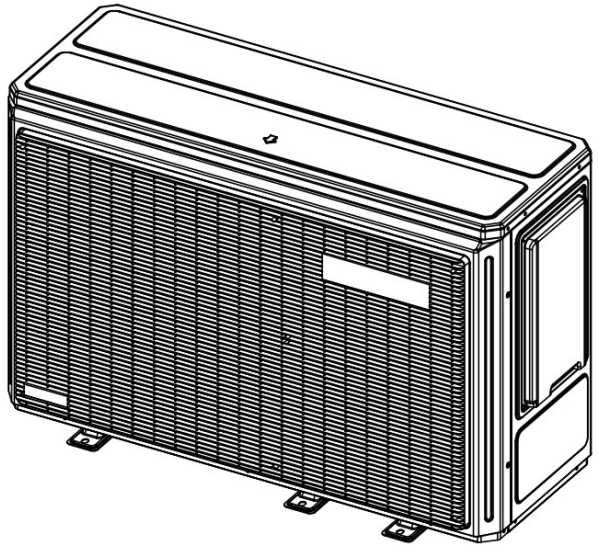
Hien®

Installation and Operation Manual

Triple Heating Pump Unit

(WDLRK-___BM/A3 Series)



Dear Users,

Thank you for selecting Hien® air source heating pump unit!

◇ To ensure the safe use of this product, please read this Manual carefully before installation and operation, and keep it properly for reference when necessary.

◇ Be sure to install the earth leakage protection device.

◇ The triple heating pump unit must be grounded reliably. Do not operate the unit without reliable grounding, and do not connect the ground wire to the neutral wire or a tap water pipe.

◇ Do not insert anything into the unit or cover it with anything, lest an accident should occur.

◇ The hot water pipe of the equipment is a high-temperature pipe. Do not touch it with your hands or open the gate valve to get water directly.

◇ A Y-type filter must be installed on the inlet pipe of the equipment, and any damage due to the failure to install the filter is not covered by the warranty of the company.

◇ For its long-time normal operation, the unit can only be connected to tap water, and the use of inferior water sources including groundwater is strictly prohibited.

◇ If the ambient temperature is below 0ºC, add antifreeze of an appropriate type to the water system. If the unit is idled for a long time, drain the water system to avoid the freezing and cracking of the heat exchanger and pipes.

◇ In case of extremely severe weather, when the equipment is operating in a low-temperature and high-humidity environment continuously, we recommend checking the equipment once every 12 hours. If much ice is found on the air outlet grille and the return air grille, remove the ice immediately to maintain the normal operation of the equipment.

◇ AC contactors must be installed when an external air conditioning circulating pump, a solar water pump, a lower return pump, an electric heater, and other electrical equipment are to be connected.

◇ If the technical parameters and circuit diagrams included in this Manual are different from those pasted on the machine, the contents on the machine's nameplate shall prevail.

◇ When designing an engineering scheme concerning the equipment, select the type of the unit according to the local minimum ambient temperature, lest the selected unit should be too small to meet the customer's demand for energy, resulting in a poor user experience. Otherwise, an additional auxiliary electric heater shall be installed on the water pipeline in the engineering system of the unit for supplemental heating in severe weather. The power of the electric heater shall be calculated and selected according to the customer's actual demand.

◇ The equipment has an automatic anti-freeze function, and its power supply must be maintained and must not be cut off in winter. If, at an ambient temperature lower than 0°C, a normal power supply cannot be guaranteed, drain the water system or add antifreeze of an appropriate type to it to prevent the water pipeline from freezing and cracking.

◇ Upon expiration of the service life of the equipment, contact a qualified appliance recycling company for its disposal according to the applicable local laws and regulations.

◇ For safe operation, be sure to connect the wires according to the wiring diagram. R32 refrigerant shall be used for the unit. Do not dismantle it for maintenance without authorization. Please contact the after-sales station as designated for repairs.

1. For R32 Refrigerant appliance:

The Refrigerant (R32) is contained within the refrigerant circuit of the appliance, a natural gas with a high level of environmental compatibility, which is nevertheless flammable.

During transportation and installation of the appliance, ensure that none of the components of the refrigerant circuit becomes damaged.

The refrigerant (R32) is flammable.

If the refrigerant circuit was damaged:

Avoid opening flames and sources of ignition.

Thoroughly ventilate the room in which the appliance is situated.

Appliance is supplied with flammable refrigerant (R32). It must be transported and installed with the utmost care since any excessive knocking or shaking could damage the refrigerating circuit.

Keep ventilation openings in the appliance enclosure or in the built-in structure clear of obstruction.

Do not use mechanical devices or other means to accelerate defrosting process, other than those recommended by the manufacturer.

Do not damage the refrigerant circuit.

Do not use electrical appliance inside the food storage compartments of the appliance, unless they of the type recommended by the manufacturer.

Service operations

WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.

Do not pierce or burn.

Be aware that refrigerants may not contain an odour.

– Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.

– Servicing shall only be performed as recommended by the equipment manufacturer.

Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.

Service personnel who shall be instructed to undertake the following when servicing an appliance that employs a flammable refrigerant.

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer’s maintenance and service guidelines shall be followed. If in doubt consult the manufacturer’s technical department for assistance.
The following checks shall be applied to installations using flammable refrigerants:
– the charge size is in accordance with the room size within which the refrigerant containing parts are installed;
– the ventilation machinery and outlets are operating adequately and are not obstructed;
– if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
– marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
– refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking; that there is continuity of earth bonding.

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Ensure that apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres.

Intrinsically safe components do not have to be isolated prior to working on them.

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of ageing or continual vibration from sources such as compressors or fans.

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. accordance with the manufacturer's specifications. that no live electrical components and wiring are exposed whiule charging, recovering or purging the system;

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.
Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:
remove refrigerant;
purge the circuit with inert gas;
evacuate;
purge again with inert gas;
open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be "flushed" with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.
Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

In addition to conventional charging procedures, the following requirements shall be followed.
– Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
– Cylinders shall be kept upright.
– Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
– Label the system when charging is complete (if not already).
– Extreme care shall be taken not to overfill the refrigeration system.

Prior to recharging the system it shall be pressure tested with OFN. The system shall be leaktested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.
a) Become familiar with the equipment and its operation.
b) Isolate system electrically.
c) Before attempting the procedure ensure that:
mechanical handling equipment is available, if required, for handling refrigerant cylinders;
all personal protective equipment is available and being used correctly;
the recovery process is supervised at all times by a competent person;
recovery equipment and cylinders conform to the appropriate standards.
d) Pump down refrigerant system, if possible.
e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
f) Make sure that cylinder is situated on the scales before recovery takes place.
g) Start the recovery machine and operate in accordance with manufacturer's instructions.
h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants.

In addition, a set of calibrated weighing scales shall be available and in good working order.

Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

2. Link to the Manual

www.hien-ne.com

Contents

Chapter 1 Identification Symbols and Meanings

1. Warning symbols and meanings

	Fire warning Indicating that there are flammable materials and attention shall be paid to fire prevention.
	Electric shock warning Indicating that the object is electrically charged, and touching it may cause an electric shock.
	Danger warning Indicating that death or injury may be caused.
	Blade warning Indicating that the blade cannot be touched when the fan is running.
	High temperature warning Indicating that the temperature of the object is high, and touching it may cause burns.

2. Caution symbols and meanings

	Please read the installation and operation manual before installation.
	Please read the installation and operation manual before maintenance and repair.
	Please read the installation and operation manual.
	Recycling symbol. Please send it back for recycling.
	Watch out for danger. Indicating a situation that may cause damage to equipment or property.

Chapter 2 Instructions on the Safety of Specific Installation Personnel

Always comply with the following instructions and regulations on safety.

Regulations on installation sites

	Warning: ➢ Install the equipment according to the dimensions of the maintenance space set forth herein. Please refer to “Requirements for Equipment Installation” for details.

Installation procedure

	Caution: ➢ Please comply with local laws and regulations, report to the local competent authorities, and obtain installation and construction licenses; ➢ According to the requirements of local laws and regulations, paste and publicize the construction license, the instructions on shutting down the system in emergency circumstances, the emergency contact person, the addresses and telephone numbers of the fire/police station and the hospital, and so on.
	Warning: ➢ Tear open plastic bags and throw them to the designated location, ensuring that no person (especially no children) can play with the bags, so as to avoid the danger of suffocation; ➢ Dispose in a safe way of such packaging materials as nails and other metal or wood components that may cause personal injury; ➢ Do not place any article or device on top of the equipment; ➢ Do not sit, climb or stand on the equipment; ➢ Wear adequate personal protective equipment (protective gloves, safety glasses, etc.) when installing, maintaining, or servicing the system.

Special requirements for R32

	Warning: ➢ As a combustible substance, it shall be kept away from open fire. Be careful with fire; ➢ Do not pierce through or burn the components for refrigerant circulation; ➢ The equipment shall be stored in a well-ventilated room without a continuously operating ignition source to prevent mechanical damage (e.g. open fire, a gas appliance in operation, or an electric heater in operation); ➢ Do not use methods other than those recommended by the manufacturer to speed up the defrosting process or clean the equipment; ➢ Do not install, repair, maintain, and overhaul the equipment by yourself. Please contact the authorized personnel with relevant qualification certificates and ask them to do such work.

Requirements for electric installation

	Warning: The electrical wiring and connection method must comply with the following instructions: ➢ All the accessories and electrical components purchased on site must comply with the applicable local regulations; ➢ All wiring must be performed by the authorized electricians with relevant qualification certificates and must comply with the applicable local regulations; ➢ Make sure that all electrical appliances are protectively grounded and must comply with the applicable local regulations; ➢ Make sure that necessary fuses or circuit breakers are installed and must comply with the applicable local regulations; ➢ Any power cord damaged must be replaced by the manufacturer, its service agent, or a person with a relevant qualification certificate, so as to avoid the occurrence of any hazard.
	Warning: ➢ Turn off all power supplies before removing a switch box cover, connecting a wire, or touching an electrical component; ➢ After the power supplies are disconnected for more than 10 minutes, measure the voltage at the terminals of the capacitors or electrical components of the main circuit before doing repairs. Only after the voltage is lower than 50V DC can the electrical components be touched. Please refer to the wiring diagram for the positions of the terminals; ➢ Do not touch the electrical components with wet hands; ➢ Do not leave the unit unattended after removing the service cover.

	Warning: ➢ Before installing the equipment, please read carefully the circuit diagram of the equipment (attached to the inside of the terminal box on the right side of the equipment). ➢ The equipment shall be properly grounded. Its grounding wire shall not be connected to a utility pipe, a surge absorber, or a telephone grounding wire. No circuit breakers can be installed on the grounding wire. ➢ Cables shall be secured with cable ties so that they will not come into contact with sharp edges or pipes; ➢ Ribbon conductors, stranded conductors, extension cords, or star systems shall not be used for connection; ➢ Do not push the extra cables into or place them in the equipment; ➢ Make sure that all the terminal boxes are closed before starting the equipment.

	Warning: ➢ Adequate measures shall be taken to prevent the unit from being used as a shelter for small animals. A small animal that comes into contact with the electrical components may cause failure, smoke, or fire.
	Warning: ➢ Power cords of different diameters shall not be connected to the same power supply terminal (a loose power cord will lead to abnormal heating); ➢ Use the designated power cords for wiring and connect and fix them firmly to prevent external pressure from being applied to the terminal boards; ➢ Use a proper screwdriver to tighten the terminal screws. A small screwdriver may cause damage to the head of a screw. Tighten the terminal screws properly. If a screw is tightened too hard, it may break.
	Warning: ➢ Connecting the power supply: First connect the grounding cable, and then connect the current-carrying cable; ➢ Disconnecting the power supply: First disconnect the current-carrying cable, and then disconnect the grounding cable.

Installation of pipes

	Warning: ➢ The on-site pipe installation method must follow the instructions in the Manual; ➢ Make sure that the water quality complies with the requirements of the local laws and regulations.

Installation and commissioning of the unit

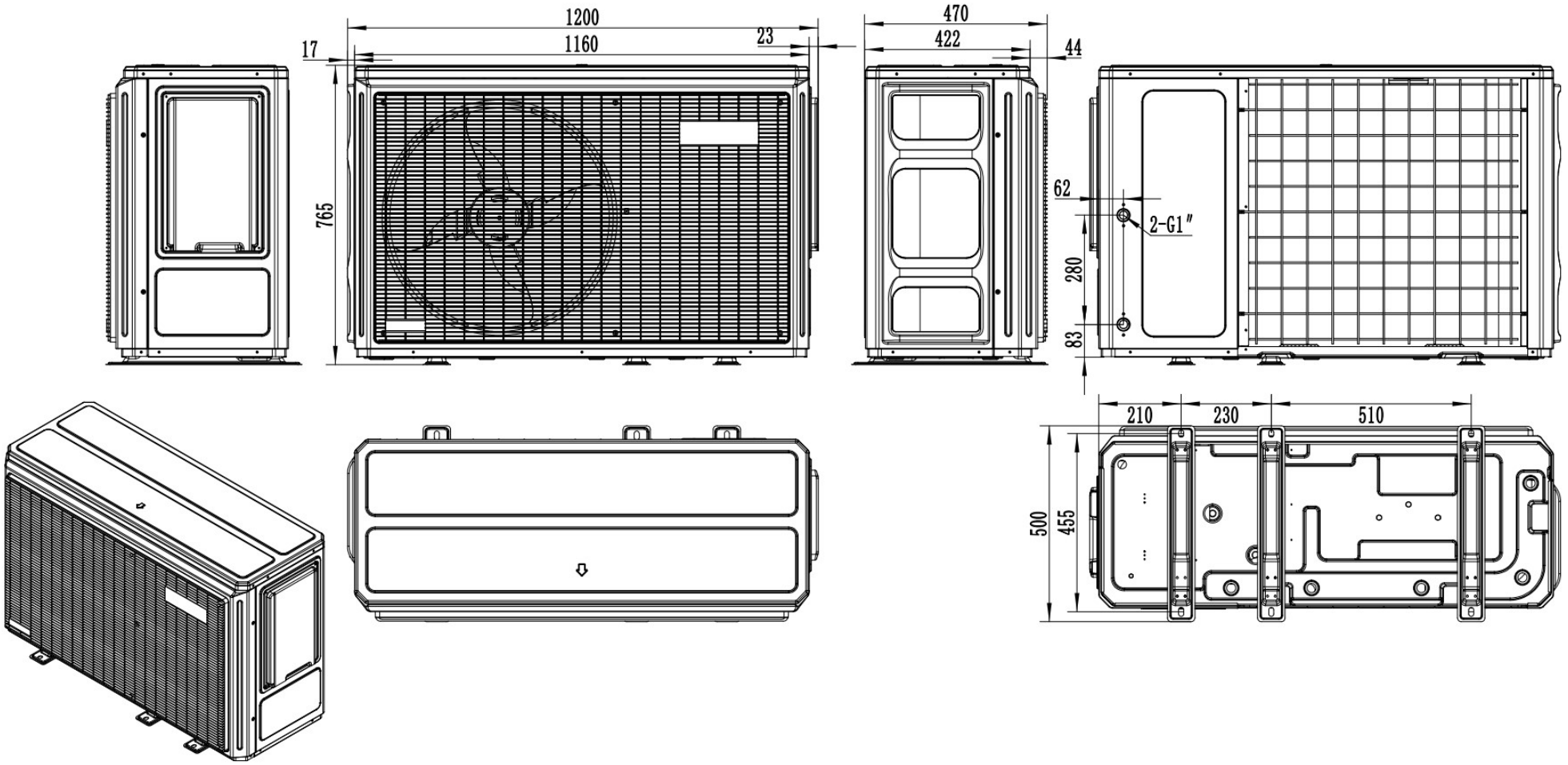
	Warning: ➢ Do not leave the unit unattended after removing the service cover; ➢ Do not touch the blade when the equipment is energized, for the fan may start suddenly; ➢ Do not stay at the air inlet or the aluminum fin of the equipment when it is in operation, so as to avoid personal injury; ➢ The outdoor unit must be secured according to the instructions in the Manual.

Warning:

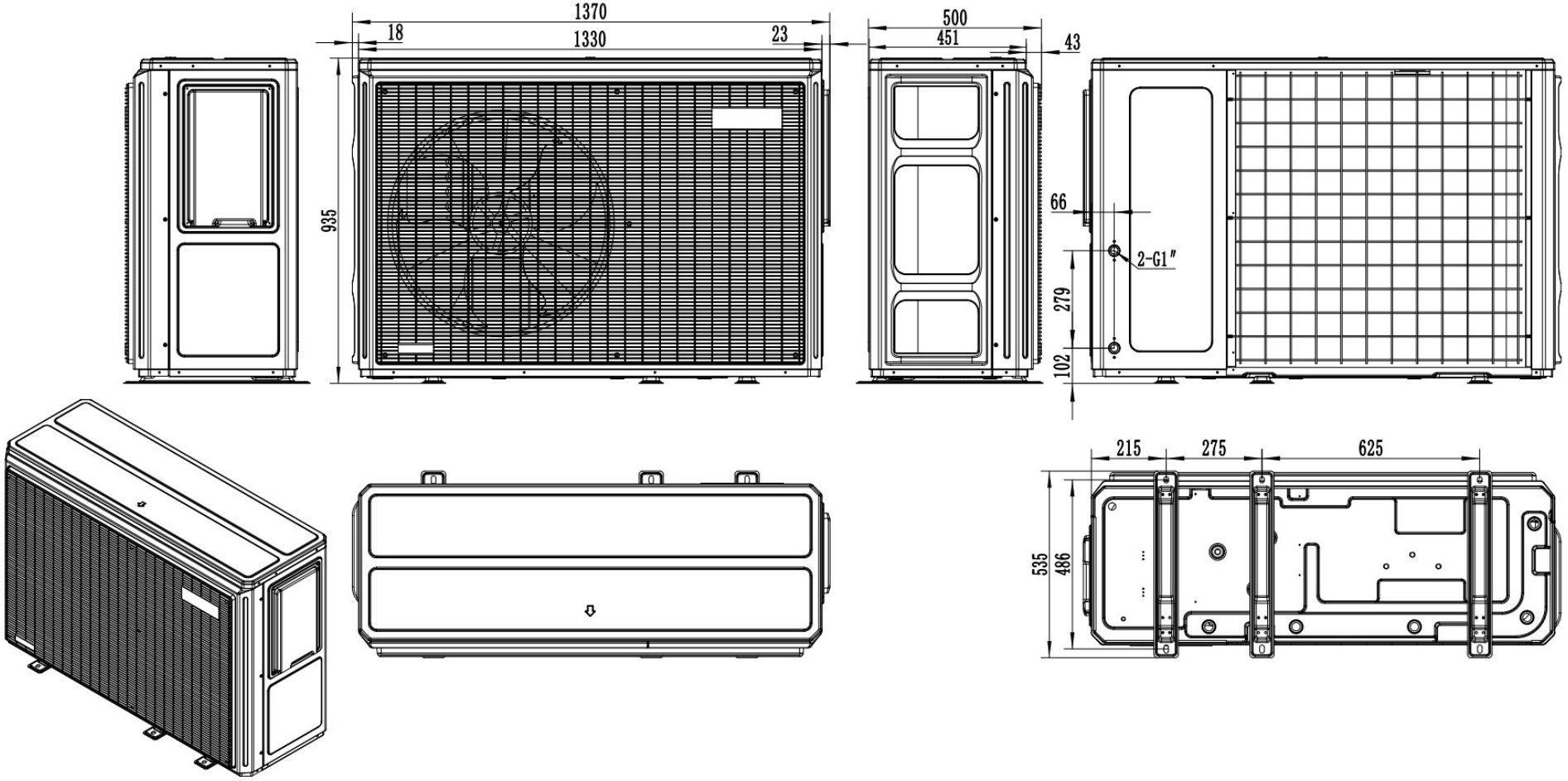
- Incorrect installation of the equipment and its accessories may result in electric shocks, short circuit, leakage, fire, or other damage to the equipment;
- During the testing process, using a pressure higher than that indicated on the equipment nameplate to pressurize the equipment is strictly prohibited.

Chapter 3 Dimensional Drawings of the Equipment

Equipment Model: WDLRK-6 (8/10/12)IBM/A3, WDLRK-12IIBM/A3



Equipment Model: WDLRK-14(16)IBM/A3, WDLRK-14(16)IIBM/A3



Chapter 4 Unpacking the Equipment

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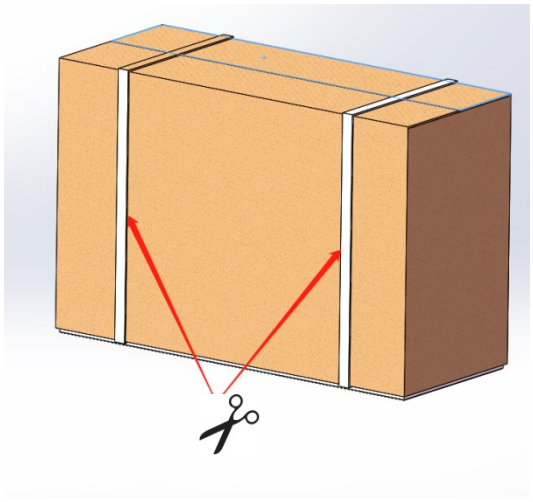

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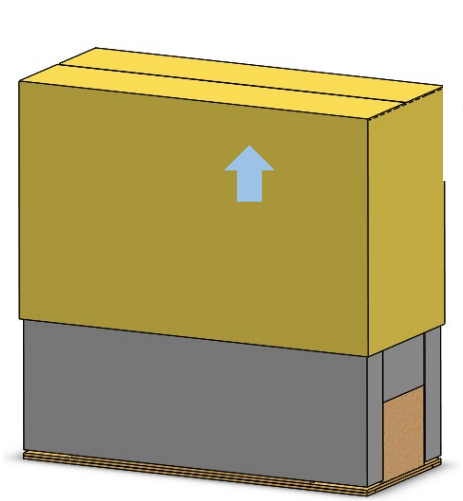

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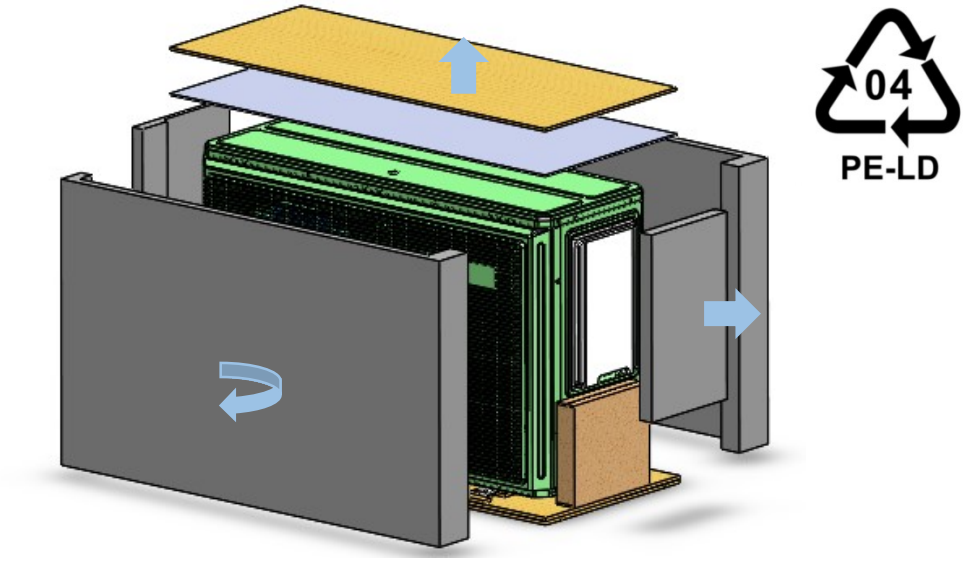

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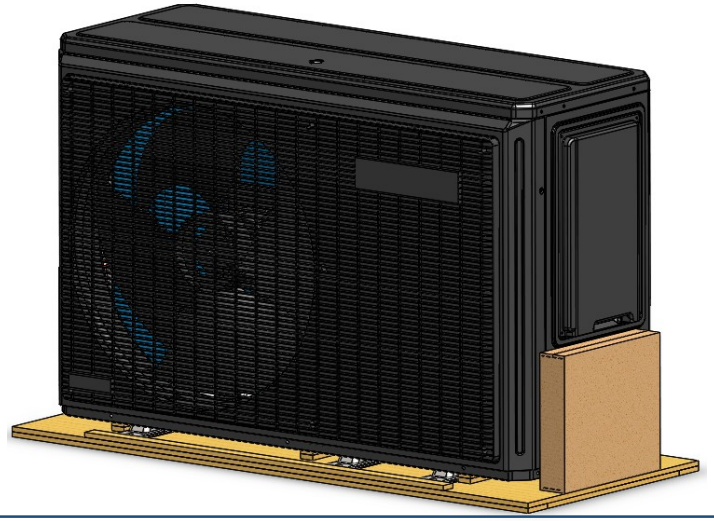


*Please place all packages at designated recycling points by category!

Chapter 5 Requirements for Equipment Installation

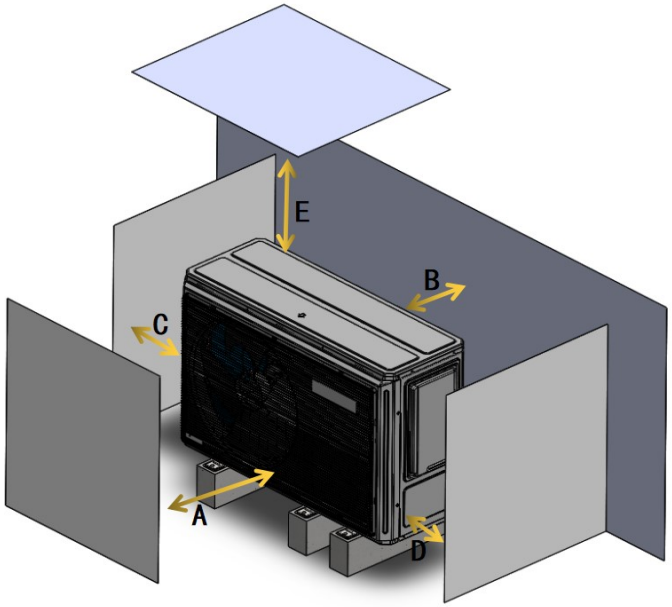
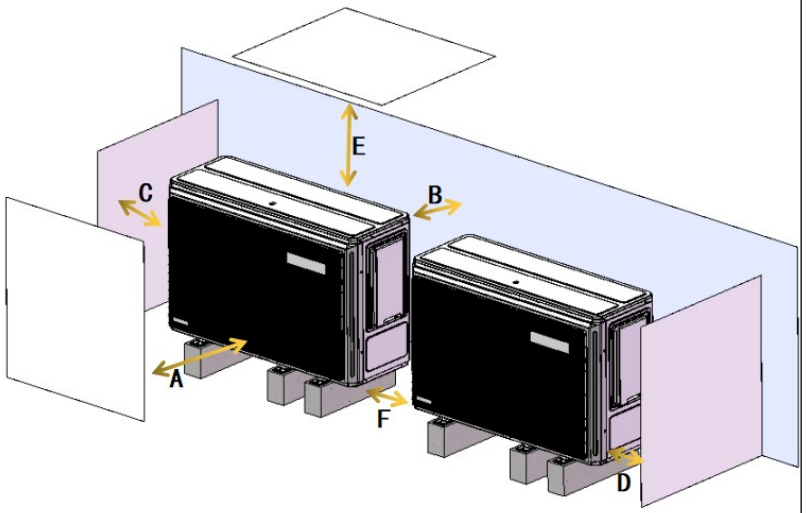
5.1 Equipment installation site

Warning:

- Main unit
  - The equipment shall be stored in a place where there are no ignition sources (e.g. open fire, gas appliances in operation, or electric heaters in operation);
  - The equipment shall be installed in a well-ventilated place with ample space.
  - The installation site shall be able to ensure that the air inlet and outlet are unimpeded;
  - A drainage ditch or outlet shall be provided nearby the installation site to facilitate drainage;
  - The installation base or bracket shall be solid and firm to ensure the smooth operation of the unit;
  - Make sure that the whole installed unit is upright without tilting;
  - Do not install the main unit in a place where there is pollution, corrosive gases, and contaminants like ash, sand, and fallen leaves;
  - The elevation of the site where the unit is installed shall not be higher than 1,000 m. If it is more than 1,000 m, please contact the maintenance technicians.
- Water tank
  - The water tank shall be installed in a place where the ambient temperature is above 0°C;
  - A drainage ditch or outlet shall be provided nearby the installation site to facilitate drainage;
  - The installation base or bracket shall be solid and firm, and shall be designed to be able to bear the weight of the water tank;
  - Do not install the water tank in a place where there is pollution and corrosive gases.

Select an installation site with sufficient space to facilitate transportation equipment's entry into and exit from the site. Do not install the unit in a place that is often used for work. If a lot of dust is produced on the installation site, protective measures (e.g. covering the unit with a dust shield) must be taken.

	Warning: ➢ Ask your distributor or qualified personnel to do the installation according to the Manual. Do not install the unit by yourself. Improper installation may result in water leakage, electric shocks, or fire; ➢ Give full consideration to a strong wind, hurricane, or earthquake when performing a specified installation task. Improper installation work may cause the equipment to fall.
	Caution: ➢ Do not pile the units one above another; ➢ Do not hang the unit from the ceiling.

