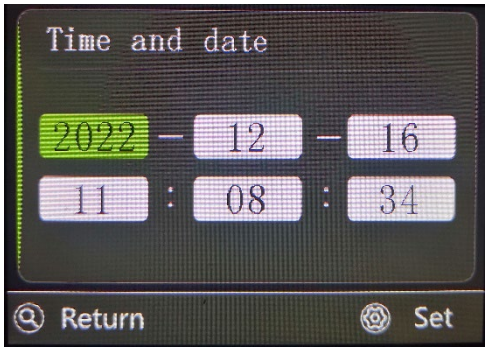


- After setting the timing parameters, remember to press the "Select" button to select the required timing Settings (if not checked, this function will be invalid).
- Three time periods can be set for timed power on/off, and the settings for each period are the same as above.

3. DATE AND YIME SETTINGS

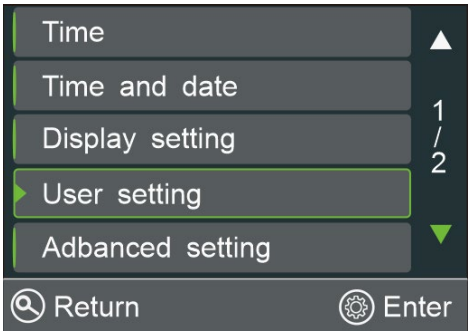


- On the Parameter Setting directory screen, press the [Up] or [Down] key, select User Settings, and press the [Enter] key to enter the User Settings screen.

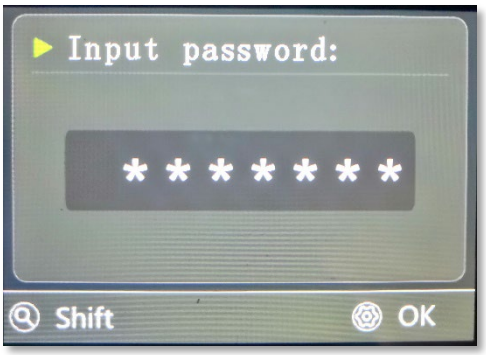


- Enter the "Time and date" interface, press the "Up" or "Down" button, and select the "Year", "month", "day", "hour", "minute" and "second" to be set (for the selected parameter, the background color will turn green, press "Setting", and then press the "up" or "down" button to adjust the value.

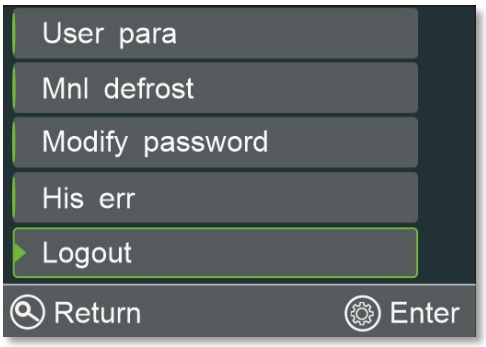
4. USER SET DIRECTORY



- On the Parameter Setting directory screen, press the [Up] or [Down] key, select User Settings, and press the [Enter] key to enter the User Settings screen.

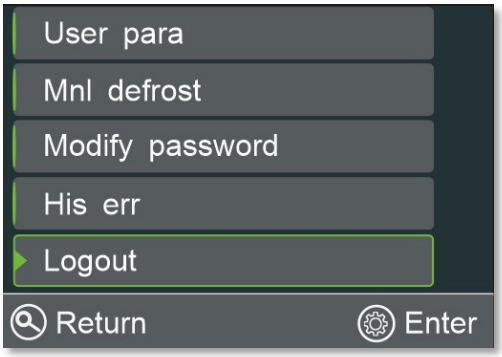


- Enter the " Input password " interface, enter the user password: 123, (press the selected digit "shift", the background color will turn green, then press the "up" or "down" button, respectively from left to right to enter 123 three digit password.
- After entering the password, press the "Confirm" button. If the password is correct, the User Para directory page is displayed.

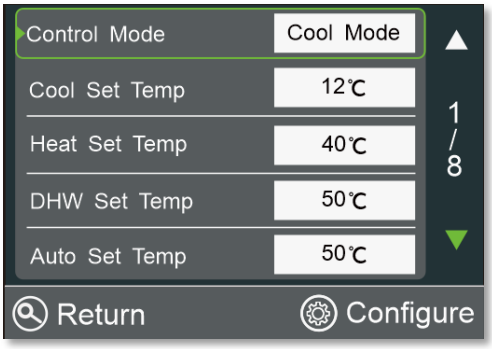


- User Parameters: Set device parameters on this screen.
- "Manual Defrost" : Set manually defrost by entering this interface;
- “Modify Password”: Allows to change the original password on this screen.
- ”His err”: You can view historical faults of the device on this screen.
- “Log Out”: Log out of the user on this screen and restore the function that requires you to enter the password to enter the user Settings.

