POOL HEAT PUMP (65K-150K EX-MODELS)

INSTALLATION & OWNER'S MANUAL

Models Covered:
PHP-EX-65
PHP-EX-90
PHP-EX-130
PHP-EX-150

WARNING: DO NOT destroy or lose this manual. Please read the manual thoroughly. Also, store the manual in a place that allows for easy retrieval and future reference. As a result of continuous product improvement, the specification and design of this product are subject to change without advanced notice. Consult your manufacturer or your dealer for further details regarding this product. The images and illustrations within this this manual are for reference only. The actual shape and size of your product may vary.

VERSION DATE: 7-16-25

IMPORTANT

These installation instructions constitute an integral component of the product and are imperative for transmission to the installer, while also mandating retention by the end user.
The warnings and directives contained within this manual demand meticulous reading and comprehension, as they furnish pivotal information pertaining to the safe handling and operation of the product.

Consequently, this handbook must consistently remain accessible for subsequent reference.
The installation process must be executed in strict adherence to local regulations and the comprehensive guide issued by the manufacturer, all of which necessitate engagement by a qualified professional. For the purpose of this directive, a "qualified professional" is defined as an individual possessing the necessary skills, knowledge, education, training, and experience to perform any specific job relating to this equipment competently and safely.

It is imperative to acknowledge that any lapse in the installation procedure could result in physical harm to individuals or animals, as well as mechanical damage, for which the manufacturer cannot, under any circumstances, be held liable. Before embarking on any installation, manipulation, or repair work concerning the heat pump, it is important to isolate the electrical power supply to the unit. In the event of a malfunction and/or operational error with the heat pump, the electrical power supply must be severed, and no attempt should be made to rectify the issue.
It is crucial to emphasize that this heat pump may exclusively be employed for the purpose for which it was expressly designed: heating a swimming pool / cooling the swimming pool.

All contractual or non-contractual liabilities of the products shall be deemed null and void in relation to any damage stemming from installation or operational lapses, or the failure to adhere to the instructions provided by the manufacturer or the applicable installation standards pertaining to the equipment detailed in this document.

SAFETY PRECAUTIONS

This appliance is not intended for use by persons (including children) with reduced physical,sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

We have provided important safety messages in this manual and on your heat pump.

2.1 Warning 

Please always read and obey all safety messages.
The 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 extremely important.
a. Keep the heat pump away from a fire source.
b. It must be placed in a well-ventilated area; an indoor or closed area is not allowed.
c. Repair and disposal must be carried out by trained service personnel
d. Vacuumize completely before welding. Welding can only be carried out by professional personnel in a service center.

2.2 Attention

2.3 Safety

a. Please read the following instructions before installation, use and maintenance.

b. Installation must be done by professional staff only in accordance with this manual.

c. Leakage test must be performed after installation.

d. Please don't stack substances, which will block air flow near inlet or outlet area, otherwise the efficiency of the heat pump will be reduced or even stopped.

e. Set proper temperature in order to get comfortable water temperature to avoid overheating or overcooling.

f. In order to optimize the heating effect, please install heat preservation insulation on pipe between swimming pool and the heat pump, and please use a recommended cover on the swimming pool.

g. Connecting pipes of the swimming pool and the heat pump should be ≤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.

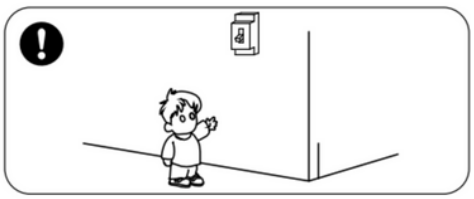
i. If a repair is required, please contact the nearest after-sales servicae center. The repair process must be strictly in accordance with manual. All repair practice by non-professionals is prohibited.

j. Don't use or stock combustible gas or liquid such as thinners, paint and fuel to avoid fire.

k. This unit can only be installed outdoors.

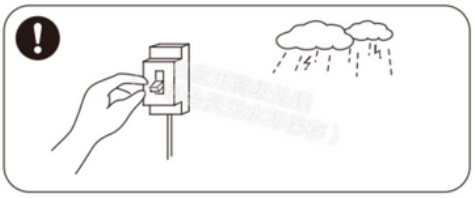
l. This unit can only be connected to a power source with a single complete cord.

n. Please keep the main power supply switch far away from the children.



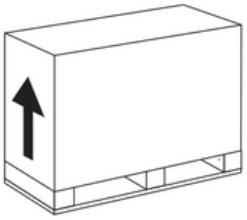
m. When a power cut happens during operation, and later the power is restored, the heat pump will start up.

o. Please switch off the main power supply in lightning and storm weather to prevent from machine damage caused by lightning;

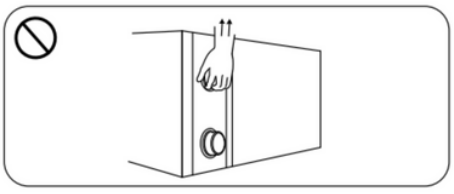


p. Safety inspection must be carried out before the maintenance or repair for heat pumps with R32 gas in order to minimize the risk.

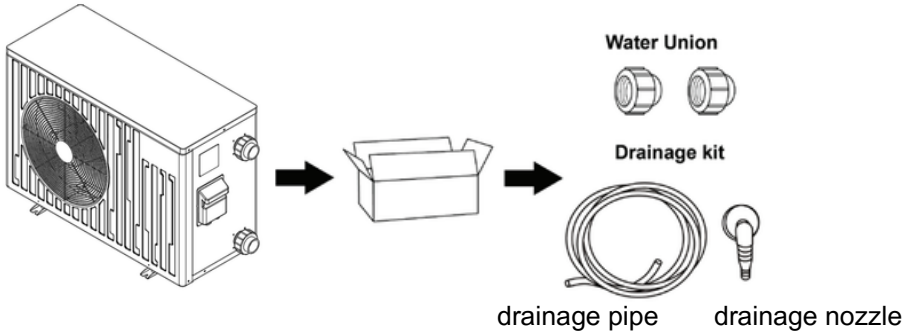
q. Always keep upright



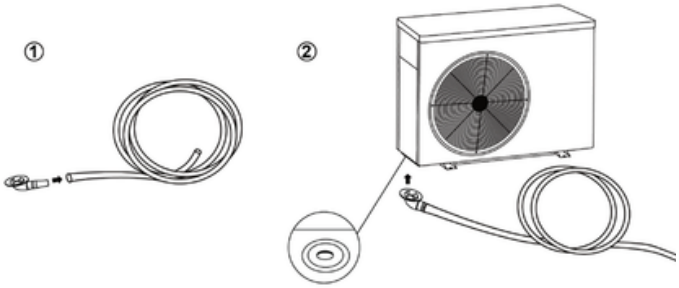
r. Do not lift the water union the titanium heat exchanger inside the heat pump may be damaged



2.4 Accessories Contents



When the machine is running, there will be condensation water discharged from the bottom, Please hold the drainage nozzle (accessory) into the hole and clip it well, and then connect a pipe to drain the condensation water out.



