
Installation & Operation Manual






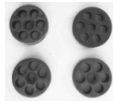

Full Inverter Swimming Pool Heat Pump




iX-7 iX-11 iX-14 iX-17 iX-21 iX25 iX30 iX35


Thank you very much for purchasing our product, please keep and read this manual carefully before you install the heat pump.


Packing List

No.	Name	Qty.	Remark
1	Installation & Operation Manual	1	
2	Wire-controller	1	
3	Wire controller box and sponge pad (to be installed on the heat pump shell)	1	
4	Drain pipe (2 m)	1	
5	Drain-pipe connector	1	
6	Rubber shock absorber	4	
7	Heat Pump Unit (The pipe connector has been installed on the unit)	1	

Please keep installation manual properly, and read it carefully before using.

 The unit must be installed by qualified technicians according to the instructions in this manual.

 **WARNING:** if the unit is installed in locations that are at risk of lightning strikes, lightning protection measures must be provided.

 **WARNING:** if the pool will be winterized (meaning the heat pump will not be used) all water must be drained from the unit during winter, or it could freeze inside the unit causing damage to the internal components.

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1. Accessories

Each unit produced by our factory comes with the following accessories:

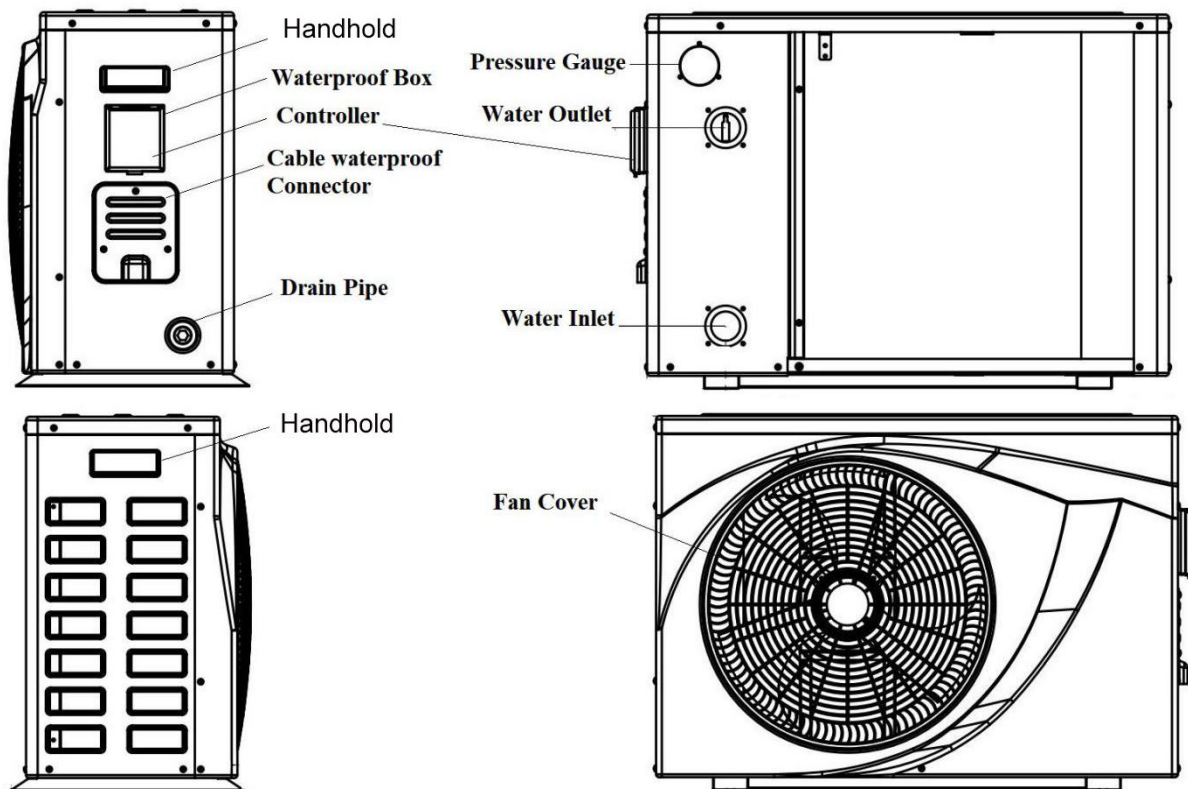
No.	Name	Qty.	Use
1	Installation & Operation Manual	1 PC	User Guide to install the unit
2	Wire Controller	1 PC	Used for the machine operation interface
3	Drain-pipe	1 PC	Used for draining the condensate water
4	Drain-pipe connector	1 PC	To connect the drain pipe to the heat pump
5	Rubber Shock Absorber	4 PCS	To reduce vibration and noise
6	Heat pump unit	1 SET	For heating water

In order for the system to work the following parts are required

No.	Name	Qty.	use
1	Water pump	1	To circulate the pool water
2	Filter system	1	To clean the pool water which passes through the heat pumps
3	Water pipes system	1	To connect the equipment and circulate the water in the pool

NOTE

The types and quantity of the water pipes, valves, filter equipment, sterilizing equipment used for the swimming pool heating/circulation pipe system, will depend on the project design. We do not recommend to install auxiliary electric heaters in the system.



2. Safety

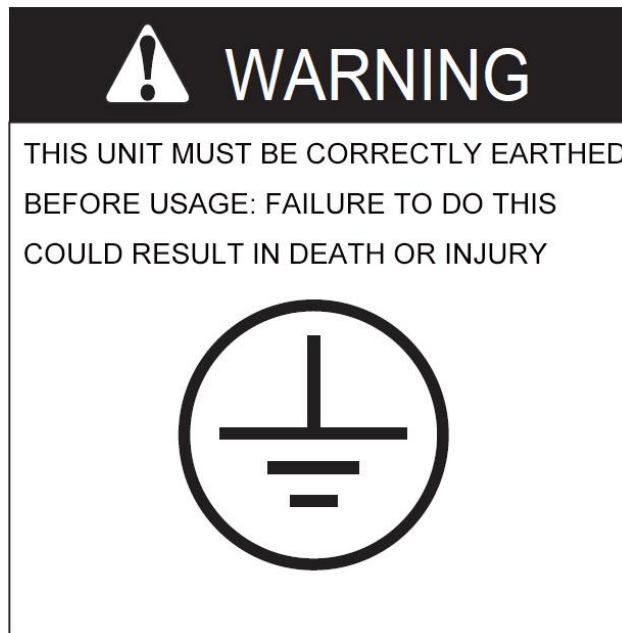
Range of application:

1. Power supply: 220V-240V/1N~50Hz.

2. Ambient temperature: -10°C~ 43°C :

3. Working water temperature: Min. inlet water temperature 8°C. Max. outlet Water Temperature 40°C. If the system is planned to be used with water temperatures that are outside this range, please contact Proteam.

- The installation should be done by qualified technicians to prevent leaking, electric shock or fire.
- Check the ground connection: if this is not done correctly, it may cause electric shock.



When installing the heat pump in a small room, make sure it is well ventilated.

- Don't put fingers or objects into the air inlet or outlet as the rotating fan could cause serious injuries.
- If you smell anything burning, turn off the manual power switch immediately, stop operation and contact the after-sale service department. Continued abnormal operation may cause electric shock or fire.
- When the unit needs to be removed or re-installed, please ensure that the work is carried out by qualified technicians. Incorrect installation may result in damage to the heat pump, electric shock, fire, injury, leakage etc.
- Please ensure that any repairs are carried out by qualified professionals: failure to make proper repairs may result in damage to the heat pump, electric shock, fire, injury, leakage etc.
- Do not install the unit near flammable sources, as any leakages could cause a fire.
- Make sure the base on which the unit is installed is strong enough to support it.
- Make sure a leakage protection switch is installed to prevent electric shock or fire.
- When cleaning the heat pump, stop operation, switch it off and disconnect the power.

3. Heat pump working principle

3.1 Heat pump operation

Heat pumps use heat from the sun by collecting and absorbing energy from the outside air.

This energy is then compressed and transferred to the pool water. Your existing water pump circulates the water through the heat pump, which is normally installed next to the pool filtration system, and the water warms up. The heat pump timer can be set so that the pump operates at the times you want: for example, during daylight hours from 9am to 5pm.

The unit contains a fan that draws in outside air and directs it over the surface of the EVAPORATOR (energy collector). The liquid refrigerant inside the EVAPORATOR coil absorbs the heat from the outside air and becomes a gas.

The warm gas inside the coil passes through the COMPRESSOR, which concentrates and increases the heat to form a very hot gas, which then passes through the CONDENSER (water heat exchanger). It is here that the heat exchange occurs as the heat from the hot gas is transferred to the cool swimming pool water circulating through the heat exchanger.

The pool water becomes warmer and the hot gas returns to its liquid form as it flows through the CONDENSER coil. The gas then passes through the Electronic Expansion Valve and the whole process begins again.

Developments in heat pump technology mean that today heat pumps can efficiently collect heat from the outside air even when the temperature is as low as 7-10°C. This means that for tropical and subtropical climates the pool can be maintained between 26°C and 32°C.

3.2 Air source heat pump working principle

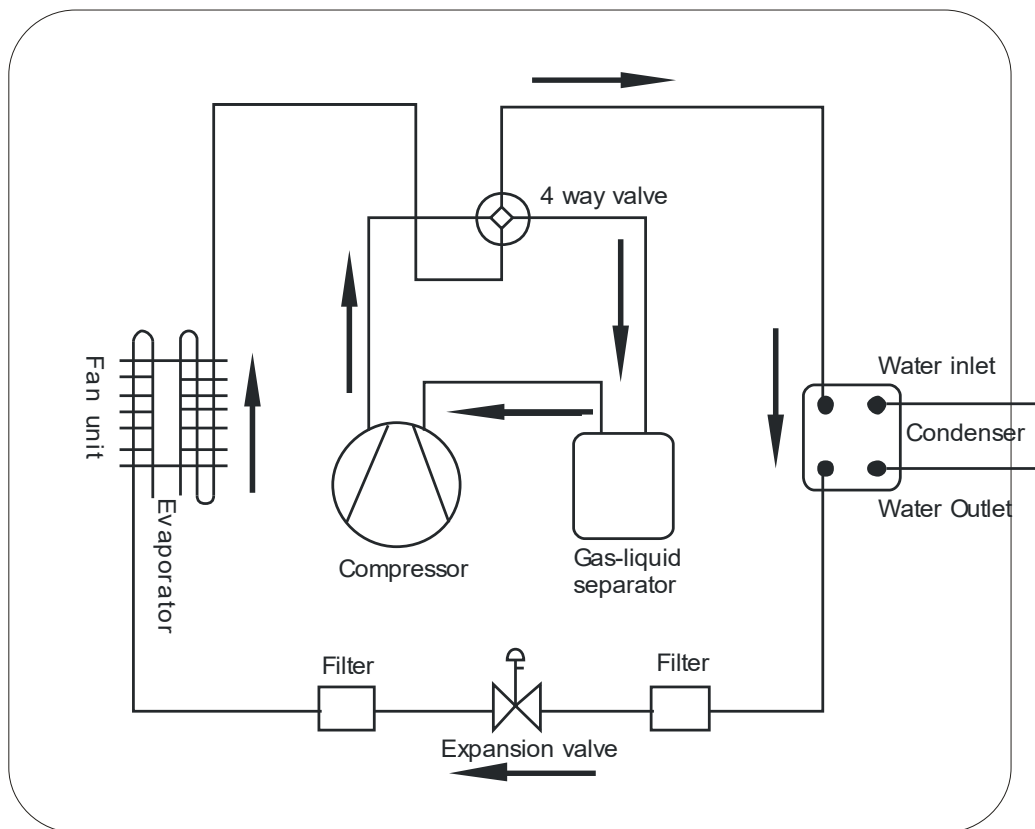


Figure 1

$$Q_c \text{ (Heat energy)} = Q_a \text{ (Compressor consumption)} + Q_b \text{ (Heat energy absorbed from ambient environment)}$$

4. Installation of the unit

4.1 Installation Guidelines

- Do not install in locations containing mineral oil.

-
- Do not install in locations where the air contains salt or other corrosive gases.
 - Do not install in locations with serious power supply voltage fluctuation.
 - Do not install in unstable places (without a firm supporting base), such as a car or cabin.
 - Do not install near flammable items.
 - Do not install in locations with strong electromagnetic forces.
 - Do not install in locations with harsh environmental conditions.

4.2 Installation check

- Check that the model, number, name etc, are correct.
- Make sure there is enough space for installation and maintenance/servicing.
- Install in a dry, well-ventilated place and make sure there are no obstructions around the air inlet and outlet.
- Make sure the supporting base is strong enough and prepared correctly to avoid shocks.
- The power supply and diameter of the cables used must be in accordance with the electrical installation requirements.
- Electrical installation must comply with the relevant technical standards in the country of operation, and electrical insulation work must be done.
- The unit must be in an upright position (normal running position) for at least eight hours before running.