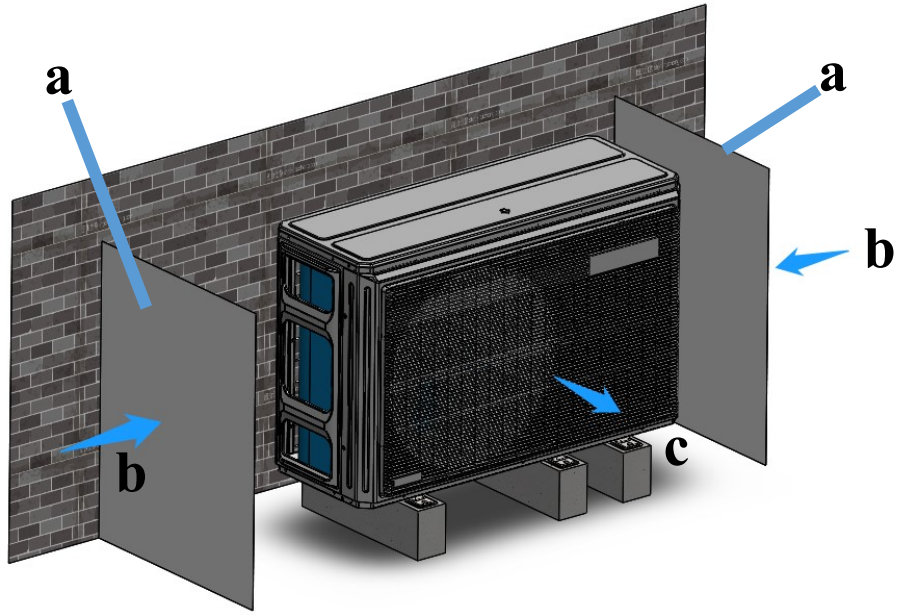
Installation Mode	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
Single-unit installation 	≥2000	≥500	≥500	≥500	≥1000	/
Double-unit installation 	≥2000	≥500	≥500	≥500	≥1000	≥1000

5.2 Requirements for equipment installation

A strong wind (≥18 km/h) blows into the air outlet of the outdoor unit, resulting in a short circuit (exhaust gas is inhaled). This may lead to the following results:

- The performance of the unit will be degraded;
- Acceleration of frosting occurs frequency during the heating operation;
- The operation is interrupted due to the decrease of low pressure or increase of high pressure;
- The fan breaks (if the strong wind blows on the fan continuously, the fan will rotate rapidly until it breaks);

We recommend installing a baffle plate to prevent the fan from coming into direct contact with a strong wind.



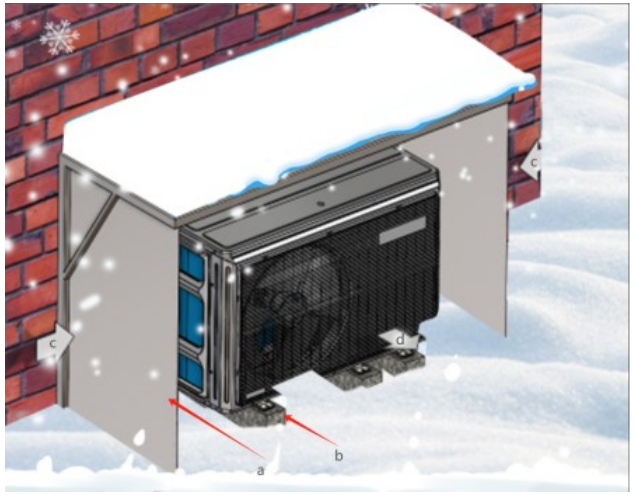
a: Baffle plate b: Prevailing wind direction c: Air outlet

	Caution: Do not install the main unit in the following places ➢ A sound-sensitive area (e.g. a place that is near your bedroom or disturbs your neighbors). Note: Due to ambient noise and sound reflection, the sound power level measured may be higher than that referred to on the nameplate; ➢ A place where mineral oil mists, sprays, or vapors may be present in the atmosphere. Plastic components may deteriorate, come off, or cause water leakage; ➢ A place where flammable gases may leak, or a potentially explosive environment; ➢ A place with narrow space; ➢ A place with large fluctuation in voltage; ➢ On a vehicle or a vessel;

	➢ A place with acidic or alkaline vapors. When the unit is to be installed by the seaside, make sure that the outdoor unit is not directly exposed to sea winds, lest it should be corroded by the air with high salinity and its service life should be shortened.

Additional requirements for the installation site of an outdoor unit in a cold climate.

- To protect the main unit, do not install it in a place where its suction side may be directly exposed to wind and snow;
- In any case, a free space of at least 150 mm shall be available beneath the unit;
- In an area that gets heavy snowfall, it is very important to select an installation site where accumulated snow will not affect the unit. If lateral snowfall is possible, make sure that the pipeline of the heat exchanger is not affected by snow. Install a rain shelter and a base if necessary.



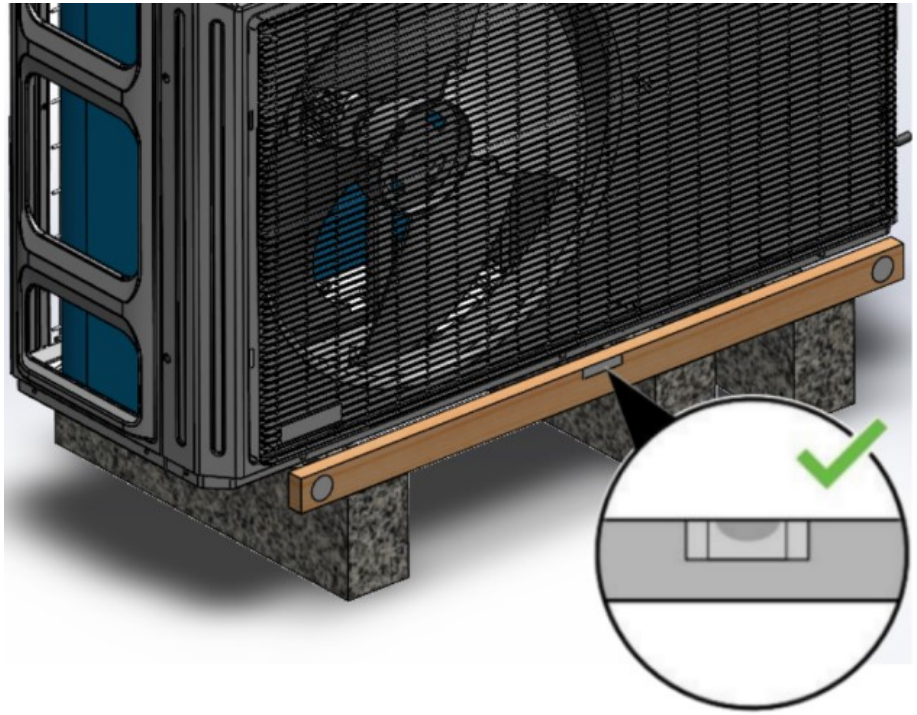
a: Rain shelter b: Base c: Prevailing wind direction d: Air outlet

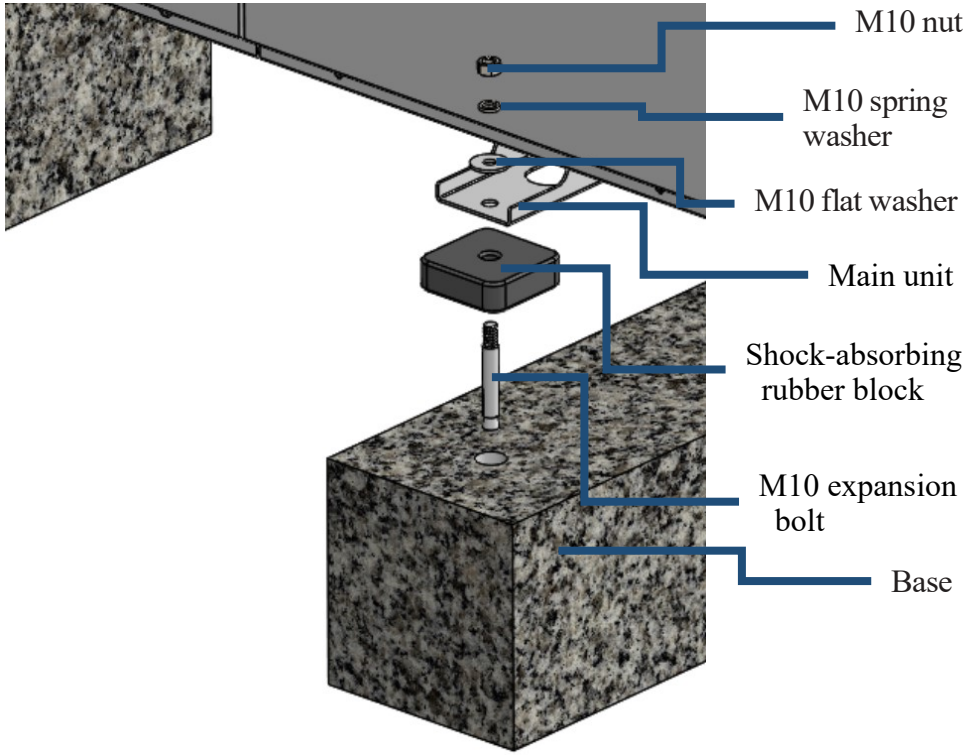
	Caution: ➢ If extreme weather comes locally, and the equipment operates continuously in a low-temperature and high-humidity environment, we recommend checking the equipment once every 12 hours. If much ice is found on both the air outlet grille and the return air grille, remove the ice immediately to maintain the normal operation of the equipment.

Selection of the installation site in hot climate.

The outdoor temperature is measured by a thermistor on the equipment. Direct sunlight may cause the outdoor temperature detected by the equipment to be higher than the actual ambient temperature, and the protection system is triggered to make the equipment unable to operate, resulting in a poor user experience. The unit shall be installed in a cool place or under an awning to avoid direct sunlight, so that it will not be affected by solar heat.

⚠	Warning: In any case, the following principles shall be abided by: ➢ The equipment shall be installed on a base that is at least 150 mm tall; ➢ Before installation, inspect the base with a level instrument to ensure the levelness of the equipment; ➢ We recommend placing shock-absorbing rubber blocks between the equipment and the base; ➢ Fix the equipment to the base with 6 sets of M10 bolts. Note: The length of the part of each bolt inside the base shall be at least 20 mm.



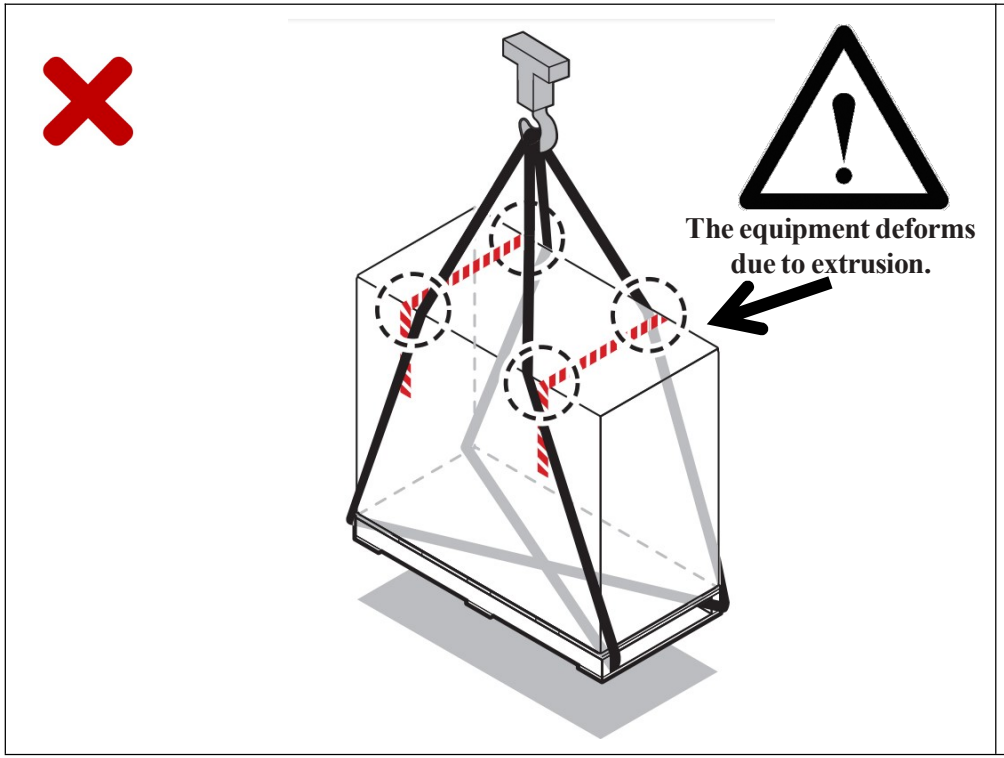


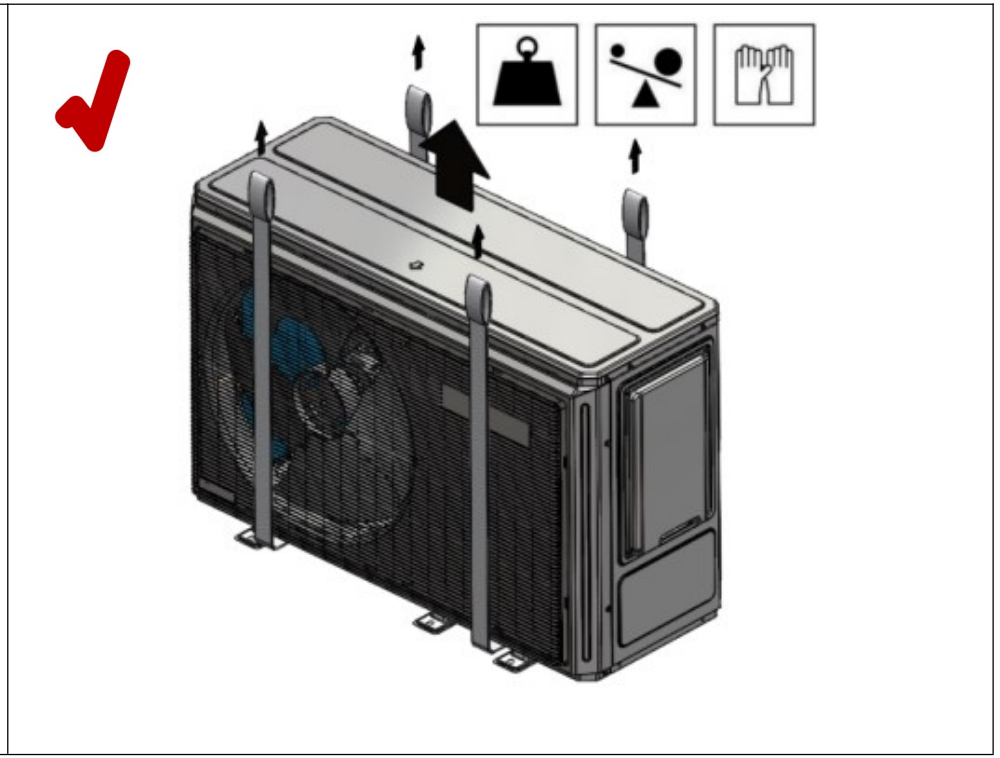
5.3 Requirements for equipment hoisting

	Warning: ➢ To avoid dangers, contact the personnel with relevant qualification certificates and ask them to hoist the equipment. ➢ The equipment must be hoisted according to the instructions in this Manual.

① Handle the equipment with slings, and then place it on the structural frame for installation:

	Warning: ➢ After placing the equipment on the base, fix it with bolts immediately. Do not leave it unattended, lest an accident should occur.





② Fix the equipment to the structural frame for installation:

	Warning: ➢ After placing the equipment on the structural frame for installation, fix it with bolts immediately and then remove the slings. Do not leave it unattended, lest a hazard should occur.

5.4 Requirements for water supply and drainage

- Make sure that condensate drains away quickly;
- Install the unit on the base to make a proper drainage system available, so as to avoid ice build-up;
- Build a drainage channel around the base to discharge the waste water outside the unit, lest the waste water should flow over the sidewalk, making it slippery and then causing people to slip and fall.

	Caution: ➢ If the equipment is installed in cold climate, take appropriate measures to prevent the discharged condensate from freezing. (We recommend installing a heater on the drain pipeline.)

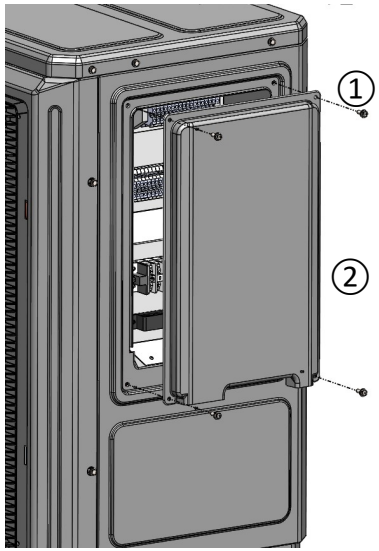
5.5 Removal and installation of the front panel of the equipment

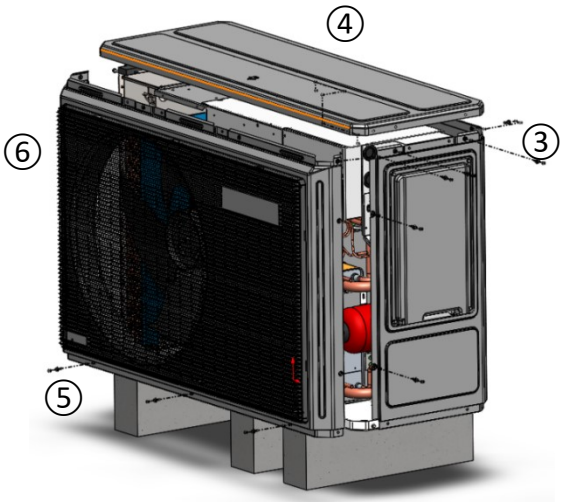
	Warning: ➢ To avoid injury, do not touch the air inlet or the aluminum fin of the equipment when it is in operation.
	Warning: ➢ Do not do any work when the equipment is energized. All the work must comply with applicable local laws and regulations.

	Caution: ➢ When removing the terminal box's cover/the front panel, hold it to prevent it from falling and breaking.

1) Removal of the terminal box's cover
   ① Remove the four M4 screws fixing the terminal box's cover;
   ② Remove the terminal box's cover.
   Installation of the terminal box's cover: Install it in the reverse order of its removal.

2) Removal and installation of the front panel
   ③ Remove nine M5 screws fixing the terminal box's cover;
   ④ Remove the top cover upwards;
   ⑤ Remove the seven M5 screws fixing the front panel;
   ⑥ Move the front panel forward.
   Installation of the front panel: Install it in the reverse order of its removal.





Chapter 6 Installation of the Engineering Pipes

6.1 Requirements for the pipes

Caution:

- All the work must be done by the personnel with relevant qualification certificates;
- Do not apply excessive force when connecting the on-site pipes and make sure that the pipes are aligned properly;
- A deformed pipe will cause an equipment failure;
- Connect the water inlet and outlet of the unit with flexible connectors;
- Install an antifreeze valve (to be supplied on the site) at each of the lowest points of the on-site pipes;
- The normally closed valves (near the inlet/outlet of the indoor pipes) can prevent all the water in the indoor pipes from being discharged when the antifreeze valves are opened;
- The pipes of the whole water circuit must be insulated for heat preservation (the insulating materials shall reach fire protection rating B1 and conform to the applicable local laws and regulations), lest condensate water should occur during the period of refrigeration operation to reduce the heating and refrigerating capacity;
- Pay attention to the flow direction of the valves.

The outdoor water pipes must be external pipes insulated for heat preservation. Make sure that the external pipes are insulated according to the instructions to prevent heat leakage, freezing, condensate water, etc.

Note: For the pipes in free air, we recommend using the insulation thicknesses shown in the table below (thermal conductivity coefficient λ= 0.039W/mK) as a minimum.

Length of the pipe (m)	Minimum insulation thickness (mm)
<20	19
20~30	32
30~40	40
40~50	50

Warning:

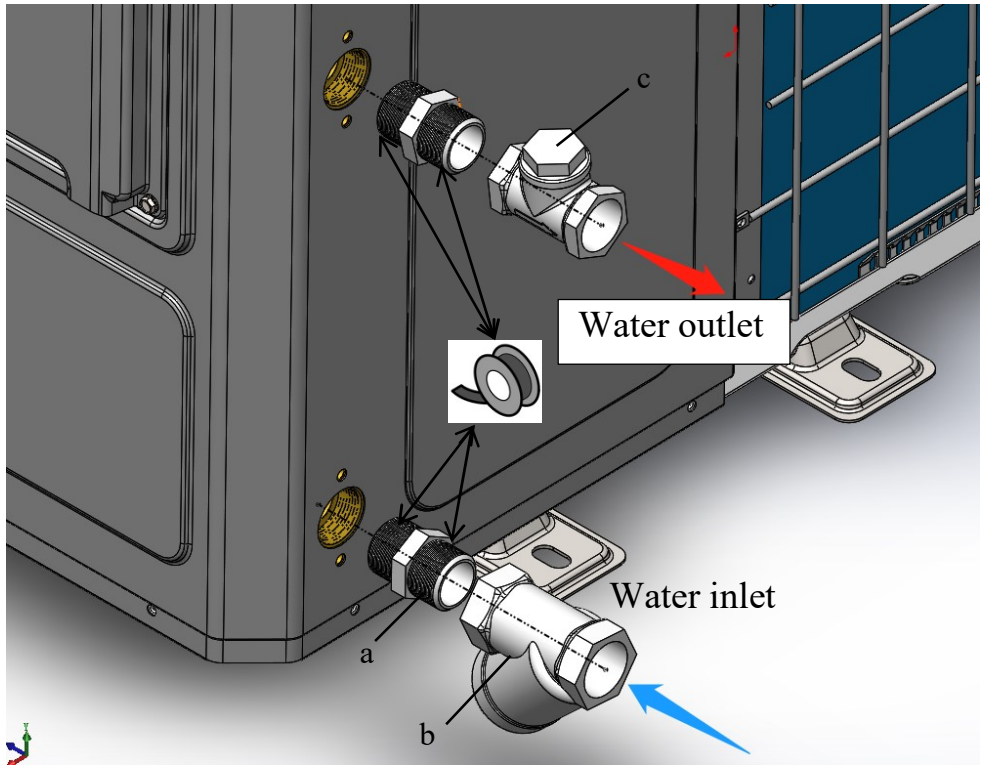
- **If the ambient temperature is below 0ºC, add antifreeze of an appropriate type to the water system.**

Warning:

- Install the filter properly at the water inlet of the equipment (the filter provided as an accessory has a 60-mesh screen);
- We recommend connecting the water inlets/outlets of all the water pumps with flexible connectors.
- ***If ethylene glycol is added to water, do not install antifreeze valves. Possible consequence: ethylene glycol leaks from the antifreeze valves.***

Caution:

- Inject water to get a water pressure of approximately 2.0 bar. Use the air exhaust valve to remove as much air as possible from the water circuit. The air in the water circuit may cause an equipment failure;
- The water pressure varies with the water temperature (the higher the water temperature, the larger the water pressure). However, the water pressure shall always be maintained above 0.5 bar to keep air out of the water circuit;
- The equipment may discharge excessive water through the pressure relief valve.



a: Counter threaded joint b: Filter c: One-way valve

Caution:

Problems may occur if air, moisture, or dust enters the water circuit. Therefore, when connecting the water circuit, consideration shall be always given to the following matters:

- Use clean pipes only;
- When removing burrs, keep the pipe ends down;
- Cover its end when a pipe passes through a wall to avoid the entry of dust;
- Seal the joints with a good thread sealant. The sealing must be able to withstand the system's pressure and temperature;
- When using a non-copper metal pipe, make sure to insulate the two materials against each other to avoid galvanic corrosion;
- Since copper is a soft material, connect the water circuit with appropriate tools. Inappropriate tools may cause damage to the pipes.

6.2 Use of ethylene glycol for freeze protection

Frosting can cause damage to the system. To prevent the hydraulic components from freezing, the system has special anti-freeze functions such as water pipe freeze protection and drainage, including starting the pumps at a low temperature. However, in case of a power failure, these functions cannot provide the system with sufficient protection.

The following operation can be performed to prevent the water circuit from freezing:

1) Add ethylene glycol to water: Ethylene glycol can lower the freezing point of the mixed liquid.

2) Install antifreeze valves: The antifreeze valves are used to discharge water from the system before the water freezes.

Warning:

The system may be corroded due to the presence of ethylene glycol. The uncontrolled ethylene glycol becomes acidic under the influence of oxygen. The presence of copper and a high temperature will speed up this process. The ethylene glycol with uncontrolled acidity can erode metal surfaces and form a galvanic corrosion battery, thus causing serious damage to the system. Therefore, it is important that:

- The water is properly treated by water experts with relevant qualification certificates;
- Use ethylene glycol containing a corrosion inhibitor to counteract the acid formed during the oxidation of ethylene glycol;
- Do not use automotive ethylene glycol because its corrosion inhibitor has a limited service life and contains silicates that can contaminate or clog the system.
- ***Do not use galvanized pipes for an ethylene glycol system because they may cause certain components in the ethylene glycol corrosion inhibitor to precipitate.***

	Caution: ➢ Ethylene glycol absorbs water from its surrounding environment. Therefore, do not add the ethylene glycol that has been exposed to air. The concentration of water will increase after the cover of an ethylene glycol container is removed, and then the concentration of ethylene glycol will be lower than the assumed value. As a result, the hydraulic components may freeze finally. Take preventive measures to minimize the contact of ethylene glycol with air.

① Types of ethylene glycol

The type of ethylene glycol to be used depends on whether there is a domestic hot water tank in the system:

If	Then
There is a domestic hot water tank in the system	Only propylene glycol (a) will be used.
There is no domestic hot water tank in the system	Either propylene glycol (a) or ethylene glycol can be used.

(a) Propylene glycol, including the necessary inhibitors, is classified as Class III 7 according to EN1717.

Caution: Both ethylene glycol and propylene glycol are toxic.

② Concentration of the ethylene glycol required

The concentration of the ethylene glycol required depends on the expected minimum outdoor temperature and whether you want to protect the system from bursting or freezing. To prevent the system from freezing, you need more ethylene glycol.

Add ethylene glycol according to the table below.

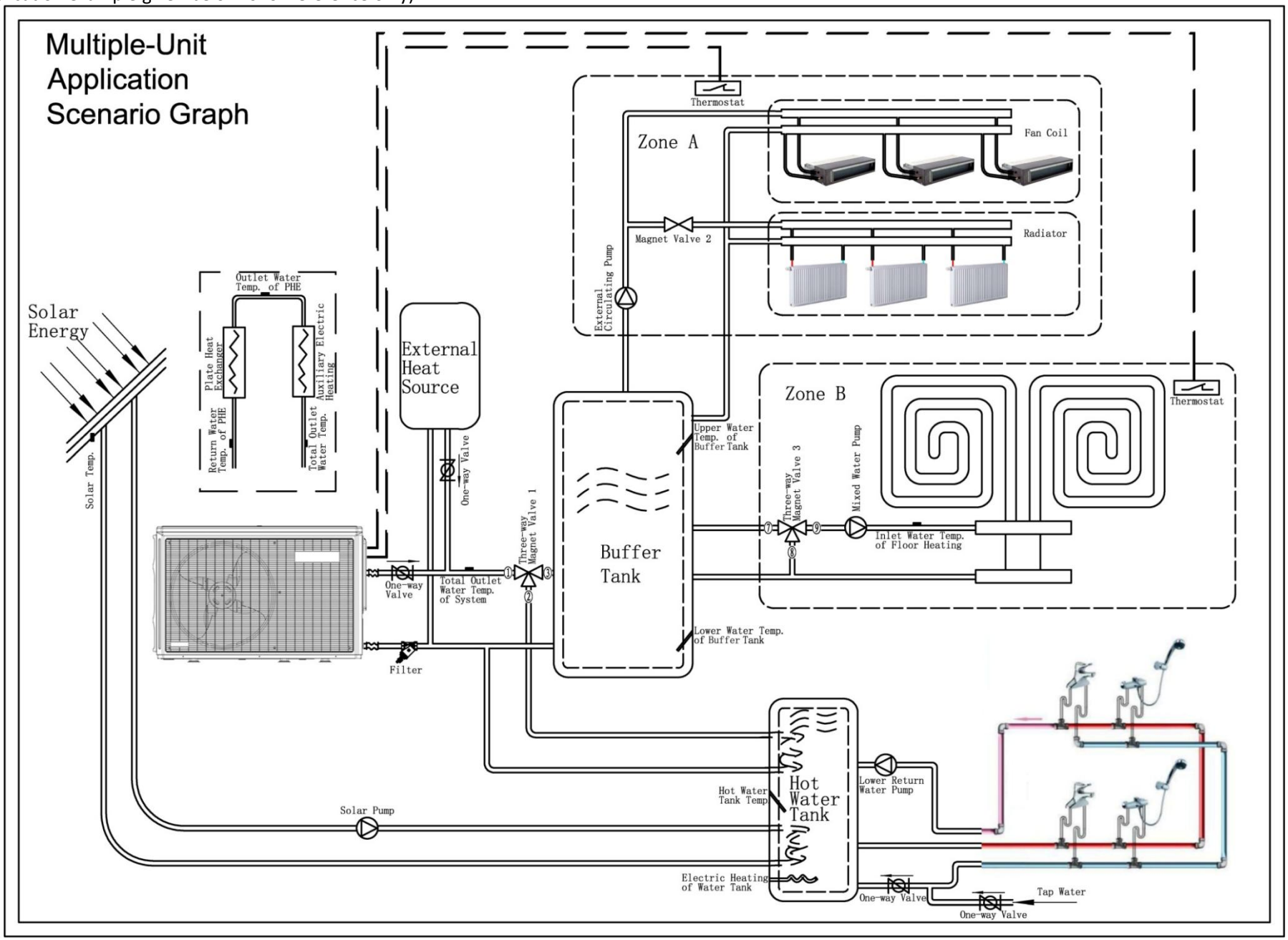
Expected minimum outdoor temperature	Anti-bursting concentration	Anti-freezing concentration
–5°C	10%	15%
–10°C	15%	25%
–15°C	20%	35%
–20°C	25%	—
–25°C	30%	—
–30°C	35%	—

	Caution: ➢ Anti-bursting concentration: Ethylene glycol can prevent the pipes from bursting, but cannot prevent the liquid inside the pipes from freezing. ➢ Anti-freezing concentration: Ethylene glycol can prevent the liquid in the pipes from freezing.

