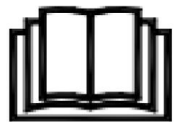


SWIMMING POOL HEAT PUMP

Installation & Instruction Manual



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1.PREFACE

•In order to provide our customers with quality, reliability and versatility, this product has been made to strict production standards. This manual includes all the necessary information about installation, debugging, discharging and maintenance. Please read this manual carefully before you open or maintain the unit. The manufacture of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, or unnecessary maintenance. It is vital that the instructions within this manual are adhered to at all times. The unit must be installed by qualified personnel.

•The unit can only be repaired by qualified installer centre , personnel or an authorised dealer.

•Maintenance and operation must be carried out according to the recommended time and frequency, as stated in this manual.

•Use genuine standard spare parts only.

Failure to comply with these recommendations will invalidate the warranty.

•Swimming Pool Heat Pump Unit heats the swimming pool water and keeps the temperature constant. For split type unit, The indoor unit can be Discretely hidden or semi-hidden to suit a luxury house.

•Our heat pump has following characteristics:

1. Durable

The heat exchanger is made of PVC & Titanium tube which can withstand prolonged exposure to swimming pool water.

2. Installation flexibility

The unit can be installed outdoors.

3. Quiet operation

The unit comprises an efficient rotary/ scroll compressor and a low-noise fan motor, which guarantees its quiet operation.

4. Advanced controlling

The unit includes micro-computer controlling, allowing all operation parameters to be set. Operation status can be displayed on the LCD wire controller. Remote controller can be chosen as future option.

•WARNING

Do not use means to accelerate the defrosting process or to clean, Other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example:open flames, an Operating gas appliance or an operating electric heater.)

Do not pierce or burn.

Be aware that refrigerants may not contain an odour.

Appliance shall be installed,operated and stored in a room with a floor area larger than 30m².

NOTE: The manufacturer may provide other suitable examples or may provide additional information about the refrigerant odour.



1.PREFACE

- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The appliance shall be installed in accordance with national wiring regulations.
- Do not operate your air conditioner in a wet room such as a bathroom or laundry room.
- Before obtaining access to terminals, all supply circuits must be disconnected.
- An all-pole disconnection device which has at least 3mm clearances in all poles and have a leakage current that may exceed 10mA the residual current device (RCD) having a rated residual operating current not exceeding 30mA and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources. (for example: open flames, an operating gas appliance or an operating electric heater)
- Do not pierce or burn.
- Appliance shall be installed, operated and stored in a room with a floor area larger than 30 m². Be aware that refrigerants may not contain an odour.
The installation of pipe-work shall be kept to a minimum 30 m².
Spaces where refrigerant pipes shall be compliance with national gas regulations. Servicing shall be performed only as recommended by the manufacturer.
The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
All working procedure that affects safety means shall only be carried by competent persons.
- Transport of equipment containing flammable refrigerants.
Compliance with the transport regulations.
Marking of equipment using signs Compliance with local regulations.
Disposal of equipment using flammable refrigerants Compliance with national regulations.
Storage of equipment/appliances.
The storage of equipment should be in accordance with the manufacturer's instructions.
Storage of packed (unsold) equipment.
Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.
The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

1.PREFACE

•Information on servicing

(1) Checks to the area Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system.

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

(3) General work area All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

(4) Checking for presence of refrigerant The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

(5) Presence of fire extinguisher If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.

(6) Ventilated area Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

(7) Checks to the refrigeration equipment Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using flammable refrigerants:

- The charge size is in accordance with the room size within which the refrigerant containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- Refrigeration pipe or components are installed in a position that they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

1.PREFACE

(8) Checks to electrical devices Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include:

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

•Detection of flammable refrigerants.

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

•Leak detection methods

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants. Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

If a leak is suspected, all naked flames shall be removed/ extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

•Removal and evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- Remove refrigerant;
- Purge the circuit with inert gas;
- Evacuate then purge again with inert gas;
- Open the circuit by cutting or brazing.

1.PREFACE

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be “flushed” with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task. Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place. Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

•Charging procedures

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

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.

Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

•Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

- a. Become familiar with the equipment and its operation.
- b. Isolate system electrically.
- c. Before attempting the procedure ensure that:
 - Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - All personal protective equipment is available and being used correctly;
 - The recovery process is supervised at all times by a competent person;
 - Recovery equipment and cylinders conform to the appropriate standards.
- d. Pump down refrigerant system, if possible.

1.PREFACE

- e. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f. Make sure that cylinder is situated on the scales before recovery takes place.
- g. Start the recovery machine and operate in accordance with manufacturer's instructions.
- h. Do not overfill cylinders. (No more than 80 % volume liquid charge).
- i. Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- k. Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

•Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

•Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used should have corresponding labels and valves. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

1.PREFACE

Caution & Warning

1. The unit can only be repaired by qualified installer centre personnel or an authorised dealer. (for Europe market)
2. 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. (for Europe market)
3. Children should be supervised to ensure that they do not play with the appliance.
4. Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
5. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person in order to avoid a hazard.
6. Directive 2002/96/EC (WEEE):
The symbol depicting a crossed-out waste bin that is underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste, must be taken to a recycling centre for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.
7. Directive 2002/95/EC (RoHs): This product is compliant with directive 2002/95/EC (RoHs) concerning restrictions for the use of harmful substances in electric and electronic devices.
8. The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas, fire can be occur.
9. Make sure that there is circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.
10. The heat pump located inside the unit is equipped with an over-load protection system. It does not allow for the unit to start for at least 3 minutes from a previous stoppage.
11. The unit can only be repaired by the qualified personnel of an installer center or an authorized dealer. (for North America market)
12. Installation must be performed in accordance with the NEC/CEC by authorized person only. (for North America market)
13. **Use supply wires suitable for 75°C.**
14. Caution: Single wall heat exchanger, not suitable for potable water connection.