4.3 Installation space

Please observe the space requirements indicated below for optimal operation and maintenance.

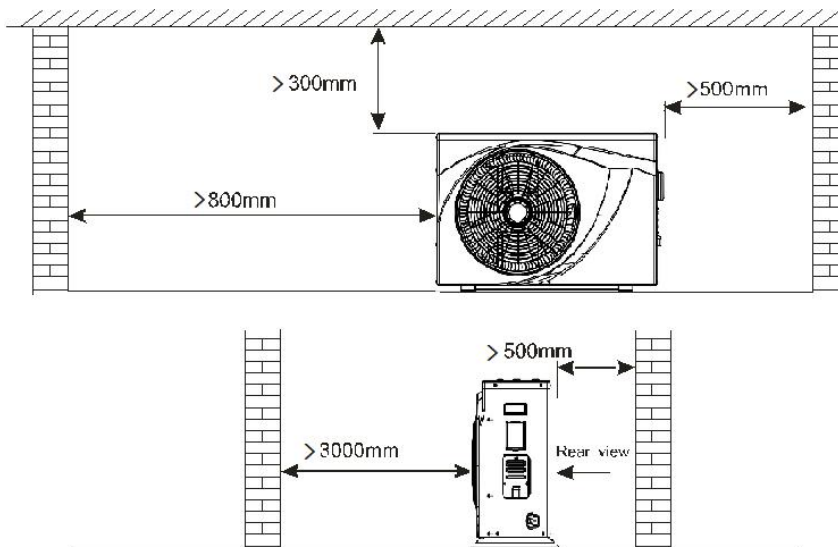


Figure 2. Horizontal installation space requirements (mm)

4.4 Heat pump dimensions

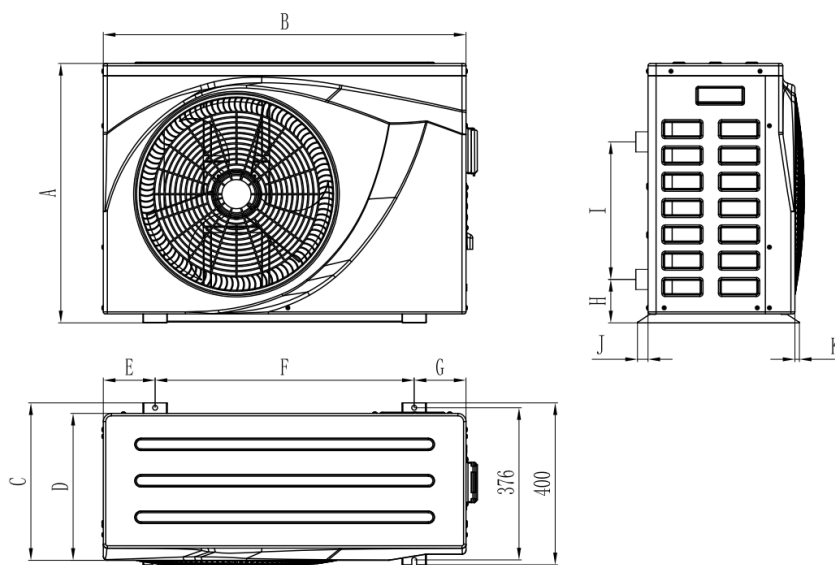
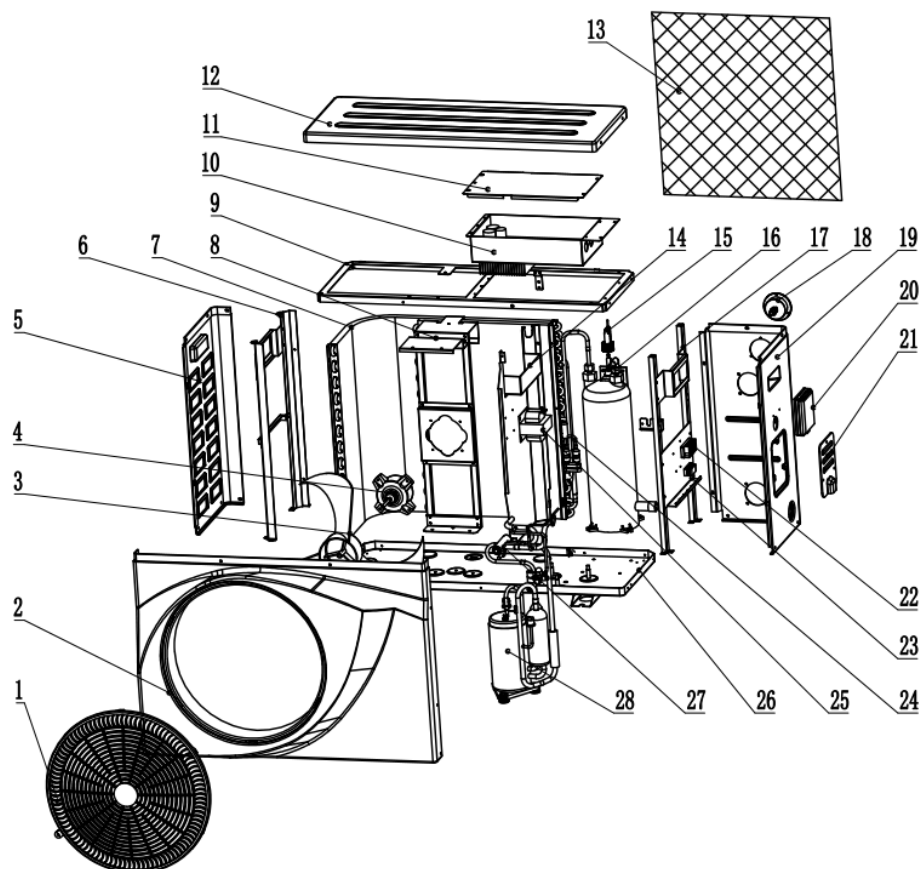


Figure 3. Heat pump dimensions iX-07 / iX-11 / iX-14 / iX-17 / iX-21 / iX-25/iX-30/iX-35

	A	B	C	D	E	F	G	H	I	J	K
iX-07 / iX-11	591	836	379	335	98	640	98	107	290	26	11
iX-14 / iX-17 / iX-21	641	896	389	363	128	640	128	107	340	26	11
iX-25/iX-30/iX-35	738	1084	445	401	187	710	187	102	440	27	17

4.5 Exploded view



	Parts		Parts
1	Protection grill for fan	15	Water flow switch
2	Front panel	16	Titanium heat exchanger
3	Fan blade	17	Right frame/support
4	Fan motor	18	Manometer/Pressure Gauge
5	Left panel	19	Right panel
6	Left frame/support	20	Controller
7	Evaporator	21	Electrical terminal cover
8	Fan-motor mounting bracket	22	Electrical terminal block

9	Upper frame	23	Electrical cable support
10	Electrical box	24	Electronic expansion valve
11	Electrical box cover	25	Reactive resistance
12	Top cover/panel/lid	26	Bottom panel
13	Plastic net	27	Four-way valve
14	Central bracket	28	Compressor

4.6 Installation base for heat pump

Please refer to Figure 4.

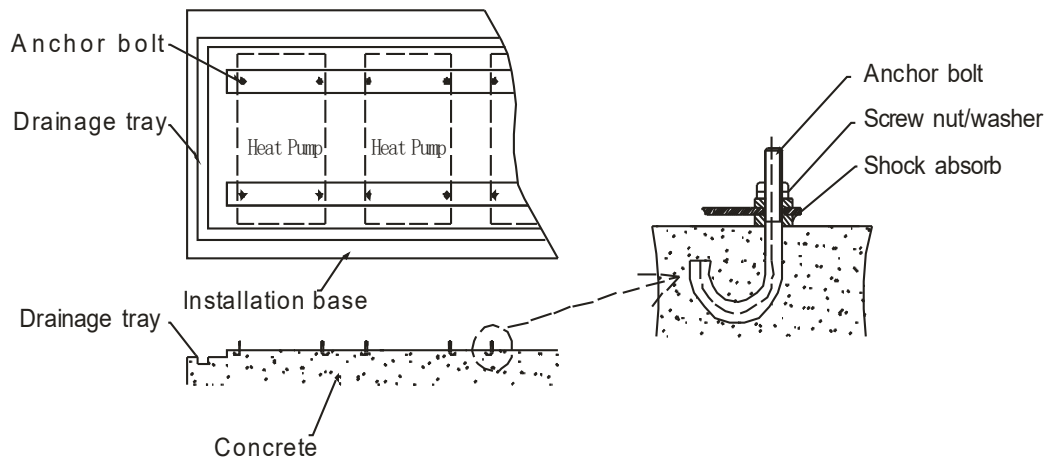


Figure 4 Installation base

4.7 Lifting

- Use four or more soft lifting belts to move/carry the units (see Figure 5).
- Use protective plates on the surface of the units when handling to avoid scratches and deformation.

-
- Double-check that the support base is strong enough before fixing the unit.
 - The heat pump will produce condensation water: remember to provide a drainage channel when making the installation base.
 - Please install the shock absorbers provided on the surface of the base (under the feet of the unit).

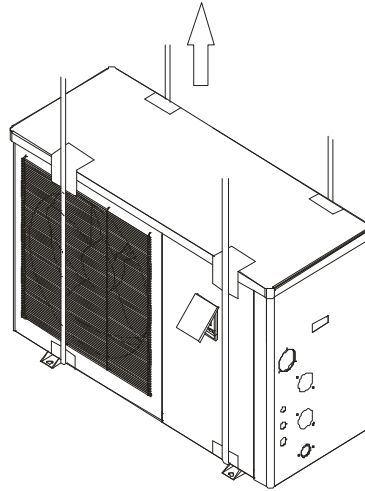


Figure 5 Lifting diagram

5. Installation of pipes

5.1 Attention

- Prevent air, dust and other material from going into the water pipes.
- Fix the whole system before installing and connecting the water pipes.
- Water inlet and outlet pipes should be protected by an insulation layer.
- Make sure that there is a stable water flow to prevent excessive throttling.
- Do not handle, move or lift the unit by holding the water inlet and outlet pipes: use only the holes on the base (see Figure 5)
- When connecting the water inlet and outlet pipes, use two pipe wrenches to adjust the two connecting parts of the pipes; make sure the water inlet and outlet pipes do not twist (see Figure 6).

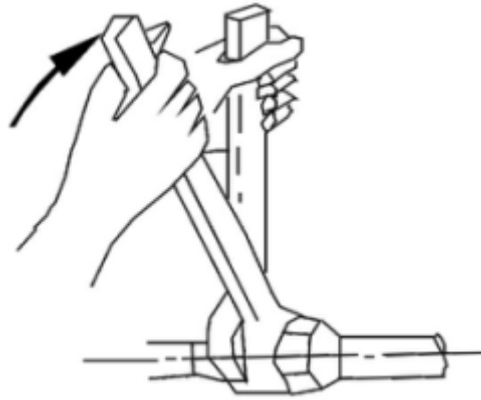


Figure 6

5.2 Instructions

5.2.1 Symbols

Valve	Filter	Flexible connection	Check valve	Pump	Air valve	Pressure gage	Flow switch	Feeding tank	Flared joint	Hair collector	Sand Filter	Chemical dosing system

5.2.2 Pipeline installation diagram

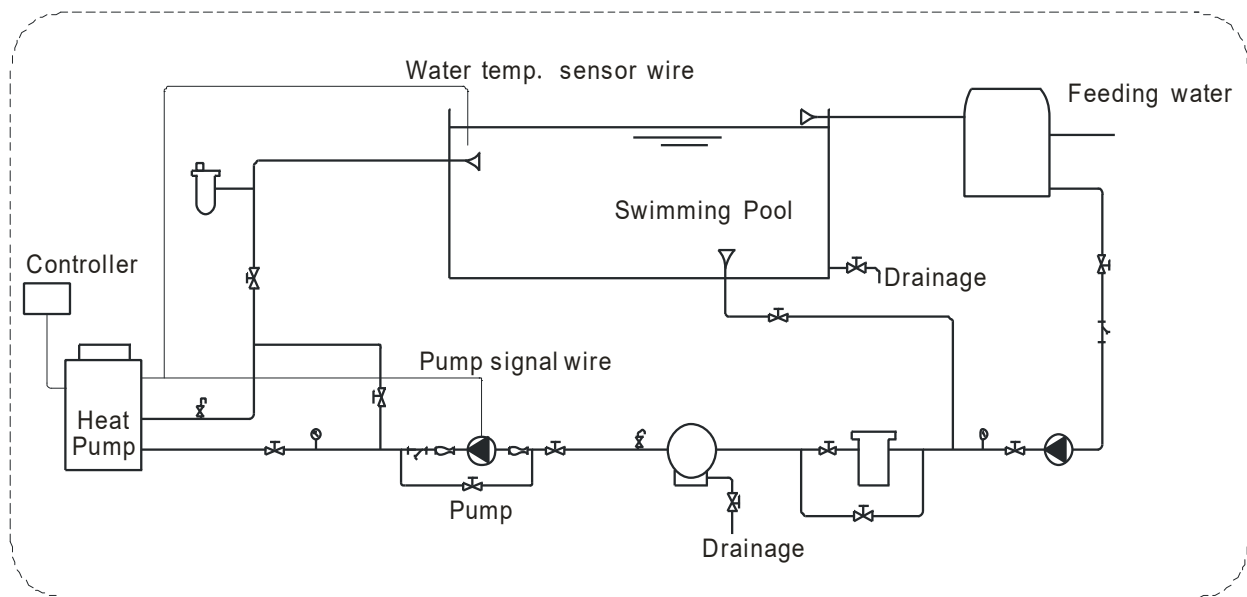


Figure 7 Diagram (Single unit for reference)

- It is recommended to install a one-way valve for each unit to prevent water back flow.
- Multiple units can be installed as part of a system, but each unit should be controlled independently.
- All pipes and valves should be insulated.