	Caution: ➢ The concentration required may vary with the type of ethylene glycol. Always compare the requirements in the table above with the specifications provided by the ethylene glycol manufacturer. If necessary, meet the requirements set by the ethylene glycol manufacturer. ➢ The concentration of the ethylene glycol added shall not exceed 35%. ➢ If the liquid in the system freezes, it is impossible to start the pump. Note that if you only prevent the system from bursting, the liquid in the system may still freeze. ➢ If the water in the system is at rest, the system is likely to freeze and become damaged.

6.3 Application scenario graph

(the application example given below is for reference only)



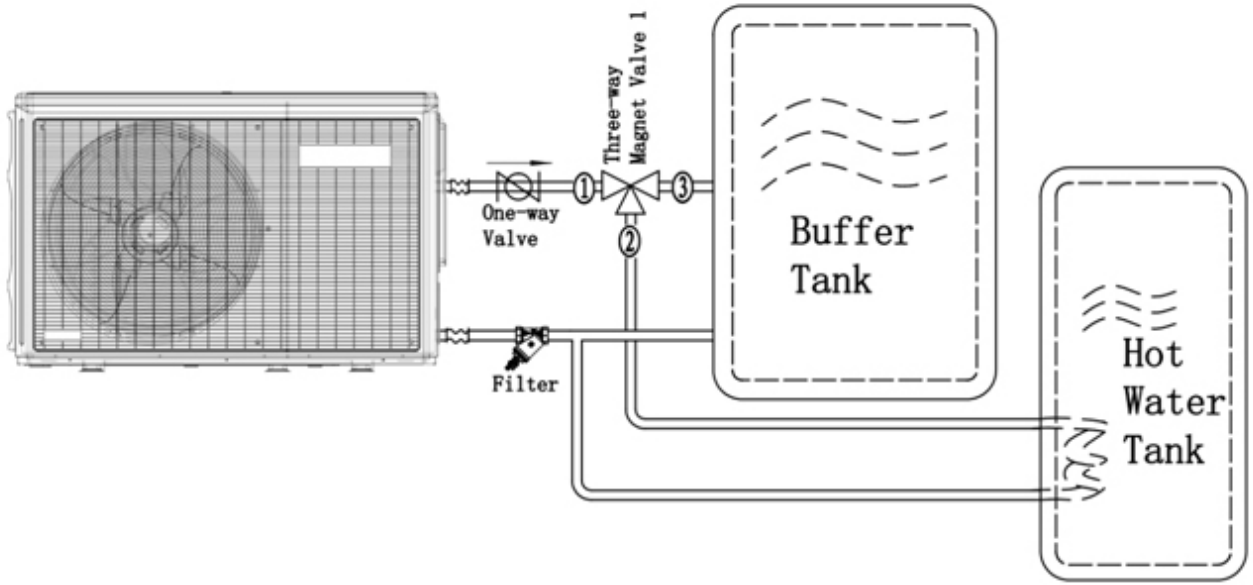
	Caution: ➢ Please be sure to install one-way valves at the water outlets of the external heat sources and the heating pumps, lest short circuit of the water circuit should occur to result in self-circulation between the external heat sources and the heating pumps and a poor user experience; ➢ Be sure to install a one-way valve at the return water inlet of the hot water tank to avoid heat loss of the hot water tank. ➢ Be sure to install a one-way valve at the municipal tap water inlet to avoid water pollution caused by backflow. ➢ The pipes of the whole water circuit must be insulated for heat preservation, lest condensate water should occur during the period of refrigeration operation to reduce the heating and refrigerating capacity.

6.4 Instructions on the installation of three-way magnet valves

	Caution: ➢ Three-way magnet valves play a key role in the water system. Realize the switch-over of functions in the system by changing the flow direction of the water circuit with the three-way magnet valves. Be sure to read the instructions on three-way magnet valves carefully and install them cautiously, lest the three-way magnet valves should be installed in the wrong direction to affect the normal operation of the equipment and cause unnecessary losses; ➢ All the valve symbols in the Manual are schematic, and the appearance and shape of the valves shall be subject to the actual models selected.

➢ Three-way magnet valve 1

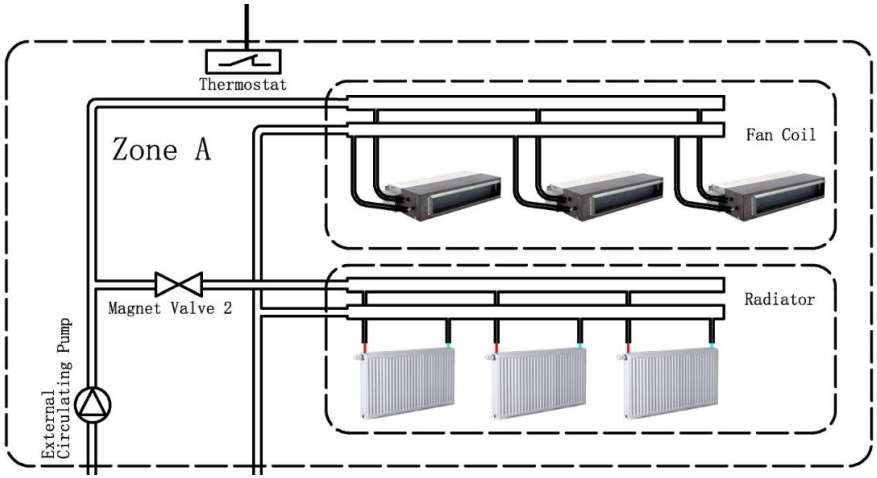
Three-way magnet valve 1 is used to control the direction of the water circuit between the heating pump and the hot water tank and the buffer tank in the water system. By switching over three-way magnet valve 1, you can connect the equipment to the hot water tank or the buffer tank, as shown in the figure below:



- When three-way magnet valve 1 OFF is turned on, three-way magnet valve magnet 1 will be switched over to the direction ①=>②, and the heating pump is connected to the hot water tank, so as to heat the latter;
- When three-way magnet valve 1 ON is turned on, three-way magnet valve magnet 1 will be switched over to the direction ①=>③, and the heating pump is connected to the buffer tank, so as to cool down and heat the latter.

➢ Magnet Valve 2

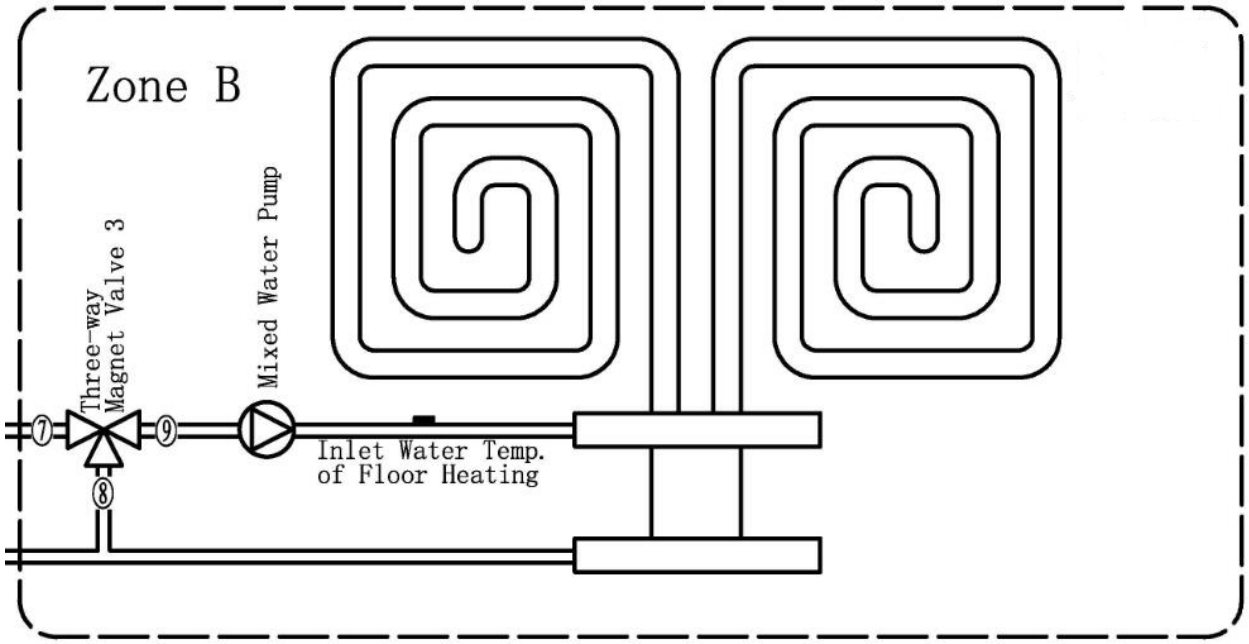
Magnet Valve 2 is used to control the direction of the water circuit in Zone A in the water system. By switching over Magnet Valve 2, you can connect the buffer tank to the radiator or disconnect them from each other, as shown in the figure below:



- When Zone A needs heating, the heating pump is switched over to the heating mode. At this moment, Magnet Valve 2L is turned on, and the buffer tank is connected to both the radiator and the fan coil to heat Zone A;
- When Zone A needs cooling, the heating pump is switched over to the cooling mode. At this moment, Magnet Valve 2L is turned off, and the buffer tank is connected only to the fan coil to cool Zone A.

➢ Three-way magnet valve 3

Three-way magnet valve 3 is used to control the direction of the water circuit in Zone B in the water system. By switching over three-way magnet valve 3, you can adjust the temperature of Zone B, as shown in the figure below:



- If Zone B needs heating, three-way magnet valve 3 OFF is turned on, and three-way magnet valve 3 is switched over to the direction ⑦=>⑨, the buffer tank is connected to the floor heating to heat Zone B;
- If Zone B does not need heating, three-way magnet valve 3 ON is turned on, and three-way magnet valve 3 is switched over to the direction ⑧=>⑨, the buffer tank is disconnected from the floor heating, and the floor heating achieves self-circulation.

Chapter 7 Electrical Installation

	Warning: Electric shock hazard ➢ All wires must be connected by authorized electricians with relevant qualification certificates, and must comply with the applicable local laws and regulations; ➢ All cables and electrical components must comply with the local laws and regulations.

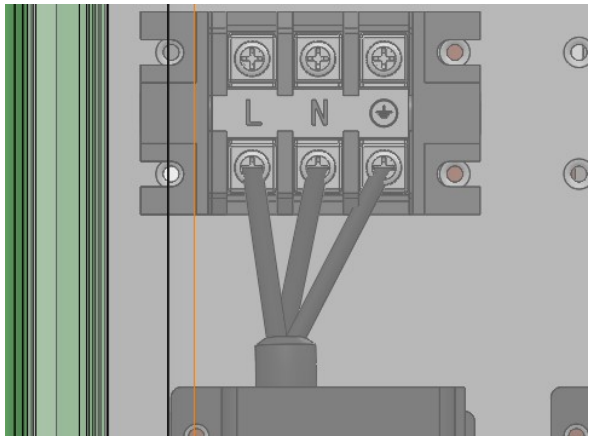
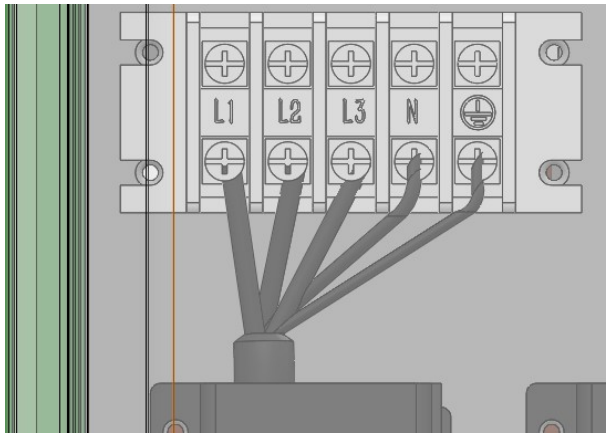
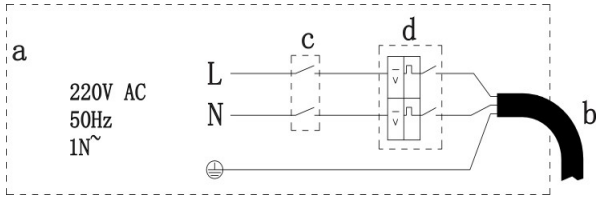
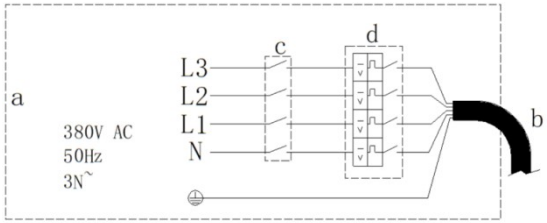
	Warning: ➢ Always use multi-core cables as power cables; ➢ Do not push the extra cables into or place them in the equipment; ➢ Make sure that all electrical appliances are grounded for protection and must comply with the applicable laws and regulations; ➢ All wires must be connected by authorized electricians and must comply with the applicable laws and regulations.
	Warning: ➢ Any power cord damaged must be replaced by the manufacturer, its service agent, or a person with a relevant qualification certificate to avoid the occurrence of any hazard; ➢ Install the fuses or circuit breakers as required; ➢ Do not use tape wires, stranded wires, extension wires, or connections from the star system, for they may cause overheating, electric shocks, or fire; ➢ Cables shall be secured with cable ties so that they will not come into contact with sharp edges or pipes, especially at the high voltage side; ➢ Before switching on the power supply or repairing the outdoor unit, make sure that the fan grille covers the fan to avoid the occurrence of any hazard.

	Caution: ➢ The distance between the strong and weak current systems shall be at least 50 mm; ➢ During the installation of the field power supply or the selection of cables, a sufficient length of cable shall be reserved, so that it is possible to open the switch box and get access to other components during the period of service.

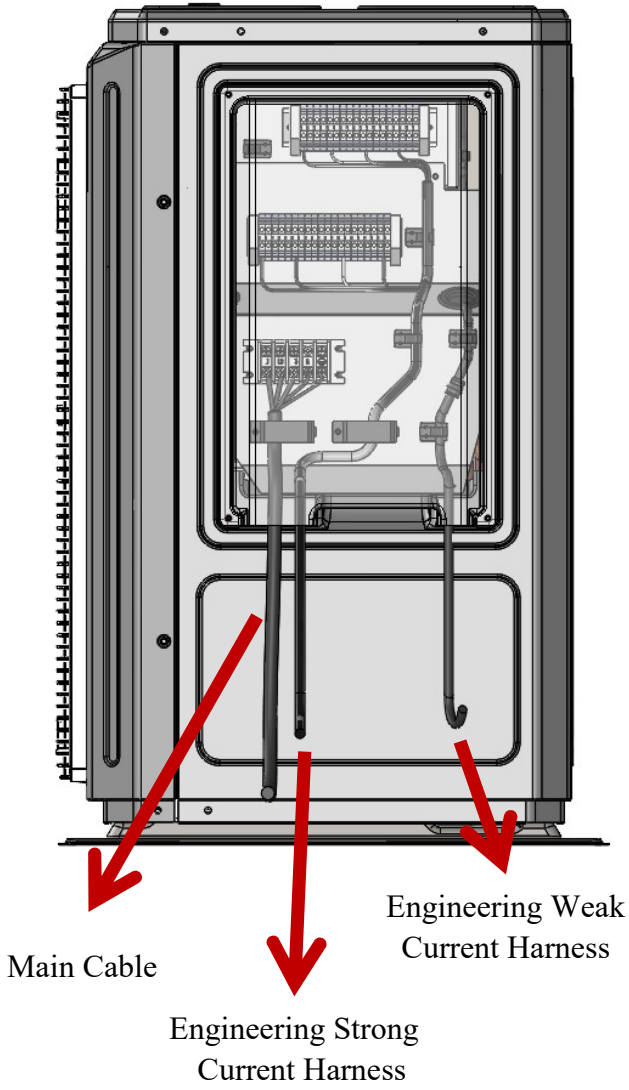
	Caution: ➢ 30 mA high-speed circuit breakers shall be used as earth leakage circuit breakers and must comply with the applicable laws and regulations; ➢ Be sure to use a dedicated power supply. Do not use a power supply to be shared with other equipment.

❖ **Power cords of different diameters must not be connected to the same power supply terminal (a loose power cord will lead to abnormal heating).**

7.1 Schematic wiring diagram of the equipment's main power supply

Schematic Wiring Diagram of Single-phase Power	Schematic Wiring Diagram of Three-phase Power
	
	

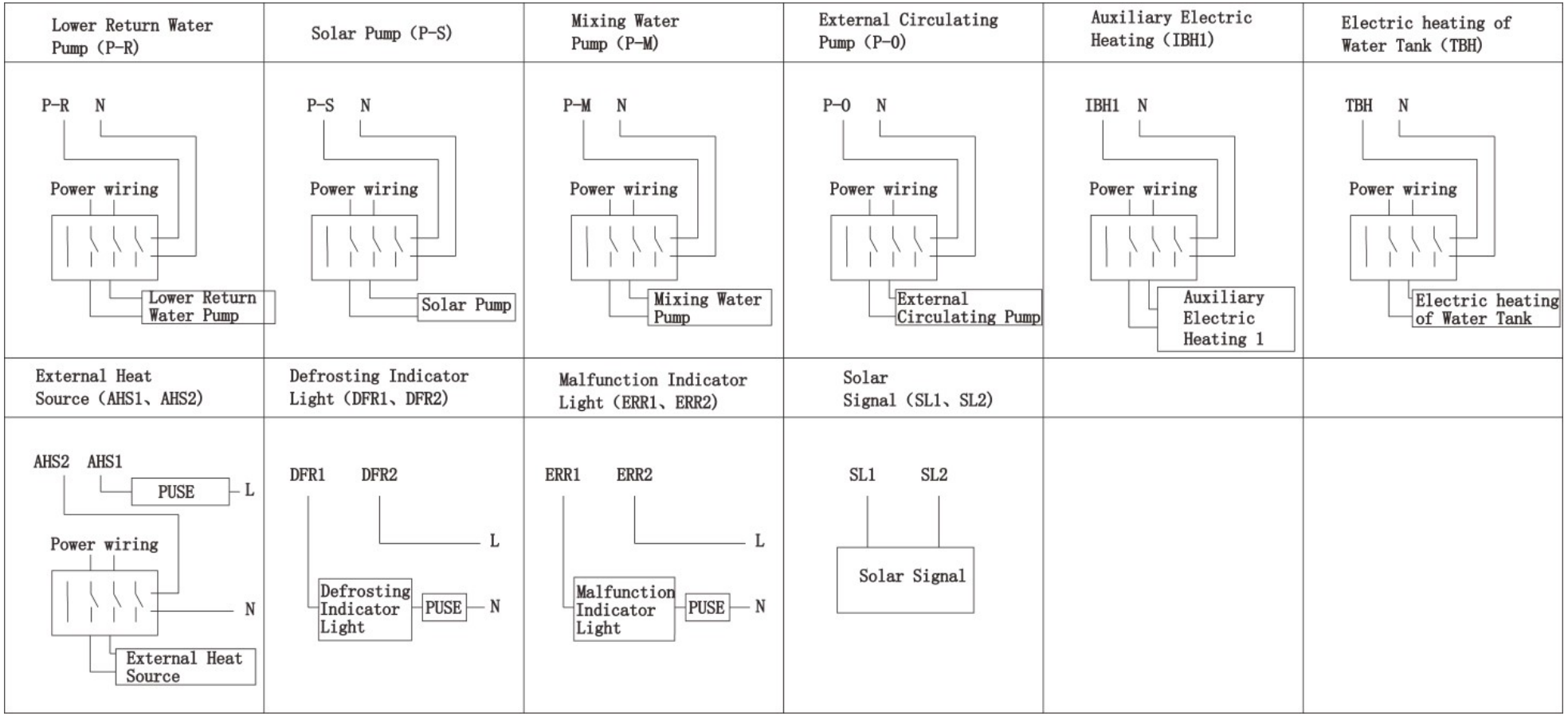
a: Field Cabling b: Main Cable of Equipment c: Earth Leakage Circuit Breaker d: Overload Fuse

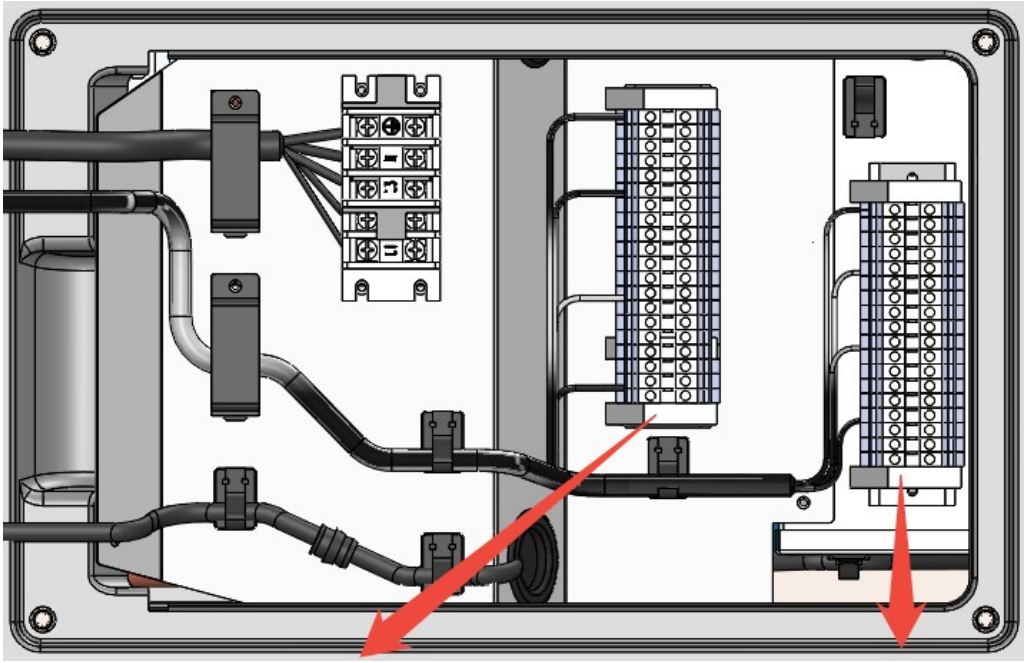


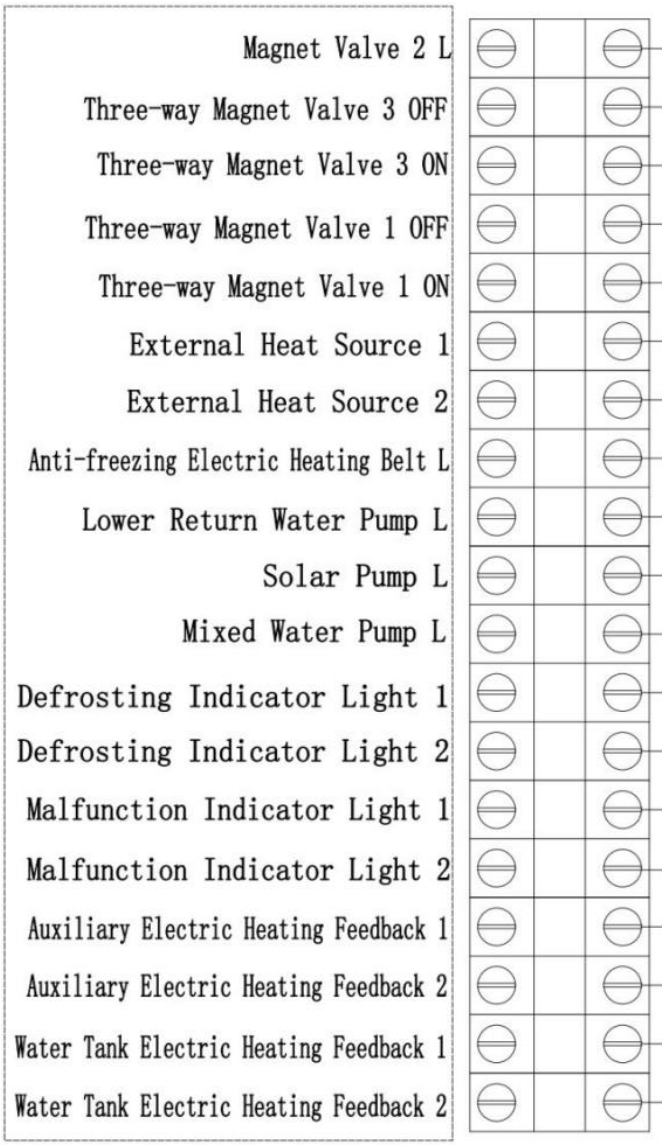
7.2 Schematic wiring diagram of the equipment's engineering strong current system

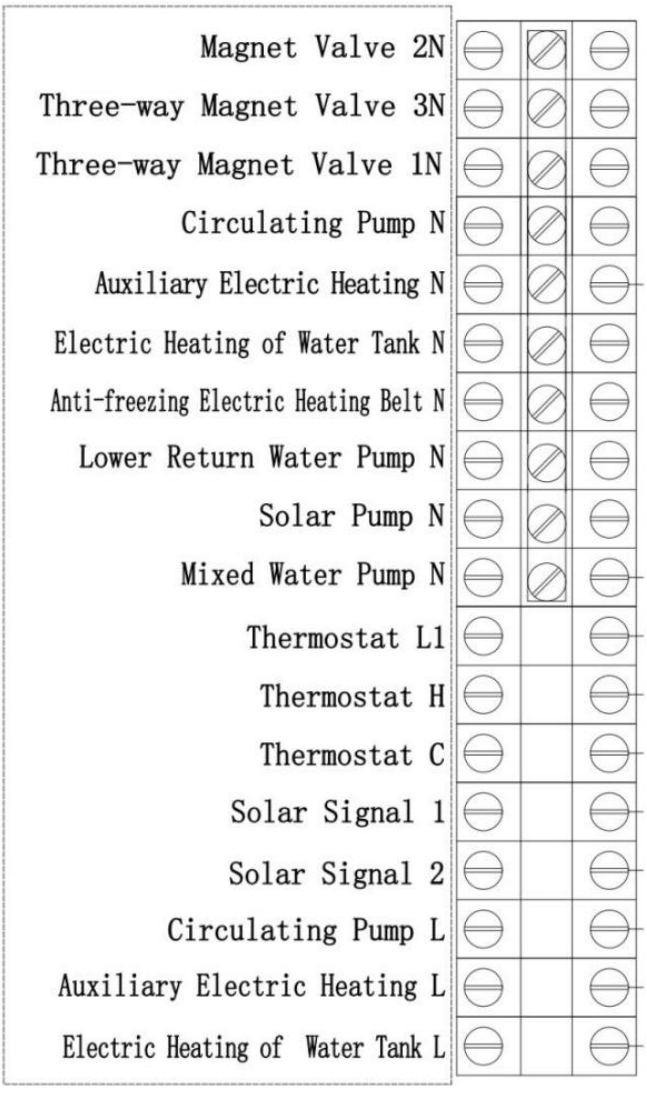
Caution: ***The wiring of this zone is only for AC contactor action signals. Do not connect any electrical equipment with an electrical power greater than 300W directly to the equipment, lest the equipment should be damaged due to overload!!!***

- **Specification of the fuses for the indoor and outdoor unit boards (Delayed fuse): 10A/250V**
- **Specification of the fuses for frequency converters (Delayed fuse): 30A/250V**