5. PARAMETER SETTING

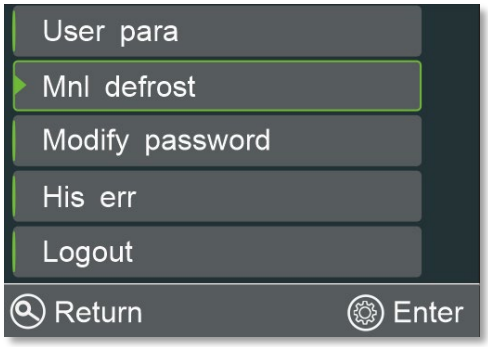


- On the User Para directory screen, press the [Up] or [Down] key, select User Parameters, and press the [Enter] key to enter the User Settings screen.
- Parameter adjustment operation: press the "Up" or "Down" button to select the parameter to be modified, and then press the "Set" button, or press the "Set" button to adjust the parameter through the "Up" or "down" button.

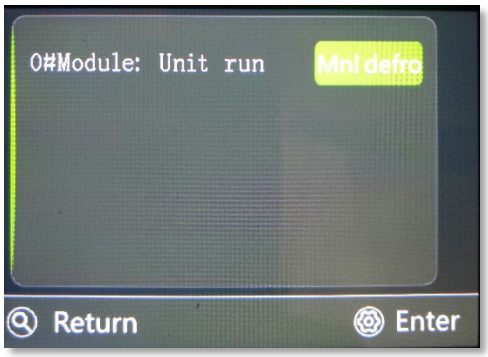


- Press the [Up] or [Down] key, View and set other parameters

6. MANUAL DEFROSTING

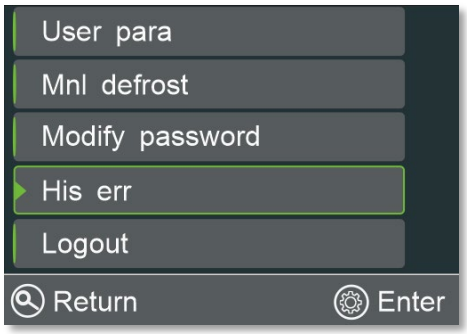


- On the User Parameter directory screen, press the [Up] or [Down] button to select “Mnl Defrost”. Press the [Enter] button to enter the setting screen of “Mnl Defrost”.

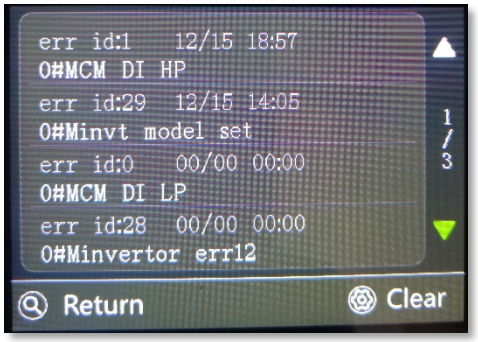


- Press the "Enter" button on the interface, and the device can enter the manual dehumidification state. After defrosting, the device will automatically restore to the original state.

7. HISTORICAL FAULT QUERY

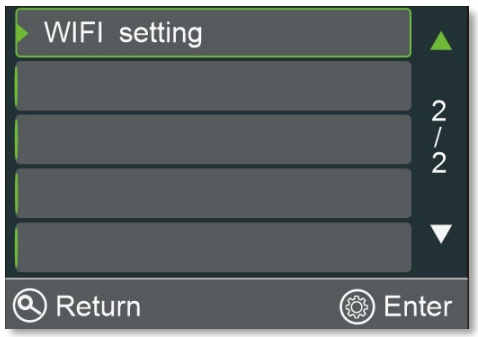


- On the User Parameter Directory screen, press the [Up] or [Down] key, select “His err”, and press the [Enter] key to go to the Historical Fault Query screen.

