



P-K EvoHP Installation and Instruction Manual

Patterson-Kelley
155 Burson Street
East Stroudsburg, PA 18301
Telephone: (570) 476-7261
Toll Free: (877) 728-5351
Facsimile: (570) 476-7247
www.pattersonkelley.com

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1. Preface

Welcome to the air source water heat pump.

By choosing this heat pump, you're setting the stage for years of rewarding performance. This guarantees that you've acquired a top-tier heat pump system, meticulously crafted in a state-of-the-art facility and driven by innovation.

Qualified Personnel only

Only qualified personnel are authorized to carry out the positioning, installation, and commissioning procedures in accordance with the provided operating and installation instructions.

For information

For informational purposes, the pictures and diagrams in this manual serve as reference material. The manufacturer reserves the right to modify or enhance the product as necessary, without prior notification to users.

Necessary reading

It is imperative to thoroughly review and securely retain these operating and installation instructions. In the event of equipment transfer, these instructions must be passed on to the subsequent owner and provided to trained contractors for servicing purposes.

Protection

Safety precautions must be observed, especially when children or individuals with limited physical, sensory, or mental capabilities are involved in operating this equipment. Supervision or instruction by a responsible individual is required to ensure safe usage, and children should be monitored to prevent any misuse.

Quality check at first receipt of this product

Upon receipt of the product, a thorough quality check is recommended to detect any transportation damage. In case of damage, please contact the forwarder or contractor promptly.

To ensure the integrity of the heat pump unit for future installation, please adhere to the following guidelines to prevent damage, rust, or abrasion:

1. Ensure all water connections are properly sealed.
2. Store the unit away from direct sunlight and maintain a temperature below 113°F (45°C).
3. Keep the unit free from heavy dust accumulation to prevent dirt buildup on the evaporator.
4. Store the unit in an organized manner to minimize the risk of accidents.
5. Periodically inspect the unit during storage to identify any potential issues."





2. Safety Precautions




To ensure the safety of users and prevent damage to the unit or other property, as well as to facilitate proper utilization of the heat pump, it is imperative to thoroughly review and comprehend this manual.

Installation of piping connections and wiring must adhere to local legal statutes, regulations, and professional standards.

2.1 Mark Notes



| Mark | Meaning |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
|  WARNING | A wrong operation may lead to death or heavy injury on people. |
|  ATTENTION | A wrong operation may lead to harm on people or loss of material. |



2.2 Icon Notes




| Icon | Meaning |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|  | Prohibition. What is prohibited will be nearby this icon. |
|  | Compulsory implement. The listed action need to be taken. |
|  | ATTENTION (include WARNING) Please pay attention to what is indicated. |



2.3 Warning




| Installation | Meaning |
|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
|  Professional installer is required. | The heat pump must be installed by qualified personals, to avoid improper installation which can lead to water leakage, electrical shock, or fire. |
|  Grounding is required | The heat pump must be installed by qualified personnel, to avoid improper installation which can lead to water leakage, electrical shock, or fire. |





| Operation | Meaning |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|  PROHIBITED | DO NOT put fingers or others into the fans and evaporator of the unit, otherwise harm may occur. |
|  Shut off the power | When there is something wrong or a strange smell, the power supply needs to be shut off. Continuing to run may cause an electrical short or fire. |

| Move and repair | Meaning |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  Entrust | When the heat pump needs to be moved or installed again, please entrust dealer or qualified personnel to carry it out. Improper installation may lead to water leakage, electrical shock, injury or fire. |
|  Entrust | When the heat pump needs to be repaired, please entrust dealer or qualified personnel to carry it out. Improper movement or repair on the unit may lead to water leakage, electrical shock, injury, or fire. |
|  Prohibited | It is prohibited to repair the unit by the user himself, otherwise electrical shock or fire may occur. |



2.4 Attention

| Installation | Meaning |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
|  Installation Place | The unit CANNOT be installed near any flammable gas. If there is any leakage of gas, fire can occur. |
|  Fix the unit | Make sure that the base of the heat pump is strong enough, to avoid any decline or falling down of the unit |
|  Need circuit breaker | Make sure that there is a circuit breaker for the unit, as lack of a circuit breaker can lead to electrical shock or fire. |

| Operation | Meaning |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
|  Check the installation base | Please check the installation base in a period (one month), to avoid any decline or damage on the base, which may hurt people or damage the unit |
|  Switch off the power | Please switch off the power for cleaning or maintenance. |
|  Prohibited | It is prohibited to use copper or iron as a fuse. The right fuse must be fixed by a qualified electrician for the heat pump. |
|  Prohibited | It is prohibited to spray flammable gas on or near the heat pump, as it may cause fire. |



3. Overall Information of the heat pump

3.1 Device description

The air source heat pump operates by extracting heat from the surrounding air and transferring it to water. This energy is then circulated to efficiently warm the house. With the utilization of floor heating, the heat pump's Coefficient of Performance (COP) can reach as high as 4.5. Additionally, the system offers the capability for reverse cooling when necessary.

Compared to oil boilers, gas boilers, and electric heaters, the heat pump stands out as the optimal solution due to its high efficiency, safety features, and environmental friendliness.

Equipped with advanced heating technology and an intelligent control system, this air source heat pump can generate hot water at temperatures of up to 149°F / 65°C, suitable for various applications including radiators, fan coils, and floor heating.

Furthermore, the heat pump can also serve sanitary purposes, providing hot water for use in kitchens, showers, and other similar applications.

3.2 Features of the AIR HEAT PUMP

1. Environmental Conservation through Green Technology

The heat pump operates by transferring heat from the air to indoor spaces for heating purposes, eliminating the need for combustion and thus reducing waste and harmful emissions. This environmentally friendly approach helps to preserve the Earth's resources and maintain a healthy environment for human habitation.

2. Efficiency and Cost Savings for Enhanced Service

Driven by electricity, the heat pump boasts an average efficiency rating exceeding 4 annually. Through the utilization of timer functions, users can optimize energy consumption during off-peak hours, resulting in significant cost savings for households.

3. Promoting Safety and Well-being

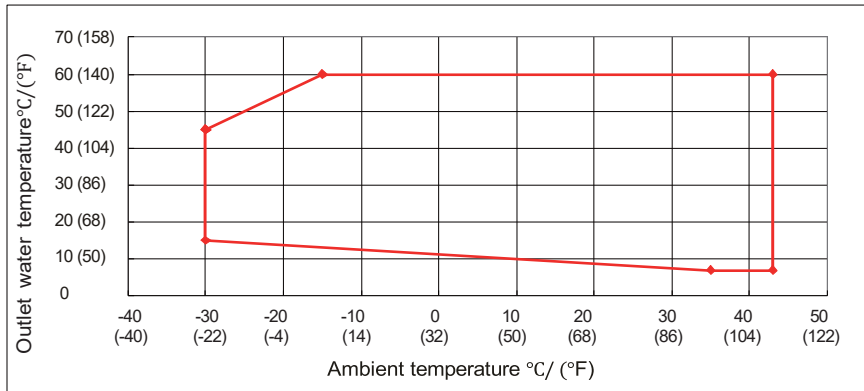
Utilizing a heat pump for heating purposes mitigates the risks associated with electrical shocks and burns, thereby ensuring the safety of individuals and minimizing the likelihood of accidents such as explosions or poisoning.

4. User-Friendly Operation

Controlled and safeguarded by a micro-computer-based controller, the heat pump offers ease of operation. Users can set the desired water temperature according to specific requirements, while a comprehensive system protection program ensures reliable operation even in challenging environments.



3.3 Running Range



3.4 New Technology

1. Enhanced Vapor Injection (EVI) Heating Technology

Compared with normal heat pump systems, heat pumps with EVI greatly improve the system running safely in low ambient temperature.

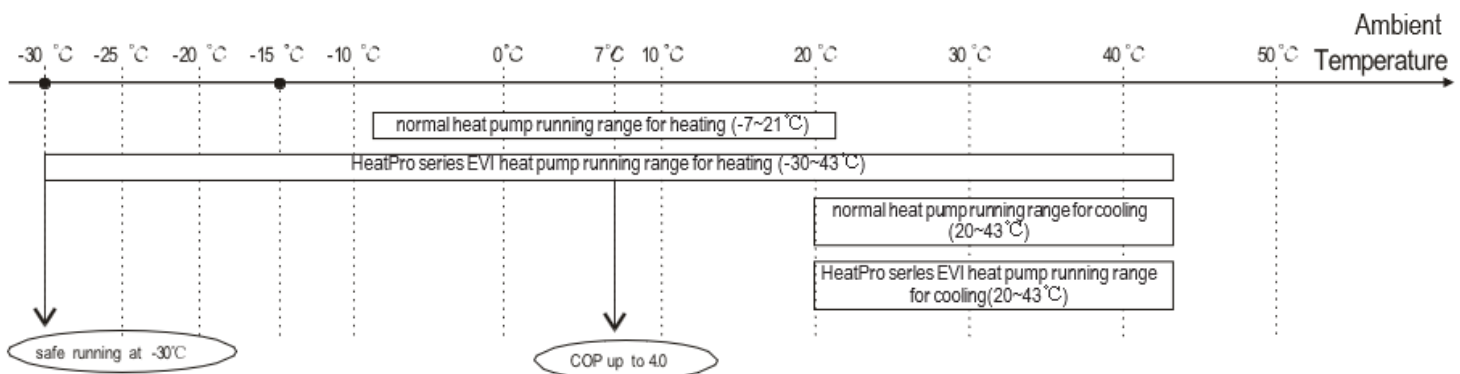
Meanwhile, COP is increased by 15% and heating capacity is increased by 20%. Low

2. Ambient Temperature Heating Capability

This heat pump is engineered to operate efficiently and reliably even in extreme cold conditions, maintaining optimal performance down to -30°C ambient temperature.

3. High Coefficient of Performance (COP)

Achieving a COP of 4.0 under rated heating conditions, this heat pump demonstrates exceptional energy efficiency, delivering substantial heating output while minimizing energy consumption.





4. **Advanced Heating/Cooling Features with Smart Defrost and Auto Protection**

This heat pump incorporates intelligent functions including smart defrost, auto protection, multiple module control, automatic reset for partial failures, auto alert system, and remote-control capabilities. These features ensure efficient operation and safeguard the unit against various operational challenges.

5. **Comprehensive Heat Pump Protection Measures**

To ensure reliable performance and longevity, the heat pump is equipped with a range of protective mechanisms. These include water flow protection, compressor overload protection, discharge air temperature protection, discharge air pressure over-high protection, suction air pressure over-low protection, water (out) temperature over-high protection, water (out) temperature over-low protection, suspension of anti-freezing protection in winter, and protection against compressor frequent switching. These safeguards minimize the risk of damage and ensure optimal functioning in diverse conditions.



3.5 Specification data

| | | |
|-------------------------------------------------|-------|----------------------------------------|
| Model | | HP700 |
| *Heating Capacity | kW | 45.5-145.3 |
| | Btu/h | 154700-494020 |
| **Heating Capacity | kW | 74.8-215.0 |
| | Btu/h | 254320-731000 |
| Cooling Capacity | kW | 46.6-132.0 |
| | Btu/h | 158440-448800 |
| *Power Input for Heating | kW | 15.8-62.2 |
| **Power Input for Heating | kW | 18.8-75.4 |
| Power Input for Cooling | kW | 16.5-56.2 |
| Running Current (*Heating/**Heating/Cooling) | A | 25.5-100.4/30.4-121.7/26.6-90.7 |
| Power Supply | | 440-460V/3N~/60Hz |
| Compressor Quantity | | 4 |
| Compressor Type | | Scroll |
| Fan Quantity | | 2 |
| Fan Rotate Speed | RPM | 300-700 |
| Noise | dB(A) | 63-72 |
| Water Connection | mm | DN80 |
| Water Flow Rate | m³/h | 23.2 |
| Water Pressure Drop | kPa | 80 |
| Unit Dimension (L/W/H) | mm | (Subject to drawings of the heat pump) |
| Packing Size (L/W/H) | mm | (Subject to data on the package) |
| Net Weight | kg | (Subject to data on the nameplate) |
| Gross Weight | kg | (Subject to data on the package) |