5.2.3 Connection sizes

Model No.	Inlet	Outlet
iX-7 / iX-11 / iX-14 / iX-17 / iX-21 / iX-25 / iX-30 / iX-35	DN50	DN50

- The pipe pressure and flow rate should be calculated before selecting the diameter of the pipe, pressure drop range is 0.3~0.5 kgf/cm²(3~5m) head pipe flow rate range is 1.2~2.5 m/s.
- The hydraulic calculation should be made after selecting the pipe diameter. If the resistance is more than the pump head, then a more powerful pump or larger pipes are required.

5.2.4 Required Water Quality

- Bad quality water will produce more lime scale and sand: this kind of water should be filtered and demineralized.
- The water quality should be analyzed before operating the unit: PH value, conductivity, chloride ion

concentration and sulphate ion concentration should be checked.

●Acceptable water quality shown below:

PH value	Total hardness	Conductivity	Sulphate ion	Chlorine ion	Ammonia ion
7~8.5	< 50ppm	<200 μ V/cm(25°C)	None	< 50ppm	None
Sulfate ion	Silicon	Iron content	Sodium	Ca	
< 50ppm	< 50ppm	< 0.3ppm	No requirement	< 50ppm	

● Suggested filter mesh = 40.

6.Installation of optional accessories

6.1 Selection of the water pump

●The circulation pump is required for the system to operate, there is a terminal connection for the pump (single phase)

NOTE 

For single-phase pumps, please check the wiring diagram.

●Head of circulation pump = height difference between water level and main unit + total pipeline resistance (determined by the hydraulic calculation) + pressure loss of main unit (see nameplate on heat pump).

NOTE 

Multiple units installed in parallel place more demand on the water pump requirement.

6.2 Water pipe selection

- The selection of the water pipe should be based on the actual system specifications
- The flow switch can be installed horizontally or vertically. If installed vertically, the direction of the water flow must be upwards and NOT downwards.
- The flow switch must be installed on a straight pipeline, and there must be more than five times the length

of the pipe diameter on either side of the flow switch (see Figure 8 below). The direction of fluid must follow the arrow on the controller. The terminal block should be installed in a position that is easy to operate.

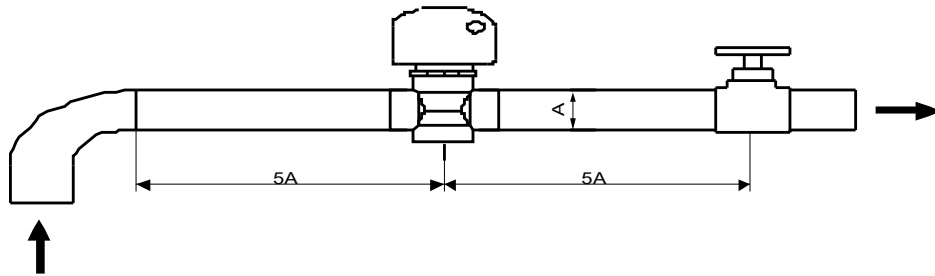


Figure 8

7. Installation of electrical devices

7.1 Electrical wiring

- The unit should have a dedicated power supply in accordance with the recommended voltage.
- Unit power supply circuit must have an effective external grounding.
- Wiring and electrical connections must be made by qualified professionals in accordance with the wiring diagram.
- Power line and signal line layout should be neat and cables should not interfere with each other.
- Do not install the units if the power supply specifications are not met.
- After all wiring connections have been completed, check them again carefully before switching on the power.

7.2 Electrical Wiring Specification

Model	Cable Size
iX-7 / iX-11	3*1.5 mm ²
iX-14 / iX-17	3*2.5 mm ²

iX-21 / iX-25 / iX-30	3*4 mm ²
iX-30T	5*2.5 mm ²
iX-35	3*6mm ²
Terminal	Terminal cable max. 4 mm ²

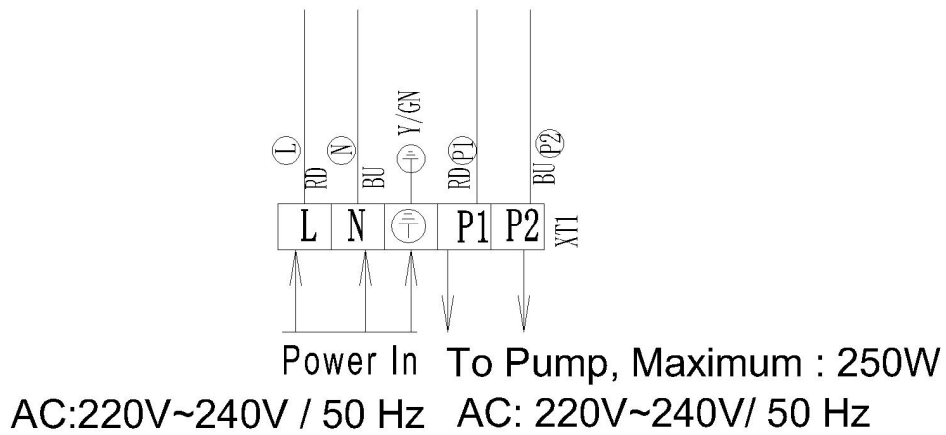
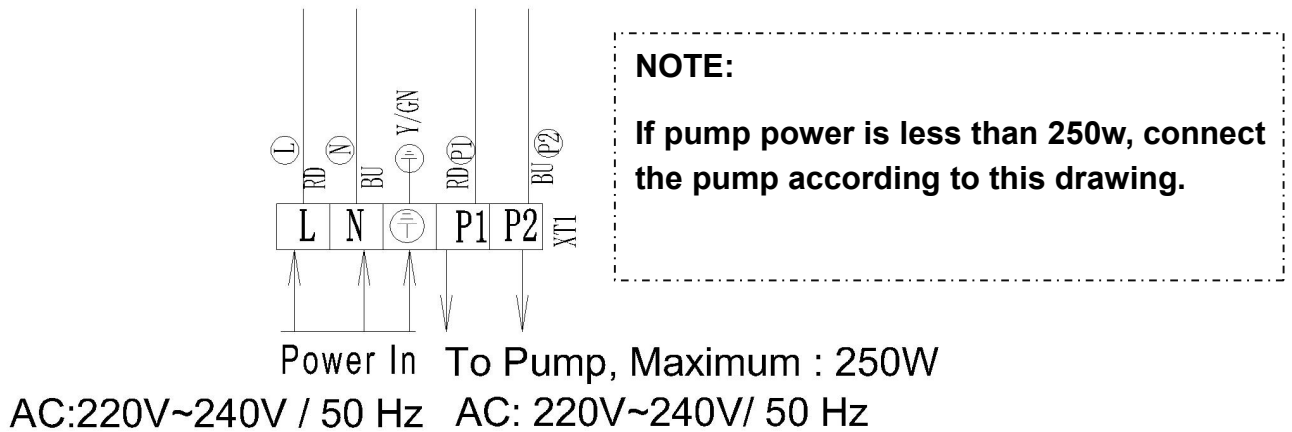


Figure 9

7.3 Circulation pump installation

The heat pump only provides a signal for the circulation pump, A separate A.C. Contactor is required to connect the circulation pump.



NOTE:

If pump power is less than 250w, connect the pump according to this drawing.

Figure 10

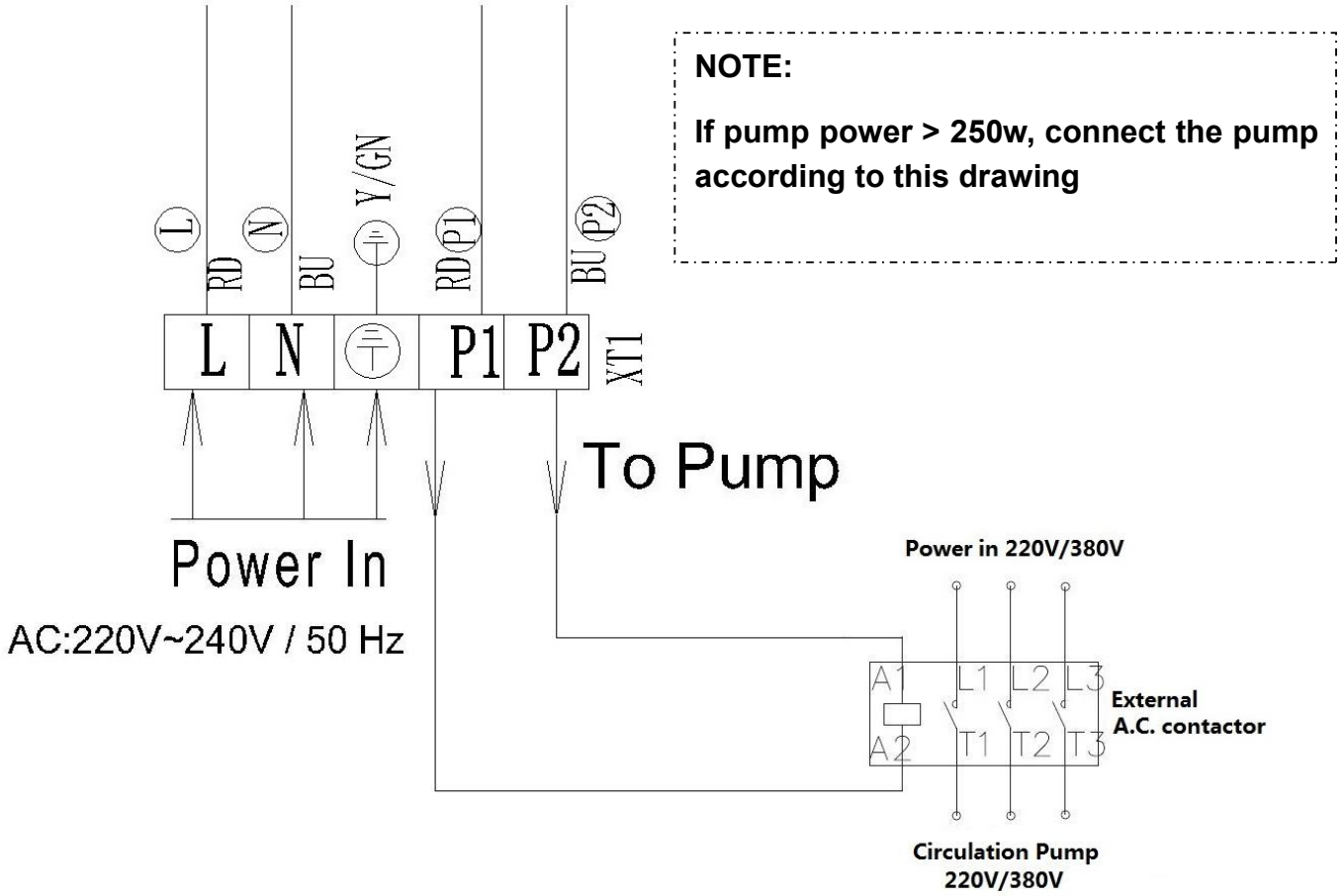


Figure 11

7.4 Electric wiring diagram

COMP : COMPRESSOR	GND : GROUND
AMBT: AMBIENT TEMPERATURE SENSOR	WFS: WATER FLOW SWITCH
LOW : LOW PRESSURE SWITCH	HIGH : HIGH PRESSURE SWITCH
COIL: EVAPORATOR COIL TEMPERATURE SENSOR	OWT/INWT: INLET / OUTLET WATER TEMPERATURE SENSOR