2.Specification

2.1 Performance date of swimming pool heat pump

SPECIFICATION TYPE	UNITS	PASRW010-P-BP12	PASRW015-P-BP12	PASRW020-P-BP12
* Heating capacity	KW	2.0~5.4	2.0~7.0	2.4~9.0
	BTU/h	6824~18425	6824~23884	8188~30708
* Power consumption	KW*h	0.196~0.87	0.25~1.21	0.3~1.55
* COP	/	10.2~6.2	10.2~5.8	10.0~5.8
** Heating capacity	KW	1.1~3.8	1.1~5.0	1.2~6.5
	BTU/h	3753~12965	3753~17060	4094~22178
** Power consumption	KW*h	0.18~0.88	0.18~1.25	0.2~1.57
** COP	/	6.0~4.32	6.0~4.0	6.0~4.1
Power supply	V	220-240V /50Hz		
Max. Power Input	KW	1.57	1.57	2.25
Max. Input Current	A	6.80	6.80	9.90
Water Flow Rate	m ³ /h	2.8	2.8	3.2
Water Pressure Drop	kPa	1.8	2.8	2.7
Hydraulic Connection	mm	50		
Sound Pressure (1m)	dB(A)	38~51	38~51	40~52
Sound Pressure (10m)	dB(A)	18-31	18-31	20-32
Fan Speed	r/min	500~700	500~700	500~850
Refrigerant	/	R32		
Weight of refrigerent	kg	0.32	0.32	0.4
GWP	/	675		
CO2 EQUIVALENT	t	0.216	0.216	0.27
Net Weight	kg	See package label		
Shipping Weight	kg	See package label		

* Outdoor air temperature DB 27°C/WB 24.3°C - Inlet water temperature 26°C and outlet 28°C in heating mode.

** Outdoor air temperature DB 15°C/WB 12°C - Inlet water temperature 26°C and outlet 28°C in heating mode.

2.Specification

SPECIFICATION TYPE	UNITS	PASRW030-P-BP12	PASRW035-P-BP12	PASRW040-P-BP12
* Heating capacity	KW	2.56~11.5	3.20~13.2	4.05~15.5
	BTU/h	8734~39238	10918~45038	13818~52886
* Power consumption	KW*h	0.3~1.9	0.38~2.28	0.5~2.63
* COP	/	10.4~6.0	10.3~5.8	10.1~5.6
** Heating capacity	KW	1.5~8.5	1.78~9.95	2.2~11.4
	BTU/h	5118~29002	6073~34051	7506~38896
** Power consumption	KW*h	0.24~1.97	0.29~2.26	0.35~2.59
** COP	/	6.2~4.3	6.2~4.4	6.2~4.4
Power supply	V	220-240V /50Hz		
Max. Power Input	KW	2.35	2.36	3.36
Max. Input Current	A	11.5	10.5	14.9
Water Flow Rate	m ³ /h	4.7	5.2	6.3
Water Pressure Drop	kPa	2.7	3	6
Hydraulic Connection	mm	50		
Sound Pressure (1m)	dB(A)	42~53	42~54	44~55
Sound Pressure (10m)	dB(A)	22-33	22-34	24-35
Fan Speed	r/min	500~850	500~850	500~750
Refrigerant	/	R32		
Weight of refrigerent	kg	0.45	0.46	0.65
GWP	/	675		
CO2 EQUIVALENT	t	0.304	0.311	0.439
Net Weight	kg	See package label		
Shipping Weight	kg	See package label		

*Outdoor air temperature DB 27°C/WB 24.3°C - Inlet water temperature 26°C and outlet 28°C in heating mode.

**Outdoor air temperature DB 15°C/WB 12°C - Inlet water temperature 26°C and outlet 28°C in heating mode.

2.Specification

SPECIFICATION TYPE	UNITS	PASRW050-P-BP12	PASRW060-P-BP12	PASRW060S-P-BP12	PASRW070S-P-BP1
* Heating capacity	KW	4.38~18.4	4.7~24.0	9.8~24.6	7.7~28.0
	BTU/h	14944~62780	16036~81888	33438~83935	26272~95536
* Power consumption	KW*h	0.52~3.17	0.36~4.0	0.70~3.52	0.59~4.7
* COP	/	10.0~5.8	13.0~6.0	14.0~7.0	13.0~6.0
** Heating capacity	KW	2.4~13.8	4.40~18.5	7.2~19.1	6.4~21.8
	BTU/h	8188~47085	15013~63122	24566~65169	21837~74382
** Power consumption	KW*h	0.39~3.14	0.611~4.021	0.94~3.60	0.877~4.739
** COP	/	6.1~4.5	7.20~4.60	7.6~5.3	7.30~4.60
Power supply	V	220-240V /50Hz	220-240V /50Hz	380-415V /50Hz	380-415V /50Hz
Max. Power Input	KW	3.61	4.96	6.30	6.30
Max. Input Current	A	15.7	22.5	10.22	10.22
Water Flow Rate	m ³ /h	7.5	10.0	10.0	12.0
Water Pressure Drop	kPa	6	14	14	17
Hydraulic Connection	mm	50			
Sound Pressure (1m)	dB(A)	44~56	45-56	44-56	45-57
Sound Pressure (10m)	dB(A)	24-36	25~46	25~46	25~47
Fan Speed	r/min	500~750	400~800	600~700	400~800
Refrigerant	/	R32			
Weight of refrigerent	kg	0.75	1.15	1.35	1.35
GWP	/	675			
CO2 EQUIVALENT	t	0.506	0.776	0.911	0.911
Net Weight	kg	See package label			
Shipping Weight	kg	See package label			

*Outdoor air temperature DB 27°C/WB 24.3°C - Inlet water temperature 26°C and outlet 28°C in heating mode.