2.5 Operating condition and range

The heat pump can work between air 32°F-109°F, and its ideal operation range is between air 59°F-77°F

2.6 Introduction of different modes

a. The heat pump has three modes: Silence / Smart / Turbo
b. They have different strengths under different conditions.

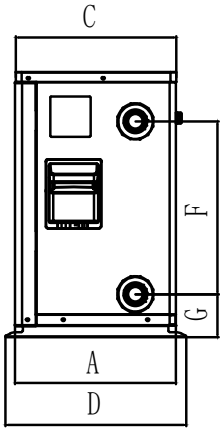
Mode Icon	Modes	Strength	Noise level	Manufacturer suggestion
	Silence mode	Heating capacity: 20%-60% Capacity Intelligent optimization Slow heating	20-dBA	Best used when the water is already warm. Maintains maximum efficiency in hot climates.
	Smart mode	Heating capacity: 40%-80% Capacity Intelligent optimization Midium heating	40-dBA	Ideal for maintaining warm water during moderate climate conditions.
	Booster mode	Heating capacity: 60%-100% Capacity Intelligent optimization Fast heating	50-dBA	Use when first opening the pool or when quick heating is needed.

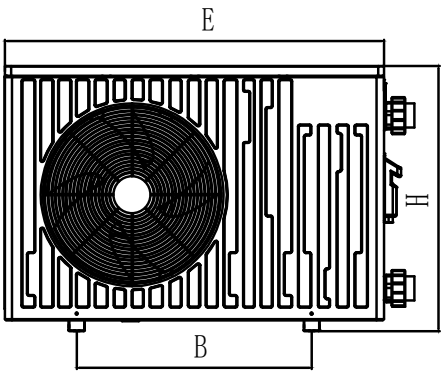
2.7 Technical parameter

Model		PHP-EX-65	PHP-EX-90	PHP-EX-130	PHP-EX-150
Performance Condition: Air 80° F/Water 80° F/Humidity 80%					
Heating capacity (BTU)		65000	96000	121000	150000
Heating capacity (KW)		19.1	28.13	35.4	43.96
COP Range		5.62	5.66	5.12	5.25
Performance Condition: Air 80'F/Water 80° F/ Humidity 63%					
Heating capacity (BTU)		62700	92100	110500	135000
Heating capacity (KW)		18.4	26.99	32.45	39.56
COP Range		5.56	5.04	4.28	4.12
Performance Condition: Air 50° F/Water 80° F/Humidity 63%					
Heating capacity (BTU)		38500	68700	69900	86900
Heating capacity (KW)		11.3	20.13	20.49	25.47
COP Range		3.53	3.43	3.53	3.46
TECHNICAL SPECIFICATIONS					
Advised pool volume (gallons)		10600~20000	18,000-26,000	18,000-31,000	25,000-41,000
Operating air temperature (° F)		14℉~110℉			
Operating air temperature (° C)		-10~43			
Heat exchanger		32~ 109			
Power supply		208~240V/1Ph/60Hz			
Water connection (inch)/ (mm)		1.5″（38.1mm）	2″（50.8mm）	2″（50.8mm）	2″（50.8mm）
Rated input power at air 80° F (kW)		3.4	5.14	6.32	7.31
Rated input power at air 80° F (BTU)		11600	17537	21256	24941
Rated input current at air 80° F (A)		14.72	22.3	29.14	33
Maximum input current (A)		18.75	30	33	42
Sound level at 10ft dB(A)LP		36~49	37~50	37~51	37~52
Advised water flux	(L/min)	110~145	163~202	205~254	255~315
	(GPM)	24.2~31.9	43~54	54~68	67~84
Net dimension LxWxH	(mm)	987×400×660	845×868×797	845×868×797	1010×1041×894
	(inch)	38-7/8 × 15-3/4 × 26	33-1/4 × 34-3/16 × 31-5/16	33-1/4 × 34-3/16 × 31-5/16	40-1/32 × 40-31/32 × 35-3/16
Net Weight	(Kg)	60	93	120	170
	(Ib)	132	205	265	375

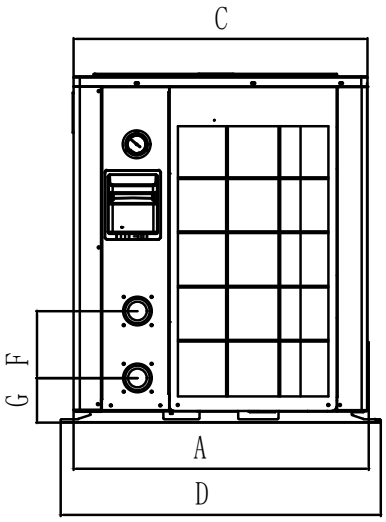
2.8 Dimension

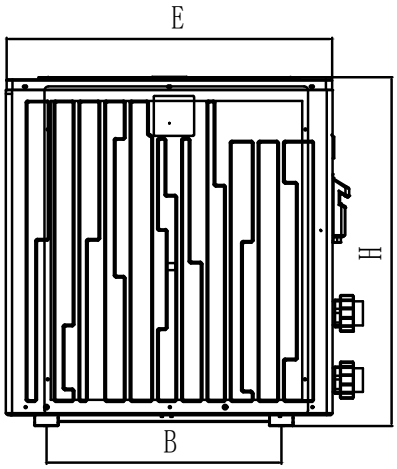
For heating capacity model
65,000BTU
PHP-EX-65



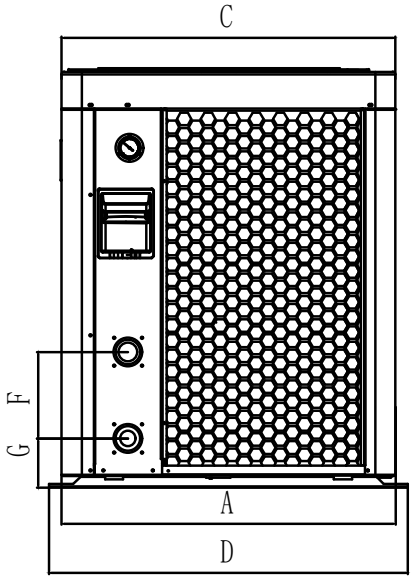


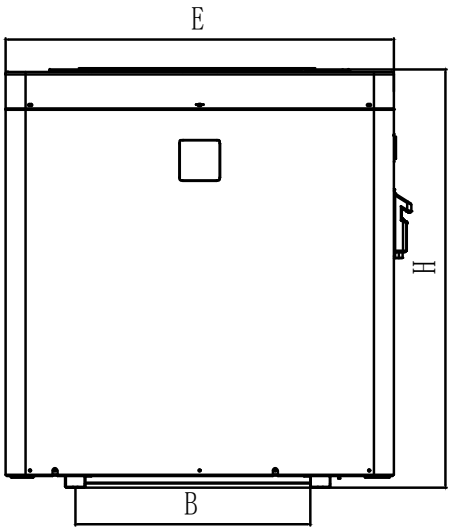
For heating capacity model
90,000BTU & 120,000BTU
PHP-EX-90 & PHP-EX-130





