



**P-K Heat Pump Installation and
Instruction Manual**

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1. Table of Contents

- 1. Preface 3
- 2. Safety Precautions 4
 - 2.1 Mark Notes 4
 - 2.2 Icon Notes 4
 - 2.3 Warning 5
 - 2.4 Attention 6
- 3. Overall Information of the heat pump 7
 - 3.1 Device description 7
 - 3.2 Features of the AIR HEAT PUMP 7
 - 3.3 Running Range 8
 - 3.4 New Technology 8
 - 3.5 Specification data 10
 - 3.6 Heat pump dimension and view 11
- 4. Installation 12
 - 4.1 Transit 12
 - 4.2 Installation occasions 12
 - 4.3 Installation method 12
 - 4.4 Water loop connection 12
 - 4.5 Location of the unit 13
 - 4.6 Water Connection Diagram 15
 - 4.6.1 Water Circuit Installation Diagram 15
 - 4.7. Power supply connection 16
 - 4.8 Cable and switch 16
 - 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. ... 16
 - The power supply circuit must incorporate an All-pole disconnect device with a contact opening distance of at least 3mm. 16
 - Wiring tasks should be carried out exclusively by professional technicians in strict accordance with the circuit diagram..... 16
 - 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..... 16
 - 4.9 Trial running 17
- 5. Controlling and Operation 18
 - 5.1 Main interface display and function 18
 - 5.2 Instructions for operation of wire controller 20



5.3 Electronic control failure code and troubleshooting table.....30
5.4 Interface diagram35
6. Appendix.....42
6.1 Caution & Warning.....42
6.2 Cables specification.....43

PRELIMINARY



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 persons, 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

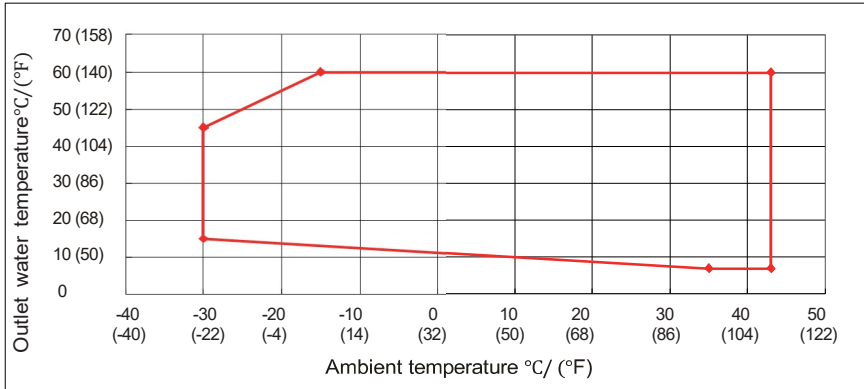
Utilizing a heat pump for heating purposes mitigates the risks associated with electrical shocks and burns, thereby ensuring the safety of individuals and minimizing the likelihood of accidents such as explosions or poisoning.

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.

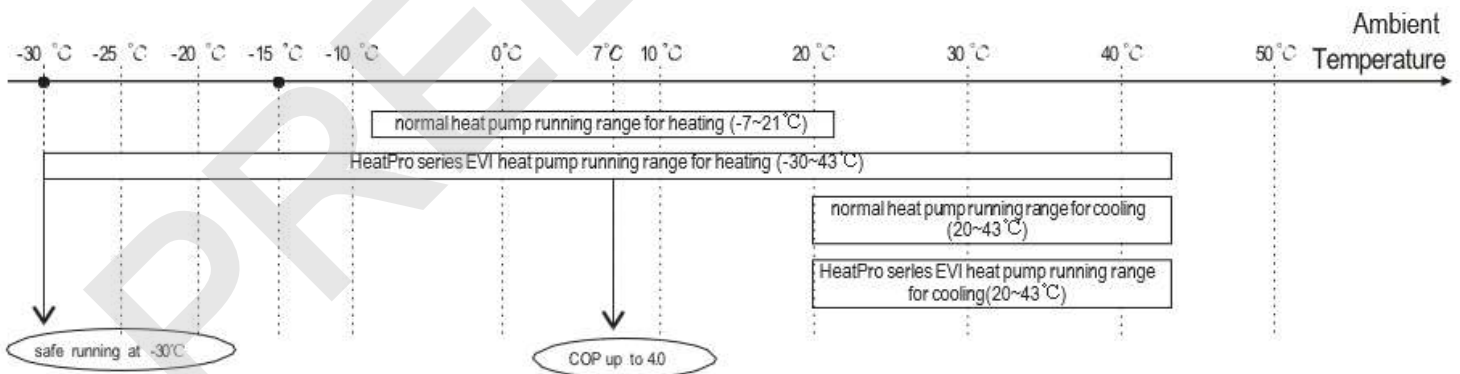


3.3 Running Range



3.4 New Technology

- 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
- 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.
- 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	m ³ /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)