**Outdoor air temperature DB 15°C/WB 12°C - Inlet water temperature 26°C and outlet 28°C in heating mode.

2. Specification

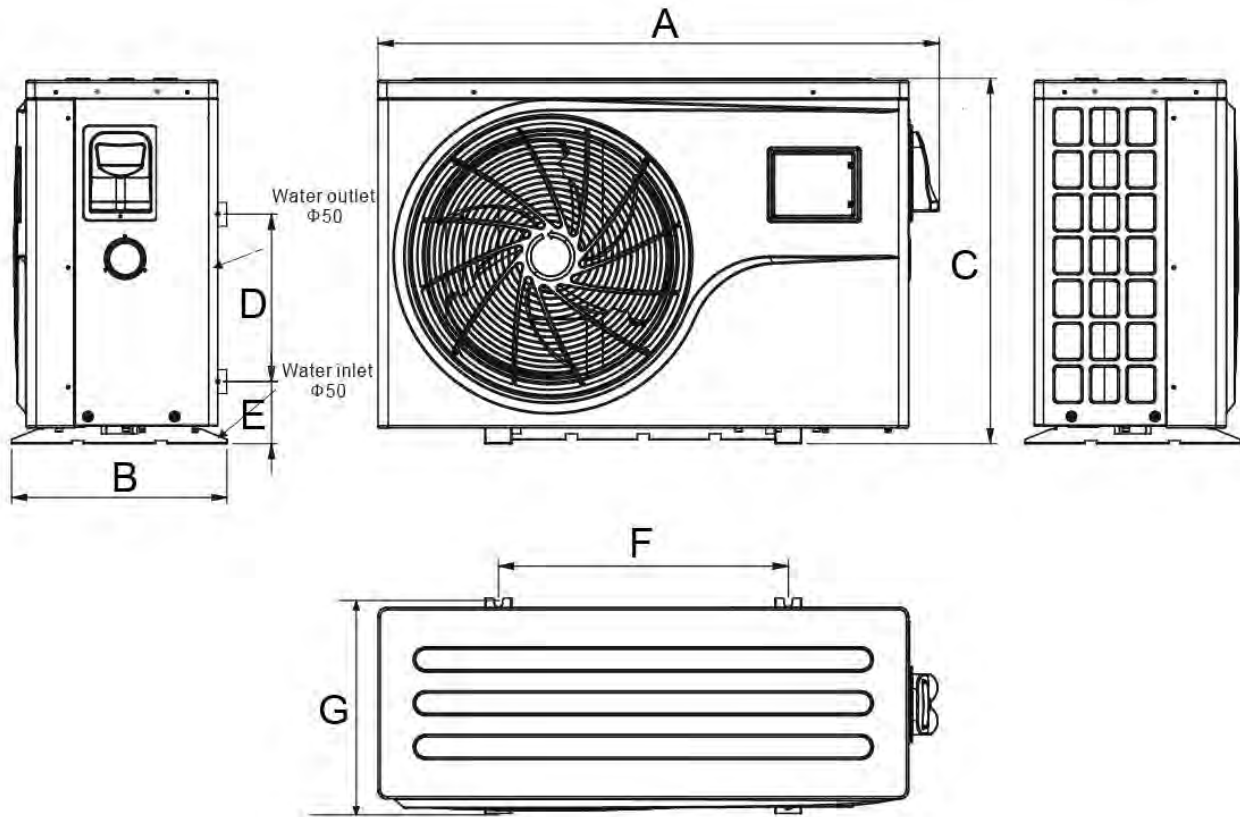
2.2 Heat pump operation condition

Use the swimming pool heat pump within the following ranges of temperature and humidity to ensure safe and efficient operation.

Operating Range	Heating mode	Cooling mode
Outside temperature	-7°C ~ 43°C	-7°C ~ 35°C
Water temperature	15°C ~ 40°C	8°C ~ 32°C
Relative humidity	< 80%	< 80%
Setting range from the set point	15°C ~ 40°C	8°C ~ 32°C

2.Specification

2.3 Dimensions for swimming pool heat pump (unit: mm)



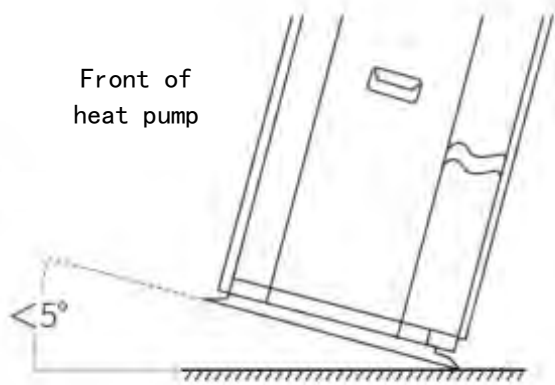
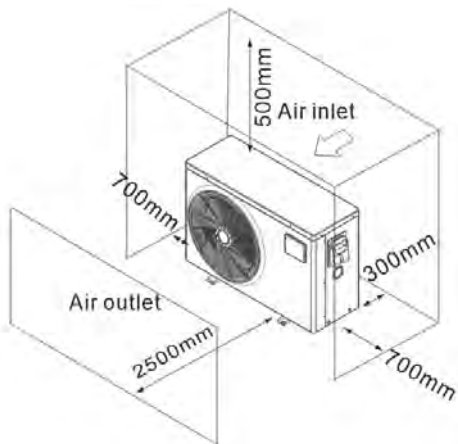
Model	A	B	C	D	E	F	G
PASRW010-P-BP12	934	360	611	280	103	485	350
PASRW015-P-BP12							
PASRW020-P-BP12							
PASRW030-P-BP12							
PASRW035-P-BP12							
PASRW040-P-BP12	1048	453	770	350	103	615	443
PASRW050-P-BP12							
PASRW060-P-BP12	1161	490	866	465	98	790	480
PASRW060S-P-BP12							
PASRW070S-P-BP12							

3. Installation and Connection

3.1 Installation requirements

In order for the unit to operate properly (exchange heat), make sure that the heat pump is installed in an open area so that there is enough space around the unit.

To allow condensate and rainwater to drain properly, do not tilt the unit more than 5 degrees relative to the horizontal.