For heating capacity model
150,000BTU
PHP-EX-150

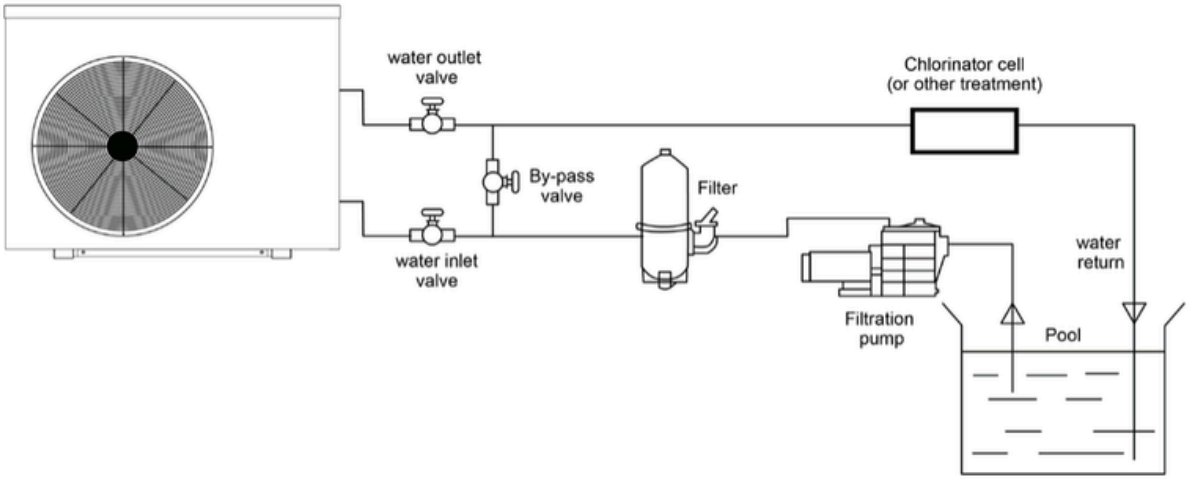




Size(inch) Name / Model	A	B	C	D	E	F	G	H
PHP-EX-65	16.00	23.00	16.00	18.00	37.00	17.00	4.00	26.00
PHP-EX-90 & PHP-EX-130	29.00	23.00	29.00	31.00	32.00	7.00	4.00	34.00
PHP-EX-150	33.00	23.00	33.00	35.00	38.00	9.00	5.00	41.00

INSTALLATION AND CONNECTION

3.1 Only a professional staff is allowed to install the heat pump. The users are not qualified to install by themselves, otherwise the heat pump might be damaged and risky for users' safety



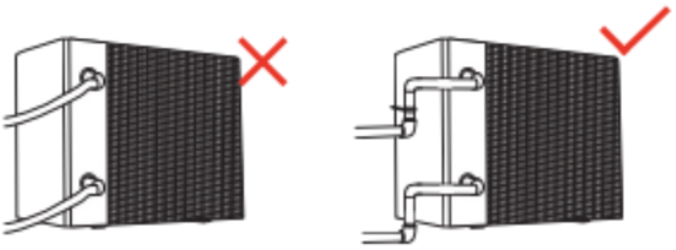
The inverter pool heat pump should be installed in a good ventilation place.

Installation items:
The factory only provides the heat pump unit; the other items in the illustration are necessary spare parts for the water system,that provided by users, noted The machine needs an appended pump (Supplied by the user). The recommended pump specification: Refer to Technical Parameter, Max. lift ≥10m

Attention:
Please follow these steps when using it for the first time
（1）Open the valve and charge water.
（2）Make sure that the pump and the water-in pipe have been filled with water.
（3）Close the valve and start the unit.

ATTENTION: It is necessary that the water-in pipe is higher than the pool surface.
The schematic diagram is for reference only. Please check the water inlet/outlet label on the heat pump during plumbing installation.

Use a PVC Pipe to connect to the Filtration System. The use of soft, flexible pipe is not recommended as the weight of these pipes will damage the internals of the unit and not be covered by warranty.



2.9 Swimming Pool Heat Pumps Location

The unit will perform well in any outdoor location provided that the following three factors are presented:

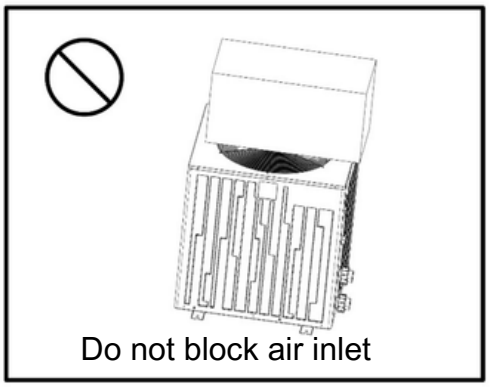
（1）**Fresh Air**

（2）**Electricity**

（3）**Pool filter piping**

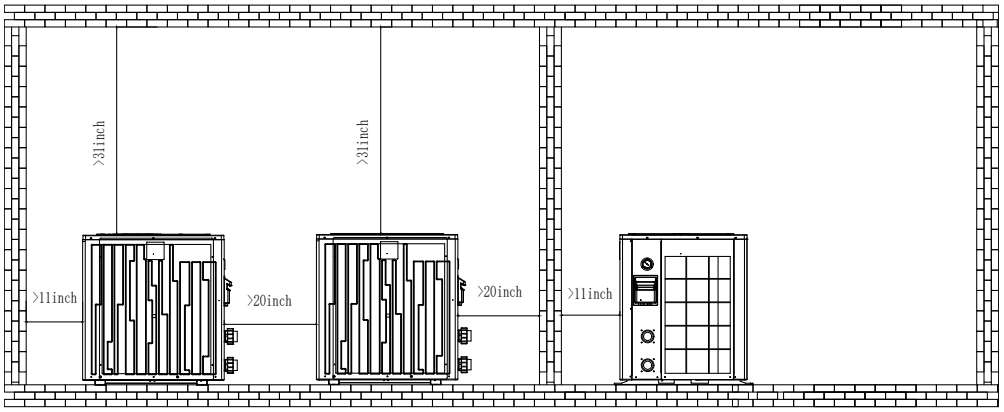
The unit may be installed virtually anywhere outdoors. Unlike a gas heater, it has no draft or pilot light problem in a windy area.