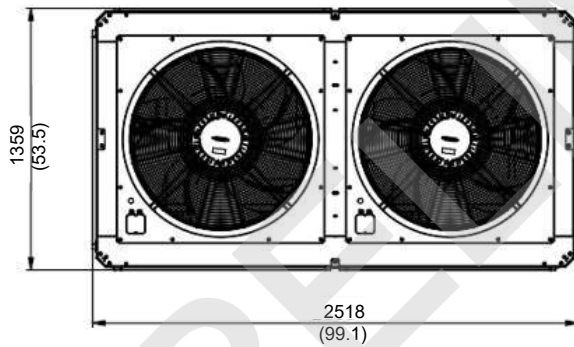
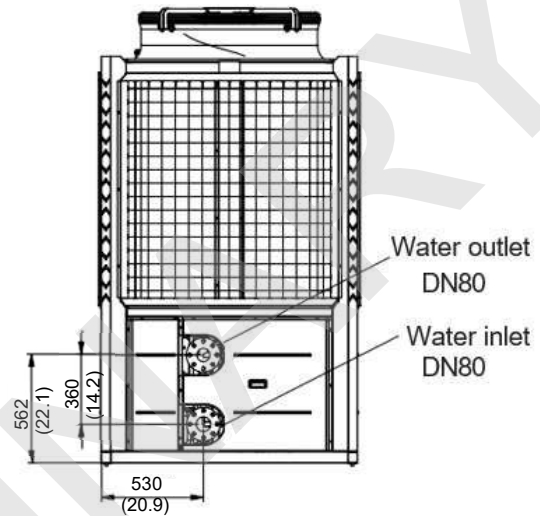
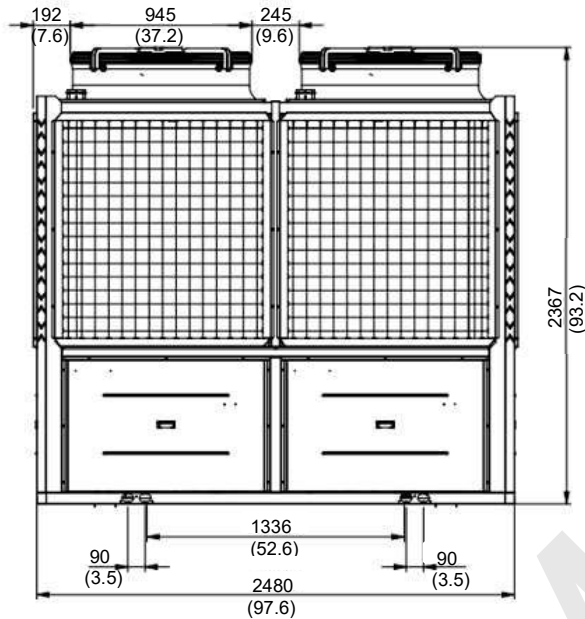
- 1.*Heating: ambient temp.(db/wb): -12°C / -14°C (10°F / 7°F), water temp.(out): 41°C (106°F)
- 2.**Heating: ambient temp.(db/wb): 7°C / 6°C (44°F / 43°F), water temp.(in/out):40°C / 45°C (104°F / 113°F)
- 3.Cooling: ambient temp.(db/wb): 35°C / 24°C (95°F / 75°F), water temp.(in/out):12°C / 7°C (54°F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



3.6 Heat pump dimension and view

Model: HP700

Unit: mm / (in)





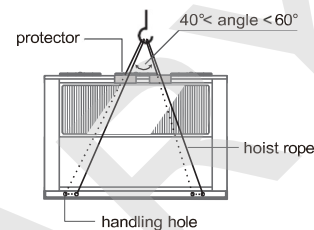
4. Installation


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.

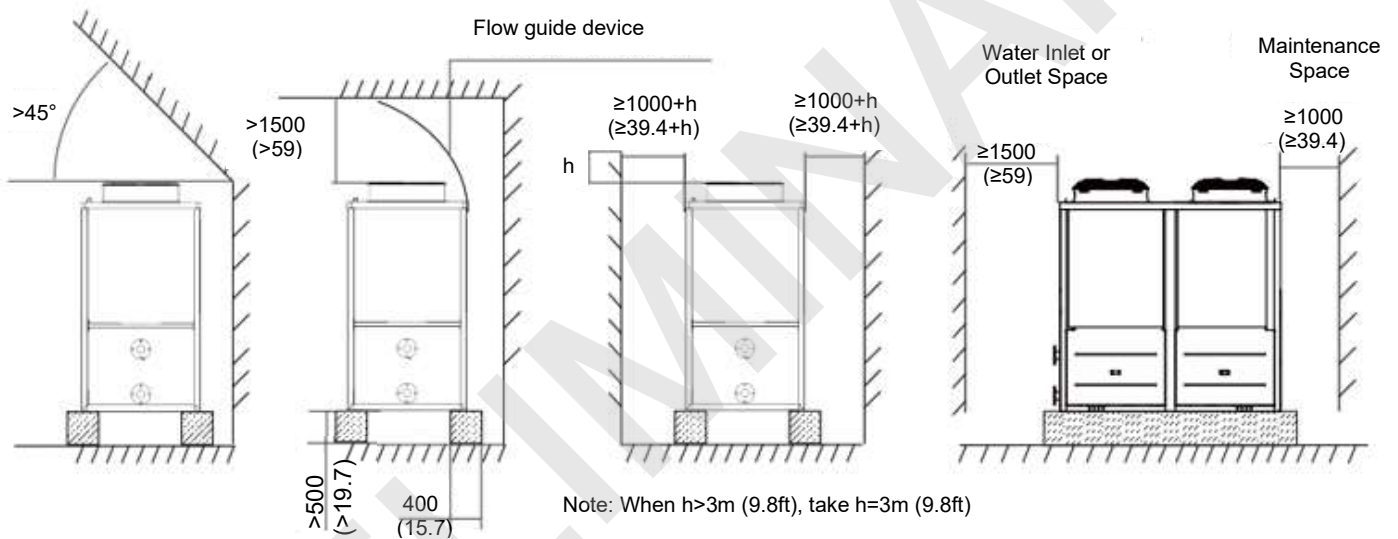


- Minimize air entrapment within the water pipe, incorporating an air vent at the highest point of the water loop.
- Install thermometers and pressure gauges at the water inlet and outlet for convenient monitoring during operation.
- Provide drainage at low points of the water system, including drainage 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

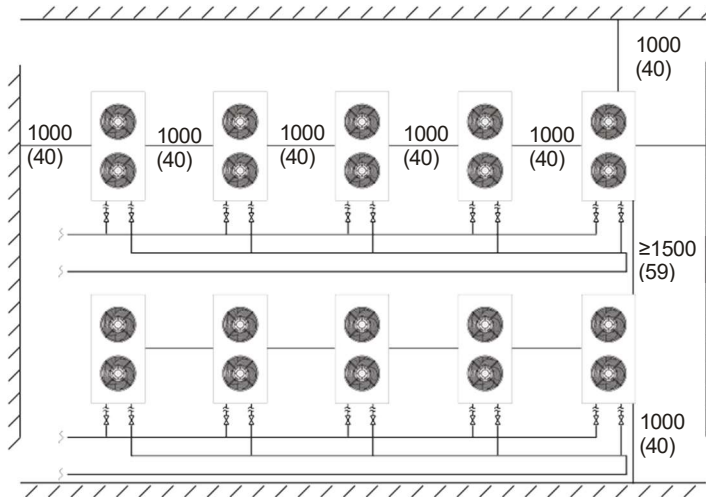
The unit can be installed individually or in multiple configurations. When installing multiple units in combination, careful attention should be given to their arrangement.

