Ice Bath Chiller

Installation & Instruction Manual

IMPORTANT NOTE:

Thank you very much for purchasing our product. Before using your device, please read this manual carefully and keep it for future reference.

CONTENT

1. FOREWORD

1.1. Read the Manual Before Operations

WARNING

To keep users under safe working condition and property safety, please follow the instructions below：

① This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given super-vision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.Please install the device in compliance with local laws, regulations and standards;

② If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly.

③ The appliance shall be installed in accordance with national wiring regulations.

④ An all-pole disconnection device which has at least 3mm clearances in all poles , and have a leakage current that may exceed 10mA, the residual current device (RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

Initial safety checks shall include:

① That capacitors are discharged: this shall be done in a safe manner to avoid the possibility of sparking;

② That no live electrical components and wiring are exposed while charging, recovering, or purging the system;

③ That there is continuity of earth bonding.

Checks to the area

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

Work procedure

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

General work area

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.

Checking for presence of refrigerant

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.

Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

No ignition sources

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.

Ventilated area

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.

Checks to the refrigeration equipment

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:

① The charge size is in accordance with the room size within which the refrigerant containing parts are installed;

② The ventilation machinery and outlets are operating adequately and are not obstructed;

③ If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

④ Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

⑤ 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.

Checks to electrical devices

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.
Initial safety checks shall include:
• That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
• That there no live electrical components and wiring are exposed while charging, recovering or purging the system;
• That there is continuity of earth bonding.

Repairs to sealed components
DD.5.1 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.

DD.5.2 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 the apparatus is mounted securely.
Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

Repair to intrinsically safe components
Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.
Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.
NOTE:The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment.
Intrinsically safe components do not have to be isolated prior to working on them.

Cabling
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 aging or continual vibration from sources such as compressors or fans.

Detection of flammable refrigerants

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.

Leak detection methods

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.

Removal and evacuation

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:

① Remove refrigerant;
② Purge the circuit with inert gas;
③ Evacuate;
④ Purge again with inert gas;
⑤ 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 device 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 pipework are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed:

① Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them. Cylinders shall be kept upright.

② Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.

③ Label the system when charging is complete (if not already).

④ 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 leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Decommissioning

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.

① Become familiar with the equipment and its operation.

② Isolate system electrically.

③ 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.

④ Pump down refrigerant system, if possible.

⑤ If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

⑥ Make sure that cylinder is situated on the scales before recovery takes place.

⑦ Start the recovery machine and operate in accordance with manufacturer's instructions.

⑧ Do not overfill cylinders. (No more than 80 % volume liquid charge).

⑨ Do not exceed the maximum working pressure of the cylinder, even temporarily.

⑩ 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.

⑪ Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

Labeling

Equipment shall be labeled stating that it has been decommissioned 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.

Recovery

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 labeled 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.

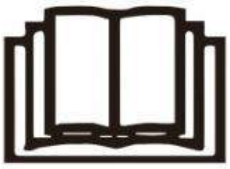
The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery devices and especially not in cylinders.

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.

1.2. Symbol Description of the Device

The precautions listed here are divided into the following types. They are quite important, so be sure to follow them carefully. Meanings of DANGER, WARNING, CAUTION and NOTE symbols.

Symbols	Meaning	Description
	**GENERAL WARNING**	All information marked with this symbol is important and should be viewed carefully.Otherwise, it may cause injury or even death.
	**FLAMMABLE WARNING**	The symbol shows that this appliance uses flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.

Symbols	Meaning	Description
	**ELECTRIC SHOCK WARNING**	This symbol shows that there might be an electric shock if the appliance still connects the power during cleaning, examination and repair.
	**GENERAL CAUTION**	All information marked with this symbol is a reminder and should be noted.
	**ANTI-FREEZE CAUTION**	This symbol shows anti-freezing protection. It is necessary to prevent the freezing of heat exchanger or water pipes, the power of device can not be shut off in the ambient temperature lower than 2℃. All the water in the device and plumbing system must be drained out if the device will be turned off for a long time.
	**MANUAL READING CAUTION**	This symbol shows that the operation manual should be read carefully.
	**RECYCLING CAUTION**	This symbol shows that when you intend to discard this device, it must be sent to an appropriate facility for recovery and recycling.

1.3. Statement

To keep users under safe working condition and property safety, please follow the instructions below：

① Wrong operation may result in injury or damage;
② Please install the device in compliance with local laws, regulations and standards;
③ Confirm power voltage and frequency;
④ The device is only used with grounding sockets;
⑤ Independent switch must be offered with the device.

1.4. *Safety Factors*

The following safety factors need to be considered:

① Please read the following warnings before installation;

② Be sure to check the details that need attention, including safety factors;

③ After reading the installation instructions, be sure to save them for future reference.

Warning

Make sure that the device is installed safely and reliably.

- If the device is not secure or not installed, it may cause damage. The minimum support weight required for installation is 21g/㎜²
- If the device was installed in a closed area or limited space, please consider the size of room and ventilation to prevent suffocation caused by refrigerant leakage.

① Use a specific wire and fasten it to terminal block so that the connection will prevent pressure from being applied to parts.

② Wrong wiring will cause fire. Please connect power wire accurately according to wiring diagram on the manual to avoid burnout of the device or fire.

③ Be sure to use correct material during installing. Wrong parts or wrong materials may result in fire, electric shock, or falling of the device.

④ Install on the ground safely, please read installation instructions. Improper installation may result in fire, electric shock, falling of the device, or water leaking.

⑤ Use professional tools for doing electrical work. If power supply capacity is insufficient or circuit is not completed, it may cause fire or electric shock.

⑥ The device must have grounding device. If power supply does not have grounding device, be sure not to connect the device.

⑦ The device should be only removed and repaired by professional technician. Improper movement or maintenance of the device may cause water leakage, electric shock, or fire. Please find a professional technician to do.

⑧ Don't unplug or plug power during operation.It may cause fire or electric shock.

⑨ Don't touch or operate the device when your hands are wet. It may cause fire or electric shock.

⑩ Don't place heaters or other electrical appliances near the power wire. It may cause fire or electric shock.

⑪ The water must not be poured directly from the device. Do not let water to permeate into the electrical components.

Warning

① Do not install the device in a location where there may be flammable gas.

② If there is flammable gas around the device, it will cause explosion.

According to the instruction to carry out drainage system and pipeline work. If drainage system or pipeline is defective, water leakage will occur. And it should be disposed immediately to prevent other household products from getting wet and damage.

③ Do not clean the device while power is on. Turn off power before cleaning the device. If not it may result in injury from a high-speed fan or electric shock.

④ Stop operating the device once there is a problem or an fault code. Please turn off power

and stop running the device. Otherwise it may cause electric shock or fire.

⑤ Be careful when the device is not packed or not installed. Pay attention to sharp edges and fins of heat exchanger.

⑥ After installation or repair, please confirm refrigerant is not leaking. If refrigerant is not enough, the device will not work properly.

⑦ The installation of the device must be flat and firm. Avoid abnormal vibration and noise.

⑧ Don't put your fingers into fan and evaporator. High speed running fan will result in serious injury.

2. OVER VIEW OF THE DEVICE

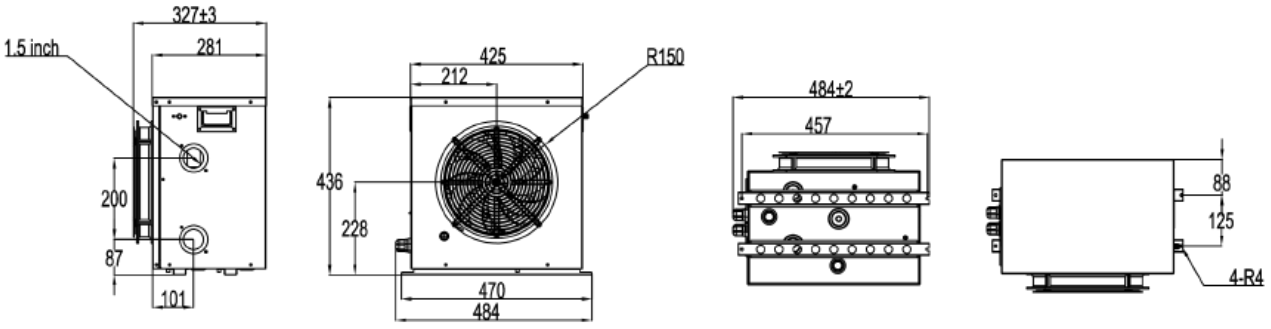
2.1. Accessories Supplied With the Device

After unpacking, please check if you have all the following components.

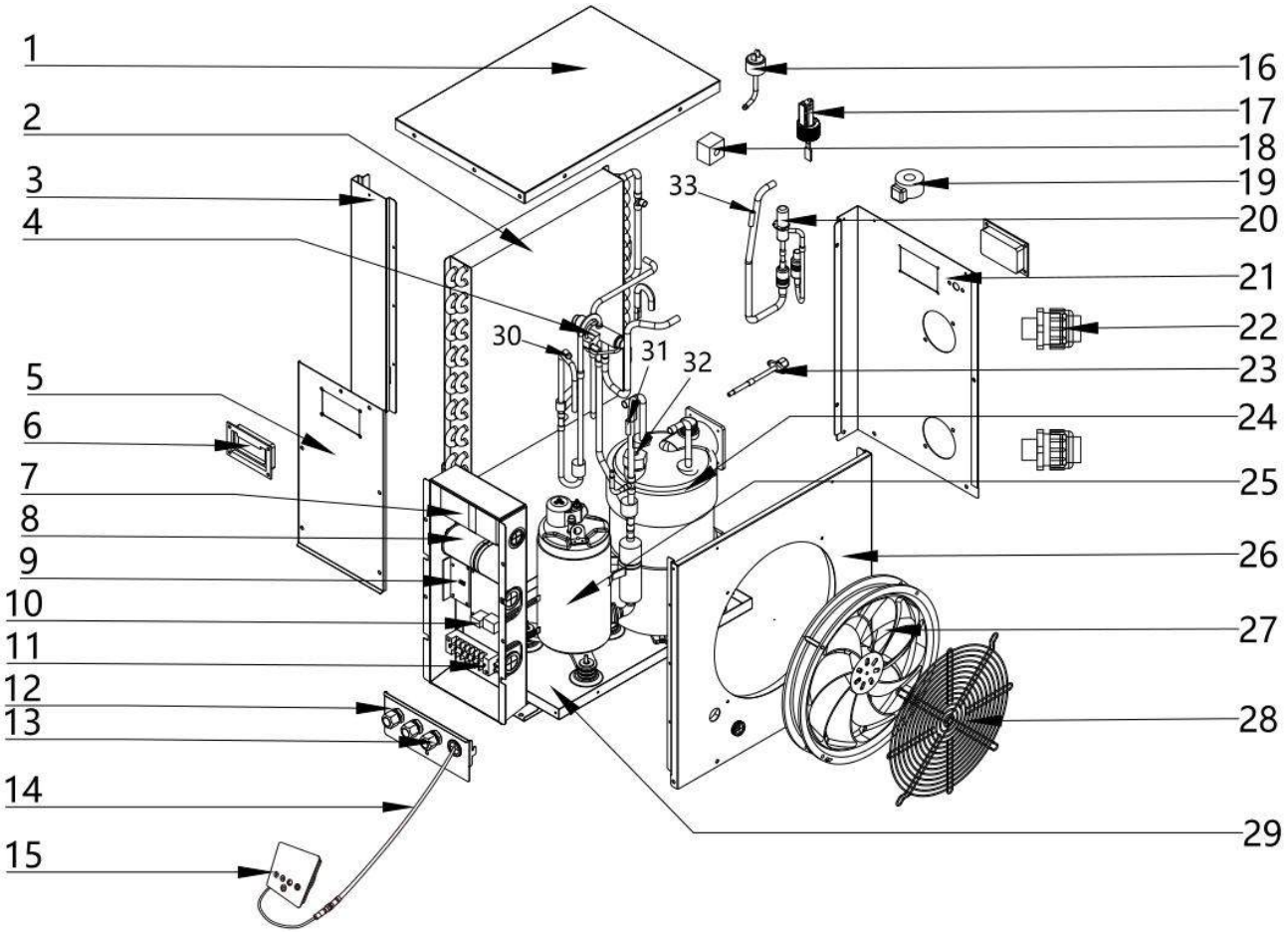
NO.	Components	Quantity	Appearance	NO.	Components	Quantity	Appearance
1	User Manual	1 pcs		5	Drain Nozzle	1 pcs	
2	Drain Pipe	1 pcs		6	Rubber Pads	4 pcs	
3	Water Pipe Joint	2 pcs		7	Controller	1 pcs	
4	Communication Cable	1 pcs					