DO NOT place the unit near shrubs which can block air inlet and DO NOT put obstacles before the air inlet and outlet of the Heat Pump. Air ventilation is vital for the performance of your Heat Pump.These locations deny the unit of a continuous source of fresh air which reduces it efficiency and may prevent adequate heat delivery.

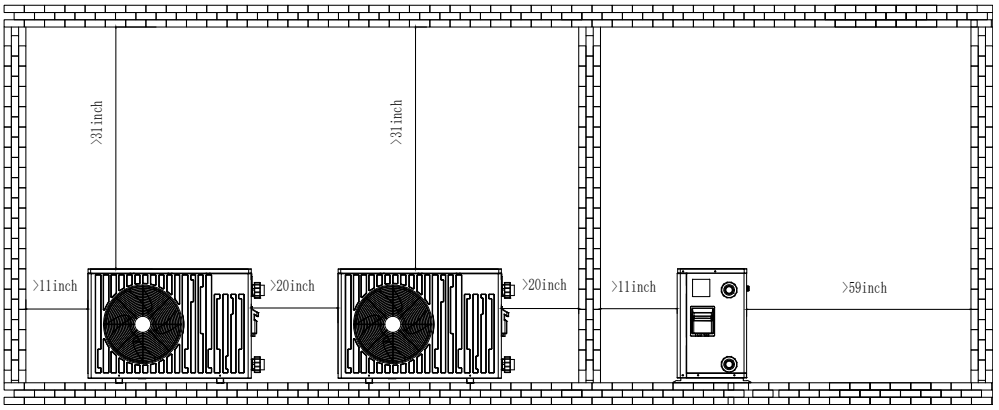


DO not place the unit in an enclosed area with a limited air volume, where the units discharge air will be re-circulated. The minimum required distances mentioned below must be respected in order to avoid any risk of air recirculation and a deficiency in the unit's overall performance.

For top discharge model



For side discharge model



Please note that these are absolute minimum distances and where possible, should always have a greater difference. Under no circumstances should any of the distances be reduced as performance will be affected. More ventilation is better. These units must be installed outdoors in a well-ventilated area. it's recommended not to be installed in decks, under houses, In sheds or any sort of indoor location.

Wiring

3.2 Electric wiring diagram

a. Connect to the appropriate power supply, the voltage should comply with the rated voltage of the products.

b. Earth the machine well.

c. Wiring must be handled by a professional technician according to the circuit diagram.

d. Set leakage protector according to the local code for wiring (leakage operating current ≤ 30mA).

e. The layout of power cable and signal cable should be orderly and not affect each other.

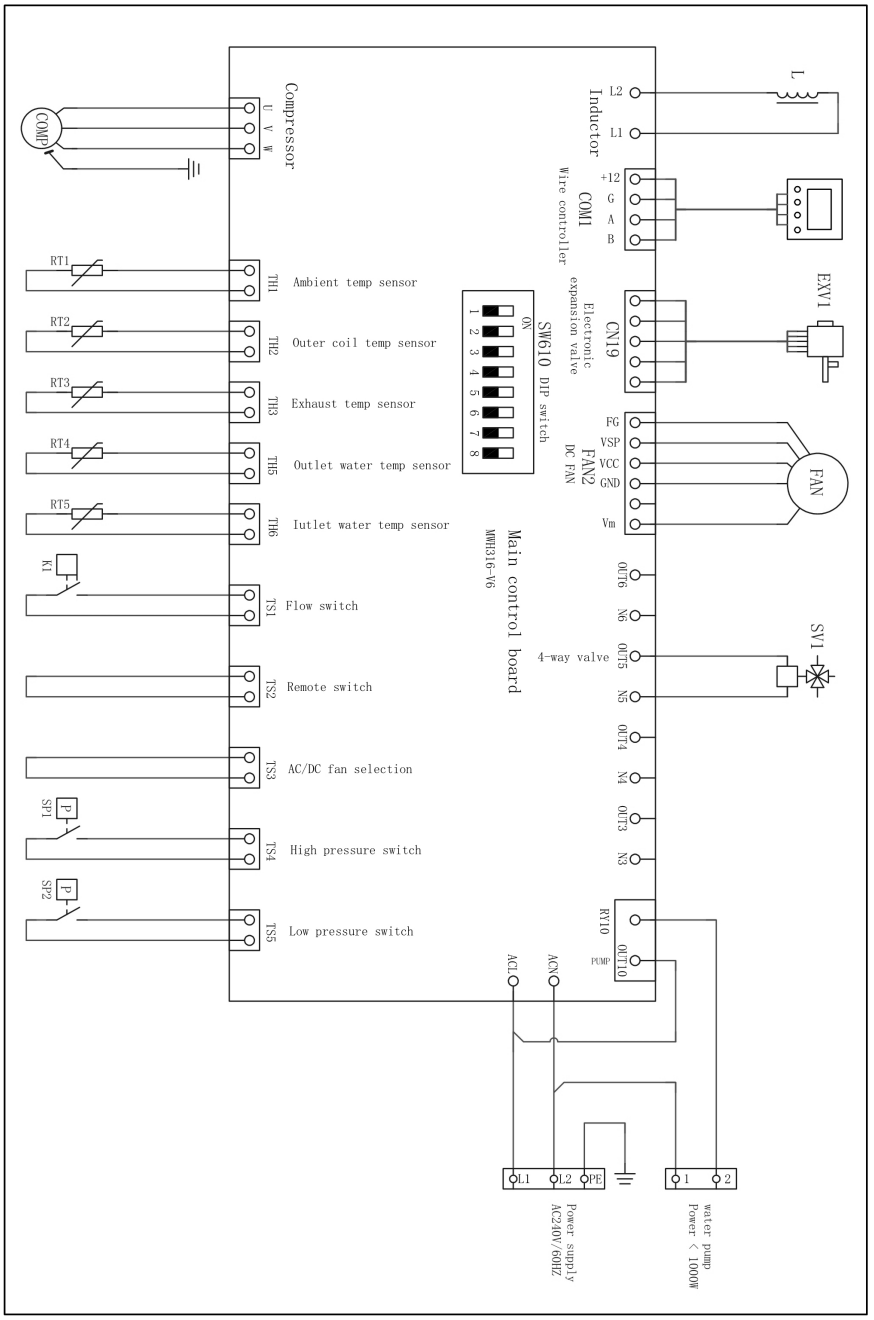
f. The appliance shall be installed in accordance with national wiring regulations.

