Spa Heat Pump
User and Service Manual

IMPORTANT NOTE:

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

CONTENT

1. FOREWORD

1.1. Read the Manual Before Operation

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.

Initial safety checks shall include:

① That capacitors are discharged: this shall be done in a safe manner to avoid 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 CO2 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.

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 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 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 Solate 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.

① Pump down refrigerant system, if possible.

② If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

③ Make sure that cylinder is situated on the scales before recovery takes place.

④ Start the recovery machine and operate in accordance with manufacturer's instructions.

⑤ Do not overfill cylinders. (No more than 80 % volume liquid charge).

⑥ Do not exceed the maximum working pressure of the cylinder, even temporarily.

⑦ 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.

⑧ 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 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.

1.2. The 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
	**WARNING**	The symbol shows that this appliance uses a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	**WARNING**	All information marked with this symbol is important and should be viewed carefully.
	**WARNING**	This symbol shows that there might be an electric shock if the appliance still connects the power cleaning, examination and repair.
	**CAUTION**	This symbol shows that the operation manual should be read carefully.

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 unit in compliance with local laws, regulations and standards;

③ Confirm power voltage and frequency;

④ The unit is only used with grounding sockets;

⑤ Independent switch must be offered with the unit.

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 unit is installed safely and reliably.

- If the unit is not secure or not installed, it may cause damage. The minimum support weight required for installation is 21g/㎜²
- If the unit 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 unit 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 unit.

④ Install on the ground safely, please read installation instructions.

Improper installation may result in fire, electric shock, falling of the unit, 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 unit must have grounding device.

If power supply does not have grounding device, be sure not to connect the unit.

⑦ The unit should be only removed and repaired by professional technician.

Improper movement or maintenance of the unit may cause water leakage, electric shock, or fire.

Please find a professional technician to do.

① Don't unplug or plug power during operation.It may cause fire or electric shock.

② Don't touch or operate the unit when your hands are wet. It may cause fire or electric shock.

③ Don't place heaters or other electrical appliances near the power wire.It may cause fire or electric shock.

④ The water must not be poured directly from the unit. Do not let water to permeate into the electrical components.

⚠ **WARNING**

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

② If there is flammable gas around the unit, 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 unit while power is on. Turn off power before cleaning the unit. If not it may result in injury from a high-speed fan or electric shock.

④ Stop operating the unit once there is a problem or an fault code. Please turn off power and stop running the unit. Otherwise it may cause electric shock or fire.

⑤ Be careful when the unit 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 unit will not work properly.

⑦ The installation of external unit 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.

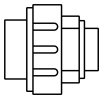
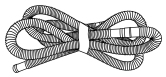
⑨ This device is not designed for people who is physically or mentally weak (including children) and who does not have experience and knowledge of heating and cooling system. Unless it is used under direction and supervision of professional technician, or has received training on the using of this unit. Children must use it under supervision of

an adult to ensure that they use the unit safely. If power wire is damaged, it must be replaced by a professional technician to avoid danger.

2. OVERVIEW OF THE UNIT

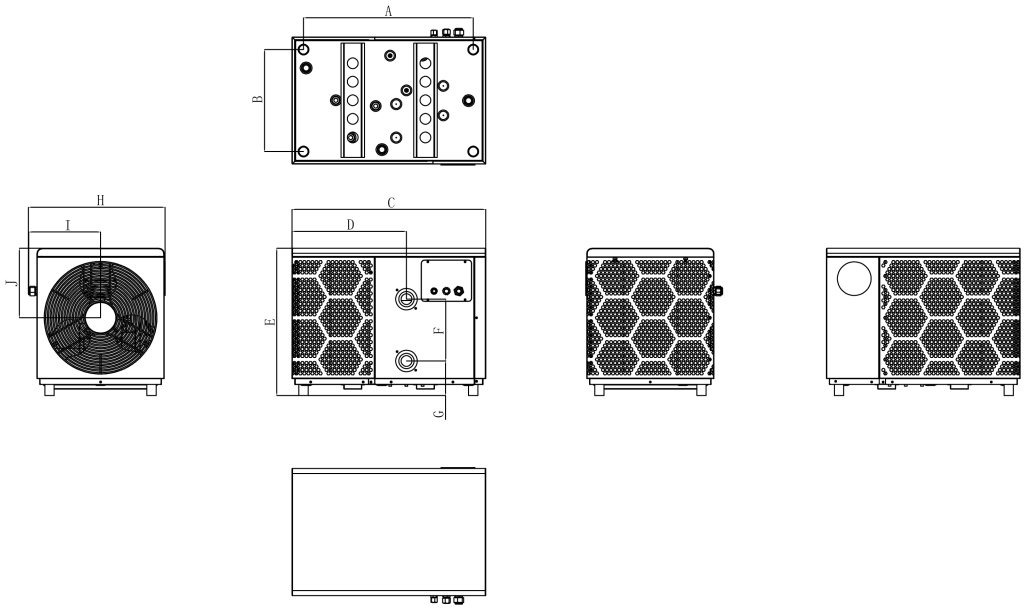
2.1. Accessories Supplied With the Unit

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

NO.	Components	Quantity	Appearance	NO.	Components	Quantity	Appearance
1	User Manual	1 pcs		3	Water Pipe Joint	2 pcs	
2	Drain-pipe	1 pcs		4	Drain Nozzle	2 pcs	
5	Vibration Dampers	4 pcs		6	Wrench	1 pcs	

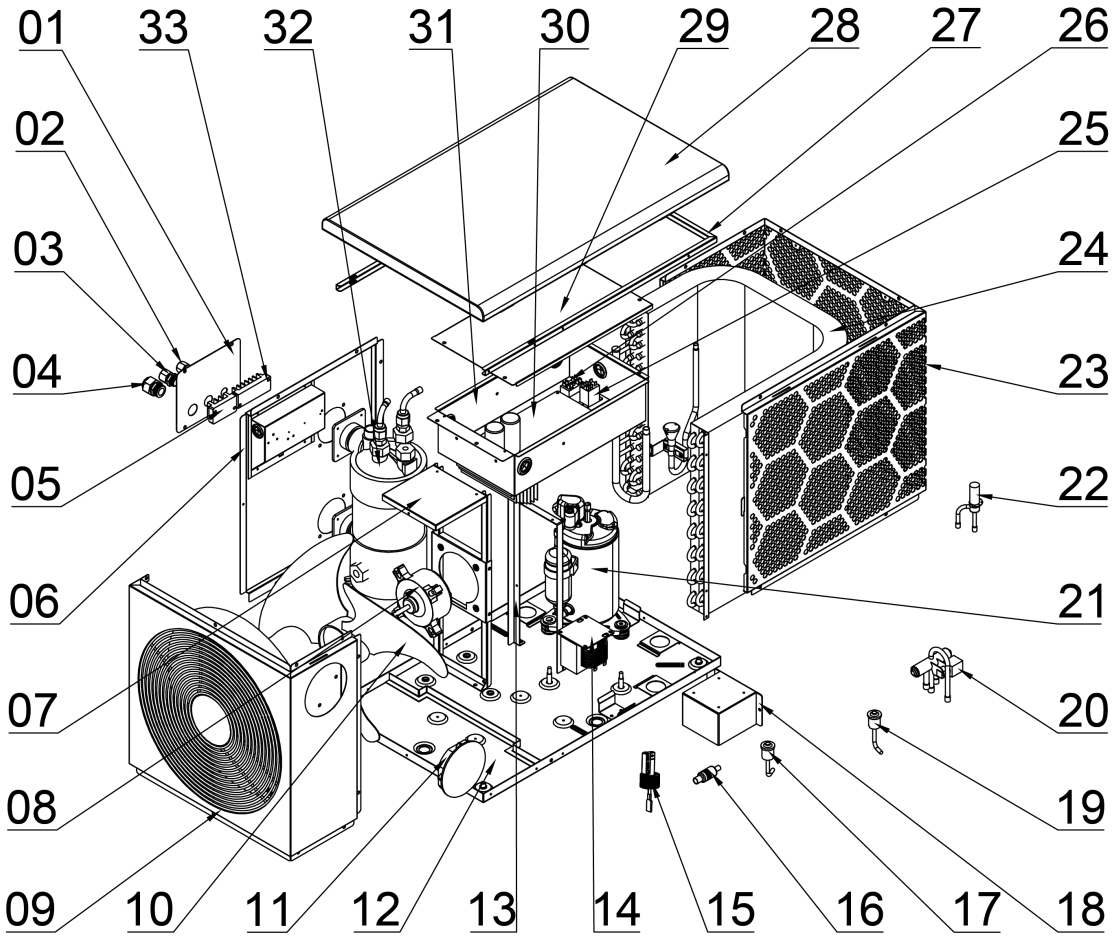
2.2. Dimensions of the Unit

Unit:mm



Model	A	B	C	D	E	F	G	H	I	J
WSH-007	549	330	626	370	477	200	112	442	232	256

2.3. Main Parts of the Unit



1	Junction Box Cover	12	Chassis	23	Back Plate
2	PG9 Connector	13	Electrical Box Support	24	Fin Heat Exchanger
3	PG13.5 Connector	14	Reactor	25	Relay
4	PG16 Connector	15	Water Flow Switch	26	2 Poles Terminal Board
5	3 Poles Terminal Board	16	Filter	27	Top Frame Structure
6	Side Plate	17	High Pressure Switch	28	Top Cover
7	Motor Support	18	Reactor Box	29	Electrical Box Cover
8	DC Fan Motor	19	Low Pressure Switch	30	Main Board
9	Front Plate	20	4-way Valve	31	Electrical Box
10	Fan Blade	21	Compressor	32	Titanium Heat Exchanger
11	Wired Controller	22	EEV	33	6 Poles Terminal Board