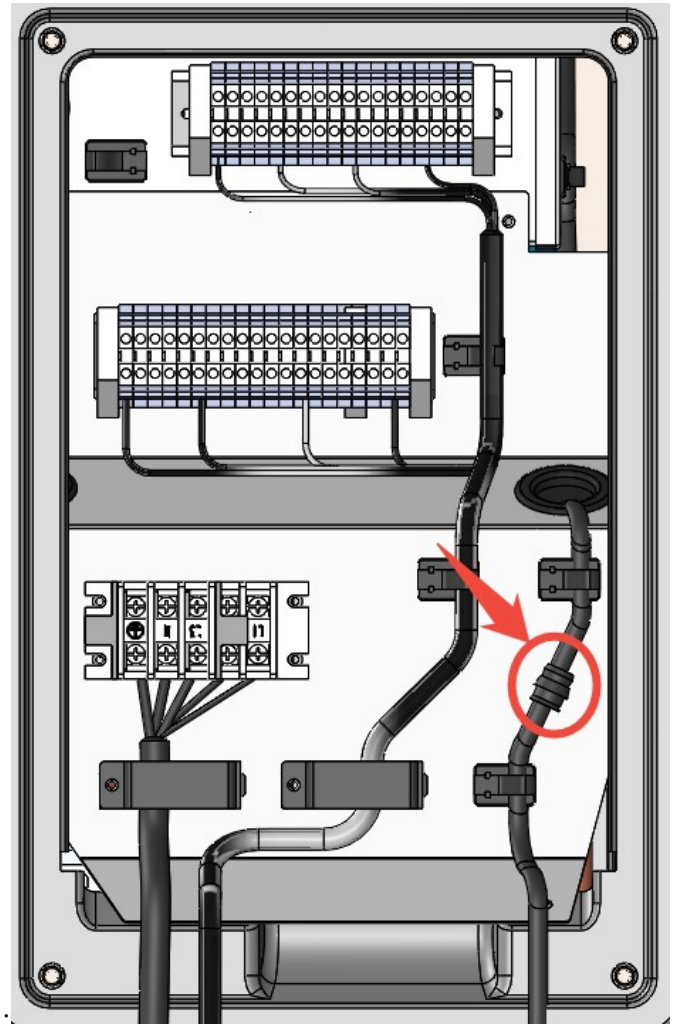


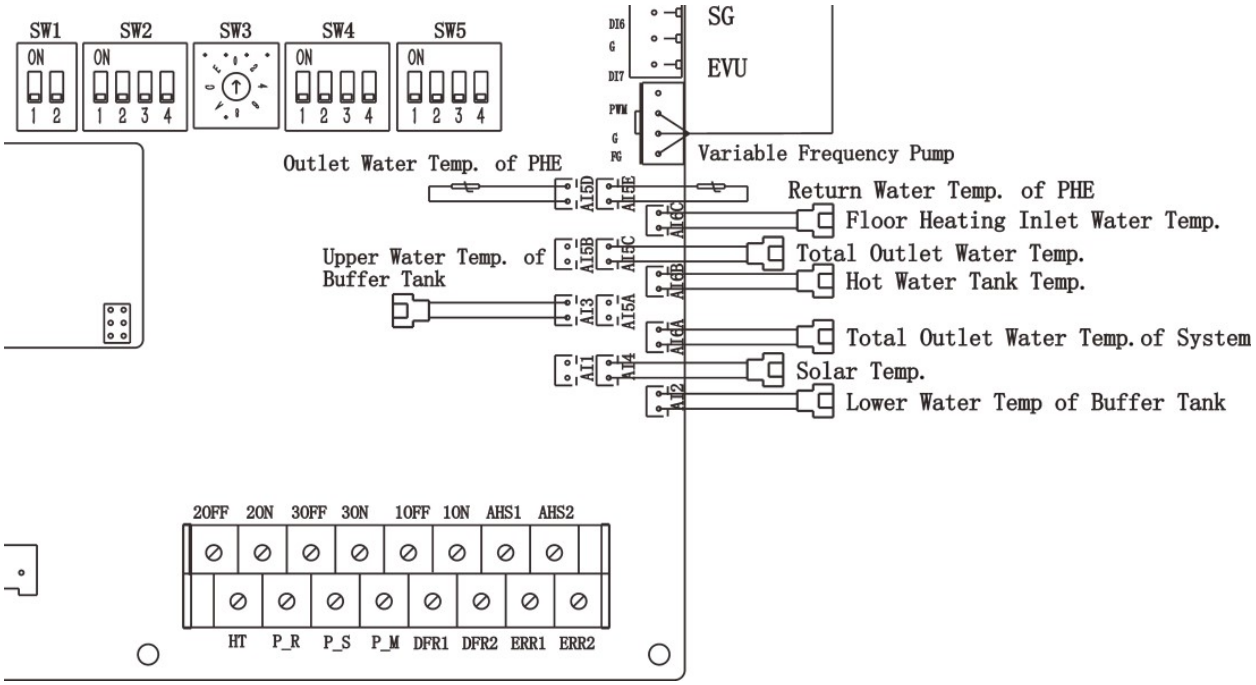



Magnet Valve 2 L
Three-way Magnet Valve 3 OFF
Three-way Magnet Valve 3 ON
Three-way Magnet Valve 1 OFF
Three-way Magnet Valve 1 ON
External Heat Source 1
External Heat Source 2
Anti-freezing Electric Heating Belt L
Lower Return Water Pump L
Solar Pump L
Mixed Water Pump L
Defrosting Indicator Light 1
Defrosting Indicator Light 2
Malfunction Indicator Light 1
Malfunction Indicator Light 2
Auxiliary Electric Heating Feedback 1
Auxiliary Electric Heating Feedback 2
Water Tank Electric Heating Feedback 1
Water Tank Electric Heating Feedback 2


Magnet Valve 2N
Three-way Magnet Valve 3N
Three-way Magnet Valve 1N
Circulating Pump N
Auxiliary Electric Heating N
Electric Heating of Water Tank N
Anti-freezing Electric Heating Belt N
Lower Return Water Pump N
Solar Pump N
Mixed Water Pump N
Thermostat L1
Thermostat H
Thermostat C
Solar Signal 1
Solar Signal 2
Circulating Pump L
Auxiliary Electric Heating L
Electric Heating of Water Tank L

7.3 Schematic wiring diagram of the equipment’s engineering weak current system

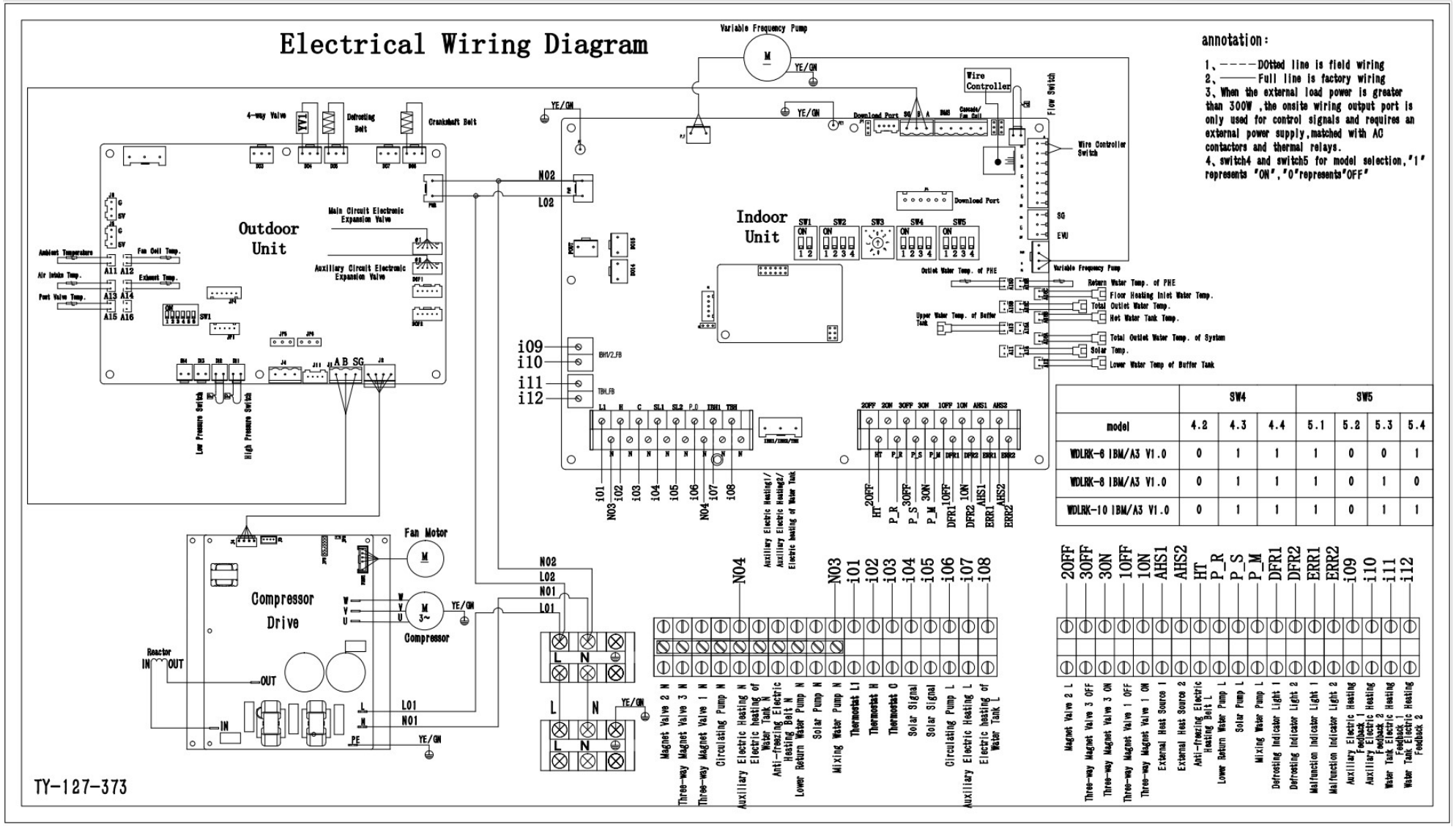




The temperature sensing probes required by the system can be found in the terminal box on the right side of the equipment, and they shall be connected to the temperature sensors in the accessory package, as shown in the figure above.

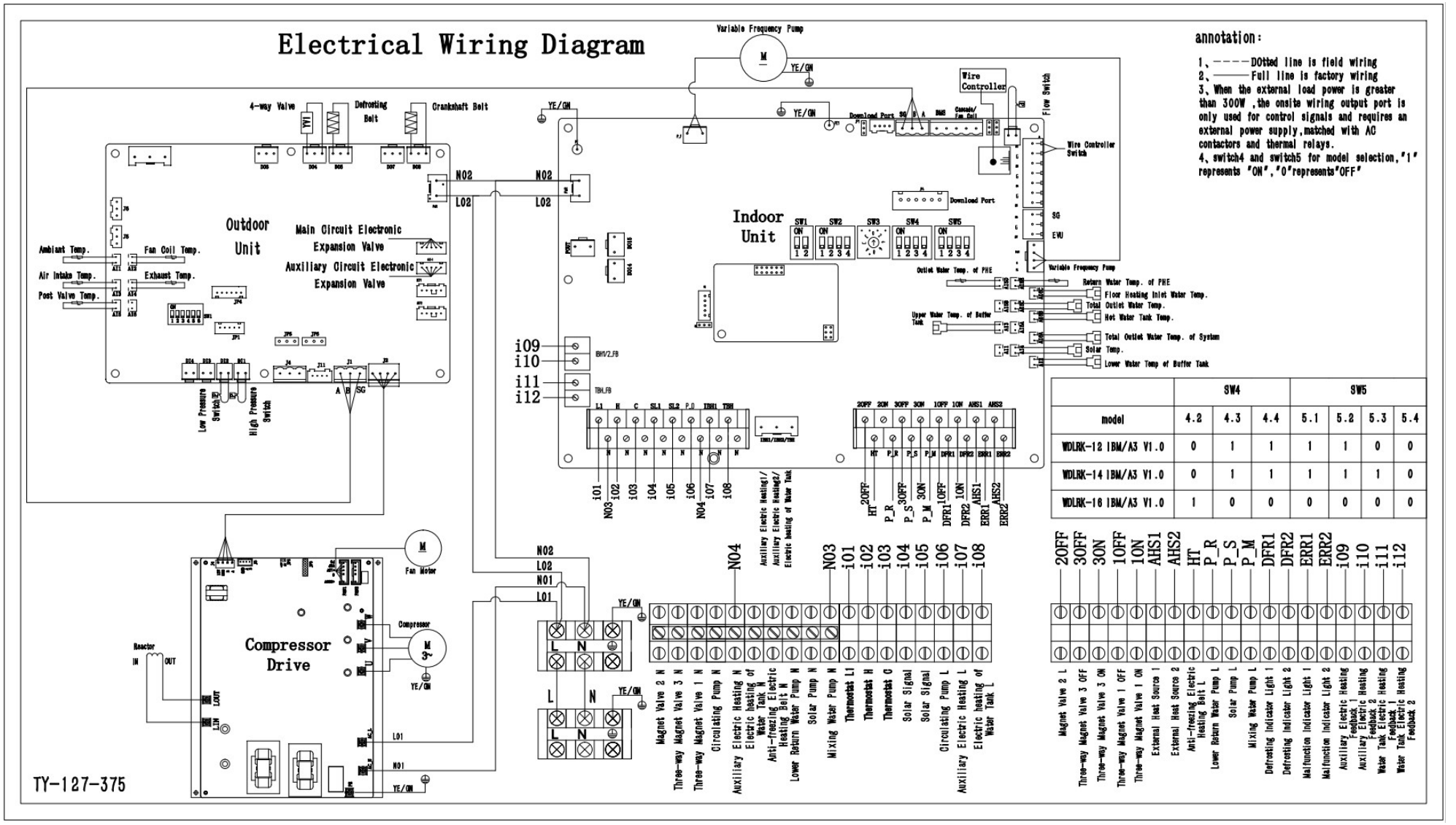
7.4 Electrical wiring diagram

Equipment Model: WDLRK-6(8/10)IBM/A3



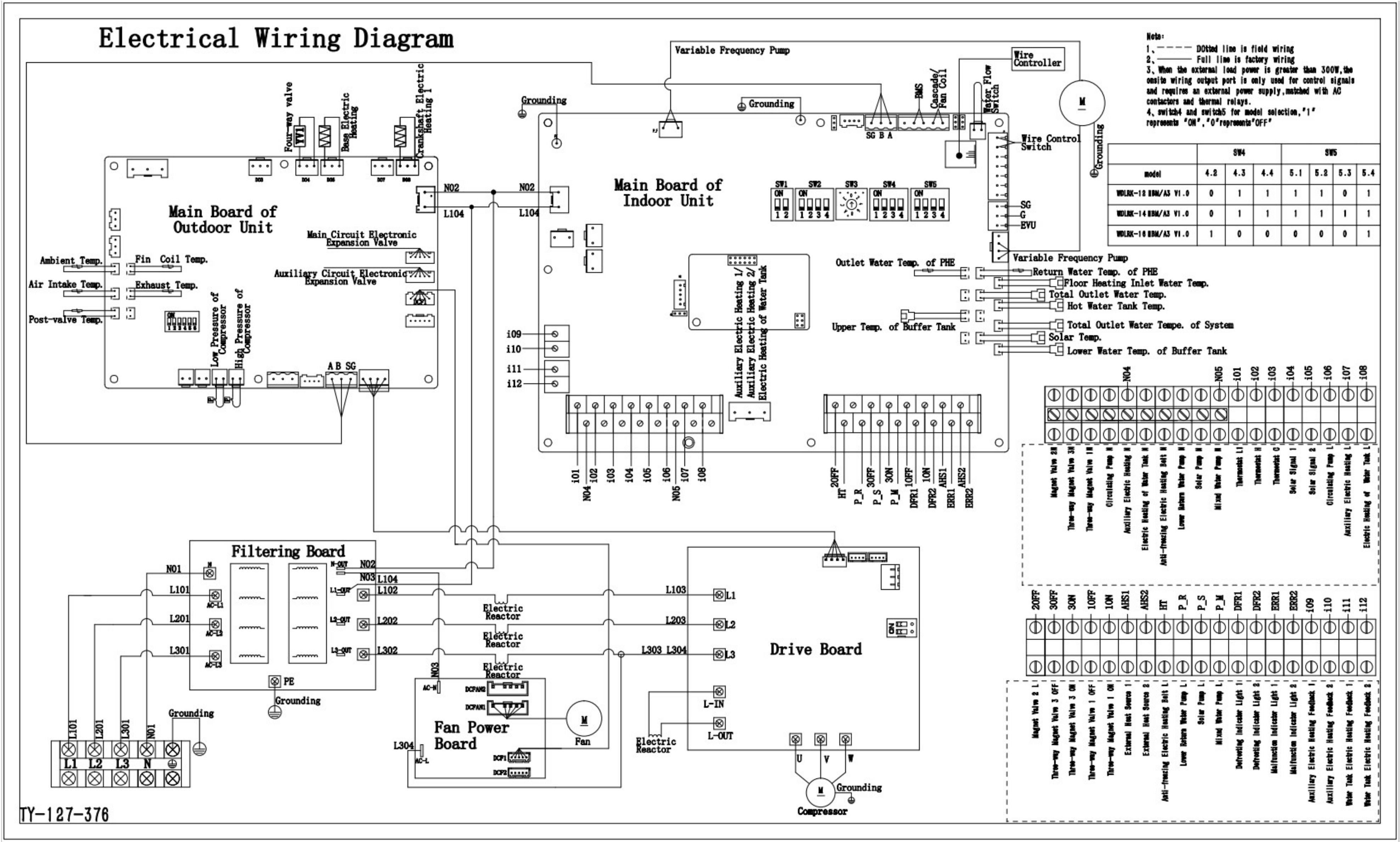
	SW4			SW5			
model	4.2	4.3	4.4	5.1	5.2	5.3	5.4
WDLRK-6 IBM/A3 V1.0	0	1	1	1	0	0	1
WDLRK-8 IBM/A3 V1.0	0	1	1	1	0	1	0
WDLRK-10 IBM/A3 V1.0	0	1	1	1	0	1	1

Equipment Model: WDLRK-12(14/16)IBM/A3



	SW4			SW5			
model	4.2	4.3	4.4	5.1	5.2	5.3	5.4
WDLRK-12 IBM/A3 V1.0	0	1	1	1	1	0	0
WDLRK-14 IBM/A3 V1.0	0	1	1	1	1	1	0
WDLRK-16 IBM/A3 V1.0	1	0	0	0	0	0	0

Equipment Model: WDLRK-12(14/16)IIBM/A3

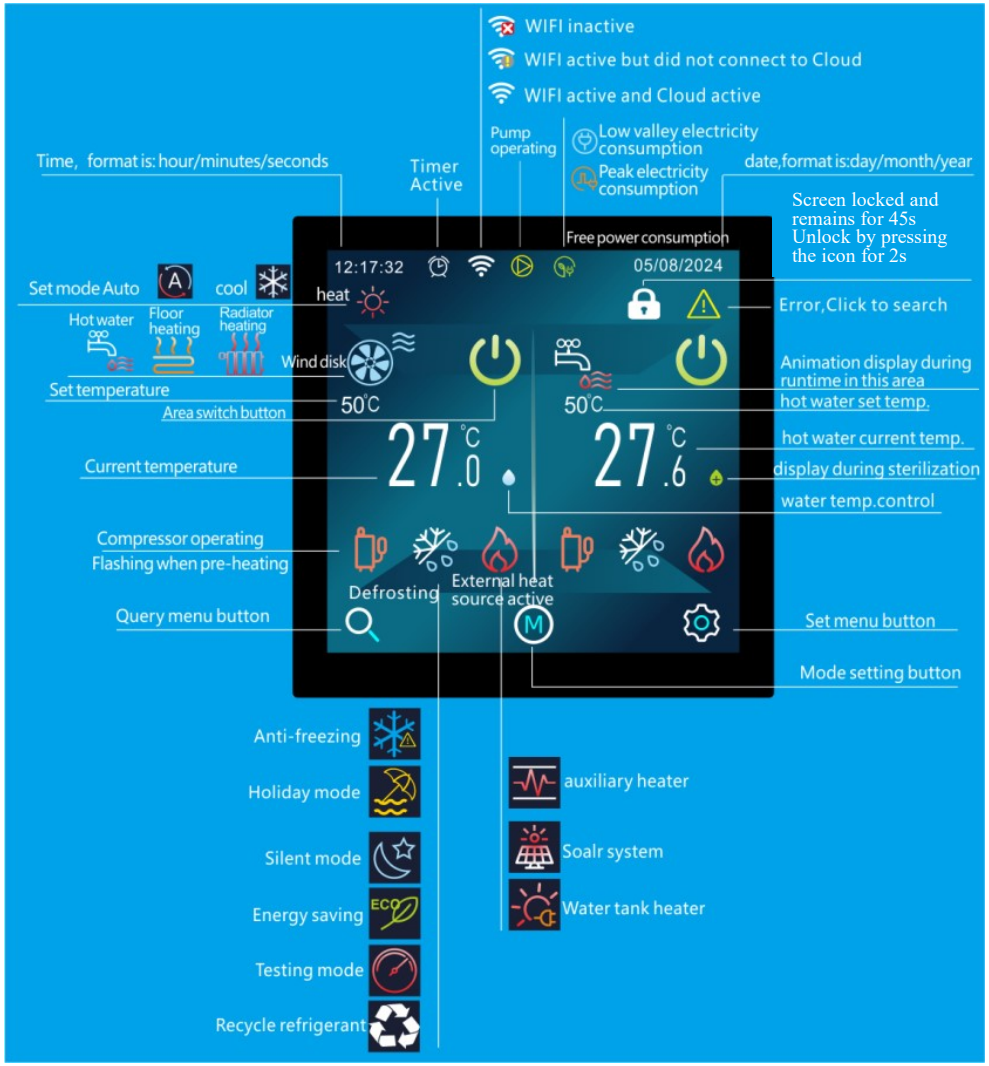


Note:
1、- - - - DOtted line is field wiring
2、——— Full line is factory wiring
3、When the external load power is greater than 300W,the onsite wiring output port is only used for control signals and requires an external power supply,matched with AC contactors and thermal relays.
4、switch4 and switch5 for model selection,"1" represents "ON","0"represents"OFF"

	SW4			SW5			
model	4.2	4.3	4.4	5.1	5.2	5.3	5.4
WDLRK-12 IIBM/A3 V1.0	0	1	1	1	1	0	1
WDLRK-14 IIBM/A3 V1.0	0	1	1	1	1	1	1
WDLRK-16 IIBM/A3 V1.0	1	0	0	0	0	0	1

Chapter 8 Instructions on the Display's Operation

8.1 Description of the Icons on the Display



A total of 6 touch buttons:

Button icon	Significance	Name
	Used to enter the query menu	[Query]
	Used to set mode	[Mode]
	Used to enter the Setting menu	[Settings]
	Used for turning on and off the machine	[On/off]
	Used to return to the previous screen	[Back]
	Used to return to the main screen	[Homepage]

The main screen varies according to the application scenario. The following describes the possible scenarios:

Main Interface 1 (Single zone water temperature + Hot water):

The system includes single-zone air conditioning water temperature control and domestic hot water control.

Note: All icons in the manual are for explanatory purposes and may differ from the actual content on the screen.

Main Interface 2 (Single zone room temperature + Hot water):

The system includes single-Zone Air conditioning room temperature control and domestic hot water control.

Note: The display should be installed indoors to detect the room temperature.

Main Interface 3 (Two-zone mixing + Hot water):

The system includes dual zone air conditioning control (Zone A water temperature + Zone B room temperature) and domestic hot water control.

Note: The display should be installed indoors to detect the room temperature. In heating mode, two zones can be opened at the same time. In cooling mode, only Zone A can be opened.

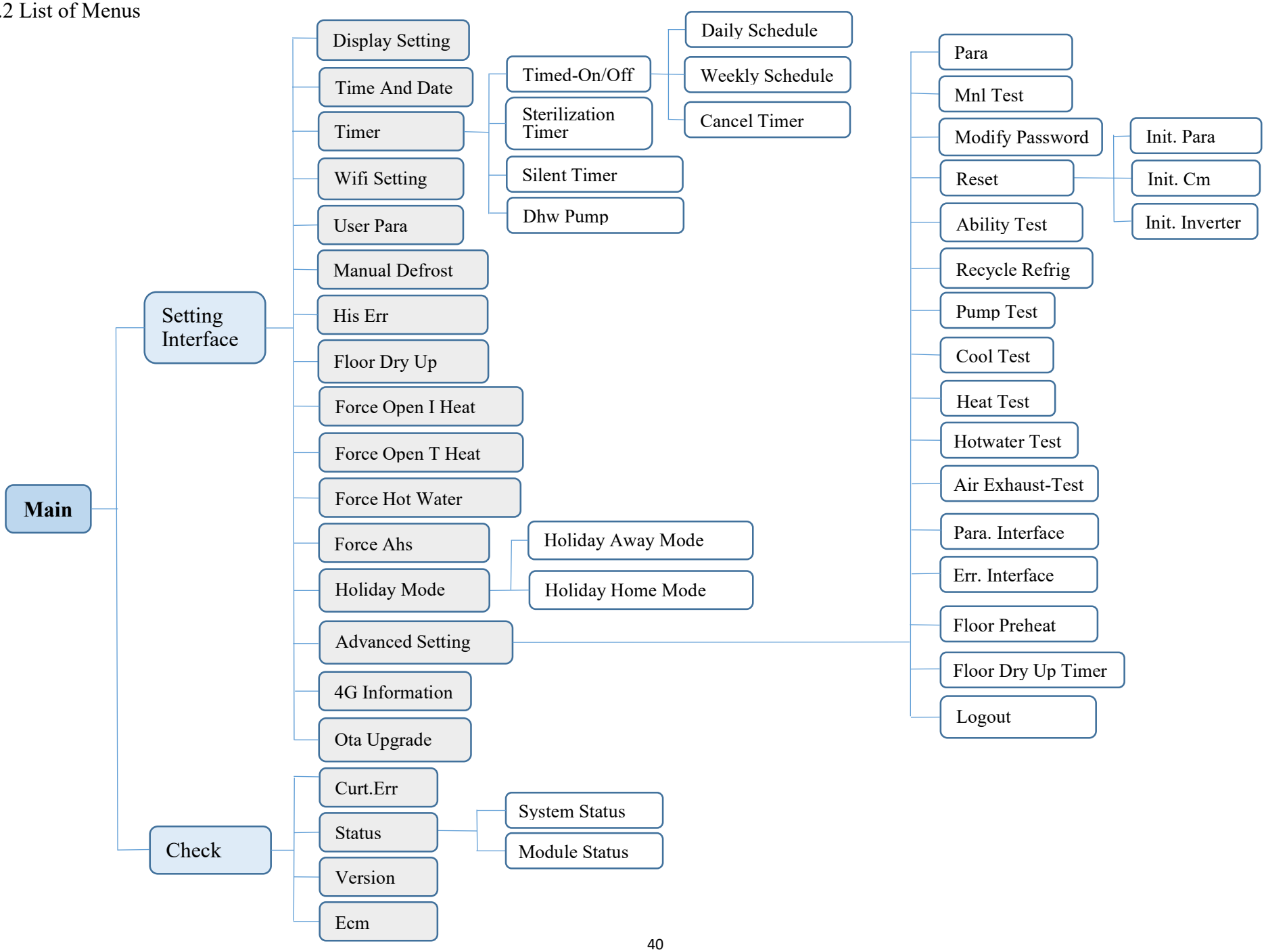
Main Interface 4 (Two-zone water temperature + Hot water):

The system includes dual zone air conditioning control (Zone A + Zone B) and domestic hot water control.

Note: In heating mode, two zones can be opened at the same time. In cooling mode, only Zone A can be opened.

Note: When using the thermostat control, the unit can only control the water temperature. When the end is floor heating, the target temperature of the corresponding area should not be set too high.

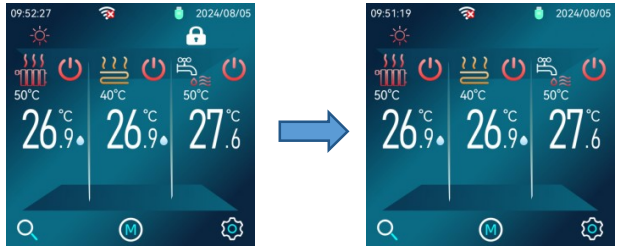
8.2 List of Menus



8.3 Basic Usage

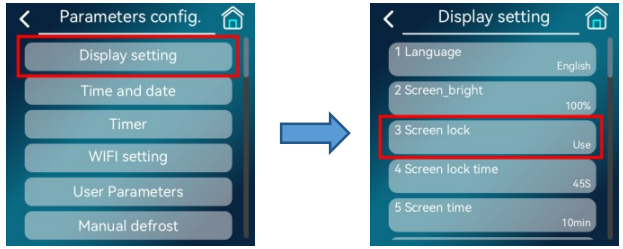
8.3.1 Screen Unlock

If the lock screen icon appears on the screen, the display will not operate; long press key for two seconds, the lock screen icon will disappear, and the display can be operated, as shown in the figure:



Lock screen function use/disable settings:

Click on the main interface to enter the setting menu interface, find “Display setting” and click [Screen lock] to adjust.

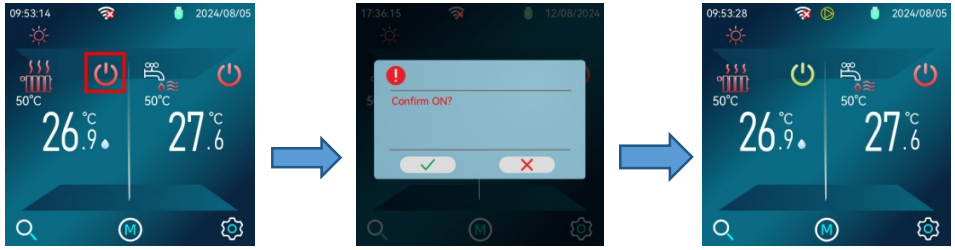


8.3.2 Turning On/Off

- Turning on/off the air conditioning area on the display

Click area on the home screen to turn on/off cooling or heating for the corresponding area.

Take single zone water temperature as an example, first click the button of air conditioning zone, and then click to confirm the on/off of air conditioning Zone A, as shown in the figure:



- Turning on/off the air conditioning area on the thermostat

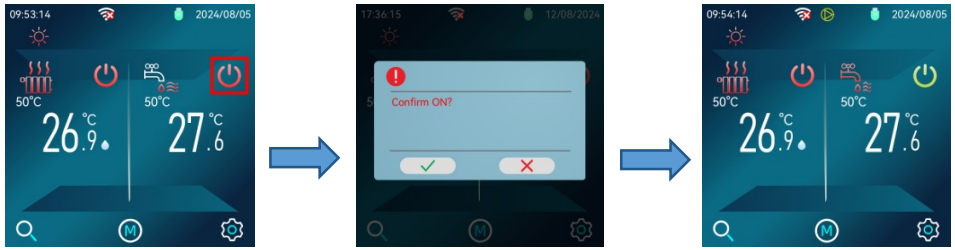
[Thermostat control] When “Single zone mode switch” is selected, Zone A the thermostat controls the Zone A’s operation mode as well as turning it on/off.

[Thermostat control] When selecting “Single zone switch” or “Two zone switch”, the air conditioning area is turned on and off by the thermostat, and the operation mode of the air conditioning area is set via the display.

- Turning on/off the domestic hot water on the display

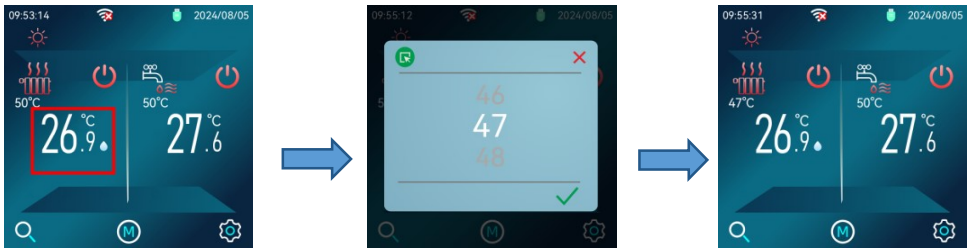
First, make sure that the [Hot water] function is set to “Use”, otherwise the hot water will not be turned on.