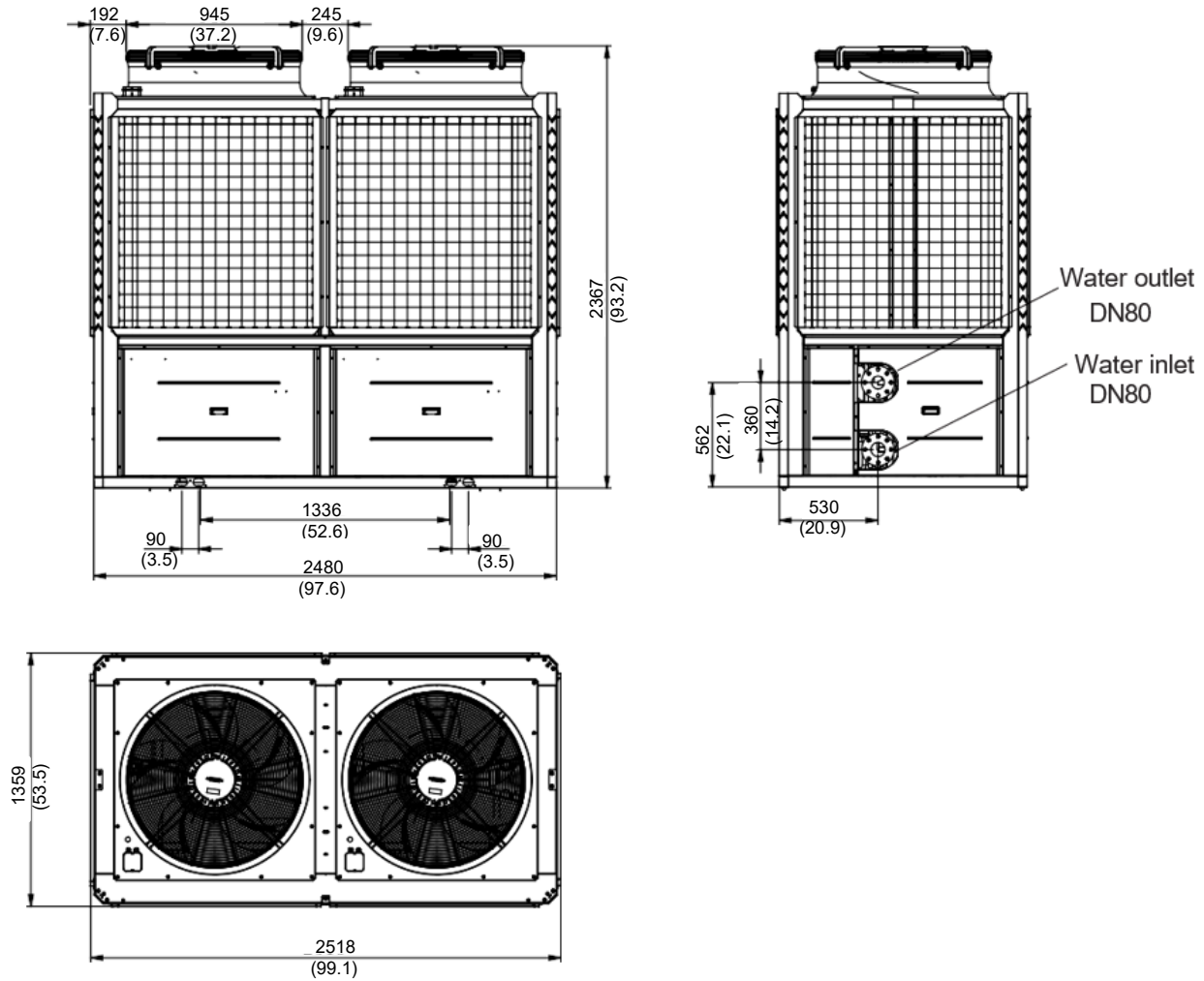
- 1.*Heating: ambient temp.(db/wb): -12°C / -14°C (10°F / 7°F),water temp.(out): 41°C (106°F)
- 2.**Heating: ambient temp.(db/wb): 7°C / 6°C (44°F / 43°F),water temp.(in/out):40°C / 45°C (104°F / 113°F)
- 3.Cooling: ambient temp.(db/wb): 35°C / 24°C (95°F / 75°F),water temp.(in/out):12°C / 7°C (54°F / 45°F)



3.6 Heat pump dimension and view

Model: HP700

Unit: mm / (in)





4. Installation

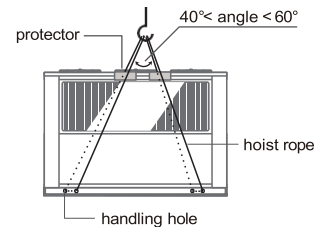
4.1 Transit

During transportation, it is imperative to maintain the heat pump in an upright position. Laying the unit down may result in damage to its internal components.



When suspending the unit during installation, ensure the availability of an 8-meter cable, with soft material placed between the cable and the heat pump cabinet to prevent any damage. Refer to picture 1 for clarification.

Alternatively, utilizing a forklift is recommended, as the package includes a wooden chassis for added protection.



WARNING

DO NOT touch the heat exchanger of the heat pump with fingers or other objects!

4.2 Installation occasions

- The unit can be installed outdoors on surfaces capable of supporting heavy machinery, including terraces, rooftops, and ground areas.
- Adequate ventilation is necessary at the installation site to promote optimal performance.
- The location should be free from heat radiation and open flames to mitigate potential risks.
- During winter, utilize a protective cover, such as a pall (refer to picture 2), to shield the heat pump from snow accumulation.
- Ensure there are no obstructions near the air inlet and outlet to maintain proper airflow.
- Establish a water channel around the unit to facilitate condensate drainage.
- Choose a location sheltered from strong air currents to prevent operational disruptions.
- Allow sufficient space around the unit to accommodate maintenance and servicing requirements.

4.3 Installation method

The heat pump can be installed using expansion screws onto a concrete base or secured onto a steel frame with rubber feet, suitable for placement on the ground or rooftops. It is imperative to ensure that the unit is positioned horizontally during installation to guarantee proper functionality.

4.4 Water loop connection

Please pay attention to below matters when the water pipe is connected:

- Minimize water resistance within the piping system.
- Ensure that the piping is clean and devoid of any obstructions or debris. Conduct a water leakage test before insulation to confirm the absence of leaks.
- Conduct pressure testing on the pipe individually; avoid testing it simultaneously with the heat pump.
- Install an expansion tank at the highest point of the water loop, with the water level maintained at least 0.5 meters above the loop's apex.
- Verify the wiring and operation of the flow switch, located within the heat pump, to ensure normal functionality under controller control.
- Opt for flexible connections between the heat pump and the structure to mitigate vibration transmission. Support for the water pipe should be independent and not reliant on the heat pump unit.

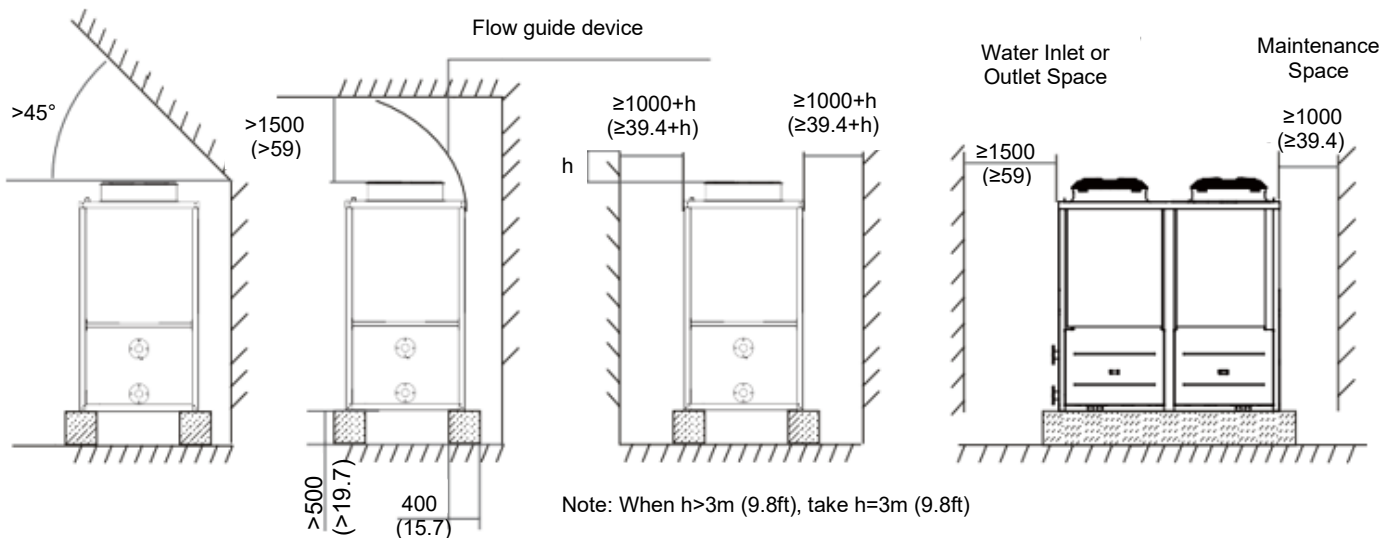


- Minimize air entrapment within the water pipe, incorporating an air vent at the highest point of the water loop.
- Install thermometers and pressure gauges at the water inlet and outlet for convenient monitoring during operation.
- Provide drainage at low points of the water system, including drainage on the heat pump chassis. During inactive periods in winter, drain the water from the system. Additionally, incorporate an air vent at the system's highest point to purge air.
- Insulation is unnecessary for drainage and air vents to facilitate maintenance.

4.5 Location of the unit

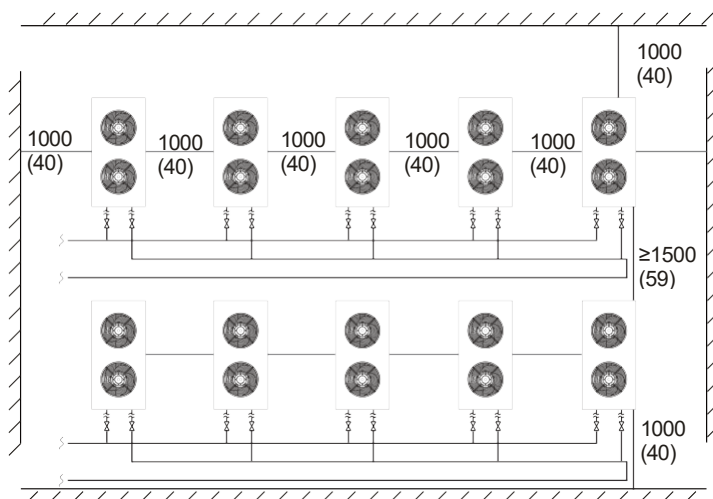
The unit can be installed individually or in multiple configurations. When installing multiple units in combination, careful attention should be given to their arrangement.

Installation space for single unit: unit: mm / (in)





Installation space for multiple units (same pipe length): unit: mm (in)



NOTE:

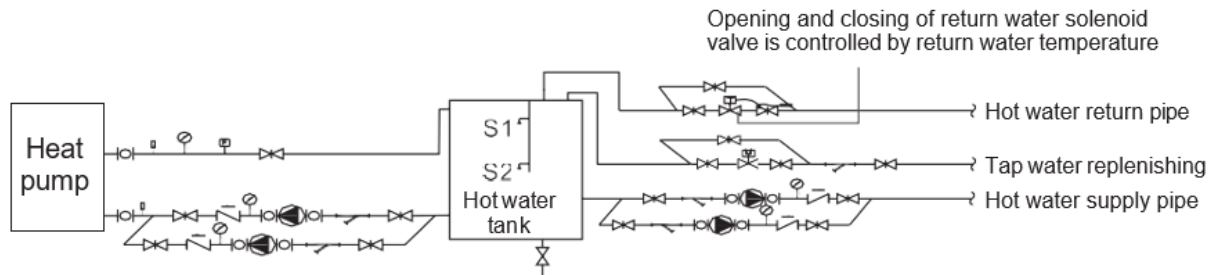
- Ensure that the air outlet of the unit remains uncovered.
- If there is an obstruction above the unit, maintain a clearance of 3000mm/118in.
- In case of objects stacked around the unit, ensure that their height is at least 400mm/16in lower than the top of the unit.
- When installing the unit in a confined space, take necessary precautions to prevent refrigerant leakage. Exceeding the permissible concentration of leakage may result in suffocation. Please consult your dealer for detailed guidance on precautionary measures.



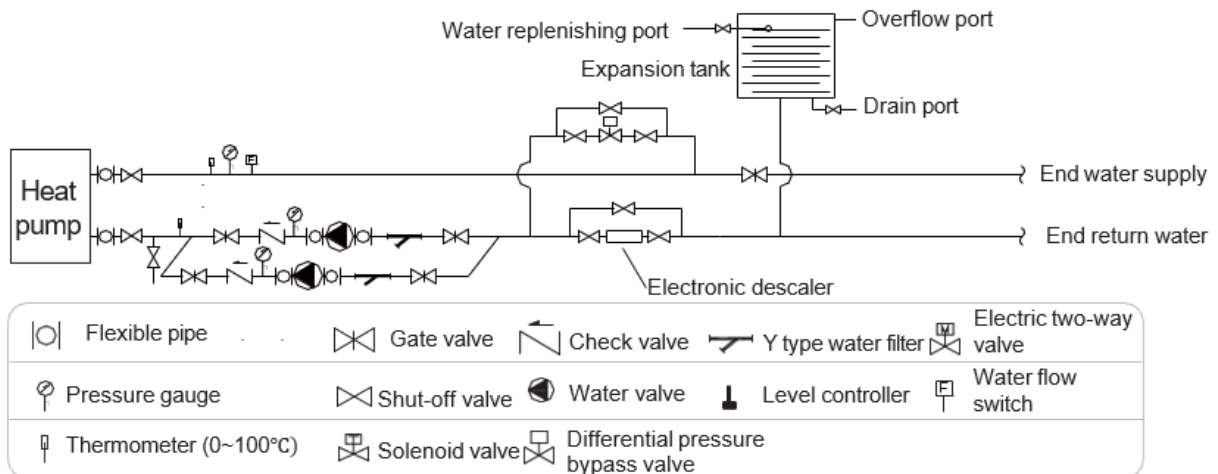
1.6 Water Connection Diagram

4.6.1 Water Circuit Installation Diagram

Hot Water Circuit Diagram



Heating (cooling) water circuit diagram





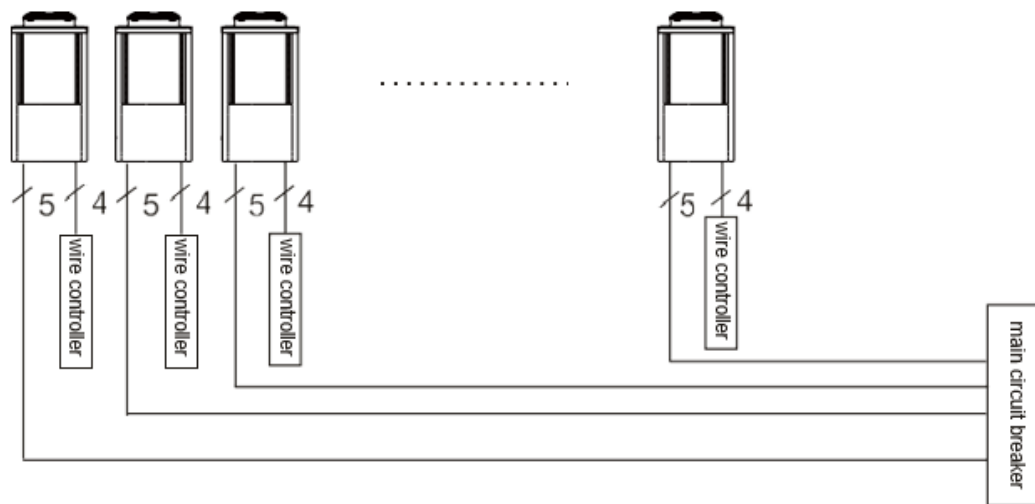
- Ensure proper installation of the Y filter at the water inlet of the unit. Attention should be given to the positioning for ease of removal and cleaning.
- Maintain a minimum distance of 100mm/3.9in between the circulating water inlet of the unit and the bottom of the water tank. Additionally, ensure that the customer's hot water supply pipe is at least 80mm/3.2in away from the circulating water inlet.
- Control tap water replenishment using a water level switch. When the water level is high, the water is heated to the unit's set temperature, causing the unit to stop at this temperature. Conversely, when the water level is low, the electromagnetic two-way valve opens for water replenishment while the unit is operational.
- Note that the water flow switch is not included with the unit and must be purchased separately.

