



PI Series INVERTER POOL & SPA HEAT PUMP



USER MANUAL

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1.Introduction

Congratulations on the purchase of your new PI Series Heat Pump.

The PI Series Heat Pump has been specifically designed for Pool & Spa applications ensuring optimum performance and many years of trouble-free operation.

Please read and understand this complete user manual before attempting to install your PI Series Heat Pump,

Thank you!



Model Number _____

Serial Number _____

Date of Purchase _____

Invoice Number _____

Please record the information above during installation, as this will be required for any service/warranty work that may be required.

The Sensa-Heat range of products are proudly designed and distributed by:
Spa-Craft Pty Ltd
1300 498 819
20 Curtis Rd Mulgrave
NSW 2756 Australia

2.Safety Precautions

We have provided important safety messages in this manual for the installation and upkeep of your heat pump.

Please thoroughly read and obey all safety messages in this manual.

Environment friendly R32 Refrigerant is used for this heat pump.

2.1 Warning



This WARNING sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury or injury to a third party. These signs are rare but are extremely important.

	a. Keep the heat pump away from fire source.
	b. The Heat Pump must be placed in a well-ventilated area, indoor or enclosed areas are not allowed.
	c. Repair and disposal must be carried out by trained service personnel
	d. Vacuum the system before welding. Welding can only be carried out by a qualified service technician.

2.2 Attention

- a. Please read the following instructions before installation, use and maintenance.
- b. Installation must be carried out by a competent person in accordance with this manual.
- c. Check all plumbing before operating the heat pump, ensure there are no water leaks.
- d. Do not obstruct or block air flow near inlet or outlet areas of the heat pump, obstruction to the air flow will greatly affect the efficiency or damage your heat pump.
- e. Carefully set the water temperature on your heat pump to your preference to avoid overheating or overcooling of your Pool/Spa water
- f. To optimize the heating effect, please install heat preservation insulation on pipes between pool/spa and the heat pump, and please use a recommended cover on your pool or spa.
- g. Connecting pipes of the pool/spa and the heat pump should be less than 10m.
- h. Except for the methods recommended by the manufacturer, do not use any methods to accelerate the defrosting process or clean the frosted parts.
- i. If a repair is required, please contact the nearest after-sales service center. The repair process must be strictly carried out in accordance with this manual by an authorized repairer. Unauthorized repairs will void your warranty.
- j. Do not use or stock combustible gas or liquid such as thinners, paint, and fuel near your heat pump as to avoid a fire risk.

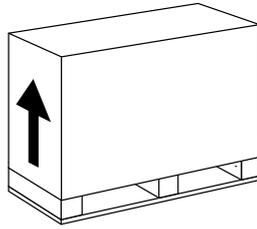
2.3 Safety

- a. Please keep the main power supply out of reach from children.
- b. When a power cut happens during operating, take caution as the heat pump will automatically restart once power is reestablished.
- c. Please switch off the main power supply in stormy weather to prevent damage that may be caused by lightning strike.
- d. Safety inspection must be carried before the maintenance or repair for heat pumps with R32 gas to minimize the risk.
- e. Any repairs should be conducted in a well-ventilated area. Any ignition source is prohibited during the inspection.
- f. If R32 gas leaks during the installation process, all operations must be stopped immediately and call an authorized service center.

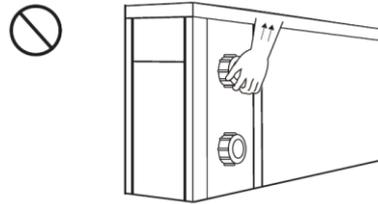
3.About your heat pump

3.1 Transportation

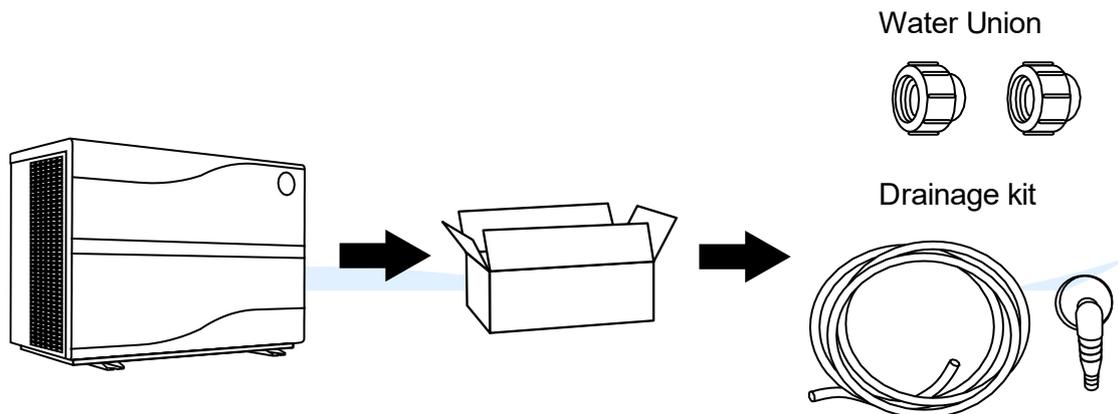
a. Always keep upright.



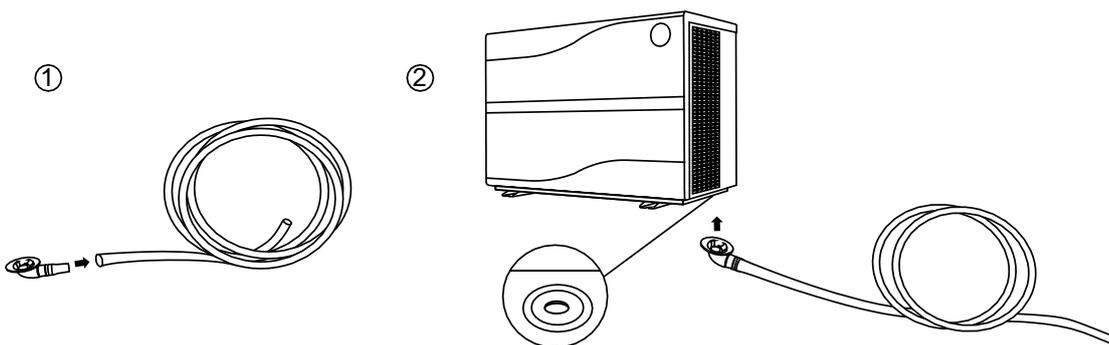
b. Do not lift the heat pump by the water unions as this may cause internal damage to the titanium heat exchanger inside the heat pumps.



3.2 Accessories



Connection of the condensate drainage kit:



3.3 Features

- a. DC Twin-rotary inverter compressor from Mitsubishi
- b. DC Brushless fan motor
- c. EEV Technology
- d. Reverse cycle defrosting
- e. High efficiency twisted titanium heat exchanger
- f. Sensitive and accurate temp control and water temp display
- g. High pressure and low-pressure protection
- h. Full protection on electrical system

3.4 Operating condition and range

- a. Air temperature operating range $-10^{\circ}\text{C}\sim 43^{\circ}\text{C}$
- b. Heating temperatures setting range $18^{\circ}\text{C}\sim 40^{\circ}\text{C}$.
- c. Cooling temperature setting range $12^{\circ}\text{C}\sim 30^{\circ}\text{C}$
- d. The ideal ambient air temperature for best performance is between air $15^{\circ}\text{C} \sim 25^{\circ}\text{C}$.