Click the hot water area  button in the main interface, and then click  to turn on/off the hot water, as shown in the figure:



8.3.3 Regulating Temperature

Click the temperature number icon in the corresponding area on the main interface, and the temperature selecting box appears. At this time, select the temperature by sliding the button, and then click to save the adjusted temperature,as shown in the figure:

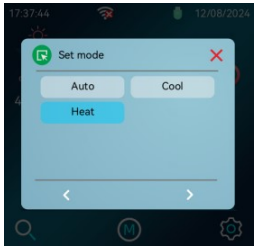


8.3.4 Spatial Mode Setting

There are three types of spatial modes：

- Cooling mode
- Heating mode
- Automatic mode

Click  button on the main interface to pop up the spatial mode setting window, as shown in the figure:

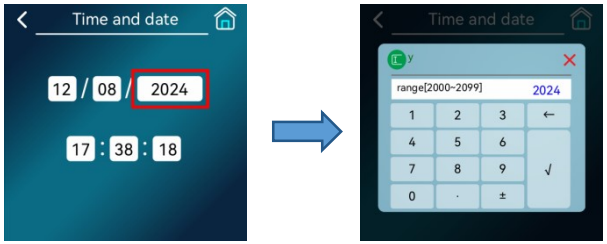


Click the mode option button you want to set, you may set it successfully. If you click  in the upper right corner, you will directly close the pop-up window and cancel the mode setting.

8.3.5 Time Setting

All the operation of time modifications (such as year, month, day, hour, minute, second) are the same in this display. Hereby takes the modification of the date and the year as an example.

Enter the “Time and date”. For the path, please refer to 8.5.2 Date and Time; By clicking the year box, the year input box will pop up.



Click the numeric keyboard to input the year number. Click to save the modification. Click  to close the pop-up window directly while giving up the modification.

8.4 Check Menu

There are four parts of check menu：

- ❖ Error check interface
- ❖ Status check interface
- ❖ Version check interface
- ❖ Electricity metering interface

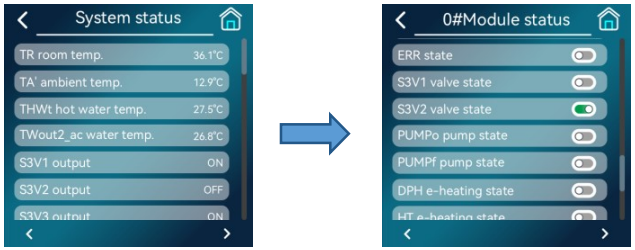
Click  on the main interface to enter the check interface. (You may view four options: error check, status check, version check, and electricity metering. Enter the function interface by clicking the corresponding option.)

8.4.1 Error Check Interface

If a error exists, the error interface is showed as the figure below. (Click  to remove the errors that meet the reset conditions). Click the corresponding error to view the complete name of it.

8.4.2 Status Check Interface

If you need to view the current information about a unit (such as the temperature and the switched-on electrical components) you may go to the status check page. Swipe the list up and down to view all status information (The right side  indicates that the part has an output).



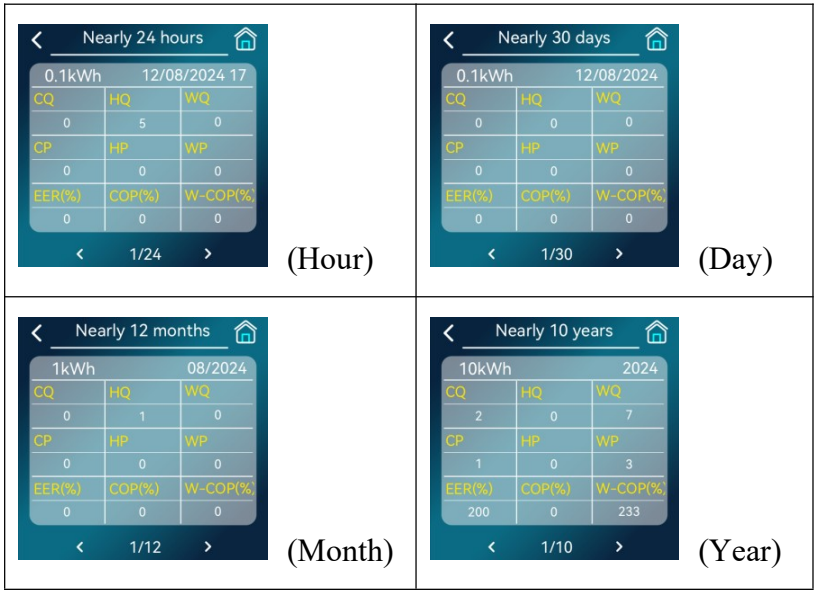
8.4.3 Version Check Interface

When dealing with some after-sales problems, in order to better locate the problem, it may be necessary to provide the software information used by the unit controller, which can be frequently viewed on the version check interface.

8.4.4 Electricity Metering Interface

In this interface, you may check the data related to the electricity consumption, cooling/thermal capacity and energy efficiency ratio recorded by the machine in the last 24 hours, 30 days, 12 months and 10 years.

In the four data interfaces in the right figure, you can switch to view the data of the past hour, day, month and year by pressing < and >.



As shown in the figure below, the electricity metering interface of hour, day, month and year is presented in the form of a table, and its abbreviation means:

CQ	Cooling quantity
HQ	Heating quantity
WQ	Hot water quantity
CP	Cooling power consumption
HP	Heating power consumption
WP	Hot water power consumption
EER	Cooling mode energy efficiency ratio
COP	Heating mode energy efficiency ratio
W-COP	Hot water mode energy efficiency ratio

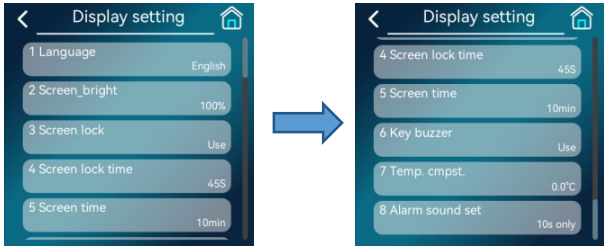
Please note that the units used for electricity consumption and cooling/heating capacity are different, with 0.1kw/h for the hour and day, 1kw/h for the month and 10kw/h for the year.

8.5 Setting Menu

8.5.1 Display Setting

Display Setting allows you to set the requirements for daily use, such as Language, Screen lock, Screen lock time, and Key buzzer. Enter the Display Setting in the following path.

"Main interface" > "Parameters config." > "Display settings"



Note: If the "Screen time" is set to "0", the function will be disabled and the screen will stay on.

8.5.2 Time and Date Setting

If the date and time do not correspond to the actual, you may change them by following the path below.

"Main interface" > "Parameters config." > "Time and date"

Please refer to 8.3.5 Time Setting.

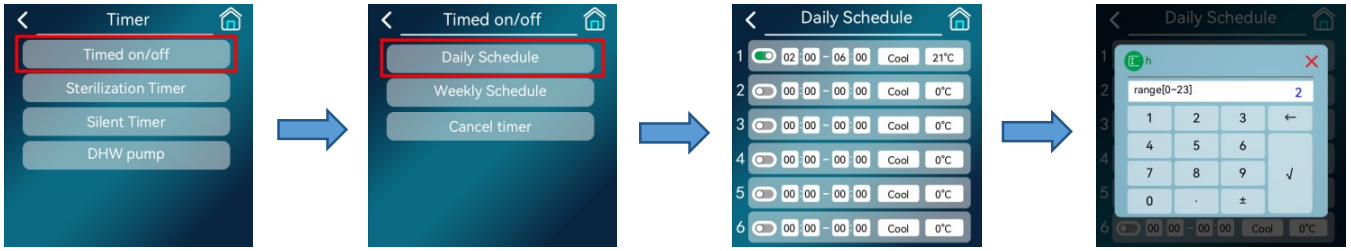
8.5.3 Timer Setting

8.5.3.1 Timed On/Off

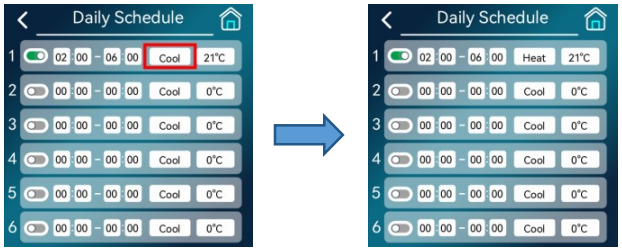
- Daily Schedule

Click  on the main interface to enter the setting menu and select "Timer setting".

Click the “Timed on/off” to enter the on/off menu; then click the “Daily schedule” to enter the daily schedule settings interface. Click  to use or cancel this group of timers. Clicking on the number box will bring up a pop-up window where you may input hours or minutes. Please refer to 8.3.5 Time Setting.



Click the “Mode” box to switch modes.



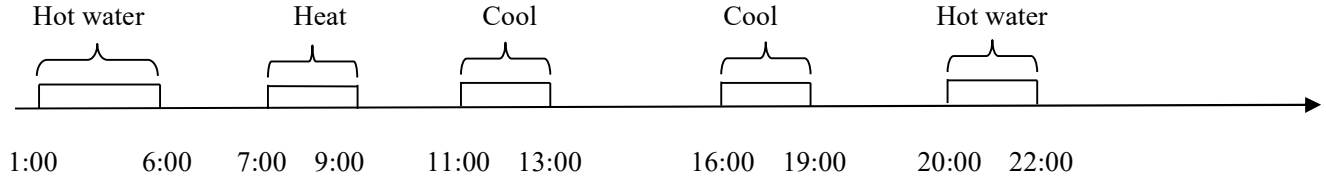
Click  or  to adjust the setting value. If you click  , you will close the pop-up window without saving the changes. If you click  , you will save the settings and close the pop-up window.

Temperature setting is the same as above.

Example: Five sets of timing settings according to the table below

No.	Switch on time	Switch off time	Mode	Temperature
1	1:00	6:00	Hot Water	50℃
2	7:00	9:00	Heat	30℃
3	11:00	13:00	Cool	20℃
4	16:00	19:00	Cool	20℃
5	20:00	22:00	Hot Water	50℃

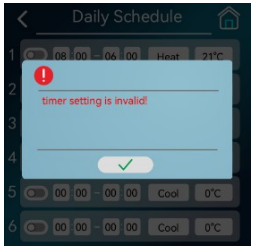
The unit will be controlled as shown below



The operations of the unit are described as follows:

Time	The specific movements of the unit
1:00	Hot water mode switch on
6:00	Hot water mode switch off
7:00	Heat mode switch on
9:00	Heat mode switch off
11:00	Cool mode switch on
13:00	Cool mode switch off
16:00	Cool mode switch on
19:00	Cool mode switch off
20:00	Hot water mode switch on
22:00	Hot water mode switch off

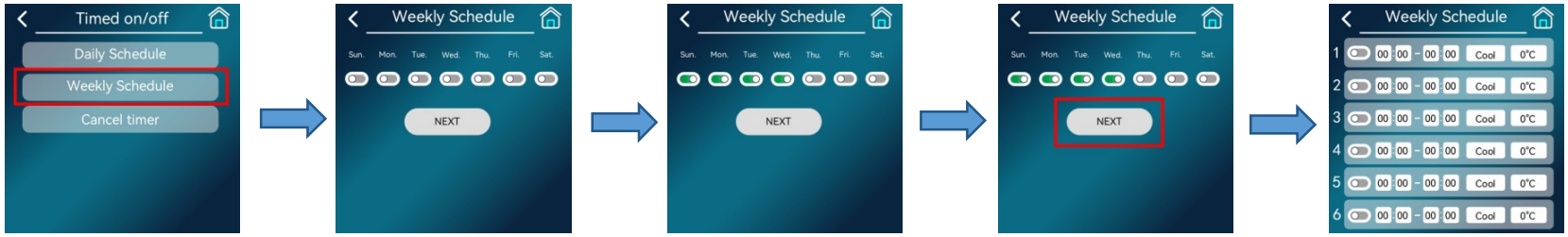
Note: If the start time and end time are the same, the start time is later than the end time, the setting is set across days, or the temperature exceeds the allowable range of this mode, this group of timer settings will be invalid, and the following screen will appear.



- Weekly Schedule

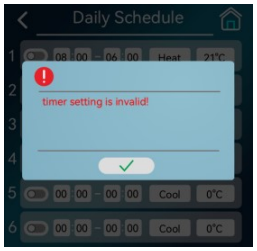
Click  on the main interface to enter the setting menu and select “Timer setting”.

Click the “Weekly schedule” option in the timed on/off menu to enter the week selection interface. Click  to set the corresponding date to enable or cancel the timer function. Click “NEXT” to enter the timer group setting screen.



Note: The operation of timer setting is the same as the daily schedule.

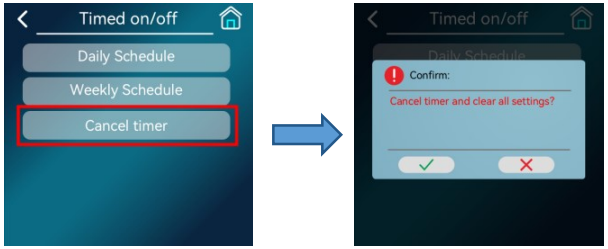
Note: If the start time and end time are the same, the start time is later than the end time, the setting is set across days, or the temperature exceeds the allowable range of this mode, this group of timer settings will be invalid, and the following screen will appear.



- Cancel Timer

  If you want to cancel all the timed on/off settings in the lump (without affecting other timer settings), you may follow the introduction in this section.

  Click the “Cancel timer” in the timed on/off menu. Click ⚙ to pop up a confirmation window.



  Click ✓ to clear the timer and close the pop-up window, click ✗ to cancels and close the pop-up window.

The timer icon will be shown on the main interface when the timer is activated.

The timer icon will not be shown on the main interface when the timer is invalid.

8.5.3.2 Sterilization Timer

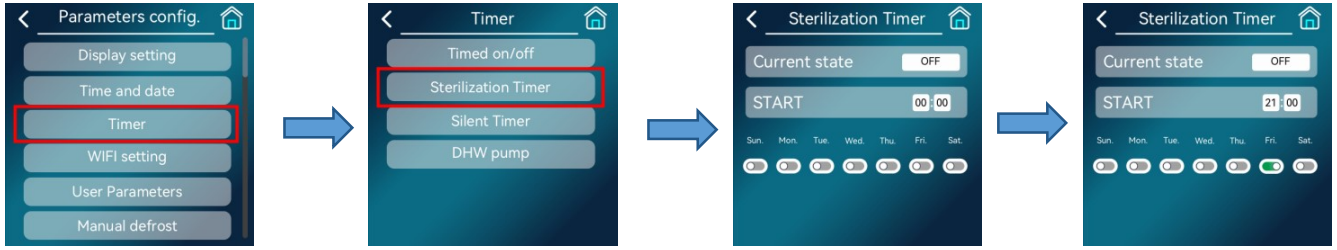
There are two ways to use the sterilization function:

- Timed use
- Manual use

The sterilization timer function will force the temperature of the hot water tank to 61-70°C (the specific value is determined by the parameter of sterilization temperature) to kill bacterial germs in it. The sterilization temperature can be set in the Advanced Setting.

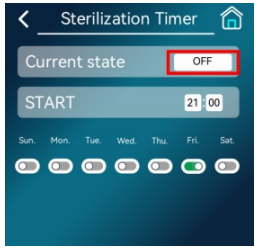
Before using the sterilization function, make sure that the parameter in “User parameters” ＞ [Sterilization Timer] is set to use (for details of this parameter, please refer to the parameter table in 8.5.5 User Parameters). If this parameter is disabled, the sterilization function cannot be used. The following describes the methods of timed and manual use respectively. Timed use is as follows:

Click  on the main interface to enter the setting menu; Click “Timer” option to enter the timer menu and then click “Sterilization Timer” option to set sterilization timer; after setting the start time, click  to take effect or cancel a certain day.



Manual control operates as follows:

Manual control has a higher priority than timed control. Click the “Current state” option.



If the current state is “OFF”, click to manually turn on the sterilization function.

If the current state is “ON”, click to manually exit the sterilization function.

8.5.3.3 Silent Timer

There are two ways to use the silent function:

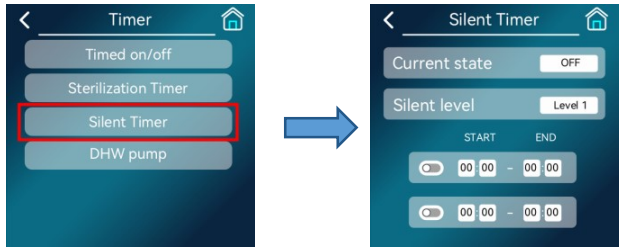
- ·Timed use
- ·Manual use

There are two levels of the silent mode, Level 1 and Level 2. The maximum speed of the fan and the compressor in Level 2 mode is slower than that of Level 1. The next section describes how to use silent timer:

Click  on the main interface to enter the setting menu and click “Timer”. Then click “Silent Timer” option to set silent timer; click the “Silent level” button to switch the level (Level 1 and Level 2).

There are two groups of timer, click  to enable or cancel the timer ( in enabling state).

Note: For time setting, please refer to 8.3.5 Time Setting.



Manual control operates as follows:

Manual control has a higher priority than timed control, click the “Current state” button.

If the current state is “OFF”, click it to manually turn on the silent mode (performing timer operation at the next timer node).

If the current state is “ON”, click it to manually exit the silent mode.

Check whether there is a silent icon in the main interface to confirm the mode, as shown in the figure, it is in silent mode.

8.5.3.4 DHW Pump

The lower return water pump function is used to return water from the network.

In the main interface, click  to enter the setting menu. Click “Timer” to enter the timer menu, and then click “DHW pump” to set the DHW pump. Click  to enable or cancel this timer group.

8.5.4 Network Configuration Guidelines

This display has built-in WIFI module, which can communicate with mobile phone APP and operate the unit via the APP.

When configuring the display to the WIFI network for the first time, it is necessary to ensure that the display and the mobile phone are connected to the same WIFI with appropriate signal strength. Through the “Main interface” > “Parameters config.” > “WIFI setting”, enter the configuration information interface. The interface shows the current WIFI status, MAC address and the instructions.

If the WIFI status shows “Connected to cloud server”, the display has been configured and can be operated on the account that has completed the configuration before.

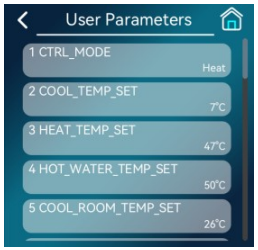
If the WIFI status displays other contents or needs to cancel the previously completed configuration, the following steps can be followed: (Note: the account with completed configuration and successful communication will no longer be able to operate the unit.)

Click “Reset WIFI” on the configuration information interface, and when we see WIFI status is “Configuring the network in smart mode”, we may start to configure and connect via APP. For details, please refer to the “User Manual of Huilian Smart APP for Equipment Network Configuration”.

For detailed instructions of network configuration, please scan the QR code below to view Chapter 9.

8.5.5 User Parameters

The user parameters can be used directly by the end users, with the interface as shown in the figure:



For more user parameters, refer to the table below (actual parameters shall be those shown on the display):

User parameters					
Settings item		Setting range	Default value	Authority	Remarks
01	Control mode	Cooling mode Heating mode Automatic mode	Heating mode		It can be changed and switched over when the unit is in operation.
02	Set temperature of cooling	min…max	12		See the [Lower limit of cooling temperature rising] and [Upper limit of cooling temperature rising] for set range of min and max for details
03	Set temperature of heating	min…max	50		See the [Lower limit of heating temperature rising] and [Upper limit of heating temperature rising] for set range of min and max for details
04	Set temperature of hot water	min…max	50		See the [Lower limit of heating temperature rising] and [Upper limit of heating temperature rising] for set range of min and max for details
05	Set room temperature of cooling	16…30	26		
06	Set room temperature of heating	16…30	20		

09	Set temperature of heating (B)	40…60	50		
10	Set room temperature of heating (B)	16…30	26		
11	Power mode	Standard Strong Energy-saving	Standard		
13	Timed Sterilization	Disabled, enabled	Disabled		
14	Sterilization temperature	60…70	70		
15	Maximum period of sterilization	90…300	210		
16	High temperature time of sterilization	5…60	15		
26	Cooling curve of Zone A	Disabled Low temperature curve 1 Low temperature curve 2 Low temperature curve 3 Low temperature curve 4 Low temperature curve 5 Low temperature curve 6 Low temperature curve 7 Low temperature curve 8 High temperature curve 1 High temperature curve 2 High temperature curve 3 High temperature curve 4 High temperature curve 5 High temperature curve 6 High temperature curve 7 High temperature curve 8 Curve 9	Disabled		
27	Heating curve of Zone	Disabled	Disabled		

	A	Low temperature curve 1 Low temperature curve 2 Low temperature curve 3 Low temperature curve 4 Low temperature curve 5 Low temperature curve 6 Low temperature curve 7 Low temperature curve 8 High temperature curve 1 High temperature curve 2 High temperature curve 3 High temperature curve 4 High temperature curve 5 High temperature curve 6 High temperature curve 7 High temperature curve 8 Curve 9			
28	Cooling curve of Zone B	Disabled Low temperature curve 1 Low temperature curve 2 Low temperature curve 3 Low temperature curve 4 Low temperature curve 5 Low temperature curve 6 Low temperature curve 7 Low temperature curve 8 High temperature curve 1 High temperature curve 2 High temperature curve 3 High temperature curve 4 High temperature curve 5 High temperature curve 6 High temperature curve 7	Disabled		

		High temperature curve 8 Curve 9			
29	Heating curve of Zone B	Disabled Low temperature curve 1 Low temperature curve 2 Low temperature curve 3 Low temperature curve 4 Low temperature curve 5 Low temperature curve 6 Low temperature curve 7 Low temperature curve 8 High temperature curve 1 High temperature curve 2 High temperature curve 3 High temperature curve 4 High temperature curve 5 High temperature curve 6 High temperature curve 7 High temperature curve 8 Curve 9	Disabled		
30	Curve 9 cooling ambient temperature 1	-5…46	35		
31	Curve 9 cooling ambient temperature 2	-5…46	25		
32	Curve 9 cooling output temperature 1	5…25	10		
33	Curve 9 cooling output temperature 2	5…25	16		
34	Curve 9 heating ambient temperature 1	-25…35	7		
35	Curve 9 heating ambient temperature 2	-25…35	-5		
36	Curve 9 heating output	25…65	28		

	temperature 1				
37	Curve 9 heating output temperature 2	25…65	35		
38	00# Module setting	Disabled, enabled	Enabled		

8.5.5.1 Ambient Temperature Presetting

Through the function of ambient temperature presetting, the target water temperature can be preset based on external ambient temperature. The heating can be reduced when the weather warms up. In order to save energy, when the external ambient temperature rises, a lower target water temperature for heating can be selected through the function of ambient temperature presetting.

On the “User Parameters” screen, select one or more of the parameters, i.e. “A_ZONE_COOL_CURVE”, “A_ZONE_HEAT_CURVE”, “B_ZONE_COOL_CURVE”, and “B_ZONE_HEAT_CURVE” as required, click the parameter items to pop up the parameter option screen, and click the parameter options to disable or enable different “preset ambient temperature curves”.

Note: The preset ambient temperature curves consist of cooling and heating, which use different curves. For heating, there are a total of 8 low temperature curves, 8 high temperature curves, and one curve that is set. For cooling, there are a total of 8 low temperature curves, 8 high temperature curves, and one curve that is set. The curves are given in table form in Appendix A. Please refer to Appendix A.

8.5.6 Manual Defrost

During its normal operation, the unit is capable of intelligent (automatic) defrosting. However, in certain cases, the manual defrosting may be used through the following path:

“Main interface” > “Parameters config.” > “Manual defrost”. The current status of each module, such as stop, running, and defrosting, will be displayed on the screen. This is shown in the figure:

Only when the module is in the operation, the water temperature, fin temperature and other conditions are met, can the defrosting be successfully entered by clicking the corresponding item. At this time, the current state of the module will be switched to defrosting. Otherwise, it will maintain the original status.

8.5.7 History Error

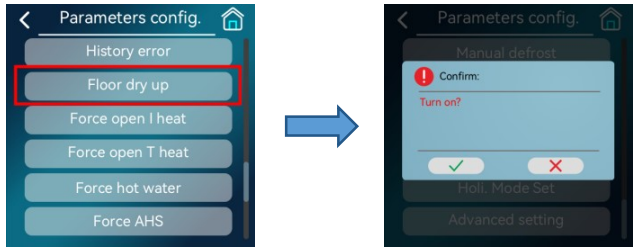
The errors that have occurred to the unit (including those that have been reset) are recorded in the controller. The check path is as follow:

Enter the “Historical error” option through the path of “Main interface” > “Parameters config.” > “History error”. In this interface, you may see the code and occurrence time of each error in the past, please be caution to click since it can clear all the history error. Click the corresponding error to view its complete name.

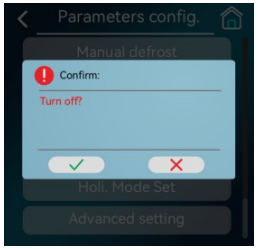
8.5.8 Floor Dry Up

This function can only be switched on if the “Underfloor heating inlet temperature probe” is in use as well as the unit in standby.

Enter “Main interface” > “Parameters config.” > “Floor dry up”; Click “Floor dry up” option to pop up a confirmation window (as shown in the figure), then click to turn on this function and close the pop-up window, click to cancel and close the pop-up window.



If this function is turned on, click “Floor dry up” option to pop up a confirmation window to turn off this function (as shown in the figure). Click to turn it off and close the pop-up window，click to cancel and close the pop-up window.

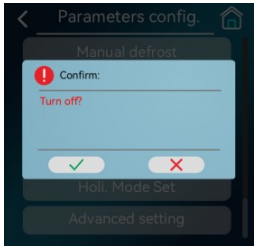


8.5.9 Forced Open I Heat

Find the “Force open I heat” function by following the path below:

“Main interface” > “Parameters config.” > “Force open I heat”. Click “Force open I heat” to pop up a confirmation window (as shown in the figure), click  to turn on this function and close the pop-up window, click  to cancel and close the pop-up window.

If the function has been turned on, click “Force open I heat” to pop up a confirmation window to turn off the function (as shown in the figure).Click  to turn it off and close the pop-up window， click  to cancel and close the pop-up window.

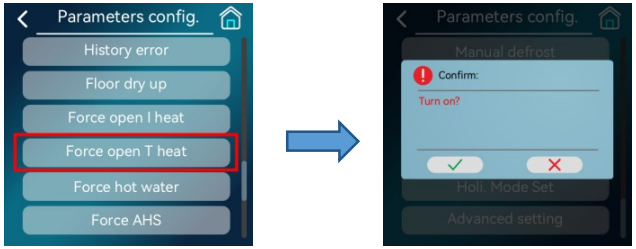


8.5.10 Forced Open T Heat

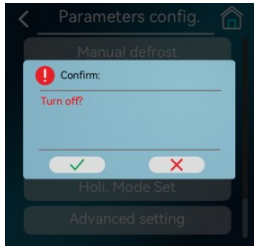
The force open T heat can produce hot water by forcibly turning on the electric heating in the tank.

There may be a demand for hot water when there is a demand for cooling or heating in the system and the heat pump is in cooling or heating mode, which can be produced with the force open T heat.

The path is as follows: Click  to enter setting menu in the main interface and swipe down to find the “Force Open T Heat” option. Click it to pop up a confirmation window. Click  to turn on this function and close the pop-up window, click  to cancel and close the pop-up window.



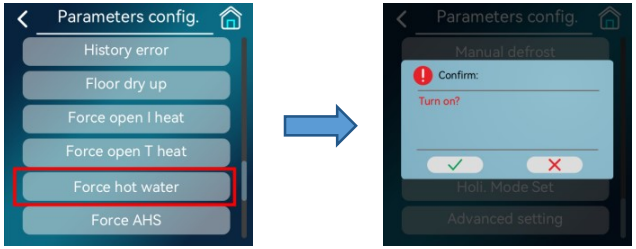
If the function has been turned on, click “Force open T heat” to pop up a confirmation window to turn off this function (as shown in the figure). Click  to turn it off and close the pop-up window, click  to cancel and close the pop-up window.



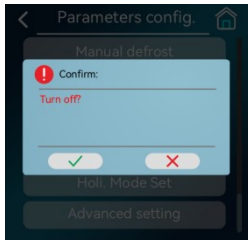
8.5.11 Forced Open Hot Water Mode

The forced hot water mode function forces the system to run into hot water production mode, with the heat pump and the forced open I heat, the forced open T heat and the external heat source all operating in the Forced Hot Water Mode when conditions are met.

Click  to enter setting menu in the main interface and swipe down to find the “Force hot water” option. Click it to pop up a confirmation window, then click  to turn on this function and close the pop-up window, click  to cancel and close the pop-up window.



If the function has been turned on, click “Force hot water” to pop up a confirmation window to turn off this function. Click  to turn it off and close the pop-up window, click  to cancel and close the pop-up window.