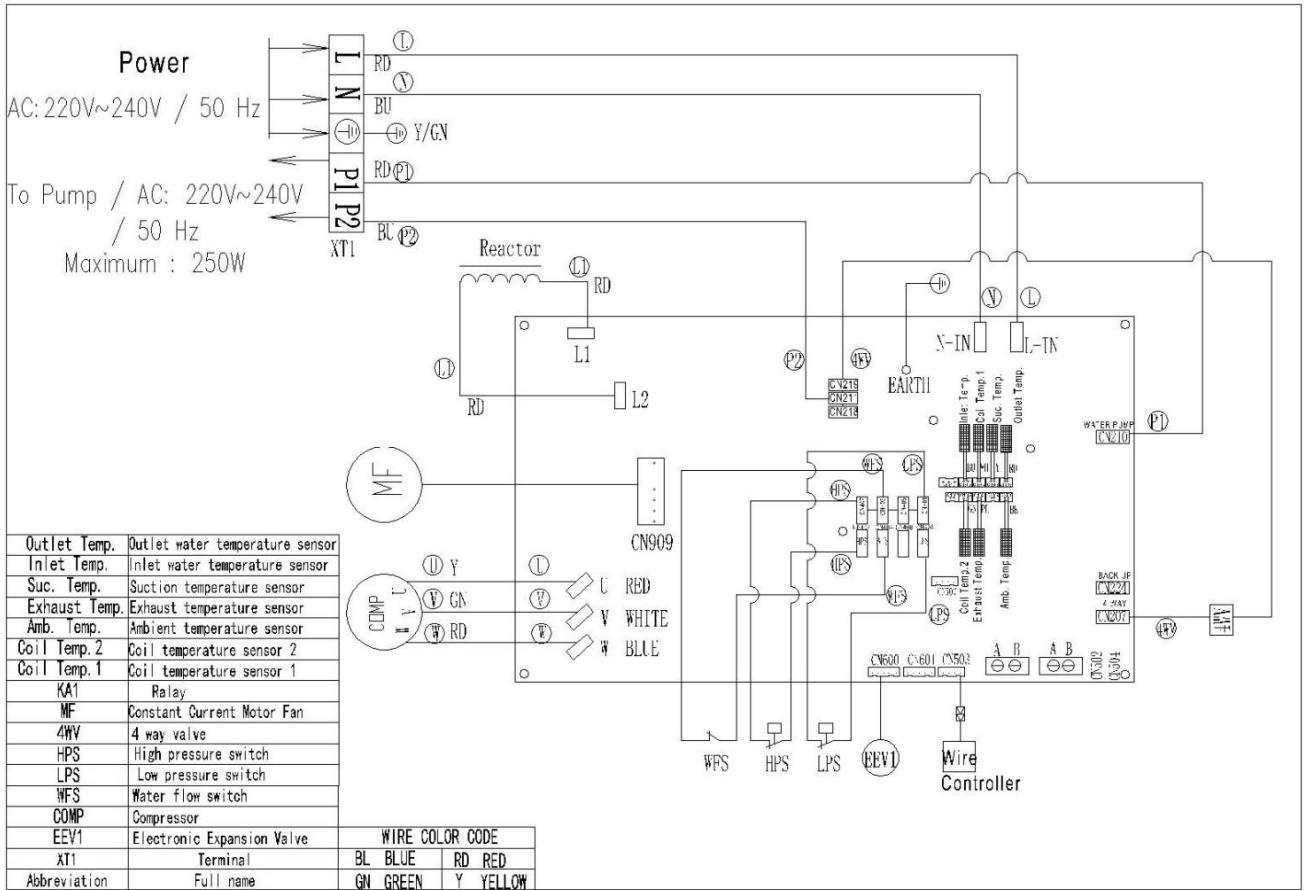


Figure 12 Electrical wiring diagram

8. Operating Instructions


1. ON/OFF and Lock Function



1.1 Icon definition

 Lock--The display is locked if the icon is lit.

1.2 ON/OFF Operation steps






Step1:  Press this button once to switch the heat pump on or off;

Step2: Press  to switch off the heat pump from the main menu; in other menus, press  to return to the main menu.

1.3 Lock/Unlock Operation steps



1.3.1 Step1 (Lock): The controller will be automatically locked if it remains on standby for more than 60 seconds or if you press and hold  for 3 seconds. When the controller is locked it is not possible to perform any operation (this icon  is lit when the controller is locked).














1.3.2 Step 2 (Unlock): Press and hold  for 3s to unlock the controller and activate the buttons for operation of the unit.

2. Mode Selection



Mode Selection


2.1 Icon definition


-  Energy Conservation Mode
—Select Energy Conservation Mode for most efficient operation of the compressor
-  Heating Mode
—Select Heating Mode to heat the water to the setting temperature
-  Boost Mode
—Select Boost Mode to reach the set water temperature in the shortest time.
-  Energy Conservation Heating Mode
-  Boost Heating Mode
-  Cooling Mode
—Select Cooling Mode to cool the water to the set temperature.
-  Defrost Mode
—The heat pump will work more efficiently in automatic Defrost Mode (preset in system)
-  Water-Heating Mode
—Not applicable for swimming pool heat pumps.
-  Automatic Mode
-  Compressor is on/running
-  Electric Heater is on
-  Water Pump is on/running
-  4-Way valve is on/running


□ IN Water Inlet Temperature






□  FAN is on/running

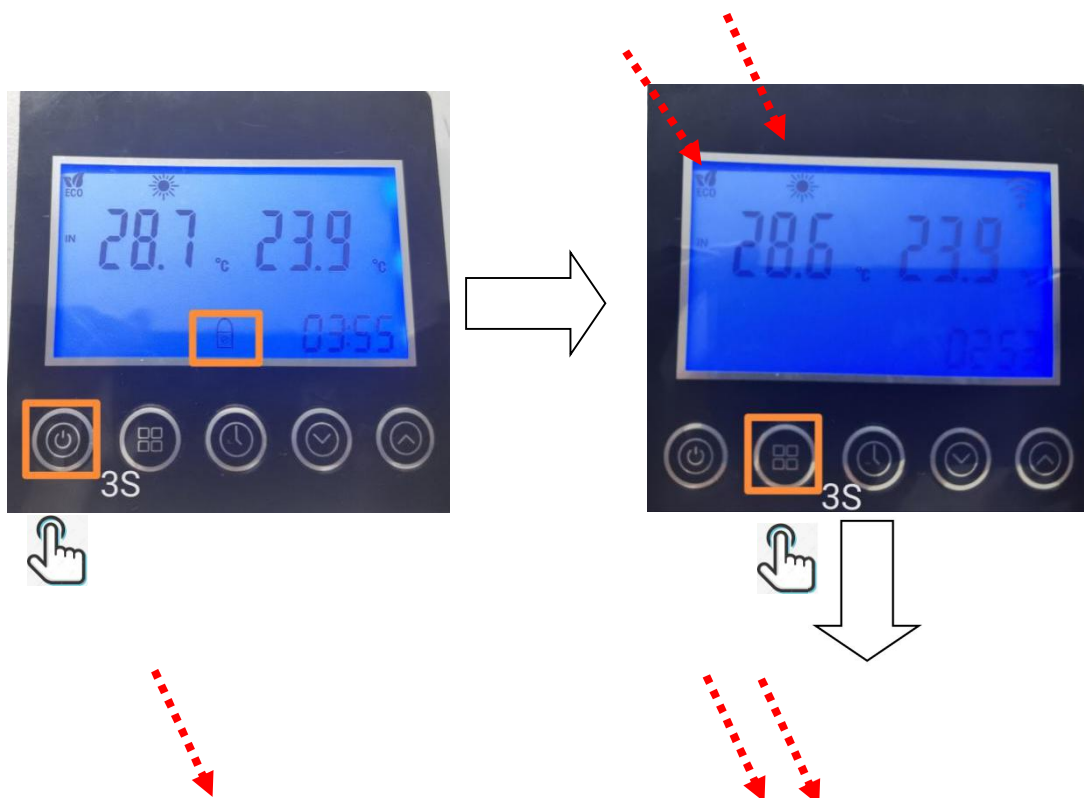
2.2 Operation steps

Step 1: Check lock icon  status (controller is locked if the icon  is lit).

Step 2: Press and hold  for 3s to unlock the controller.

Step 3: Press and hold  for 3 seconds to select the mode:

  Energy Conservation Heating Mode □   Boost Heating Mode □  Cooling Mode (remark: mode menus can be different according to series of heat pump, refer to chapter 6)









3. Key Parts


Key Parts



3.1 Icon definition

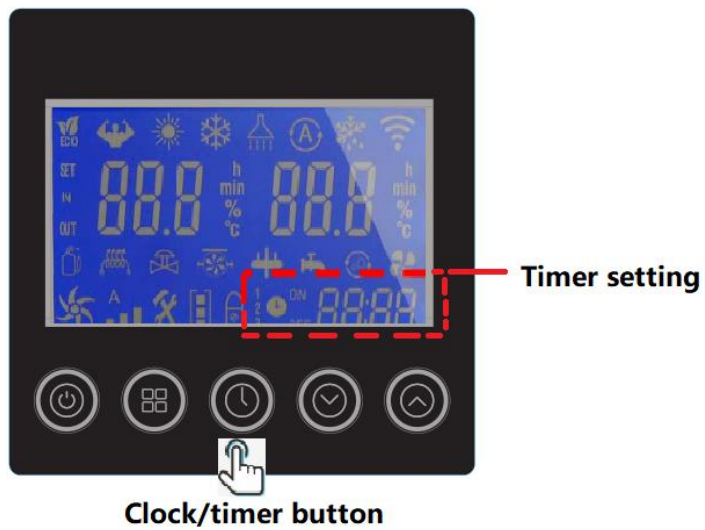
-  Compressor is running
-  Electric Heater is running
-  Water Pump is running
-  4-Way valve is running

□ IN Water Inlet Temperature


□  Main FAN is running



4. Timer Setting







4.1 Icon Definitions


□  : Multiple phase timer setting

☐  Timer ON/OFF

☐  : Time


4.2 Time setting operation steps

Step1: Press  in main menu to set "hour" function: "hour" digits will flash  ; press  or  to set the "hour".

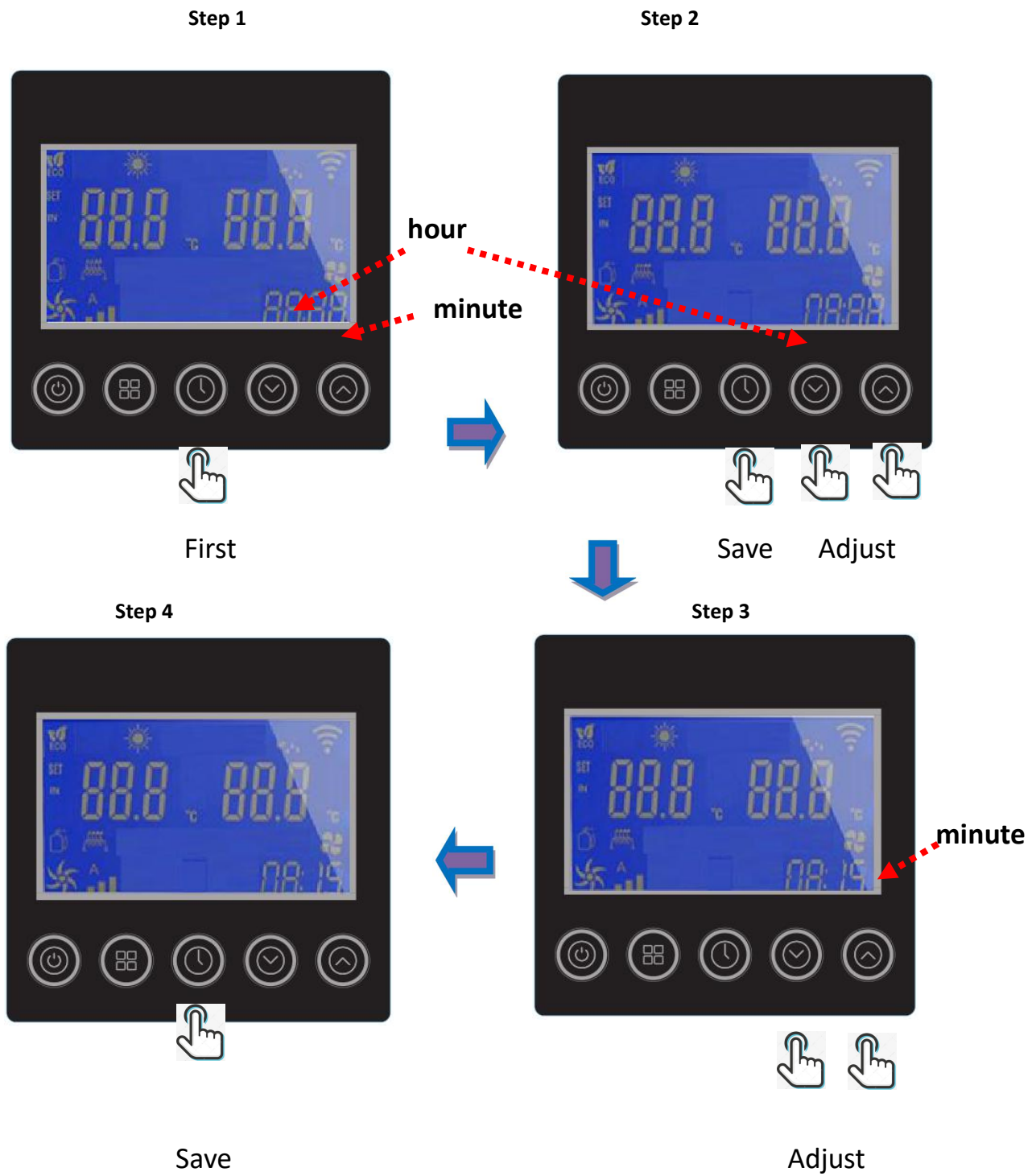
Step2: Press  again to save the "hour" setting.