3.5 Introduction of different modes

- a. The heat pump has two modes: Boost and Silence.
- b. They have different strengths under different conditions.

Mode	Modes	Capacity
	Boost mode	Heating capacity: 20% to 100% capacity Intelligent optimization Fast heating
	Silence mode	Heating capacity: 20% to 80% capacity Sound level: 3dB (A) lower than Boost mode

3.6 Technical parameter

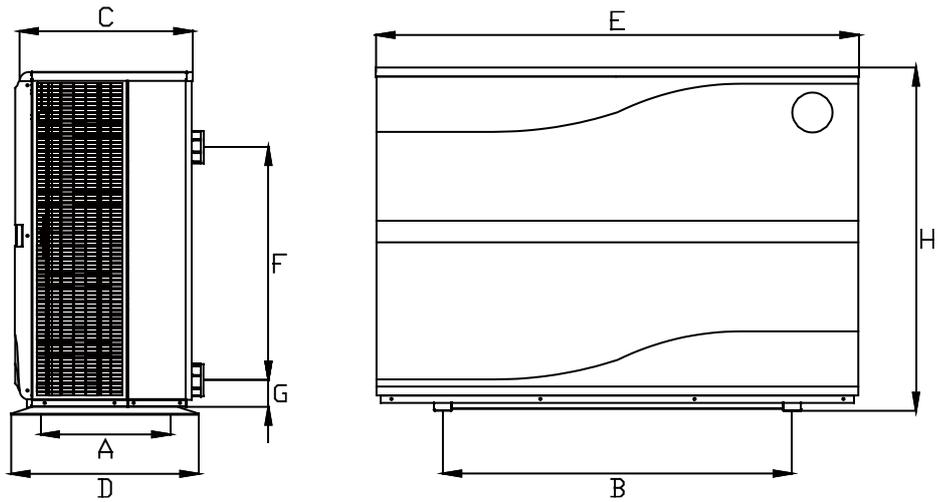
Model	HPPI09	HPPI13	HPPI17	HPPI21	HPPI28
PERFORMANCE CONDITION: Air 27°C/ Water 27°C/ Humid. 80%					
Heating capacity (kW)	9.0	13.0	17.5	20.8	27.8
COP Range	14~7.4	14.5~7.1	15.6~6.9	14.6~7.0	15.8~7.2
PERFORMANCE CONDITION: Air 15°C/ Water 26°C/ Humid. 70%					
Heating capacity (kW)	6.5	8.9	12.3	14.3	18.8
COP Range	7.3~4.7	7.5~4.9	7.7~4.9	6.9~4.9	7.8~4.9
TECHNICAL SPECIFICATIONS					
Advised pool volume (m ³)	20~45	35~65	40~80	50~95	60~120
Operating air temperature (°C)	-10°C~43°C				
Power supply	230V 1PH				
Rated input power(kW)	0.19~1.38	0.26~1.82	0.32~2.51	0.38~2.92	0.5~3.84
Rated input current(A)	0.83~5.98	1.13~7.83	1.39~10.9	1.65~12.7	2.17~16.7
Power cord(mm ²)	3X2.5	3X2.5	3X4	3X4	3X6
Sound level at 10m dB(A)	16.8~26.1	20.1~28.7	21.1~31.8	18.9~32.2	21.5~32.9
Advised water flux(m ³ /h)	2~4	4~6	6~8	8~10	10~12
Water connection (mm)	40				

Remarks:

This heat pump can perform normally within an air temperature of -10°C~+43°C, efficiency will not be guaranteed out of this range. Please take into consideration that the pool heat pump performance and parameters are different under various conditions.

Related parameters are subject to adjustment periodically for technical improvement without further notice. Please refer to the ID plate on your heat pump for up-to-date details.

3.7 Dimension



Size(mm) / Name / Model	A	B	C	D	E	F	G	H
HPPI09	410	645	390	430	890	250	75	657
HPPI13	410	645	390	430	890	280	75	657
HPPI17	410	710	390	430	1060	320	75	657
HPPI21	410	710	390	430	1060	390	75	757
HPPI28	410	710	390	430	1060	640	75	957

*Above data is subject to modification without notice.

Note: The picture above is the specification diagram of the pool & spa heat pump, for technician's installation and layout reference only. The product is subject to adjustment periodically for improvement without further notice.

4. Installation guidance

4.1 Installation reminder

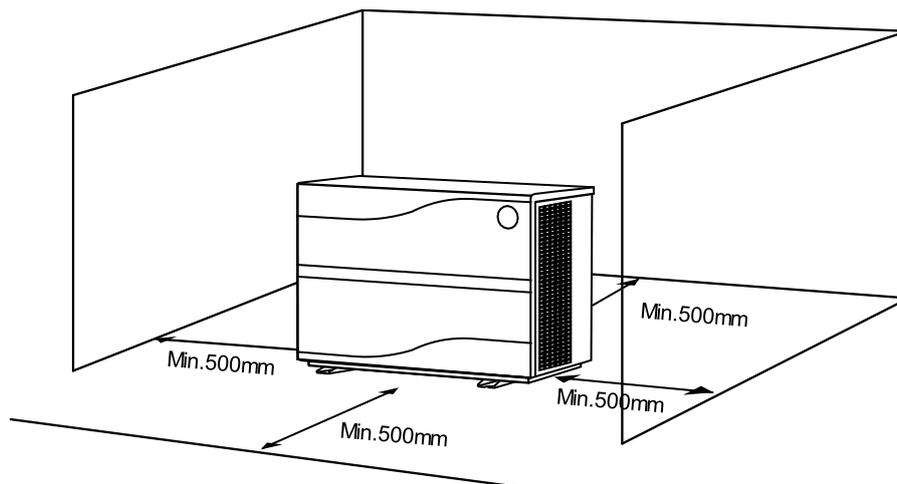
Only competent persons are authorized to install the heat pump and should be educated with the relevant building codes and standards of their state or local governing body. All electrical connections must be performed by a licensed electrician.

- a. Location and clearances – see appendix for further ventilation scenarios.
- b. The heat pump should be installed in an outdoor location with adequate ventilation. Installing a heat pump without adequate ventilation will result in poor performance or damage to your heat pump.
- c. The heat pump must be installed in an easily accessible position to ensure easy access when maintenance and service is required.