2.4. Parameter of the Unit

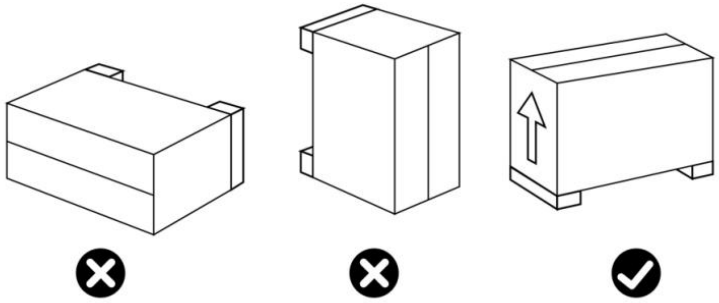
Model		WSH-007
Type	/	Heating/Cooling
Heating Temperature Range	°C	15~40
Cooling Temperature Range	°C	8~35
Operating Range	°C	-20~40
[Swimming Pool Heating]Ambient:26°C,Humidity:80%,Water Inlet/Outlet:26°C/28°C		
Heating Capacity	kW	2.75~7.25
Power Input	kW	0.22~1.22
COP	kW/kW	12.50~5.94
[Swimming Pool Cooling]Ambient:35°C,Water Inlet/Outlet:27°C/-°C		
Cooling Capacity	kW	1.5~3.14
Power Input	kW	0.30~1.08
EER	kW/kW	5.00~2.90
[SPA Heating]Ambient:15°C,Humidity:70%,Water Outlet:38°C		
Heating Capacity	kW	2.02~5.24
Power Input	kW	0.28~1.36
COP	kW/kW	7.21~3.85
[SPA Heating]Ambient:0°C,Humidity:70%,Water Outlet:38°C		
Heating Capacity	kW	1.36~3.02
Power Input	kW	0.34~1.24
COP	kW/kW	4.00~2.43
[SPA Heating]Ambient:-10°C,Humidity:70%,Water Outlet:38°C		
Heating Capacity	kW	0.95~2.51
Power Input	kW	0.31~1.28
COP	kW/kW	3.1~1.96
[SPA Heating]Ambient:-20°C,Humidity:70%,Water Outlet:38°C		
Heating Capacity	kW	0.76~2.08
Power Input	kW	0.30~1.16
COP	kW/kW	2.53~1.79
Power Supply	/	220-240V~/50Hz
Max. Power Input	kW	2.0
Max. Current	A	9.0
Sound Pressure Level at 1m	dB(A)	<53
Sound Pressure Level at 10m	dB(A)	<32
Compressor Brand	/	Mitsubishi
Compressor Type	/	Rotary
Water Side Heat Exchanger	/	Titanium
Water Pressure Drop	kPa	18
Refrigerant	/	R32
Display	/	LCD Screen

Min. Pressure/ Max. Pressure	Mpa	0.12/4.4
Water Proof Level	/	IPX4
Electricity Proof Level	/	Class I
Wi-Fi	/	Yes
Water Pipe Connection	mm	Φ50
Net Weight	kg	38
Gross Weight	kg	45
Unit Net Dimensions	mm	632*468*474
Package Dimensions	mm	671*516*511
* Above data are subjects to modification without notice.		

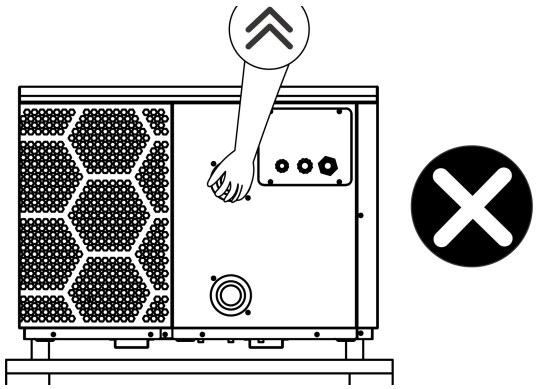
3. INSTALLATION AND CONNECTION

3.1. Transportation

1. When storing or moving the heat pump, the heat pump should be at the upright position.

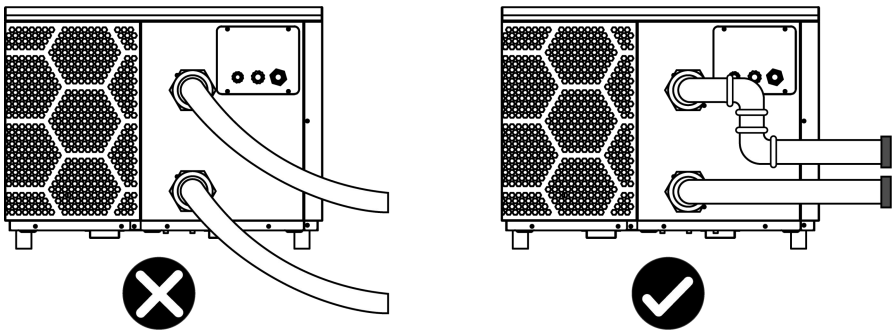


2.When moving the heat pump, do not lift the water union since the titanium heat exchanger inside the heat pump will be damaged.



3.2. Notice Before Installation

1.The inlet and outlet water unions can’t bear the weight of soft pipes. The heat pump must be connected with hard pipes!



2.In order to guarantee the heating efficiency, the water pipe length should be ≤10m between the spa/pool and the heat pump.

3.3. Installation Instruction

3.3.1 Pre-requirements

Equipment necessary for the installation of your heat pump:

① Power supply cable suitable for the unit’s power requirements.

② A By-Pass kit and an assembly of PVC tubing suitable for your installation as well as stripper, PVC adhesive and sandpaper.

③ A set of wall plugs and expansion screws suitable to attach the unit to your support.

④ We recommend that you connect the unit to your installation by means of flexible PVC pipes in order to reduce the transmission of vibrations.

⑤ Suitable fastening studs may be used to raise the unit.

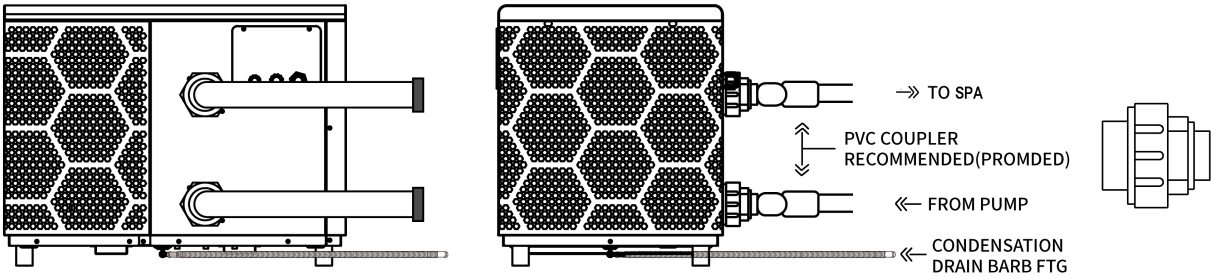
3.3.2 Heat Pump Installation

① The frame must be fixed by bolts (M10) to concrete foundation or brackets. The concrete foundation must be solid; the bracket must be strong enough and anti-rust treated;

② The heat pump needs a water pump (Supplied by the user). The recommended pump specification-flux: refer to Technical Parameter, Max. lift ≥10m;

③ When the heat pump is running, there will be condensation water discharged from

the bottom, please pay attention to it. Please insert the drainage tube(accessory) into the hole and clip it well, then connect a pipe to drain off the condensation water.Install the heat pump, raising it at least 10 cm with solid water-resistant pads, then connect the drainage pipe to the opening located under the pump.



3.3.3 Location and Space

Please comply with the following rules concerning the choice of heat pump location.

① The unit'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 unit.

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

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

⑤ Check that the unit 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 unit for servicing and maintenance operations.

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

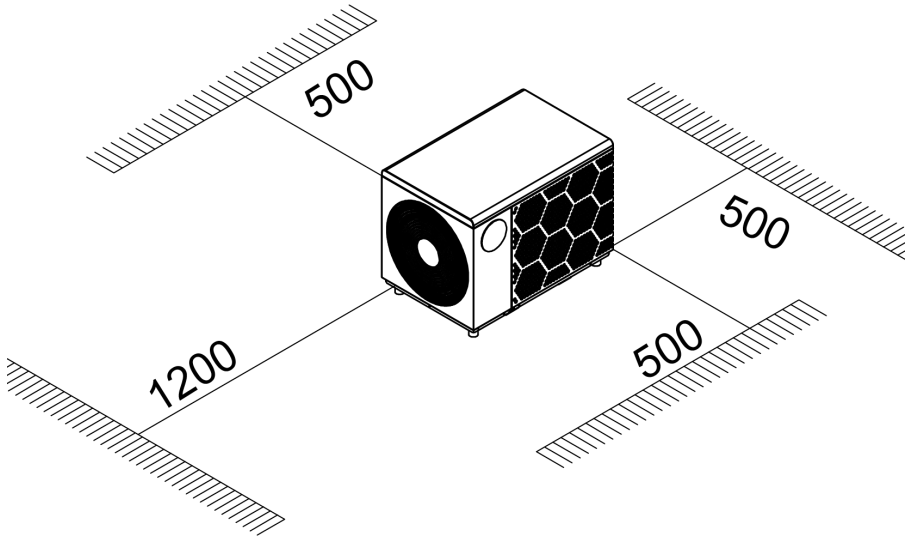
⑦ To prevent mud splashes, do not install the unit near a road or track.

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

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

⑩ Installation space:

Unit: mm



Do not put anything less than one meter in front of the heat pump.