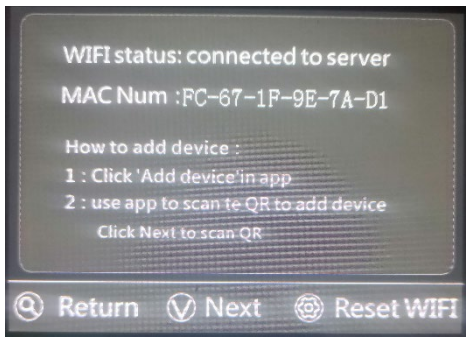


- On this screen, view the fault type and fault occurrence time of the device.
- In this interface, press the "Clear" button to clear all fault records (once the fault records are cleared and cannot be recovered, please exercise caution)

8. WIFI SETTING



- On the parameter setting directory screen, press the "Up" or "Down" button, select "WIFI Setting", and press the "Enter" button to enter the "WIFI Setting" screen.

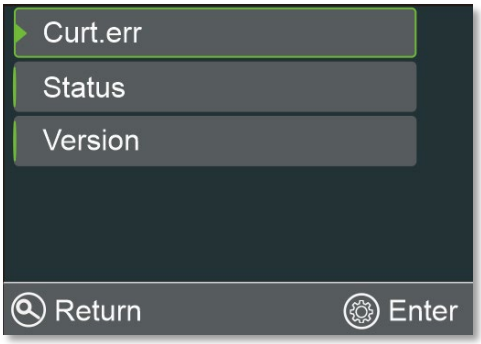


- Follow the instructions step by step to connect to WIFI and control the device through the APP.

9. DEVICE INFORMATION QUERY

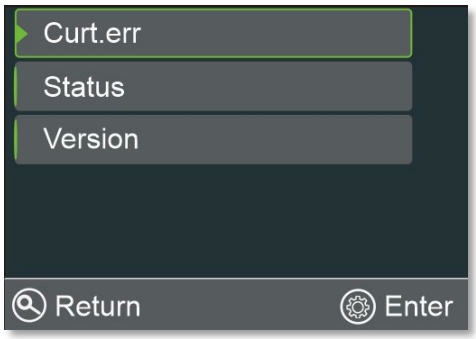


- On the home screen, press Query to enter the Query Device Status screen.



- “Curt.err”: Query the current fault of the device.
- ”Status”: Queries the current running status
  parameters of the device.
- "Version": Query the driver version number of the device.

10. CURRENT FAULT QUERY

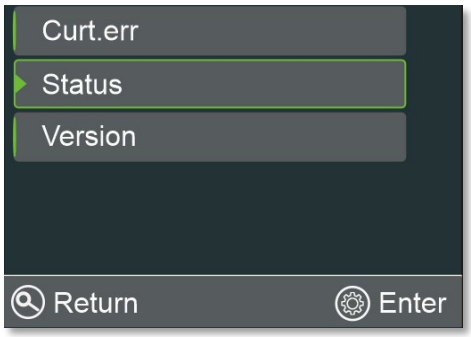


- On the device status query screen, press the [Up] or [Down] key and select“Curt.err”. The Current Fault screen is displayed.

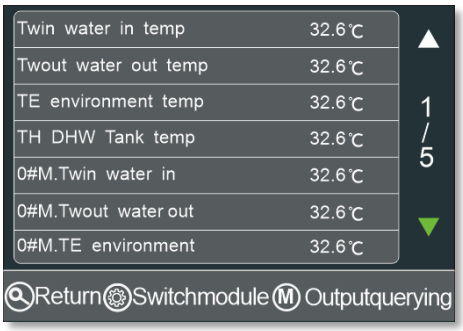


- Press the “Detail” button to viewing err information;
- After the fault is removed, press the "Reset" button to eliminate the current fault.

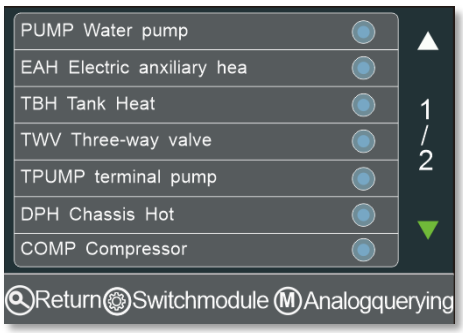
11. STATUS QUERY



- On the device status query screen, press the [Up] or [Down] key and select "Status Query". The "Status Query" screen is displayed.

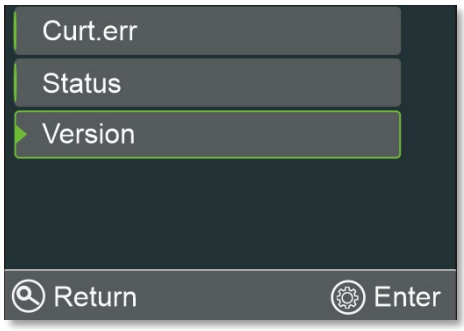


- Press the "Up" or "Down" button to turn the page and view other status parameters;
- Press the "Outputquerying" button to check the output status of the device;
- ”Switch module” button, which only works when a wire controller controls multiple units.