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





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



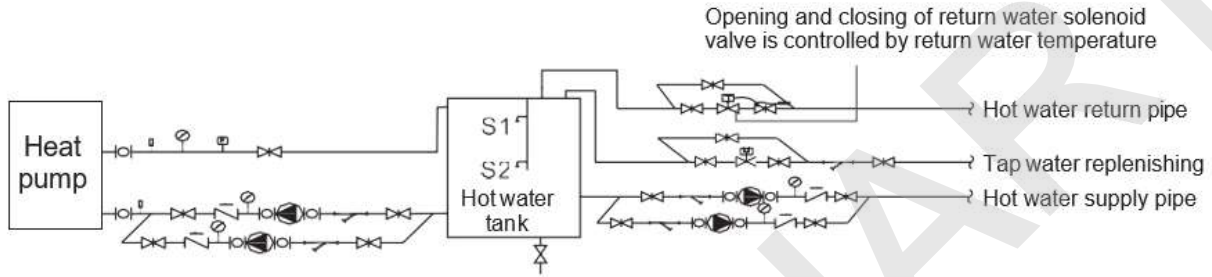
NOTE:

- 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.

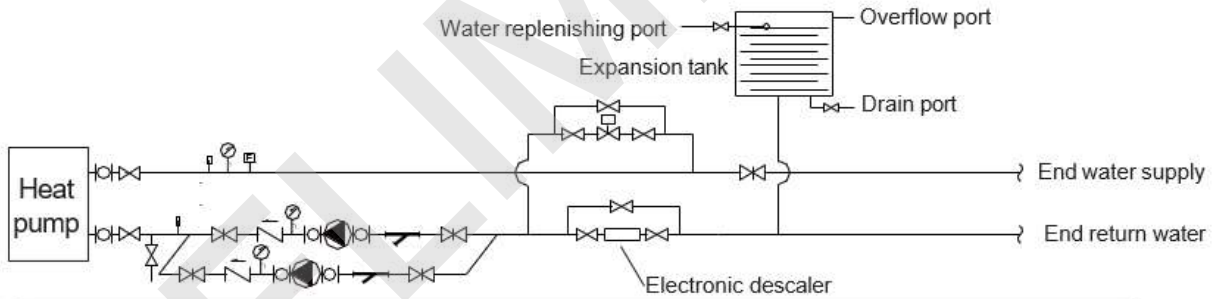


1.6 Water Connection Diagram
4.6.1 Water Circuit Installation Diagram

Hot Water Circuit Diagram



Heating (cooling) water circuit diagram



	Flexible pipe		Gate valve		Check valve		Y type water filter		Electric two-way valve
	Pressure gauge		Shut-off valve		Water valve		Level controller		Water flow switch
	Thermometer (0~100°C)		Solenoid valve		Differential pressure bypass valve				



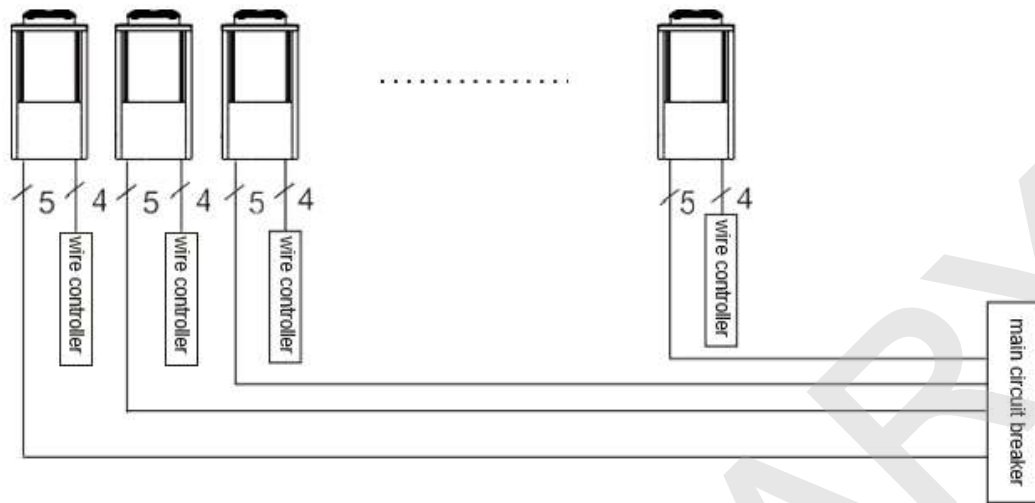
- Ensure proper installation of the Y filter at the water inlet of the unit. Attention should be given to the positioning for ease of removal and cleaning.
- Maintain a minimum distance of 100mm/3.9in between the circulating water inlet of the unit and the bottom of the water tank. Additionally, ensure 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