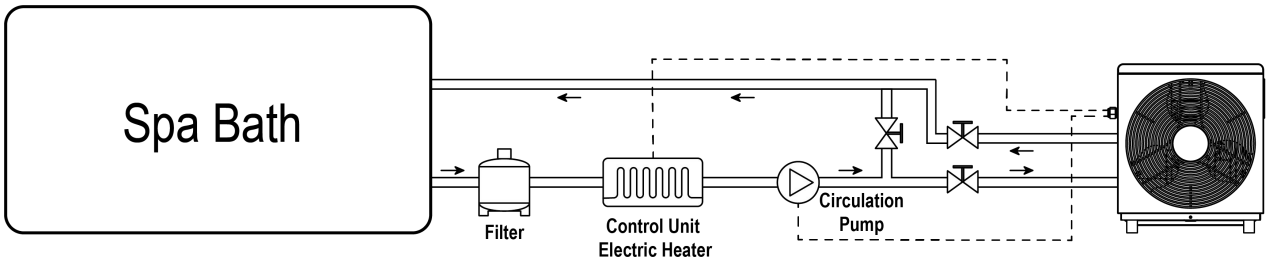
Leave 500 mm of empty space on the sides and back of the heat pump and free ventilation above

Do not leave any obstacles above or in front of the device!

3.3.4 Installation Layout

Notice:The filter must be cleaned regularly to ensure that water in the system is clean and avoid blocking of filter. It is necessary that drainage valve is fixed on the lower water pipe. If the unit is not running during winter months, please disconnect power supply and let out drain water from unit through drainage valve. If ambient temperature of running unit is below 0℃, please keep water pump running.

The installation diagram is shown in the following figure:



3.3.5 Electrical Installation

To function safely and maintain the integrity of your electrical system, the unit 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 heat pump 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 unit’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 heat pump’s compressor will not work.

⑤ In places open to the public, it is mandatory to install an emergency stop button close to the heat pump.

Model	Power Supply Wires		
	Electricity Supply	Cable Diameter	Specification
WSH-007	220-240V~/50Hz	3G 2.5mm²	AWG 14

3.3.6 Electrical Connection

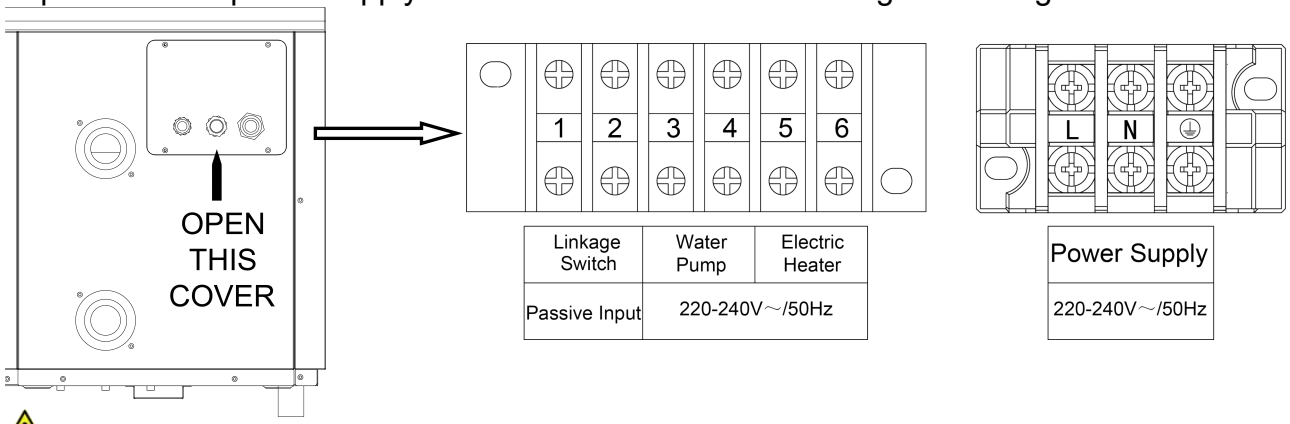
⚠ **WARNING:**Power supply of heat pump must be disconnected before any operation.

Please comply with the following instruction to connect heat pump.

Step 1: Detach electrical side panel by a screwdriver to access electrical terminal block.

Step 2: Insert cable into heat pump unit port.

Step 3: Connect power supply cable to terminal block according to the diagram below.



⚠ **WARNING: The maximum power of external electric heater is 3 kW.**

3.4. Trial After Installation

⚠ **WARNING:**Please check all the wiring carefully before turning on the heat pump.

3.4.1. Inspection Before Trial Running

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

☐	Correct unit installation
☐	Power supply voltage is the same as unit rated voltage
☐	Correct piping and wiring
☐	Air inlet & outlet port of unit is unblocked
☐	Drainage and venting is unblocked and no water leaking
☐	Leakage protector is working
☐	Piping insulation is working
☐	Ground wire is connected correctly

3.4.2. 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 unit at setting temperature;

Step 4:Items need to be checked during running test:

① During the first running, unit 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 heating circulation system;

⑤ Condensate drain is normal or not;

⑥ Are there any abnormal sound or vibration during running?

4. Remoter controller operation guidance

4.1. Control Panel Diagram

Basic Icons

Symbol	Name	Symbol	Name	Symbol	Name
	On-off		Heating Mode		Fault
	Mode		Cooling Mode		Silent Mode
	Up		Defrosting		Smart Mode
	Down		Wifi		Powerful Mode
	Set		Key Lock		

4.2. Key Operating Instruction

NO.	Item	Operation Way
1	Lock/Unlock	Press the "  " and "  " keys for 3 seconds in the main interface to unlock /lock the screen.
2	On-off	In the main interface, press and hold the "  " key for 3 seconds to turn on / off.
3	Check Running Parameters	In the main interface, press and hold the "  " key for 3 seconds to enter the unit status parameter query, cooperate with the "  " and "  " keys for parameter browsing, and press the "  " key to exit the parameter query.(See table 1)
4	Choose Mode	In the power on state, long press "  " for 3 seconds to switch the working mode: heating mode and cooling mode.
5	Adjust Temperature	In the power on interface, press "  " or "  " to adjust the current mode setting temperature.
6	Adjust Time	Long press "  " and "  " for 3 seconds to enter the clock setting state. First, the hour flashes, indicating that the hour value of the current time can be adjusted through "  " and "  " keys. Every time you press the "  " key for plus one hour, every time you press the "  " key for minus one hour. If you hold down the "  " key or "  " key, the hours will be incremented or decremented automatically. After setting the hour value, press "  " again; At this time, the minute flashes, indicating that the minute value of the current time can be adjusted through the "  " and "  "key. After setting the minute value, press "  " again to finish.

NO.	Item	Operation Way
7	Adjust Timing	Press "  " for 3 seconds to enter the timing setting: Enter timing selection,the hour of "Timing On 1" will flash ,collect "  " and "  "can set hour; Click "  " again to switch to the minute of "Timing On 1" ,collect "  " and "  " can set minute; Click "  " again to set "Timing Off 1" in the same way. Other time period setting in turn and so on; Press"  "can Exit and Enter; Back to main interface, it will show the number of scheduled time periods; Cancel timing setting: When the “Timing On” and “Timing Off” are the same, the timer setting of the current time period is canceled.
8	Forced Defrosting	Press the "  "and "  " keys to enter the forced defrost mode. When entering the defrost, showing flashes"  ".
9	Frequency Mode Switch	In the power on interface, press “  ” to switch frequency mode: silent mode, smart mode, powerful mode.
10	Celsius/ Fahrenheit switch	When unit is off ,press "  "and"  " for 3 seconds in main interface to switch Celsius/Fahrenheit
11	Turn on Electric Heater Manually	Long press "  " for 3 seconds in main interface to turn on/off the electric heater function.
12	Restore Factory Settings	In the shutdown state, hold down the "  " + "  " + "  " +"  "button for 3 seconds to restore factory Settings by wire control. In this case, the buzzer will ring twice, and all parameter values will change to default values.

4.3. System Status Parameter Query

Code	Meanings
A01	Water inlet temperature
A02	Water outlet temperature
A03	Ambient temperature
A04	Exhaust temperature
A05	Suction temperature
A06	Heating coil temperature
A07	Cooling coil temperature
A08	Main EEV Steps
A09	Reserved
A10	Compressor current
A11	IPM temperature
A12	DC bus voltage value
A13	Actual speed of compressor
A14	DC fan speed

4.4. Trouble Shooting

● **Fault code and solution**

In the running process of unit, the unit may be faulted if the following code is displayed, please turn off power switch of the unit and turn on power switch of unit again after 30 seconds. The code is no longer displayed, that means the unit could be used again. If the code is displayed again, please contact our company for trouble shooting!

Code	Description	Reservations
Er 03	Water flow protection	Check water flow switch, change the switch if necessary
Er 04	Winter anti-freezing	Water pump will run automatically for first grade antifreeze
Er 05	High pressure protection	Measure the pressure value when heat pump is heating(cooling), if it's higher than 44.0 bar, it means that the heat pump is under higher pressure protection: 1. Detect EEV step, low pressure and suction temp; 2. Detect the inlet/outlet water temp,; 3. Maybe there is some air in the refrigeration system; 4.Clean the water exchanger or water filter

Code	Description	Reservations
Er 06	Low pressure protection	(According to actual model) Measure the pressure value when heat pump is heating(cooling), if it's lower than 6 bar, it means heat pump has got really lower pressure protection: 1.Maybe there is some leakage in the refrigeration system; 2.Ambient temp. is too low; 3.There is some blockages on the refrigerant system; 4.Clean the fin heat exchanger.
Er 09	Communication fault between display and PCB	1.Check if the communication connection wire between display and PCB is well . Change or mend the wire if necessary . Check the PCB or display. If damaged, Change the corresponding part .
Er 10	Communication fault of frequency conversion module(alarm when communication between display and PCB is disconnected)	Change PCB.
Er 12	High exhaust temp. protection	1.Replace the compressor exhaust temperature sensor. 2.Reconnect or clean compressor exhaust temperature sensor and wrap it with insulation tape. 3.Replace the controller or PC Board.
Er 15	Water inlet temperature fault	Check the connection, change the sensor if necessary.
Er 16	External coil temperature fault	Check the connection, change the sensor if necessary.
Er 18	Exhaust temperature fault	Check the connection, change the sensor if necessary.
Er 19	DC fan motor fault	1.Check DC fan motor. Change it if damaged. Check output port of DC fan motor on PCB. Change the PCB if there is no output.
Er 20	Abnormal protection of frequency conversion module	Solve it according to the subsidiary error codes in the following table.
Er 21	Ambient temperature fault	Check the connection, change the sensor if necessary.
Er 23	Low outlet water temp protection when cooling	Check the water flow and water system,mend it if necessary.
Er 27	Water outlet temperature fault	Check the connection, change the sensor if necessary.
Er 28	CT over current protection	
Er 29	Suction temperature fault	Check the connection, change the sensor if necessary.
Er 32	High outlet water temperature protection when heating	Check the water flow and water system,mend it if necessary.