- Press the "Up" or "Down" button to turn the page and view other output status of the device;
- Press the "Analogquerying" button to check the status parameters;
- ”Switch module” button, which only works when a wire controller controls multiple units.

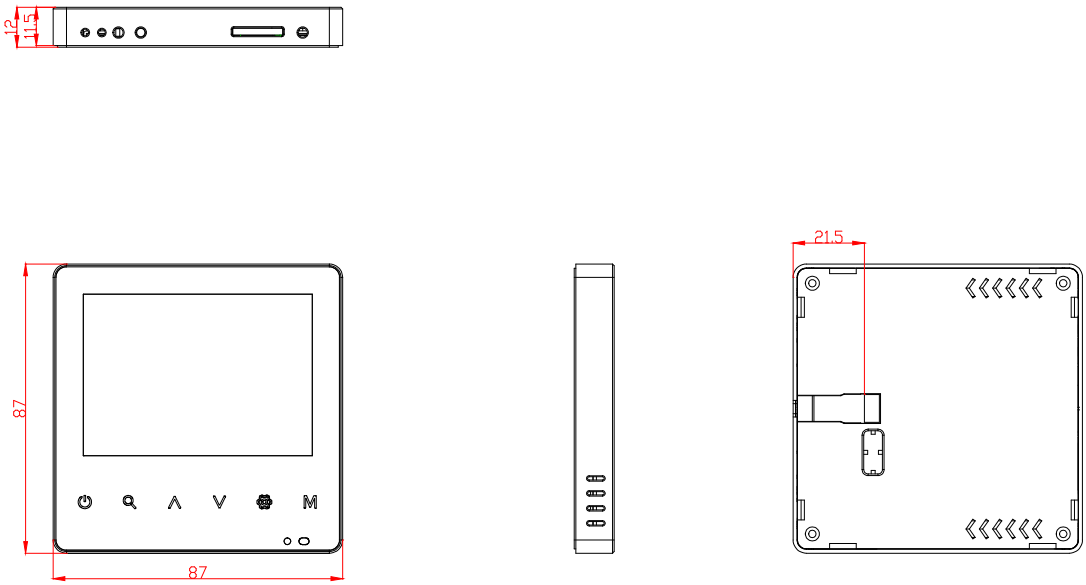
12. VERSION QUERY



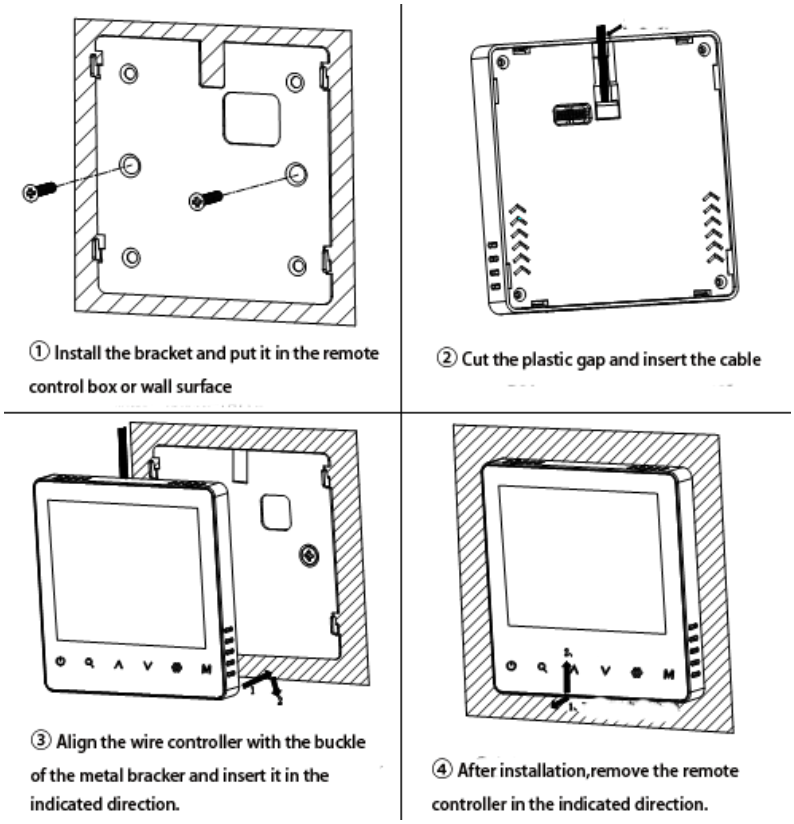
12. Version Query

- On the device status query screen, press the [Up] or [Down] key and select “Version”. The “Version” screen is displayed.