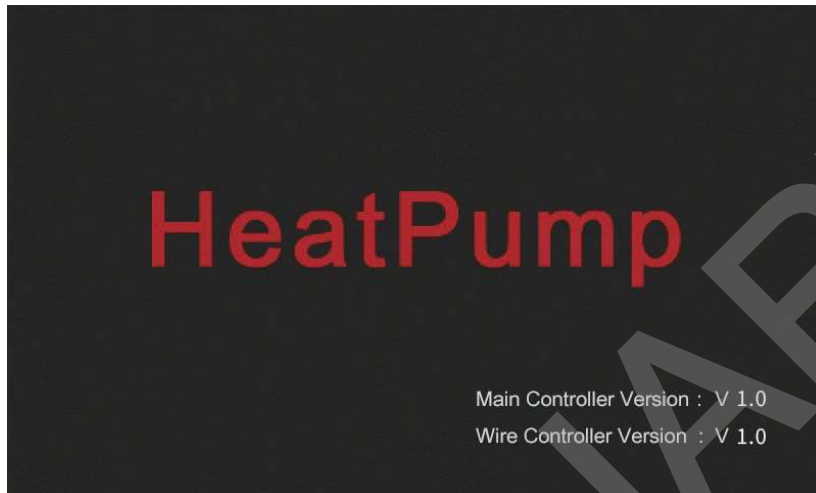


Fig.1 Electricity interface

(2) Main interface of power-off interface

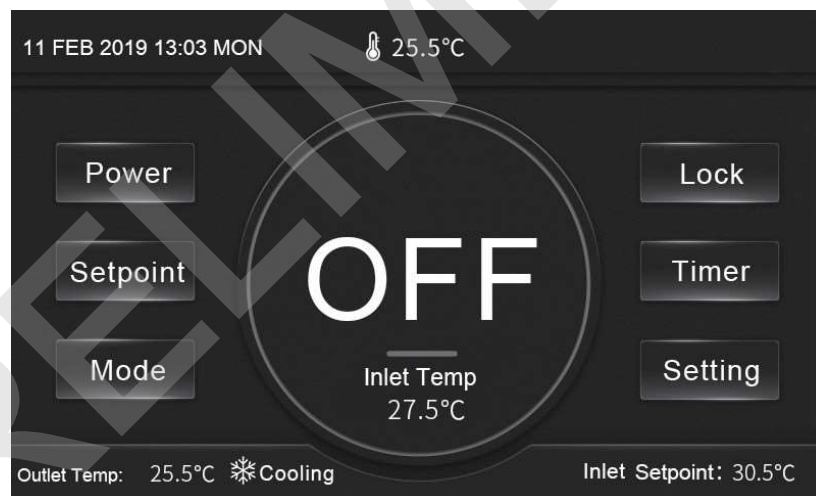


Fig.2 Power-off interface



(3) Main interface of power-on

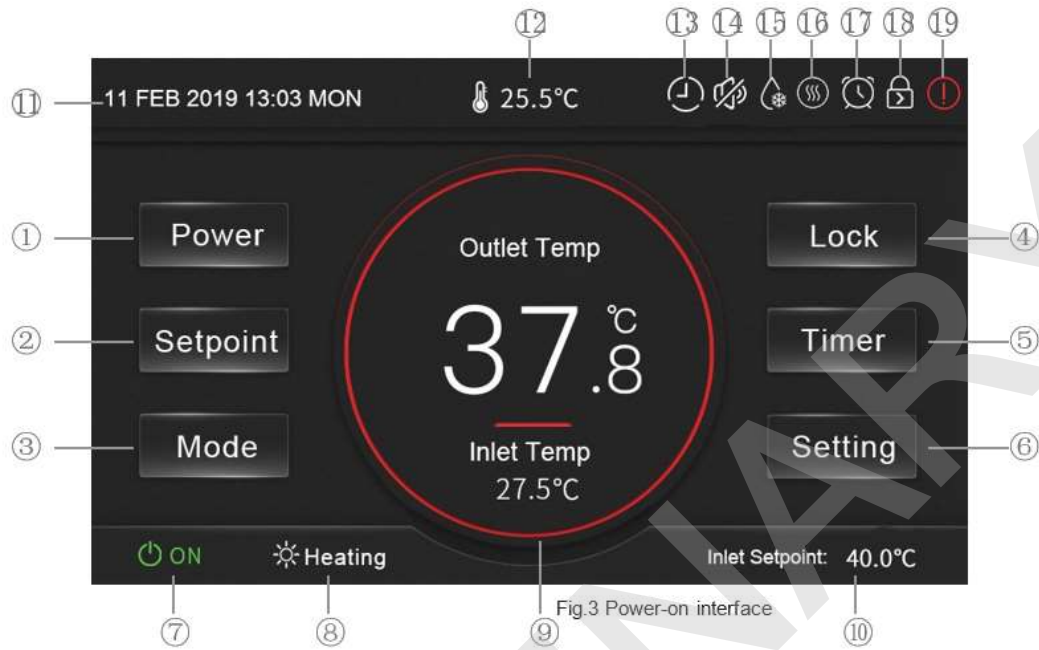


Fig.3 Power-on interface

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

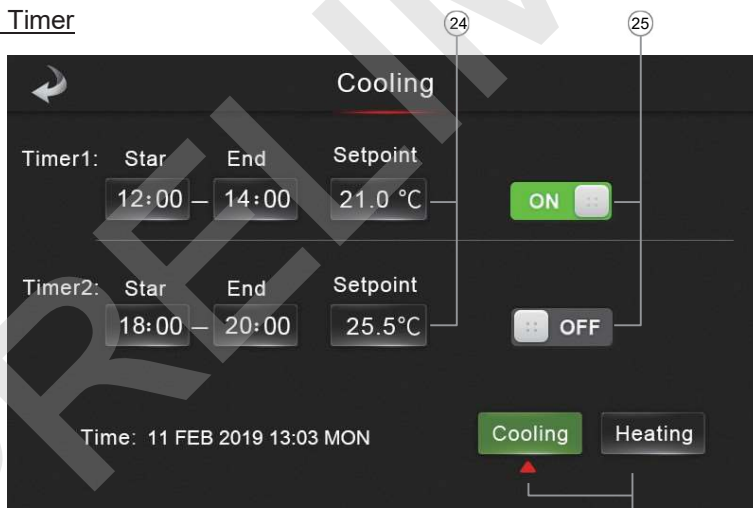


Fig. 5 Temp timer interface



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

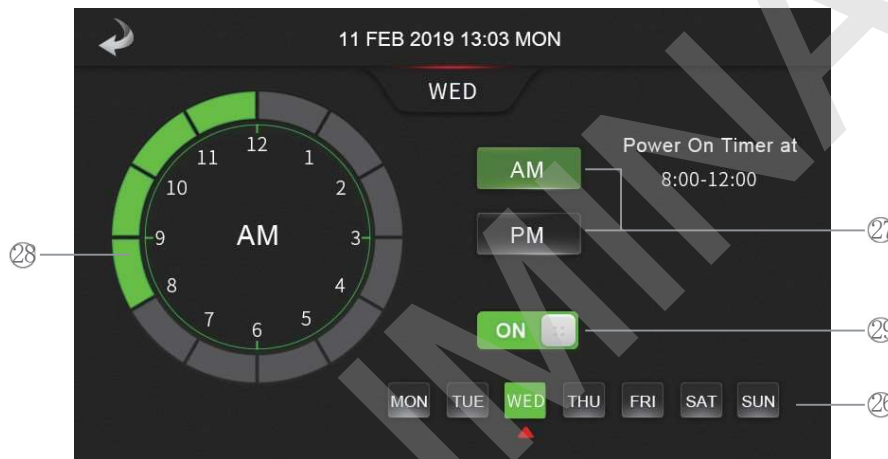


Fig. 6 Power timer interface

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

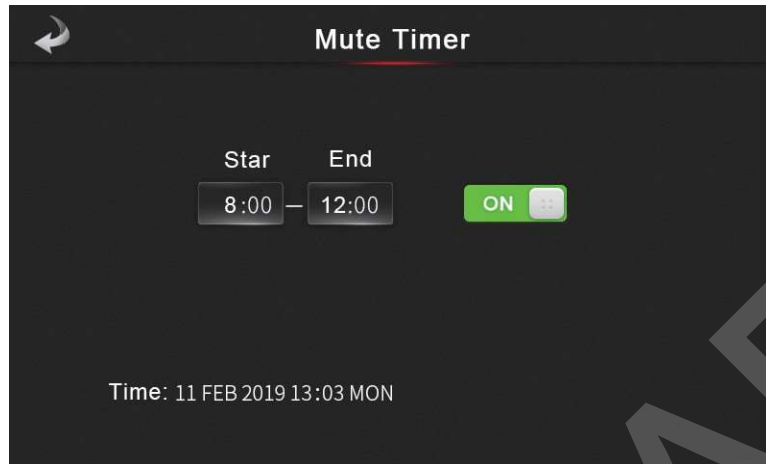


Fig. 7 Mute timer interface

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.