Code	Description	Reservations
Er 33	Outdoor coil high temperature protection	Wait for the ambient temperature drops and restart the unit.
Er 42	Internal coil temperature fault	Check the connection, change the sensor if necessary.

E20 fault will display the following error codes at the same time, the error codes will switch every 3 seconds. Among them, error codes 1-128 appear in priority. When error codes 1-128 don't appear, then it will show error codes 257-384 . If two or more error codes appear at the same time, then display error codes accumulation. For example, 16 and 32 occur at the same time, it will show 48.

Code	Parameters Meaning	Fault Solution
1	Compressor Over-current	1. The compressor is temporarily overloaded (for example, liquid compression) 2. The program does not match the compressor 3. The U, V, and W lines of the compressor are inversely connected, and the compressor reverses 4. Compressor wear (lack of oil, liquid compression lead to wear cylinder block)
2	Compressor out of step	1. The compressor is temporarily overloaded (for example, liquid compression) 2. The program does not match the compressor 3. The compressor start pressure difference is too high and low.
8	Compressor phase loss	1. Cables U, V, and W of the compressor are missed or improperly connected 2. The program does not match the compressor 3. The compressor starts too high and low pressure difference
16	DC voltage is too low	1. Check whether the AC voltage is abnormal 2. AC power is suddenly cut off, and the DC voltage will be too low when the converter capacitor is left for the chip to work
32	DC voltage is too high	Check whether the AC voltage is abnormal
257	Communication is abnormal	1. Check whether the communication cable is improperly connected 2. Check whether the baud rate and communication address code are set according to the communication protocol 3. Replace the driving board for testing
258	AC phase loss or CT is disconnected	1. The current transformer on the driving board is damaged during transportation 2. Check whether the current transformer is improperly inserted during production 3. The AC current at the frequency above 40Hz is very small, resulting in abnormal detection of the current transformer

Code	Parameters Meaning	Fault Solution
260	AC over-current or compressor overpower	1. AC over current (currently available for external models with a separate filter board), the load is suddenly too large to reduce the frequency 2. Compressor overpower (combined plate, three-phase 380V, no single filter plate model) the load is suddenly too large to reduce the frequency too late 3. Compressor overpower (combined plate, three-phase 380V, models without separate filter plate) The compressor starts too high and low pressure difference
288	IPM over heat protection	1. The heat dissipation is poor. The condensing fan rotates at a low speed or stops unexpectedly 2. The ambient temperature rises too fast, leading to too late reaction of over-temperature frequency reduction
320	Compressor current protection	1. The compressor is temporarily overloaded (for example, liquid compression) 2. The program does not match the compressor 3. The U, V, and W lines of the compressor are inversely connected, and the compressor reverses 4. Compressor wear (lack of oil, liquid compression lead to wear cylinder block)
384	PFC module over heat protection	1. The heat dissipation is poor. The condensing fan rotates at a low speed or stops unexpectedly 2. The loop temperature rises too fast, leading to too late reaction of over-temperature frequency reduction

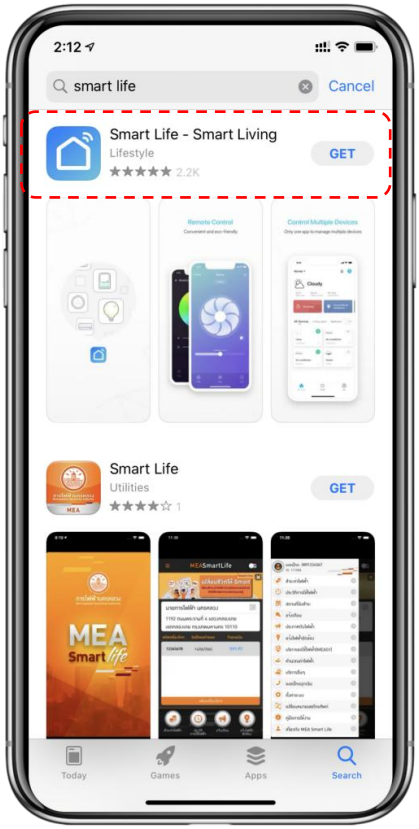
Other Malfunctions and Solutions (No display on LED wire controller)

Phenomenon	Cause	Solution
Unit 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
Unit is not running after starting up	1. Compressor protection time interval is not up 2. Water temperature of the unit does not reach starting up water temperature value	1. Please wait patiently for the end of protection time 2. Normal phenomenon and wait for water temperature to reach
Unit is running normally, but hot water temperature is low	1. Improper temperature setting 2. Large hot water consumption 3. Air inlet port or outlet port of outdoor machine or indoor machine is blocked	1. Set up proper temperature 2. Wait for temperature of hot water to rise 3. Clear tuyere obstruction
Unit is running automatically	Reach timing to start up	Please shutdown manually or cancel timing if needn’t start up

4.5. Wi-Fi Settings

4.5.1 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

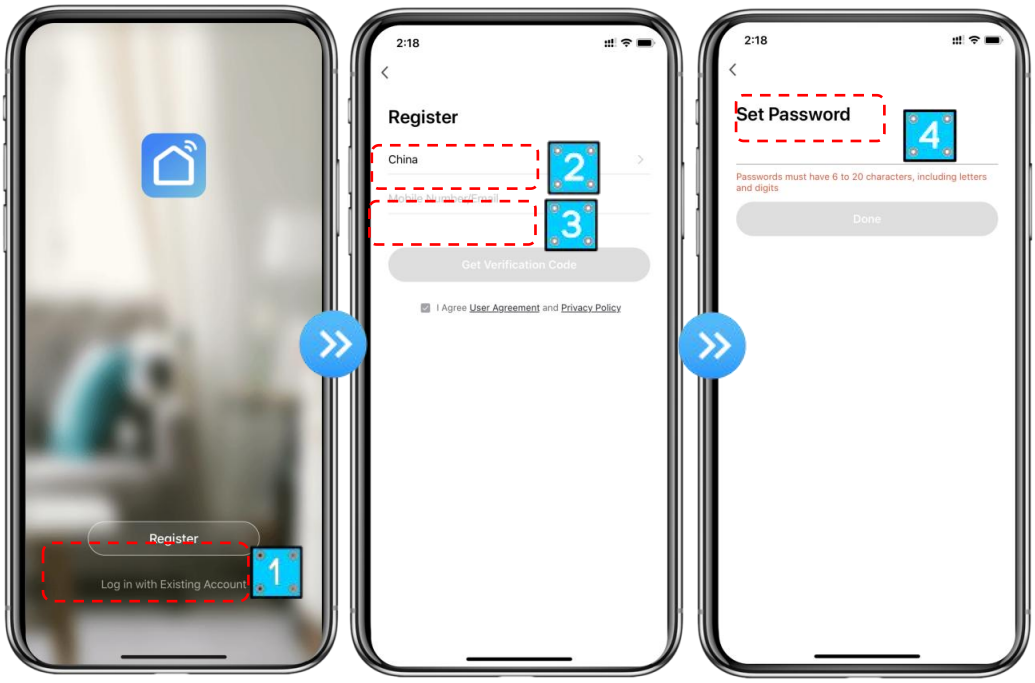
4.5.2 Software Startup

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

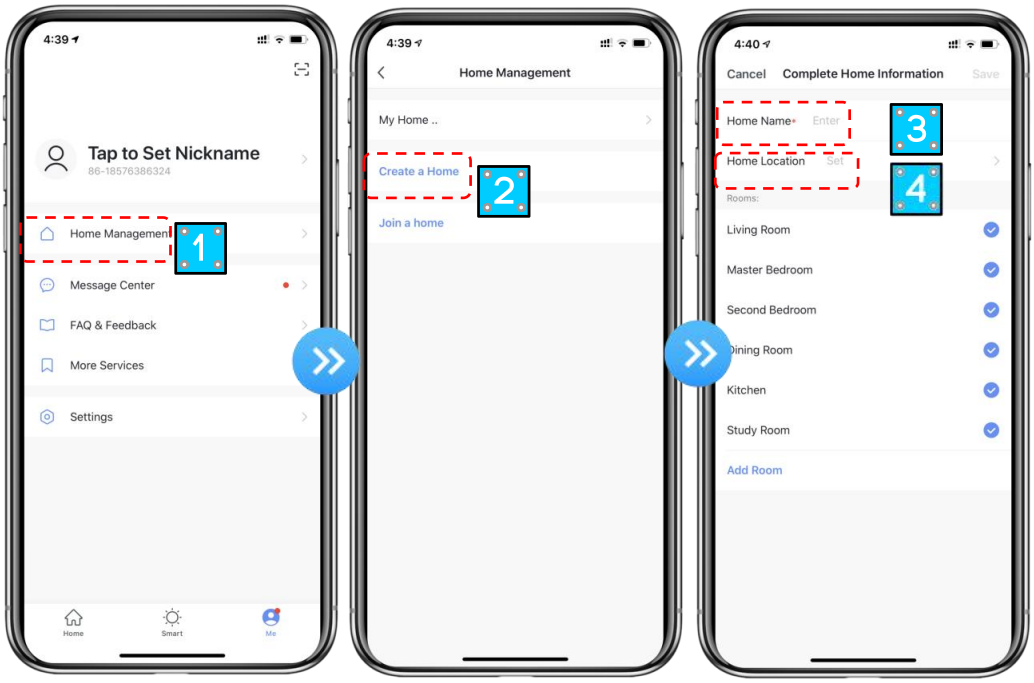
4.5.3 Software Registration and Configuration