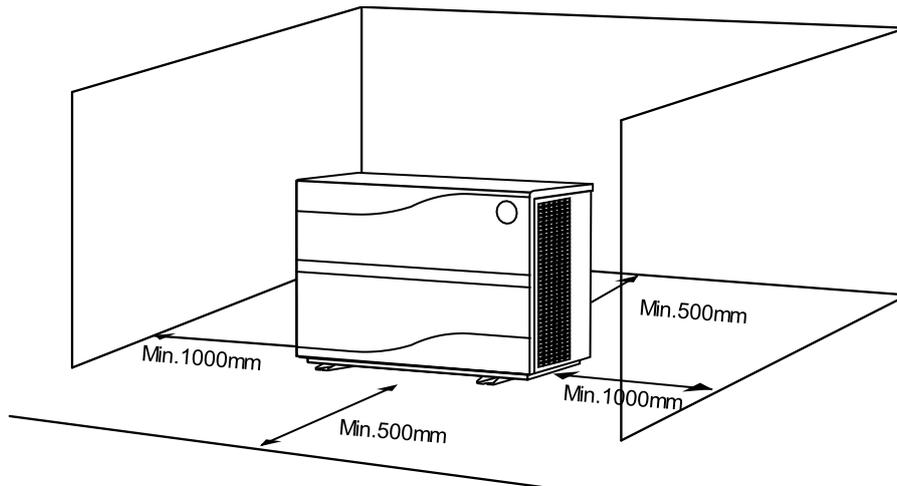


The inverter heat pump should be installed in an outdoor well ventilation area. The below diagram displays the minimum ventilation area, for optimum performance it is advised to exceed the minimum clearances.

For 17kw and below models



For 21kw and above models

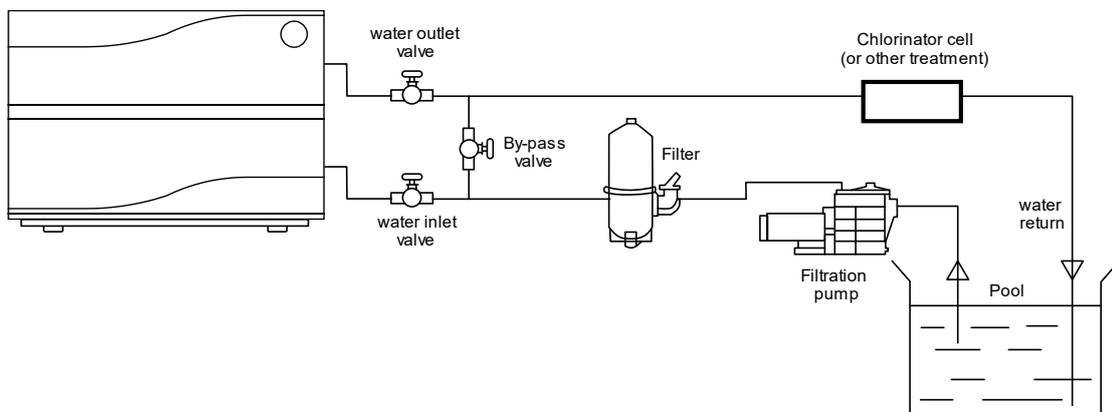


d. Typical plumbing installation diagram,

NOTE: If installing the heat pump on an existing pump/filtration setup, the heat pump must be installed after the pump/filter and before the chlorinator/sanitizer

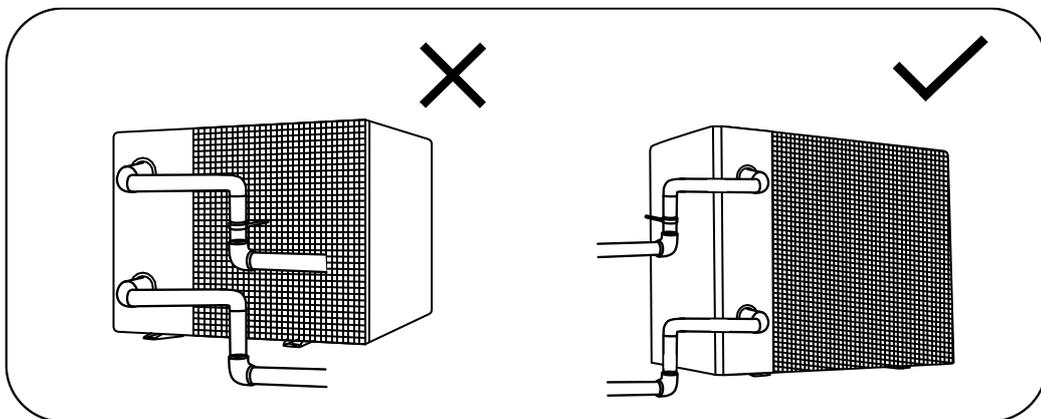
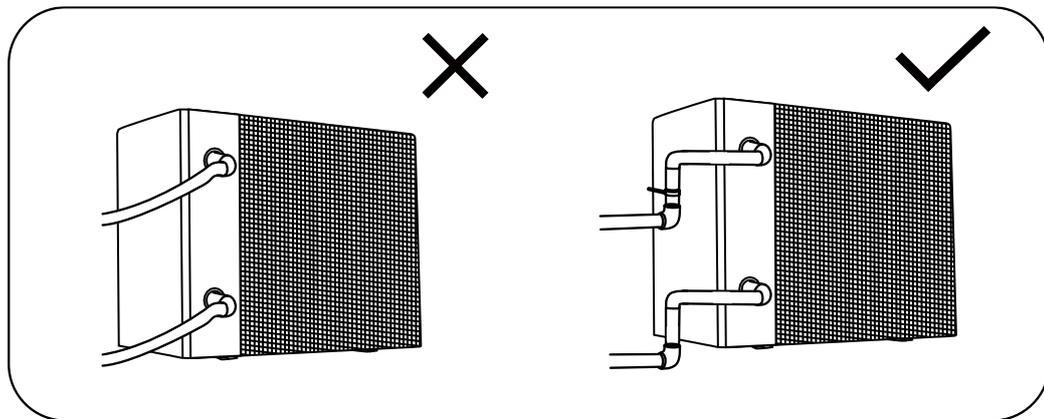
Please note: Water connection locations may differ from the diagram; this diagram is to be used as a guide only!

 The inlet and outlet water unions must be connected using hard pipe with a PN12 rating.



- 1) The frame must be fixed by bolts (M10) to concrete foundation or brackets. The concrete foundation must be solid and fastened; the bracket must be strong enough and antirust treated;
- 2) Do not stack substances that will block air flow near inlet or outlet area, and there is no barrier within 50cm behind the main heat pump, or the efficiency of the heat pump will be reduced or may damage your heat pump
- 3) The heat pump needs an appended water pump (Supplied by the user). The recommended pump must meet required flow rates as per the Technical Parameter, Max. lift $\geq 10\text{m}$;
- 4) When the heat pump is running, there will be condensation water discharged from the bottom of the heat pump. Please insure the drainage nozzle (included with your heat pump) is inserted into the drainage hole and clip in, connect a pipe to drain the condensation water out.

b. The inlet and outlet water unions cannot stand the weight of flexible pipes. The heat pump must be plumbed with rigid PVC pipes!