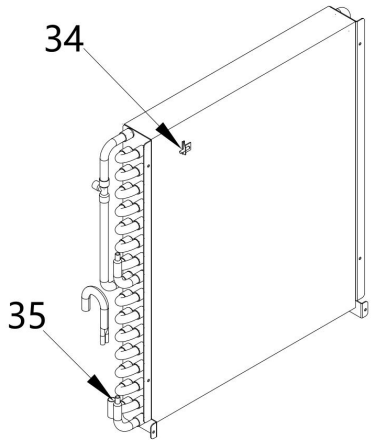
2.2. Dimensions of the Device

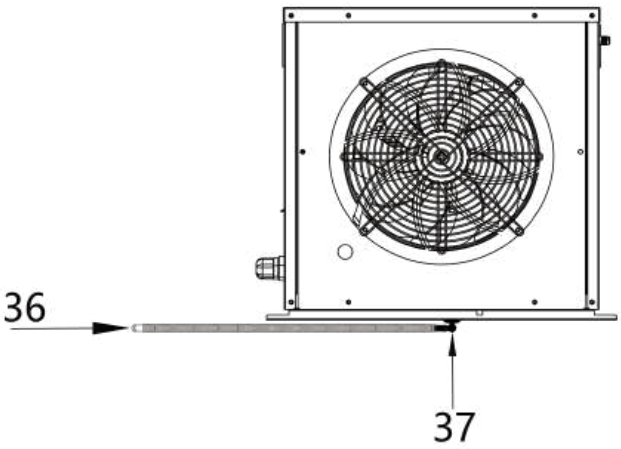
Dimensions (mm)



2.3. Main Parts of the Device







No.	Name	No.	Name	No.	Name
1	Top Cover	14	Communication Cable	27	DC Fan Motor
2	Fin Heat Exchanger	15	Wire Controller	28	Fan Guard Net
3	Left Rear Pillar	16	High Pressure Switch	29	Chassis
4	4-Way Valve	17	Water Flow Switch	30	Exhaust Temperature Sensor
5	Left Plate	18	4-Way Valve Coil	31	Suction Temperature Sensor

6	Handle	19	EEV Coil	32	Water Outlet Temperature Sensor
7	Power Adaptor	20	EEV	33	Cooling Coil Temperature Sensor
8	Capacitor	21	Right Plate	34	Ambient Temperature Sensor
9	Power Board	22	Water Connection	35	Heating Coil Temperature Sensor
10	PCB	23	Refrigerant Needle Valve	36	Drain Pipe
11	Terminal Board	24	Titanium Heat Exchanger	37	Drain Nozzle
12	Electrical Box Cover	25	Compressor		
13	PG13.5 Joint	26	Front Plate		

2.4. Parameter of the Device

Model:	**NF-20CR3-B-SA**	**NF-25CR3-B-SA**
Type	Heating/Cooling	Heating/Cooling
Water Volume&Chilling Time (From 25℃ to 5℃) Ambient Temp. (30℃)	50L: ≤0.8h 100L: ≤1.65h 200L: ≤3.3h 300L: ≤5h 500L ≤8.3h	50L: ≤0.65h 100L: ≤1.35h 200L: ≤2.7h 300L: ≤4.1h 500L: ≤6.75h
Cooling Water Temp. Range (℃)	2~28	2~28
Heating Water Temp. Range (℃)	15~40	15~40
Cooling Running Ambient Temp. Range (℃)	10-43	10-43
Heating Running Ambient Temp. Range (℃)	-5~43	-5~43
[Cooling] Ambient: 35℃, Water Outlet: 27℃, Water flow: 2.3m³/h		
Cooling Capacity (W)	1900	2350
Power Input (W)	708	867
Current Value (A)	3.08	3.77
EER	2.68	2.71
[Cooling] Ambient: 27℃, Water Outlet: 10℃, Water flow: 2.3m³/h		
Cooling Capacity (W)	1500	1800
Power Input (W)	568	679
Current Value (A)	2.47	2.95
EER	2.64	2.65
[Cooling] Ambient 15℃, Water Outlet: 5℃, Water flow: 2.3m³/h		
Cooling Capacity (W)	1640	2010
Power Input (W)	492	600
Current Value (A)	2.14	2.61
EER	3.33	3.35
[Cooling] Ambient 15℃, Water Outlet: 2℃, Water flow: 2.3m³/h		
Cooling Capacity (W)	1510	1600

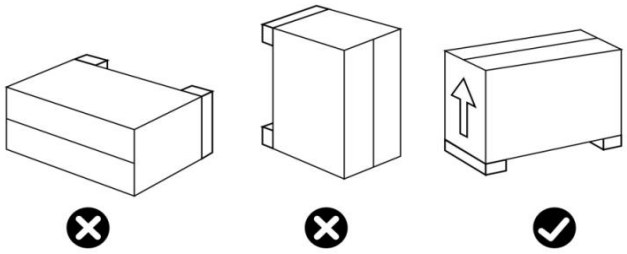
Model:	NF-20CR3-B-SA	NF-25CR3-B-SA
Power Input (W)	452	476
Current Value (A)	1.97	2.07
EER	3.34	3.36
[Heating] Ambient: 27℃, Water Inlet: 26℃, Humidity: 80%, Water flow: 2.3m³/h		
Heating Capacity (W)	3180	4200
Power Input (W)	499	664
Current Value (A)	2.17	2.88
COP	6.37	6.33
[Heating] Ambient: 15℃, Water Inlet: 26℃, Humidity: 70%, Water flow: 2.3m³/h		
Heating Capacity (W)	2150	2530
Power Input (W)	530	641
Current Value (A)	2.31	2.78
COP	4.05	3.95
[Heating] Ambient: 27℃, Water Inlet: 38℃, Humidity: 80%, Water flow: 2.3m³/h		
Heating Capacity (W)	2850	3380
Power Input (W)	807	952
Current Value (A)	3.51	4.14
COP	3.53	3.55
Power Supply	220-240V~/50Hz	
Rated Power Input (kW)	0.85	1140
Rated Current (A)	3.70	4.96
Running Water Flow Volume (m³/h)	2.3	2.30
Refrigerant	R32	
Max. Pressure（Mpa）	4.4	
Sound Pressure Level [dB(A)]	48	49
Compressor Type	Rotary	
Water Connection（mm）	48.3	
Water Heat Exchanger	Titanium heat exchanger	
Carry Handle	Yes	
Water Proof Level	IPX4	
Display	LED screen	
Air Flow Direction	Horizontal	
Net Weight (kg)	25	28
Net Dimensions [(L×W×H) mm]	484*327*436	484*327*436
The above data are for reference only, the specific data are subject to actual product.		

3. INSTALLATION AND CONNECTION

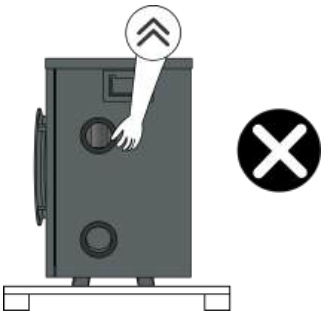
⚠ **WARNING:** The chiller must be installed by a professional team. The users are not qualified to install by themselves, otherwise the chiller might be damaged and risky for users' safety.
This section is provided for information purposes only and must be checked and adapted if necessary according to the actual installation conditions.

3.1. Transportation

1. When storing or moving the bath chiller, the bath chiller should be at the upright position.



2. When moving the bath chiller, do not lift the water union since the titanium heat exchanger inside the bath chiller will be damaged.



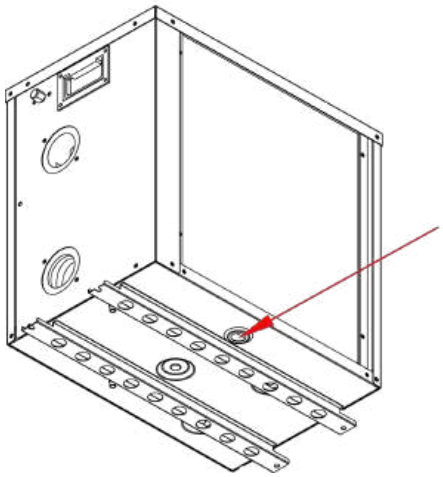
3.2. Installation Instruction

3.2.1 Pre-requirements

Equipment necessary for the installation of your bath chiller:

① Power supply cable suitable for the device's power requirements.
② A set of wall plugs and expansion screws suitable to attach the device to your support.
③ We recommend that you connect the device to your installation by means of flexible PVC pipes in order to reduce the transmission of vibrations.
④ Suitable fastening studs may be used to raise the device.
⑤ When installing the chiller, ensure there is at least 20 mm from the bottom of the chiller to the ground, then connect the drain-pipe to the bottom located under the chiller. The condensate water should be drained into a water collector via a pipe or discharged onto the external ground.

For indoor use, it is necessary to drain the condensate water from the heat pump into the drain, for example, a floor drain or a tank. It is the customer's responsibility to arrange this.



Drain Nozzle

Drain Pipe

Condensate water :

When the device is running, there will be condensation water discharged from the bottom, please attach the drain pipe in to the drain nozzle and after the drainage nozzle should be attach into the hole and clip it well.

Note：The drain pipe should be tilted downward to drain the condensed water better.