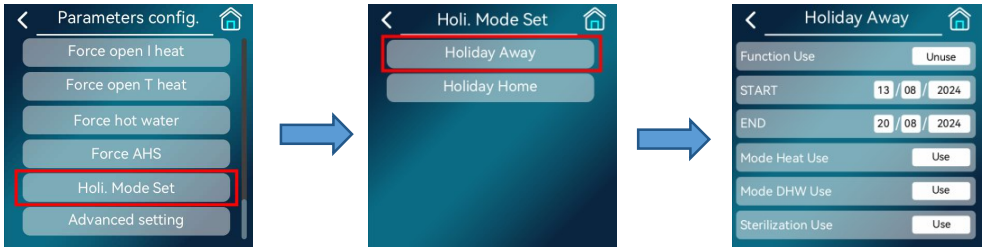
8.5.12 Holiday Mode

8.5.12.1 Holiday Away Mode

If holiday away mode is on, the following icons will appear on the main interface.

Holiday away mode is often used to prevent waterways from freezing when you are away on a winter holiday. Turn on this mode after you leave home and turn it off before you return.

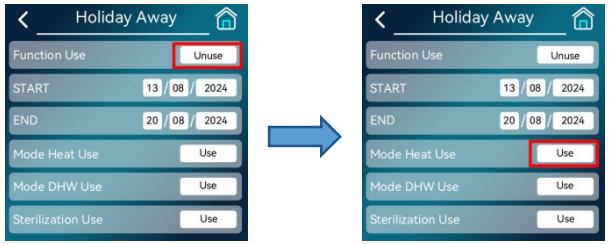
Click  to enter setting menu in the main interface and swipe down to find the “Holiday Mode Set” option. Click “Holiday Away” to enter the holiday away mode interface.



Application example: Assuming that it is now January 3, 2020 and you will be going out for a fortnight in three days, which means going out on January 6, 2020 and coming home on January 20, 2020. You can set up the function as shown in the table below in order to prevent the waterways from freezing.

Parameters	Value
Function Use	Use
START	January 6, 2020
END	January 20, 2020
Mode Heat Use	Use
Mode DHW Use	Use

The operation is as follows: click “Function Use” button to set it as “Use” (click again to set it to Unuse) to use the Holiday Away function. Click “Mode Heat Use” button to set it as “Use”.



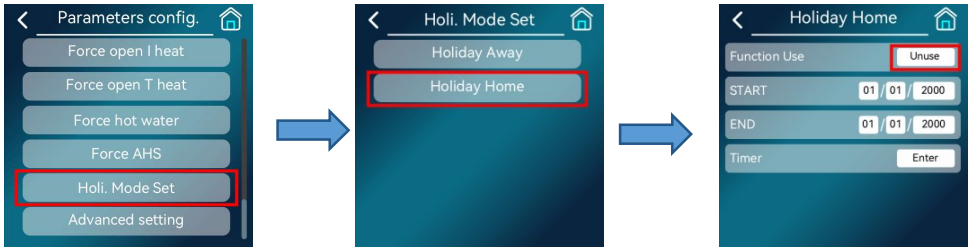
The setup of “Mode DHW Use” and “Sterilization Use” is the same as above.

8.5.12.2 Holiday at Home Mode

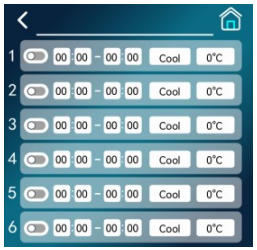
Holiday at home mode is similar to Timer mode. When Holiday at home mode is in effect, the setting of timer function will be disabled. For example, if the Holiday at home function is enabled and set to turn on this mode from July 1, 2020 -July 7, 2020 the regular time function will be executed before July 1, 2020 and after July 7, 2020, and the Holiday at Home function will be executed during July 1, 2020- July 7, 2020.

Follow the path below to enter the Holiday at Home mode setting interface:

“Main interface” > “Parameters config.” > “Holi. Mode Set” > “Holiday Home”; Click “Function Use” button to set as “Use” (click again to set it to unuse) to use the Holiday Leave function; Refer to 8.3.5 Time Setting Operation for “Start Time” and “End Time” setting operations.



Click the “Timer” button to enter the Timer Setting interface, refer to 8.5.3.1 Daily Schedule.



8.5.13 Advanced Setting

For installation, service, etc., authorized engineers or service personnel may modify the parameters of the controller by entering the password through the following path.

The path to the Advanced Settings screen is as follows:

“Main interface” > “Parameters config.” > “Advanced setting”. Enter the correct password on the following screen and click √ to confirm. (The advanced password for the user is 123 by default).

Exit Advanced Setting

After confirming the modification of all parameters, you need to logout this password. Scroll down in the Advanced Setting interface and find “Logout”, and then click on it. When the next time to re-enter the advanced setting interface, you have to re-enter the password.

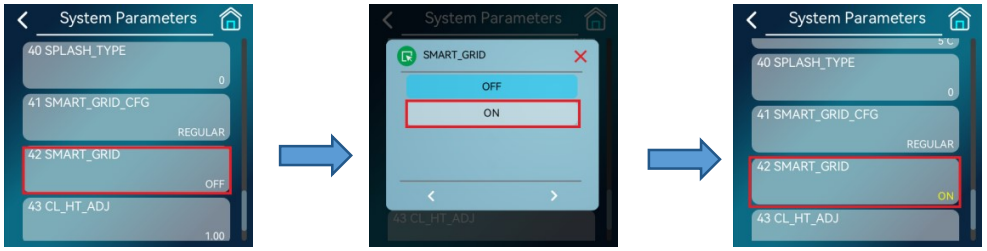
If you don’t click Logout, you don’t need to enter the password the next time when you re-enter the Advanced Setting screen (unless it's re-powered or hasn't been operated for too long).

8.5.14 Smart Grid

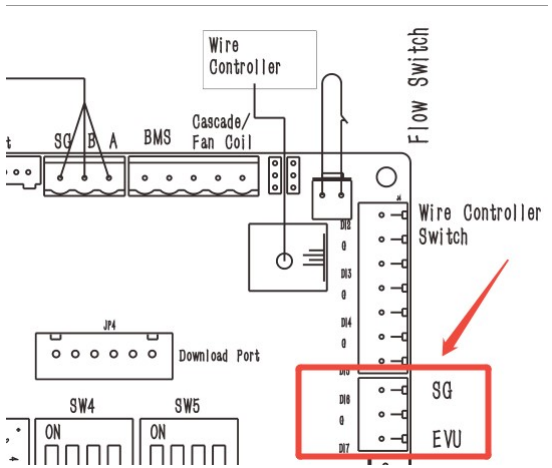
When entering “Advanced Setting”, you can enter a password with the high-level permission to obtain the permission to set the smart grid function.

After entering the password in “Advanced setting”, you enter “Parameter setting”, and multiple parameter groups will be shown.

Click “System parameters” option, then scroll down and click “Smart grid” to turn “ON” or “OFF” the function.



Click the “System Parameters” option, scroll down and click the “Smart Grid Configuration”, and select “General” or “Configuration 1”.

As shown in the figure on the right, connect the power grid signal to the main board inside the electrical control box at the top of the unit.	

a. General;

When SG and G are connected but EVU and G are not connected (for ten consecutive minutes)  : The hot water function and the electric heater are turned off; for the air conditioning zone/floor heating, the duration of operation shall not exceed the “energy-saving operation time”.

When SG and G are not connected, and EVU and G are not connected (for one consecutive minute)  : The heat pump operates in energy-saving mode (remaining unchanged if it is not automatic), the hot water function and the electric heater are turned off.

When SG and G are not connected but EVU and G are connected (for ten consecutive minutes)  : The heat pump operates in the strong mode (remaining unchanged if it is not automatic), the hot water function takes priority, and the electric heating of the hot water tank operates (it is turned on when the temperature drops 2°C below the set point and turned off when it rises 3°C above the set point).

When SG and G are connected, and EVU and G are connected (for ten consecutive minute)  : The heat pump operates in the strong mode (remaining unchanged if it is not automatic), the hot water function is enabled automatically, and the electric heating of the hot water tank is turned on. (shut down when it is heated to 70℃)

b. Configuration 1:

When SG and G are connected but EVU and G are not connected (for ten consecutive minutes)  : The heat pump operates in standard mode.

When SG and G are not connected, and EVU and G are not connected (for one consecutive minute)  : The heat pump operates in energy-saving mode (remaining unchanged if it is not automatic), the hot water function and the electric heater are turned off.

When SG and G are not connected but EVU and G are connected (for ten consecutive minutes)  : The heat pump operates in the strong mode (remaining unchanged if it is not automatic), the hot water function takes priority, and the electric heating of the hot water tank operates (it is turned on when the temperature drops 2°C below the set point and turned off when it rises 3°C above the set point).

When SG and G are connected, and EVU and G are connected (for ten consecutive minute)  : The heat pump operates in the strong mode (remaining unchanged if it is not automatic), the hot water function is enabled automatically, and the electric heating of the hot water tank is turned on. (shut down when it is heated to 70℃)

8.6 Setting of the Multi-zone Mode

Upon delivery, the equipment is in the single-zone water temperature mode by default, and can be set to multi-zone operation according to the actual situation.

8.6.1 Single-zone water temperature:

It is set by default upon delivery, and you do not need to perform any operation.

8.6.2 Single-zone water temperature + Hot water: The system includes single-zone air conditioning water temperature control and domestic hot water control.

When you need to enable the hot water mode, follow the path of “Main interface” > “Parameters config.” > “Advanced setting” > “Parameter setting” > “System parameters”, then scroll down to find “Hot water function”. If you click it, it will change to “ON”. At this moment, the main interface is switched over to that as shown in the figure on the right.

8.6.3 Single-zone room temperature + Hot water: The system includes single-zone air conditioning room temperature control and domestic hot water control.

If air conditioning needs to be controlled by the room temperature, follow the path of “Main interface” > “Parameters config.” > “Advanced setting” > “Parameter setting” > “System parameters”, then scroll down to find “Display Control”, and click it to enter the menu. Click “Single-zone Room Temperature” to complete the changes. At this moment, the main interface is switched over to that as shown in the figure on the right.

8.6.4 Two-zone mixing + Hot water: The system includes two-zone air conditioning water temperature (Zone A) + room temperature (Zone B) control (Zone A can be heated or cooled, and Zone B can only be heated) and domestic hot water control.

If floor heating is added to the system, follow the path of “Main interface” > “Parameters config.” > “Advanced setting” > “Parameter setting” > “System parameters”, then scroll down to find “Display control”, and click it to enter the menu. Click “Two-zone water and room temperature” to complete the changes. At this moment, the main interface is switched over to that as shown in the figure on the right.

8.6.5 Two-zone water temperature + Hot water: The system includes two-zone air conditioning water temperature control (Zone A can be heated or cooled, and Zone B can only be heated) and domestic hot water control.

If floor heating is added to the system, follow the path of “Main interface” > “Parameters config.” > “Advanced setting” > “Parameter setting” > “System parameters”, then scroll down to find “Display Control”, and click it to enter the menu. Click “Two-zone water temperature” to complete the changes. At this moment, the main interface is switched over to that as shown in the figure on the right.

Caution:

- The room temperature sensor is located in the display. If the air conditioning zone is controlled by room temperature, be sure to place the display indoors;

- Connect the temperature sensor in the accessories to the corresponding position according to the actual situation, so that the equipment can operate normally, and unnecessary losses will not be caused.

According to the actual situation, follow the path of "Main interface" > "Parameters config." > "Advanced setting" > "Parameter setting" > "On-off value and probe", then scroll down to select the corresponding temperature sensing probe and change it to "Enabled".

Chapter 9 Operation of Device Configuration

The FUT RF Output Power 18.2dBm(66.02mW);
Operating Frequency Band 2400-2483.5 MHz.

1. Connect your phone to Wi-Fi

Make sure the phone is in the same Wi-Fi environment as the device to be connected to the network. Select the 2.4GHz Wi-Fi network on the phone and enter the password to connect the phone to WI-FI.

***Note:** If the current Wi-Fi environment is 5GHz, first set the router to 2.4GHz. The router is generally set as follows:

If your router supports both 2.4GHz and 5GHz Wi-Fi, but only one Wi-Fi name can be found on your phone's Wi-Fi search page, you may refer to the following steps (as the specific setup process for different brands of routers may vary, refer to the router manual for final instructions):

① Access to the "Wireless" page of the router (the method is usually on the label on the back of the router).
② Find the 2.4GHz setting screen, change the Wi-Fi name (SSID) to "xxx-2.4G", and save the setting.
③ Find the 5GHz setting interface, change the Wi-Fi name (SSID) to "xxx-5G", and save the setting.
④ After the change, find the two Wi-Fi names "xxx-2.4G" and "xxx-5G" on the Wi-Fi search page of your phone.

2. Add device

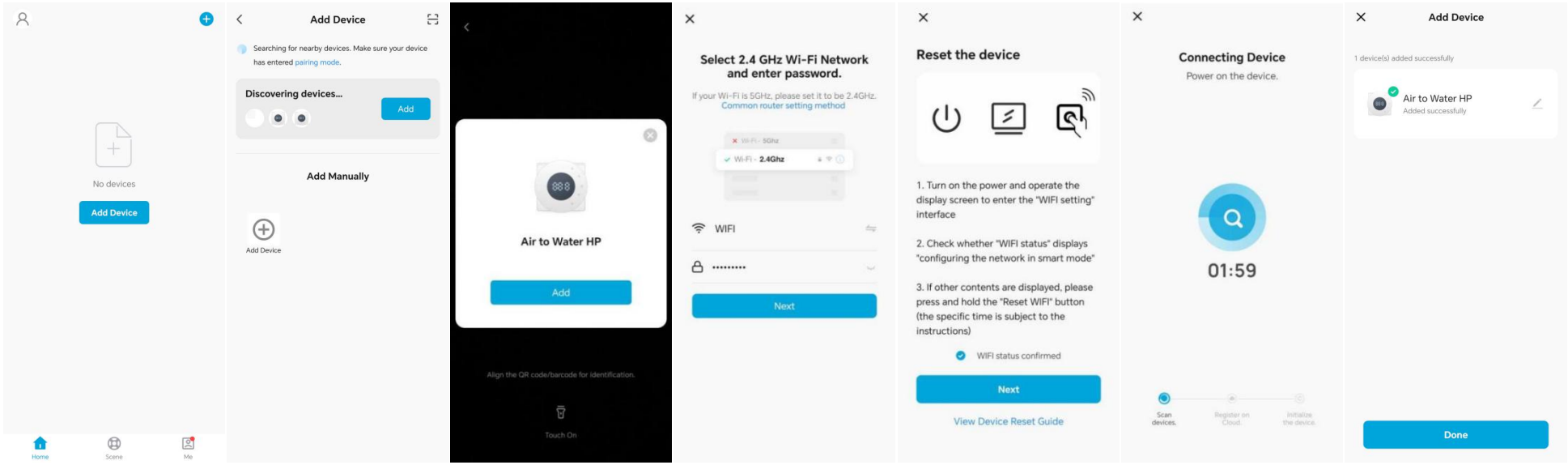
① Turn on your phone's Wi-Fi and Bluetooth, and enable location access. Make sure that your phone's Wi-Fi and Bluetooth are both activated for the best network experience;
② Open the "Huilian Smart" app on your mobile phone and select "Homepage" from the bottom navigation bar;
③ Click the "+" button in the upper right corner of the homepage, or click the "Add Device" button in the center of the homepage, to enter the screen of adding device;
④ In the screen of adding device, you may try to add the device in one of the following ways:

Option 1: Scanning Code for Configuration

Click the "Scan" icon in the upper right corner of the screen of adding device, automatically scan the QR code of device configuration inside the scanning field, and follow the steps below to add the device.

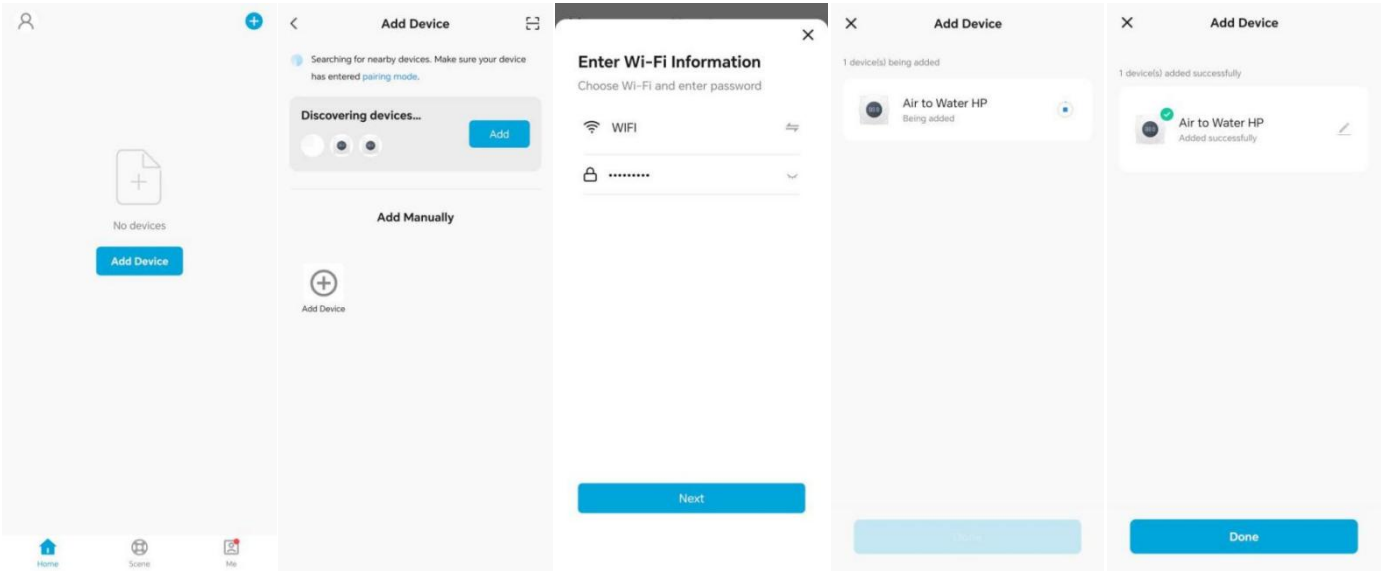
* Note 1: Obtain the QR code of device configuration from the corresponding display of the product.

* Note 2: If the WI-FI status of the device has been checked and confirmed to be correct, select to "Reset device first" and directly "Confirm WI-FI status", and click the "Next" button to directly configure the device without reset.



Option 2: Auto Find

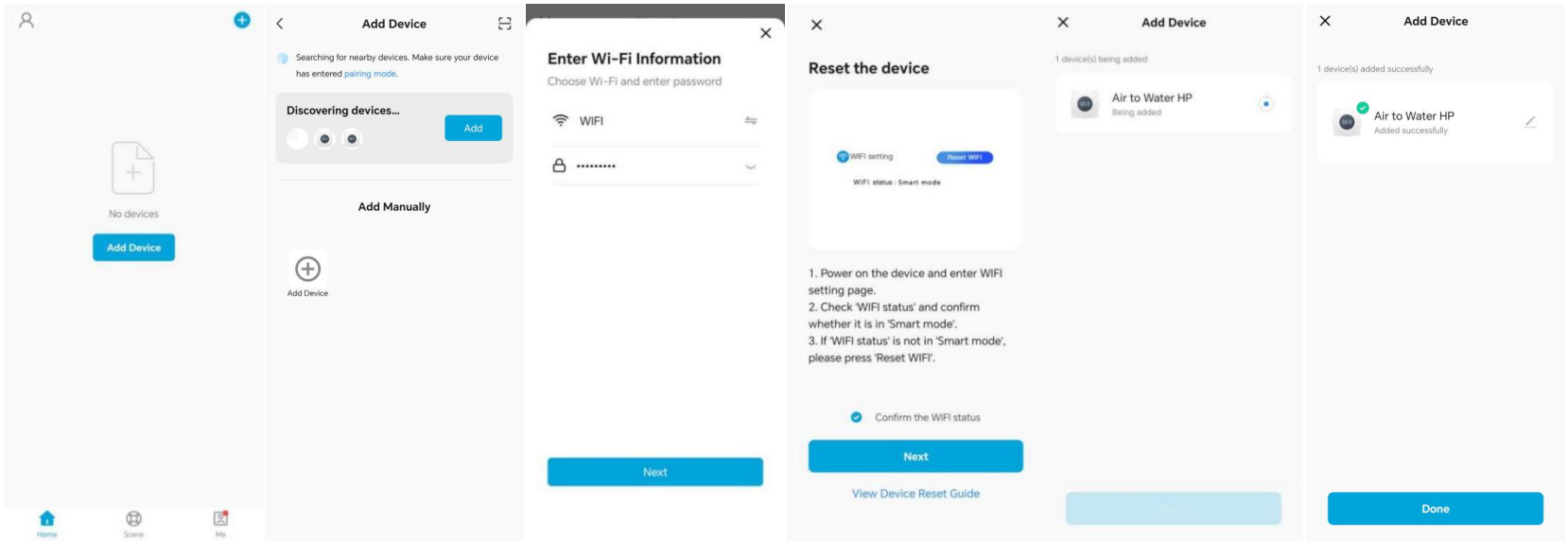
The phone will automatically discover nearby available devices. After discovering the device, click "Add", then click "Next" and follow the instructions in the following figure to complete the subsequent distribution network operation。



Option 3: Add manually

Select the "Add Device" icon button to manually add a device. Please follow the instructions in the following figure to add the device.

* Note: If the WI-FI status of the device has been checked and confirmed to be correct, select to “Reset device first” and directly “Confirm WI-FI status”, and click the “Next” button to directly configure the device without reset.



3. Complete space information

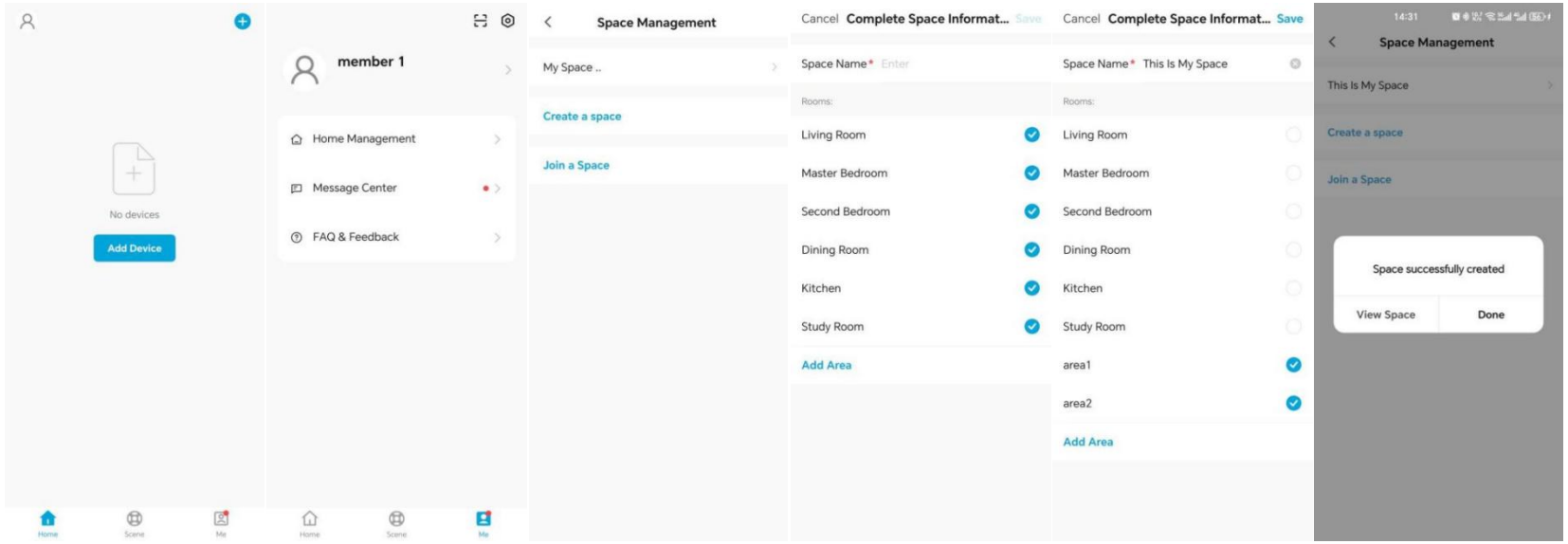
1) Enter the “Huilian Smart” APP on your phone, click “My” - “Space Management” - “My Space... ” to complete the space information, and the information that can be completed includes Space Name, Space Location, and Adding Areas in the Space. Please follow the instructions in the figure below to enter the “Complete Space Information” interface.

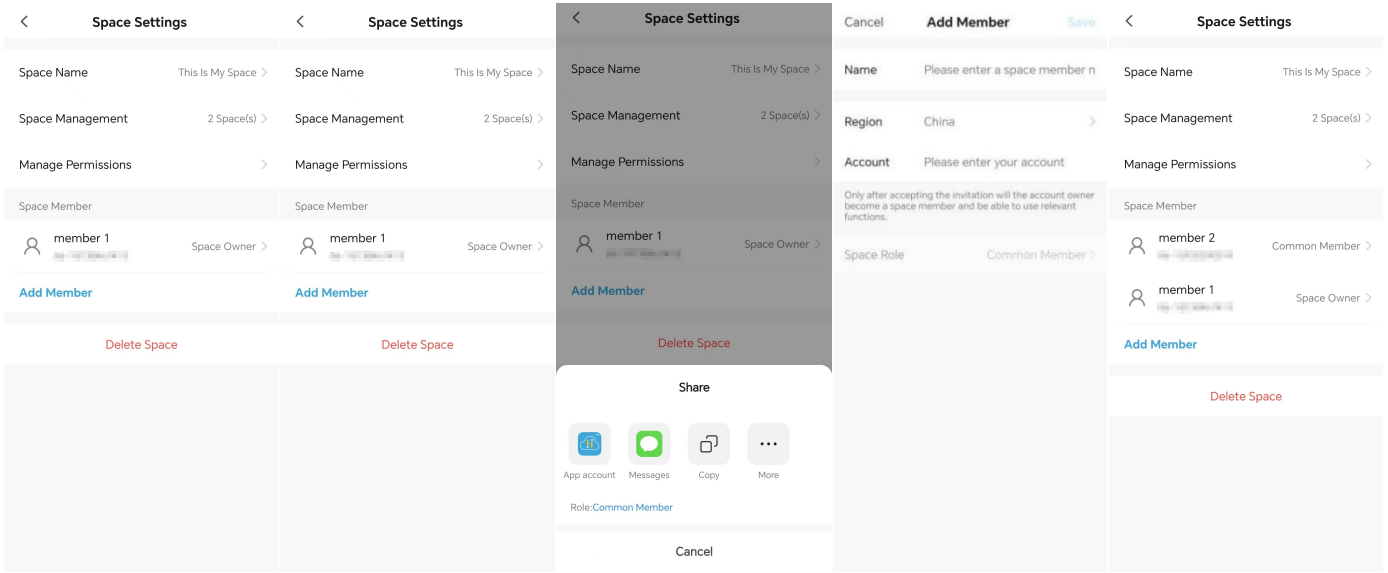
Note 1: If additional space is required, please click “Create Space” to create the space by yourself.

Note 2: The addition of new areas in the space is conducive to refining device management.

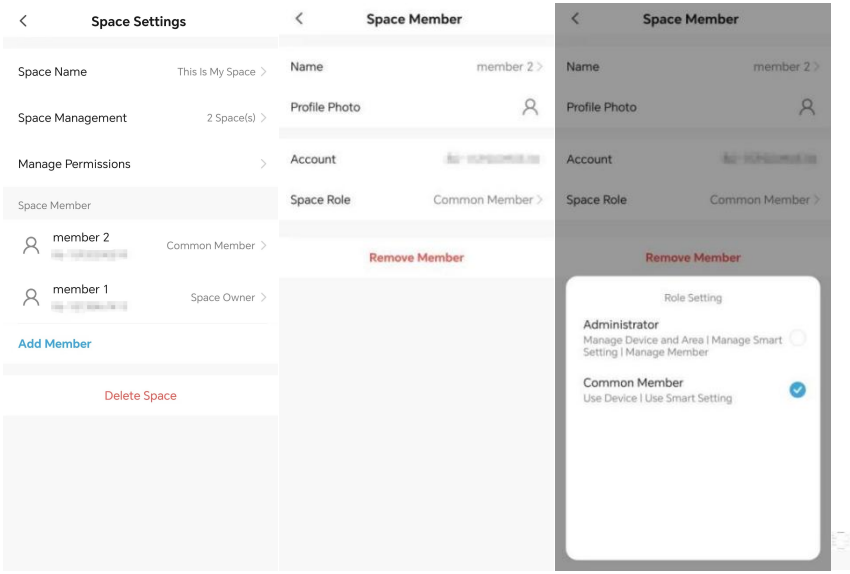
2) After completing the space information, please click “Save” in the top right corner to save the space information so completed. After the space information is updated, click “View Space” in the prompt box to further add new members to this space. By adding members, relevant personnel can access all devices in the current space. Please follow the instructions in the figure below to complete the space information and add space members.

Note: The methods for inviting space members include: adding the App account, sending the invitation codes via short text message and message, etc. Here, adding the App account is taken as an example.