Step3: Next you will then be able to set the "minute" function in the same way: "minute" digits will flash

 , press  or  to set the "minutes" .




Step 4: Press  to save the "minute" setting.





EXAMPLE: If you would like to set 08:15, please follow below operations:









4.3 Timer Operation Steps

Phase 1 timer on/off setting:

Step1: Press and hold  for 3S until  icon is lit: you will now enter the 1st phase of the timer setting function. The “hour” digits  will flash.

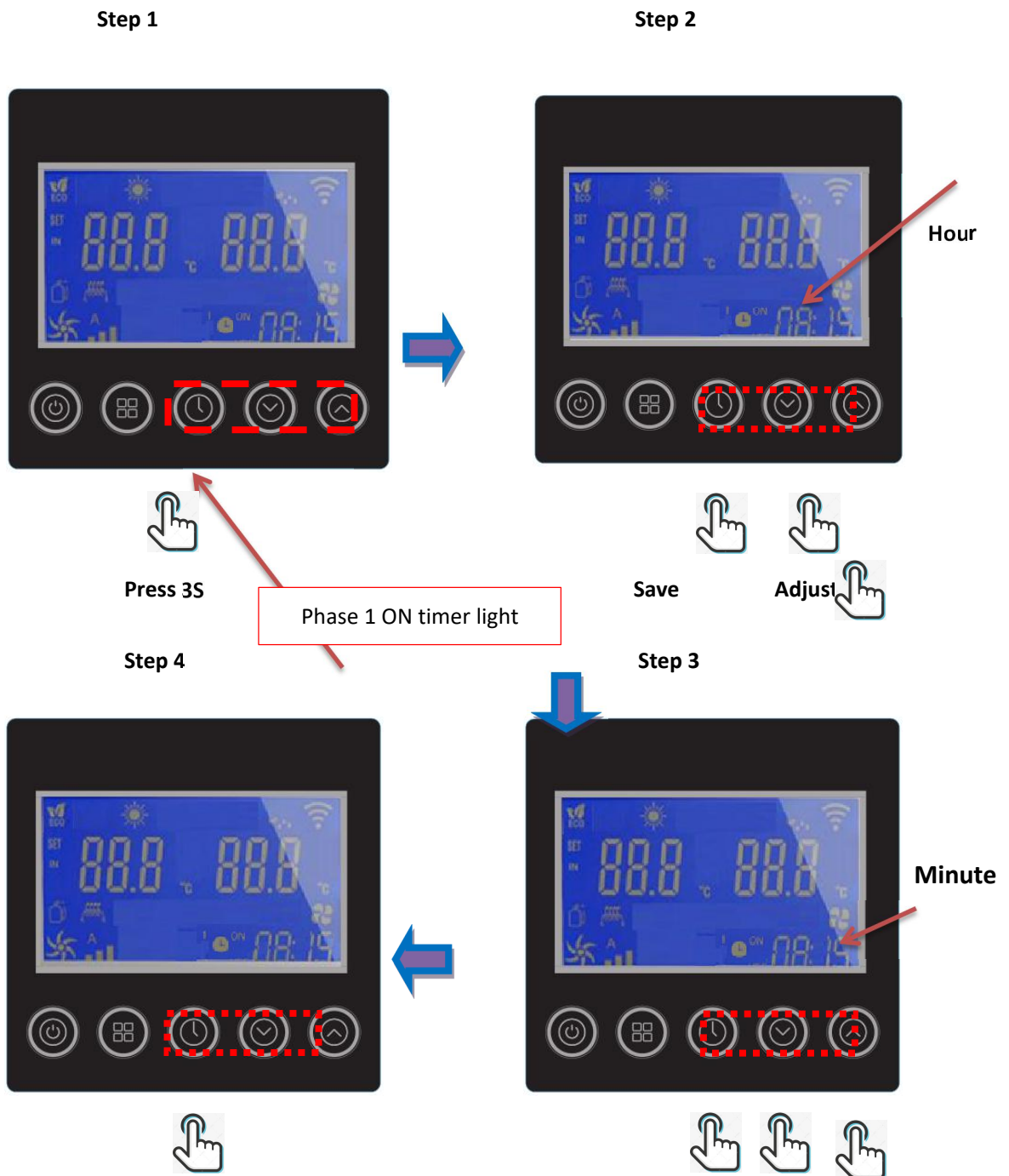
Step2: Press  or  to set “hour” while “hour” digits  are flashing. The setting will be saved when you press .

Step3: Once the “hour” has been set, the “minute” digits  will flash. Press  or  to set the “minutes”. Press  so save the ‘ON’ setting for the Phase 1 timer.

Step4: “  icon will be lit after Step 3 has been completed. Follow the same steps (1 and 2 above) to set the Phase 1 timer ‘OFF’ setting. After the “hours” and “minutes” are set, press  to save Phase 1 ON/OFF timer setting and return to main.

EXAMPLE:

If the timer is set to 08:15 ON, heat pump will start at 08:15 every day. And it will switch itself off every day according to the Timer OFF setting.



Saved Phase 1 ON/OFF timer


Set ON timer and then follow same
Step 2 and 3 to set OFF timer.





Save

Adjust


4.4 Phase 2 and 3 timer on

Phase 2 and 3 timer on/off setting:



Different operation: After you are finished Phase 1 ON/OFF timer setting, do not press  to




save. Press  to enter Phase 2 timer setting menu. You will see  : to set
Phase 2 and 3 ON/OFF timer, follow the same steps as for Phase 1 ON/OFF timer setting
(refer to chapter 4.3). After you are finished Phase 2 ON/OFF timer setting, do not press 
to save. Press  to enter Phase 3 timer setting menu.

4.5 Cancel Timer Function


If the timer function is already set, press and hold  for 3S to cancel the timer when the controller is unlocked.

5. Browse Function

Function 1: press  or  to scroll through the parameters of the heat pump.

Function 2: In the main when the heat pump is ON, press  or  to modify the set temperature
for the current Mode. Press  to save and return to main menu after setting the
temperature.

6. Parameters

6.1 Parameter Status: Press  to enter browse the Parameter Status

Code	Description	Scope	Unit	
c01	Ambient temperature		0.1°C	
c02	Outside coil temperature		0.1°C	
c03	Exhaust temperature		0.1°C	
c04	Suction pipe temperature		0.1°C	
c05	Reserved		0.1°C	
c06	Reserved		0.1°C	
c07	Inside coil temp (after throttle)		0.1°C	
c08	Water inlet temperature		0.1°C	
c09	Water outlet temperature		0.1°C	
c10	Reserved			
c11	Reserved			
c12	Reserved			
c13	Sensor failure			
c14	System failure			
c15	Driver failure			
c16	Signal output			
c17	Running status			
c18	AC voltage		V	
c19	DC voltage		V	
c20	Actual frequency		Hz	
c21	EEV open degree			
c22	Reserve			
c23	Heat pump current		A	
c24	Compressor current		A	
c25	DC FAN Speed		Rpm	









6.2. Error Codes











Code	Description
------	-------------

E03	flow failure
E04	anti-freeze protection
E05	high pressure protection
E06	low pressure protection
E07	Temperature sensor before auxiliary valve
E08	Temperature sensor after auxiliary valve
E09	Connection failure between main PCB and controller
E10	Connection failure between driver and main PCB
E11	Temperature sensor failure
E12	Exhaust temperature overheat
E15	Water inlet sensor failure
E16	Outside coil sensor failure
E18	Exhaust sensor failure
E20	Drive module protection
E21	Ambient temperature sensor failure
E22	Excessive temperature variations between inlet and outlet
E23	Water outlet temperature lower in Cooling Mode
E27	Water outlet sensor failure
E29	Suction pipe sensor failure
E30	Low outdoor environment temperature protection
E31	Auxiliary electric heating overload protection
E32	Water outlet temperature exceeded in Heat Mode
E33	Outside coil temperature exceeded in Cooling Mode
E34	Compressor drive failure
E35	Compressor current overload
E36	Compressor output failure

E37	IPM current failure
E39	Power overload shutdown (PFC failure)
E40	DC voltage overload
E41	DC voltage too low
E42	Inside coil sensor failure
E43	AC voltage too low
E44	AC current overload
E45	Driver E2 failure
E46	DC FAN failure
E47	AC voltage over

6.3 Icon List

NO	Icon	Description
1		Energy Conservation Mode
2		Boost Mode
3		Heating Mode
4		Cooling Mode
5		Water-Heating Mode (only for BHP)
6		Automatic Mode
7		Defrost Mode
8		WIFI connection status

9	SET	Setting
10	IN	Water Inlet
11		Compressor
12		Electrical Heater
13		Water Pump
14		4-Way valve
15		Heat Pump FAN
16	A 	FAN speed
17		Unit locked
18	1 2 3 	Multi-phase timer
19		Timer ON/OFF
20		Time

9.Wireless / remote control

WIFI Function

Download and install the software following app from the Apple App (iOS) or Google Play (Android)

Store:






Step1: WIFI connection: The WIFI icon will flash to signal after the unit is switched on.

If the WIFI icon remains lit for longer than 5 seconds WIFI has been successfully connected.

You can check the connection status in your mobile APP.

If the WIFI icon is not lit it means WIFI connection has failed. You can reconnect in the following 2 ways.□

1. Restart the controller OR

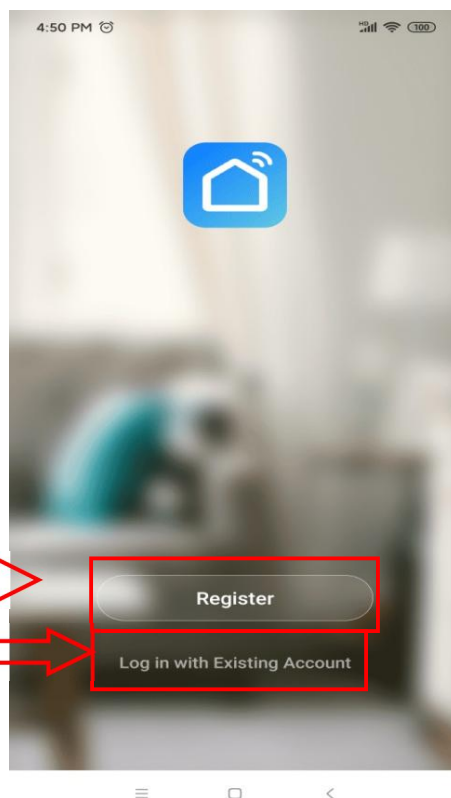
-
2. Press and hold these three buttons  +  +  simultaneously for 5 seconds to reset the WIFI module: the WIFI icon will flash again.

User registration

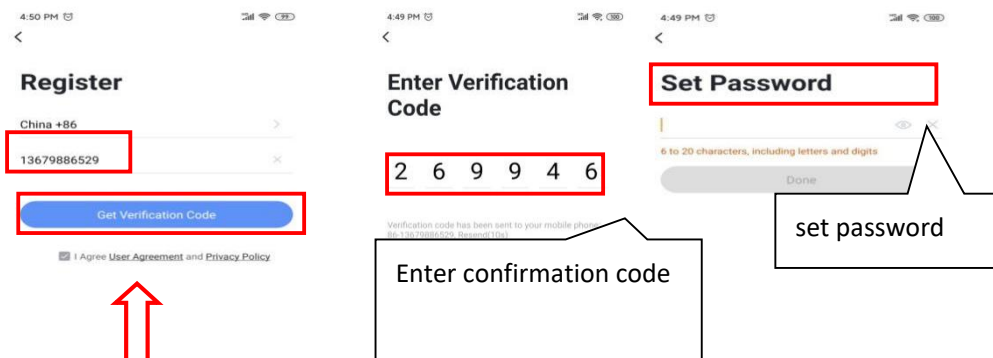
When using the "Smart Life" app for the first time, user registration is required.