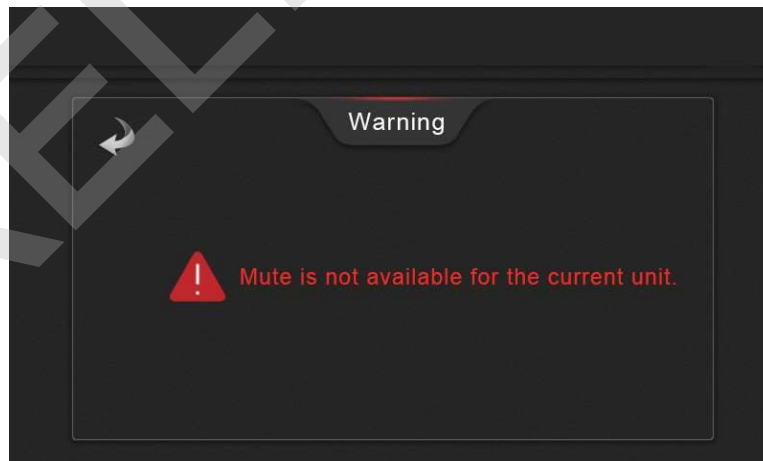


Fig. 8 Warning interface



(1) Setting function



Fig. 9 Setting interface

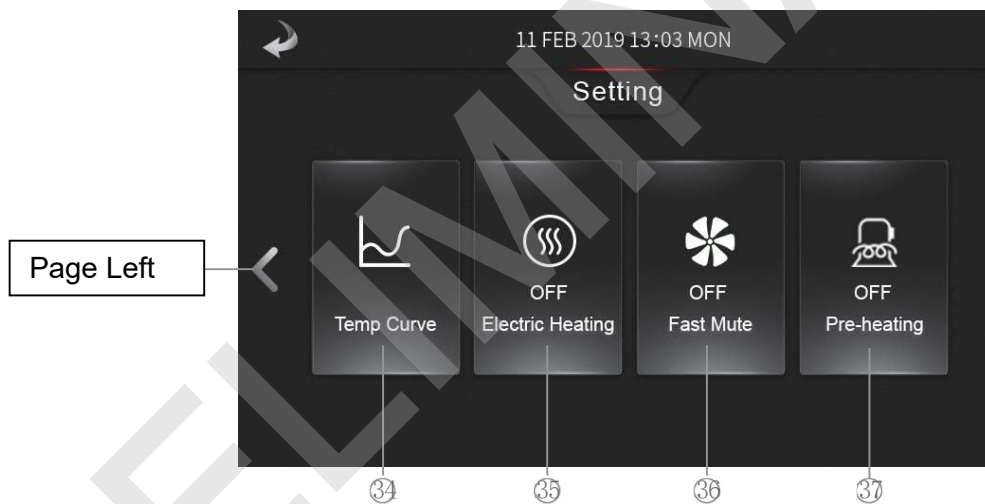


Fig. 10 Setting interface



Button function

No.	Name	Function
⑩	Status	Press to jump to the status inquiry interface to inquire the running and unit status parameter
⑪	Parameter	Press and enter password "22" to inquire installer parameter
⑫	Failure	Press to inquire failure record
⑬	Time	Press to jump to the Time Setting interface and adjust system time parameter
⑭	Temp Curve	Press to inquire the temperature curve
⑮	Electric Heating	Press to turn on/off the electric heating mode
⑯	Fast Mute	Press to turn on/off fast mute mode
⑰	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).