4.7. Power supply connection

- Open the front panel and access the power supply.
- Route the power supply through the wire access and connect it to the power supply terminals within the control box. Subsequently, connect the wire plugs of the wire controller and main controller.
- If an external water pump is required, insert the power supply wire into the wire access and connect it to the water pump terminals.
- For the integration of an additional auxiliary heater, controlled by the heat pump controller, ensure that the relay (or power) of the auxiliary heater is connected to the corresponding output of the controller.

4.8 Cable and switch

- The unit uses an independent power supply, with wiring specifications outlined in Table 6.1. It is imperative that the power supply voltage aligns with the rated voltage of the unit.
- The power supply circuit must incorporate an All-pole disconnect device with a contact opening distance of at least 3mm/0.11in.
- Wiring tasks should be carried out exclusively by professional technicians in strict accordance with the circuit diagram.
- The power supply circuit must include an earth wire, which should be securely connected to an external earth wire. Additionally, the external earth wire must be properly organized and maintained.



4.9 Trial running

Inspection before Trial Running

1. Verify the correctness of the indoor unit, ensuring that pipe connections are accurate and relevant valves are open.
2. Inspect the heat pump unit thoroughly, assessing the condition of all screws and components. Upon powering on, review the controller indicator for any indication of failure. Utilize a gas gauge connected to the check valve to monitor system pressure during trial running.
3. Evaluate the water loop to confirm adequate water levels in the expansion tank, sufficient water supply, full water loop without air pockets, and proper insulation of water pipes.
4. Scrutinize the electrical wiring to confirm normal power voltage, secure screw fastening, adherence to wiring diagrams, and proper grounding.

Trial Running:

1. Initiate the heat pump by pressing the designated key on the controller. Monitor the operation of the water pump; normal operation should register 0.2 MPa on the water pressure meter.
2. After one minute of water pump operation, the compressor will engage. Listen for any unusual sounds emanating from the compressor. In case of abnormal noises, halt operation and inspect the compressor. If the compressor operates normally, assess the refrigerant pressure meter.
3. Verify the alignment of power input and running current with the manual specifications. If discrepancies arise, cease operation, and conduct troubleshooting.
4. Assess the stability of outlet water temperature.
5. Factory-set parameters on the controller should not be altered by the user.
6. Adjust water loop valves as necessary to ensure proper hot or cold water supply to each zone, meeting heating or cooling requirements.



5. Controlling and Operation

5.1 Main interface display and function

(1) Electricity Interface

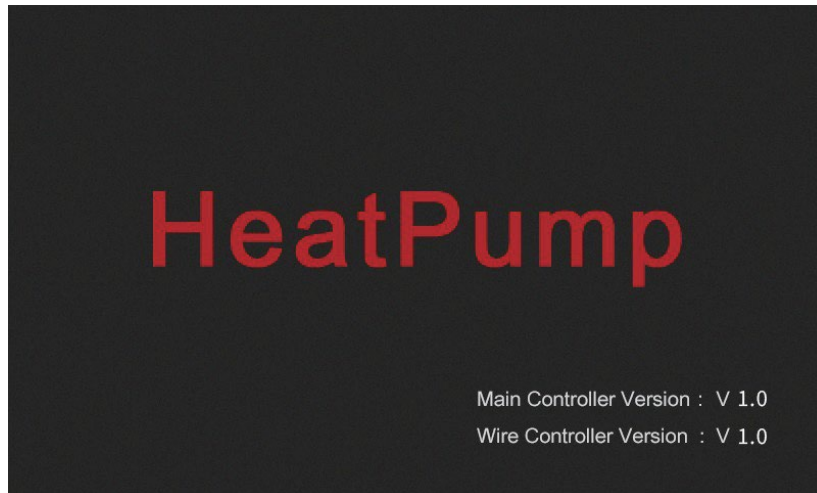


Fig.1 Electricity interface

(2) Main interface of power-off interface

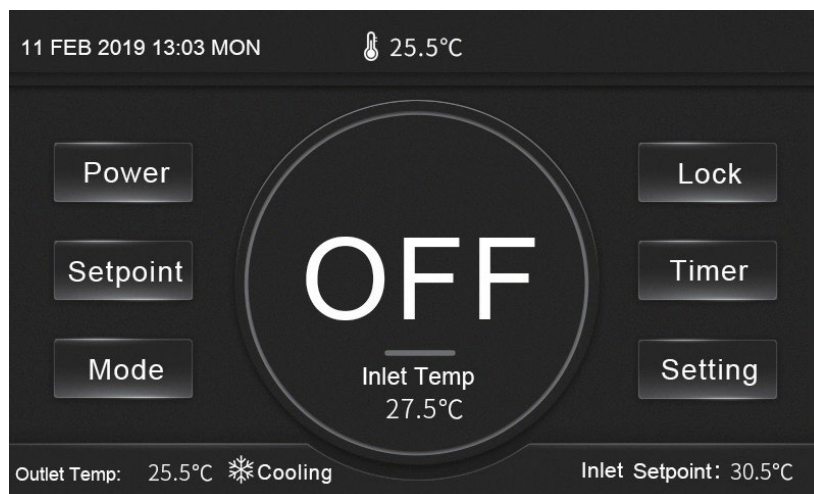


Fig.2 Power-off interface



(3) Main interface of power-on



Button function

| No. | Name | Function |
|-----|----------|------------------------------------------------------------------------------|
| ① | Power | Press to switch ON or OFF |
| ② | Setpoint | Press to set the target temperature |
| ③ | Mode | Press to select cooling or heating mode |
| ④ | Lock | Press to lock or unlock screen |
| ⑤ | Timer | Press to enter timer setting interface (Temp Timer, Power Timer, Mute Timer) |
| ⑥ | Setting | Press to enter function setting interface (Status, Parameter, Failure, Time) |

Running status icons description

| No. | Icon | Description |
|-----|------|---------------------------------------------------|
| ⑦ | | Indicating that the unit is power-on |
| ⑧ | | Indicating the operating mode: Heating or Cooling |



| No. | Icon | Description |
|-----|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| ⑨ | Display circle | Indicating the operating status: blue--cooling mode; red-heating mode; grey-power-off mode. |
| ⑩ | Inlet Setpoint: | Indicating the target temperature of inlet water |
| ⑪ | 11 FEB 2019 13:03 MON | Indicating the date and time |
| ⑫ | 25.5°C | Indicating the ambient temperature |
| ⑬ | | Indicating the Temp Timer function is activated |
| ⑭ | | Indicating that the mute mode is activated |
| ⑮ | | Indicating that the defrost mode is activated |
| ⑯ | | Indicating that the electric auxiliary heating mode is activated |
| ⑰ | | Indicating that the power timer mode is activated |
| ⑱ | | Indicating the lock screen status |
| ⑲ | | Failure alarm icon. Indicating that while the failure occurs, the icon blinks; after the failure is removed, the icon is no longer displayed |

5.2 Instructions for operation of wire controller

1. Power On/Off:

On the main interface, press the "Power" button (①) to either power on or off the unit.

2. Mode Selection:

On the main interface, press the "Mode" button (③) to toggle between cooling and heating modes. The current operating state is displayed on the status bar (⑧). Additionally, on the power-on main interface (Fig. 2), the color of the display circle (⑨) changes according to the operating state (blue for cooling, red for heating).

3. Target Temperature Setting:

To adjust the target temperature, first select the desired running mode (cooling or heating), then press the "Setpoint" button (②) to access the parameter setting interface. Enter the required parameter within the displayed effective range located at the bottom of the screen.

4. Lock Screen Function:

On the main interface, press the "Lock" button to activate the lock screen function; the status icon will illuminate. Press the "Lock" button again, then enter the password "22" to unlock the screen. Upon unlocking, the status icon will no longer be displayed.



Timer setting

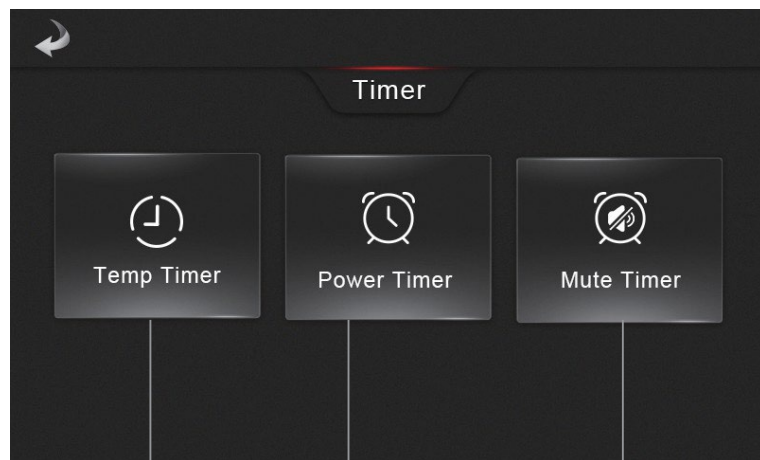


Fig. 4 Timer interface

Button function

| No. | Name | Function |
|-----|-------------|-------------------------------------------------------------------------|
| ⑳ | Temp Timer | Press to jump to the time-sharing temperature control setting interface |
| ㉑ | Power Timer | Press to jump to the timing switch setting interface |
| ㉒ | Mute Timer | Press to jump to the Mute Timer interface |

Temp Timer

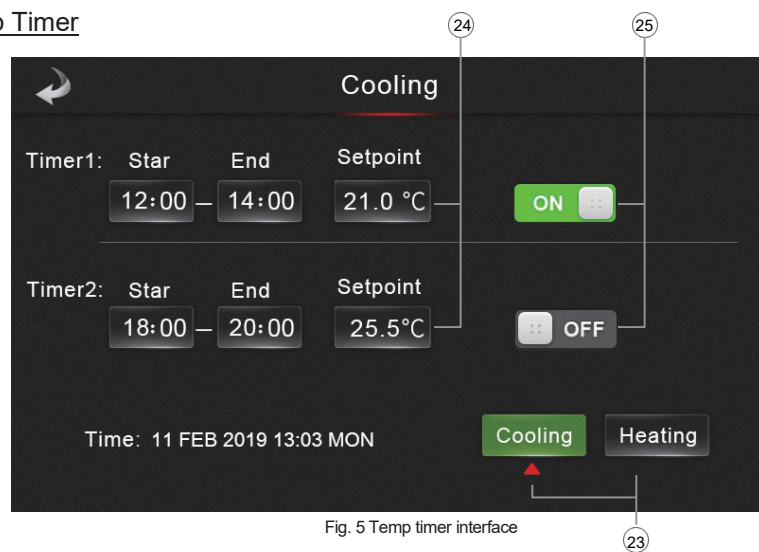


Fig. 5 Temp timer interface



The Temp Timer function entails time-sharing temperature control, comprising two segments of staggered peak temperature control. Users can set different target temperatures for each segment based on various modes. When the system time aligns with the staggered peak time and the time-sharing temperature control function is activated, the main interface displays " ".

To activate the Temp Timer function, follow these steps:

1. Press the Timer button on the main interface.
2. Subsequently, press the Temp Timer button labeled "20" (refer to Fig. 4), which will navigate to the Temp Timer interface (refer to Fig. 5).
3. Press "23" to select either cooling or heating mode, then input the starting and ending times along with the desired target temperature setpoint value "24".
4. Press "25" to enable or disable the setting. Note that green indicates the setting is enabled, while grey indicates it is not enabled.

Power Timer

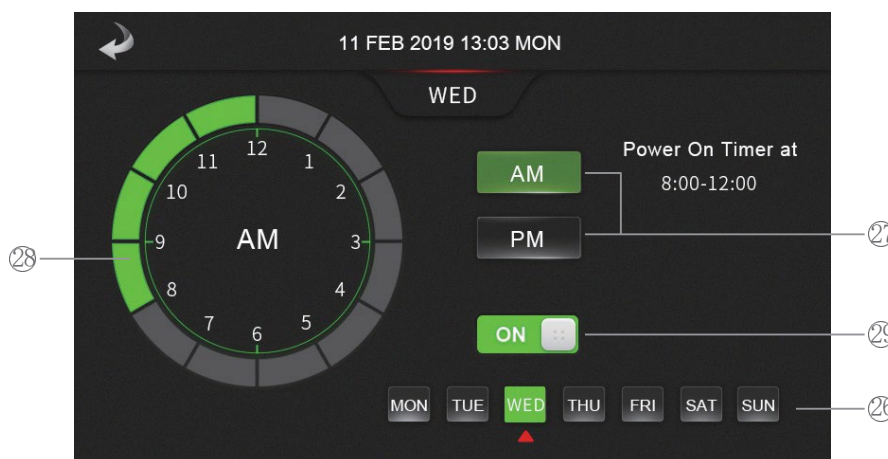


Fig. 6 Power timer interface

The Power Timer function enables users to schedule the unit's operating time for each day of the week. When this function is enabled, the main interface displays "🕒".