Electric wiring diagram

For power supply: 230V 60Hz 1Phase

For 65.000BTU model

For PHP-EX-65 model



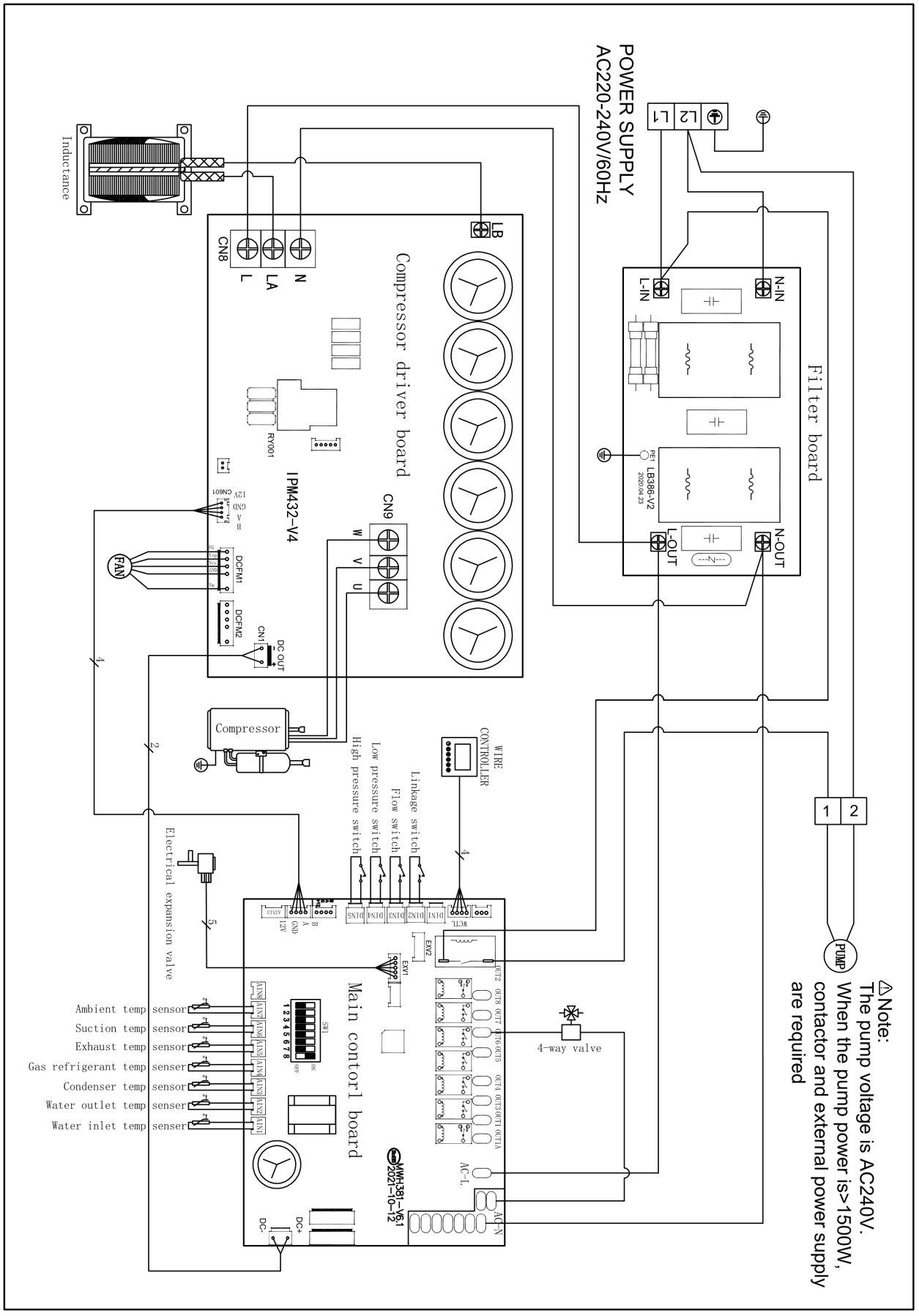
1. Must be hard-wired; plug is not allowed.
2. The swimming pool heat pump must be earthed well.
3. The power cord and signal wire must be installed with conduit.
4. WARNING: Before obtaining access to terminals, all supply circuits must be disconnected.

Electric wiring diagram

For power supply: 230V 60Hz 1Phase

For 90.000BTU and 120.000BTU model

For PHP-EX-90 and PHP-EX-130 model



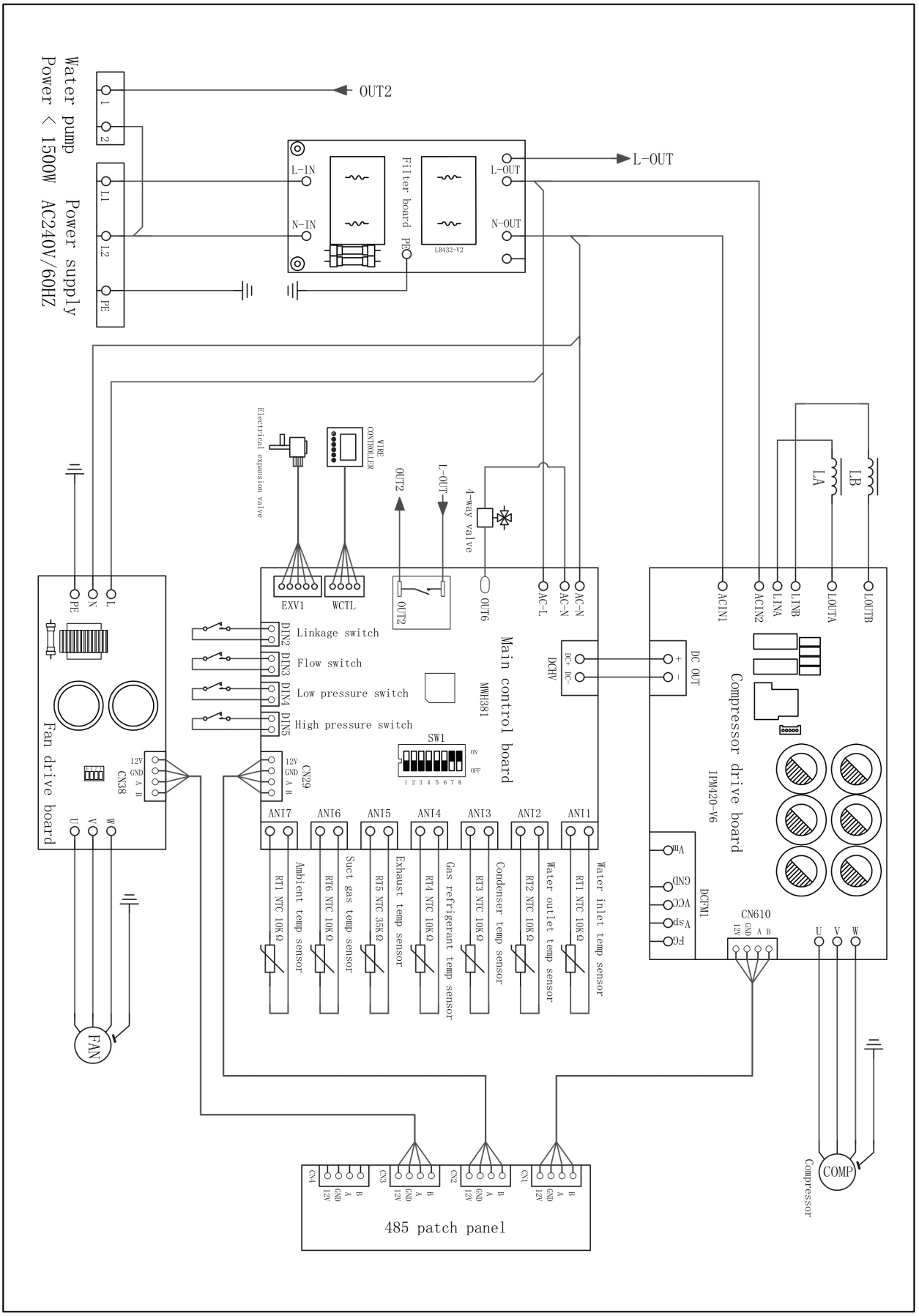
1. Must be hard-wired; plug is not allowed.
2. The swimming pool heat pump must be earthed well.
3. The power cord and signal wire must be installed with conduit.
4. WARNING: Before obtaining access to terminals, all supply circuits must be disconnected.