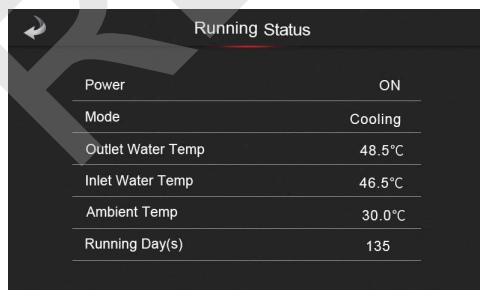


Fig.11-1 Running Status interface

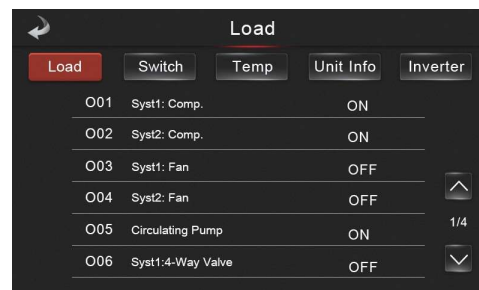



Fig.11-2 Unit Status interface



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).

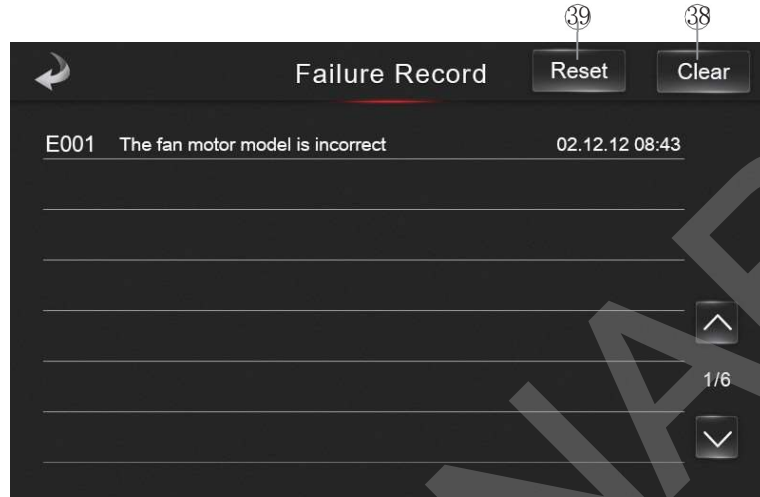


Fig.12 Failure Record interface

- After the failure is resolved:
 - (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.
 - (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).

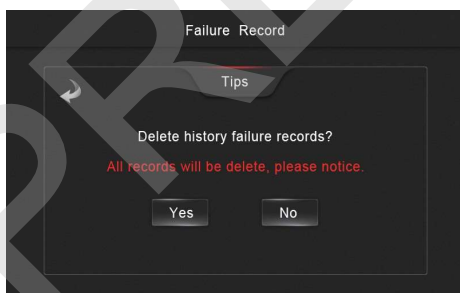


Fig.13-1 Delete history failure interface



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.

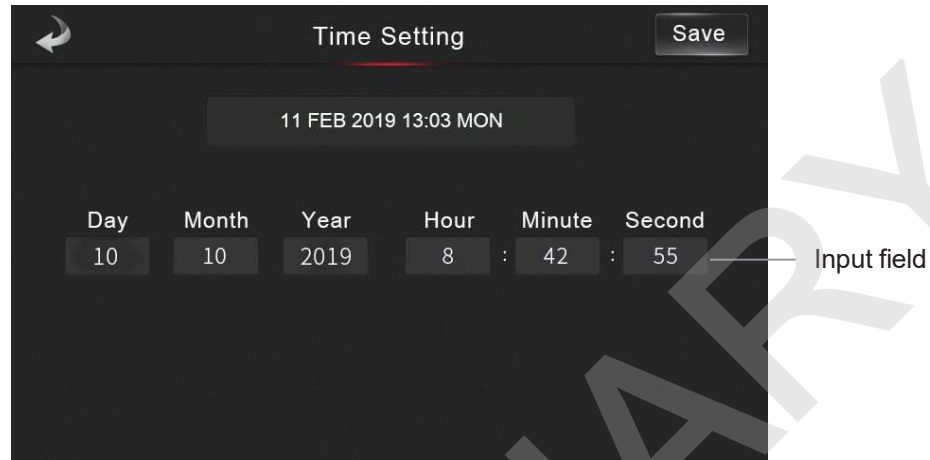


Fig.14 Time Setting interface

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).

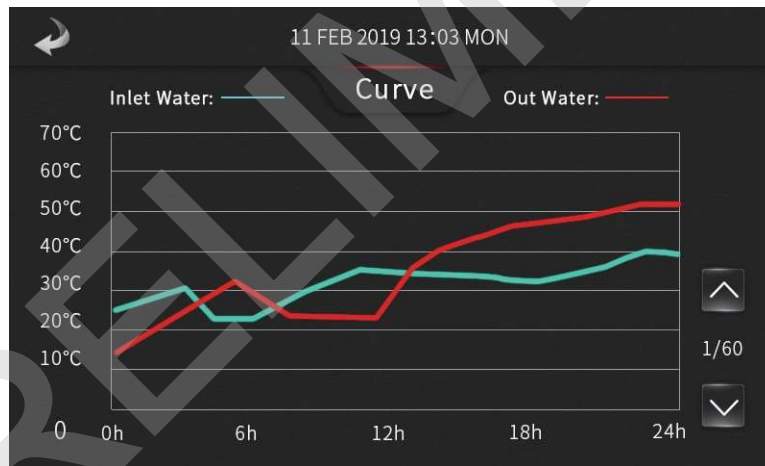


Fig.15 Temperature Curve interface

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.