Click the "Create New User" link to enter the registration interface.

If you already have an account, just click 'log in'.



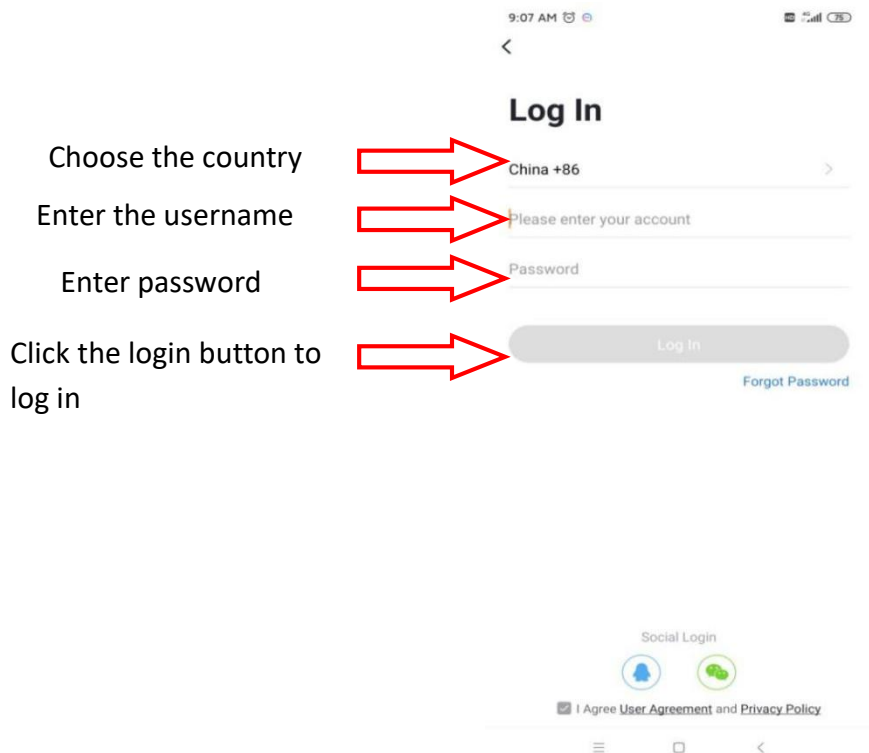
After entering the registration page, please follow the instructions on the page to register.

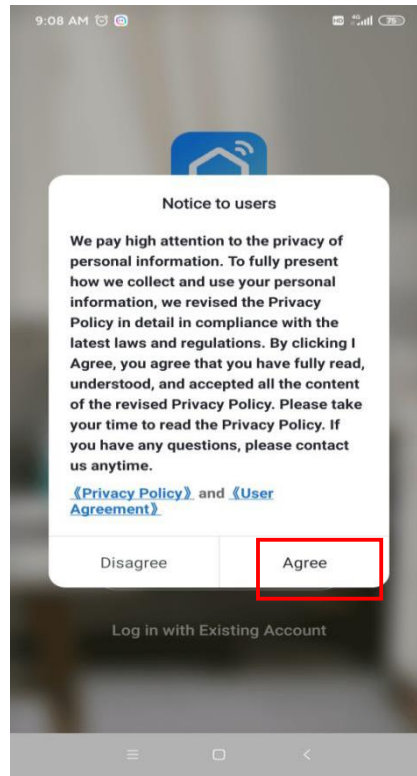


Enter the phone number you want to register and click Next

User login

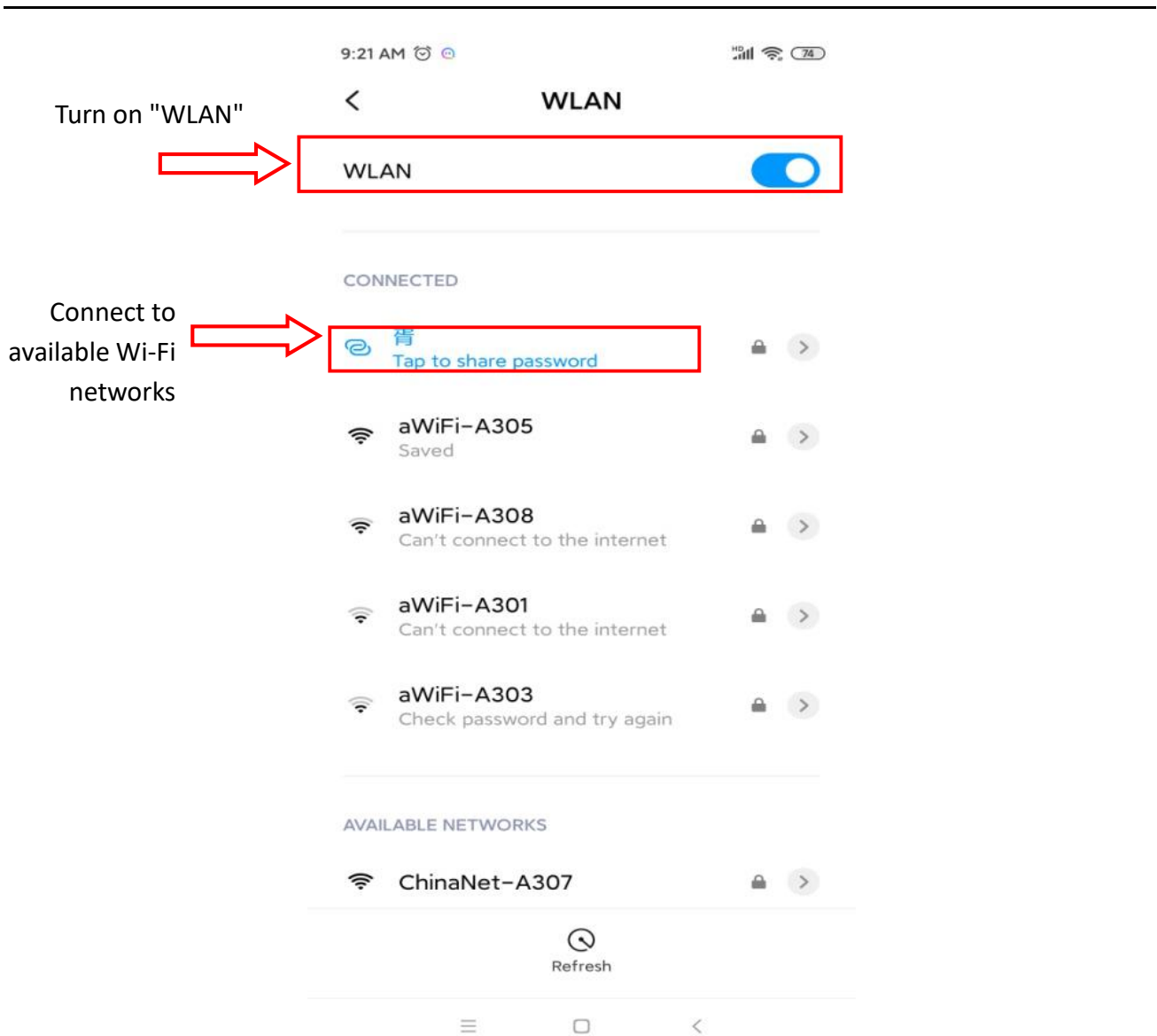
After successful registration, the software will take you to the login interface: enter the correct "user name" and "password" to log in.





Read the terms and click on "Agree" to proceed

The phone must be connected to an available WIFI network



Turn on "WLAN"



Connect to available Wi-Fi networks



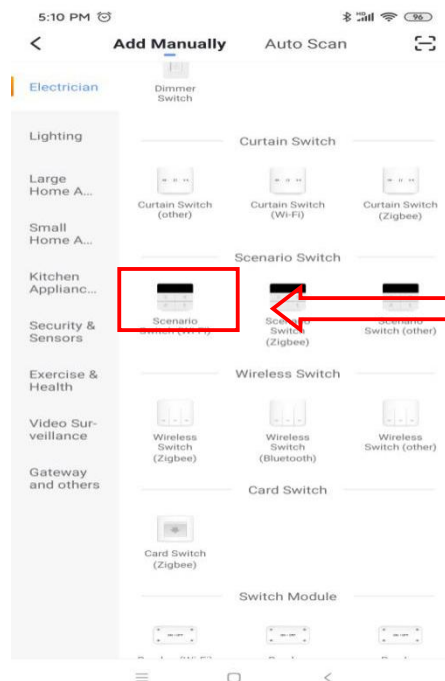
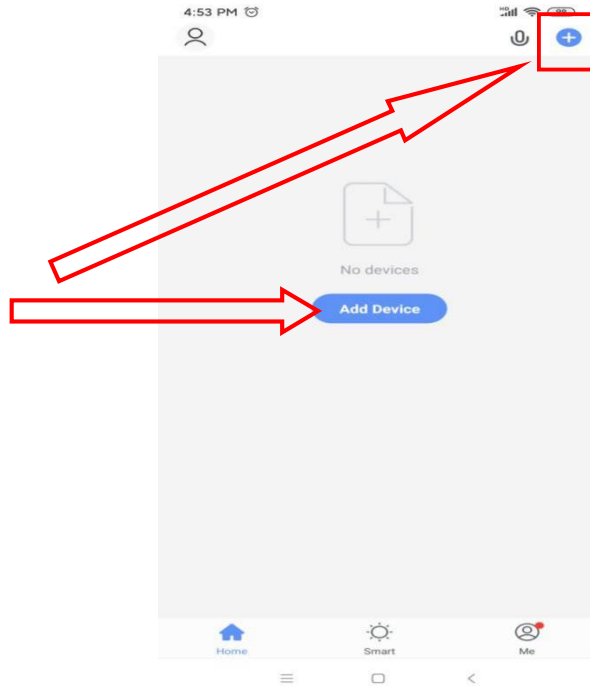
This WIFI is not the WIFI in the heat pump module but an existing WIFI network that is connected to the Internet;

After logging in to the app as a user, you can add devices

Device binding

Click "+" or "Add Device" in the upper right corner to bind.

Click "Add Device"

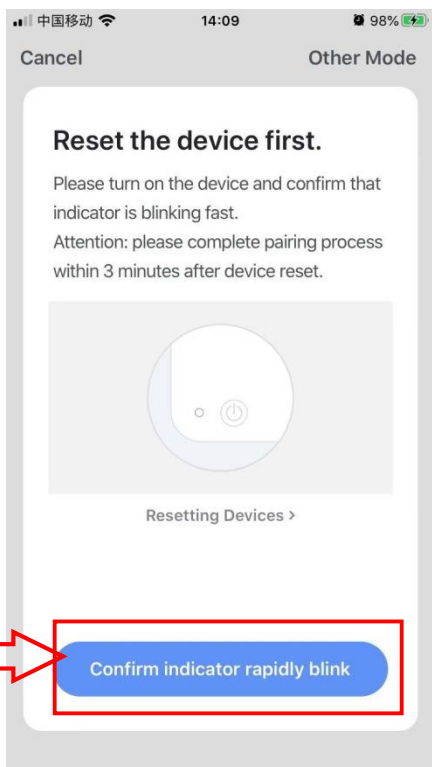


Select "switch WI-FI"

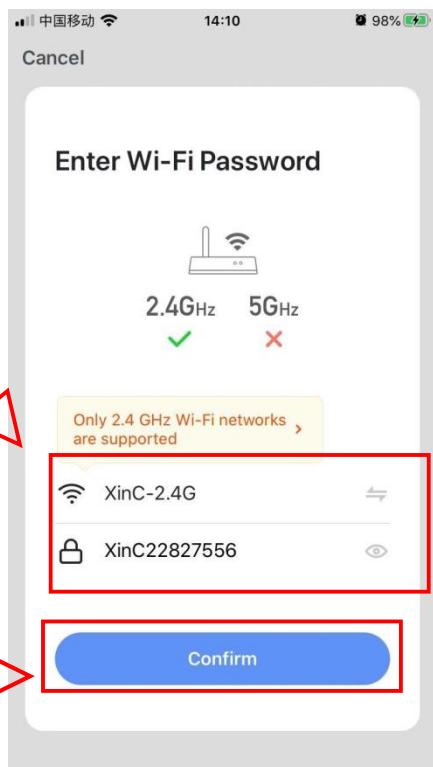
After selecting the "Device Type", enter the "Add Device Interface": the network configuration methods are divided into "default mode (WI-FI fast connection)" and "compatibility mode (hotspot distribution network)"