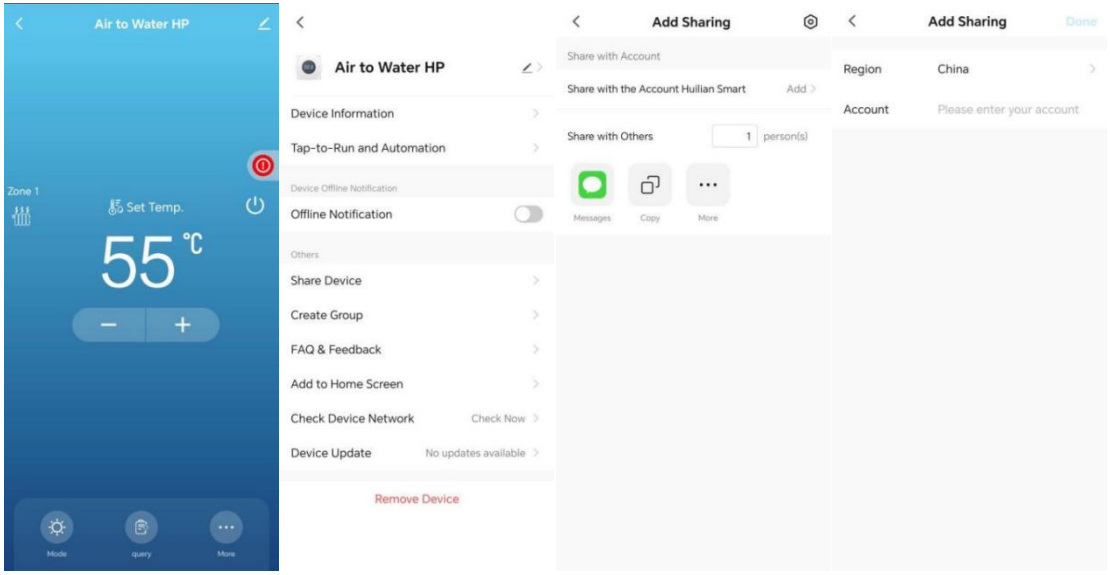
3) Each space has only one space owner. By default, the role of each space member is an “ordinary member”, who has the permission to use devices and smart. If you want to designate a space member to manage devices and areas, you can set his/her space role as “Administrator”. The setting method is shown in the figure below.



4. Shared Device

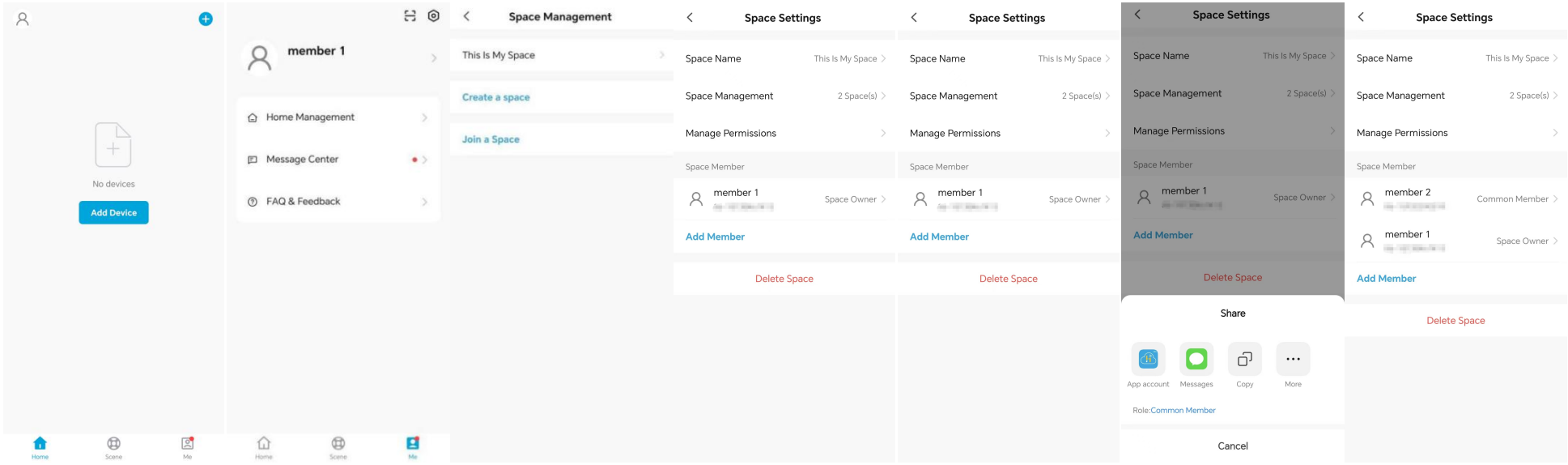
1) Separate sharing of device

After entering the device panel, click the “Modify” button in the upper right corner to enter the screen of device details. Click the “Shared device” – “Add share”, and enter the app account to be shared (the app account is the registered phone number or email), to separately share your device with other users. Follow the instructions below to separately share the device.



2) Space sharing

If multiple devices need to be shared in the same space, it is recommended to select the corresponding space in “My” – “Space management” and enter the screen of “Space setting” to add or invite space members, as shown in the following figure. When a space member accepts an invitation, all the devices in the space are available.



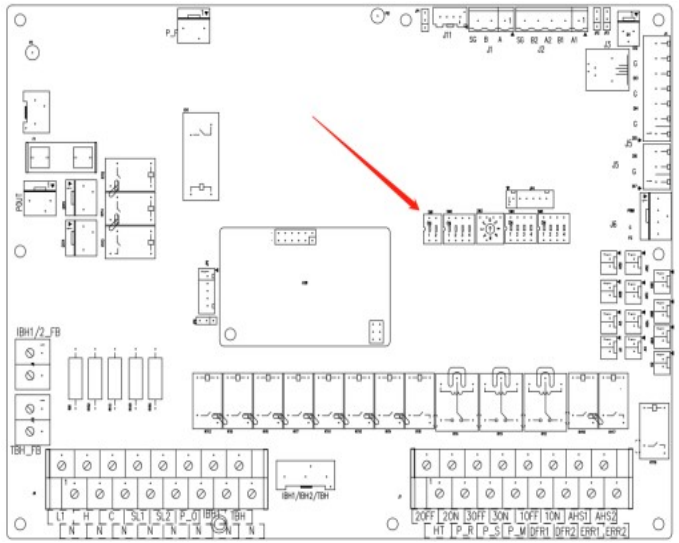
Chapter 10 Instructions on Other External Heat Sources

1. Auxiliary electric heater:

If an auxiliary electric heater shall be added to the system, connect it in series behind the heating pump.

The parameters and the dial codes shall be set. In “Main interface → Advanced setting → Parameter setting → Energy control”, set “Auxiliary electric heater” to “Enabled”; and the dial codes shall also be set on the main board as follows: (Note: If any of the dial codes and the parameters is not set, the auxiliary electric heater will become invalid)

/	SW1.1	SW1.2
No auxiliary electric heater output	OFF	OFF
IBH1 auxiliary electric heater output	OFF	ON
IBH2 auxiliary electric heater output	ON	OFF
IBH1+IBH2 auxiliary electric heater output	ON	ON



Note: OFF on SW terminal indicates “0”, and ON indicates “1”. IBH2 auxiliary electric heater output is located in the lower middle part of the main board as shown in the figure above.

Before using the auxiliary electric heater, connect the temperature sensor in the accessories to “Total Water Outlet Temperature” on the terminal box on the right side of the equipment, and place the temperature sensor within 20 cm behind the auxiliary electric heater. (In “Main interface” > “Setting menu” > “Advanced setting” > “Parameter setting” > “On-off Value and Probe”, set “Total Water Outlet Temperature” to “Enabled”.)

Before using the auxiliary electric heater, connect the feedback signal line on the auxiliary electric heater to the corresponding position on the terminal box on the right side of the equipment, so that the equipment can operate normally, and unnecessary losses will not be caused.

2. The electric heater of the water tank:

If the electric heater of the water tank needs to be added to the system, place the electric heater into the hot water tank.

To use the electric heater, you need to set the parameters. Set the parameters in “Electric Heater of Water Tank” in “Main interface → Advanced setting → Parameter setting → System parameters”.

Before using the electric heater of the water tank, connect the feedback signal line on the electric heater of the water tank to the corresponding position on the terminal box on the right side of the equipment, so that the equipment can operate normally, and unnecessary losses will not be caused.

3. Solar energy

If solar energy needs to be added to the system, connect solar energy into the hot water tank in parallel.

When using solar energy, connect the signal line to the corresponding position on the terminal box on the right side of the equipment.

The solar water pump is controlled by the temperature probe or the solar signal. (Note: The solar temperature probe is set in “Advanced setting → Parameter setting → On-off Value and Probe”)

- If the “Solar Energy Temperature Probe” is set to “Enabled”, the solar water pump is controlled by the “Solar Temperature Probe”, and “Solar Signal” is invalid.
- If the “Solar Temperature Probe” is set to “Disabled”, the solar water pump is controlled by “Solar Signal”, and “Solar Temperature Probe” is invalid. When the solar signal is received, the solar water pump is turned on; and when the solar signal is not received, the solar water pump is turned off.

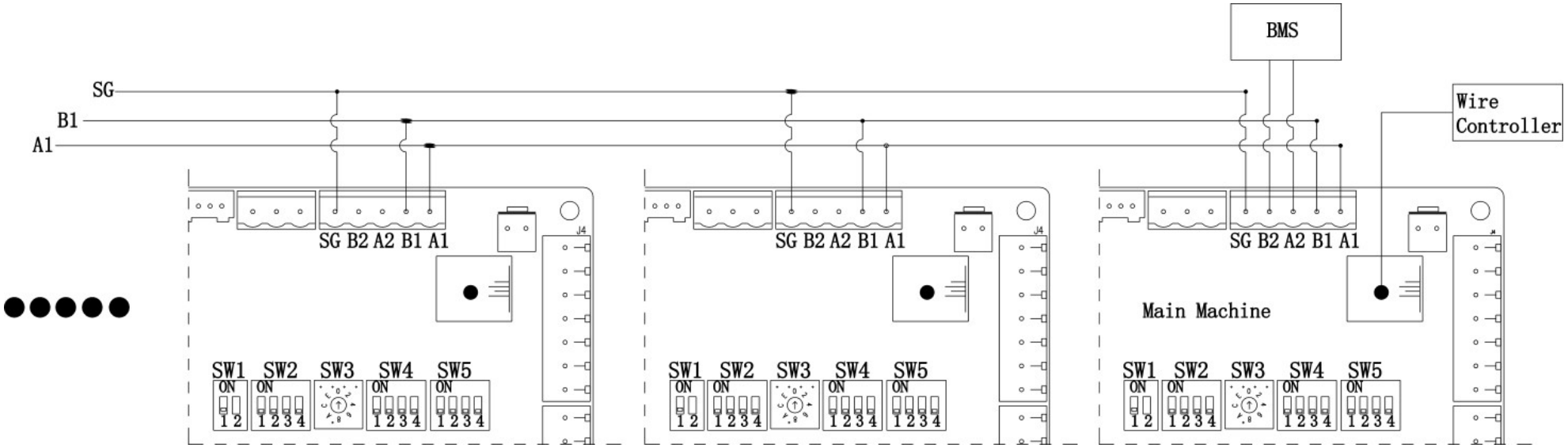
4. External heat source

If the external heat source needs to be added to the system, connect it behind the heating pump in parallel (If an auxiliary electric heater is provided, connect the external heat source behind the auxiliary electric heater).

To use the external heat source, you need to set the parameters. Set “External heat source” to “Enabled” in “Advanced setting → Parameter setting → Energy control”, and connect the signal to the corresponding position on the terminal box on the right side of the equipment.

Chapter 11 Operation Instructions on Connection

1. Cascade



- Operation instructions on cascading connection

The above figure is the schematic diagram for the cascading connection of eight modules at most.

Operating steps for module cascading

Step 1: Switch off all module units;

Step 2: Connect wires to the cascading interfaces accordingly;

As shown in the figure, controller J2 is a module cascading terminal.

If the modules shall be cascaded, the wires shall be connected properly from A1 to A1, B1 to B1, SG to SG on J2 terminal of each module, and from the main unit to slave 1, from slave 1 to slave 2, from slave 2 to slave 3, and so on.

Step 3: Dial codes of module address;

As shown in the figure, the circular dial of controller SW3 is the dial code of the module address.

It can be seen that the dial is a 16-bit dial code from 0 to F (the first eight bits of the current series equipment shall be valid). When grouping the modules, you need to dial the main unit address SW3 to 1, the slave 2 module SW3 address to 2, the slave 3 module SW3 address to 3, and so on, so as to dial the address properly one by one.

Step 4: Switch on all modules.

Step 5: Enter the module parameter setting, and set the number of modules based on the actual number of the grouped modules.

Caution: If the module address is dialed with power on, the controller can read the address only after the unit is switched on again.

➢ Operation instructions on cloud service connection

After the operation of cascade connection is completed, dial the main unit address SW3 to 0, locate J2 terminal of the controller, connect A2 of J2 terminal to A of the cloud service equipment, connect B2 to B of the cloud service equipment, and then connect the cloud service equipment to the computer.

2.Linked Switch

➢ Wire Controller Switch (weak current control)

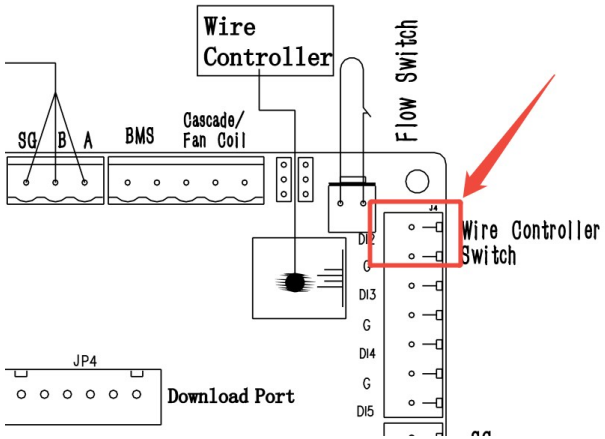
Set the trigger method: It can be done through “System Parameters → Type of Wire Controller Switch”.

Toggle switch: When detecting that the wire controller switch signal LDIrm is closed, start up the unit; when it is disconnected, shut down the unit

Pulse switch: It is effective when detecting that the wire controller switch signal LDIrm is changed from closed to disconnected (pulse width >300ms);

If the unit is shut down, start up it; if it is operating, shut it down

As shown in the figure on the right, connect the switch button to the main board inside the electrical control box at the top of the unit.



By setting the “System Parameters → Linkage Function Setting”, and there are six function options.

- Disabled
- Linkage action enabled
- Linkage closure enabled
- Wire Controller Turning-on/off
- Electric Heater of Wire Controller Water Tank
- External Heat Source of Wire Controller

① Linkage action enabled: (mainly based on the linked switch)

When the linked switch changes from disconnected to closed: The unit is started up

When the linked switch remains closed: The unit cannot be turned off via the display

When the linked switch changes from closed to disconnected: The unit is turned off

When the linked switch remains disconnected: The unit can be turned on/off via the display

② Linkage closure enabled: (The closure of the linked switch is the precondition for startup)

When the linked switch is disconnected:

If the display is turned on, the unit is in the ready state. Do not turn on the air conditioning pump and compressor until the linked switch is closed

If the display is turned off, the unit is in the standby state

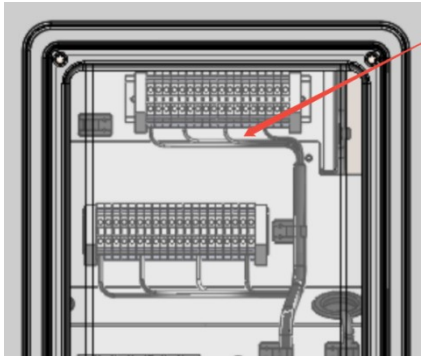
When the linked switch is closed:

If the display is turned on, the unit is started up normally

If the display is turned off, the unit is in the standby state

③ Wire Controller Turning-on/off:

Both the wire controller and the display can be turned on/off independently.



➢ Thermostat switch (high-voltage electrical control, L1 has an output voltage of 220~240V)

As shown in the figure on the right, there are corresponding thermostat terminal blocks on the junction box on the right side of the unit. Connect the thermostat according to the corresponding functions and set the functions as required.

Caution:

◆ When using the thermostat control, the unit can only control the water temperature. When the end is floor heating, the target temperature of the corresponding area should not be set too high;

◆ The thermostat control can only operate in Zone A/B, and cannot control the hot water function.

By setting the “System Parameters → Thermostat Setting”, and there are four function options.

- Disabled
- Single-zone mode switching
- Single-zone switch
- Dual-zone switch

① If the “Single zone mode switching” is selected, the operation mode as well as turning-on/off of Zone A are controlled by the thermostat;

If the thermostat L1 and the signal C are closed, Zone A will operate in the cooling mode; if the thermostat L1 and the signal H are closed, Zone A will operate in the heating mode. If no signal is closed, Zone A is in the turning-off state.

② If the “single-zone switch” is selected, the turning-on/off of Zone A is controlled by the thermostat, and the operation mode of Zone A is set via the display.

If the thermostat L1 and the signal C are closed, Zone A of the unit will operate. If the thermostat L1 and the signal C are disconnected, Zone A is in the turning-off state. The signal H is invalid.

③ If the “dual-zone switch” is selected, the turning-on/off of the air conditioning area is controlled by the thermostat, and the operation mode of the air conditioning area is set via the display.

If the thermostat L1 and the signal C are closed, Zone A of the unit will operate; if the thermostat L1 and the signal H are closed, Zone B of the unit will operate. If no signal is closed, the air conditioning area is in the turning-off state. Note that the signal H is invalid if the unit is in cooling mode.

Chapter 12 Trial operation

Warning:

- Check whether the appearance of the unit and the pipeline system in the unit are damaged during transportation;
- Check whether the fan blades are working well;
- Check whether the system pipeline, water supply pipes, return water pipes, pressure gauges, valves, and other equipment are installed correctly;
- Check whether the insulation measures of the system are in a good condition;
- Turn on the power to start the unit, and the main unit will start up automatically after a delay of 6 minutes. For the equipment with an external three-phase power supply, first check whether it rotates in the correct direction; if not, turn off the power immediately, and adjust the phase sequence;
- It is necessary to make sure that the system runs properly with no abnormalities before leaving.

Warning:

- Check whether the power supply is consistent with that required on the nameplate of the unit;
- Check whether all power supply and control lines are connected correctly according to the wiring diagram, whether the grounding is reliable, and whether all wiring terminals are tightened;
- You must make sure that the covers of the terminal boxes of all the electrical components are closed.

The trial operation shall include the air emptying trial operation, the water pump trial operation, the cooling trial operation, the heating trial operation, and the hot water trial operation.

✧ When performing the “air emptying trial operation”, run from the heating pump to the buffer tank, from the heating pump to the hot water tank, the water system of heating in Zone A, cooling in Zone A, and floor heating in Zone B for 10 minutes, respectively.

When performing the “water pump trial operation”, run the external circulating water pump, the solar water pump, and the mixing water pump for 5 minutes, respectively.

Conditions for exit: 1. The program running ends; 2. A failure occurs; 3. The command of next trial operation is received.

✧ When the “cooling/heating/hot water production trial operation” is performed, the water pump will run until the default water temperature reaches the target (the cooling target is 7°C, the heating target 35°C, and the hot water target 55°C).

Conditions for exit: 1. The target temperature is reached; 2. A failure occurs; 3. The command of next trial operation is received.

Note: During trial operation, attention shall always be paid to the occurrence of any abnormality in the whole system (whether the water system is sealed, and whether the thermal insulation measures are taken properly).

Chapter 13 Common Faults and Troubleshooting

Fault	Reset Mode	Alarm Action	Troubleshooting
Faults with the controller itself			
EEPROM data error	Switch-on reset	An alarm goes off, and the equipment cannot be started.	1. Initialize all parameters. 2. If the fault is still not fixed after initialization, please contact us!
System maintenance data error	Switch-on reset	An alarm goes off, and the equipment cannot be started.	1. Initialize the setting of system maintenance. 2. If the fault is still not fixed after initialization, please contact us!
Frequency converter communication fault	A	Shut down the compressor	1. Short-circuit or open circuit: Reconnect the wires correctly. 2. Damage to the frequency converter communication line: Replace it with a new one.
Frequency converter fault	A/M	Shut down the compressor	Please contact us!
Frequency converter model is being set	A	Shut down the compressor	1. Switch on the power again. 2. If the fault is still not fixed after initialization, please contact us!
Fan coil communication fault n	A	An alarm only, and no shutdown	1. Check the connection and setting of the terminal communication and whether the power supply is available.
Fan coil fault n	A	An alarm only, and no shutdown	1. Check the fan coil.
Module n# communication fault Module n# abnormal communication	A	Shut down the corresponding module	1. There are no connecting wires between the line controller and the equipment: Connect the wires. 2. The communication line sequence is incorrect: Reconnect the communication line sequence. 3. Whether there is any interference from a high-intensity magnetic field or a high power, such as an elevator, a high-power transformer, and ETC. 4. Check the dial code of the address: Set the dial code according to the circuit diagram or the manual.
Abnormal setting of model	Switch-on reset	Shut down the corresponding module	1. Check the dial code of the address: Set the dial code according to the circuit diagram or the manual.
Faults with the unit			

Insufficient water flow	A/M	Shut down the unit and the pump; do not shut down the end pump; if “Insufficient Water Flow for Pump Start” is “Enabled”, and the ambient temperature TA is lower than 2°C, do not shut down the air conditioning pump.	1. Short-circuit or open circuit: Reconnect the wires correctly. 2. Too low water flow: Check whether the filter is blocked and whether the head goes beyond the design range. 3. Fault with the water flow switch: Replace it. 4. Check whether the water pump is damaged: Replace it.
Overload of the auxiliary electric heater	M	An alarm only, and no shutdown	1. Check whether the water flow is too small: Clean the filter and check whether the water flow switch is abnormal. 2. Check whether the feedback signal line is short-circuited or open-circuited: Reconnect the wires correctly. 3. Check whether the protector is faulty: Replace it.
Overload of the electric heater of the water tank	M	An alarm only, and no shutdown	1. Check whether the feedback signal line is short-circuited or open-circuited: Reconnect the wires correctly. 2. Check whether the protector is faulty: Replace it. 3. Check whether the water temperature in the water tank is too low: Add water and adjust the water supply valve.
High pressure of the compressor	A/M	Shut down the compressor “Non-frequency-decrease shutdown”	1. Check whether the water temperature goes beyond the design range: adjust the set temperature of the unit. 2. The protector line is short-circuited or open-circuited: Reconnect it correctly. 3. Check whether the water temperature probe is damaged: Replace it. 4. Check whether the protector is damaged: Replace it. 5. Check whether the ambient temperature for operation is higher than the designed ambient temperature.
Too high pressure of the pressure sensor	A/M		
Low pressure of the compressor	A/M	Shut down the compressor	1. Check whether there is leakage in the unit: Ask professional personnel to come for repairing and troubleshooting. 2. The protector line is short-circuited or open-circuited: Reconnect it correctly. 3. Check whether the water temperature probe is damaged: Replace it. 4. Check whether the protector is damaged: Replace it. 5. Check whether the ambient temperature for operation is higher than the designed ambient temperature.
Too low pressure of the pressure sensor	A/M		

Too high exhaust temperature	A/M	Shut down the compressor “Non-frequency-decrease shutdown”	1. Check whether the water temperature goes beyond the design range: Adjust the set temperature of the unit. 2. The water temperature or exhaust temperature probe line is short-circuited or open- circuited: Reconnect it correctly. 3. Check whether the water temperature and exhaust probes are damaged: Replace them. 4. Check whether the ambient temperature for operation is higher than the designed ambient temperature.
Too low water output temperature of the plate heat exchanger	A/M	Shut down the compressor “Non-frequency-decrease shutdown”	1. Check whether the temperature probe is damaged: Replace it. 2. Check whether the temperature probe is loose: Reconnect it.
Too low return water temperature of the plate heat exchanger	A/M		
Too high water output temperature of the plate heat exchanger	A/M	Shut down the compressor	
Too high return water temperature of the plate heat exchanger	A/M		
Too high difference between the output temperature and the return water temperature of the plate heat exchanger	A/M	Shut down the compressor	1. Check whether the temperature probe is damaged: Replace it. 2. Check whether the temperature probe is loose: Reconnect it. 3. Check whether the water flow is too small: Clean the filter and check whether the water flow switch is abnormal.
Abnormal difference between the output temperature and the return water temperature of the plate heat exchanger	A/M	Shut down the compressor	
Frequent emergency defrosting	M	Shut down the compressor	1. Check whether there is leakage in the unit: Ask professional personnel to come for repairing and troubleshooting. 2. Check whether the water temperature probe is damaged: Replace it. 3. Check whether the water temperature probe is short-circuited or open-circuited: Reconnect it correctly.
Too low cooling suction	A/M	Shut down the compressor “Non-frequency-decrease shutdown”	
Abnormal rotational speed of fan 1	M	Shut down the compressor	1. Check whether the wiring of PWM fan is loose: Reconnect the wires. 2. Check whether the blades are suffering from foreign matter interference: Remove the foreign matters and check whether the blades are damaged (if

			damaged, replace them). 3. Check whether the fan is faulty: Replace it.
Abnormal difference between the suction temperature and the exhaust temperature	M	Shut down the compressor “Non-frequency-decrease shutdown”	1. Check whether the suction temperature and the exhaust temperature probes are faulty: Replace them. 2. Check whether the suction temperature and the exhaust temperature probes are connected reversely: Connect them according to the circuit diagram. 3. Check whether the compressor is running: Ask professional personnel to come for repairing and troubleshooting.
Too low cooling evaporation	A/M	Shut down the compressor “Non-frequency-decrease shutdown”	1. Whether the temperature probe is faulty: Replace it. 2. Check whether there is leakage in the unit: Ask professional personnel to come for repairing and troubleshooting. 3. Check whether the water temperature goes beyond the design range: Adjust the set temperature of the unit.
Too low ambient temperature limiting the switch-on of the compressor	A	Shut down the compressor	1. Whether the temperature probe is faulty: Replace it. 2. Check whether the ambient temperature for operation is higher than the designed ambient temperature.
Fault with the communication between the indoor unit and the outdoor unit	A	Shut down the compressor	1. There are no connecting wires between the line controller and the equipment: Connect the wires. 2. The communication line sequence is incorrect: Reconnect the communication line sequence. 3. Whether the mainboards of the indoor unit and the outdoor unit are properly energized: Connect the power supply according to the circuit diagram. 4. If the fault still cannot be fixed after initialization, please contact us!
Too early a version of the protocol	A	Shut down the compressor	1. If the fault is still not fixed after initialization, please contact us!
Faults with the sensors			
Fault with the ambient temperature	A	Shut down the compressor	1. Check whether the temperature probe is damaged: Replace it. 2. Check whether the temperature probe is short-circuited or open-circuited: Reconnect it correctly.
Fault with the fin temperature	M		
Fault with the exhaust temperature	M		
Fault with the suction temperature	M		
Fault with J5 pressure sensor	M		
Fault with J6 pressure sensor	M		

Fault with the hot water tank temperature	A	Shut down the compressor	
Fault with the total water outlet temperature	A	Shut down the compressor	
Fault with the total water outlet temperature of the system	A	Shut down the external heat source (AHS)	
Fault with the water inlet temperature of the floor heating	A	Shut down the compressor	
Fault with the water outlet temperature of the plate heat exchanger	A	Shut down the compressor	
Fault with the return water temperature of the plate heat exchanger	A	Shut down the compressor	
Fault with the temperature on the liquid side of the coolant	A	An alarm only	
Fault with the temperature on the gas side of the coolant	A	An alarm only	
Fault with the solar energy temperature	A	Shut down the solar water pump (PUMPsl)	
Fault with the room temperature	A	Shut down the unit	

Four resetting modes for faults:

1) Switch-on reset
   - Faults that can be reset by switching on the power again after troubleshooting;
   - Faults that can be reset by switching on the power again: See the fault list.
2) Limited automatic resetting (A/M)
   - After a fault alarm goes off, if the fault is fixed, delay **[Fault Reset Time]**; and if the same fault does not occur during this period, resetting will be carried out automatically;
   - Within the set **[Allowable Time for Automatic Resetting]**, it can be reset twice automatically, and it will be locked when a third alarm goes off; and resetting will be carried out automatically only after the unit is shut down for the "Specified Time";
     - Specified Time: It starts from 30 minutes and increases by 30 minutes each time locking is triggered, and its upper limit is 4 hours;
   - After the manual resetting, the number of alarms shall be added up again, and the "Specified Time" shall start from 30 minutes again.

Limited faults: See the fault list.

3) Automatic resetting A

- The alarm can be reset automatically after the fault is fixed;
- The number of automatic re-settings is not limited;

4) Manual resetting M

- The alarm can be reset manually only on the controller after the fault is fixed;
- The faults of types 2) and 3) can also be reset manually.

Caution: If the faults cannot be fixed by the aforesaid operations, contact the local dealer or the designated maintenance entity in time. Do not dismantle the equipment for repair without authorization!!!

Chapter 14 Maintenance and Servicing

The air source heating pump unit is a kind of equipment with a high degree of automation, and its status shall be inspected regularly. Its operational reliability and service life will be improved by long-term and effective maintenance and servicing.

1) The water filter installed outside the equipment shall be cleaned regularly to guarantee the cleanliness of the water in the system, lest the unit should be damaged due to a dirty and blocked water filter.

2) When using and maintaining the unit, the user shall realize that all the safety protection devices in the unit have been set before delivery, and that adjustment shall not be made without authorization.

3) Often check whether the wires of the power supply and the electrical system of the unit are firm and whether the electrical components operate abnormally. If there is any abnormality, carry out repairs or replacement immediately.

4) Often check whether the water supply to the water system as well as the safety valves, the level controllers, and the exhaust devices of the water tank are working normally, lest air should enter the system to result in a reduction in the circulating water, thus affecting the heat production and operational reliability of the equipment.

5) Often check whether the pumps and the water circuit valves are working normally and whether the water pipes and water pipe joints are leaking.

6) Do not pile up sundries around the equipment, lest the air inlet and outlet should be blocked. Keep the area around the equipment clean, dry, and well-ventilated. Clean the heat exchanger on the air side regularly (once every 1-2 months) to maintain a good heat exchange effect.

7) Check the operating conditions of the components of the equipment regularly, check whether there are oil stains at the pipe joints and valves in the equipment, and make sure that there is no leakage of refrigerant from the equipment.

8) If the equipment will be shut down for a long time, you need to discharge the water out of the equipment's pipeline, cut off the power supply, and put on the protective cover properly. Before re-starting the equipment, check the system thoroughly.

9) If you cannot fix a fault that occurs on the equipment, call the company's local special maintenance station and ask it to dispatch personnel to do the repairs in time.