To activate the Power Timer function, follow these steps:

1. Press the Timer button labeled "5" on the main interface.
2. Next, press the Power Timer button labeled "21" (refer to Fig. 4), which will navigate to the Power Timer interface (refer to Fig. 6).
3. Press "26" to select the desired day of the week.
4. Press "27" to choose between AM or PM.
5. Then, press "28" to select the desired time.
6. Finally, press "29" to enable or disable the setting. Green indicates the setting is enabled, while grey indicates it is not enabled.



Mute Timer

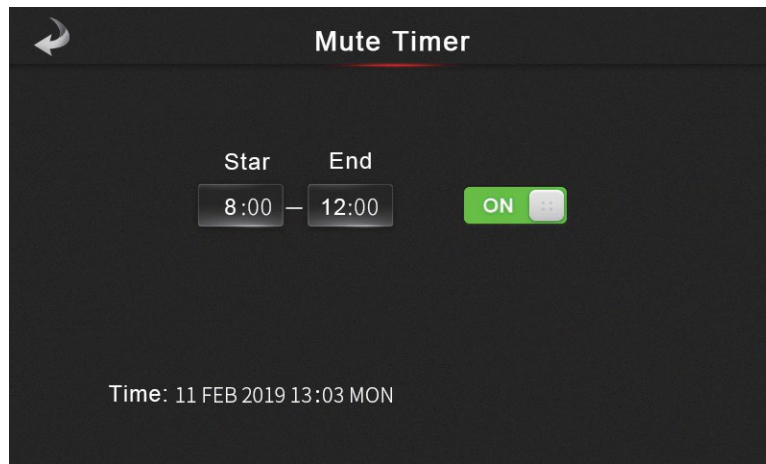


Fig. 7 Mute timer interface

To activate the Mute Timer function, follow these steps:

1. Press the Timer button labeled "5" on the main interface.
2. Then, press the Mute Timer button labeled "22" (refer to Fig. 4), which will navigate to the Mute Timer interface.
3. Enter the start and end times for the timer.
4. Press the on/off button to enable or disable the setting.
5. When the Mute Timer function is enabled, the main interface displays "🔇".

Note: Green indicates that the function is enabled, while grey indicates that it is not enabled.

If the unit lacks the Mute Timer function, this operation is not available and will display the Warning below.

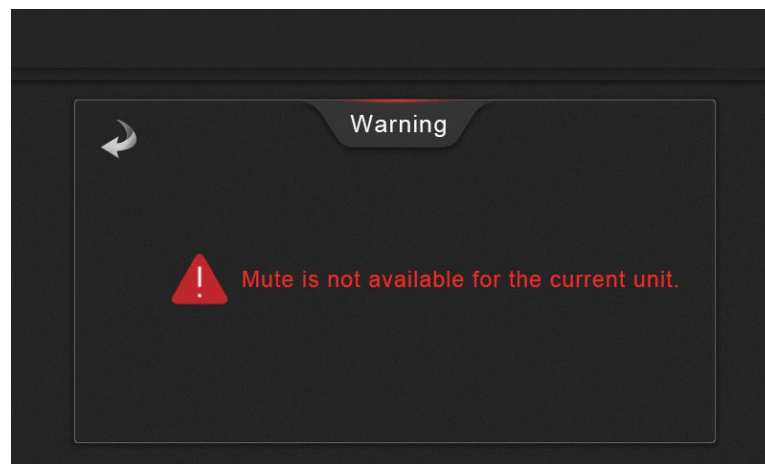


Fig. 8 Warning interface



(1) Setting function

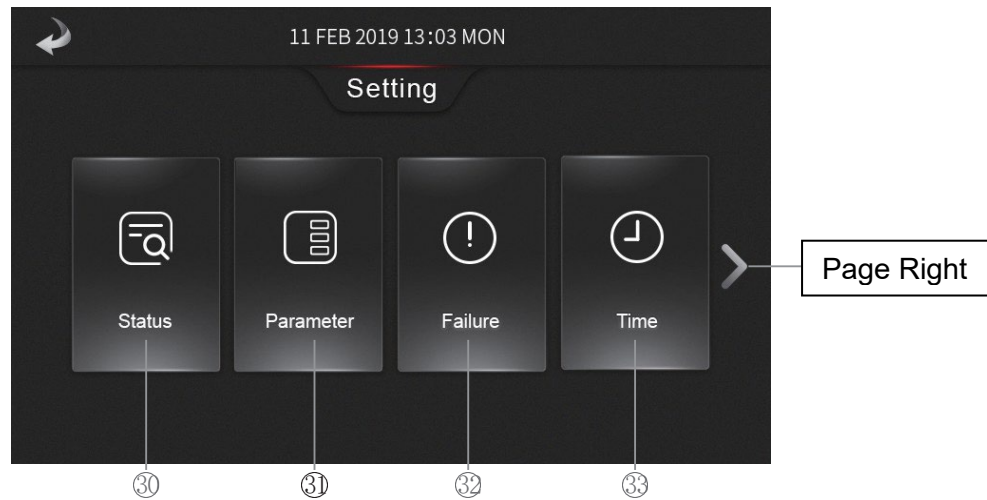


Fig. 9 Setting interface

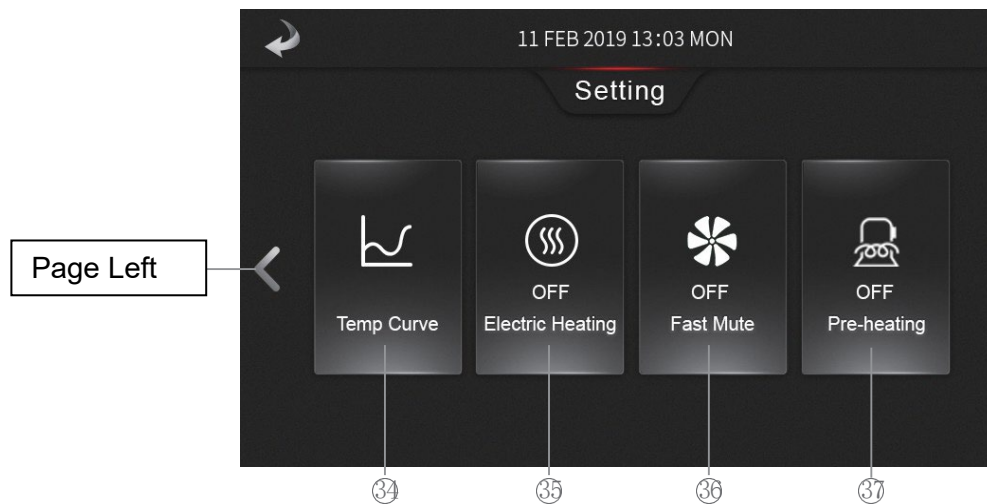


Fig. 10 Setting interface



Button function

| No. | Name | Function |
|-----|------------------|----------------------------------------------------------------------------------------------------------|
| ③① | Status | Press to jump to the status inquiry interface to inquire the running and unit status parameter |
| ③② | Parameter | Press and enter password "22" to inquire installer parameter |
| ③③ | Failure | Press to inquire failure record |
| ③④ | Time | Press to jump to the Time Setting interface and adjust system time parameter |
| ③⑤ | Temp Curve | Press to inquire the temperature curve |
| ③⑥ | Electric Heating | Press to turn on/off the electric heating mode |
| ③⑦ | Fast Mute | Press to turn on/off fast mute mode |
| ③⑧ | Pre-heating | Press to jump to the electric auxiliary heating menu and turn on the electric auxiliary heating function |

Setting Interface:

- On the main interface, press the Setting button (⑥) to navigate to the Setting interface (refer to Fig. 9).

Status Inquiry Function:

- In the Setting interface (Fig. 9), press the Status button to access the Status interface.

Running Status Inquiry Function:

- In the Status interface, press the Running Status button to inquire about the running status parameters (refer to Fig. 11-1).

Unit Status Inquiry Function:

- Within the Status interface, press the Unit Status button and enter the password "22".
- To inquire about the unit status parameters, press **Switch**, **Temp**, **Unit Info**, **Load** OR **Inverter** (Fig.11-2).

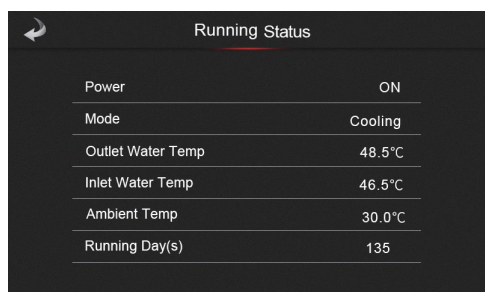


Fig.11-1 Running Status interface

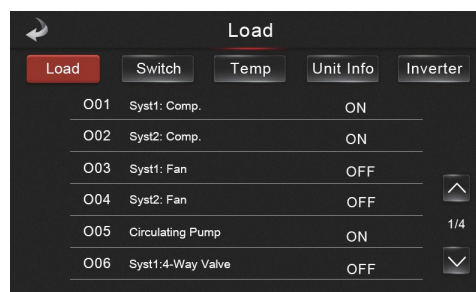



Fig.11-2 Unit Status interface



Failure record inquiry function

- When a failure occurs, the icon  flashes on the main interface.
- Navigate to the Setting interface (refer to Fig. 9) and press the Failure button to access the Failure Record interface for querying the current failure records (refer to Fig. 12).

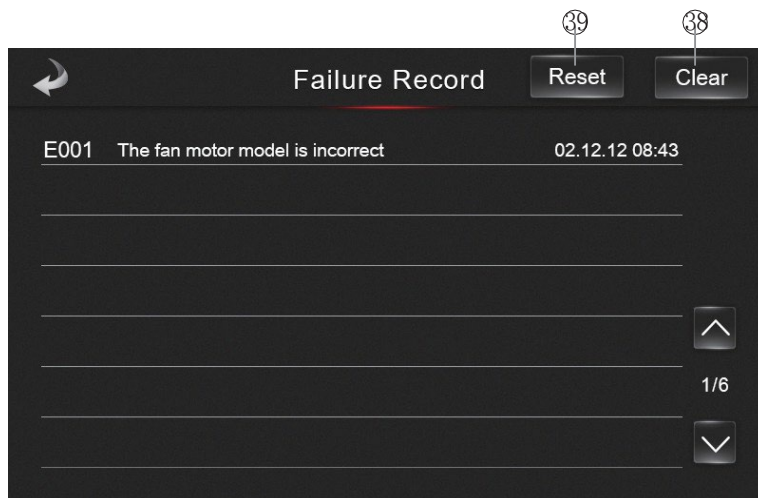


Fig.12 Failure Record interface

- After the failure is resolved:
 - a. (1) The failure code, failure name and occurrence time recorded on the failure interface will still be saved;
(2) Click “38” to clear the failure record. The resolved failure will not appear in the failure record.
 - b. (1) The failure record has the power failure memory function, but if the record is manually cleared, the record will not appear again.
(2) In the Failure Record interface (Fig.12), press “38” to enter delete all the history failure records interface (Fig.13) Ordinary solution see 5.3. In the Failure Record interface (Fig.12), press to enter recovery the failure three times to lock interface(Fig.13-2).

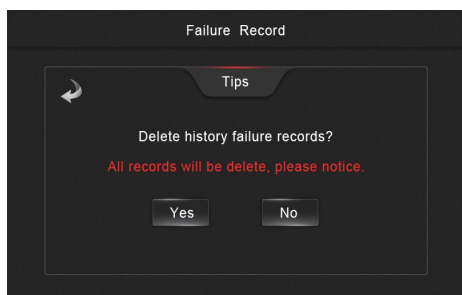


Fig.13-1 Delete history failure interface

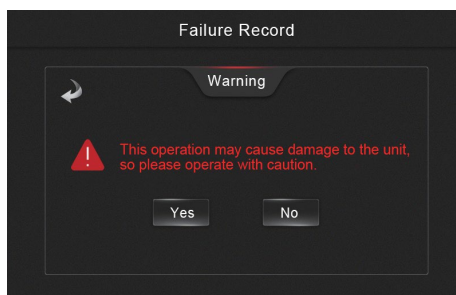


Fig.13-2 Recovery the failure three times to lock interface



System time setting

In the Setting interface (Fig.9), press Time button “33” to jump to Time Setting interface (Fig. 14), click on the input field and enter time digital, press **Save** to save the settings.

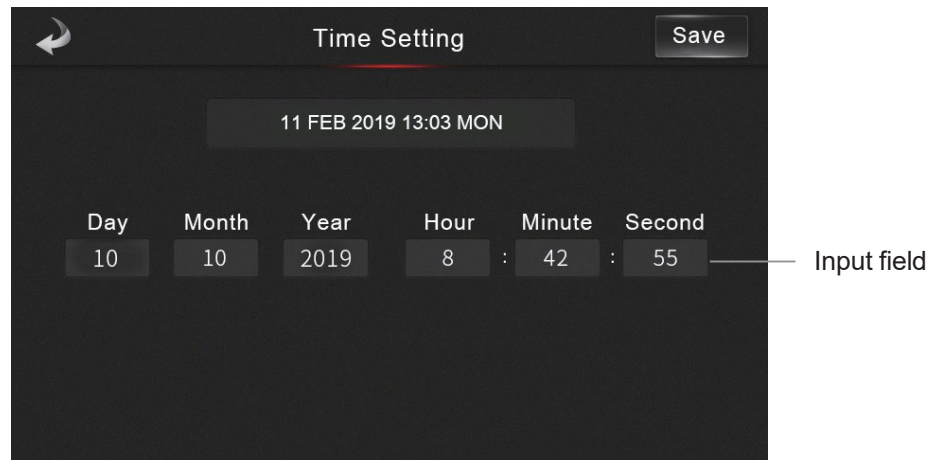


Fig.14 Time Setting interface

Temp Curve inquiry function

In the Setting interface (Fig.10), press Temp Curve button “34” to inquire the inlet and outlet temperature curve interface (Fig.15).