Default mode (WI-FI fast connection):

On the controller simultaneously press the up key + mode key for 3 seconds to enter the "default mode" distribution network

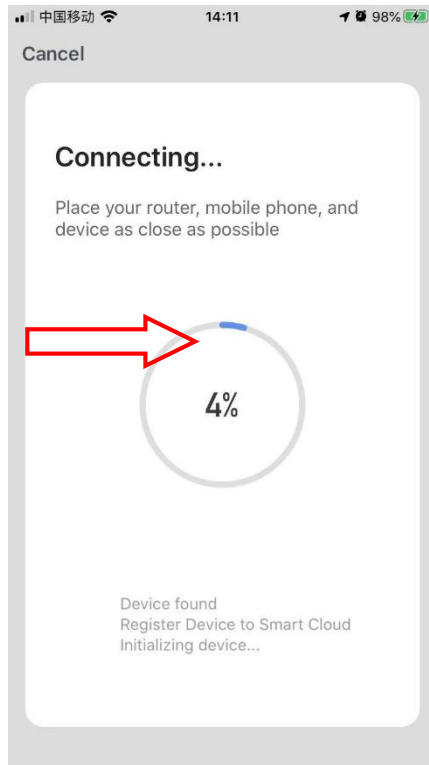


Enter the Wi-Fi password

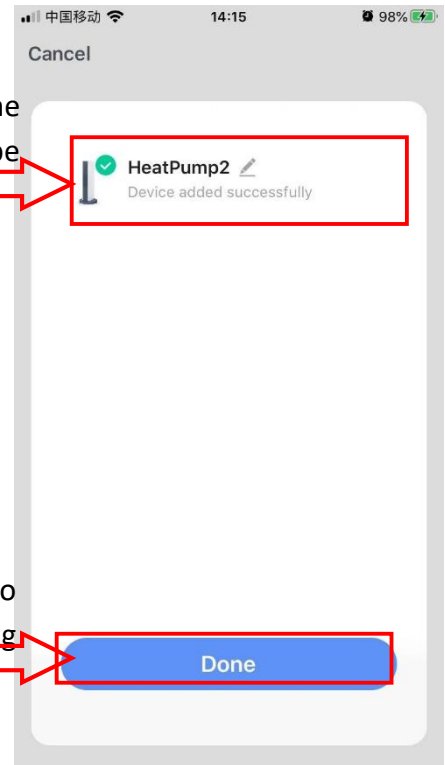


Click 'Confirm'

Enter the password and confirm: connection screen will appear



Device name can be modified



中国移动 14:17 98%

Close

Device not responding Try "Switch Pairing Mode"

- ① Check if the device has been reset and the indicator is blinking quickly.
- ② Check if it is 2.4 GHz Wi-Fi.
- ③ Verify the Wi-Fi password.

Retry

Switch Pairing Mode

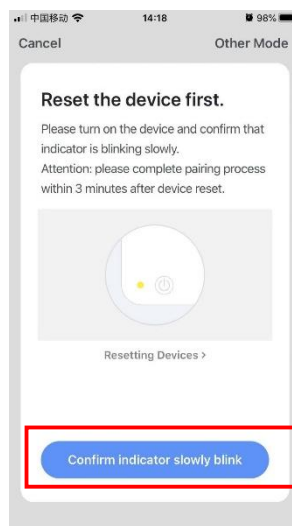
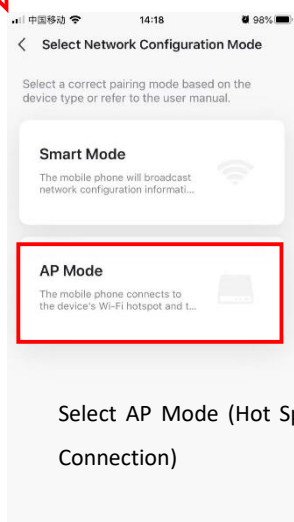
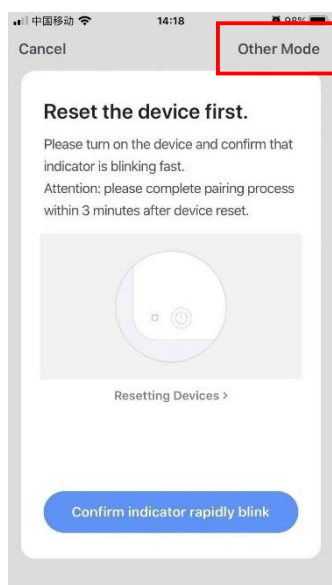
[More device-pairing FAQs](#)



If you are unable to connect, the page above will be displayed on the App: you can try connect again or view 'help' screen.

Compatibility mode:

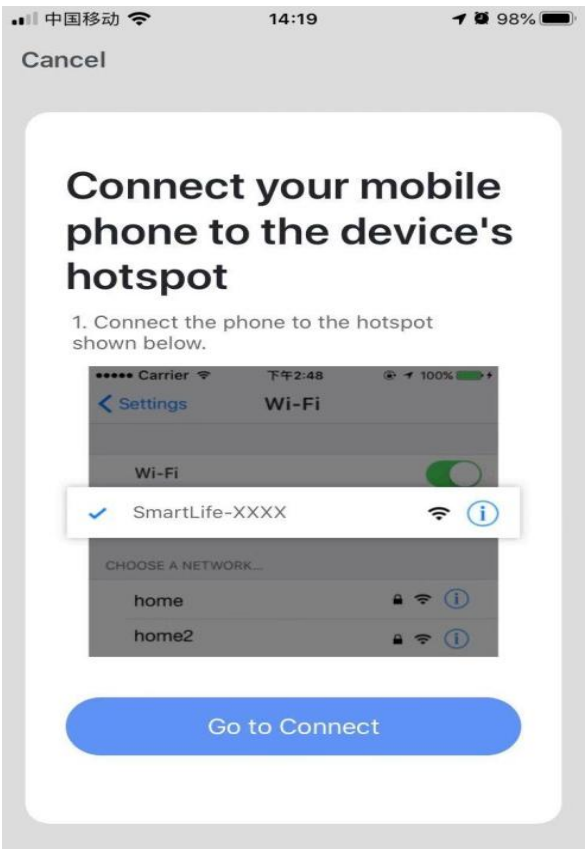
Select "Other Mode" on the Add Device screen



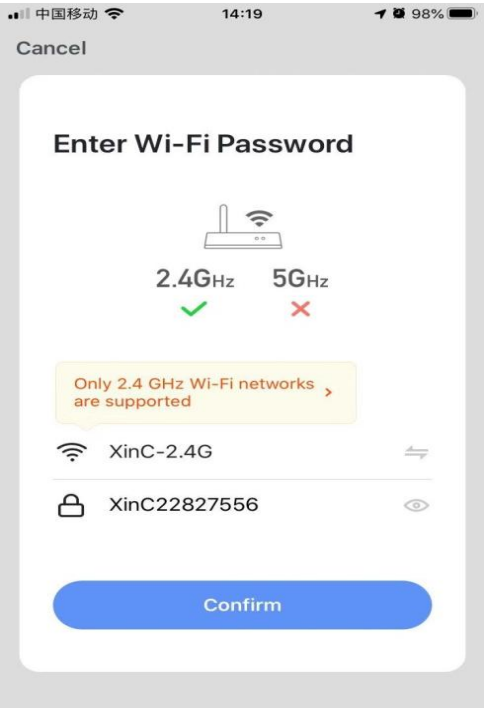
Press and hold the time key +, down key + and power key simultaneously for 3 seconds to enter "compatibility mode".



Click 'Go to connect' which will take you to the Wi-Fi connectionscreen; select 'SmartLife-xxxx'



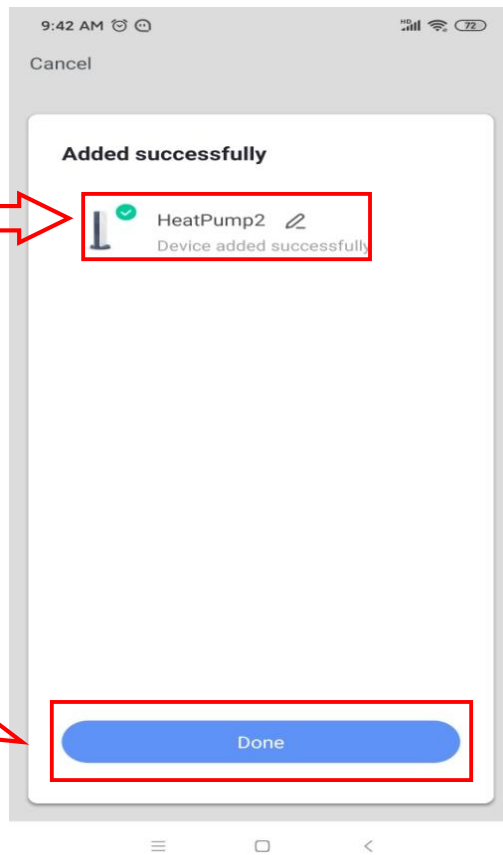
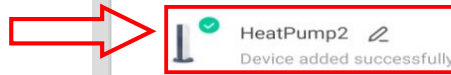
After selecting and connecting, return to the App and go to the network connection screen.



Enter the correct password and click confirm

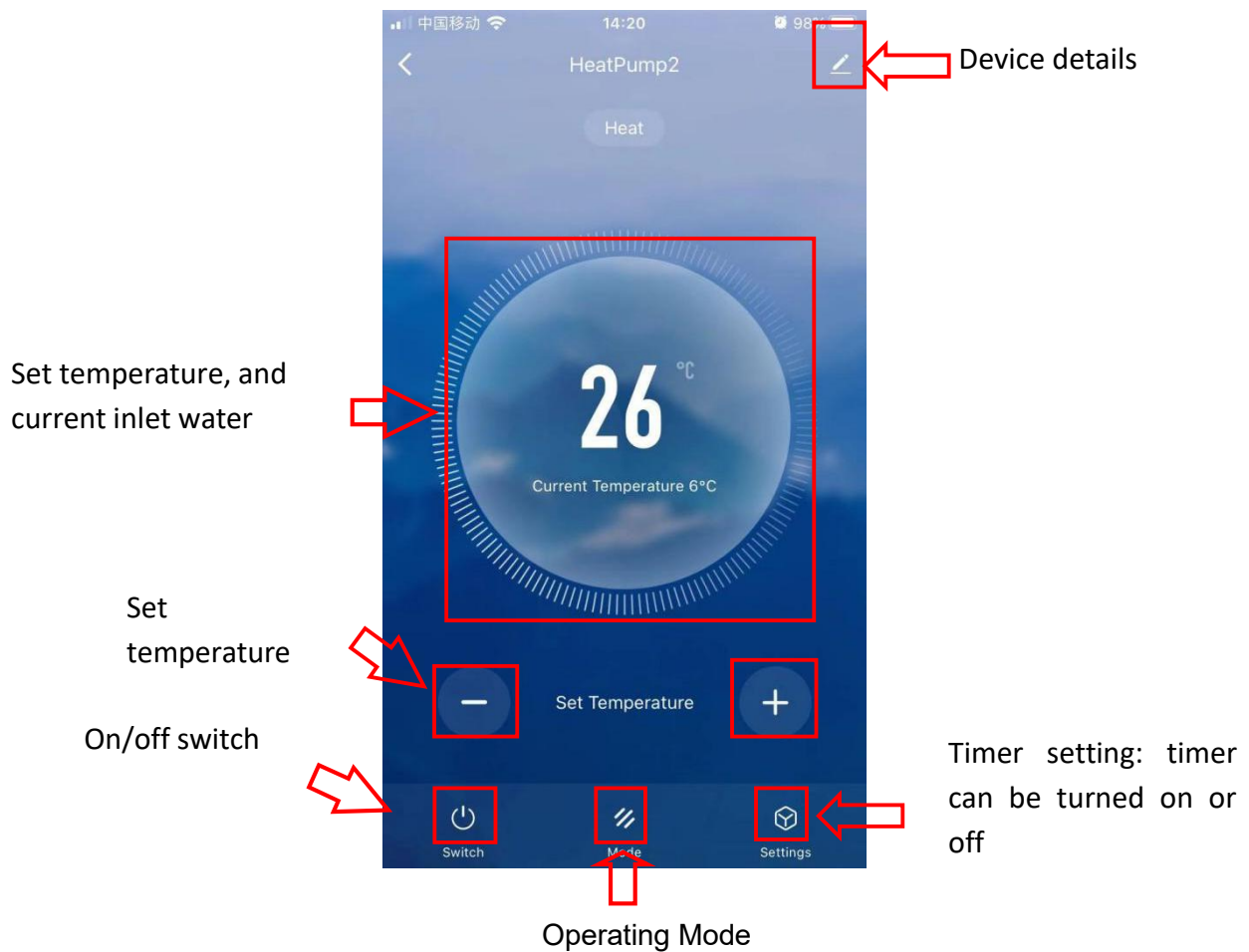
Control introduction

Successfully
connected device



Click to go to
control screen





10.Adjusting and Initial operation

10.1 Attention

- Do not make any adjustments until after the electrical safety inspection has been carried out.
- After the power has been connected, start the test running of heat pump to see if it is working properly.
- Forced operation is forbidden as it is very dangerous to work without protectors.