3.2 Plumbing installation

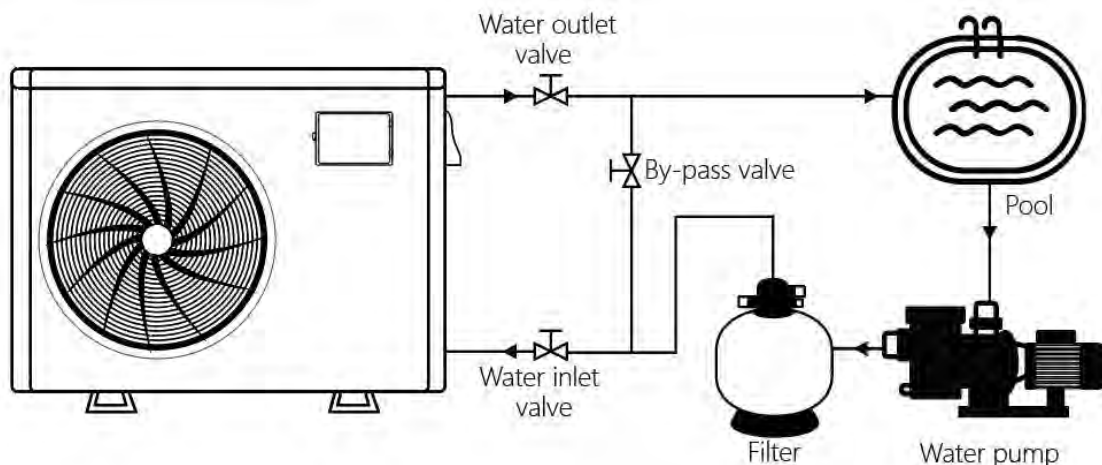
3.2.1 Plumbing installation for single unit

If there is a problem with the water line, please contact the dealer.

The factory only provides the main unit and the pipe connector, the other items in the illustration are necessary spare parts for the water system, that provided by users or the installer.

Attention: Make sure that the pump and the water charge pipe have been filled with water before first start. It is necessary that the water charge pipe is higher than the pool surface.

The illustration is for reference only. Please check the water inlet/outlet label on the heat pump while plumbing installation.

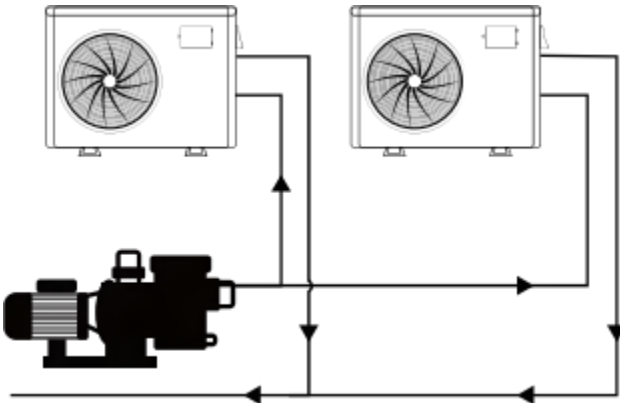


3. Installation and Connection

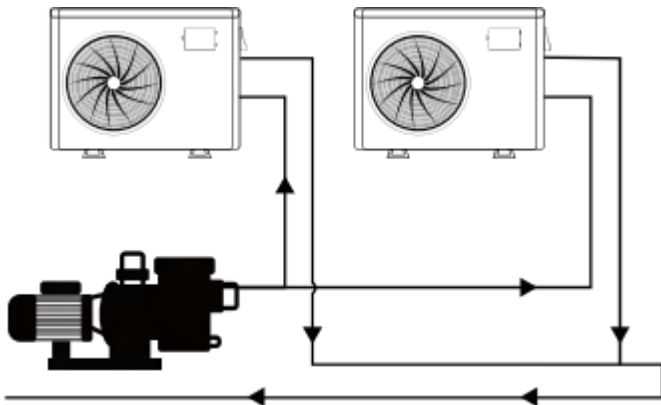
3.2.2 Plumbing installation for multiple units

If more than one machine needs to be connected for one pool together in parallel. Please refer to below illustrations.

The following is the wrong installation, using different path system of plumbing.



The following is the correct installation, using the same path system of plumbing that allows for more stable water flow.



3. Installation and Connection

3.3 Power cable specifications

3.3.1 Single phase unit

Nameplate maximum current	Power cable	Fuse	Earth leakage circuit breaker	Signal cable
≤13 A	3 x 1.5 mm ²	20A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤19 A	3 x 2.5 mm ²	25 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤25 A	3 x 4 mm ²	32 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤32 A	3 x 6 mm ²	40 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤45 A	3 x 10 mm ²	50 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤60 A	3 x 16 mm ²	80 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤80 A	3 x 25mm ²	100 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤100 A	3 x 35 mm ²	125 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤120 A	3 x 50 mm ²	125 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤153 A	3 x 70 mm ²	160 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤185 A	3 x 95 mm ²	200 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤236 A	3 x 120 mm ²	250 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤240 A	3 x 150 mm ²	250 A	30 mA less than 0.1 sec	n x 0.75 mm ²

3. Installation and Connection

3.3.2 Three phase unit

Nameplate maximum current	Power cable	Fuse	Earth leakage circuit breaker	Signal cable
≤ 10 A	5 x 1.5 mm ²	16 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 14 A	5 x 2.5 mm ²	20A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 19 A	5 x 4 mm ²	25 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 25 A	5 x 6 mm ²	32 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 35 A	5 x 10 mm ²	40 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 45 A	5 x 16 mm ²	50 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 60 A	5 x 25mm ²	63 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 75A	5 x 35 mm ²	80 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 93 A	5 x 50 mm ²	100 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 120 A	5 x 70 mm ²	125 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 145 A	5 x 95 mm ²	160 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 167 A	5 x 120 mm ²	200 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 183 A	5 x 150 mm ²	200 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 207 A	5 x 185 mm ²	250 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 242 A	5 x 240 mm ²	250 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 275 A	5 x 300 mm ²	320 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 327 A	5 x 400 mm ²	400 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 373 A	5 x 500 mm ²	400 A	30 mA less than 0.1 sec	n x 0.75 mm ²
≤ 427 A	5 x 630 mm ²	500 A	30 mA less than 0.1 sec	n x 0.75 mm ²