14. WIRE CONTROLLER DIMENSION AND INSTALLATION



Wire controller dimension (unit:mm)



Wire controller installation

15. Maintenance Schedule

This unit must be maintained properly to ensure long-term reliability, efficiency, and safety. All maintenance work must be carried out by qualified service personnel only.

15.1 Daily/Weekly Checks

Maintenance Item	Action Required	Purpose
Water System Operation	Ensure continuous water flow, stable temperature, no abnormal noise	Prevents system shutdown, freezing, and performance loss
Visual Unit Inspection	Check for vibration, unusual noise, and water leakage	Early detection of mechanical issues
General Operation Status	Confirm unit is running normally without alarms	Avoids unexpected system trips

15.2 Monthly Maintenance

Maintenance Item	Action Required	Purpose
Water Filter (Strainer)	Clean and remove dirt, sludge, and debris	Prevents blockage and protects heat exchange
System Pressure Check	Ensures stable performance	Ensures stable performance
Component Check	Inspect compressor, fans, and pump operation	Maintains reliable system performance

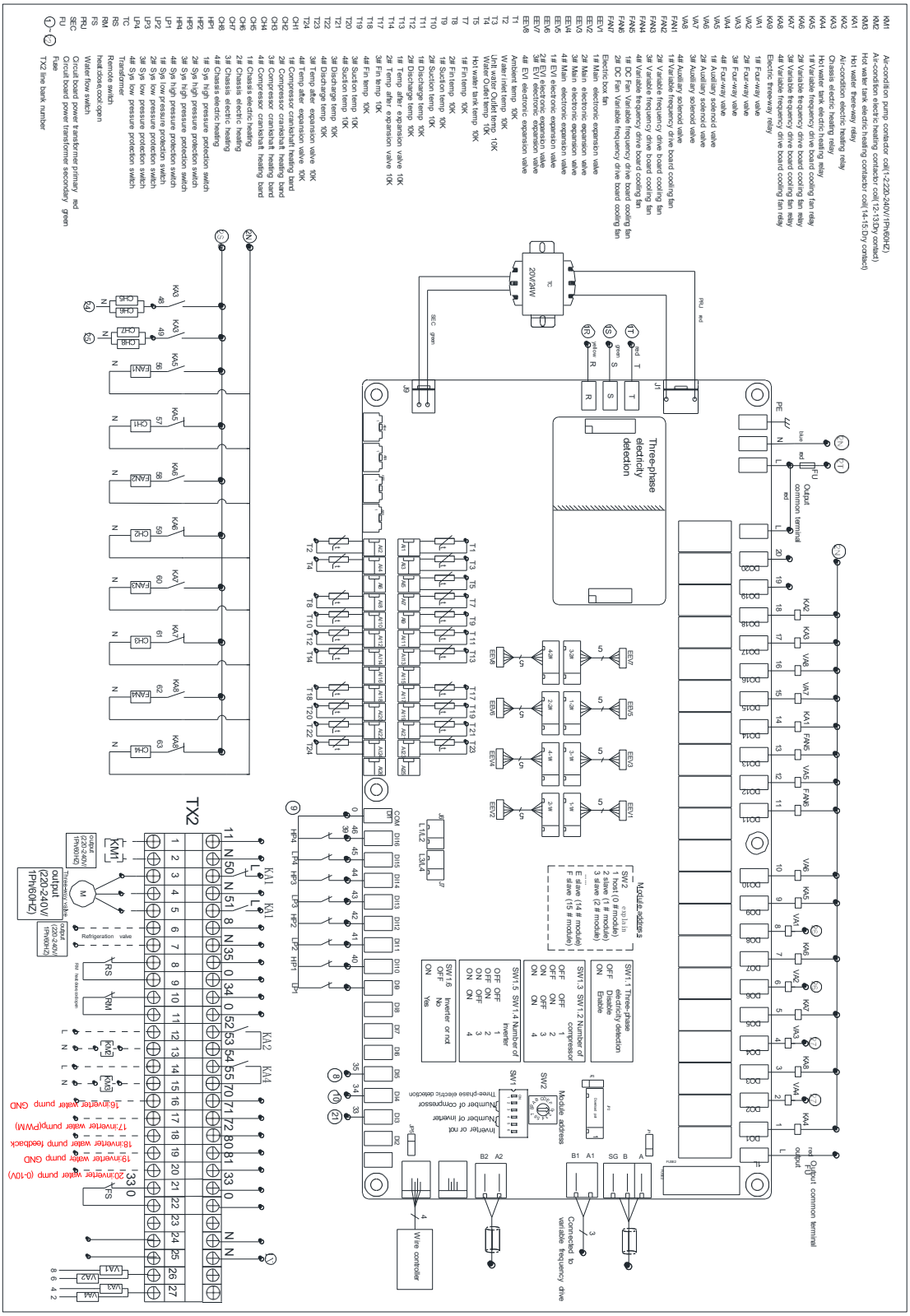
15.3 Quarterly Maintenance

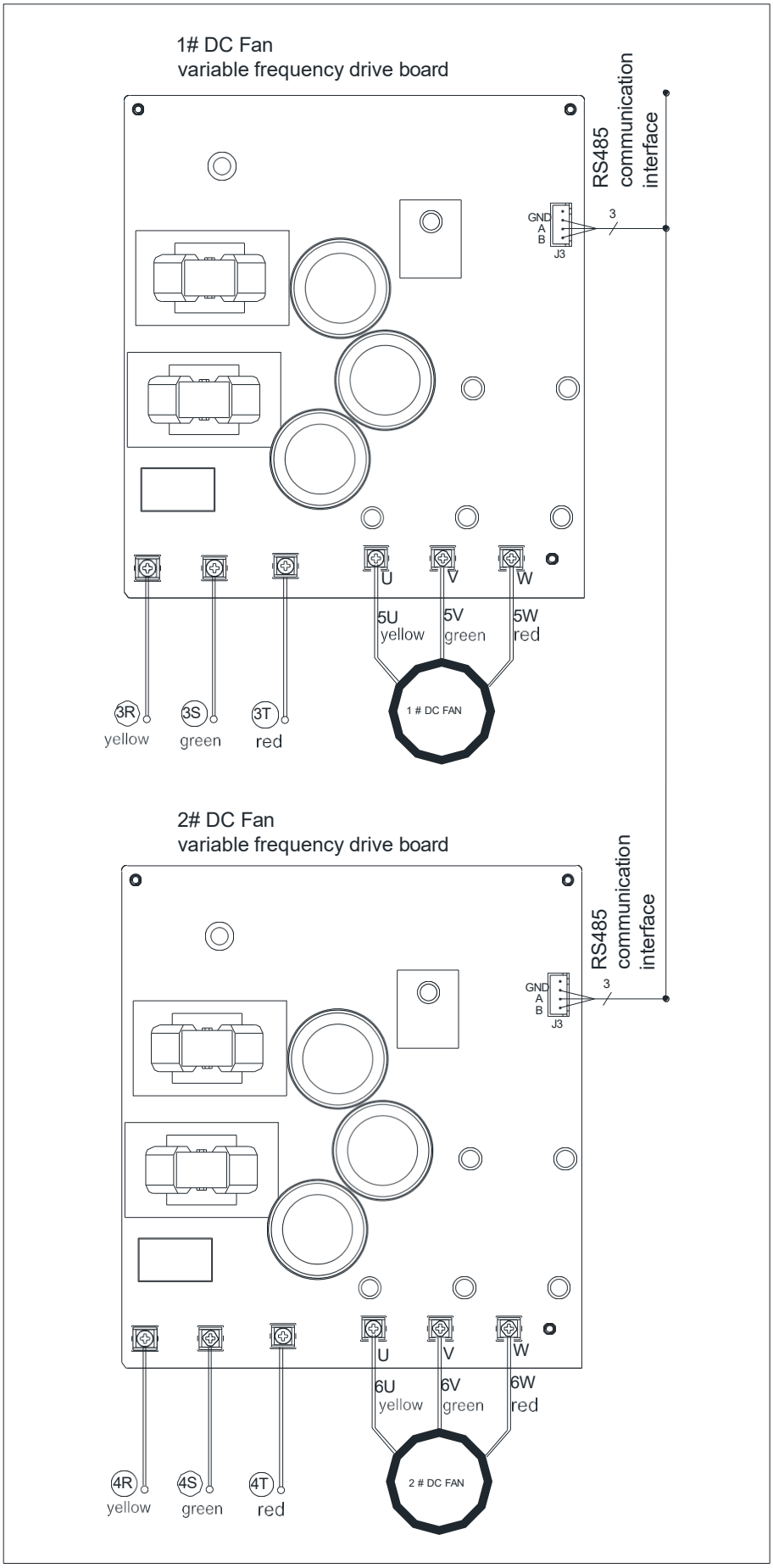
Maintenance Item	Action Required	Purpose
Electrical Connections	Tighten terminals and inspect wiring condition	Prevents overheating and electrical faults
Electrical Components	Check for abnormal smell, overheating, or damage	Avoids serious electrical failures
Electrical Components	Compare operating parameters with normal values	Detects hidden issues early