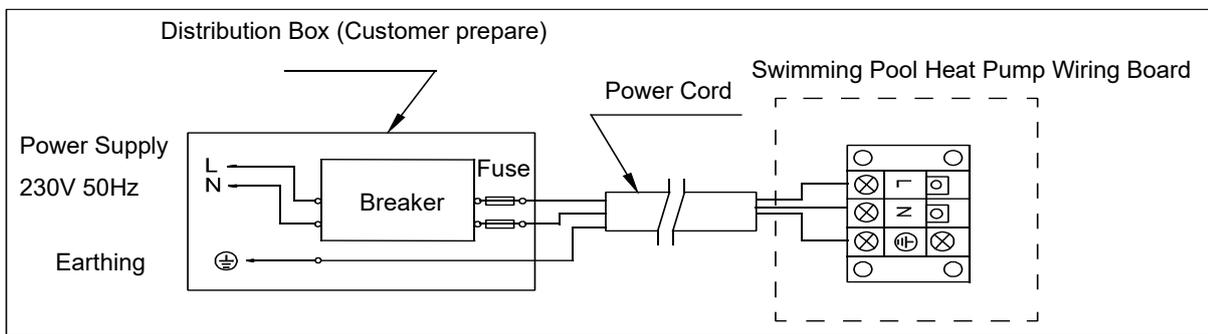
⚠ DO NOT install water pipes in such a way that they pass behind the heat pump's evaporator. In the case this cannot be avoided, cover the pipes with thermal insulation foam.

4.2 Wiring

- Connect to appropriate power supply, the voltage should comply with the rated voltage of the products.
- Heat pump must be earthed.
- Wiring must be handled by a professional technician according to the circuit diagram.
- Set leakage protector according to the local code for wiring (leakage operating current $\leq 30\text{mA}$).
- The layout of power cable and signal cable should be orderly and not affecting each other.

4.3 Electric wiring diagram

a. For power supply: 230V 50Hz



4.4 Reference for protecting devices and cable specification.

MODEL		HPPI09	HPPI13	HPPI17	HPPI21	HPPI28
Breaker	Rated Current (A)	10.5	14.5	18	21	24
	Rated Residual Action Current (mA)	30	30	30	30	30
Fuse (A)		10.5	14.5	18	21	24
Power Cord (mm ²)		3 x 2.5	3 x 2.5	3 x 4	3 x 4	3 x 6
Signal cable (mm ²)		3x0.5	3x0.5	3x0.5	3x0.5	3x0.5

※ Above data is subject to modification without notice.

Note: The above data is based on power cables less than 10m long. If the power cable required is more than 10m, wire diameter must be increased in accordance with local power regulations. The signal cable can be extended to 50m maximally.

5.Operation guidance

5.1. Key function



Symbol	Heating & cooling models
	<ol style="list-style-type: none"> 1. Power On/Off 2. Wi-Fi setting
	<ol style="list-style-type: none"> 1. Lock/Unlock Screen 2. Heating mode (18-40°C) 3. Cooling mode (12-30°C) 4. Auto mode (12-40°C)
	<ol style="list-style-type: none"> 1. Boost  2. Silence 
 	Temperature Setting

Attention:

- The controller has power-down memory function.
- The buttons will turn dark when it is locked.

1. Operating instructions

a. Screen Lock

- 1) Press "

2) Automatic Lock Period: 30 seconds if no operation

b. Power On

Press “ M” for 3 seconds to unlock screen, then press “” to power on machine.

c. Temperature Setting

Press “” and “” to display and set temperature.

d. Mode Selection

1) Heating/Cooling/Auto mode

Press “ M” to switch among heating “”, cooling “” and automatic “” mode.

Heating mode “”: Water setting range(18-40°C)

Cooling mode “”: Water setting range(12~30°C)

Automatic heating/cooling mode “”: Water setting range(12~40°C)

* When water inlet temperature is higher than setting point, automatic cooling mode starts.

* When water inlet temperature is lower than setting point, automatic heating mode starts.

2) Press “” to switch among boost mode “”, silence mode “”.

Default mode: boost 

Please choose boost mode  for initial heating

e. Wi-Fi “”

When the screen is on, press “” for 3 seconds, after “” flashing, enter Wi-Fi connection.

Connect Wi-Fi on mobile phone and input password, then control equipment by Wi-Fi. When APP connects Wi-Fi successfully, “” lights on.

f. Defrosting

1) Automatic defrosting: When machine is auto defrosting,  will flash, and return to previous working mode when it finishes.

2) Manual Defrosting: To enter forced defrosting mode, the compressor must be working more than 10 minutes. in heating mode, press “” and “” on touch controller simultaneously for 5 seconds to start forced defrosting, “” is flashing and defrost starts, “” stop flashing and defrosting stops.

(Remarks: the interval between manual defrosting should be more than 30 minutes.)

g. Round Controller Running Status Checking

1. Press “

Symbol	Content	Unit
C0	Inlet water temp	°C
C1	Outlet water temp	°C
C2	Ambient temp	°C
C3	Exhaust gastemp	°C
C4	Evaporator coil pipe temp	°C
C5	Return gas temp	°C
C6	Cooling coil pipe temp	°C
C9	Cooling plate temp	°C
C10	EEV opening angle	P

6. Temperature display conversion (Celsius/Fahrenheit)

When the screen is on, Press “

Attention: The controller has power-down memory function.

6. Testing

1. Inspect heat pump before use.

- a. Check the heat pump has adequate ventilation, ensure air inlets and outlets, and are not obstructed.
- b. Ensure heat pump is not installed in a corrosive environment.
- c. Check electric wiring is fasten and wired correctly, ensure unit is fully earthed. (all electrical work must be carried out by a licensed electrician)
- d. Check all plumbing for any water leaks,

6.1 Refrigerant leakage detection method



- a. Leakage checking is prohibited in enclosed area.
- b. Any ignition source is prohibited during the leakage inspection. A halide torch (or any other detector using a naked flame) shall not be used.
- c. Leakage detection fluids can be applied 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.
- d. Vacuumize completely before welding. Welding can only be carried out by professional personnel.
- e. Please stop using while gas leakage occurs and contact professional personnel in service center.

6.2 Trial

- a. The water pump must be started before the heat pump and turned off before the heat pump to avoid any damage to the heat pump.
- b. Before starting the heat pump, please check for any water leaks.
- c. To protect the heat pump, the heat pump is equipped with a time lag function, the fan will run for 1 minute before the compressor is turn on and for 1 minute after the compressor has turned off.
- d. After the heat pump starts up, please check for any abnormal noises from the heat pump.

NOTE: For optimum efficiency, the water inlet to outlet temperature differential should be between 2-3 degrees

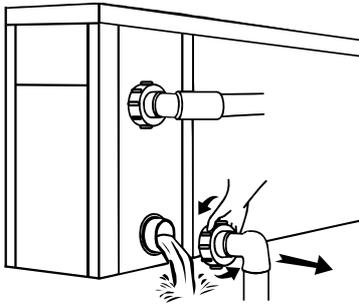
The running status function on the touch pad will verify inlet and outlet temperatures, adjust water bypass vales to active optimum water flow rates.

7.Maintenance



“SWITCH OFF” power supply to the heat pump before cleaning, examination and repair

1. In the winter season when the heat pump is not in operation.
 - a. Cut off power supply to prevent any damage to the heat pump.
 - b. Drain all the water from the heat pump.
 - c. Cover the heat pump when not in use.



!!Important:

Unscrew the water nozzle of inlet pipe to let the water flow out.