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;

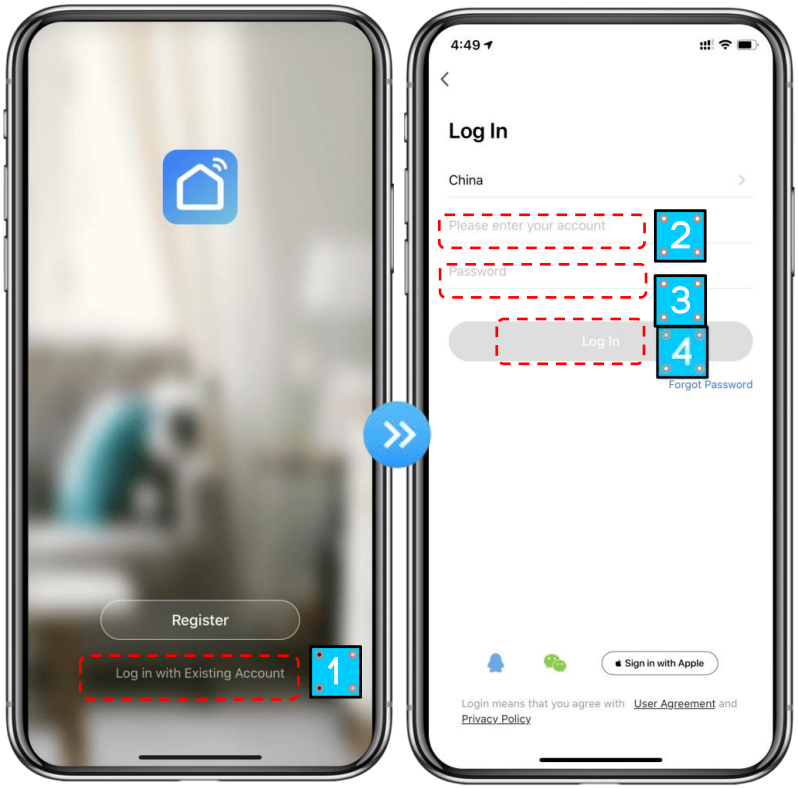


② After registration, you need to Create a Home:Create a Home → Set Home Name → Set Home Location → Add Rooms.

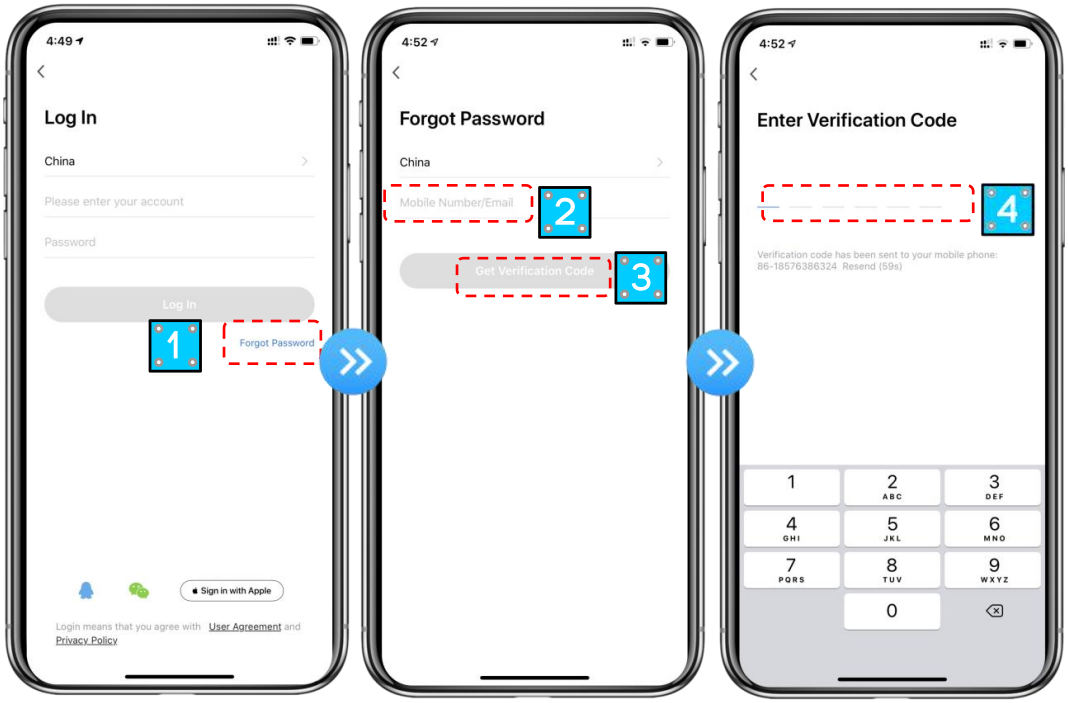


2. Account ID+ Password Login

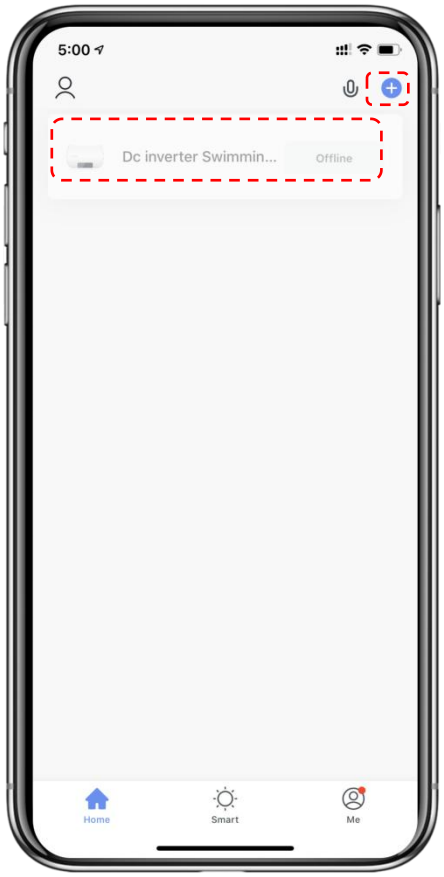
① Existing accounts can be logged in directly, in the following order.



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.



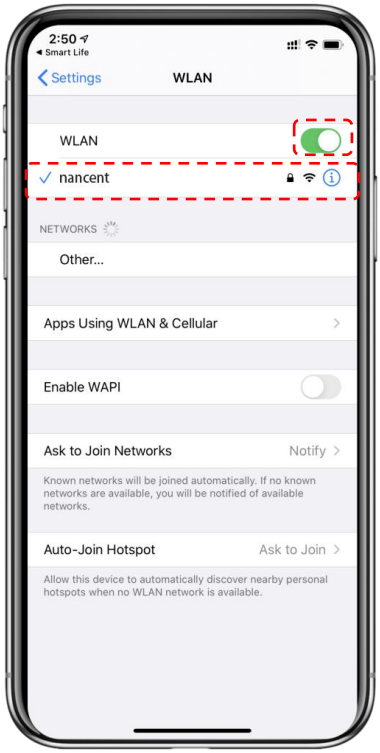
Note:
Click the device to check the status, and you can set the operating mode, ON/OFF, timer.
Click “＋” to add devices.

1. Wi-Fi Module configuration steps:

Method 1
Step 1:

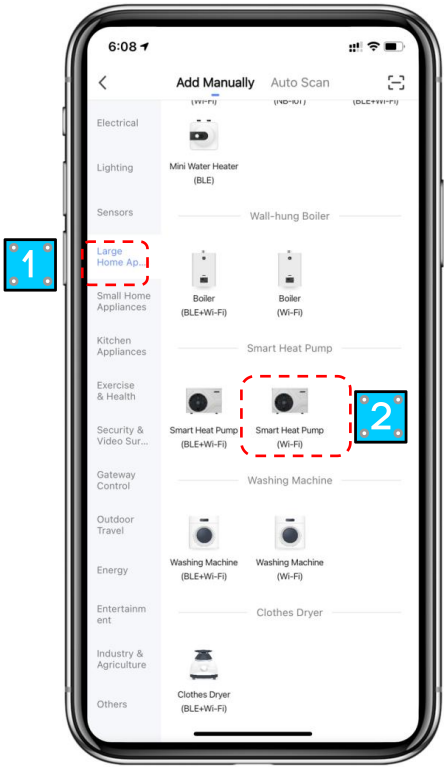
EZ Mode: When power is on, press and hold the "△" and "Ⓜ" keys at the same time for 3 seconds to enter the distribution network. The "" icon will flash rapidly;.