Electric wiring diagram

For power supply: 230V 60Hz 1Phase

For 150.000BTU model

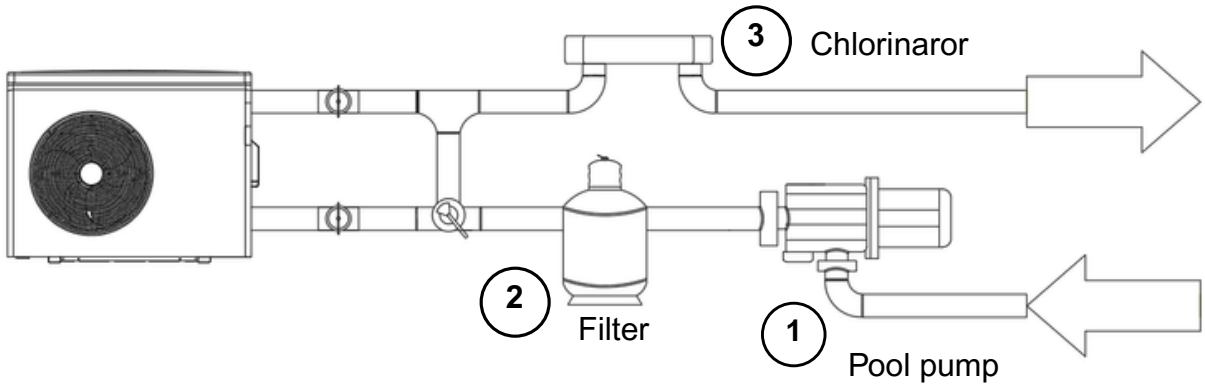
For PHP-EX-150 model



1. Must be hard-wired; plug is not allowed.
2. The swimming pool heat pump must be earthed well.
3. The power cord and signal wire must be installed with conduit.
4. WARNING: Before obtaining access to terminals, all supply circuits must be disconnected.

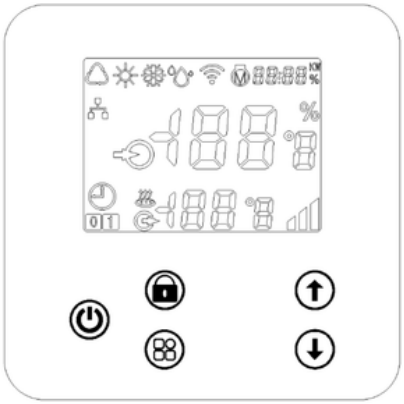
3.3 Reference for protecting devices and cable specification

HEATING CAPACITY MODEL		650,000BTU PHP-EX-65	90,000BTU PHP-EX-90	120,000BTU PHP-EX-130	150,000BTU PHP-EX-150
Breaker	Rated Current (A)	30	40	50	60
	Rated Residual Action Current (mA)	100 Type B	100 Type B	100 Type B	100 Type B
Fuse (A)		30	40	50	60
Power Cord (AWG)		3×12	3×10	3×10	3×8



1.Pool pump (1) starts based on the chlorinator or timer schedule and begins circulating pool water.
2.Water flows through the filter (2) to remove debris and then passes into the heat pump.
3.The heat pump's internal flow switch detects the water movement and automatically starts heating.
4.After heating, water flows through the chlorinator (3) where sanitizing chemicals are added before returning to the pool.
5.If water flow stops, the heat pump displays **E3**, indicating it's in standby mode — waiting for the filtration pum to resume.
6.The heat pump is connected to the pool circulation pump via a control wire. This allows the heat pump to start and stop the pump directly
7.When heating is needed, the heat pump sends a signal to activate the pool pump.
8.The flow switch inside the heat pump checks whether water is circulating properly.
9.If no water flow is detected, the heat pump displays error code **E3**.
10.After showing **E3**, the heat pump will wait 3 minutes, then automatically restart the pump and attempt operation again.
12.If the **E3** error occurs 3 times within 60 minutes, the system will lock for safety to prevent equipment damage.
13.To reset the system, power must be cycled off and on, or a manual reset must be performed

OPERATION GUIDE



Icon	Function
	Power On/Off Wifi setting
	Press to set water temperature up
	Press to set inlet water temperature down
	Press to set working mode (silence mode / Smart mode/ Turbo mode)
	1. Press 3 seconds to unlock/lock the screen. 2. After the screen is unlocked, press it to select mode， Heating/Cooling/Auto mode

Screen lock: Only after the screen is unlocked, can any other buttons function.
a. If no button is used within 30 seconds, the screen will lock automatically. At this point, the backlight will turn off, and 0% will display

	Heating
80%	Heating capacity %
	Wi-Fi connection
	Water inlet
	Water outlet

a. Press the LOCK button for 3 seconds to light up screen
→ then press POWER button to power on heat pump

b. Working mode selection
Press the LOCK button for 3 seconds to light up screen
→ then press to choose heating, cooling and automatic mode.

Icon	Function
	Heating
	Cooling
	Auto

c. Adjust/Set Temperature: When screen is unlocked, press UP or DOWN to display or adjust the set temperature
To change from Fahrenheit (°F)to Celsius (°C), press the UP and DOWN together for 5 seconds

d. Silence /Smart/ Booster mode selection:

Press the Fan button for mode selection

Mode Icon	Modes
	Silence mode
	Smart mode
	Booster mode

e. Defrosting

1. Auto Defrosting : When heat pump is defrosting, HEATING will continually flashing. After defrosting, HEATING will stop flashing.