When the water in heat pump freezes in winter season, the titanium heat exchanger may be damaged.

2. Please clean this heat pump with household detergents or clean water, NEVER use petrol, thinners, or any similar fuel.
3. Check bolts, cables, and connections regularly.
4. If repair or removal is required, please contact authorized service center nearby.
5. Do not attempt to work on the equipment by yourself. Improper operation may cause danger.
6. To reduce risk, safety inspection must be carried out before the maintenance or repair of heat pumps with R32 gas.

8. Trouble shooting for common faults.



WARNING

- a. If repair or removal is required, please contact an authorized service center.
- b. Requirements for Service Personnel
- c. Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
- d. Do not attempt to work on the equipment by yourself. Improper operation may cause danger.
- e. Strictly comply with the manufacturer's requirements when charging R32 gas and equipment maintenance. This chapter focuses on special maintenance requirements for swimming pool heat pump with R32 gas. Please refer to the technical service manual for detailed maintenance operation.
- f. Vacuumize completely before welding. Welding can only be carried out by professional personnel in service center.

Failure solution and code

Failure	Reason	Solution
Heat pump does not run	No power	Wait until the power recovers
	Power switch is off	Switch on the power
	Fuse burned	Check and change the fuse
	The breaker is off	Check and turn on the breaker
Fan running but with insufficient heating	Evaporator blocked	Remove the obstacles
	Air outlet blocked	Remove the obstacles
	3 minutes start delay	Wait patiently
Display normal, but no heating	Set temp. too low	Set proper heating temp.
	3 minutes start delay	Wait patiently
If above solutions do not work, please contact your installer with detailed information and your model number. Do not try to repair it yourself.		

Note: If the following conditions happen, please stop the heat pump immediately, and cut off the power supply immediately, then contact your dealer:

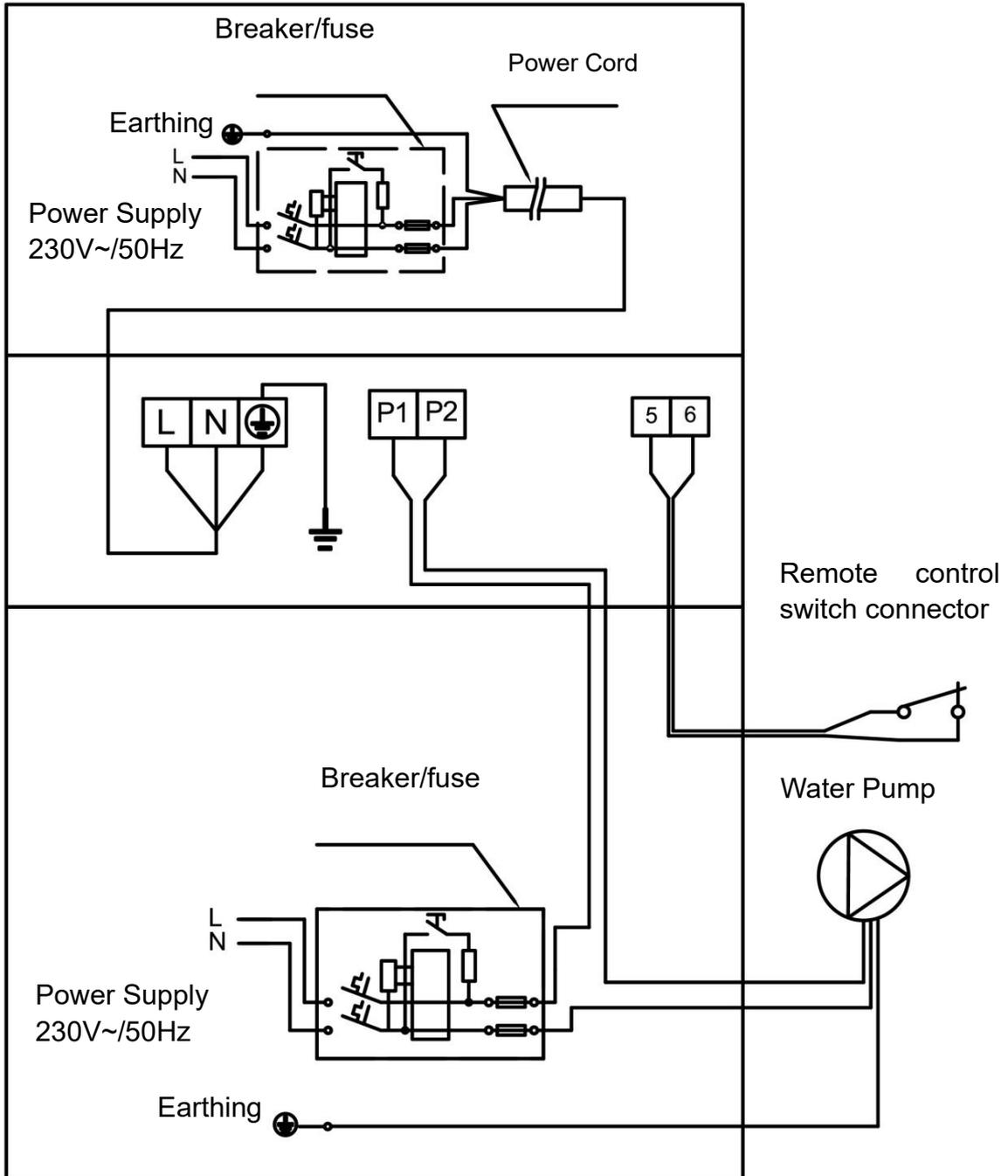
1. Inaccurate switch action.
2. The fuse is frequently tripping, or leakage circuit breaker tripped.