3.2.2 Location and Space

Please comply with the following rules concerning the choice of bath chiller location.

① The device's future location must be easily accessible for convenient operation and maintenance.

② It must be installed on the ground, fixed ideally on a level concrete floor. Ensure that the floor is sufficiently stable and can support the weight of the device.

③ A water drainage device must be provided close to the device in order to protect the area where it is installed.

④ If necessary, the device may be raised by using suitable mounting pads designed to support its weight.

⑤ Check that the device is properly ventilated, that the air outlet is not facing the windows of neighbouring buildings and that the exhaust air cannot return. In addition, provide sufficient space around the device for servicing and maintenance operations.

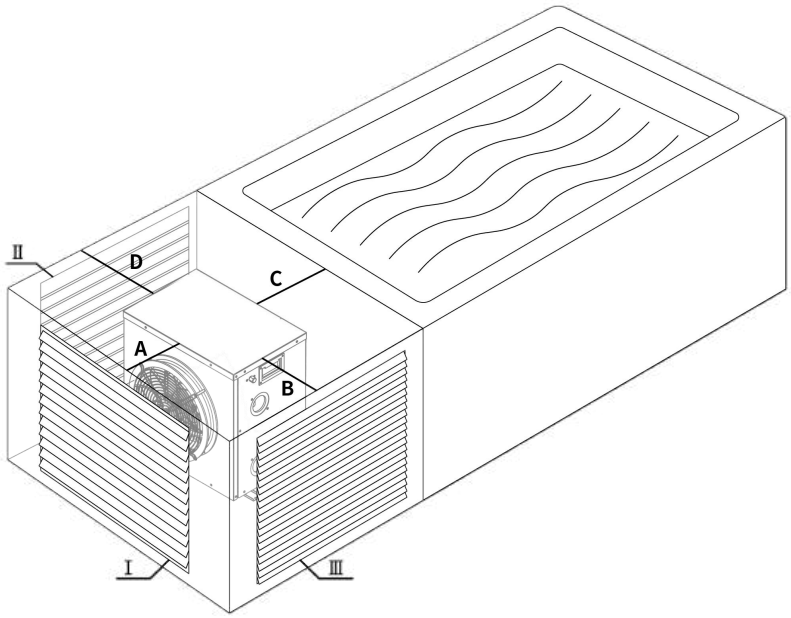
⑥ The device must not be installed in an area exposed to oil, flammable gases, corrosive products, sulphur compounds or close to high frequency equipment.

⑦ To prevent mud splashes, do not install the device near a road or track.

⑧ To avoid causing nuisance to neighbors, make sure the device is installed so that it is positioned towards the area that is least sensitive to noise.

⑨ Keep the device as much as possible out of the reach of children.

⑩ Installation Installation recommendation:



Air outlet area	
No.	Area（㎡）
Ⅰ	≥0.2
Ⅱ+Ⅲ	≥0.26

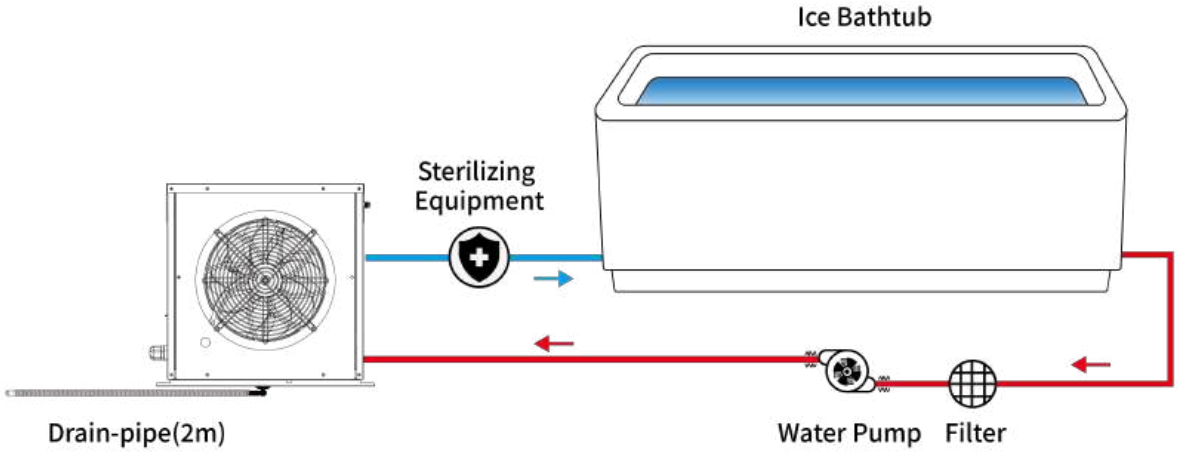
Reserve distance	
No.	Distance(mm)
A	10≤A≤30
B	≥200
C	≥150
D	≥50

The device is installed in the bathtub. Ensure that the air can go through the chiller smoothly, please install the chiller by the recommendation distance, air outlet area and the reserve distance will affect the performance of the chiller.

3.2.3 Installation Layout

Notice:

- The filter must be cleaned regularly to ensure that water in the system is clean and avoid blocking of filter..
- If ambient temp. is below 0℃, please keep water pump running.
- If the device is not running during winter months, please disconnect power supply and drain out water from drainage value.



Note:

- The inlet and outlet water pipe should not be too close.

3.2.4 Electrical Installation

To function safely and maintain the integrity of your electrical system, the device must be connected to a general electricity supply in accordance with the following regulations:

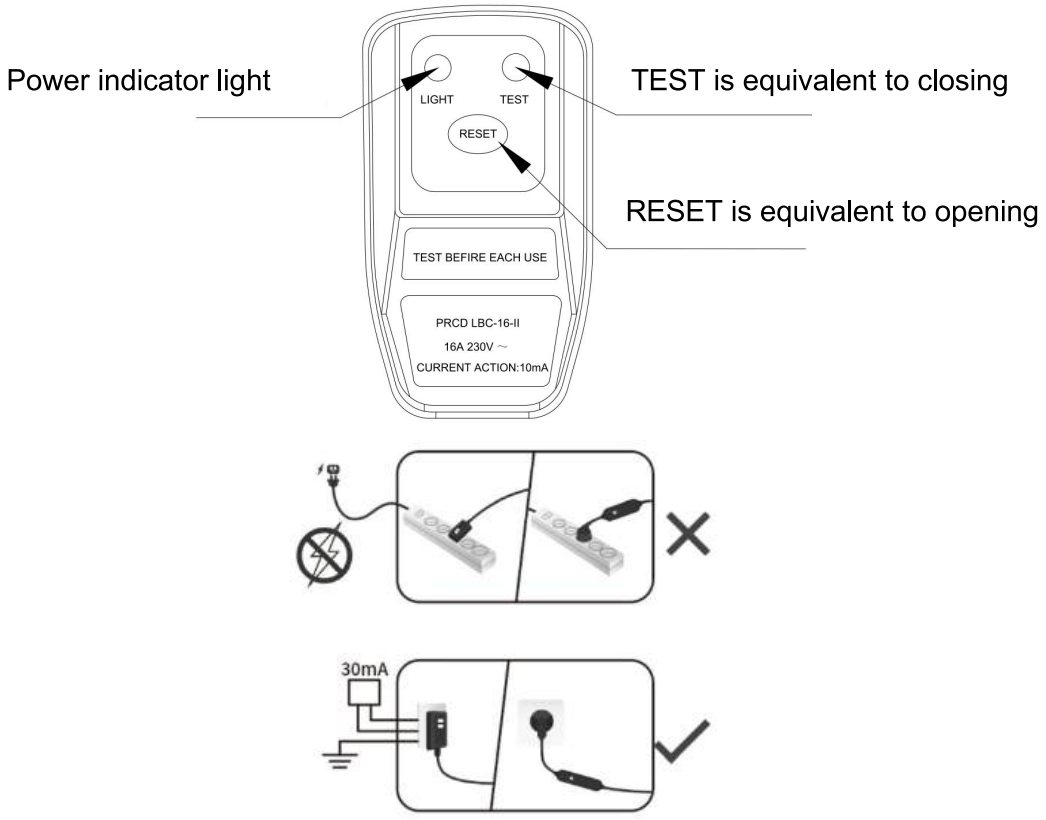
① Upstream, the general electricity supply must be protected by a 30mA differential switch.
② The bath chiller must be connected to a suitable D-curve circuit breaker in accordance with current standards and regulations in the country where the system is installed.
③ The electricity supply cable must be adapted to match the device's rated power and the length of wiring required by the installation. The cable must be suitable for outdoor use.
④ For a three-phase system, it is essential to connect the phases in the correct sequence.If the phases are inverted, the bath chiller's compressor will not work.
⑤ In places open to the public, it is mandatory to install an emergency stop button close to the bath chiller.

Model	Power Supply Wires			
	Electricity Supply	Cable Diameter	Specification	Fuse Mode
NF-20CR3-B-SA	220-240V~/ 50Hz	3G 1.5mm²	AWG 16	250V/5A
NF-25CR3-B-SA	220-240V~/ 50Hz	3G 1.5mm²	AWG 16	250V/5A

3.2.5 Electrical Connection

WARNING: Power supply of ice bath chiller must be disconnected before any operation. Please comply with the following instructions to connect the device.
Step 1: Prepare a socket
Step 2: Insert the plug into the socket as the following picture shows

Ensure that all electrical equipment is properly grounded.

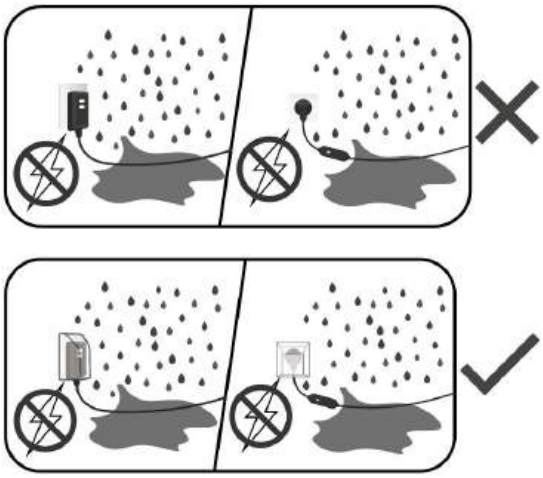


WARNING: Power supply of bath chiller must be disconnected before any operation. Please comply with the following instruction to connect bath chiller.

Step 1: Prepare a socket

Step 2: Insert plug into socket as the following picture shows

WARNING: Pay attention to waterproof and rainproof. Keep your hands dry during operation, and be careful to avoid electric shock.



3.3. Trial Running After Installation

WARNING: Please check all the wiring carefully before turning on the bath chiller.