10.2 Preparation Before Adjustment

- Check that the system is installed correctly.
- Check that pipes and cables are connected correctly.
- Check that the accessories provided have been installed.
- Make sure the drainage is working properly.
- Make sure the system piping and connections are properly insulated.
- Check that ground/earth connection had been made correctly.

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- Check that supply voltage can meet the requirement of rated voltage.
 - Check that air inlet and outlet are working correctly.
 - Check that the electrical leakage protector works correctly.

10.3 Adjustment Process

- Check that switch on display controller works properly.
- Check that function keys on display controller work properly.
- Check that indicator lights work properly.
- Check that drainage works properly.
- Check that system works correctly after starting up.
- Check that water outlet temperature is acceptable.
- Check if there are vibrations or abnormal sounds when the system is functioning.
- Check if the wind, noise and condensate water produced by the system affect the surrounding environment.
- Check if there is any refrigerant leakage.
- If any fault occurs, please check the instruction manual first to analyze and remove the fault.

11. Operation and maintenance

11.1 The heat pump should be installed and operated by qualified professionals. To ensure the continued correct functioning of the system, regular checks and maintenance are recommended. During maintenance, please pay attention to the points below:

- Check that all parameters are normal during system operation.
- Check for loose electrical connections and fix if necessary.
- Check electrical components and replace if necessary.
- After prolonged use, there may be calcium or other mineral substances deposited on the surface of the heat exchanger copper coil. This could affect the performance of heat exchanger and lead to higher than normal electrical consumption, increased discharge pressure and reduced suction pressure. Formic acid, citric acid, acetic acid or other organic acid can be used to clean the coil.

-
- Any dirt accumulated on the surface of the evaporator fins should be blown away using a 0.6Mpa air compressor, brushed by fine copper wire, or flushed with a high-pressurized water hose, usually once a month. If there is too much dirt, we can use a paintbrush dipped in gasoline to clean the evaporator.
 - After restarting the unit following a long period of inactivity, please do the following: examine and clean the equipment carefully, clean the water pipe system, check the water pump and tighten all the wire connections.
 - Always use original replacement parts.

11.2 Refrigerant

Check the refrigerant level by reading the data of the liquid level from the display screen, and also by checking the air suction and exhaust pressure. If there has been a leakage or any components of the refrigeration circulation system have been changed, it is necessary to check the air tightness before anything else.

11.3 Leak detection and air tightness testing

During leak detection and air tightness testing, never allow oxygen, ethane or other harmful flammable gases to enter the system: only compressed air, fluoride or refrigerant can be used for such a test.

11.4 To remove the compressor, please do the following

- Turn off the power supply
- Remove the refrigerant from the low pressure end; make sure **you reduce the exhaust speed**, and avoid leakage of frozen oil.
- Remove the compressor air suction and exhaust pipe.
- Remove the compressor power cables.
- Remove the compressor fixing screws.
- Remove the compressor.

11.5 To make sure the unit remains in good condition, conduct regular maintenance according to the user manual instruction.

- If there is a fire, disconnect the power immediately and put the fire out with a fire extinguisher.
- The unit's operating environment should be free of gasoline, ethyl alcohol and other flammable materials to avoid explosions or fire.
- Malfunction: if any malfunction occurs, find the reason, fix it and then reboot the unit. Never reboot the unit forcibly if the cause of the malfunction has not been eliminated. If there is refrigerant leakage, switch

the unit off. If it is not possible to turn the unit off from the controller then disconnect the main power supply.

- To protect the unit, never short connect any wires: in case of malfunction, the unit will not be protected normally and could be damaged.

12. Fault analysis and elimination method

Fault	Possible cause	Detection and elimination method
Discharge pressure is too high.	<ul style="list-style-type: none"> ◆ There is air or other non-condensable gas existed in the system. ◆ Water heat exchanger is scaling or fouling blockage. ◆ The circulation water volume is not enough. ◆ Refrigerant charging is too much. 	<ul style="list-style-type: none"> ● Vent the air from water heat exchanger ● Wash and clean the water heat exchanger ● Examine the water system pipeline and pump. ● Drain part of the refrigerant
Discharge pressure is too low.	<ul style="list-style-type: none"> ◆ Liquid refrigerant flow through evaporator to compressor, which make foam for the frozen oil ◆ Suction pressure is too low ◆ Refrigerant charging is too less, the refrigerant air goes into liquid pipeline 	<ul style="list-style-type: none"> ● Examine and adjust the expansion valve, make sure the expansion valve temperature sensor bulb is close connected with the air suction pipe, and absolutely insulated with the ambient environment. ● Please refer to "Fluorine filling if suction pressure too low"
Suction pressure is too high.	<ul style="list-style-type: none"> ◆ Discharge pressure is too high. ◆ Refrigerant charging is too much. ◆ Liquid refrigerant flow through evaporator to compressor. 	<ul style="list-style-type: none"> ● Drain part of the refrigerant. ● Examine and adjust the expansion valve, make sure the expansion valve temperature sensor bulb is close connected with the air suction pipe, and absolutely insulated with the ambient environment.
Suction pressure is too low.	<ul style="list-style-type: none"> ◆ Ambient temperature is too low. ◆ The evaporator liquid inlet or compressor suction pipe is blocked, expansion valve unadjusted, or failed. ◆ The refrigerant is not enough in the system. 	<ul style="list-style-type: none"> ● Adjust suitable overheat temperature, examine whether there is Fluorine leakage from the expansion valve temperature sensor bulb. ● Examine Fluorine leakage. ● Examine the installation condition.
Compressor stopped because of high pressure protection.	<ul style="list-style-type: none"> ◆ The water inlet temperature is too high, circulation water is not enough. ◆ The high pressure stop setting is not correct, the air suction overheat greatly. ◆ Fluorine filling is too much. 	<ul style="list-style-type: none"> ● Examine water system pipeline and water pump. ● Examine the high pressure switch. ● Examine the Fluorine filling volume, drain part of refrigerant.
Compressor stopped because of motor overloading.	<ul style="list-style-type: none"> ◆ The voltage is too high or too low. ◆ Discharge pressure is too high or too low. ◆ Device loading failure. ◆ Ambient temperature is too high. ◆ Motor or connecting terminal is in short circuit. 	<ul style="list-style-type: none"> ● The voltage should be controlled within more or less 20V than rated voltage, and phase difference within $\pm 30\%$. ● Examine the compressor current, compare with the full loading current indicated in the user manual. ● Improve air ventilation.
Compressor stopped because of built-in thermostat.	<ul style="list-style-type: none"> ◆ The voltage is too high or too low. ◆ Discharge pressure is too high. ◆ The refrigerant in the system is not enough. 	<ul style="list-style-type: none"> ● Examine the voltage to make sure it is within the specialized range. ● Examine the discharge pressure and find out the reason. ● Examine whether there is Fluorine leakage.
Compressor stopped because of low voltage production	<ul style="list-style-type: none"> ◆ Dry filter clogging. ◆ Expansion valve failure. ◆ The refrigerant is not enough. 	<ul style="list-style-type: none"> ● Examine, maintain, or change dry filter. ● Adjust or change expansion valve. ● Fill in refrigerant.
High noise of compressor	<ul style="list-style-type: none"> ◆ There is liquid hammer for liquid refrigerant flowing through evaporator to compressor. 	<ul style="list-style-type: none"> ● Adjust liquid supply, examine whether normal for the expansion valve and air suction over heat degree.
Compressor can not start.	<ul style="list-style-type: none"> ◆ Over current relay is tripped, insurance is burn. ◆ The control circuit is not connected. ◆ No current. ◆ The pressure is too low, which can not conduct the pressure switch. ◆ The contactor coil is burn out. ◆ Water system failure, relay is tripped. 	<ul style="list-style-type: none"> ● Set the control circuit in manul mode, restart the compressor after maintenance. ● Examine controlling system. ● Examine power supply. ● Examine whether the refrigerant is too less. ● Reconnect, adjust two of the wiring.

13. Technical parameters

Model No.	iX-7	iX-11	iX-14	iX-17	iX-21	iX-25	iX-30	iX-30T	iX-35
Heating Capacity at Air 26°C, Humidity 80%, Water: 26°C in, 28°C out									
Heating Capacity (kW)	7.76~1.76	10.55~2.40	14.01~3.09	17.15~3.88	21.41~4.85	25.92~5.86	30.01~6.81	30.05~6.84	35.62~8.26
Power Input (kW)	1.12~0.11	1.52~0.15	1.95~0.19	2.46~0.24	3.08~0.30	3.71~0.36	4.30~0.42	4.30~0.42	5.10~0.51
COP	15.75~6.94	15.84~6.95	16.12~6.98	15.96~6.98	15.95~6.96	16.15~6.99	16.11~6.98	16.14~6.99	16.12~6.98
Heating Capacity at Air 15°C, Humidity 70%, Water: 26°C in, 28°C out									
Heating Capacity (kW)	5.76~1.30	7.85~1.78	10.12~2.29	12.78~2.89	15.91~3.59	19.56~4.43	22.05~4.98	22.14~4.99	28.52~6.62
Power Input (kW)	1.16~0.17	1.58~0.23	2.03~0.30	2.57~0.38	3.20~0.47	3.92~0.58	4.43~0.65	4.44~0.65	5.73~0.87
COP	7.57~4.96	7.59~4.97	7.64~4.99	7.63~4.98	7.59~4.97	7.65~4.99	7.62~4.98	7.63~4.99	7.62~4.98
Cooling Capacity at Air 35°C, Water: 29°C in, 27°C out									
Cooling Capacity (kW)	4.28~1.06	5.92~1.48	7.25~1.82	9.47~2.35	11.58~2.96	14.22~3.51	15.86~3.91	15.89~3.93	20.11~4.67
Power Input (kW)	1.15~0.16	1.57~0.22	1.89~0.26	2.51~0.34	3.07~0.43	3.72~0.50	4.18~0.56	4.17~0.56	5.28~0.67
EER	6.61~3.73	6.74~3.76	6.95~3.83	6.89~3.78	6.87~3.77	6.97~3.82	6.94~3.79	6.98~3.81	6.97~3.81
Power supply	220~240V / 1/ 50 Hz							380~415V / 3/	220~240V / 1/
								50 Hz	50 Hz
Rated Power Input (kW)	1.2	1.6	2.1	2.6	3.2	3.9	4.4	4.4	5.7
Rated Current (A)	5.4	7.3	9.4	11.7	14.6	17.8	20.1	7.9	26
Compressor	Mitsubishi	Mitsubishi	Mitsubishi	Mitsubishi	Mitsubishi	Mitsubishi	Mitsubishi	Mitsubishi	Mitsubishi
Refrigerant	R32	R32	R32	R32	R32	R32	R32	R32	R32
Heat Exchanger	Titanium	Titanium	Titanium	Titanium	Titanium	Titanium	Titanium	Titanium	Titanium
Air Flow Direction	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal	Horizontal
Water Flow Volume (m ³ /h)	2.5	3.5	4.5	5.5	6.5	9	10	10	12
Defrost function	4-way valve	4-way valve	4-way valve	4-way valve	4-way valve	4-way valve	4-way valve	4-way valve	4-way valve

Working temperature range (°C)	-15~43	-15~43	-15~43	-15~43	-15~43	-15~43	-15~43	-15~43	-15~43
Noise level (dBa)	≤ 43	≤ 43	≤ 46	≤ 46	≤ 46	≤ 46	≤ 48	≤ 48	≤ 49
Casing Material	ABS plastic	ABS plastic	ABS plastic	ABS plastic	ABS plastic	ABS plastic	ABS plastic	ABS plastic	ABS plastic
Net Dimensions (mm) (L x W x H)	860*320*592	860*320*592	920*360*640	920*360*640	920*360*640	1080*370*730	1080*370*730	1080*370*730	1080*370*730
Package Dimensions (mm) (L x W x H)	940*400*710	940*400*710	990*430*760	990*430*760	990*430*760	1140*440*860	1140*440*860	1140*440*860	1140*440*860
Net Weight (kg)	40	42	51	54	58	84	86	86	105
Gross Weight (kg)	51	53	62	65	69	95	97	97	116
Water Proof Level	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4	IPX4

14. After-sale service

If your heat pump does not operate normally, please turn off the unit and cut off the power supply at once, then contact our service center or technical department.