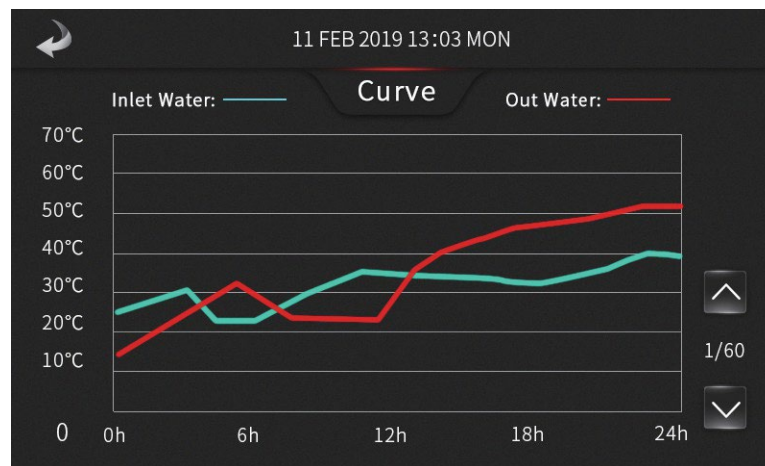


Fig.15 Temperature Curve interface

1. This curve function records the water inlet temperature and water outlet temperature.
2. Temperature data is collected every 5 minutes, and 12 sets of temperature data are saved every hour. Timekeeping is based on the latest data saved. If a power disruption occurs when the time is less than 1 hour (12 sets), the data during that period will not be saved.
3. Only the curve for electricity status is recorded; the curve for outage status will not be saved.
4. The value of the abscissa indicates the time from the point on the curve to the current time point. The leftmost point on the first page (0 on the abscissa) represents the latest temperature record.
5. The temperature curve record is equipped with a power-off memory function. In the event of disrupted curve recording and display, after the next power-on cycle, the wire controller will automatically clear the historical curve record, and the curve recording function will return to a normal state.



Electric Heating function

In the Setting interface (refer to Fig.10), when the button displays "OFF Electric Heating", ensure that the unit is operating in heating mode. Then, press the Electric Heating button to navigate to the Electric Heating interface (refer to Fig.16-1). Click the button to switch it to the ON position, activating the electric auxiliary heating mode. While the unit is running in electric auxiliary heating mode, follow the same operation steps to turn off the electric heating function.

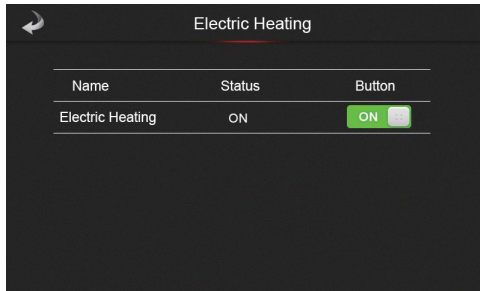


Fig.16-1 Electric Heating interface

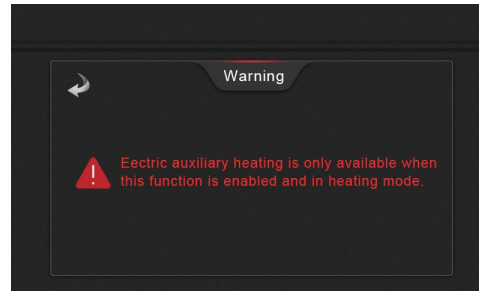




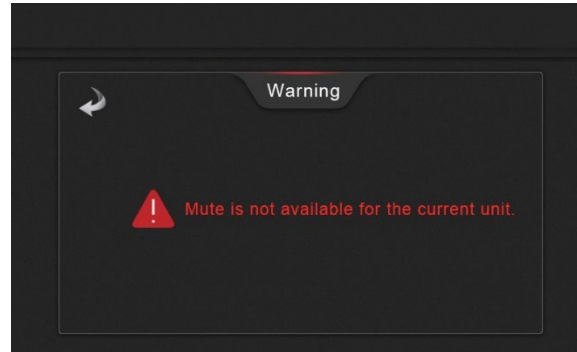
Fig.16-2 Warning interface

Note: Electric auxiliary heating is only available when this function is enabled and in heating mode.





Fast Mute function

In the Setting interface (Fig.10), while the button “36” displays “OFF Fast Mute” and “”, press button “36” to enable fast mute function. It displays “ON Fast Mute” and “”. While the fast mute mode is enabled, press this button again to turn it off. Fast Mute is only available when this function is enabled, or else the fast mute function cannot be set.



Pre-Heating Function

In the Setting interface (Fig.10), while the button “37” displays “OFF Pre-heating” and “”, press button “37” to enable pre-heating function and it displays “ON Pre-heating” and “”. While the pre-heating mode is enabled, press this button again to turn it off. Pre-heating is only available when the unit is powered off, or the pre-heating function cannot be set.



5.3 Electronic control failure code and troubleshooting table

Failure code and troubleshooting table

| Protection/failure | Codes | Causes | Removal methods |
|----------------------------------------|-------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Communication Fault | E08 | Abnormal communication between wire controller and the main board | Inspect whether the wire controller, the main board and the connection thereof are reliable |
| Controller Don't Match Motherboard | E084 | The mainboard software code is inconsistent with the setting | Normal operation, not affected |
| DC Fan Board 1 Communication Fault | E081 | Communication of the speed regulation module 1 with main board is abnormal | Check the speed regulation module 1 and the main board and if their connections are normal and reliable |
| Syst1: High Pressure Prot. | E11 | The high-voltage switch of the system is disconnected | Inspect System 1 voltage switch and refrigerating circuit for any failure |
| Syst2: High Pressure Prot. | E21 | The high-voltage switch of the system is disconnected | Inspect System 2 voltage switch and refrigerating circuit for any failure |
| Syst1: Low Pressure Prot. | E12 | The low-voltage switch of the system is disconnected | Inspect System 1 voltage switch and refrigerating circuit for any failure |
| Syst2: Low Pressure Prot. | E22 | The low-voltage switch of the system is disconnected | Inspect System 2 voltage switch and refrigerating circuit for any failure |
| Water Flow Switch Prot. | E032 | The water system has no or only few water | Inspect whether the water flow of the water pipe conforms to related requirements and check the water pump for any damages |
| Electric Heater Overload Prot. | E04 | Electric heating overheat protection switch is disconnected | Inspect whether the electric heating is under operation condition of over 150 °C for a long time |
| Primary Antifreezing Prot. In Winter | E19 | Excessively low environment temperature | The environment temperature is more than 4 ° C |
| Secondary Antifreezing Prot. in Winter | E29 | Excessively low environment temperature | The environment temperature is more than 4 ° C |
| Syst1: User Side Antifreezing Prot. | E171 | The water flow of the system is insufficient | Inspect whether the water flow of the water pipe conforms to related requirements and check the water pump for any blockage |
| Syst2: User Side Antifreezing Prot. | E271 | The water flow of the system is insufficient | Inspect whether the water flow of the water pipe conforms to related requirements and check the water pump for any blockage |
| Water(Out) High Temp Prot. | E065 | Excessively high water outlet temperature | Adjust the outlet water temperature < A07-10 °C |
| Fan 1 Thermal Overload Prot. | E103 | Fan 1 thermal overload | Check if fan 1 is running normally |
| Fan 2 Thermal Overload Prot. | E203 | Fan 2 thermal overload | Check if fan 2 is running normally |
| Syst1: Exhaust Air High Temp Prot. | P182 | The system compressor is overloaded | Inspect whether the operation of System 1 compressor is normal |
| Syst2: Exhaust Air High Temp Prot. | P282 | The system compressor is overloaded | Inspect whether the operation of System 2 compressor is normal |
| Water In/Out Large Temp Diff Prot. | E06 | The water flow of the system is insufficient, the pressure difference of the water system is small | Inspect whether the water flow of the water pipe conforms to related requirements and check the water pump for any blockage |
| Water(Out) Low Temp Prot. | E071 | Excessively low water outlet temperature | Adjust the outlet water temperature °C |
| Low Water Flow Prot. | E035 | The system has no water or too low volume of water | Check if the water flow of water pipe meets the requirements and if the water pump is damaged. |
| Syst3: High Pressure Prot. | E31 | The high-voltage switch of the system is disconnected | Inspect System 3 voltage switch and refrigerating circuit for any failure |
| Syst4: High Pressure Prot. | E41 | The high-voltage switch of the system is disconnected | Inspect System 4 voltage switch and refrigerating circuit for any failure |
| Syst3: Low Pressure Prot. | E32 | The low-voltage switch of the system is disconnected | Inspect System 3 voltage switch and refrigerating circuit for any failure |
| Syst4: Low Pressure Prot. | E42 | The low-voltage switch of the system is disconnected | Inspect System 4 voltage switch and refrigerating circuit for any failure |



| Protection/fault | Codes | Causes | Removal methods |
|----------------------------------------------|-------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Syst3: User Side Antifreezing Prot. | E371 | The water flow of the system is insufficient | Inspect whether the water flow of the water pipe conforms to related requirements and check the water pump for any blockage |
| Syst4: User Side Antifreezing Prot. | E471 | The water flow of the system is insufficient | Inspect whether the water flow of the water pipe conforms to related requirements and check the water pump for any blockage |
| Syst3: Exhaust Air High Temp Prot. | P382 | The system compressor is overloaded | Inspect whether the operation of System 3 compressor is normal |
| Syst4: Exhaust Air High Temp Prot. | P482 | The system compressor is overloaded | Inspect whether the operation of System 4 compressor is normal |
| Syst1: Refrigerant Leakage Abnormal | E131 | The system compressor is overloaded | Check whether the refrigerant leaks in system 1 |
| Syst2: Refrigerant Leakage Abnormal | E231 | The system compressor is overloaded | Check whether the refrigerant leaks in system 2 |
| Syst3: Refrigerant Leakage Abnormal | E331 | The system compressor is overloaded | Check whether the refrigerant leaks in system 3 |
| Syst4: Refrigerant Leakage Abnormal | E431 | The system compressor is overloaded | Check whether the refrigerant leaks in system 4 |
| Syst3: Coil Temp Sensor1 Fault | P350 | The temperature sensor is open or short circuited | Check and replace the system 3 coil 1 temperature sensor |
| Syst3: Suction Temp Sensor Fault | P37 | The temperature sensor is open or short circuited | Check and replace the system 3 suction temperature sensor |
| Water In Sensor Fault | P01 | The temperature sensor is open or short circuited | Check and replace inlet water temperature sensor |
| Water Out Sensor Fault | P02 | The temperature sensor is open or short circuited | Check and replace outlet water temperature sensor |
| Syst1: Coil Temp Sensor1 Fault | P150 | The temperature sensor is open or short circuited | Check and replace the system 1 coil 1 temperature sensor |
| AT Sensor Fault | P04 | The temperature sensor is open or short circuited | Check and replace the ambient temperature sensor |
| Syst1: Suction Temp Sensor Fault | P17 | The temperature sensor is open or short circuited | Check and replace the system 1 return air temperature sensor |
| Syst1: User Side Antifreezing 1 Sensor Fault | P191 | The temperature sensor is open or short circuited | Check and replace the system 1 use side antifreeze 1 temperature sensor |
| Syst2: Coil Temp Sensor1 Fault | P250 | The temperature sensor is open or short circuited | Check and replace the system 2 coil 1 temperature sensor |
| Syst1: Coil(Out) Temp Sensor Fault | P152 | The temperature sensor is open or short circuited | Check and replace the system 1 coil outlet temperature sensor |
| Syst2: Coil(Out) Temp Sensor Fault | P252 | The temperature sensor is open or short circuited | Check and replace the system 2 coil outlet temperature sensor |
| Syst1: EVI(In) Temp Sensor Fault | P101 | The temperature sensor is open or short circuited | Check and replace the system 1 EVI inlet temperature sensor |
| Syst1: EVI(Out) Temp Sensor Fault | P102 | The temperature sensor is open or short circuited | Check and replace the system 1 EVI outlet temperature sensor |
| Syst1: Exhaust Air Temp Sensor Fault | P181 | The temperature sensor is open or short circuited | Check and replace the system 1 exhaust temperature sensor |
| Water Level Sensor Fault | E036 | Open circuit or short circuit of the water level sensor | Inspect and replace water level sensor |
| Syst1: Low Pressure Sensor Fault | PP11 | The sensor is open or short circuited | Check and replace the system 1 low pressure sensor |
| Syst2: Suction Temp Sensor Fault | P27 | The temperature sensor is open or short circuited | Check and replace the system 2 return air temperature sensor |
| Syst2: User Side Antifreezing 1 Sensor Fault | P291 | Temperature sensor fault | Check if the temperature sensor is working properly |
| Syst1: High Pressure Sensor Fault | PP12 | The sensor is open or short circuited | Check and replace the system 1 high pressure sensor |
| Syst2: High Pressure Sensor Fault | PP22 | The sensor is open or short circuited | Check and replace the system 2 high pressure sensor |