3.3.1 Inspection Before Trial Running

Before running test, confirm below items and write √ in block;

☐	Correct device installation
☐	Power supply voltage is the same as device rated voltage
☐	Correct piping and wiring
☐	Air inlet & outlet port of device is unblocked
☐	Drainage and venting is unblocked and no water leaking
☐	Leakage protector can work normally
☐	Water pipes have been insulated
☐	Ground wire is connected correctly

3.3.2 Trial Running

Step 1:Running test can begin after completing all installation;

Step 2:All wiring and piping should be connected well and carefully checked, then fill water tank

with water before power is switched on;
Step 3:Emptying all air within pipes and water tank, press "on-off"button on control panel to run the device at setting temp.;
Step 4:Items need to be checked during running test:

① During the first running, device current is normal or not;
② Each function button on control panel is normal or not;
③ Display screen is normal or not;
④ Are there any leakage in the whole cooling circulation system;
⑤ Condensate drain is normal or not;
⑥ Are there any abnormal sound or vibration during running?

4. CONTROLLER OPERATION GUIDANCE

NO.	Item	Icon	NO.	Item	Icon
1	Function or mode key		9	Wi-Fi	
2	Timer key		10	Defrosting	
3	" + " Key		11	Alarm	
4	" - " Key		12	Lock	
5	On/Off key		13	Timer on/off	
6	Heating mode		14	Real time clock	
7	Auto mode		15	Sterilizer	
8	Cooling mode		16	Fan motor	

4.1. Key Operation Instruction

NO.	Item	Operation Way
1	ON/OFF	Under the main interface, press  to turn on/off. OFF will be showed in the display if you turn off the device.
2	Lock/ unlock	● If the device has no input operation for 60 seconds, the wire controller display screen will enter the dormant state, and the screen will automatically lock, and the  icon of the screen is light. ● In the state of locking machine, after pressing the  for 3 seconds, the buzzer start "beep", remove the lock button and the  icon turns off.
3	Mode switching function	Press  to switch modes between heating,cooling and auto.
4	Query and set up of the user parameters	● Under the main interface, long press  for 3s to enter the query interface, query the user parameters by pressing  or  . ● In the user parameter query interface, select a parameter, press  to set the current user parameters.The parameter will become a flashing state,press  or  to modify the current user parameter value, and then press  to confirm the change of parameter value, and return the parameter query status.（PS：Parameters do not flash in query state; parameters flash in setting state) ● In the user parameter query or user parameter setting interface, if there is non-operation for 30 seconds, the changed parameter value will be automatically saved, exit the user parameter query interface or user parameter setting interface.Press  also can exit to main interface.
5	Sterilizer function	Parameter 9(0 Manual /1 Auto,default is 0) ● When the value of parameter 9 is 0, press  for 3 seconds to start

NO.	Item	Operation Way
		sterilizer function,  icon will occur. Press  for 3 seconds again to stop sterilizer function,  icon will disappear. ● When the value of parameter 9 is 1, if the device is on, the sterilizer function will start for 20 minutes and then stop for 20 minutes, and will cycle as this logic.
6	Real time clock setting	● In the main interface, press  for 5 seconds to enter the real-time clock setting interface, the hours and minutes of the clock will flash together. ● In the real-time clock setting interface, press the  , the hour part will flash, and the minute part will stop flashing. At this time, press  or  to set the hour of the real-time clock. ● After setting the hour part, press  again, the numbers in the minute part will flash and the hour part will stop flashing. At this time, press  or  to set the minutes of the real-time clock. ● After the minute part is set, press  again to confirm the real-time clock setting and return to the main interface. ● In the real-time clock setting interface, press  to confirm the current real-time clock setting value and return to the main interface. ● In the real-time clock setting interface, if there is no key operation for 30 seconds, the current real-time clock setting value will be confirmed and return to the main interface.
7	Timer setting	● Under the main interface, press the  to enter the setting interface of entering the timing group. ● When entering the timing setting interface, the timing group 1 flashes, and the wire controller has 2 timing groups. ● In period 1, press  to enter the hour setting interface of timing startup time of group 1, and flash the number of timing startup time. Then press  or  to set the startup hours of time 1 group.

NO.	Item	Operation Way
		● When the hour part is set, then press the  , the number of the minute part is flashing, and press the  or  to set the minutes of the group 1. ● When setting the startup minutes of group 1 is done, press the  , then enter the hour of timing group 1 shutdown setting, the setting method is the same as above. ● When the timing shutdown time is set, press the  to confirm the setting timing switch time of the current group,then press the  or  , you can enter the next set of timing switch time setting, the setting method is consistent with the timing group 1. ● If the time group is valid, the serial number of the time group is displayed under the main interface. ● In a set of timing settings, if the timing startup time and the timing shutdown time are the same, the timing startup / shutdown of the group is invalid. ● When timing period 1 or 2 flashes, long press the  for 3s to confirm the current timing setting,and the  or  will occur in the display. ● When the timing period 1 or 2 flashes , long press the  for 3s to cancel the current timing, the  or  will be no longer displayed. ● In the timing interface, keep non-operation for 30 seconds, confirm the current timing and return to the main interface. ● In the timing interface, press the  to confirm the current timing and return to the main interface.
8	Temp. setting function	Under the main interface，Press  or  ， the set temperature can be adjusted.

NO.	Item	Operation Way
9	Return to the Main Interface	Press  to return to the main interface.
10	Reset operation	Under the main interface of shutdown state, long press  and  for 5 seconds to restore the value of device user parameters and factory parameters to the default state of factory parameters.
11	Celsius and fahrenheit switch	Under the main interface, press  and  for 3 seconds to change Celsius and Fahrenheit.
12	Manual defrost	When the device is under heating mode or auto mode, press  and  key for 3 seconds, the defrost mode will be started.

4.2. Parameter List

4.2.1 Query control table of device temperature status.

Press  for 3s to enter, and then press  and  to turn up and down the page query.

Code	Parameter	Remark
T1	Exhaust temperature	
T2	Suction temperature	
T3	Water outlet temperature	
T4	Cooling coil temperature	
T5	Heating coil temperature	
T6	Ambient temperature	
1F	EEV steps	
od	Outdoor operation mode	0: OFF/Standby 1: Heating 2: Cooling
OF	Fan motor status	ON OFF
dF	Defrosting state	
STF	4-way valve status	
Pu	Water pump status	
HE1	Failure code history 1	

HE2	Failure code history 2	
HE3	Failure code history 3	
HE4	Failure code history 4	
Pr	Main board software version	
Sr	Display software version	

4.2.2 Control table of device user parameters

Press  for 3s to directly enter, then press  and  to query the parameters.

Code	Parameter name	Range	Default Value
L0	Target temperature setting in heating mode	15℃~40℃	27℃
L1	Deviation temperature setting for chiller starts or re-starts in heating mode	0℃~18℃	2℃
L2	Deviation temperature setting in heating constant temperature shutdown	0℃~18℃	0℃
L3	Target temperature setting in cooling mode	2℃~30℃	20℃
L4	Deviation temperature setting in chiller starts or re-starts in cooling mode	0℃~18℃	2℃
L5	Deviation temperature setting in cooling constant temperature shutdown	0℃~18℃	0℃
L6	Target temperature setting in Auto mode	2℃~40℃	27℃
L7	Water pump working mode	0:The water pump is not stopped during constant temperature shutdown. 1: When shutting down at constant temperature, the water pump delays the compressor to turn off for 60 seconds. Every (L8) minutes open 5 minutes	0
L8	The running interval of the water pump when shutting down at constant temperature	3～180min	30

L9	Sterilizer mode	0:Manual 1:Auto	0

4.3. Error Code

Check list of device fault codes	
Code	**Fault description**
E01	Exhaust temperature sensor failure
E05	Heating coil temperature sensor failure
E09	Suction temperature sensor failure
E19	Cooling coil temperature sensor failure
E18	Water outlet temperature sensor failure
E21	Communication failure between display and main board
E22	Ambient temperature sensor failure
P01	Water flow protection for circulation pump
P02	High pressure protection
P06	Water flow protection for self-priming pump
P11	High exhaust temperature protection
P17	Anti-freezing protection
P23	Low water outlet temperature protection for cooling
P25	Low/high ambient temperature protection
P26	High water outlet temperature protection for heating

4.4. Trouble Shooting

NO.	Fault	Analysis	Solution
1	High pressure protection	1.Loose wiring or poor connection of high pressure switch 2.There is something wrong with high pressure switch 3.Main board is broken 4. Poor condensing 4.1 Water temperature is too high (over range operation). 4.2 Low water flow 4.2.1 The valve in water system is not open. 4.2.2 Waterway blockage, may appear in the heat exchanger or	1. Reconnect the wire. 2. Replace the high pressure switch. 3. Replace the main board. 4.1 Operate within the allowable range. 4.2.1 Open the valve. 4.2.2 Clean the blocked part or replace it . 4.2.3 Change the pump according to the water flow and water head. 4.2.4 Replace the water pump.

NO.	Fault	Analysis	Solution
		valve part. 4.2.3 Improper water pump selection 4.2.4 The water pump is broken . 5. Refrigerant system blockage, may appear in the throttle part. 6. Refrigerant system is mixed with air, maybe the vacuum is not enough.	5. Clean or replace the clogged part. 6. Vacuumize and refill the refrigerant.
2	Water flow protection	1. The connection between water flow switch and main board is poor. 2. The water flow switch is installed wrong. 3. Water flow switch failure. 4. Main board failure. 5. Low water flow 5.1 The water system is blocked. 5.2 Water pump is not suitable 5.3 Water pipe is small 5.4 The water flow switch is stuck and cannot be reset. 6. No water flow 6.1 The valve is not open. 6.2 The water pump is not working. 6.3 Water pump failure.	1. Reconnect the water flow switch cable 2. Install the water flow switch in the correct way. 3. Need to replace the water flow switch 4. Need to replace the motherboard 5.1 Clean or replace the blocked part. 5.2 Change the pump according to the water flow and water head. 5.3 Need to change the water pipe. 5.4 Reset the water flow switch manually. 6.1 Open the valve. 6.2 Turn on the pump. 6.3 Need to replace the water pump.
3	Exhaust protection	1.Temp.sensor fault. 2.Water flow switch fault 3.Leakage happen,and refrigerant is not enough . 4.Low water flow 4.1 The water system is blocked. 4.2 Water pump is not suitable 4.3 Water pipe is small 4.4 The water flow switch is stuck and cannot be reset. 5. No water flow 5.1 The valve is not open. 5.2 The water pump is not working. 5.3 Water pump is broken .	1.Need to replace the temp.sensor. 2.Need to replace the water flow switch. 3.Repair the leakage,and refill the refrigerant according to the nameplate. 4.1Clean or replace the blocked part. 4.2 Change the pump according to the water flow and water head. 4.3 Need to change the water pipe. 4.4 Reset the water flow switch manually. 5.1 Open the valve.