10) The company recommends cleaning the main unit's condenser (the heat exchanger on the water side) with a citric acid solution with a concentration of 5% at 50ºC-60ºC. Start the circulating water pump mounted on the main unit for cleaning for 2 hours, and finally rinse the condenser with tap water three times. (It is recommended that three-way joints be reserved during the installation of the pipeline. Seal up a joint with a sluice valve or plug for connection of a pipe when cleaning the condenser.) Do not clean the condenser (the heat exchange on the water side) with a corrosive cleaning solution.

11) The scale shall be removed after the water tank has been used for a period of time (generally half a year, depending on the local water quality).

12) In extremely severe weather, when the equipment is running continuously in a low-temperature and high-humidity environment, it is recommended that the equipment be checked once every 12 hours. If much ice is found on the air outlet grille and the return air grille, remove the ice immediately to maintain the normal operation of the equipment.

Warning:

- **Do not dismantle the equipment for maintenance without authorization. Go to the after-sales service station as designated for maintenance;**
- Make sure that technicians have the relevant qualification certificates and have been authorized and that they perform maintenance and repairs under the supervision of the personnel qualified for using flammable and explosive refrigerants;
- Do not use chlorine-based cleaners, for chlorine may react with the refrigerant and corrode copper pipes;
- Under no circumstances shall the potential fire sources be used to look for or detect the leakage of refrigerant. Do not use a halide detector lamp (or any other detectors using open fire). Do not expose the live electrical components and wires when charging, restoring, or purifying the system;
- Electrified operations are prohibited under any circumstance.

14.1 Maintenance of the cooling system

Before maintaining the system containing a flammable and explosive refrigerant, you must conduct a comprehensive safety check to make sure that the equipment is not likely to catch fire. The following preventive measures shall be taken before the maintenance of the cooling system:

1. The maintenance shall be carried out in a controlled procedure, and the risk of flammable gas or vapor shall be eliminated during the process of such maintenance.

2. All the personnel involved in the maintenance of the unit must have relevant certificates of qualification, and shall not work in a confined space. Warning or caution signs shall be set up in the working area to ensure the safety of the unit maintenance area by managing and controlling the flammable and explosive refrigerants.

3. An appropriate refrigerant detector shall be used to check the area before and during the work to make sure that the unit maintenance personnel can understand the concentration of the flammable and explosive refrigerants in the working area in a timely manner and eliminate potential hazards on time. Make sure that the leak detection equipment used shall be suitable for use together with flammable and explosive refrigerants, that is, spark free, adequate sealing, or intrinsically safe.

4. If an open-fire operation needs to be performed to the cooling equipment or any related parts, appropriate fire extinguishing equipment shall be provided in the working area.

5. If braze welding is required due to the leakage of refrigerant found in the unit system, all the refrigerant shall be recovered or discharged from the system to an open and well-ventilated area. Before braze welding, it is required to make sure that the concentration of the flammable and explosive refrigerant in the pipeline of the cooling system shall fall within the safe range values. Only after the risk of explosion is eliminated can braze welding be performed.

The method for dilution of the flammable and explosive refrigerant in the pipeline of the cooling system is recommended as follows: The system shall use OFN “flushing”.

① First, all the refrigerant shall be recovered or discharged from the cooling system to an open and well-ventilated area.

② Connect the relevant meters and valves properly, and use a vacuum pump to discharge the residual refrigerant in the system out of the cooling system pipeline.

③ Connect the relevant meters and valves properly, inject an appropriate amount of OFN into the cooling system, stabilize it for 5 minutes, and then discharge OFN to an open and well-ventilated area.

④ The aforesaid operations ② and ③ shall be repeated more than three times.

6. After braze welding has been performed for the cooling system of the unit, OFN shall be used to conduct a pressure leakage test, so as to ensure no leakage in the system.

7. After confirming that there is no leakage in the system, connect the relevant meters and valves properly, and use the vacuum pump to vacuum the cooling system.

8. If the vacuum degree of the cooling system meets the technical requirements of the unit, re-inject refrigerant according to the parameters on the unit nameplate.

Warning:

If the refrigerant circuit is opened for maintenance or for any other purpose, the following procedures shall be followed:

- Removing the refrigerant: Purge the pipeline with an inert gas;
- Air emptying: Purge the pipeline with an inert gas again;
- Open the pipeline by cutting or braze welding;
- Make sure that the outlet of the vacuum pump shall not be near any fire source and shall be well-ventilated.

Caution:

During the injection of refrigerant, the following requirements shall be satisfied:

- Make sure that when the injection equipment is used, the contamination of different refrigerants will not occur. The hoses or pipelines shall be as short as possible to minimize the amount of refrigerant contained therein;

	➢ The steel cylinders shall remain upright; (Follow the instructions on the steel cylinders.) ➢ Make sure that the cooling system has been grounded before injecting the refrigerant into the system; ➢ Label the system after injection; ➢ Extra care shall be taken to use qualified measuring instruments, and inject the amount of refrigerant in strict accordance with the marking on the system.

A leakage test shall be conducted after the refrigerant is injected to the cooling system and before the commissioning. Make sure that there is no leakage in the system and no residual refrigerant in the surrounding environment before conducting the switch-on test.

- When removing the refrigerant from the system, you must safely remove all the refrigerant for maintenance or discontinuing the use of the equipment.
- The hoses shall be equipped with no-leakage disconnecting joints and in good condition.

14.2 Maintenance of electrical components

If electrical components need to be replaced, the new ones shall be fit for their purpose and conform to the correct specifications. The manufacturer's maintenance and service guidelines shall always be followed. In case of any doubt, consult with the manufacturer's technical department for assistance.

The repairs and maintenance of electrical components shall include an initial safety inspection and a component inspection procedure. If a fault that may endanger the safety is found, the power supply of the unit shall be disconnected first. Before the fault is eliminated, the owner of the equipment shall be informed in time, and switching on the power supply of the unit shall be prohibited.

	Warning: Particular attention shall be paid to the following matters: ➢ Make sure that when the electrical components are operated, their enclosures shall not be changed to affect their level of protection, including damage to cables, excessive number of connections, nonconformance of terminals to original specifications, damage to seals, and incorrect installation of glands; ➢ Make sure that the equipment shall be installed firmly; ➢ Make sure that the seals or the sealing materials are not degraded so that they still can be used to prevent access in a flammable environment; ➢ Check and make sure that the cables shall not be subject to wear, corrosion, overpressure, vibration, sharp edges, or any other adverse environmental effects. During checking, consideration shall also be given to the effects of aging or continuous vibration of such electrical components as compressors or fans.

Chapter 15 Schedule I

➢ **Unit start-stop control**

Parameter value	Name	Start-stop mode allowed		
		Start-stop by the display screen (including timer, automatic switch-on start function)	Start-stop by the line control switch	Online monitoring start-stop
0 (default)	Combined	√	√	√
1	Remote	×	√	√
2	Local	√	×	×
3	Line control	×	√	×
4	Network control	×	×	√

Schedule II

➢ **Installation configuration of the power cords**

◇ The power cords connected to the main unit must be those wires conforming to the local regulations, and they shall be fastened with wire fixing devices. Improper connection or fastening will lead to fire;

◇ If a power cord is damaged, it must be replaced by qualified personnel to avoid any hazard;

◇ During the installation of the unit, the power cords shall be configured with reference to the table below:

Model	Type of power supply	Cross sectional area						Capacity of the air switch
		Phase wire		Neutral wire		Ground Wire		
		Diameter (CWG)	Wire No. (AWG)	Diameter (CWG)	Wire No. (AWG)	Diameter (CWG)	Wire No. (AWG)	
WDLRK-6IBM/A3	220-240V～,50Hz	2.5mm²	12#	2.5mm²	12#	2.5mm²	12#	16A
WDLRK-8IBM/A3	220-240V～,50Hz	2.5mm²	12#	2.5mm²	12#	2.5mm²	12#	16A
WDLRK-10IBM/A3	220-240V～,50Hz	4.0mm²	10#	4.0mm²	10#	4.0mm²	10#	25A
WDLRK-12IBM/A3	220-240V～,50Hz	4.0mm²	10#	4.0mm²	10#	4.0mm²	10#	32A
WDLRK-12IIBM/A3	380-415V,3N～,50Hz	2.5mm²	12#	2.5mm²	12#	2.5mm²	12#	16A
WDLRK-14IBM/A3	220-240V～,50Hz	6.0mm²	8#	6.0mm²	8#	6.0mm²	8#	32A
WDLRK-14IIBM/A3	380-415V,3N～,50Hz	2.5mm²	12#	2.5mm²	12#	2.5mm²	12#	16A
WDLRK-16IBM/A3	220-240V～,50Hz	6.0mm²	8#	6.0mm²	8#	6.0mm²	8#	40A
WDLRK-16IIBM/A3	380-415V,3N～,50Hz	4.0mm²	10#	4.0mm²	10#	4.0mm²	10#	25A

Note:

1. The diameter of the wire selected shall be larger than that as required above, and the wiring shall comply with IEC 57.
2. The above wire diameters are selected on condition that the distance between the unit and the distribution boxes is less than 100 meters. If the distance exceeds 100 meters, consult professionals about the selection.

Schedule III

➢ Model Dial Code List

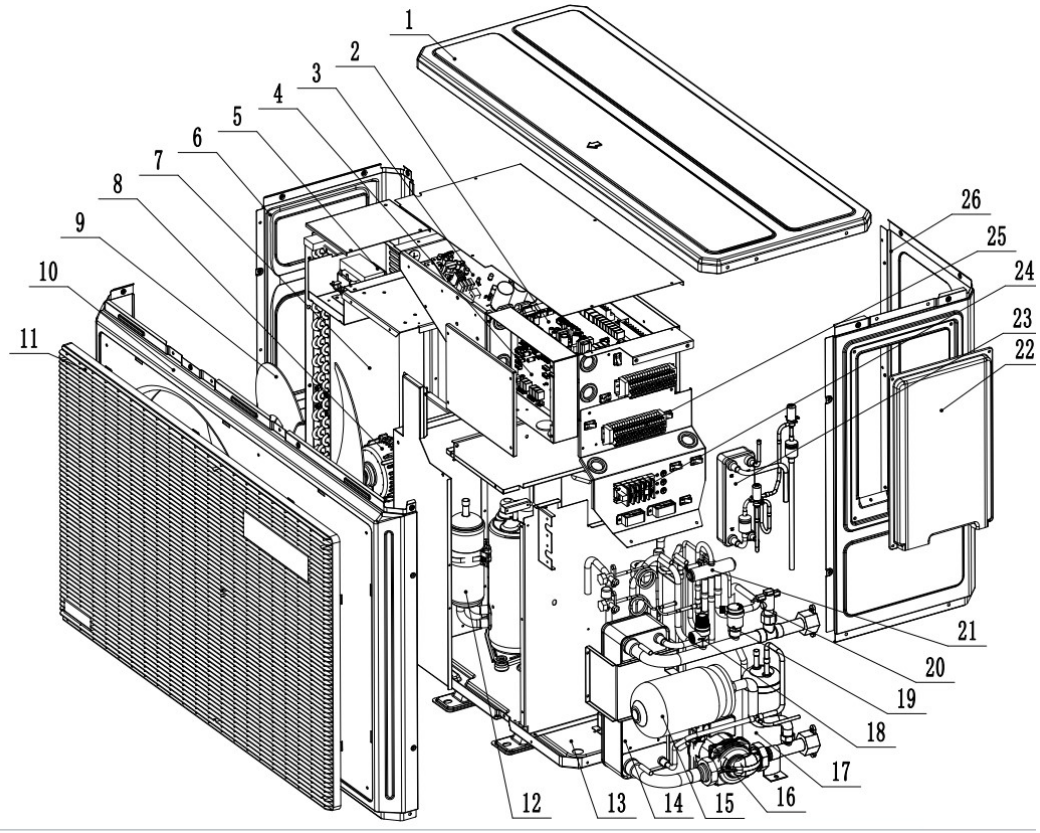
If the mainboard shall be replaced, be sure to contact the manufacturer and ask it to dispatch its service agent or qualified personnel to replace the mainboard and select the corresponding model code on SW4 and SW5 terminals on the mainboard, so as to avoid any hazard.

Model	Model Code						
	Terminal SW4			Terminal SW5			
	2	3	4	1	2	3	4
WDLRK-6IBM/A3	0	1	1	1	0	0	1
WDLRK-8IBM/A3	0	1	1	1	0	1	0
WDLRK-10IBM/A3	0	1	1	1	0	1	1
WDLRK-12IBM/A3	0	1	1	1	1	0	0
WDLRK-12IIBM/A3	0	1	1	1	1	0	1
WDLRK-14IBM/A3	0	1	1	1	1	1	0
WDLRK-14IIBM/A3	0	1	1	1	1	1	1
WDLRK-16IBM/A3	1	0	0	0	0	0	0
WDLRK-16IIBM/A3	1	0	0	0	0	0	1

Note: On SW terminal, OFF indicates “0”, and ON indicates “1”.

Schedule IV

➢ **Exploded Drawing**



No.	Component name	No.	Component name
1	Top cover	14	Insulation cotton plate-type heat exchanger component
2	Main board of the indoor unit	15	Expansion tank
3	Driver board	16	Water pump
4	Main board of the outdoor unit	17	Liquid reservoir
5	Electric reactor	18	Safety valve
6	Left side plate	19	Automatic exhaust valve
7	Fin-type heat exchanger component	20	Target flow switch
8	DC motor	21	Four-way valve component
9	Fan blade	22	Terminal box
10	Front panel	23	Economizer component
11	Plastic net guard	24	Power supply terminal block
12	Compressor	25	1-positoin terminal block
13	Base component	26	Right side plate

Schedule V

➢ Product parameters

Model	WDLRK-8IBM/A3	WDLRK-10IBM/B3	WDLRK-12IBM/A3	WDLRK-12IIBM/A3	WDLRK-14IBM/A3
Rated Heating Capacity	8.0kW	10.0kW	11.6kW	11.6kW	14.0kW
Rated Heating Input	1.80kW	2.22kW	2.64kW	2.64kW	3.04kW
Rated Heating Current	7.85A	9.66A	11.46A	4.00A	13.23A
COP	4.43	4.50	4.40	4.40	4.60
Rated Cooling Capacity	9.0kW	11.5kW	13.2kW	13.2kW	16.2kW
Rated Cooling Input	2.42kW	3.09kW	4.00kW	3.61kW	4.62kW
Rated Cooling Current	10.51A	13.44A	17.39A	5.49A	20.12A
EER	3.72	3.72	3.30	3.65	3.50
Power Supply	220-240V～,50Hz	220-240V～,50Hz	220-240V～,50Hz	380-415V, 3N～,50Hz	220-240V～,50Hz
Rated Power Input	3.35kW	4.14kW	4.58kW	4.70kW	5.47kW
Rated Current	15.33A	18.94A	20.96A	7.51A	25.04A
HP.PS	4.2MPa	4.2MPa	4.2MPa	4.2MPa	4.2MPa
LP.PS	1.6MPa	1.6MPa	1.6MPa	1.6MPa	1.6MPa
Maximum Allowable Pressure	4.2MPa	4.2MPa	4.2MPa	4.2MPa	4.2MPa
Refrigerant/Charge/GWP	R32/1.50kg/675	R32/1.70kg/675	R32/1.95kg/675	R32/1.95kg/675	R32/2.50kg/675
Potential Value of Carbon Dioxide	1.01t	1.15t	1.32t	1.32t	1.69t
Waterproof Grade	IPX4	IPX4	IPX4	IPX4	IPX4
Electrical Shockproof	Class I	Class I	Class I	Class I	Class I
Sound Power Level	53dB(A)	58dB(A)	62dB(A)	62dB(A)	62dB(A)
Maximum Outlet Temperature	60℃	60℃	60℃	60℃	60℃

Heating Ambient Temperature	-25℃ ~ 43℃	-25℃ ~ 43℃	-25℃ ~ 43℃	-25℃ ~ 43℃	-25℃ ~ 43℃
Cooling Ambient Temperature	-7℃ ~ 48℃	-7℃ ~ 48℃	-7℃ ~ 48℃	-7℃ ~ 48℃	-7℃ ~ 48℃
Minimum/Maximum Return Water Temperature for Heating	28℃ ~ 55℃	28℃ ~ 55℃	28℃ ~ 55℃	28℃ ~ 55℃	28℃ ~ 55℃
Minimum/Maximum Return Water Temperature for Cooling	12℃ ~ 35℃	12℃ ~ 35℃	12℃ ~ 35℃	12℃ ~ 35℃	12℃ ~ 35℃
Diameter of Water Connection	DN25	DN25	DN25	DN25	DN25
Minimum/Maximum Water Pressure	0.05MPa/0.3MPa	0.05MPa/0.3MPa	0.05MPa/0.3MPa	0.05MPa/0.3MPa	0.05MPa/0.3MPa
Rating Water Flow	1.38m³/h	1.72m³/h	1.99m³/h	1.99m³/h	2.41m³/h
Water Pressure Drop	19.1kPa	23.1kPa	25.4kPa	25.4kPa	42.2kPa

Heating: Ambient temperature (dry bulb/wet bulb) 7℃/6℃, water temperature (In/Out): 30℃/35℃

Cooling: Ambient temperature (dry bulb/wet bulb) 35℃/24℃, water temperature (In/Out): 23℃/18℃

Note: The water pressure drop of this unit is measured by its own pump.

Model	WDLRK-14IIBM/A3	WDLRK-16IBM/A3	WDLRK-16IIBM/A3
Rated Heating Capacity	14.0kW	16.0kW	16.0kW
Rated Heating Input	3.13kW	3.41kW	3.43kW
Rated Heating Current	4.75A	14.82A	5.21A
COP	4.47	4.70	4.66
Rated Cooling Capacity	16.2kW	18.0kW	18.0kW
Rated Cooling Input	4.72kW	5.07kW	5.10kW
Rated Cooling Current	7.17A	22.04A	7.75A
EER	3.43	3.55	3.53
Power Supply	380-415V, 3N～,50Hz	220-240V～,50Hz	380-415V, 3N～,50Hz
Rated Power Input	5.63kW	6.55kW	6.75kW
Rated Current	9.01A	29.00A	10.79A
HP.PS	4.2MPa	4.2MPa	4.2MPa
LP.PS	1.6MPa	1.6MPa	1.6MPa
Maximum Allowable Pressure	4.2MPa	4.2MPa	4.2MPa
Refrigerant/Charge/GWP	R32/2.50kg/675	R32/2.60kg/675	R32/2.60kg/675
Potential Value of Carbon Dioxide	1.69t	1.76t	1.76t
Waterproof Grade	IPX4	IPX4	IPX4
Electrical Shockproof	Class I	Class I	Class I
Sound Power Level	62dB(A)	64dB(A)	64dB(A)
Maximum Outlet Temperature	60℃	60℃	60℃
Heating Ambient Temperature	-25℃ ~ 43℃	-25℃ ~ 43℃	-25℃ ~ 43℃
Cooling Ambient Temperature	-7℃ ~ 48℃	-7℃ ~ 48℃	-7℃ ~ 48℃

Minimum/Maximum Return Water Temperature for Heating	28℃ ~ 55℃	28℃ ~ 55℃	28℃ ~ 55℃
Minimum/Maximum Return Water Temperature for Cooling	12℃ ~ 35℃	12℃ ~ 35℃	12℃ ~ 35℃
Diameter of Water Connection	DN25	DN25	DN25
Minimum/Maximum Water Pressure	0.05MPa/0.3MPa	0.05MPa/0.3MPa	0.05MPa/0.3MPa
Rating Water Flow	2.41m³/h	2.75m³/h	2.75m³/h
Water Pressure Drop	42.2kPa	52.7kPa	52.7kPa

Heating: Ambient temperature (dry bulb/wet bulb) 7℃/6℃, water temperature (In/Out): 30℃/35℃

Cooling: Ambient temperature (dry bulb/wet bulb) 35℃/24℃, water temperature (In/Out): 23℃/18℃

Note: The water pressure drop of this unit is measured by its own pump.

Appendix A

1 .Low Temperature Curve of Heating (Heating Ambient Temperature - Target Temperature Table) Unit: ℃

Ambient temperature TA	**≤ -20**	**-19**	**-18**	**-17**	**-16**	**-15**	**-14**	**-13**	**-12**	**-11**	**-10**	**-9**	**-8**	**-7**	**-6**	**-5**	**-4**	**-3**	**-2**	**-1**	**0**
Low temperature curve 1	38	38	38	38	38	37	37	37	37	37	37	36	36	36	36	36	36	35	35	35	35
Low temperature curve 2	37	37	37	37	37	36	36	36	36	36	36	35	35	35	35	35	35	34	34	34	34
Low temperature curve 3	36	36	36	35	35	35	35	35	35	34	34	34	34	34	34	33	33	33	33	33	33
Low temperature curve 4	35	35	35	34	34	34	34	34	34	33	33	33	33	33	33	32	32	32	32	32	32
Low temperature curve 5	34	34	34	33	33	33	33	33	33	32	32	32	32	32	32	31	31	31	31	31	31
Low temperature curve 6	32	32	32	32	31	31	31	31	31	31	31	31	30	30	30	30	30	30	30	30	29
Low temperature curve 7	31	31	31	31	30	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	28
Low temperature curve 8	29	29	29	29	28	28	28	28	28	28	28	28	27	27	27	27	27	27	27	27	26
Ambient temperature TA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**≥ 20**	
Low temperature curve 1	35	35	34	34	34	34	34	34	33	33	33	33	33	33	32	32	32	32	32	32	
Low temperature curve 2	34	34	33	33	33	33	33	33	32	32	32	32	32	32	31	31	31	31	31	31	
Low temperature curve 3	32	32	32	32	32	32	31	31	31	31	31	31	30	30	30	30	30	30	29	29	
Low temperature curve 4	31	31	31	31	31	31	30	30	30	30	30	30	29	29	29	29	29	29	28	28	
Low temperature curve 5	30	30	30	30	30	30	29	29	29	29	29	29	28	28	28	28	28	28	27	27	
Low temperature curve 6	29	29	29	29	29	29	28	28	28	28	28	28	27	27	27	27	27	27	26	26	
Low temperature curve 7	28	28	28	28	28	28	27	27	27	27	27	27	26	26	26	26	26	26	25	25	
Low temperature curve 8	26	26	26	26	26	26	26	25	25	25	25	25	25	25	25	24	24	24	24	24	

2. High Temperature Curve of Heating (Heating Ambient Temperature - Target Temperature Table) Unit: ℃

Ambient temperature TA	**≤ -20**	**-19**	**-18**	**-17**	**-16**	**-15**	**-14**	**-13**	**-12**	**-11**	**-10**	**-9**	**-8**	**-7**	**-6**	**-5**	**-4**	**-3**	**-2**	**-1**	**0**
High temperature curve 1	55	55	55	55	54	54	54	54	54	54	54	54	53	53	53	53	53	53	53	53	52
High temperature curve 2	53	53	53	53	52	52	52	52	52	52	52	52	51	51	51	51	51	51	51	51	50
High temperature curve 3	52	52	52	52	51	51	51	51	51	51	51	51	50	50	50	50	50	50	50	50	49
High temperature curve 4	50	50	50	50	49	49	49	49	49	49	49	49	48	48	48	48	48	48	48	48	47
High temperature curve 5	48	48	48	48	47	47	47	47	47	47	47	47	46	46	46	46	46	46	46	46	45
High temperature curve 6	45	45	45	45	44	44	44	44	44	44	44	44	43	43	43	43	43	43	43	43	42
High temperature curve 7	43	43	43	43	42	42	42	42	42	42	42	42	41	41	41	41	41	41	41	41	40
High temperature curve 8	40	40	40	40	39	39	39	39	39	39	39	39	38	38	38	38	38	38	38	38	37
Ambient temperature TA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**≥20**	
High temperature curve 1	52	52	52	52	52	52	52	51	51	51	51	51	51	51	51	50	50	50	50	50	
High temperature curve 2	50	50	50	50	50	50	50	49	49	49	49	49	49	49	49	48	48	48	48	48	
High temperature curve 3	49	49	49	49	49	49	49	48	48	48	48	48	48	48	48	47	47	47	47	47	
High temperature curve 4	47	47	47	47	47	47	47	46	46	46	46	46	46	46	46	45	45	45	45	45	
High temperature curve 5	45	45	45	45	45	45	45	44	44	44	44	44	44	44	44	43	43	43	43	43	
High temperature curve 6	42	42	42	42	42	42	42	41	41	41	41	41	41	41	41	40	40	40	40	40	
High temperature curve 7	40	40	40	40	40	40	40	39	39	39	39	39	39	39	39	38	38	38	38	38	
High temperature curve 8	37	37	37	37	37	37	37	36	36	36	36	36	36	36	36	35	35	35	35	35	

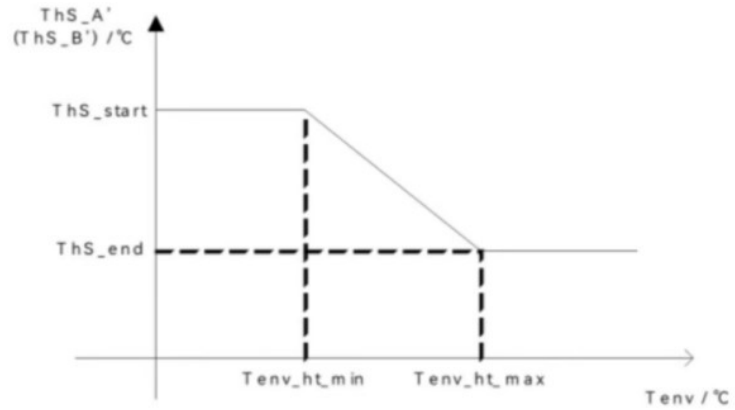
3. Low Temperature Curve of Cooling (Cooling Ambient Temperature - Target Temperature Table) Unit: ℃

Ambient temperature TA	-10≤TA＜15	15≤TA＜22	22≤TA＜30	30≤TA
Low temperature curve 1	16	11	8	5
Low temperature curve 2	17	12	9	6
Low temperature curve 3	18	13	10	7
Low temperature curve 4	19	14	11	8
Low temperature curve 5	20	15	12	9
Low temperature curve 6	21	16	13	10
Low temperature curve 7	22	17	14	11
Low temperature curve 8	23	18	15	12

4 .High Temperature Curve of Cooling (Cooling Ambient Temperature - Target Temperature Table) Unit: ℃

Ambient temperature TA	-10≤TA＜15	15≤TA＜22	22≤TA＜30	30≤TA
High temperature curve 1	20	18	17	16
High temperature curve 2	21	19	18	17
High temperature curve 3	22	20	19	17
High temperature curve 4	23	21	19	18
High temperature curve 5	24	21	20	18
High temperature curve 6	24	22	20	19
High temperature curve 7	25	22	21	19
High temperature curve 8	25	23	21	20

Heating curve 9 is an automatically set curve (a linear curve generated by setting parameters), and is calculated as follows:



Among which, Tenv_ht_max: MAX ([Curve 9 heating ambient temperature 1], [Curve 9 heating ambient temperature 2])

Tenv_ht_min: MIN ([Curve 9 heating ambient temperature 1], [Curve 9 heating ambient temperature 2])

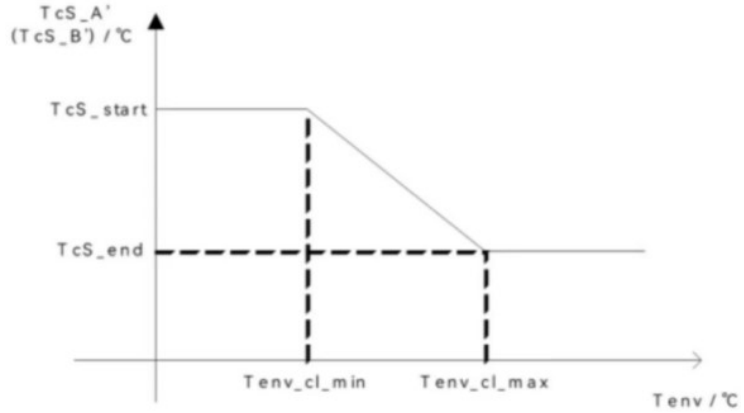
ThS_end: MIN ([Curve 9 heating output temperature 2], [Curve 9 heating output temperature 1])

ThS_start: MAX ([Curve 9 heating output temperature 2], [Curve 9 heating output temperature 1])

Note: MAX(A,B) refers to taking the larger value between A and B

MIN(A,B) refers to taking the smaller value between A and B

Cooling curve 9 is an automatically set curve (a linear curve generated by setting parameters), and is calculated as follows:



Among which, Tenv_cl_max: MAX ([Curve 9 cooling ambient temperature 1], [Curve 9 cooling ambient temperature 2]);

Tenv_cl_min: MIN ([Curve 9 cooling ambient temperature 1], [Curve 9 cooling ambient temperature 2]);

TcS_end: MIN ([Curve 9 cooling output temperature 1], [Curve 9 cooling output temperature 2]);

TcS_start: MAX ([Curve 9 cooling output temperature 1], [Curve 9 cooling output temperature 2]);

Note: MAX(A,B) refers to taking the larger value between A and B

MIN(A,B) refers to taking the smaller value between A and B


Hien®
Zhejiang AMA & Hien Technology Co.,Ltd.
QUALITY CHECKED
Date of Inspection : _____
Inspector : _____
This product has passed the inspection and is allowed to leave

Packing List

No.	Accessory name	Quantity	Remarks
1	Main unit	1	/
2	Display	1	/
3	Display communication line	1	/
4	Y-type filter	1	60-mesh screen
5	Temperature sensor	7	/
6	Shock-absorbing rubber block	6	/
7	Quality certificate	1	Attached to the Operation Manual
8	Packing list	1	Attached to the Operation Manual
9	Operation Manual	1	/

No.: AMA-SMS-391
Version: VER1.03