15.4 6-Month Maintenance

Maintenance Item	Action Required	Purpose
Water System Cleaning	Clean internal piping and heat exchanger	Maintains heat transfer efficiency
Scale & Deposit Removal	Remove sludge, scale, and buildup	Reduces energy consumption and prevents damage

16. WIRING DIAGRAM




1# DC Fan
variable frequency drive board
RS485 communication interface
GND
A
B
J3
3
U
V
W
5U
yellow
5V
green
5W
red
1 # DC FAN
3R
yellow
3S
green
3T
red
2# DC Fan
variable frequency drive board
RS485 communication interface
GND
A
B
J3
3
U
V
W
6U
yellow
6V
green
6W
red
2 # DC FAN
4R
yellow
4S
green
4T
red

17. PERFORMANCE DATA

Heating Capacity KW

Ambient Temperature (ºF)														
Water Outlet (ºF)	-22	-13	-4	5	19,4	35,6	44,6	53,6	68	73,4	78,8	84,2	89,6	95
90	88,00	100,00	116,00	132,00	150,00	170,00	186,00	206,00	230,00	236,00	242,00	248,00	254,00	260,00
95	86,00	98,00	114,00	130,00	148,00	168,00	184,00	204,00	228,00	234,00	240,00	246,00	252,00	258,00
113	82,00	94,00	110,00	126,00	144,00	164,00	180,00	200,00	222,00	230,00	236,00	242,00	248,00	254,00
131	78,00	90,00	106,00	122,00	140,00	160,00	176,00	196,00	216,00	226,00	232,00	238,00	244,00	250,00
140	76,00	88,00	104,00	120,00	138,00	158,00	176,00	194,00	214,00	224,00	230,00	236,00	242,00	248,00

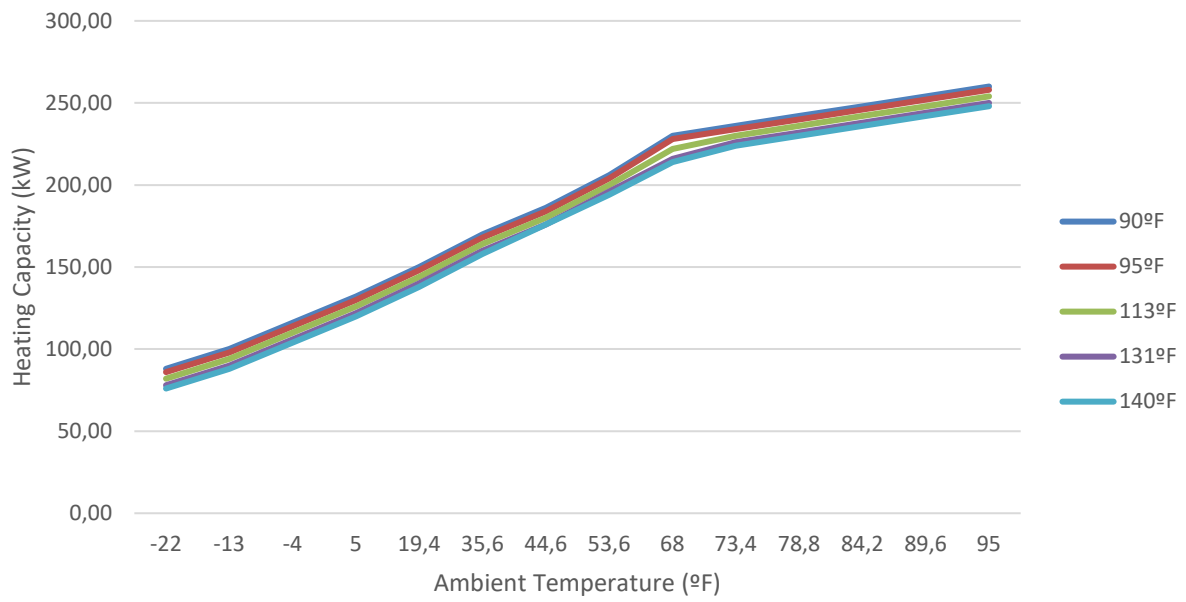
Power Input kW

Ambient Temperature (ºF)														
Water Outlet (ºF)	-22	-13	-4	5	19,4	35,6	44,6	53,6	68	73,4	78,8	84,2	89,6	95
90	44,20	45,80	47,20	48,20	49,80	52,80	54,40	56,20	57,80	59,60	60,40	61,40	62,40	63,40
95	44,80	46,40	47,80	48,80	50,40	53,40	55,00	56,80	58,40	60,20	61,00	62,00	63,00	64,00
113	43,80	45,40	46,80	57,80	49,40	52,40	54,00	55,90	58,60	60,40	61,20	62,20	63,20	64,20
131	42,80	44,40	45,80	56,80	48,40	51,40	53,00	55,10	58,80	60,60	61,40	62,40	63,40	64,40
140	47,40	49,00	50,40	51,40	53,00	56,00	57,60	59,40	59,40	61,20	62,00	63,60	64,00	65,00