NO.	Fault	Analysis	Solution
			5.2 Turn on the pump. 5.3 Need to replace the water pump.
4	Over-current protection	1.Poor condensing 1.1 Water temp. is too high (over range operation). 1.2 Low water flow 1.2.1 The valve in water system is not open. 1.2.2 Waterway blockage, may appear in the heat exchanger or valve part. 1.2.3 Improper water pump selection 1.2.4 The water pump is broken . 2.Refrigerant system is mixed with air, maybe the vacuum is not enough. 3.The water pipe is blocked. 4.The valve opening steps not enough. 5.Excessive refrigerant. 6.The fan is blocked.	1.1 Operate within the allowable range. 1.2.1 Open the valve. 1.2.2 Clean the blocked part or replace it . 1.2.3 Change the pump according to the water flow and water head. 1.2.4 Replace the water pump. 2. Vacuumize and refill the refrigerant according to the nameplate. 3. Clean or replace the water pipe. 4. Turn the valve up appropriately. 5. Bleed out the refrigerant and refill the refrigerant according to the nameplate. 6. Clean out the blockage from the fan or replace the fan.
5	Ambient/Inlet /Outlet/Exhaust/ Suction /Heating coil /Cooling coil sensor fault	1. The connection between the temp. sensor and the main board is poor. 2. Temp. sensor fault. 3.The sensor resistance on the main board fault.	1.Reconnect the temp.sensor cable. 2.Replace the temp.sensor. 3.Replace the main board.
6	Communication fault	1.The connection between wire controller and main board is poor. 2.Wire controller fault. 3. Main board fault. 4. Communication wire and strong electricity wire put together, resulting in power interference communication	1. Reconnect the wire controller cable. 2. Replace the wire controller. 3. Replace the main board. 4. Communication wire is placed separately from the strong electricity wire.

NO.	Fault	Analysis	Solution
7	Anti-freeze protection	1. Low ambient temp. running. 2. Low water temp.	1. When the ambient temp. is ≥ 2°C, exit the anti-freeze state. 2.When the inlet water temp. > 15°C, exit the anti-freeze state.

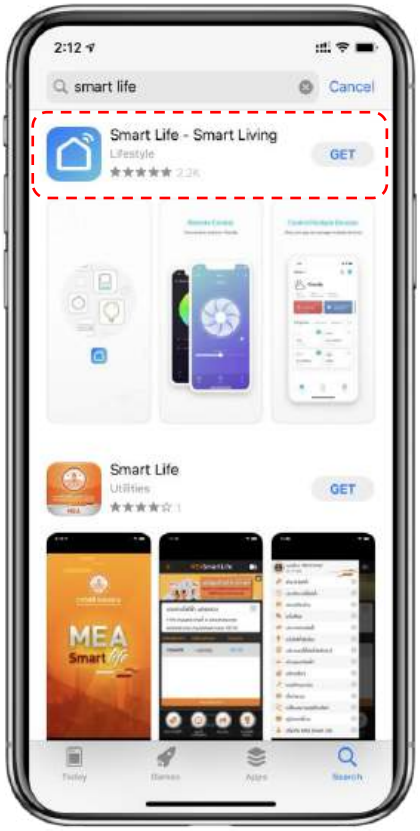
4.5. Other Malfunctions and Solutions(No display on wire controller)

NO.	Phenomenon	Cause	Solution
1	Device is not running	1. Power outage 2. Power switch is not connected 3. Power switch fuse is burned-out 4. Timing is not up	1. Please wait for power supply recovery 2. Connect power 3. Replace fuse 4. Please wait or cancel timing setting
2	Device is not running after starting up	1. Compressor protection time interval is not up 2. Water temp. of the device does not reach starting up water temp. value	1. Please wait patiently for the end of protection time 2. Normal phenomenon and wait for water temp. to reach
3	Device is running normally, but can't get the demand water temp.	1. Improper temp. setting 2. Filter element is dirty 3. Air inlet port or outlet port of outdoor machine or indoor machine is blocked	1. Set up proper temp. 2. Replace the filter element 3. Clear tuyere obstruction
4	Device is running automatically	Reach timing to start up	Please shutdown manually or cancel timing if needn't start up

4.6. Wi-Fi Settings

4.6.1 Software Installation

① Method 1: Search ”Smart life” in your APP store ,install “ ”.Click “GET” to install.



② Method 2: Scan the QR code below.

For IOS and Android Users

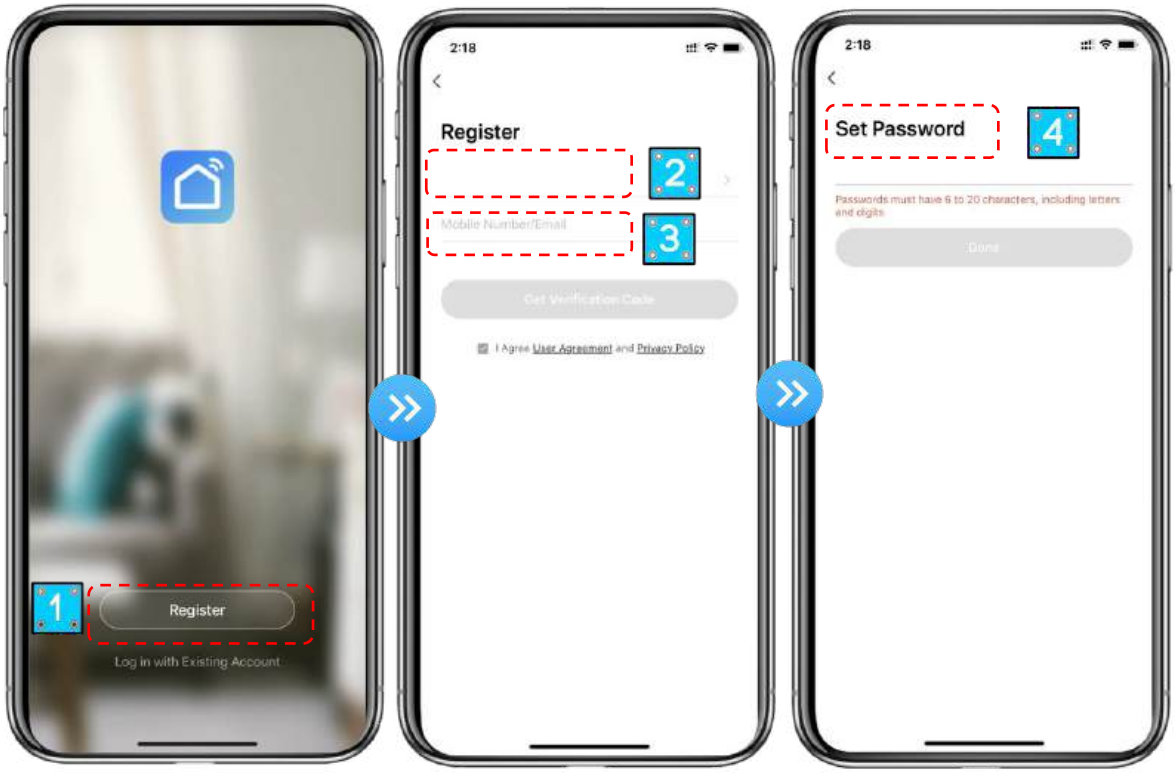
4.6.2 Software Startup

After installation,click “ ” on your desktop to start up Smart Life.

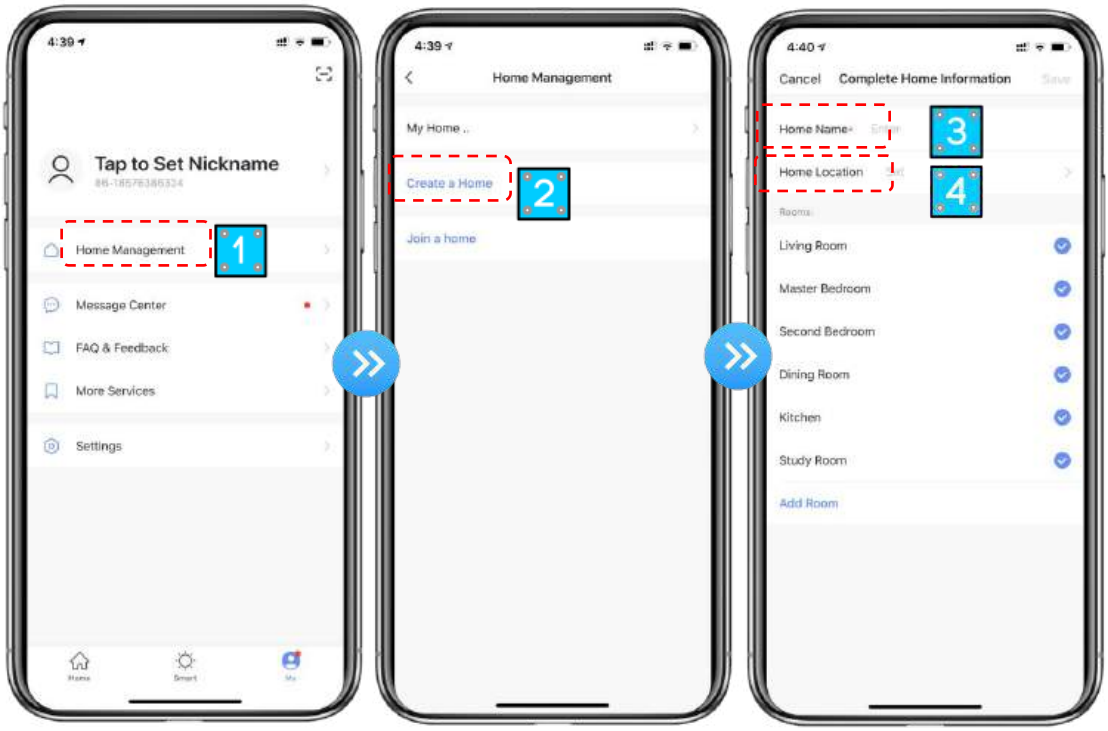
4.6.3 Software Registration and Configuration

1. Registration

① Users don't have account can click "Register" to create an account: Register → Enter your phone number → Get Verification Code → Enter Verification Code → Set Code;

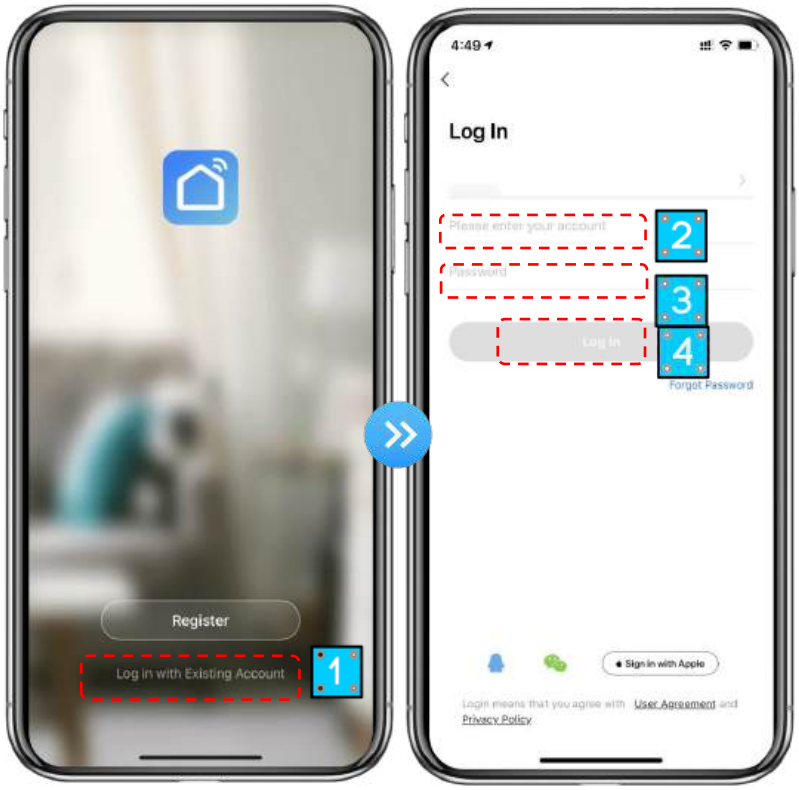


② After registration, you need to Create a Home:Create a Home → Set Home Name → Set Home Location → Add Rooms.