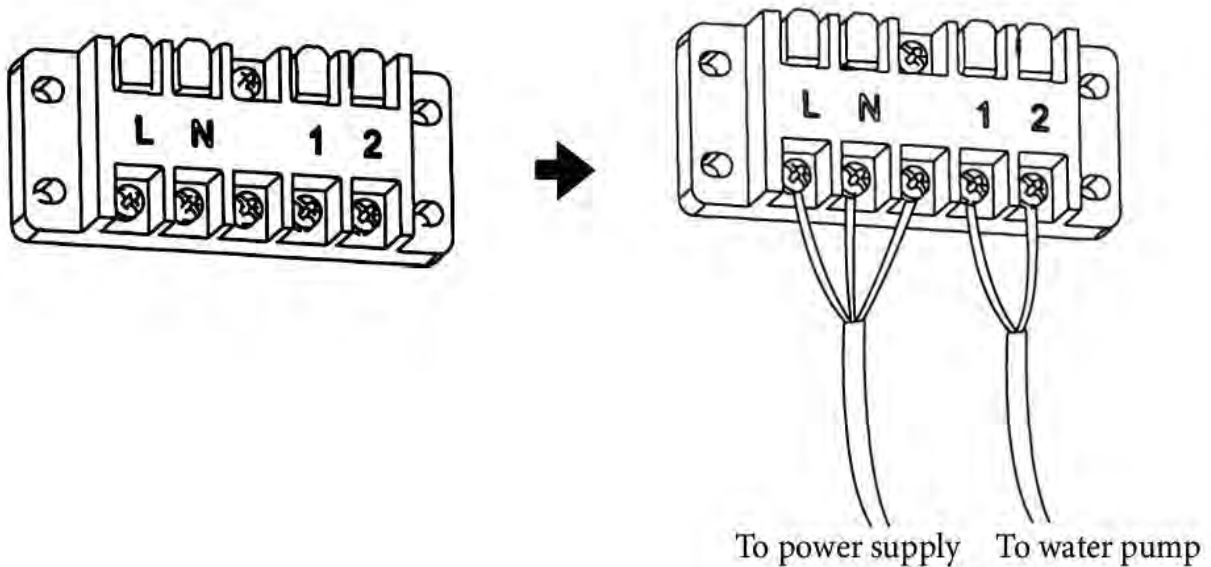
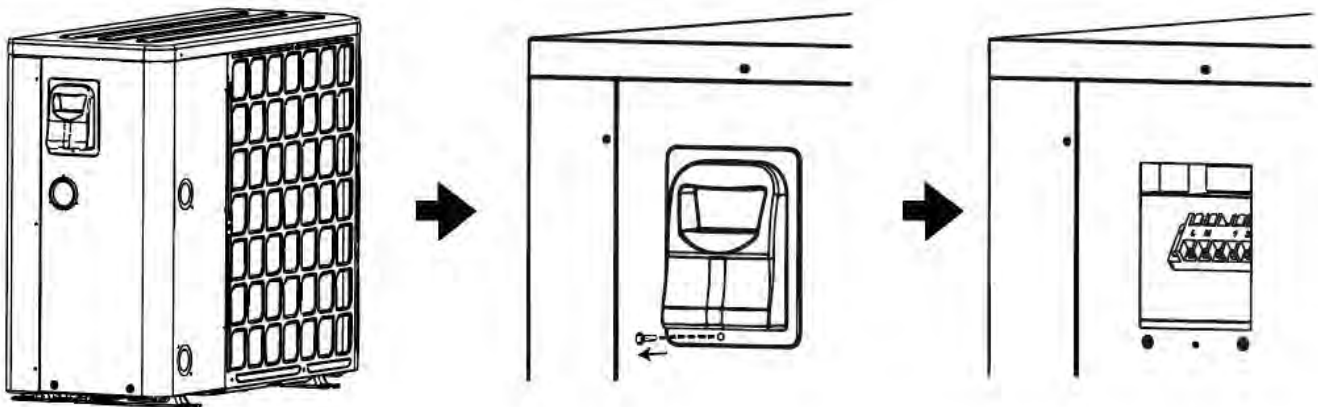
3. Installation and connection

3.4 Power cable wiring

To connect the power cable, please find the handle on the side of the unit. After removing the handle with a screwdriver, you can see the power supply terminal.

Please pass the power cable through the handle, and then refer to the picture for wiring.

1. Remove the screw and handle, pass the power cable through the handle.
2. Connect the wires.
3. Install the handle with the screwdriver, put the wire protectors into the handle holes.

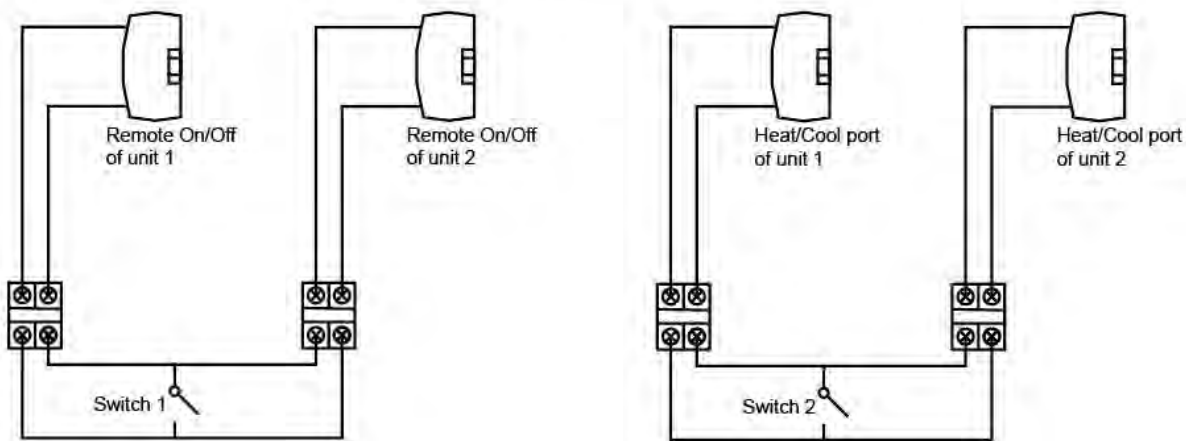
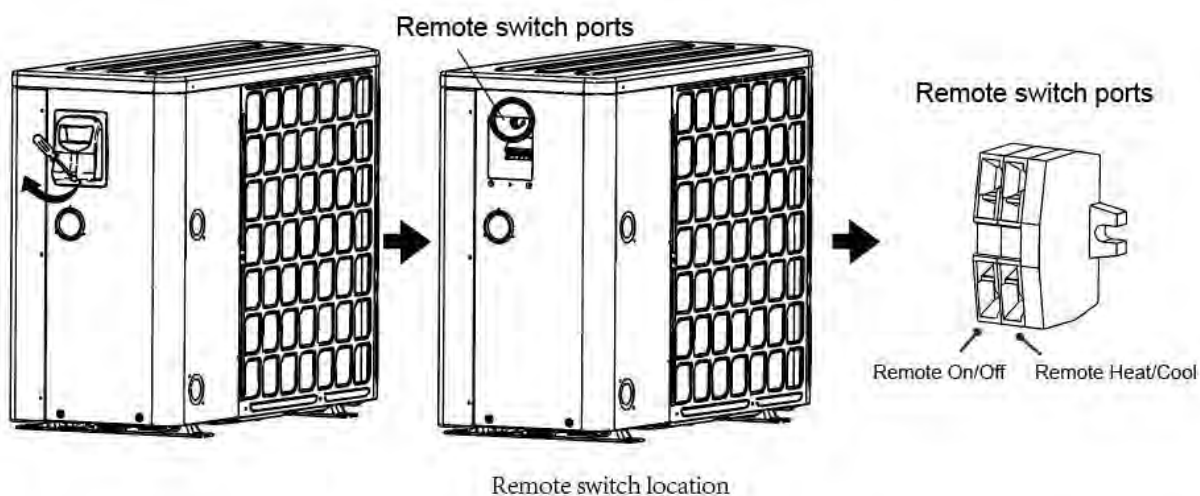