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:

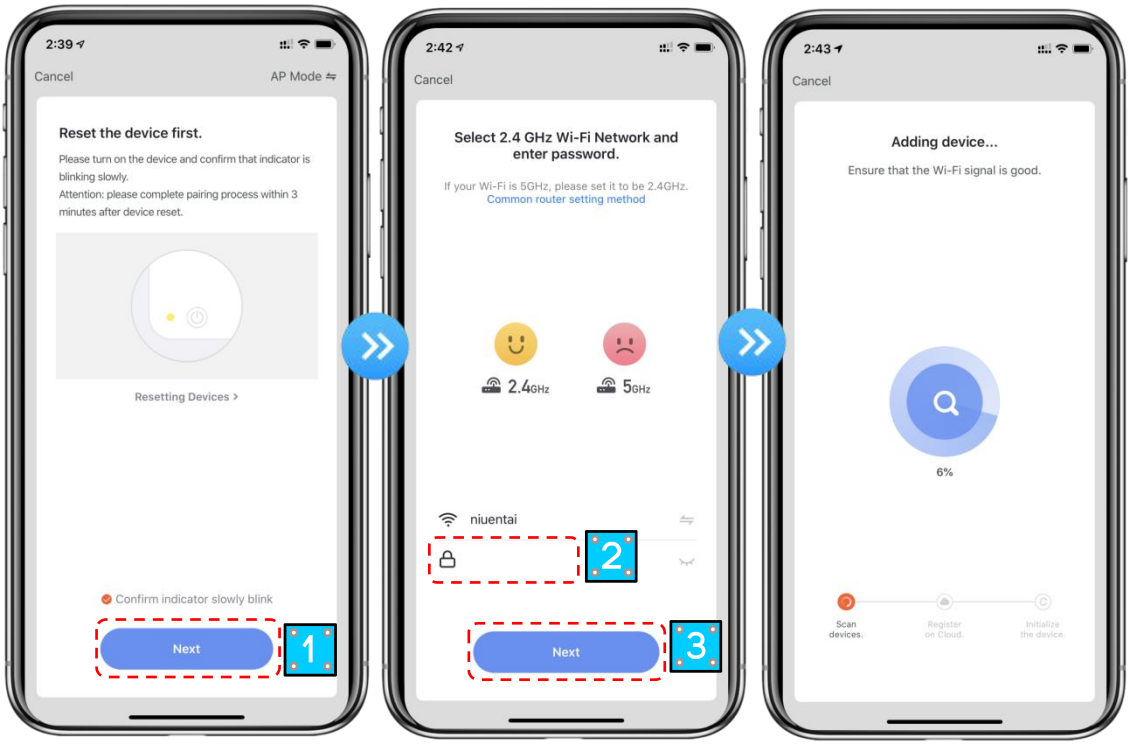
Open the "smart life" APP, log in into the main interface, click on the top right corner "+" or "add equipment" of the interface, enter the equipment type selection, the "Large Home Appliances" , select "Smart Heat Pump" equipment and add equipment into the interface.



Step 4:

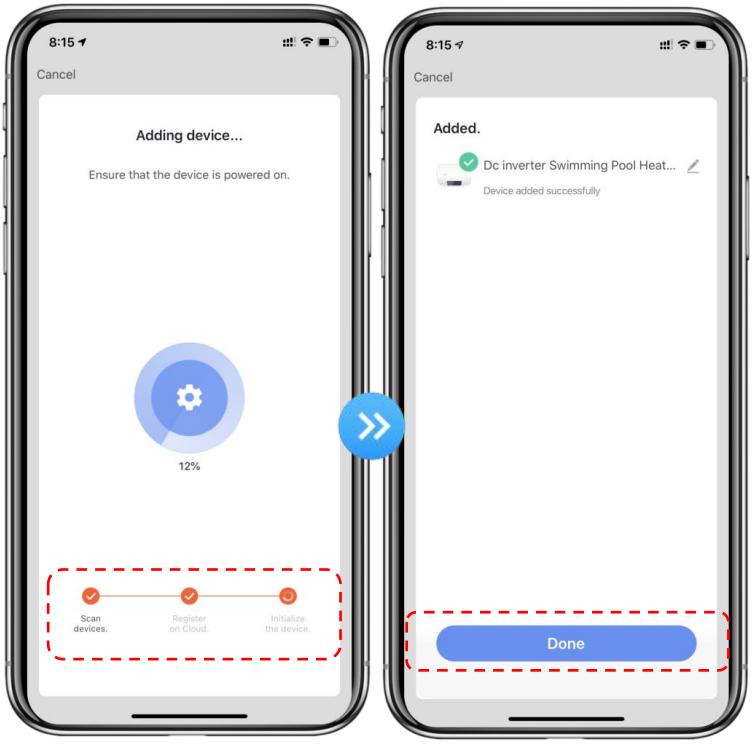
After selecting "Smart Heat Pump", enter the interface of "Add Equipment", and confirm that the wire controller has selected the EZ mode. After the indicator light under "  " flashes rapidly , click" Confirm indicator rapidly blink ".

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.



Method 2

Step 1

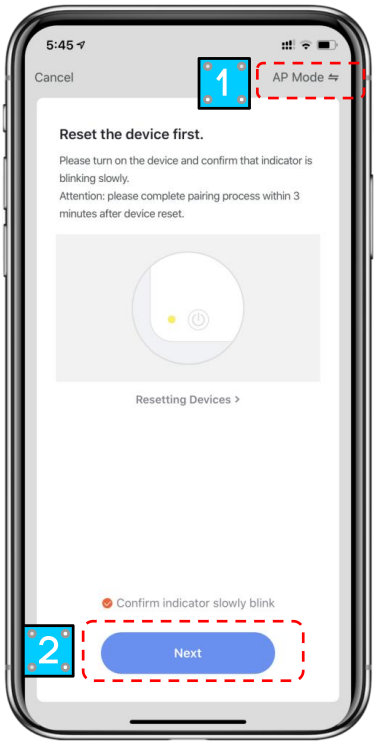
AP Mode: Press and hold the "▽" and "⏻"keys at the same time for 3 seconds to enter the distribution network. The "📶" icon will flash slowly.

Step 2&3

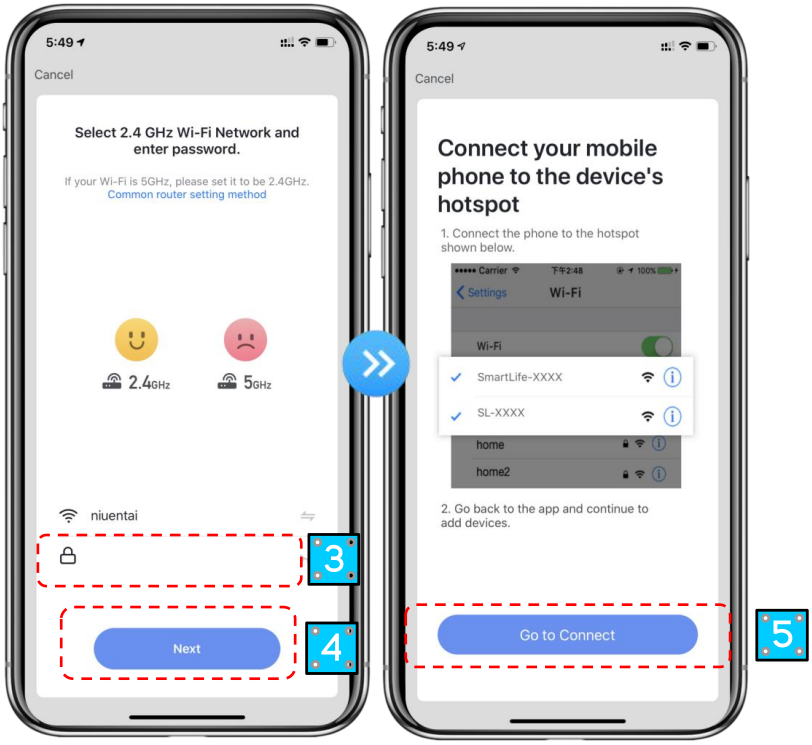
Same with EZ Mode above.

Step 4

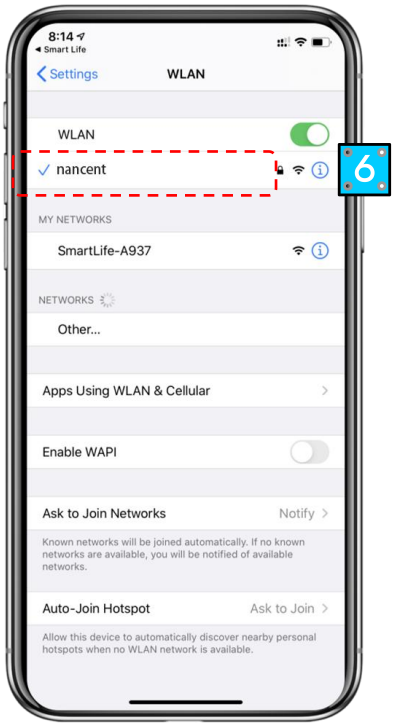
After entering the add device interface, click "EZ Mode" in the upper right corner; Enter the AP mode to add the device interface, confirm that the AP mode has been selected, and click"Confirm indicator slowly blink".



The interface of Wi-Fi connection will pop up, enter the Wi-Fi password of the mobile phone (it must be the same as the Wi-Fi of the mobile phone), click "Next", "Connect your mobile phone to the device's hot spot" will pop up, and click "Go to Connect";



Enter the mobile phone Wi-Fi connection interface, find the “Smart Life_XXXX” connection, and the APP will automatically enter the device connection status.



Step 5 : Same as EZ mode above.

Note: If the connection is failed, please enter the AP mode manually and reconnect according to the above steps.

4.5.4 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.