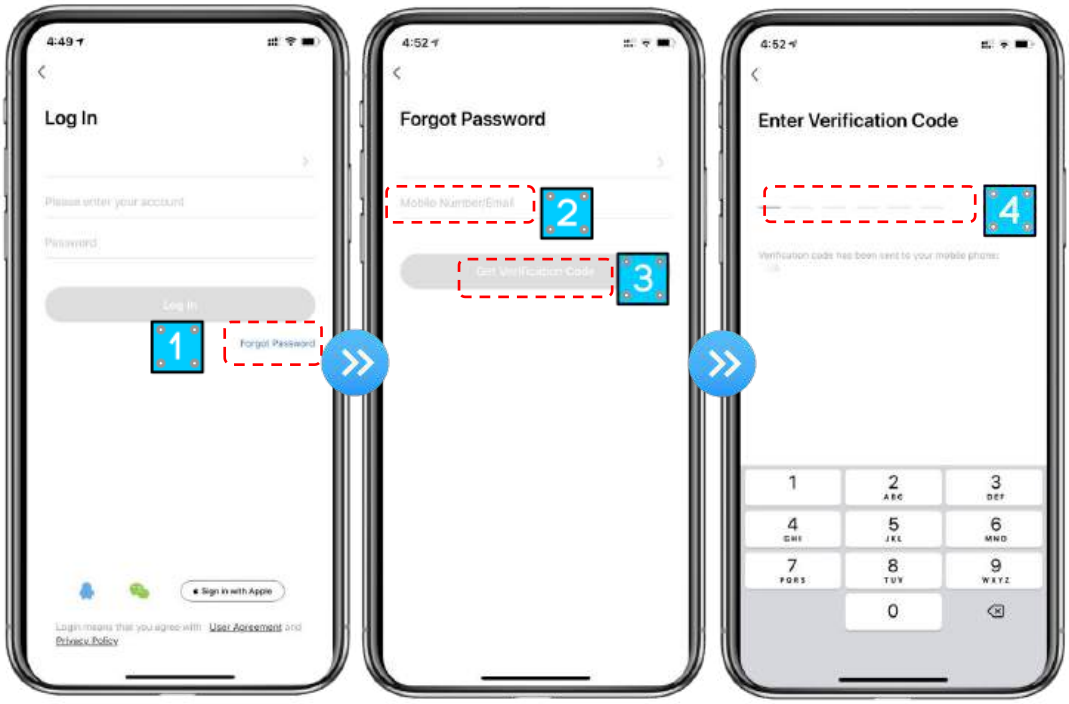


2. Account ID+ Password Login

① Existing accounts can be logged in directly, in the following order.



② If you forget your password you can choose to login with your verification code and select "Forget Password": Enter your phone number → Get verification code .



③ After creating a home or logged in,enter the main interface of APP.

Note:

Click the device to check the status, and you can set the operating mode, ON/OFF, timer.

Click “＋” to add devices.

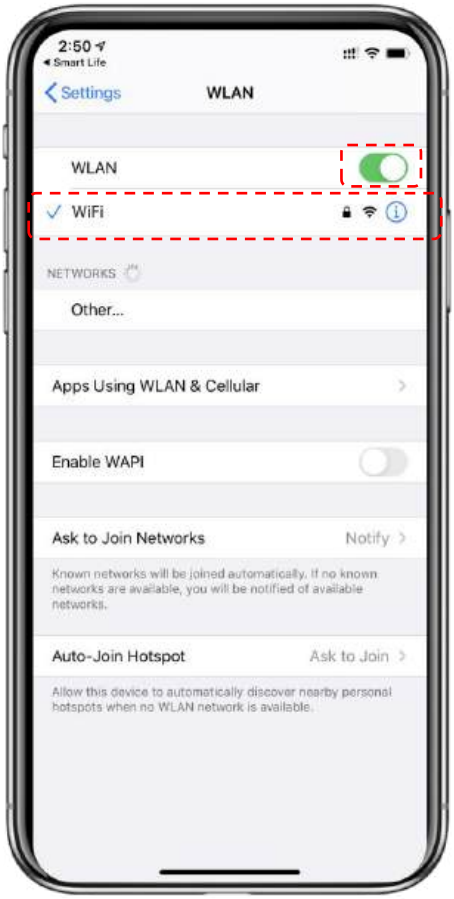
1. Wi-Fi Module configuration steps:

Step 1:

When power is on, press and hold the "  " and "  " keys at the same time for 3 seconds to enter the distribution network. The "  " icon will flash rapidly;.

Step 2:

Turn on the phone's Wi-Fi function and connect to the Wi-Fi hot-spot. The Wi-Fi hot-spot must be able to connect to the Internet normally;



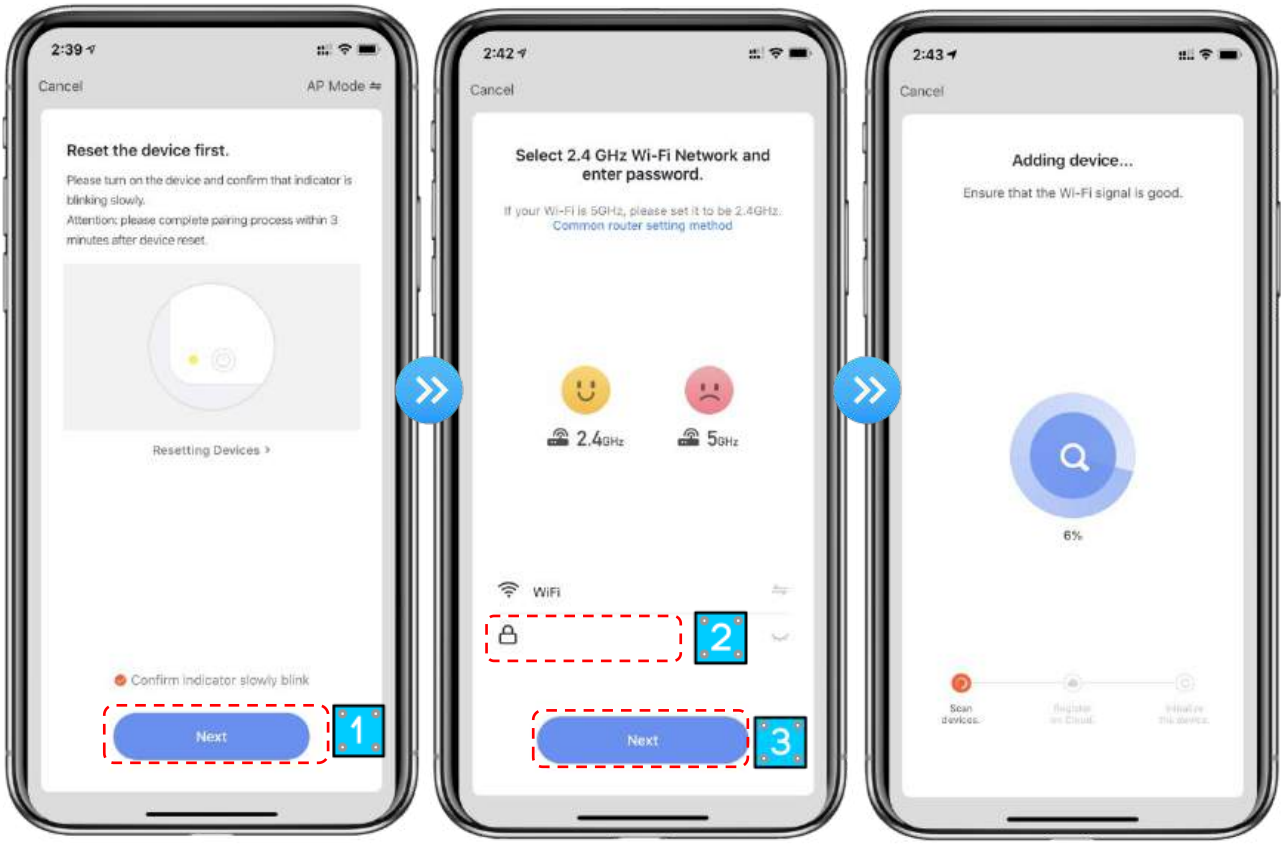
Step 3:

Open the "smart life" APP, log in into the main interface, click on the top right corner "+" or "add equipment" of the interface, enter the equipment type selection, the "Large Home Appliances" , select "Smart Heat Pump" equipment and add equipment into the interface.

Step 4:

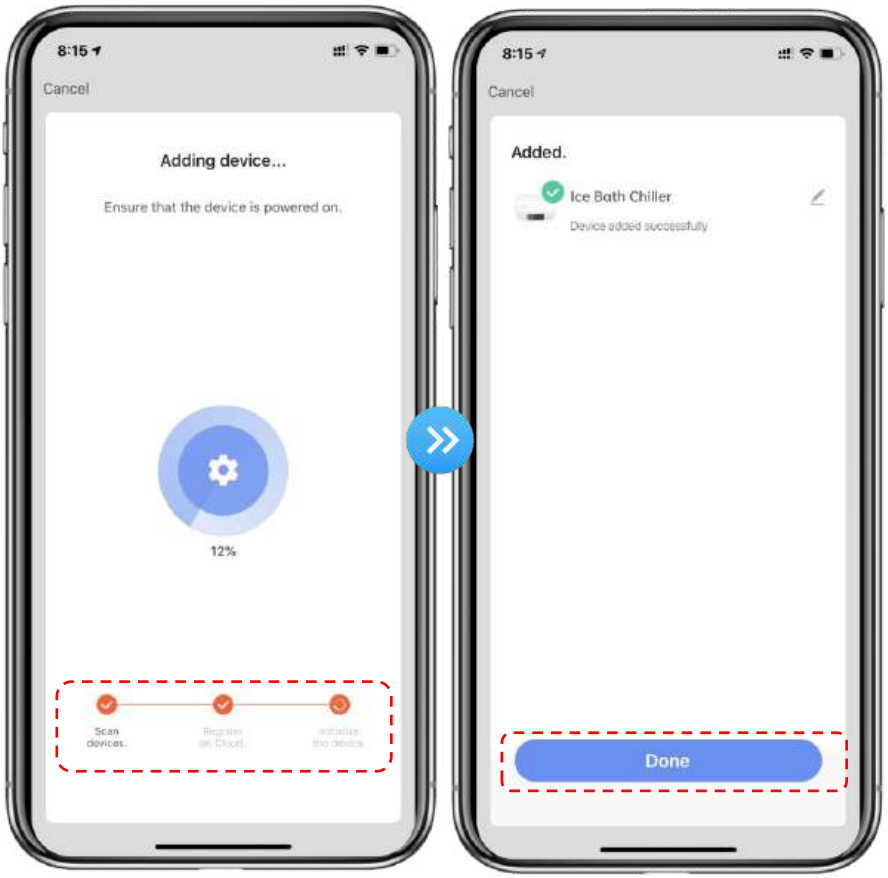
After selecting "Smart Heat Pump", enter the interface of "Add Equipment", after the indicator light under "  " flashes rapidly , click" Confirm indicator rapidly blink ".