3. Installation and Connection

3.5 Remote switch application

This unit can be switched on and off at the same time for multiple units by using the Remote switch ports. To connect the ports, please find the handle on the side of the unit. After removing the handle with a screwdriver, you can see the port's terminal. Let the wires pass through the handle when connecting the units.

After completing the wiring, install the handle with the screwdriver, put the wire protectors into the handle holes.



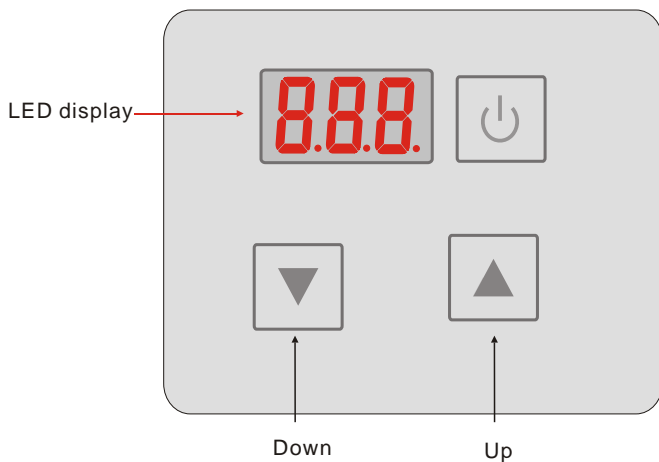
Connection diagram




When the switch 1 closed , the unit will be on, When the switch 1 opened, the unit will be off.

When the Switch 1 closed, the switch 2 closed, the unit will be heating, When the Switch 1 closed, the switch 2 opened, the unit will be cooling.

4. Use and Operation Instruction

1. Function of the controller



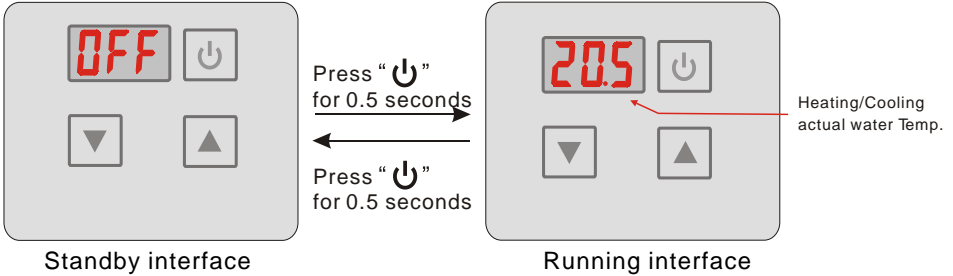
Key	Key name	Key function
	ON/OFF	Press this key to turn on/off the unit.
	Up	Press this key to select the upward option or increase the parameter value.
	Down	Press this key to select the downward option or decrease the parameter value.

4. Use and Operation Instruction

2. Usage of the controller

2.1 Turn ON/OFF the unit

When the unit is off, press the key “⏻” and hold on for 0.5 seconds to turn on the unit; When the unit is on, press the key “⏻” and hold on for 0.5 seconds to turn off the unit.



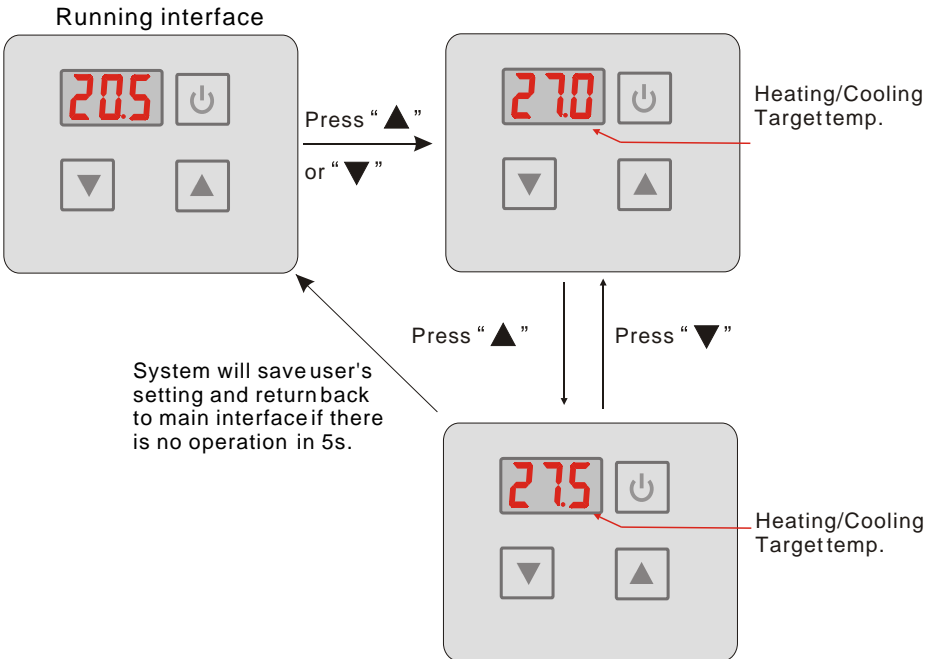
2.2 Setting temperature

In the running interface, press “▲” or “▼” then the current mode target-temperature flashes, then press “▲” to increase the temp. value, or press “▼” to decrease it.