Protection & Failure codes

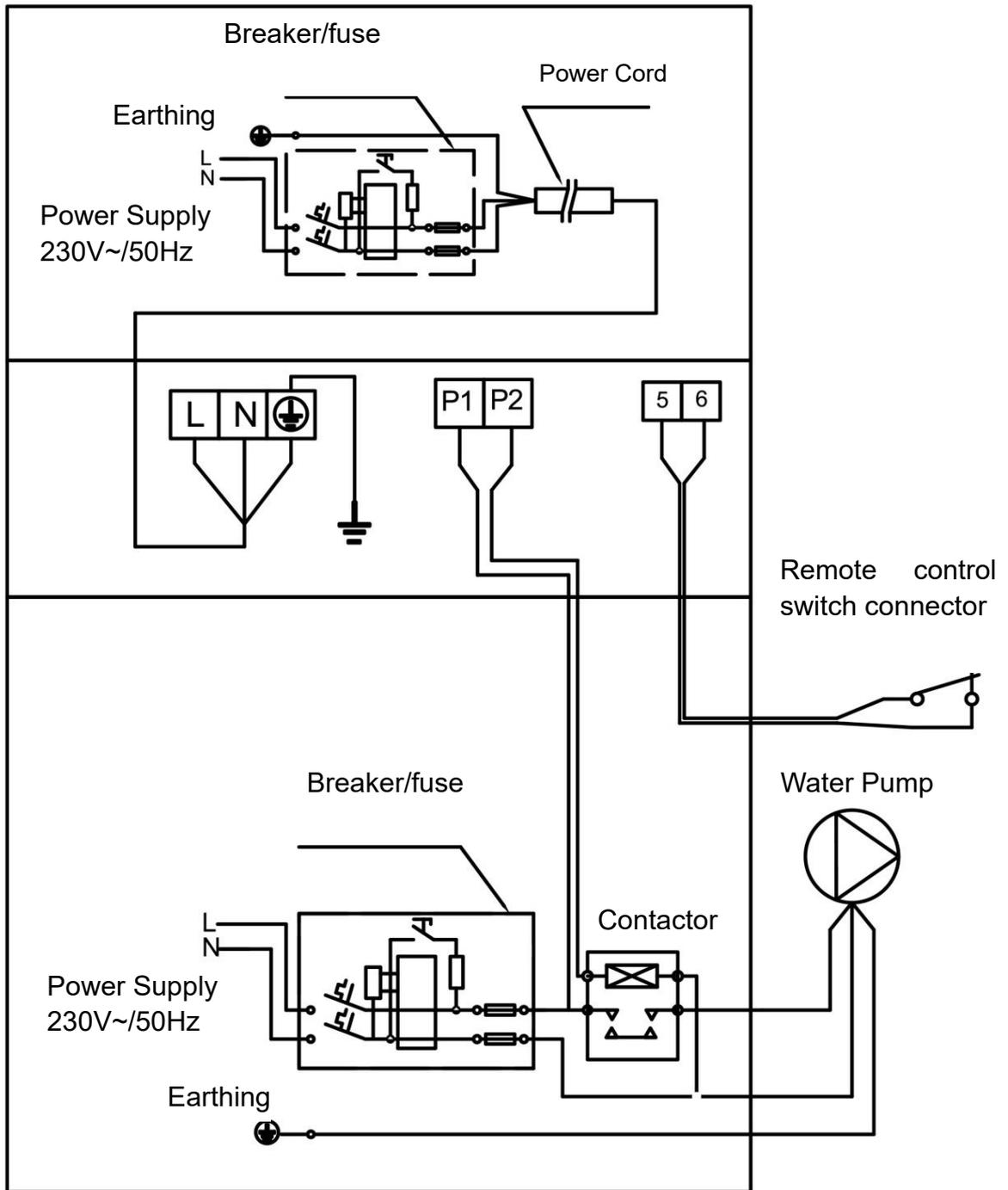
NO.	Display	Protection code description
1	E3	No water protection
2	E5	Power supply excess operation range
3	E6	Excessive temp difference between inlet and outlet water (Insufficient water flow protection)
4	Eb	Ambient temperature too high or too low protection
5	Ed	Anti-freezing reminder
NO.	Display	Failure code description
1	E1	High pressure protection
2	E2	Low pressure protection
3	E4	3 phase sequence protection (three phase only)
4	E7	Water outlet temp too high or too low protection
5	E8	High exhaust temp protection
6	EA	Evaporator overheat protection (only at cooling mode)
7	P0	Controller communication failure
8	P1	Water inlet temp sensor failure
9	P2	Water outlet temp sensor failure
10	P3	Gas exhaust temp sensor failure
11	P4	Evaporator coil pipe temp sensor failure
12	P5	Gas return temp sensor failure
13	P6	Cooling coil pipe temp sensor failure
14	P7	Ambient temp sensor failure
15	P8	Cooling plate sensor failure
16	P9	Current sensor failure
17	PA	Restart memory failure
18	F1	Compressor drive module failure
19	F2	PFC module failure
20	F3	Compressor start failure
21	F4	Compressor running failure
22	F5	Inverter board over current protection
23	F6	Inverter board overheat protection
24	F7	Current protection
25	F8	Cooling plate overheat protection
26	F9	Fan motor failure
27	Fb	Power filter plate No-power protection
28	FA	PFC module over current protection

9. Water Pump Control Connection

Water pump: 230V voltage, $\leq 500W$ capacity

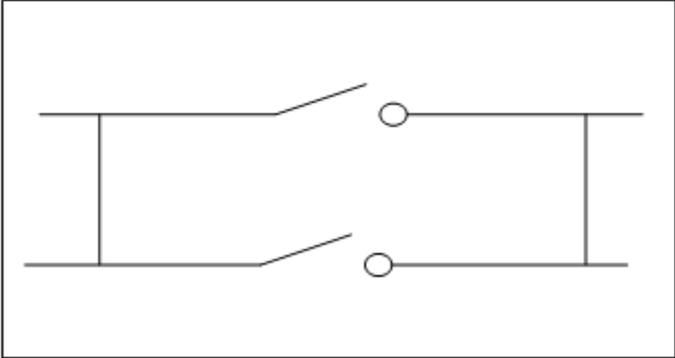


Water pump: 230V voltage, >500W capacity



Water pump control and timer connection

1: Water pump timer



2: Water pump wiring of Heat Pump

Note: The installer should connect 1 parallel with 2 (as above picture). To start the water pump, condition 1 or 2 is connected. To stop the water pump, both 1 and 2 should be disconnected.

10.Wi-Fi operation

① APP Download



Android please download from



iOS please download from

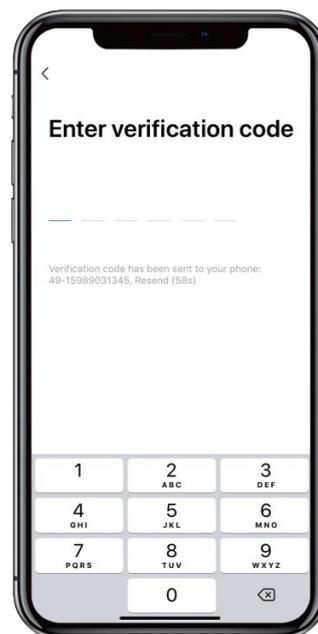
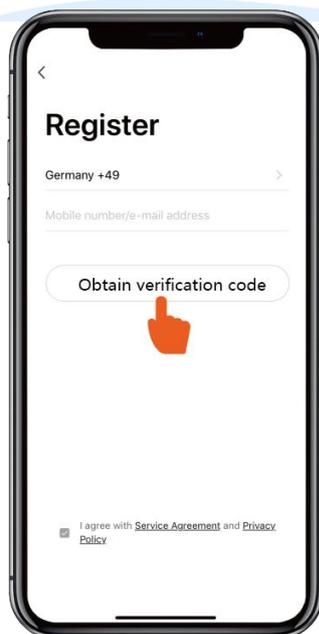