Enter the Wi-Fi connection interface, enter the Wi-Fi password of the mobile phone (it must be the same as the Wi-Fi of the mobile phone), click "Next", and then directly enter the connected status of the device.



Step 5:

When “Scan devices”, “Register on Cloud”, “Initialize the device” are all completed, connect succeeds.



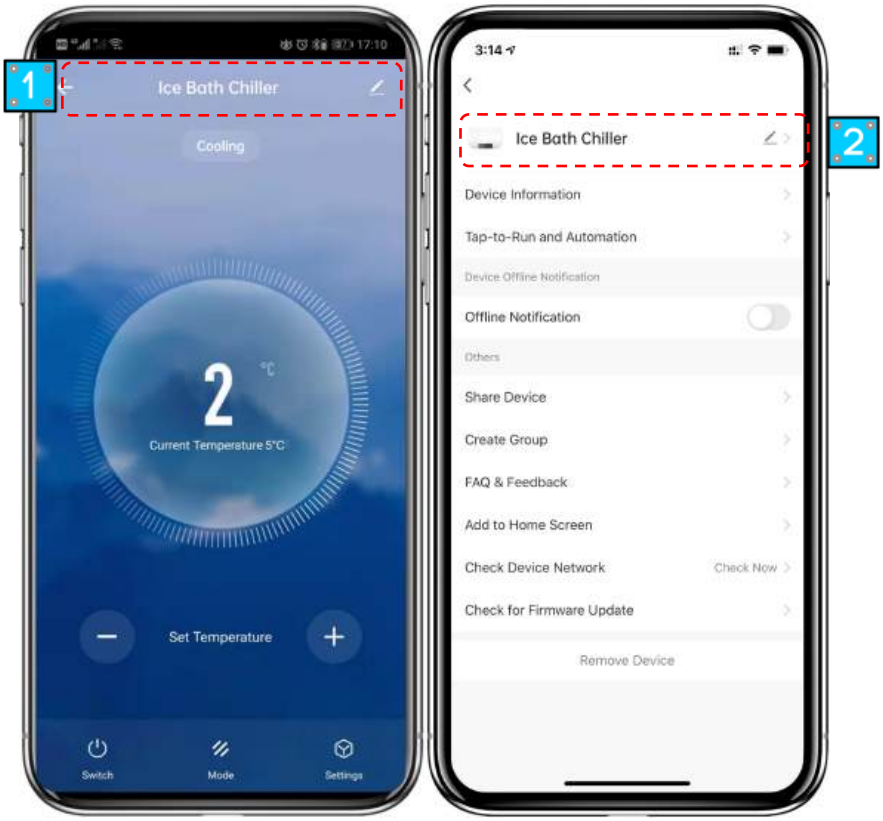
4.6.4 Software Function Operation

- After the device is bound successfully, enter the operation interface of “Smart heat pump” (Device name, modifiable)
- In the main interface of “Smart Life”, click “Smart heat pump” to enter the operation interface.

① Back
② More: You can change device name, select device installation location, check networking status, add shared users, create device cluster, view device information, and more.
③ Setting temp. adjustment: The circle slides counterclockwise to reduce the temp., but clockwise to increase the temp..
④ Target temp.
⑤ Current temp.
⑥ ON/OFF
⑦ Mode switching: Click to select the mode to be switched.
⑧ Timing: Click to add timing off/on time.

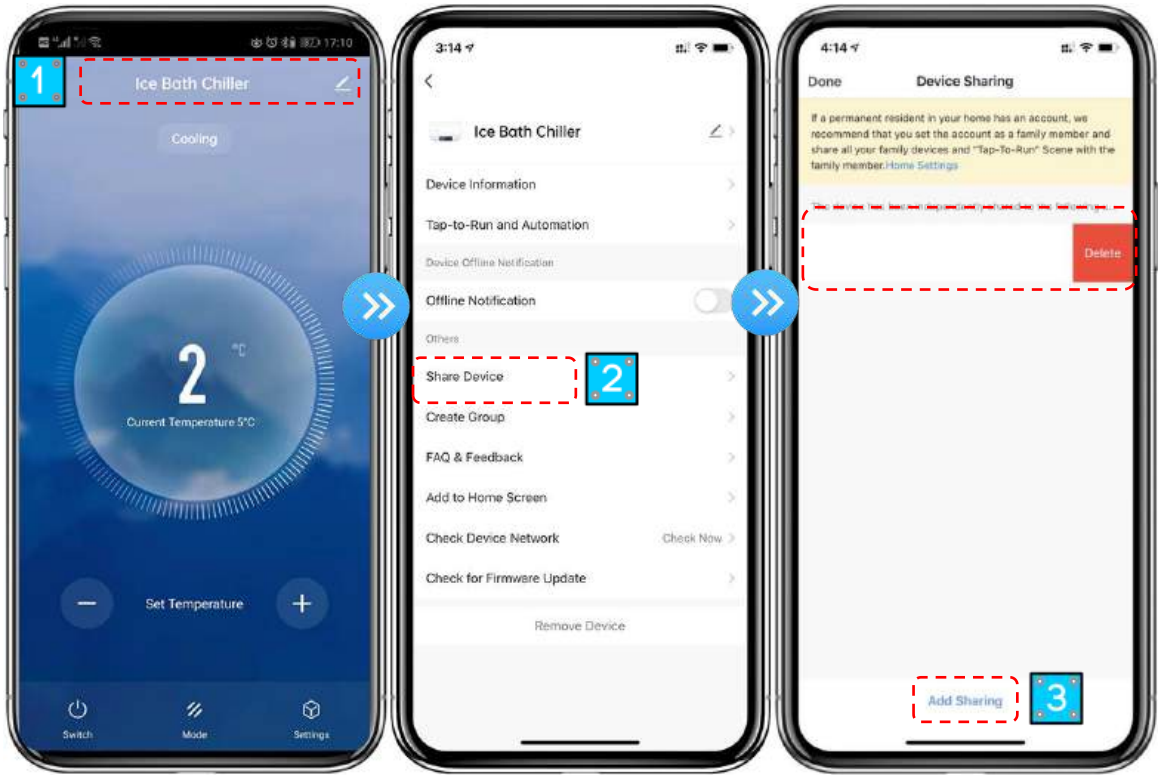
● **Modify device name**

Click in the following order to enter device details, and click "Device Name" to rename the device.

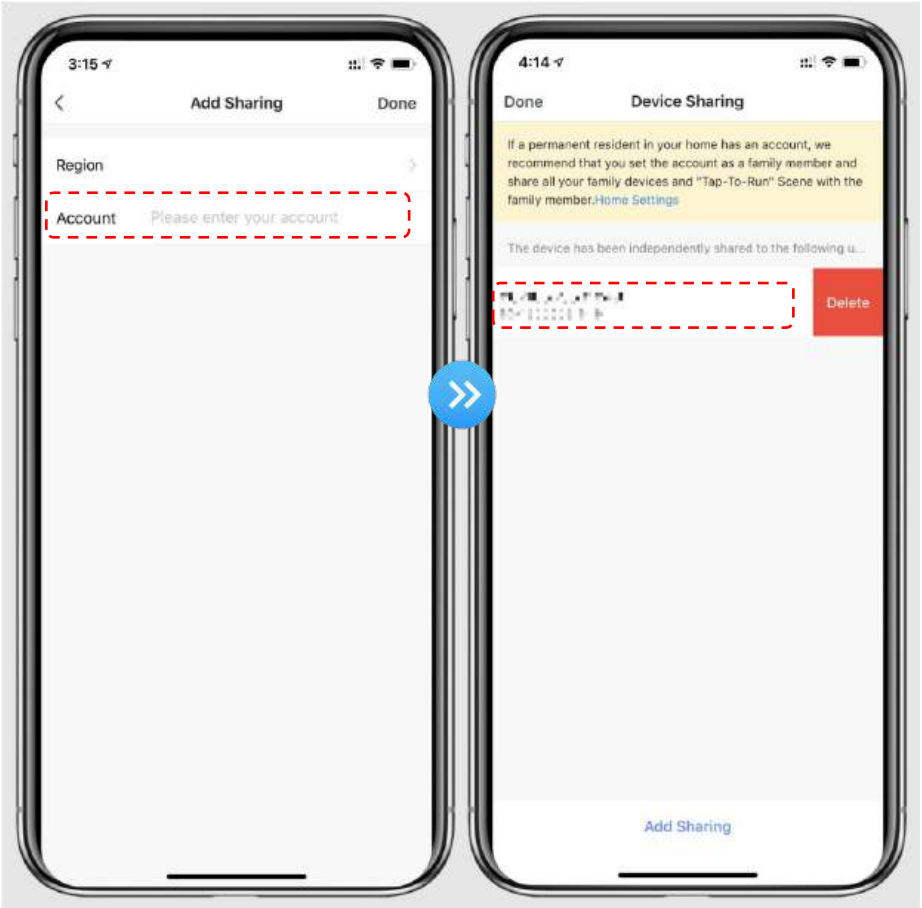


● **Device sharing**

- ◆ To share a bound device, the user should do so in the following order.
- ◆ After successful sharing, the list will be added to show the person shared
- ◆ If you want to delete the account you shared to, cross the selected account to the left,and delete it.
- ◆ The user interface is as follows.



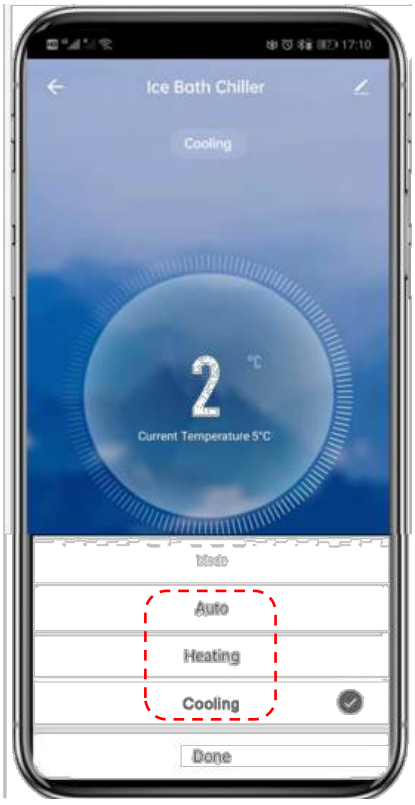
◆ Enter the account of the shared, click "Done", and the share success list shows the newly added account of the Shared.