| Protection/fault | Codes | Causes | Removal methods |
|--------------------------------------|-------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Syst2: Exhaust Air Temp Sensor Fault | P281 | Open circuit or short circuit of the temperature sensor | Inspect and replace System 2 exhaust temperature sensor |
| Syst2: Low Pressure Sensor Fault | PP21 | Open circuit or short circuit of the sensor | Inspect and replace System 2 low-voltage sensor |
| Water Tank Temp Fault | P03 | Open circuit or short circuit of the temperature sensor | Inspect and replace water tank temperature sensor |
| Syst2: EVI(In) Temp Sensor Fault | P201 | Open circuit or short circuit of the temperature sensor | Inspect and replace System 2 enthalpy inlet temperature sensor |
| Syst2: EVI(Out) Temp Sensor Fault | P202 | Open circuit or short circuit of the temperature sensor | Inspect and replace System 2 enthalpy outlet temperature sensor |
| Low AT Power-Off Prot. | TP | Excessively low ambient temperature | Adjust the ambient temperature |
| Syst1: Coil Temp Sensor2 Fault | P154 | The temperature sensor is open or short circuited | Check and replace the system 1 coil 2 temperature sensor |
| DC Fan Board 2 Communication Fault | E082 | Communication of the speed regulation module 2 with main board is abnormal | Check the speed regulation module 2 and the main board and if their connections are normal and reliable. |
| Syst2: Coil Temp Sensor2 Fault | P254 | The temperature sensor is open or short circuited | Check and replace the system 2 coil 2 temperature sensor |
| Syst1: Comp. Communication Fault | F151 | Communication failure with system 1 compressor drive board | 1. Check if the communication line is normal; 2. Check if the system 1 compressor drive board is normal |
| Syst1: Comp. Start Fault | F152 | System 1 compressor failed to start | 1. Check if the compressor line is normal; 2. Check if the system 1 compressor is blocked |
| Syst1: Start IPM Prot. | F153 | System 1 compressor starting current is too large | 1. Check if the starting high pressure is excessive; 2. Check if the system 1 compressor is blocked |
| Syst1: Running IPM Prot. | F154 | System 1 compressor running current is too large | Check if the pressure ratio is too high |
| Syst1: Comp. Overcurrent Prot. | F156 | System 1 compressor running current is too large | Check if the pressure ratio is too high |
| Comp. 1 IPM Over-Temp. Prot. | F155 | System 1 compressor drive board has poor heat dissipation | Check if there is a gap in the installation of the fluorine-cooled heat sink |
| Comp. 1 Bus Over Voltage Prot. | F157 | Voltage is too high | Check if the input voltage is higher than 480V |
| Comp. 1 Bus Under Voltage Prot. | F158 | Voltage is too low | Check if the input voltage is lower than 250V |
| Syst2: Comp. Communication Fault | F251 | Communication failure with system 2 compressor drive board | 1. Check if the communication line is normal; 2. Check if the system 2 compressor drive board is normal |
| Syst2: Comp. Start Fault | F252 | System 2 compressor failed to start | 1. Check if the compressor line is normal; 2. Check if the system 2 compressor rotor is locked |
| Syst2: Start IPM Prot. | F253 | System 2 compressor starting current is too large | 1. Check if the starting high pressure is excessive; 2. Check if the system 1 compressor is blocked |
| Syst2: Running IPM Prot. | F254 | System 2 compressor running current is too large | Check if the pressure ratio is too high |
| Syst2: Comp. Overcurrent Prot. | F256 | System 2 compressor running current is too large | Check if the pressure ratio is too high |
| Comp.2 IPM Over-Temp Prot. | F255 | System 2 compressor drive board has poor heat dissipation | Check if there is a gap in the installation of the fluorine-cooled heat sink |
| Comp.2 Bus Over Voltage Prot. | F257 | Voltage is too high | Check if the input voltage is higher than 480V |
| Comp.2 Bus Under Voltage Prot. | F258 | Voltage is too low | Check if the input voltage is lower than 250V |
| Fan 1 Output Phase Loss Prot. | F111 | System 1 fan failed to start | Check if the system 1 fan line is normal |
| Fan 1 Output Zero Speed Prot. | F102 | System 1 fan failed to start | Check if the system 1 fan rotor is locked |
| Fan 1 Start IPM Prot. | F103 | System 1 fan starting current is too large | Check if the system 1 fan rotor is locked |



| Protection/fault | Codes | Causes | Removal methods |
|----------------------------------------|-------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Fan 1 Running IPM Prot. | F104 | System 1 fan running current is too large | Check if the system 1 fan rotor is locked |
| Fan 1 Overcurrent Prot. | F105 | System 1 fan running current is too large | Check if the system 1 fan rotor is locked |
| Fan 1 Over-Temp Prot. | F106 | System 1 fan drive board has poor heat dissipation | Check the heat dissipation condition |
| Fan 1 Bus Over Voltage Prot. | F107 | Voltage is too high | Check if the input voltage is higher than 480V |
| Fan 1 Bus Under Voltage Prot. | F108 | Voltage is too low | Check if the input voltage is lower than 250V |
| Fan 2 Output Phase Loss Prot. | F211 | System 2 fan failed to start | Check if the system 2 fan line is normal |
| Fan 2 Output Zero Speed Prot. | F202 | System 2 fan failed to start | Check if the system 2 fan rotor is locked |
| Fan 2 Start IPM Prot. | F203 | System 2 fan starting current is too large | Check if the system 2 fan rotor is locked |
| Fan 2 Running IPM Prot. | F204 | System 2 fan running current is too large | Check if the system 2 fan rotor is locked |
| Fan 2 Overcurrent Prot. | F205 | System 2 fan running current is too large | Check if the system 2 fan rotor is locked |
| Fan 2 Over-Temp Prot. | F206 | System 2 fan drive board has poor heat dissipation | Check the heat dissipation condition |
| Fan 2 Bus Over Voltage Prot. | F207 | Voltage is too high | Check if the input voltage is higher than 480V |
| Fan 2 Bus Under Voltage Prot. | F208 | Voltage is too low | Check if the input voltage is lower than 250V |
| Abnormal Power Fault | EE1 | Power failure occurs on the home interface | The failure is cleared by the main control after 3 minutes |
| Fan Motor 1 Current Sampling Fault | F112 | The current sampling of fan 1 is abnormal | Check if the system 1 fan rotor is locked |
| Fan Motor 2 Current Sampling Fault | F212 | The current sampling of fan 2 is abnormal | Check if the system 2 fan rotor is locked |
| Fan Motor 1 Overspeed Protection | F109 | The fan speed of system 1 is too high | Check if the system 1 fan rotor is locked |
| Fan Motor 2 Overspeed Protection | F209 | The fan speed of system 2 is too high | Check if the system 2 fan rotor is locked |
| Fan Motor 1 Lowspeed Protection | F110 | The fan speed of system 1 is incorrect | Check if the system 1 fan rotor is locked |
| Fan Motor 2 Lowspeed Protection | F210 | The fan speed of system 2 is incorrect | Check if the system 2 fan rotor is locked |
| Compressor Type Error | F088 | The compressor model is incorrect | Check if the compressor model parameters are consistent with the corresponding model |
| Water In/Out Abnormal Temp Diff Prot. | E064 | The difference between the current inlet water temp. and outlet water temp. is too large | Check if the inlet and outlet temperature sensor works normally |
| Comm. Failure Between Master And Slave | E085 | Abnormal communication between board A and board B | Check if the connection between board A and board B is normal |
| No A/B Prog. Code Or Version No. | E088 | Inconsistent program code or version number of A/B board | Check whether the program code or version number of A/B board are consistent |
| Syst1: 4-Way Valve Abnormal Switch | E121 | System 1 4-way valve switching failed | Check if the reversing state of 4-way valve is the required state |
| Syst2: 4-Way Valve Abnormal Switch | E221 | System 1 4-way valve switching failed | Check if the reversing state of 4-way valve is the required state |
| Syst3: 4-Way Valve Abnormal Switch | E321 | System 1 4-way valve switching failed | Check if the reversing state of 4-way valve is the required state |
| Syst4: 4-Way Valve Abnormal Switch | E421 | System 1 4-way valve switching failed | Check if the reversing state of 4-way valve is the required state |



| Protection/fault | Codes | Causes | Removal methods |
|----------------------------------------------|-------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Syst4:Coil Temp Sensor1 Fault | P450 | The temperature sensor is open or short circuited | Check and replace the system 4 coil 1 temperature sensor |
| Syst3: Coil(Out) Temp Sensor Fault | P352 | The temperature sensor is open or short circuited | Check and replace the system 3 coil outlet temperature sensor |
| Syst4: Coil(Out) Temp Sensor Fault | P452 | The temperature sensor is open or short circuited | Check and replace the system 4 coil outlet temperature sensor |
| Syst3: EVI(In) Temp Sensor Fault | P301 | The temperature sensor is open or short circuited | Check and replace the system 3 EVI inlet temperature sensor |
| Syst3: EVI(Out) Temp Sensor Fault | P302 | The temperature sensor is open or short circuited | Check and replace the system 3 EVI outlet temperature sensor |
| Syst3: Exhaust Air Temp Sensor Fault | P381 | The temperature sensor is open or short circuited | Check and replace the system 3 exhaust temperature sensor |
| Water Level Sensor Fault | E036 | Open circuit or short circuit of the water level sensor | Inspect and replace water level sensor |
| Syst3: Low Pressure Sensor Fault | PP31 | The sensor is open or short circuited | Check and replace the system 3 low pressure sensor |
| Syst4: Suction Temp Sensor Fault | P47 | The temperature sensor is open or short circuited | Check and replace the system 4 return air temperature sensor |
| Syst4: User Side Antifreezing 1 Sensor Fault | P491 | Temperature sensor fault | Check if the temperature sensor is working properly |
| Syst3: High Pressure Sensor Fault | PP32 | The sensor is open or short circuited | Check and replace the system 3 high pressure sensor |
| Syst4: High Pressure Sensor Fault | PP42 | The sensor is open or short circuited | Check and replace the system 4 high pressure sensor |
| Syst4: Exhaust Air Temp Sensor Fault | P481 | Open circuit or short circuit of the temperature sensor | Inspect and replace System 4 exhaust temperature sensor |
| Syst4: Low Pressure Sensor Fault | PP41 | Open circuit or short circuit of the sensor | Inspect and replace System 4 low-voltage sensor |
| Syst4: EVI(In) Temp Sensor Fault | P401 | Open circuit or short circuit of the temperature sensor | Inspect and replace System 4 enthalpy inlet temperature sensor |
| Syst4: EVI(Out) Temp Sensor Fault | P402 | Open circuit or short circuit of the temperature sensor | Inspect and replace System 4 enthalpy outlet temperature sensor |
| Syst3: Coil Temp Sensor2 Fault | P354 | The temperature sensor is open or short circuited | Check and replace the system 3 coil 2 temperature sensor |
| Syst4: Coil Temp Sensor2 Fault | P454 | The temperature sensor is open or short circuited | Check and replace the system 4 coil 2 temperature sensor |
| Syst3: Comp. Communication Fault | F351 | Communication failure with system 3 compressor drive board | 1. Check if the communication line is normal; 2. Check if the system 3 compressor drive board is normal |
| Syst3: Comp. Start Fault | F352 | System 3 compressor failed to start | 1. Check if the compressor line is normal; 2. Check if the system 3 compressor is blocked |
| Syst3: Start IPM Prot. | F353 | System 3 compressor starting current is too large | 1. Check if the starting high pressure is excessive; 2. Check if the system 3 compressor is blocked |
| Syst3: Running IPM Prot. | F354 | System 3 compressor running current is too large | Check if the pressure ratio is too high |
| Syst3: Comp. Overcurrent Prot. | F356 | System 3 compressor running current is too large | Check if the pressure ratio is too high |
| Comp. 3 IPM Over-Temp. Prot. | F355 | System 3 compressor drive board has poor heat dissipation | Check if there is a gap in the installation of the fluorine-cooled heat sink |
| Comp. 3 Bus Over Voltage Prot. | F357 | Voltage is too high | Check if the input voltage is higher than 480V |
| Comp. 3 Bus Under Voltage Prot. | F358 | Voltage is too low | Check if the input voltage is lower than 250V |
| Syst4: Comp. Communication Fault | F451 | Communication failure with system 2 compressor drive board | 1. Check if the communication line is normal; 2. Check if the system 3 compressor drive board is normal |
| Syst4: Comp. Start Fault | F452 | System 2 compressor failed to start | 1. Check if the compressor line is normal; 2. Check if the system 4 compressor rotor is locked |



| Protection/fault | Codes | Causes | Removal methods |
|-------------------------------------|-------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Syst4: Start IPM Prot. | F453 | System 2 compressor starting current is too large | 1. Check if the starting high pressure is excessive; 2. Check if the system 4 compressor is blocked |
| Syst4: Running IPM Prot. | F454 | System 2 compressor running current is too large | Check if the pressure ratio is too high |
| Syst4: Comp. Overcurrent Prot. | F456 | System 2 compressor running current is too large | Check if the pressure ratio is too high |
| Comp.4 IPM Over-Temp Prot. | F455 | System 2 compressor drive board has poor heat dissipation | Check if there is a gap in the installation of the fluorine-cooled heat sink |
| Comp.4 Bus Over Voltage Prot. | F457 | Voltage is too high | Check if the input voltage is higher than 480V |
| Comp.4 Bus Under Voltage Prot. | F458 | Voltage is too low | Check if the input voltage is lower than 250V |
| Low Temp Do Not Allow Cooling Prot. | TC | The current ambient temperature is too low to allow cool | Check if the ambient temperature sensor works normally |
| The Fan Motor Model Is Incorrect | E001 | Abnormal fan model and parameter | Check if the fan model and parameters are correct |

5.4 Interface diagram

(1) Wire control interface diagram and definition

| |
|---|
| V |
| R |
| T |
| A |
| B |
| G |

| Sign | Meaning |
|------|--------------|
| V | 12V (power+) |
| R | No use |
| T | No use |
| A | 485A |
| B | 485B |
| G | GND(power-) |

[illegible]