② Account Registration

1. Register by mobile or E-mail.

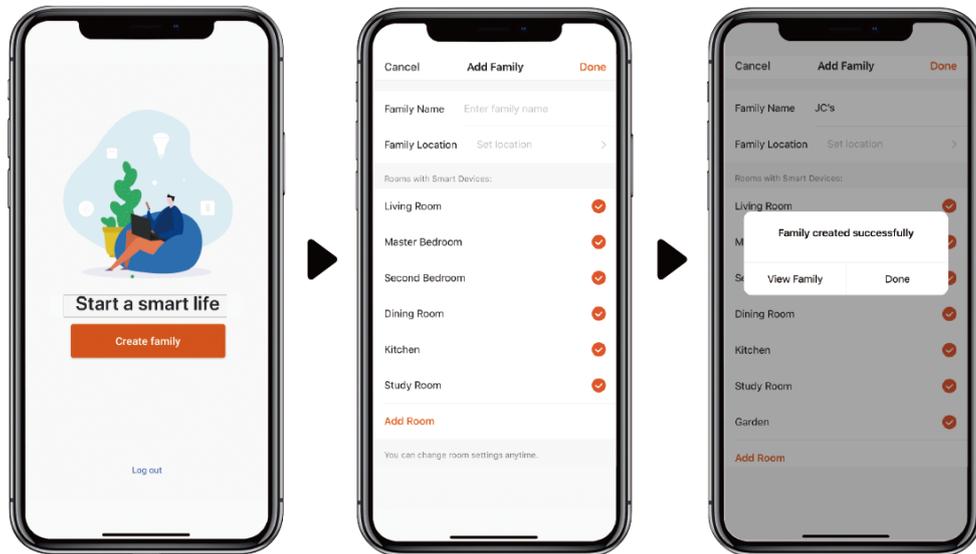


2. Mobile or E-mail registration.



3 Create Family

Please set family name and choose the room of device.

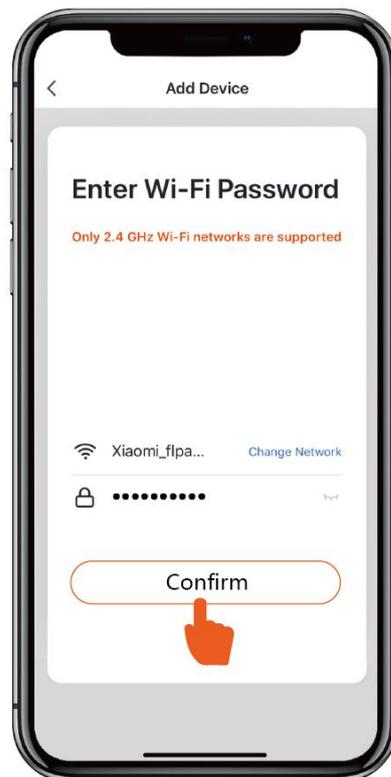
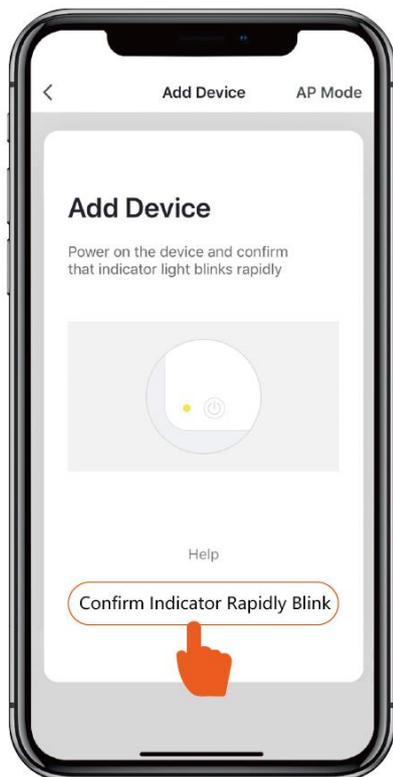
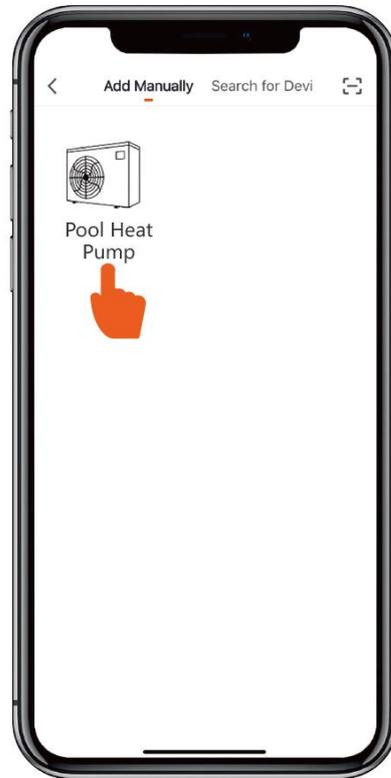
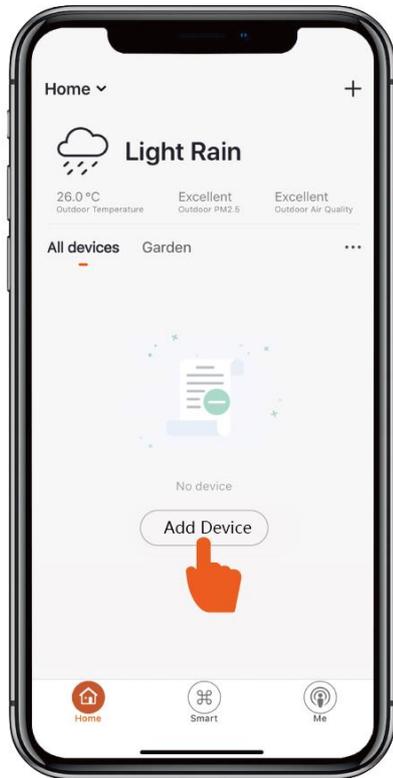


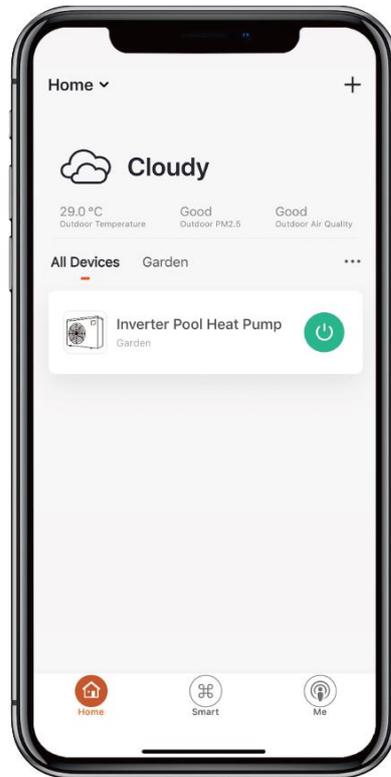
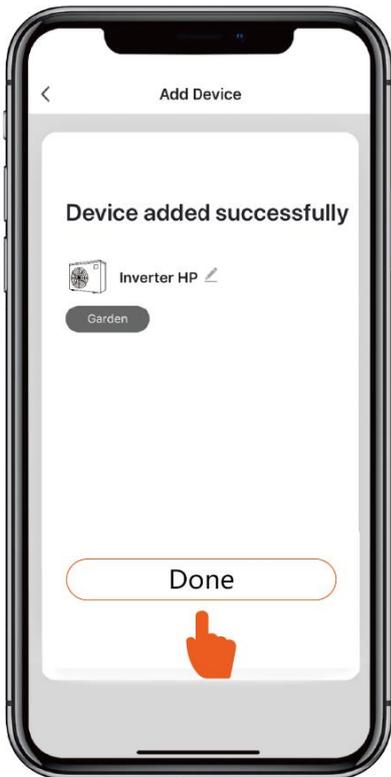
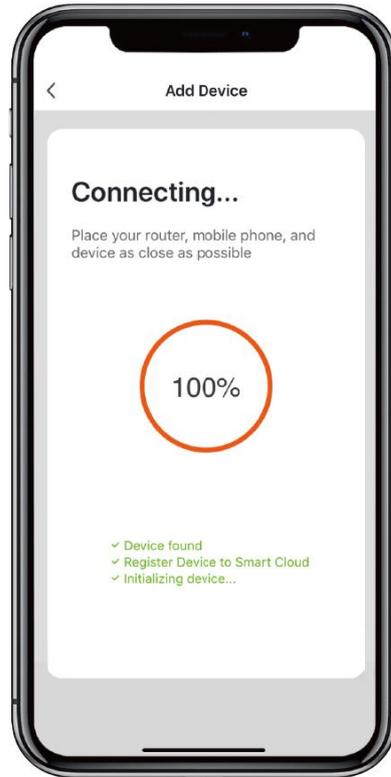
4 APP Pairing