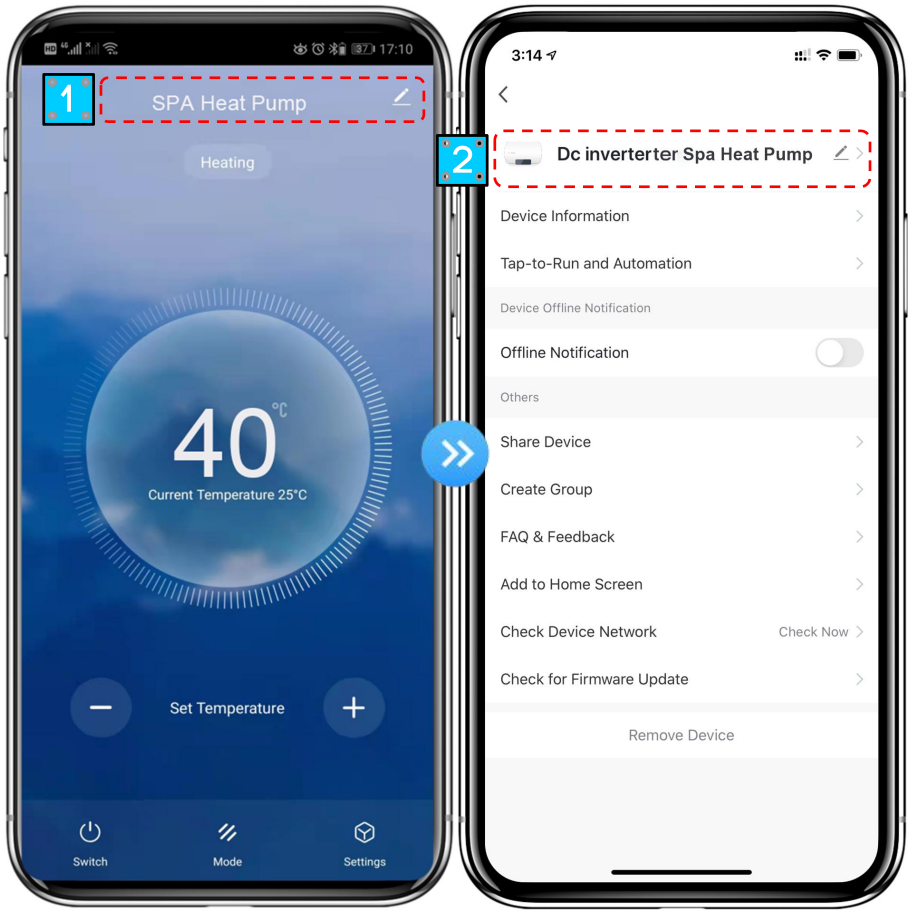
⑥ Mode switching: Click to select the mode to be switched.

⑦ ON/OFF

⑧ Timing: Click to add timing off/on time.

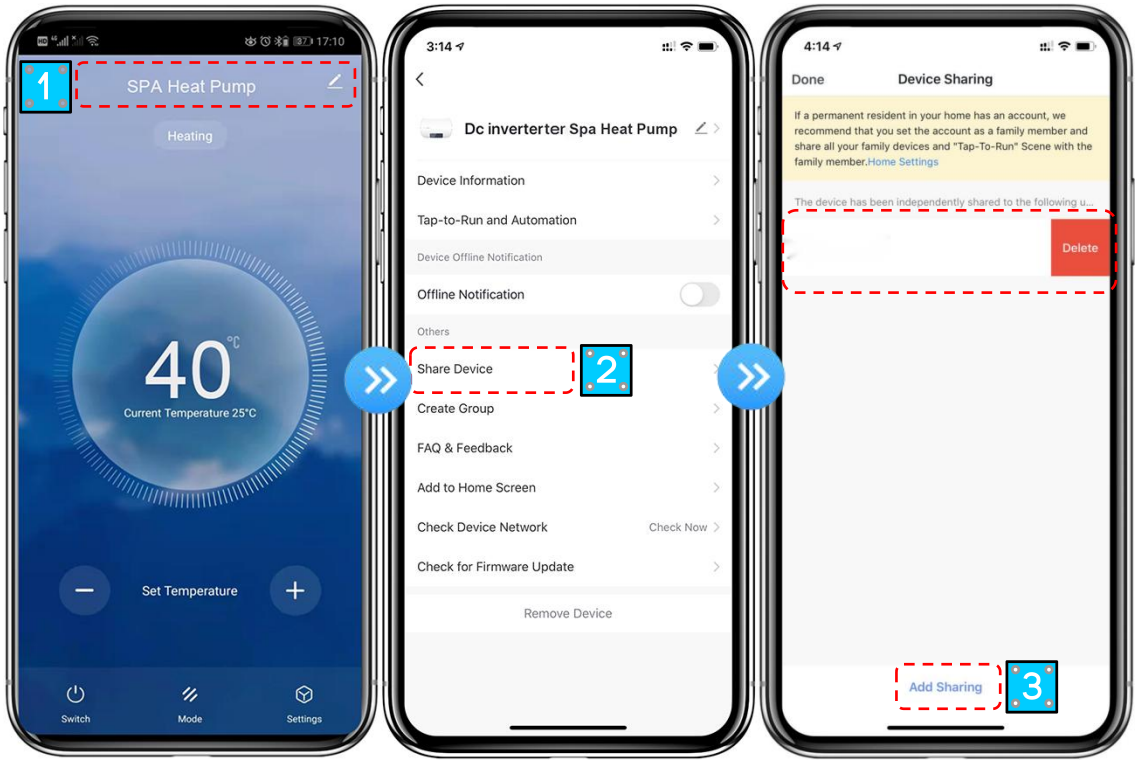
● **Modify device name**

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

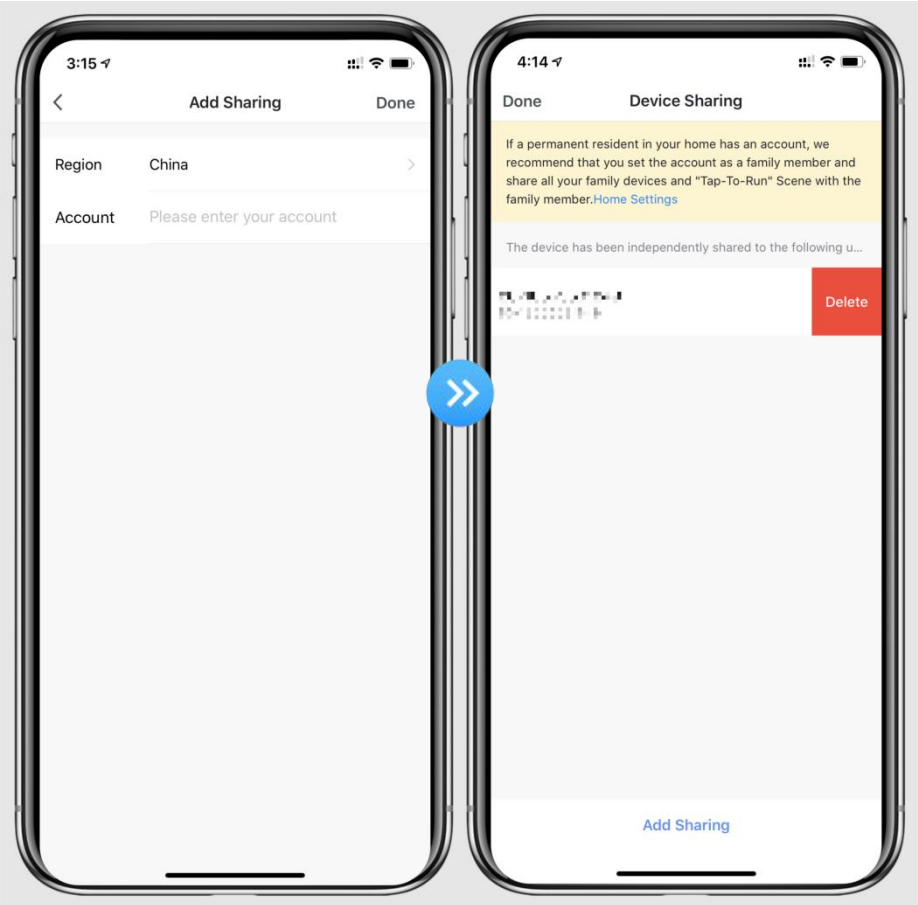


● **Device sharing**

- 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.



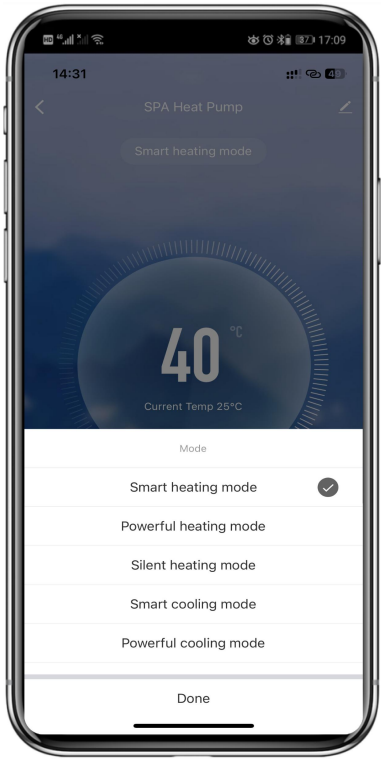
◆ Enter the account of the shared, click "Done", and the share success list shows the newly added account of the Shared.



◆ 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**

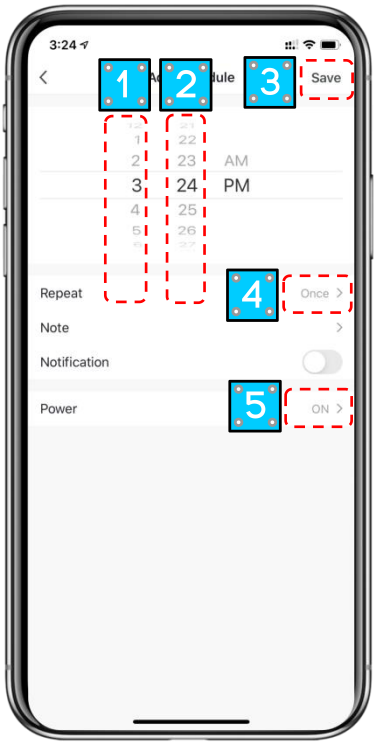
Click “ ” on the main interface to switch modes,select what you need.