(3) The input and output interface instructions

| No. | Sign | Meaning | No. | Sign | Meaning |
|-----|---------|-----------------------------------|-----|------------|--------------------------------|
| 1 | AI/DI1 | Inlet (Water) Temp | 29 | AI/DI29 | No use |
| 2 | AI/DI2 | Outlet (Water) Temp | 30 | AI/DI30 | No use |
| 3 | AI/DI3 | Syst1: Antifreezing Temp | 31 | AI/DI31 | No use |
| 4 | AI/DI4 | Syst1: Coil Temp 1 | 32 | AI/DI31 | No use |
| 5 | AI/DI5 | Syst1: Coil Temp 2 | 33 | AI/DI33 | No use |
| 6 | AI/DI6 | Syst2: Antifreezing Temp | 34 | AI/DI34 | No use |
| 7 | AI/DI7 | Ambient Temperature | 35 | AI/DI35 | No use |
| 8 | AI/DI8 | Syst1: Outlet(Coil) Temp | 36 | AI/DI36 | No use |
| 9 | AI/DI9 | Syst1: Suction Temp | 37 | AI/DI37 | Syst1: LP Switch |
| 10 | AI/DI10 | Syst2: Outlet(Coil) Temp | 38 | AI/DI38 | Syst2: LP Switch |
| 11 | AI/DI11 | Syst2: Suction Temp | 39 | AI/DI39 | Syst1: HP Switch |
| 12 | AI/DI12 | Syst1: EVI(In) Temp | 40 | AI/DI40 | Syst2: HP Switch |
| 13 | AI/DI13 | Syst1: EVI(Out) Temp | 41 | AI/DI41 | A/B board selection switch-A |
| 14 | AI/DI14 | Syst2: EVI(In) Temp | 42 | AI/DI42 | Water level switch |
| 15 | AI/DI15 | Syst2: EVI(Out) Temp | 43 | AI/DI43 | Water flow switch |
| 16 | AI/DI16 | Water tank temperature | 44 | AI/DI44 | Electric Heater Overload Prot. |
| 17 | AI/DI17 | Terminal Return Water Temperature | 45 | AI/DI45 | Emergency input |
| 18 | AI/DI18 | Syst2: Coil Temp 1 | 46 | AI/DI46 | Mode switch |
| 19 | AI/DI19 | Syst2: Coil Temp 2 | 47 | AI/DI47 | Syst1: Fan Overload Prot. |
| 20 | AI/DI20 | Water Tank Inlet Temperature | 48 | AI/DI48 | Syst2: Fan Overload Prot. |
| 21 | AI/DI21 | Water Tank Outlet Temperature | 49 | AI/DI49 | No use |
| 22 | AI/DI22 | No use | 50 | AI 50(50K) | Syst1: Exhaust Air Temp |
| 23 | AI/DI23 | No use | 51 | AI 51(50K) | Syst2: Exhaust Air Temp |
| 24 | AI/DI24 | No use | 52 | AI 52(50K) | No use |
| 25 | AI/DI25 | No use | 53 | AI 53(50K) | No use |
| 26 | AI/DI26 | No use | 54 | AI 54(50K) | No use |
| 27 | AI/DI27 | No use | 55 | AI 55(50K) | No use |
| 28 | AI/DI28 | No use | 56 | 0-5V_IN1 | Syst1: Low Pressure Sensor |



| No. | Sign | Meaning | No. | Sign | Meaning |
|-----|-------------|----------------------------------------------------------------------|-----|--------|----------------------------------|
| 57 | AI/0-5V_IN2 | Syst2: Low Pressure Sensor | 85 | CN8 | No use |
| 58 | 0-5V_IN3 | Syst1: High Pressure Sensor | 86 | OUT1 | Syst1: Fan output (low speed) |
| 59 | 0-5V_IN4 | Syst2: High Pressure Sensor | 87 | OUT2 | Syst1: Fan output (high speed 1) |
| 60 | 0-5V_IN5 | No use | 88 | OUT3 | Syst2: Fan output (low speed) |
| 61 | 0-5V_IN6 | No use | 89 | OUT4 | Syst2: Fan output (high speed 1) |
| 62 | 0-5V_IN7 | No use | 90 | OUT5 | Syst1: 4-Way Valve |
| 63 | 0-5V_IN8 | No use | 91 | OUT6 | Syst2: 4-Way Valve |
| 64 | PWM_IN1 | Flow meter | 92 | OUT7 | Syst1: Crankshaft Heater |
| 65 | PWM_IN2 | No use | 93 | OUT8 | Syst2: Crankshaft Heater |
| 66 | PWM_OUT1 | No use | 94 | OUT9 | No use |
| 67 | PWM_OUT2 | No use | 95 | OUT10 | No use |
| 68 | 0-10V_OUT1 | No use | 96 | OUT11 | No use |
| 69 | 0-10V_OUT2 | No use | 97 | OUT12 | No use |
| 70 | +5V | 5V output | 98 | OUT13 | No use |
| 71 | +12V | 12V output | 99 | OUT14 | Electric Heater |
| 72 | L、N | 220V input | 100 | OUT15 | No use |
| 73 | L1、N1 | 220V output | 101 | OUT16 | Alarm output |
| 74 | JP2 | 12V input | 102 | OUT17 | Syst1: Fan output (high speed 2) |
| 75 | JP13_1 | Wire controller/Inverter board 1 /Inverter board 2/DC fan Motor 1 | 103 | OUT18 | Syst2: Fan output (high speed) |
| 76 | JP13_2 | Communication with board B | 104 | OUT19 | Drain Pan Heating Belt Output-A |
| 77 | JP13_3 | DTU module | 105 | OUT20 | No use |
| 78 | CN1 | Syst1: EEV Big Valve | 106 | OUT21A | Circulating Water Pump Output |
| 79 | CN2 | Syst2: EEV Big Valve | 107 | OUT21B | No use |
| 80 | CN3 | Syst1: EEV Small Vale | 108 | OUT22A | No use |
| 81 | CN4 | Syst2: EEV Small Vale | 109 | OUT22B | No use |
| 82 | CN5 | Syst1: EVI EEV | 110 | OUT23 | No use |
| 83 | CN6 | Syst2: EVI EEV | 111 | OUT24 | No use |
| 84 | CN7 | No use | 112 | CN300 | Program port |

Note:

- ①JP13_1 represents +12V, 485_A1, 485_B1, GND on the JP13 terminal;
- ②JP13_2 represents +12V, 485_A2, 485_B2, GND on the JP13 terminal;
- ③JP13_3 represents +12V, 485_A3, 485_B3, GND on the JP13 terminal.





(5) The input and output interface instructions

| No. | Sign | Meaning | No. | Sign | Meaning |
|-----|---------|-----------------------------------|-----|------------|--------------------------------|
| 1 | AI/DI1 | Inlet (Water) Temp | 29 | AI/DI29 | No use |
| 2 | AI/DI2 | Outlet (Water) Temp | 30 | AI/DI30 | No use |
| 3 | AI/DI3 | Syst3: Antifreezing Temp | 31 | AI/DI31 | No use |
| 4 | AI/DI4 | Syst3: Coil Temp 1 | 32 | AI/DI31 | No use |
| 5 | AI/DI5 | Syst3: Coil Temp 2 | 33 | AI/DI33 | No use |
| 6 | AI/DI6 | Syst4: Antifreezing Temp | 34 | AI/DI34 | No use |
| 7 | AI/DI7 | Ambient Temperature | 35 | AI/DI35 | No use |
| 8 | AI/DI8 | Syst3: Outlet(Coil) Temp | 36 | AI/DI36 | No use |
| 9 | AI/DI9 | Syst3: Suction Temp | 37 | AI/DI37 | Syst3: LP Switch |
| 10 | AI/DI10 | Syst4: Outlet(Coil) Temp | 38 | AI/DI38 | Syst4: LP Switch |
| 11 | AI/DI11 | Syst4: Suction Temp | 39 | AI/DI39 | Syst3: HP Switch |
| 12 | AI/DI12 | Syst3: EVI(In) Temp | 40 | AI/DI40 | Syst4: HP Switch |
| 13 | AI/DI13 | Syst3: EVI(Out) Temp | 41 | AI/DI41 | A/B board selection switch-B |
| 14 | AI/DI14 | Syst4: EVI(In) Temp | 42 | AI/DI42 | Water level switch |
| 15 | AI/DI15 | Syst4: EVI(Out) Temp | 43 | AI/DI43 | Water flow switch |
| 16 | AI/DI16 | Water tank temperature | 44 | AI/DI44 | Electric Heater Overload Prot. |
| 17 | AI/DI17 | Terminal Return Water Temperature | 45 | AI/DI45 | Emergency input |
| 18 | AI/DI18 | Syst4: Coil Temp 1 | 46 | AI/DI46 | Mode switch |
| 19 | AI/DI19 | Syst4: Coil Temp 2 | 47 | AI/DI47 | Syst3: Fan Overload Prot. |
| 20 | AI/DI20 | Water Tank Inlet Temperature | 48 | AI/DI48 | Syst4: Fan Overload Prot. |
| 21 | AI/DI21 | Water Tank Outlet Temperature | 49 | AI/DI49 | No use |
| 22 | AI/DI22 | No use | 50 | AI 50(50K) | Syst3: Exhaust Air Temp |
| 23 | AI/DI23 | No use | 51 | AI 51(50K) | Syst4: Exhaust Air Temp |
| 24 | AI/DI24 | No use | 52 | AI 52(50K) | No use |
| 25 | AI/DI25 | No use | 53 | AI 53(50K) | No use |
| 26 | AI/DI26 | No use | 54 | AI 54(50K) | No use |
| 27 | AI/DI27 | No use | 55 | AI 55(50K) | No use |
| 28 | AI/DI28 | No use | 56 | 0-5V_IN1 | Syst3: Low Pressure Sensor |



| No. | Sign | Meaning | No. | Sign | Meaning |
|-----|-------------|---------------------------------------------------|-----|--------|----------------------------------|
| 57 | AI/0-5V_IN2 | Syst4: Low Pressure Sensor | 85 | CN8 | No use |
| 58 | 0-5V_IN3 | Syst3: High Pressure Sensor | 86 | OUT1 | Syst3: Fan output (low speed) |
| 59 | 0-5V_IN4 | Syst4: High Pressure Sensor | 87 | OUT2 | Syst3: Fan output (high speed 1) |
| 60 | 0-5V_IN5 | No use | 88 | OUT3 | Syst4: Fan output (low speed) |
| 61 | 0-5V_IN6 | No use | 89 | OUT4 | Syst4: Fan output (high speed 1) |
| 62 | 0-5V_IN7 | No use | 90 | OUT5 | Syst3: 4-Way Valve |
| 63 | 0-5V_IN8 | No use | 91 | OUT6 | Syst4: 4-Way Valve |
| 64 | PWM_IN1 | Flow meter | 92 | OUT7 | Syst3: Crankshaft Heater |
| 65 | PWM_IN2 | No use | 93 | OUT8 | Syst4: Crankshaft Heater |
| 66 | PWM_OUT1 | No use | 94 | OUT9 | No use |
| 67 | PWM_OUT2 | No use | 95 | OUT10 | No use |
| 68 | 0-10V_OUT1 | No use | 96 | OUT11 | No use |
| 69 | 0-10V_OUT2 | No use | 97 | OUT12 | No use |
| 70 | +5V | 5V output | 98 | OUT13 | No use |
| 71 | +12V | 12V output | 99 | OUT14 | No use |
| 72 | L、N | 220V input | 100 | OUT15 | No use |
| 73 | L1、N1 | 220V output | 101 | OUT16 | No use |
| 74 | JP2 | 12V input | 102 | OUT17 | Syst3: Fan output (high speed 2) |
| 75 | JP13_1 | Inverter board 3/Inverter board 4 /DC fan Motor 2 | 103 | OUT18 | Syst4: Fan output (high speed) |
| 76 | JP13_2 | Centralized color controller | 104 | OUT19 | Drain Pan Heating Belt Output-B |
| 77 | JP13_3 | Communication with board A | 105 | OUT20 | No use |
| 78 | CN1 | Syst3: EEV Big Valve | 106 | OUT21A | Circulating Water Pump Output |
| 79 | CN2 | Syst4: EEV Big Valve | 107 | OUT21B | No use |
| 80 | CN3 | Syst3: EEV Small Vale | 108 | OUT22A | No use |
| 81 | CN4 | Syst4: EEV Small Vale | 109 | OUT22B | No use |
| 82 | CN5 | Syst3: EVI EEV | 110 | OUT23 | No use |
| 83 | CN6 | Syst4: EVI EEV | 111 | OUT24 | No use |
| 84 | CN7 | No use | 112 | CN300 | Program port |

Note:
 ①JP13_1 represents + 12V, 485_A1, 485_B1, GND on the JP13 terminal;
 ②JP13_2 represents + 12V, 485_A2, 485_B2, GND on the JP13 terminal;
 ③JP13_3 represents + 12V, 485_A3, 485_B3, GND on the JP13 terminal.



6. Appendix

6.1 Caution & Warning

1. The unit can only be repaired by qualified installer center personnel or an authorized dealer for the market.
2. This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety for the market. Children should be supervised to ensure that they do not play with the appliance.
3. Please ensure that the unit and power connection have good earthing; otherwise, it may cause electrical shock.
4. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person to avoid a hazard.
5. Directive 2002/96/EC (WEEE): The symbol depicting a crossed-out waste bin underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste. It must be taken to a recycling center for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.
6. Directive 2002/95/EC (RoHS): This product is compliant with directive 2002/95/EC (RoHS) concerning restrictions on the use of harmful substances in electric and electronic devices.
7. The unit CANNOT be installed near flammable gas. Once there is any leakage of gas, a fire can occur.
8. Ensure that there is a circuit breaker for the unit; lack of a circuit breaker can lead to electrical shock or fire.
9. The heat pump located inside the unit is equipped with an overload protection system. It does not allow the unit to start for at least 3 minutes from a previous stoppage.
10. The unit can only be repaired by qualified personnel from an installer center or an authorized dealer for the North American market.
11. Installation must be performed in accordance with NEC/CEC by authorized personnel only for the North American market.
12. USE SUPPLY WIRES SUITABLE FOR 75°C/167°F.
13. Caution: Single-wall heat exchanger, not suitable for potable water connection.