Please make sure you are connected to the Wi-Fi.

1. Press “A circular smart thermostat device is shown. The central digital display shows the temperature '26.5 °C'. Above the display are icons for Wi-Fi and signal strength. Below the display are four touch-sensitive buttons: a lock icon, a refresh/cycle icon, an up arrow, and a down arrow. At the very bottom is a power button icon.

2. Click "Add Device", and then follow instructions to pair device.





5 Operation

1. For heat pump with Heating function only :

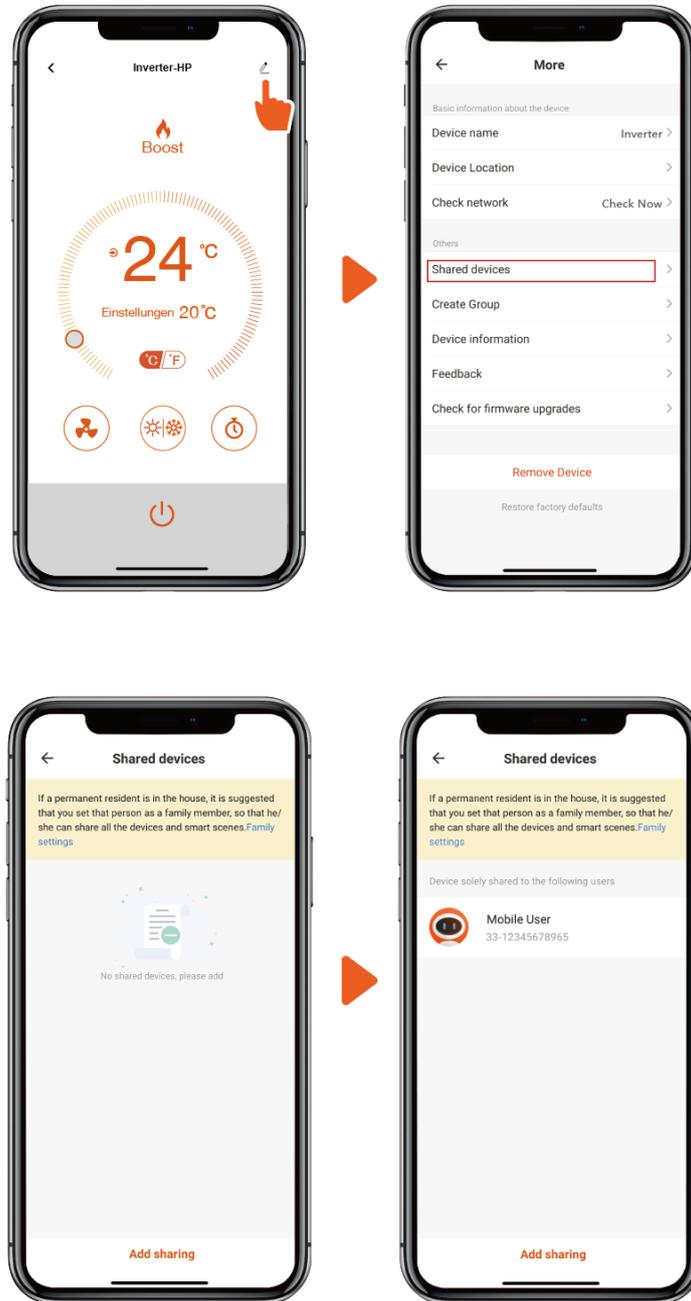


2. For heat pump with Heating&Cooling function :



6 Share Devices to Your Family Members

After pairing, if your family members also want to control the device.
Please let your family members register the APP first, and then the administrator
can operate as below:



Notice: The weather forecast is just for reference.
App is subject to updating without notice.

11. Warranty

Spa-Craft Pty Ltd (Spa-Craft) warrants all products sold will be (under normal use and service) free of defects in material and workmanship for a minimum period of one year from the date of original purchase by the customer as marked on the invoice, for specific product warranty periods please refer to below table.

Spa-Craft goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are entitled to have the goods repaired or replaced if goods fail to be of acceptable quality and the failure does not amount to a major failure. No unauthorized personnel can make any warranty representation on the behalf of Spa-Craft without written permission.

Model	Titanium Heat Exchanger	Compressor	Parts	On-Site Labour
ES Series	<i>25 years</i>	<i>3 years</i>	<i>2 years</i>	<i>1 year</i>
PI Series	<i>25 years</i>	<i>5 years</i>	<i>2 years</i>	<i>1 year</i>

This warranty does not cover the following:

- normal wear and tear
- been subject to misuse, neglect, negligence, damage, or accident
- been used, operated, or maintained other than in accordance with Spa-Craft instructions
- not been installed in accordance with the Installation Instructions or by suitably qualified personnel
- been modified or altered from original specifications or in any way not approved by Spa-Craft
- had repairs attempted or made by other than Spa-Craft or its authorized dealers
- been subject to abnormal conditions such as incorrect voltage supply, lightning, or high voltage spikes, or damages from electrolytic action, cavitation, sand, corrosive, saline or abrasive liquids and natural disasters

To make a warranty claim:

- If the product is suspected of being defective, stop using it and contact the original place of purchase. Alternatively, phone Spa-Craft Customer Service on 1300 498819 or via email to info@spa-craft.com.au
- Provide evidence or proof of date of original purchase
- Provide model number and serial number.
- If requested, return the product and/or provide further information with respect to the claim. Returning the product to the place of purchase is at your cost and is your responsibility.
- The warranty claim will be assessed by Spa-Craft based on their product knowledge and reasonable judgement and will be accepted if:
 - a relevant defect is found
 - the warranty claim is made during the relevant warranty period; and none of the excluded conditions listed above apply
- The customer will be notified of the warranty decision in writing and if found to be invalid the customer must organise collection of the product at their expense or authorise its disposal.

If the claim is found to be valid Spa-Craft will, at its option, repair or replace the product free of charge.

On Site Service

Onsite technical service is available within the normal operating area of your Spa-Craft service center, service outside this area will incur a traveling fee.