● **Timer setting**

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

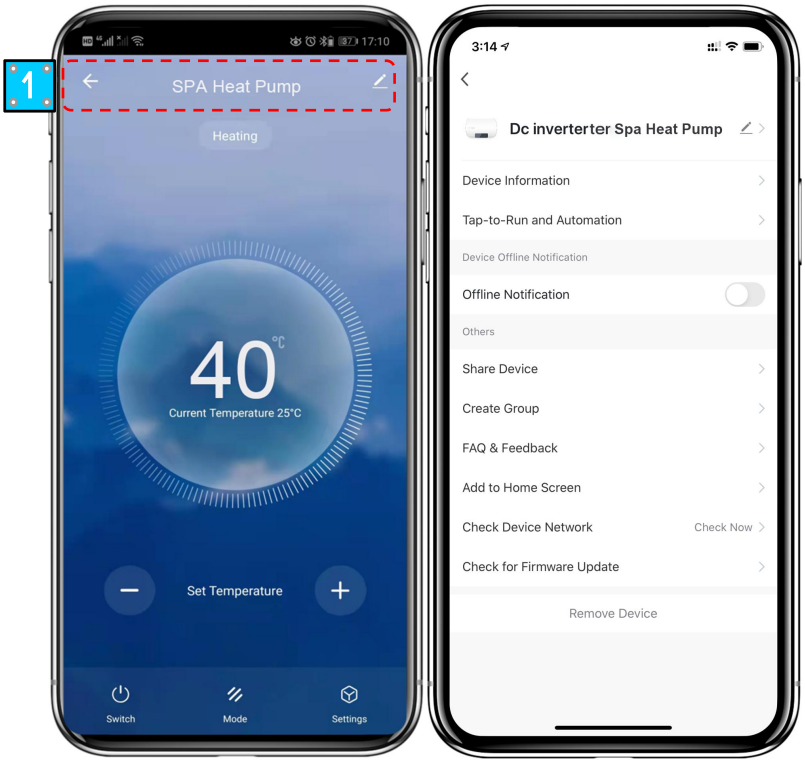
1. After entering timer setting, swipe up/down to set timer,set up repeat weeks and on/off,then click “save” to save your settings as follows.



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

4.5.5 Device Removal

Click “ ” on the top right corner of the main interface to enter the device details interface, and click “device removal” to enter EZ mode. 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:**Before undertaking maintenance work on the unit, 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.

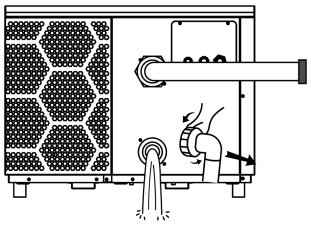
5.2 Winterizing

"CUT OFF" power supply of the heater before cleaning, examination and repairing

In winter season when you don't swim:

a. Cut off power supply to prevent any machine damage.

b. Drain water clear of the machine.



⚠ **!! Important:**

Unscrew the water nozzle of inlet pipe to let the water flow out. When the water in machine freezes in winter season, the titanium heat exchanger may be damaged.

c. Cover the machine body when not in use.

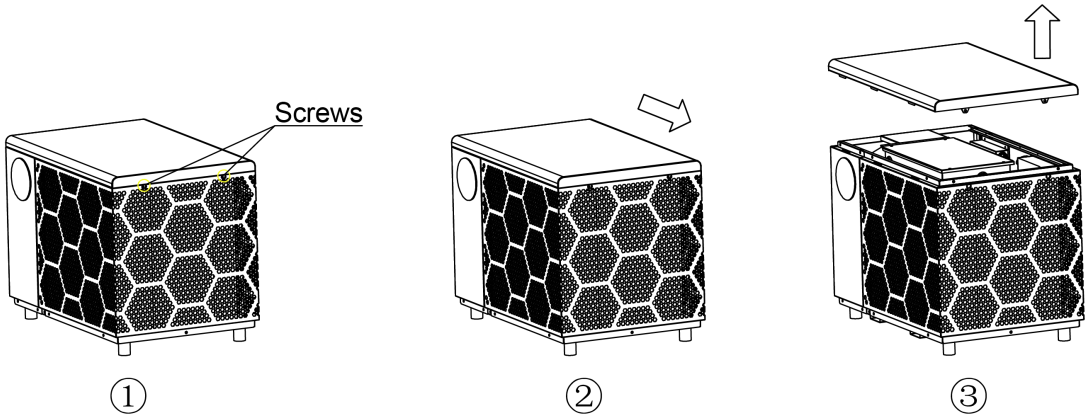
5.3 Disassembly Guidelines

Step 1: Remove the top cover

① Remove the top cover screws;

② Slide the top cover in the direction of the arrow;

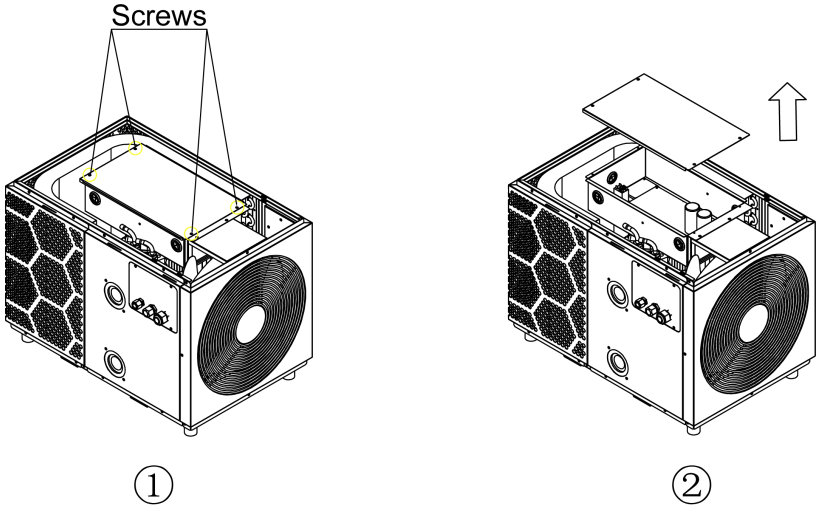
③ Pull out the top cover in the direction of the arrow.



Step 2: Remove the electrical box cover

① Remove the screws of the electrical box cover;

② Take out the electrical box cover in the direction of the arrow.



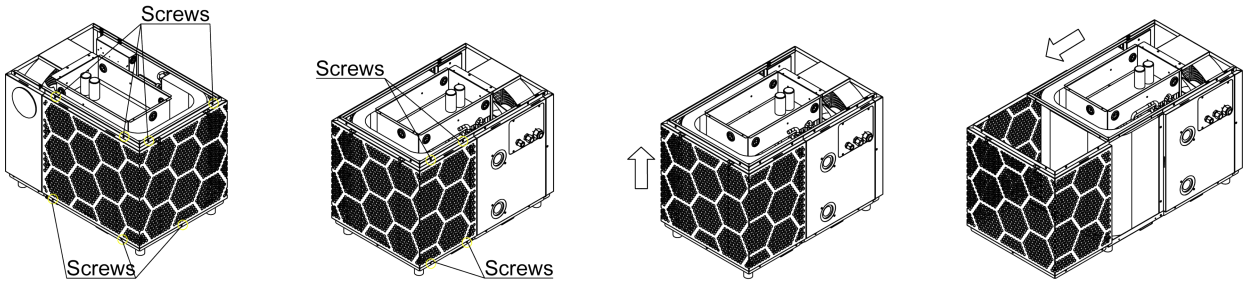
Step 3: Remove the back panel

① Remove a total of 7 screws on the front and right side of the back panel;

② Remove the 4 screws behind the rear panel;

③ Slide out the buckle in the direction of the arrow;

④ Take out the rear panel in the direction of the arrow.

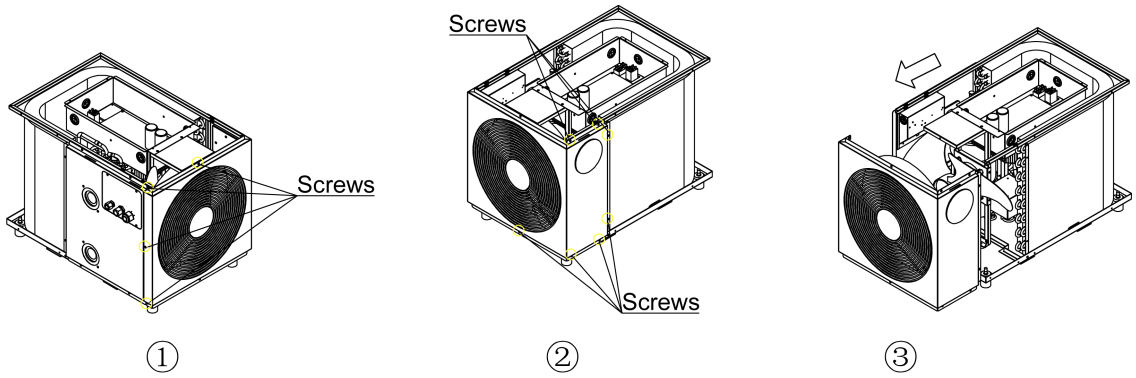


Step 4: Remove the front panel

① Remove the 4 screws on the front panel as shown in the picture;

② Remove the remaining screws on the front panel as shown in the picture;

③Take out the front panel in the direction of the arrow.



Step 5: Remove the nozzle plate and top frame

① Remove the screws of the junction box cover;

② Take out the junction box cover;

③Remove the screws of the nozzle plate;

④ Take out the nozzle plate;

③ Take out the top frame upward.