6.2 Cables specification

(1) Single phase unit

| Nameplate max. current | Phase line | Earth line | MCB | Creepage protector | Signal line |
|---------------------------|------------------------|--------------------|------|------------------------|------------------------|
| < 10A | 2 × 1.5mm ² | 1.5mm ² | 20A | 30mA less than 0.1 sec | n × 0.5mm ² |
| 10~16A | 2 × 2.5mm ² | 2.5mm ² | 32A | | |
| 16~25A | 2 × 4mm ² | 4mm ² | 40A | | |
| 25~32A | 2 × 6mm ² | 6mm ² | 40A | | |
| 32~40A | 2 × 10mm ² | 10mm ² | 63A | | |
| 40~63A | 2 × 16mm ² | 16mm ² | 80A | | |
| 63~75A | 2 × 25mm ² | 25mm ² | 100A | | |
| 75~101A | 2 × 25mm ² | 25mm ² | 125A | | |
| 101~123A | 2 × 35mm ² | 35mm ² | 160A | | |
| 123~148A | 2 × 50mm ² | 50mm ² | 225A | | |
| 148~186A | 2 × 70mm ² | 70mm ² | 250A | | |
| 186~224A | 2 × 95mm ² | 95mm ² | 280A | | |

(2) Three phase unit

| Nameplate max. current | Phase line | Earth line | MCB | Creepage protector | Signal line |
|---------------------------|------------------------|--------------------|------|------------------------|------------------------|
| < 10A | 3 × 1.5mm ² | 1.5mm ² | 20A | 30mA less than 0.1 sec | n × 0.5mm ² |
| 10~16A | 3 × 2.5mm ² | 2.5mm ² | 32A | | |
| 16~25A | 3 × 4mm ² | 4mm ² | 40A | | |
| 25~32A | 3 × 6mm ² | 6mm ² | 40A | | |
| 32~40A | 3 × 10mm ² | 10mm ² | 63A | | |
| 40~63A | 3 × 16mm ² | 16mm ² | 80A | | |
| 63~75A | 3 × 25mm ² | 25mm ² | 100A | | |
| 75~101A | 3 × 25mm ² | 25mm ² | 125A | | |
| 101~123A | 3 × 35mm ² | 35mm ² | 160A | | |
| 123~148A | 3 × 50mm ² | 50mm ² | 225A | | |
| 148~186A | 3 × 70mm ² | 70mm ² | 250A | | |
| 186~224A | 3 × 95mm ² | 95mm ² | 280A | | |



6.3 Performance Data

| Water outlet Water outlet (°F) | Model PASRW700S-PS-BP | Ambient Temperature (°F) | | | | | | | | | | | | | | |
|-----------------------------------|-----------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | -33 | -22 | -13 | -4 | 5 | 10 | 14 | 19 | 23 | 32 | 35 | 41 | 44 | 50 | 59 |
| 86 | Heating Capacity(kW) | 59.6 | 73.5 | 99.2 | 110.1 | 124.3 | 135.6 | 143.3 | 150.6 | 155.5 | 168.9 | 175.0 | 185.4 | 204.4 | 214.6 | 222.7 |
| | Power Input(kW) | 41.0 | 43.4 | 47.5 | 47.5 | 47.7 | 47.7 | 47.7 | 18.0 | 48.0 | 48.0 | 48.2 | 48.2 | 50.7 | 50.9 | 50.9 |
| | COP | 1.45 | 1.69 | 2.09 | 2.32 | 2.60 | 2.84 | 3.00 | 3.14 | 3.24 | 3.52 | 3.63 | 3.84 | 4.03 | 4.21 | 4.37 |
| 105.8 | Heating Capacity(kW) | 63.1 | 77.8 | 101.3 | 112.5 | 126.1 | 135.0 | 141.6 | 149.5 | 155.4 | 167.8 | 174.2 | 183.9 | 200.2 | 212.6 | 221.2 |
| | Power Input(kW) | 45.4 | 49.0 | 53.4 | 53.6 | 53.9 | 55.7 | 55.5 | 55.5 | 55.5 | 55.5 | 55.7 | 56.2 | 59.2 | 59.4 | 59.7 |
| | COP | 1.39 | 1.59 | 1.90 | 2.10 | 2.34 | 2.42 | 2.55 | 2.69 | 2.80 | 3.03 | 3.13 | 3.27 | 3.38 | 3.58 | 3.71 |
| 113 | Heating Capacity(kW) | 69.6 | 84.7 | 101.7 | 113.5 | 128.4 | 134.1 | 144.0 | 151.7 | 157.8 | 163.0 | 167.1 | 172.3 | 175.0 | 214.6 | 223.4 |
| | Power Input(kW) | 51.4 | 55.4 | 56.1 | 56.4 | 56.4 | 56.6 | 56.6 | 56.6 | 56.6 | 56.9 | 57.1 | 57.6 | 51.1 | 61.0 | 61.3 |
| | COP | 1.35 | 1.53 | 1.81 | 2.01 | 2.28 | 2.37 | 2.54 | 2.68 | 2.79 | 2.87 | 2.93 | 2.99 | 3.42 | 3.52 | 3.64 |
| 122 | Heating Capacity(kW) | 89.5 | 89.5 | 93.0 | 106.6 | 120.3 | 128.5 | 134.4 | 142.7 | 149.0 | 161.2 | 166.5 | 177.7 | 189.1 | 205.9 | 213.7 |
| | Power Input(kW) | 61.3 | 61.3 | 62.8 | 63.3 | 63.5 | 63.5 | 63.5 | 63.8 | 63.8 | 64.0 | 64.0 | 64.2 | 66.1 | 67.5 | 67.7 |
| | COP | 1.46 | 1.46 | 1.48 | 1.69 | 1.89 | 2.02 | 2.12 | 2.24 | 2.34 | 2.52 | 2.60 | 2.77 | 2.86 | 3.05 | 3.16 |
| 131 | Heating Capacity(kW) | 96.9 | 96.9 | 99.5 | 118.5 | 125.9 | 131.1 | 140.2 | 140.2 | 142.3 | 161.0 | 176.6 | 182.2 | 190.9 | 202.1 | 209.4 |
| | Power Input(kW) | 60.5 | 60.5 | 60.9 | 69.7 | 70.9 | 70.9 | 70.9 | 71.2 | 71.2 | 71.4 | 70.6 | 71.6 | 72.2 | 71.9 | 71.8 |
| | COP | 1.60 | 1.60 | 1.63 | 1.70 | 1.78 | 1.78 | 1.85 | 1.97 | 2.00 | 2.25 | 2.50 | 2.54 | 2.64 | 2.81 | 2.92 |
| 140 | Heating Capacity(kW) | 105.9 | 105.9 | 108.5 | 110.3 | 112.4 | 115.0 | 118.9 | 122.4 | 127.2 | 133.7 | 145.4 | 147.2 | 153.7 | 164.9 | 179.6 |
| | Power Input(kW) | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 | 60.6 |
| | COP | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 | 1.75 |



7. P-K EvoHP™ SPECIFIC LIMITED WARRANTY

Last Updated 08/14/2024

Subject to the terms and conditions herein and the Terms and Conditions of Sale (as defined herein), Patterson-Kelley ("Seller") warrants to the purchaser of the product ("Buyer") that the heat exchanger and compressor are free of defects in material and workmanship, when operated in accordance with the conditions stated herein, for a period of five (5) years for the heat exchanger, five (5) years for the compressor if a start-up report is furnished to Seller, on the start-up date shown on the report furnished to Seller (the "Warranty Period"), provided that startup is completed within six (6) months of shipment and the start-up report is furnished to Seller within thirty (30) days of startup (this "Specific Limited Warranty"). The Exclusions and limitations of liability set forth in the Terms and Conditions of Sale (as defined herein) apply to this Specific Limited Warranty. Capitalized terms used but not defined herein have the meanings ascribed to them under Seller's terms and conditions of sale for the product, which can be found at <http://pattersonkelley.com/warranty.php> (the "Terms and Conditions of Sale"). This Specific Limited Warranty is transferrable to the owner that utilizes the product(s) purchased hereunder for its intended use at the original installation site (the "Original Owner"). This Specific Limited Warranty is non-transferable to anyone who subsequently receives or purchases products from the Original Owner. If the Original Owner did not purchase the product directly from Seller, the Original Owner should contact the reseller from whom it purchased the product for a copy of the Terms and Conditions of Sale attached to the Order Acknowledgement received by the original purchaser of the product from Seller.

I. REMEDY

Seller's obligations under this Specific Limited Warranty are limited to repairing or, if in Seller's judgment it seems more appropriate, to furnishing without charge (installation not included), FCA Seller's factory (Incoterms 2010), a similar part to replace any part which after examination shall, to Seller's own satisfaction be determined to have been defective at the time it was shipped. If a replacement is provided by Seller, the defective item will be returned to Seller and become the property of Seller. Transportation to Seller's facility or other designated facility for repairs of any products or party alleged defective shall, in all events, be at Buyer's sole risk and cost. This warranty applies only if the original installer and Seller receive, within the Warranty Period, an immediate written notice, providing a detailed description of all claimed defects, upon discovery of such defects together with proof of purchase (invoice or Order Acknowledgment) and a copy of the start-up report for the affected product. Written notice must be sent to Attention: Patterson-Kelley, 155 Burson Street, East Stroudsburg, PA 1830. Seller may seek reimbursement of any costs incurred by Seller where the product is found to be in good working order, or when it has been determined that this Specific Limited Warranty does not apply as per the exclusions set forth below. The remedies available to Buyer set forth herein are exclusive remedies, and all other remedies, statutory or otherwise, including but not limited to the right of redhibition, are waived by Buyer. Buyer acknowledges that the exclusion of remedies is neither unreasonable nor unconscionable. Buyer shall indemnify and hold Seller harmless against, any claim due to any injury or death to any person or damage to any property resulting in whole or in part from any modification or alteration Buyer makes to any product sold hereunder.

II. EXCLUSIONS

To the full extent permitted by law, Seller shall have no liability for, and the Warranties do not cover:

- (A) any product which has been altered or repaired by other than Seller's personnel;
- (B) deterioration or failure of any product due to
 - (i) abrasion, corrosion, erosion or fouling,
 - (ii) misuse,
 - (iii) modification not authorized by Seller in writing or
 - (iv) improper installation, electrical/mechanical and lack of or improper maintenance or operation;
- (C) equipment not furnished by Seller by the owner, either mounted or unmounted, or when contracted for by a party or parties other than Seller to be installed or handled;
- (D) the suitability of any product for any particular application;
- (E) the design or operation of owner's plant or equipment or of any facility or system of which any product may be made a part;
- (F) any damage to the product due to abrasion, erosion, corrosion, deterioration, abnormal temperatures or the influence of foreign matter or energy;
- (G) the performance of any product under conditions varying materially from those under which such product is usually tested under industry standards at the time of shipment;
- (H) leakage or other malfunction caused by:
 - (i) defective installations in general and specifically, any installation which is made
 - (a) in violation of applicable state or local plumbing, electrical, housing or building codes or



- (b) contrary to the written instructions furnished with the product,
- (ii) adverse local conditions in general and, specifically, sediment or lime precipitation in the tubes, headers and/or shells or corrosive elements in the water, heating medium or atmosphere, or
- (iii) misuse in general and, specifically, operation and maintenance contrary to the written instructions furnished with the unit, disconnection, alteration or addition of components or apparatus, not approved by Seller, operation with heating media, fuels or settings other than those set forth on the rating plate or accidental or exterior damage;
- (I) production of noise, odors, discoloration or rusty water;
- (J) damage to surrounding area or property caused by leakage or malfunction;
- (K) costs associated with the replacement and/or repair of the unit including: any freight, shipping or delivery charges, any removal, installation or reinstallation charges, any material and/or permits required for installation, reinstallation or repair, charges to return the heatpump and/or components;
- (L) INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, SUCH AS LOSS OF THE USE OF PRODUCTS, FACILITIES OR PRODUCTION, INCONVENIENCE, LOSS OF TIME OR LABOR EXPENSE INVOLVED IN REPAIRING OR REPLACING THE ALLEGED DEFECTIVE PRODUCT;
- (M) any claim due to any injury or death to any person or damage to any property resulting in whole or in part from any modification or alteration Buyer makes to any product sold hereunder; and
- (N) Design defects where Seller has complied with Buyer's design specifications.

III. PROOF OF PURCHASE

Proof of purchase (invoice or Order Acknowledgement) and a copy of the start-up report for the affected product must be provided to Seller when requesting service under this Specific Limited Warranty.

IV. ORDER OF PRECEDENCE

The Standard Limited Warranty set forth in the Terms and Conditions of Sale, (b) this Specific Limited Warranty and (c) any applicable Extended Limited Warranty exclusively govern and control Seller's and Buyer's respective rights and obligations regarding the warranty of the product. In case of any inconsistency, conflict, or ambiguity between the Standard Limited Warranty, this Specific Limited Warranty and any applicable Extended Limited Warranty (collectively, the "Warranty Documents"), the documents shall govern in the following order: (w) any applicable Extended Limited Warranty; (x) this Specific Limited Warranty; (y) the Standard Limited Warranty and (z) other provisions in the Terms and Conditions of Sale. Information identified in one Warranty Document and not identified in another shall not be considered a conflict or inconsistency. No sales representative, agent, or employee of Seller or any reseller in the chain of sale of the product is authorized to make any modification, extension, or addition to this Specific Limited Warranty, unless agreed to in writing by Seller.