Press “⏻” will not save setting parameter but back to the main interface.

Attention : If there is no operation for 5 seconds, system will memorize parameter setting and back to the main interface.

For example :



4. Use and Operation Instruction

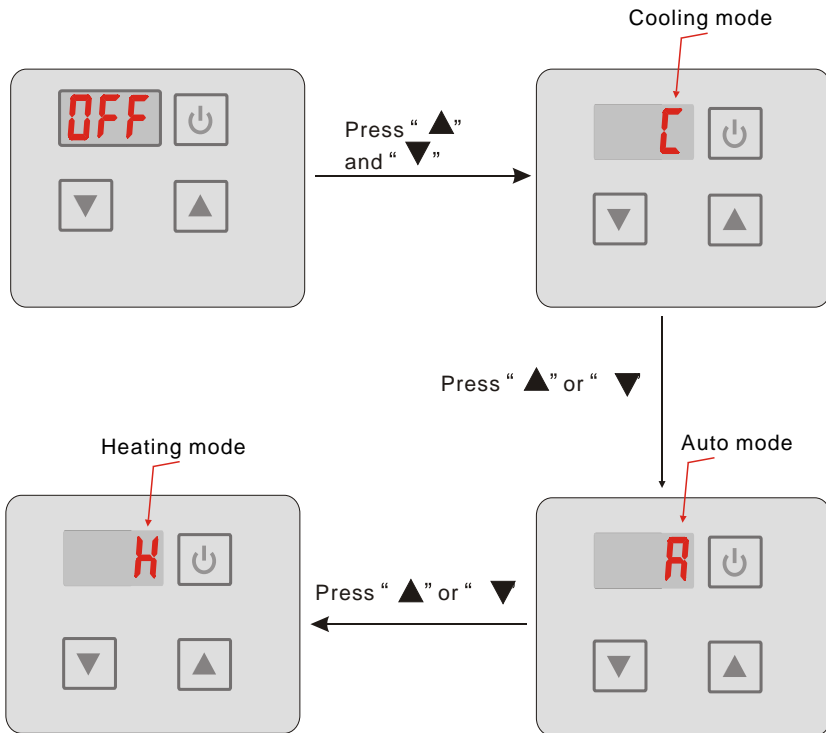
Remark:

Operation	Short press, long press “▲” or “▼” to change each time within 2s	Long press “▲” or “▼” for more than 2s to change each time
Range of temp. Variation	0.1°C/°F	1°C/°F

2.3 Mode switch

In the main interface, press “▲” and “▼” for 0.5 seconds can set the mode, press “▲” or “▼” to change the current mode, you can switch different modes of cooling, heating and auto mode.

If there is no operation for 5 seconds system will memorize the current mode and back to the main interface, if press “⏻” the change will not be saved and return to the main interface. The modes switching is useless of the unit you buy is single-cold/ single-heat unit.



2.4 Keyboard lock

To avoid mis-operations, please lock the controller after completing the setting.

At the main interface, pressing “⏻” for 5 seconds, and at the same time the wire controller will buzz for 1s, the screen is locked.

When the keyboard is locked, pressing “⏻” for 5 seconds, and at the same time the wire controller will buzz for 1s, the screen is unlocked.

NOTES: When the unit is in alarming state, the screen will be unlocked automatically.

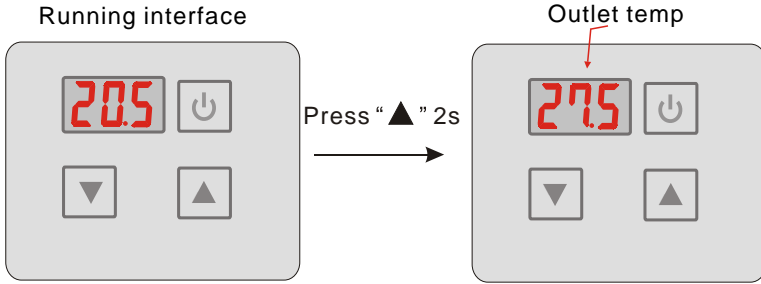
4. Use and Operation Instruction

2.5 Outlet water temperature

In the main interface, press “▲” for 2 seconds can check the outlet water temperature, and at the same time the wire controller will buzz for 1s and the outlet water temperature will flickering display .

If there is no operation for 10s or press “⏻” system will back to the main interface.

For example :

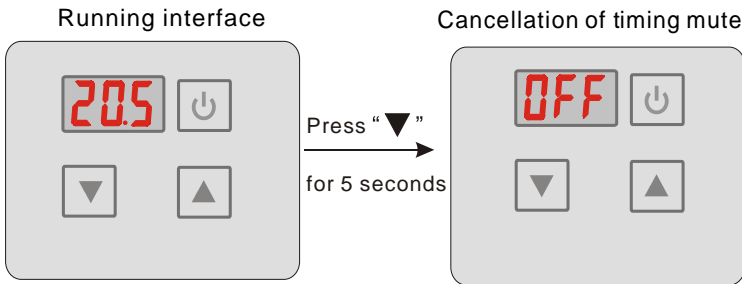


2.6 One-click Mute

In the main interface, press “▼” for 5 seconds can change the current mode, if the digital display “ON” , it means the One-click mute has been set, if the digital display “OFF” ,it means cancellation of One-click mute.

If there is no operation for 5 seconds system will save the current mode and back to the main interface.