2. Manual Defrosting:Press FAN and DOWN together for 5 seconds to start manual defrosting, HEATING will flash continuously. After defrosting, HEATING will stop flashing. (Note: Manual defrosting intervals should be more than 30 minutes and the compressor should run for more than 10 minutes.)

f. WIFI setting

"tuya"APP WIFI configuration

Step 1: Download and install the "tuya" APP in the mobile app market。

Step 2: First, connect the phone to the Wi-Fi at home. Long press the " " button for about 9 seconds in the wire controller normal display interface until the " " flashing icon appears. At this time, you have entered the WIFI networking state. If the wire controller is locked on the screen, long press the " " key for 3 seconds to unlock, and then long press the " " button.

Step 3: Open the "tuya" APP, click "+" as shown in Figure 1 and click "Add device" as shown in Figure 2. Then the device search interface will appear.

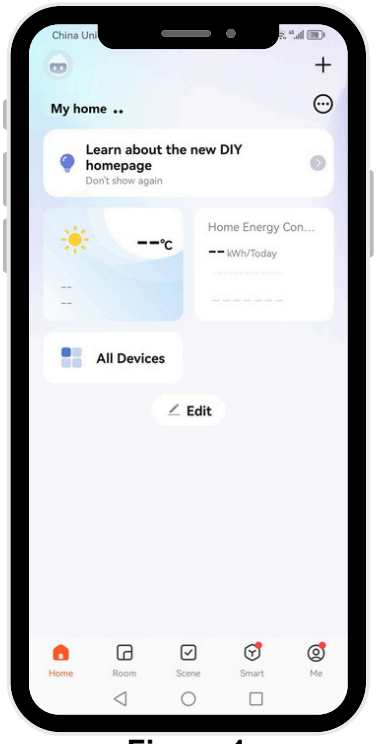


Figure 1

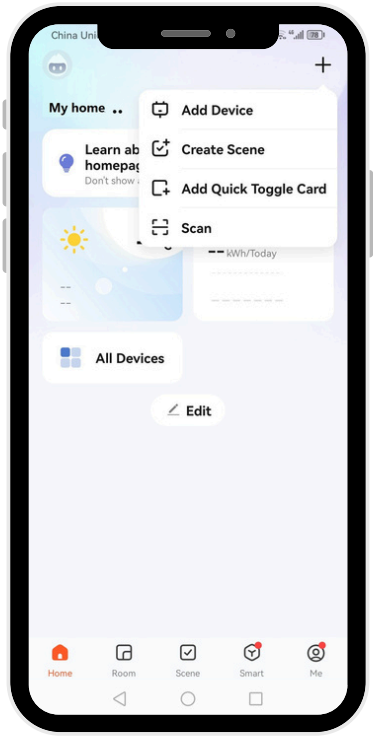


Figure 2

Step 4: After searching for the device, as shown in Figure 3, click the device icon to enter the network configuration.
Step 5: Select your home WIFI name, enter the WIFI password and click Next, as shown in Figure 4.

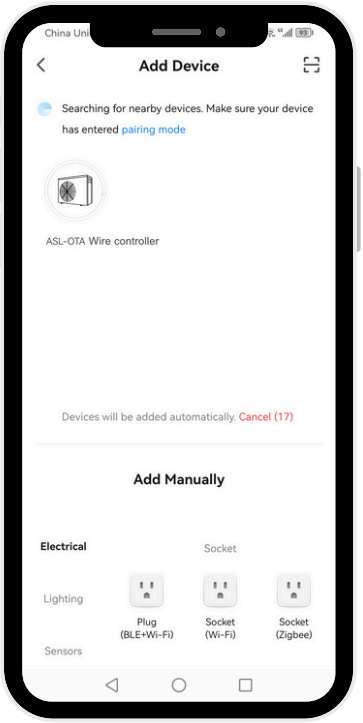


Figure 3

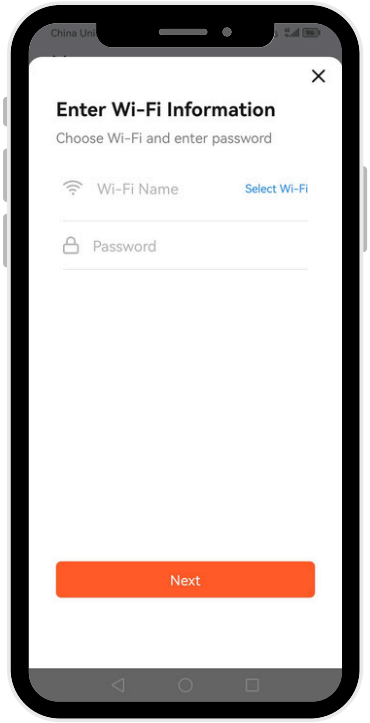


Figure 4

Step 6: In WIFI configuration, please wait 1-2 minutes patiently and do not perform other operations, as shown in Figure 5.
Step 7: The WIFI configuration is complete. Click the done button as shown in Figure 6.

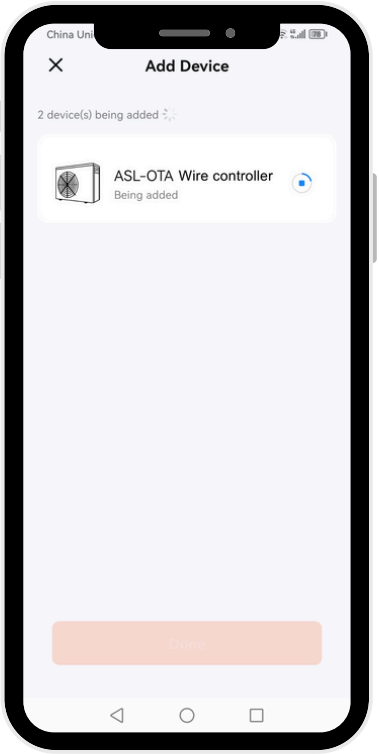


Figure 5

Figure 6

"tuya"APP Operating Instructions

- Click the ASL-OTA Wire controller on the home page of "tuya" app to enter the device operation interface, as shown in Figure 7.
- APP Home page introduction,as shown in Figure 8.

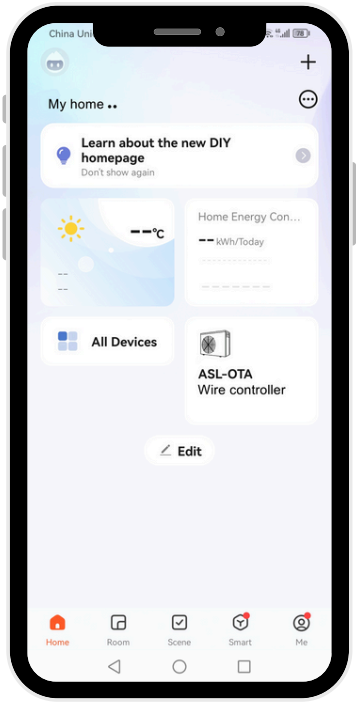


Figure 7

Figure 8

APP Home page introduction for Figure 8.