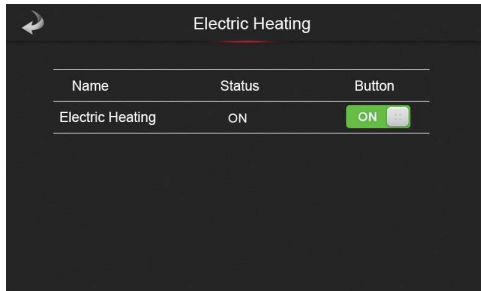


Fig.16-1 Electric Heating interface

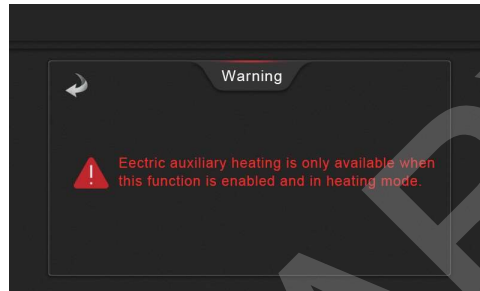




Fig.16-2 Warning interface

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

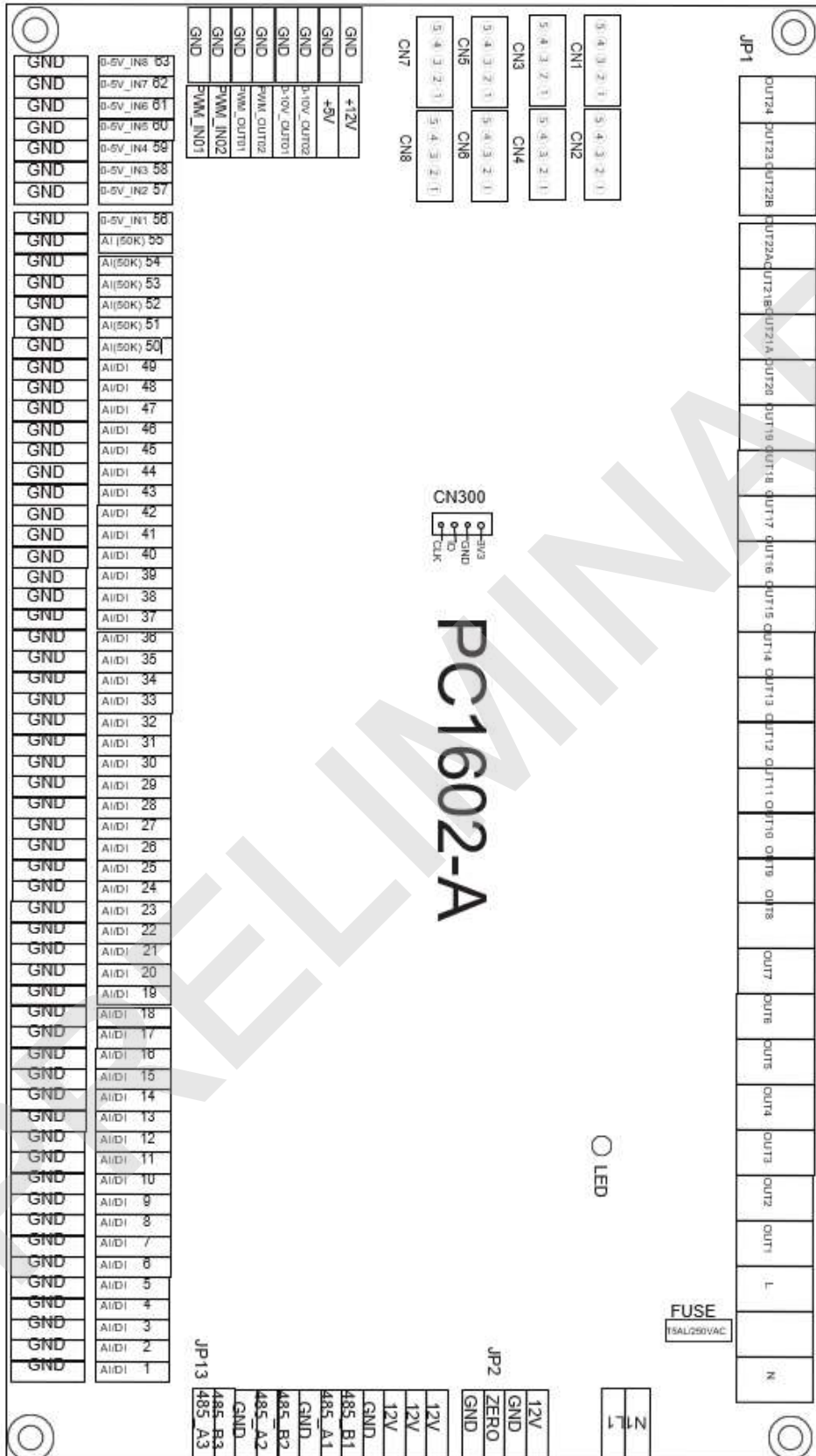
(1) Wire control interface diagram and definition