◆ The interface of the person to be shared is as follows. The received shared device is displayed. Click it to operate and control the device.

● **Mode settings**

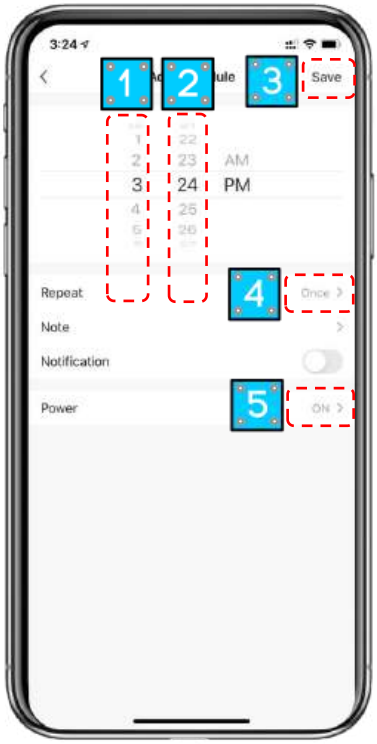
Click “ ” on the main interface to switch modes,select what you need.



● **Timer setting**

1. Click “ ” on the main interface to enter timer setting interface, as shown below, click to add timer.

1. After entering timer setting, swipe up/down to set timer,set up repeat weeks and on/off,then click “save” to save your settings as follows.



① Hours
② Minutes
③ Set the repetition
④ Set power ON/OFF
⑤ Save your modification

4.3.5 Device Removal

Click “ ” on the top right corner of the main interface to enter the device details interface, and click “device removal”. Indicator light under“ ” flashes rapidly for 3min, The network can be reconfigured within 3 minutes, and the network can be quit if it is not connected within 3 minutes. The specific operations are shown as follows.

5. MAINTENANCE AND WINTERZING

5.1 Maintenance

⚠ **WARNING:The following operations must be undertaken by a qualified person at least once a year.If there is any problem, please call or contact the professional technician to check the device.Before undertaking maintenance work on the device, ensure that you have disconnected the electrical power supply.**

- **Cleaning**

a. The bath chiller's casing must be cleaned with a damp cloth. The use of detergents or other household products could damage the surface of the casing and affect its properties.

b. The evaporator at the rear of the bath chiller must be carefully cleaned with a vacuum cleaner and soft brush attachment.

- **Annual maintenance**

The following operations must be undertaken by a qualified person at least once a year.

a. Carry out safety checks.

b. Check the integrity of the electrical wiring.

c. Check the earthing connections.

d. Monitor the state of the pressure gauge and the presence of refrigerant.

5.2 Disassembly Guidelines

Tools:

① Phillips screwdriver

② Wrench

③ Flat-blade screwdriver

Step 1: Remove electrical box cover and left panel

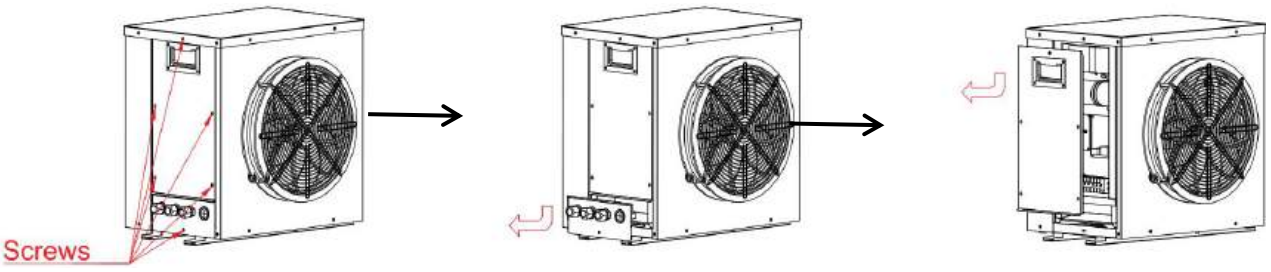
① First remove the bottom screws, pull out the electrical box cover;

then remove the three upper screws and remove the left side panel.Pull out the service plate;

② Pull down the electrical box cover and take it out;

③ Pull the left side panel down and take it out.

As the following figure shows

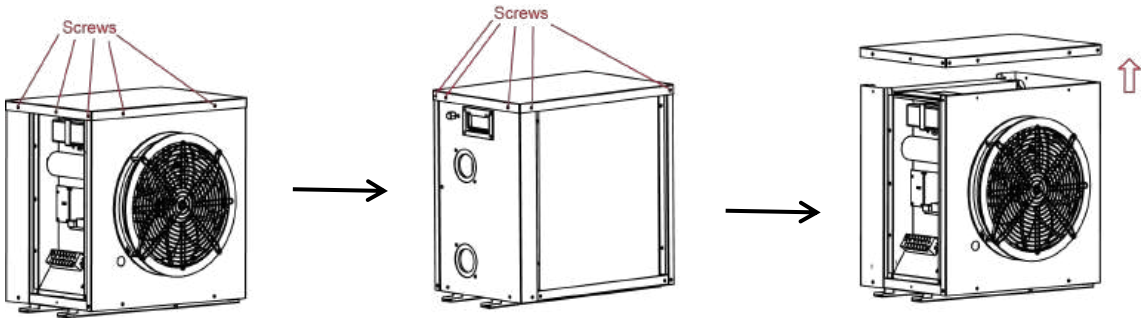


Step 2:Remove the top cover

① Remove the screws around the top cover;

② Lift up and lift out the top cover.

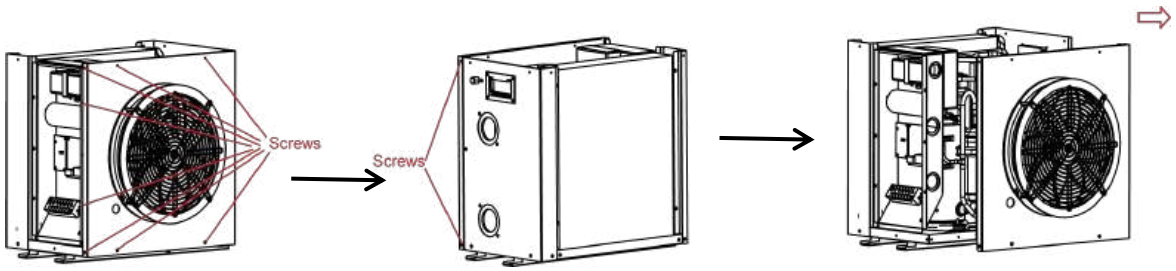
As the following figure shows



Step 3:Remove the front panel

① Remove the screws on the front panel;
② Disconnect the fan cable connector;
③ Completely remove the front panel.

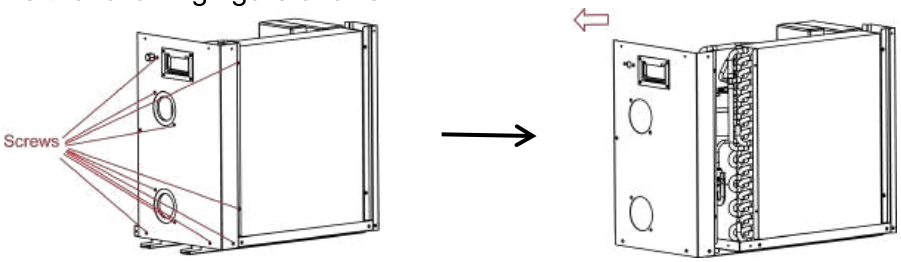
As the following figure shows



Step 4: Remove the right panel

① Remove the four screws on the right panel;
② Completely remove the right panel.

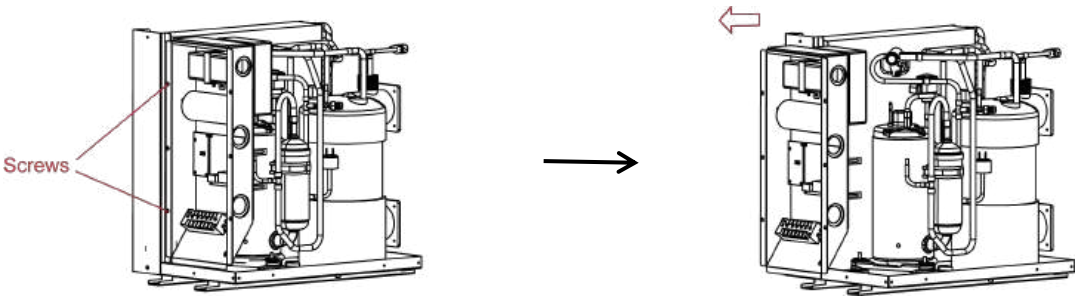
As the following figure shows



Step 5: Remove the electrical box

① Remove the remaining screws from the electrical box;
② Completely remove the electrical box.

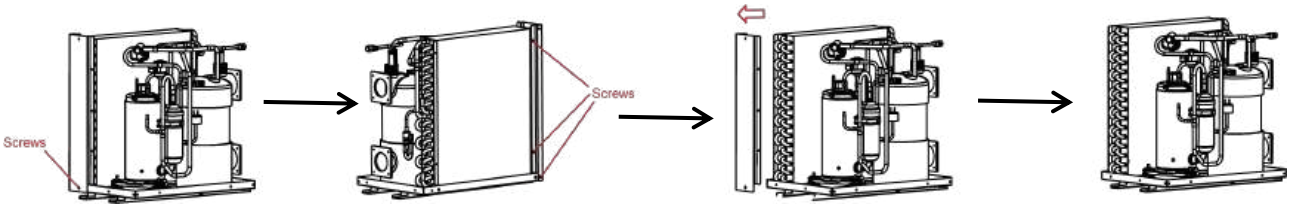
As the following figure shows



Step 6: Remove left rear pillar

① Remove the remaining screws from the left rear pillar;
② Completely remove the left rear pillar.

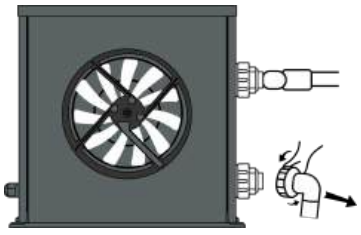
As the following figure shows



5.3 Winterizing

"CUT OFF" power supply of the chiller before cleaning, checking and repairing.

In winter season when you don't use the bath chiller:
a. Cut off power supply to prevent any machine damage.
b. Drain water clear of the machine.



Important:

Unscrew the water connection to drain out the water from the titanium heat exchanger of the chiller. Otherwise, it will be damaged by freezing in Winter if it is not operated.

c. Cover the chiller when it is not used.