TESTING

4.1 Inspect heat pump before use

a. The ventilating device and outlets are operating adequately and are not obstructed.

b. It's prohibited to install refrigeration pipe or components in corrosive environment.

c. Inspect the electric wiring on basis of the electric wiring diagram and earthing connection.

d. Double confirm the main machine power switch should be off.

e. Inspect the air inlet and outlet

4.2 Leakage detection notice and method

a. Leakage checking is prohibited in closed area.

b. The 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 in service center.

e. Please stop using while gas leakage occur, and contact professional personnel in service center

4.3 Trial

a. The user must "**Start the Pump before the Machine, and Turn off the Machine before the Pump**", or the machine will be damaged.

b. Before start the heat pump, please check for any leakage of water; and then switch on power supply.

c. In order to protect the swimming pool heat pump, the machine is equipped with a time-lag starting function, the fan will run 1 minute earlier than the compressor when starting the machine, and it will stop running 1 minute later than the compressor when power off the machine.

d. After the swimming pool heat pump start up, please kindly checking for any abnormal noise from the machine.

MAINTENANCE

CAUTION: Turn off its power supply before service work including cleaning, examination, or repair. Do not touch any electronic components until the LED indication lights on the PCB is off.

1. When a power outage happens while the heat pump is running, the heat pump will restart automatically when the power is restored. Please switch off the power supply when there is a power outage, and reset the temperature setting when power is restored.
2. If the heat pump is stopped for a long time, please cut off the power supply and drain water completely from the heat pump by opening the union of the inlet pipe.
3. Check bolts, cables, and connections regularly for looseness and adjust as needed

Cold Weather Operation

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.

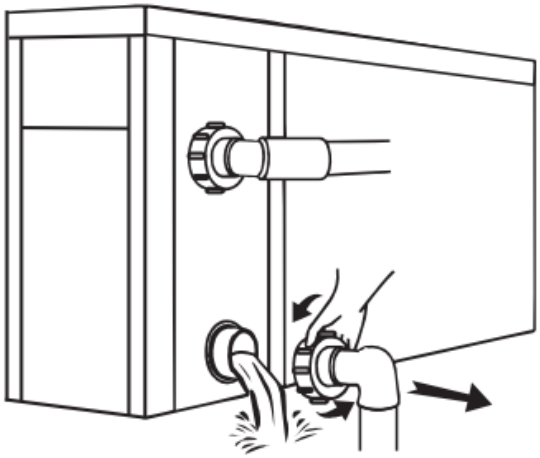
c. Cover the machine body when not in use.

d. Please clean this machine with household detergents or clean water, NEVER use gasoline, thinners or any similar fuel.

e. Check bolts, cables and connections regularly.

f. If repair or scrap is required, please contact authorized service center nearby.

g. Do not attempt to work on the equipment by yourself. Improper operation may cause danger.



!!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.

Troubleshooting

Failure	Reason	Solution
Swimming pool heat pump does not run	Main power off	Wait for the power to be restored
	Power switch is off	Turn on switch
	Fuse burnt	Replace fuse
	Circuit breaker tripped	Turn circuit breaker back on
Heat pump runs but not heat	Air inlet blocked	Remove obstructions
	Air outlet blocked	Remove obstructions
	3-minute protection	Please wait more than 3minutes for warming to start
	Temp set too low	Set temperature setting
If these above solutions do not work,contact your dealer.Do not attempt to repair the heat pumpyourself.		

Failure code

Display	Protection code description
E3	No water protection
E5	Power supply excesses operation range (not failure)
E6	Excessive temperature difference between inlet and outlet water, exceeds 10°C. (Insufficient water flow protection)
E6	Ambient temperature too high or too low protection(not failure)
Ed	Anti-freezing reminder(not failure)
Display	Failure code description
E1	High pressure protection
E2	Low pressure protection
E4	3 phase sequence protection (three phase only)
E7	Water outlet temp too high or too low protection
E8	High exhaust temp protection
EA	Heat exchanger overheat protection/Evaporator overheat protection (only at cooling mode)
P0	Controller communication failure
P1	Water inlet temp sensor failure
P2	Water outlet temp sensor failure
P3	Gas exhaust temp sensor failure
P4	Evaporator coil pipe temp sensor failure
P5	Gas return temp sensor failure
P6	Cooling coil pipe temp sensor failure
P7	Ambient temp sensor failure
P8	Cooling plate temp.sensor failure
P9	Current sensor failure
PA	Restart memory failure
F1	Compressor driver module failure
F2	PFC module failure
F3	Compressor start failure

F4	Compressor running failure
F5	Inverter board over current protection
F6	Inverter board overheat protection
F7	Current protection
F8	Cooling plate overheat protection
F9	Fan motor failure
Fb	Power filter plate No-power protection
FA	PFC module over current protection

HEAT PUMP WARRANTY AGREEMENT

Owner's Responsibilities:
Owners are required to diligently maintain and operate the equipment in accordance with the provided operating instructions.‘
Regular cleaning of air filters and replacement when necessary, ensuring clear air inlets and outlets.
maintaining a clean condensate drain,
Replacing exhausted batteries
Applying additional corrosion protection in corrosive environments
Drain water clear of the machine during winter season
Are the owner's responsibilities.

Coverage Duration and Inclusions:
Manufacturer warrants the listed equipment against defects in design, materials, and workmanship for distinct periods:
Two Years Parts (Supply Only) Coverage: Parts deemed faulty within two years from the date of purchase are covered under this warranty. This coverage strictly pertains to the supply of parts and excludes associated labor costs.
Five-year compressor (Supply Only) coverage: Compressor deemed faulty within five years from the date of purchase is covered under this warranty. This coverage strictly pertains to the supply of parts and excludes associated labor costs.
Ten Years Titanium Heat Exchanger Coverage: The titanium section of the heat exchanger is specifically warranted for a period of ten years against defects.

Exclusions from Warranty Coverage:
It is imperative to note that this warranty does not extend to cover the following circumstances
Electrical and External Factors: Damage arising from faulty external electrical wiring, incorrect power supply, voltage fluctuations, or electromagnetic interference not originating within the equipment.
Installation and Accessories: Issues resulting from incorrect or poor installation, or the utilization of non-manufacturer accessories, components, or equipment.
Natural or External Forces: Damage caused by storms, fires, floods, vandalism, misuse, negligence, Acts of God, earthquakes, war, vermin, foreign matter ingress (e.g., dirt, moisture), or any external agency. Atmospheric Conditions: Deterioration of external surfaces or refrigeration coils due to normal weathering or corrosive atmospheric conditions.

The design and specifications are subject to change without prior notice for product improvement. Consult with the sales agency or manufacturer for details. Any updates to the manual will be uploaded to the service website, please check for the latest version.