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



(2) Controller interface diagram and definition





(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



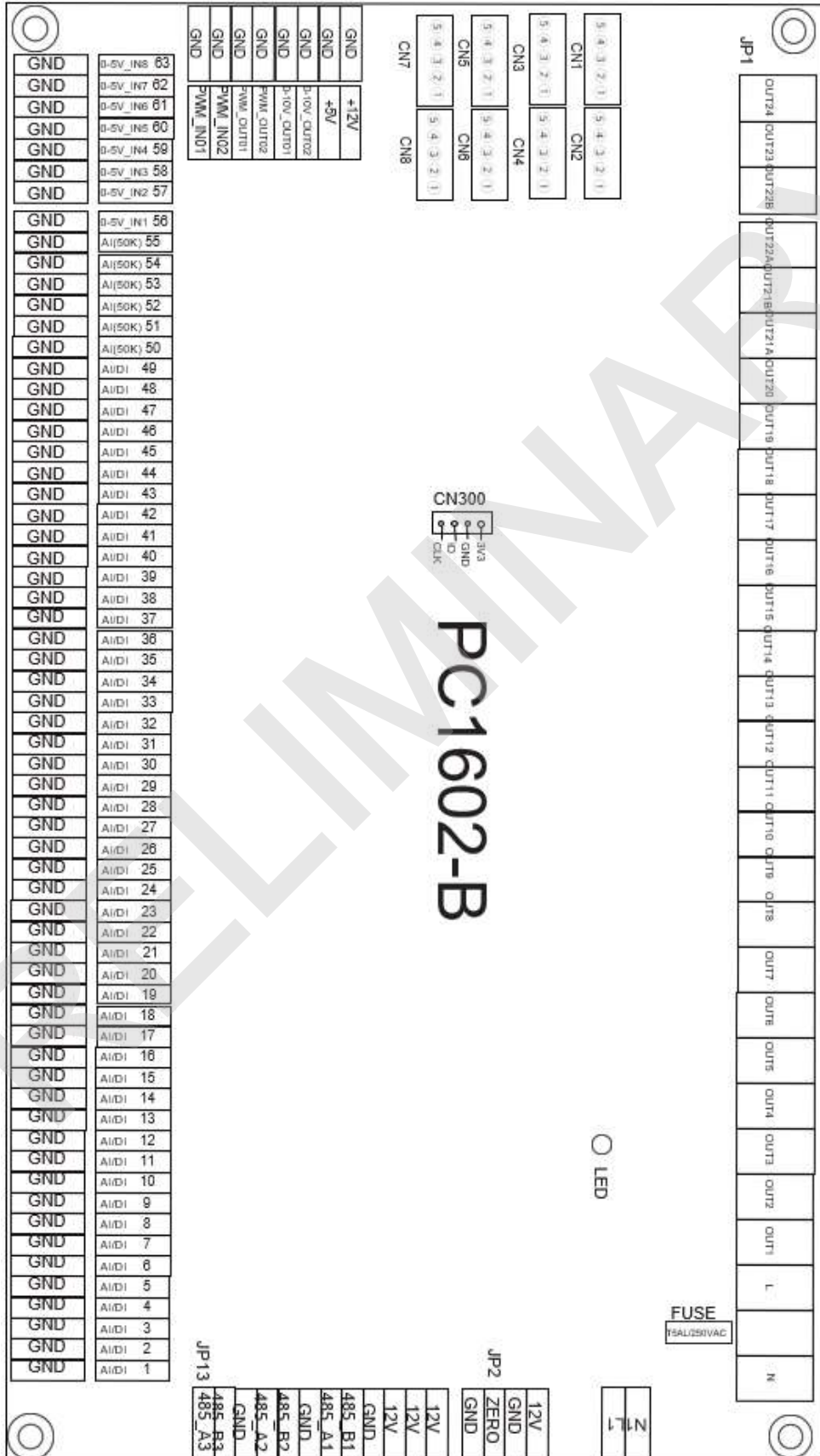
No.	Sign	Meaning	No.	Sign	Meaning
57	AI/0-5V_IN2	Syst2: Low Pressure Sensor	85	CN8	No use
58	0-5V_IN3	Syst1: High Pressure Sensor	86	OUT1	Syst1: Fan output (low speed)
59	0-5V_IN4	Syst2: High Pressure Sensor	87	OUT2	Syst1: Fan output (high speed 1)
60	0-5V_IN5	No use	88	OUT3	Syst2: Fan output (low speed)
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.



(4) Controller Interface Diagram and Definition





(5) The input and output interface instructions

No.	Sign	Meaning	No.	Sign	Meaning
1	AI/D11	Inlet (Water) Temp	29	AI/D129	No use
2	AI/D12	Outlet (Water) Temp	30	AI/D130	No use
3	AI/D13	Syst3: Antifreezing Temp	31	AI/D131	No use
4	AI/D14	Syst3: Coil Temp 1	32	AI/D131	No use
5	AI/D15	Syst3: Coil Temp 2	33	AI/D133	No use
6	AI/D16	Syst4: Antifreezing Temp	34	AI/D134	No use
7	AI/D17	Ambient Temperature	35	AI/D135	No use
8	AI/D18	Syst3: Outlet(Coil) Temp	36	AI/D136	No use
9	AI/D19	Syst3: Suction Temp	37	AI/D137	Syst3: LP Switch
10	AI/D110	Syst4: Outlet(Coil) Temp	38	AI/D138	Syst4: LP Switch
11	AI/D111	Syst4: Suction Temp	39	AI/D139	Syst3: HP Switch
12	AI/D112	Syst3: EVI(In) Temp	40	AI/D140	Syst4: HP Switch
13	AI/D113	Syst3: EVI(Out) Temp	41	AI/D141	A/B board selection switch-B
14	AI/D114	Syst4: EVI(In) Temp	42	AI/D142	Water level switch
15	AI/D115	Syst4: EVI(Out) Temp	43	AI/D143	Water flow switch
16	AI/D116	Water tank temperature	44	AI/D144	Electric Heater Overload Prot.
17	AI/D117	Terminal Return Water Temperature	45	AI/D145	Emergency input
18	AI/D118	Syst4: Coil Temp 1	46	AI/D146	Mode switch
19	AI/D119	Syst4: Coil Temp 2	47	AI/D147	Syst3: Fan Overload Prot.
20	AI/D120	Water Tank Inlet Temperature	48	AI/D148	Syst4: Fan Overload Prot.
21	AI/D121	Water Tank Outlet Temperature	49	AI/D149	No use
22	AI/D122	No use	50	AI 50(50K)	Syst3: Exhaust Air Temp
23	AI/D123	No use	51	AI 51(50K)	Syst4: Exhaust Air Temp
24	AI/D124	No use	52	AI 52(50K)	No use
25	AI/D125	No use	53	AI 53(50K)	No use
26	AI/D126	No use	54	AI 54(50K)	No use
27	AI/D127	No use	55	AI 55(50K)	No use
28	AI/D128	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		