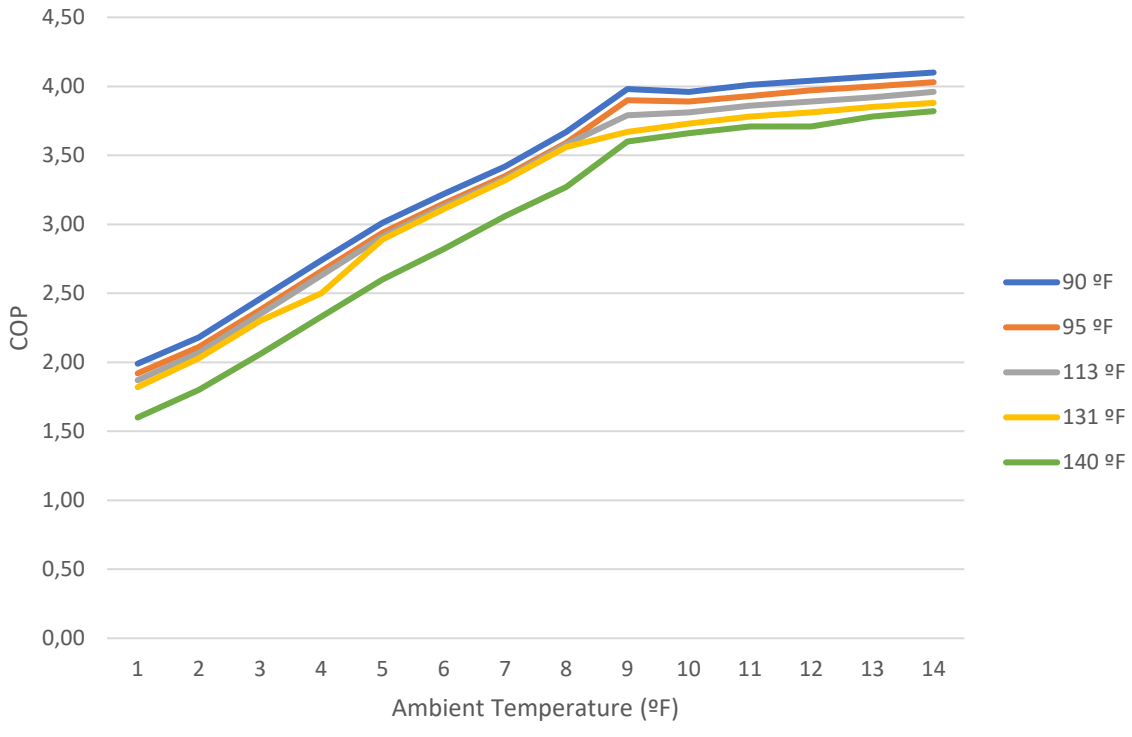
COP

Ambient Temperature (ºF)														
Water Outlet (ºF)	-22	-13	-4	5	19,4	35,6	44,6	53,6	68	73,4	78,8	84,2	89,6	95
90 ºF	1,99	2,18	2,46	2,74	3,01	3,22	3,42	3,67	3,98	3,96	4,01	4,04	4,07	4,10
95 ºF	1,92	2,11	2,38	2,66	2,94	3,15	3,35	3,59	3,90	3,89	3,93	3,97	4,00	4,03
113 ºF	1,87	2,07	2,35	2,63	2,91	3,13	3,33	3,58	3,79	3,81	3,86	3,89	3,92	3,96
131 ºF	1,82	2,03	2,30	2,50	2,89	3,11	3,32	3,56	3,67	3,73	3,78	3,81	3,85	3,88
140 ºF	1,60	1,80	2,06	2,33	2,60	2,82	3,06	3,27	3,60	3,66	3,71	3,71	3,78	3,82

Heat Performance Curve



COP Curve



APOLLO

APOLLO Heat Pump
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888-301-0737



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Wayne NJ 07470
USA