For example :



2.7 Malfunction display

There will be malfunction codes showing on the controller screen when relative malfunction occurs.

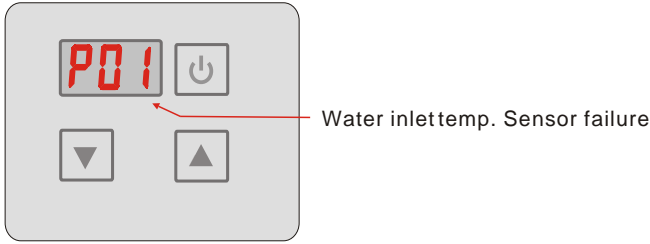
If there are more than one malfunction occurs at the same time, you can check the current error codes list by pressing “▲” or “▼” key.

In the main interface, if there is no operation for 10 seconds, it will return to the malfunction display.

You can refer to the malfunction table to find out the failure cause and solution.

4. Use and Operation Instruction

For example :



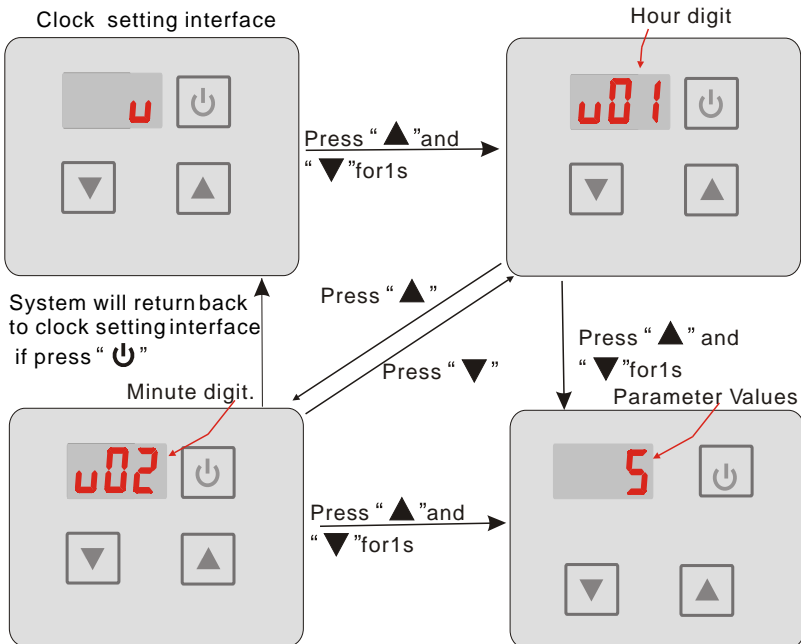
3. Clock setting

In the main interface, keep longpress of “▲” and “▼” for 10s for entering password setting interface, press “▲” or “▼” to change the password, choice password “022” and waiting for 2 seconds, it will enter user setting interface. (Password:022, unchangeable)

In the user setting interface, shortpress “▲” or “▼” can select Parameter Groups “v”, keep longpress of “▲” and “▼” for 1 second entering clock setting interface.

3.1 System time setting

In the clock setting interface, press “▲” or “▼” can choose the time parameter.

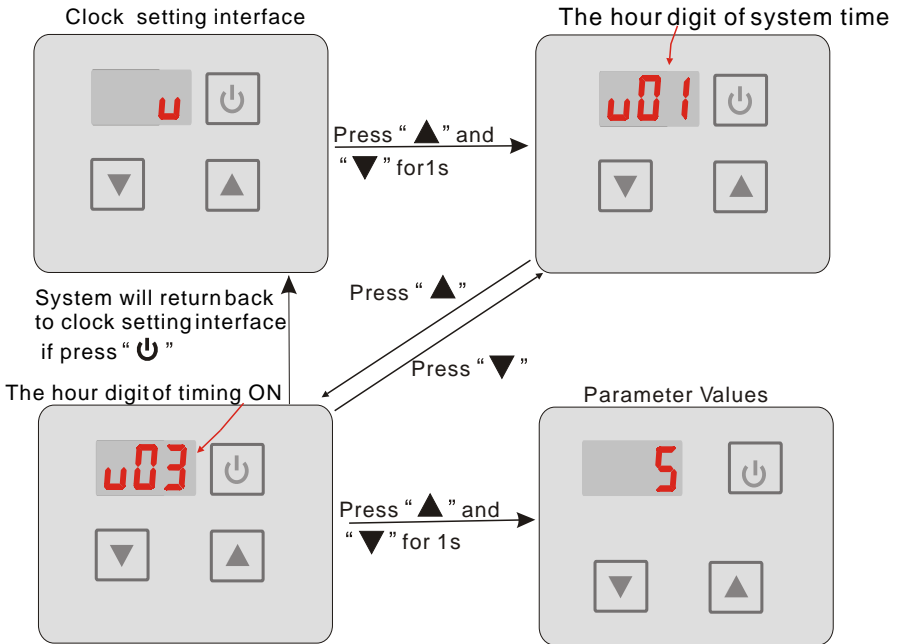


In the parameter value interface, press “▲” or “▼” for changing hour digit and minute digit, if there is no operation for 5s, the system will memorize parameter setting, and return to parameter value setting interface.

4. Use and Operation Instruction

3.2 Setting and cancellation of timing ON and OFF

In the clock setting interface, press “▲” or “▼” can choose the timing parameter.



In the hour digit of timing ON interface, short press “▲” or “▼” to circularly display among timing v03, v04, v05, v06, v07 and v08, and press “▲” and “▼” enter the parameter value interface, press “▲” or “▼” for changing the number, if there is no operation for 5s, the system will memorize parameter setting, and return to parameter value setting interface.

3.3 Time parameter table

Display	Time Parameter	Meaning
V01	The hour digit of system time	
V02	The minute digit of system time	
V03	The hour digit of timing ON	
V04	The minute digit of timing ON	
V05	The hour digit of timing OFF	
V06	The minute digit of timing OFF	
V07	Timing ON setting	1 represent saving timing ON setting, 0 represent cancelling timing ON setting.
V08	Timing OFF setting	1 represent saving timing OFF setting, 0 represent cancelling timing OFF setting.

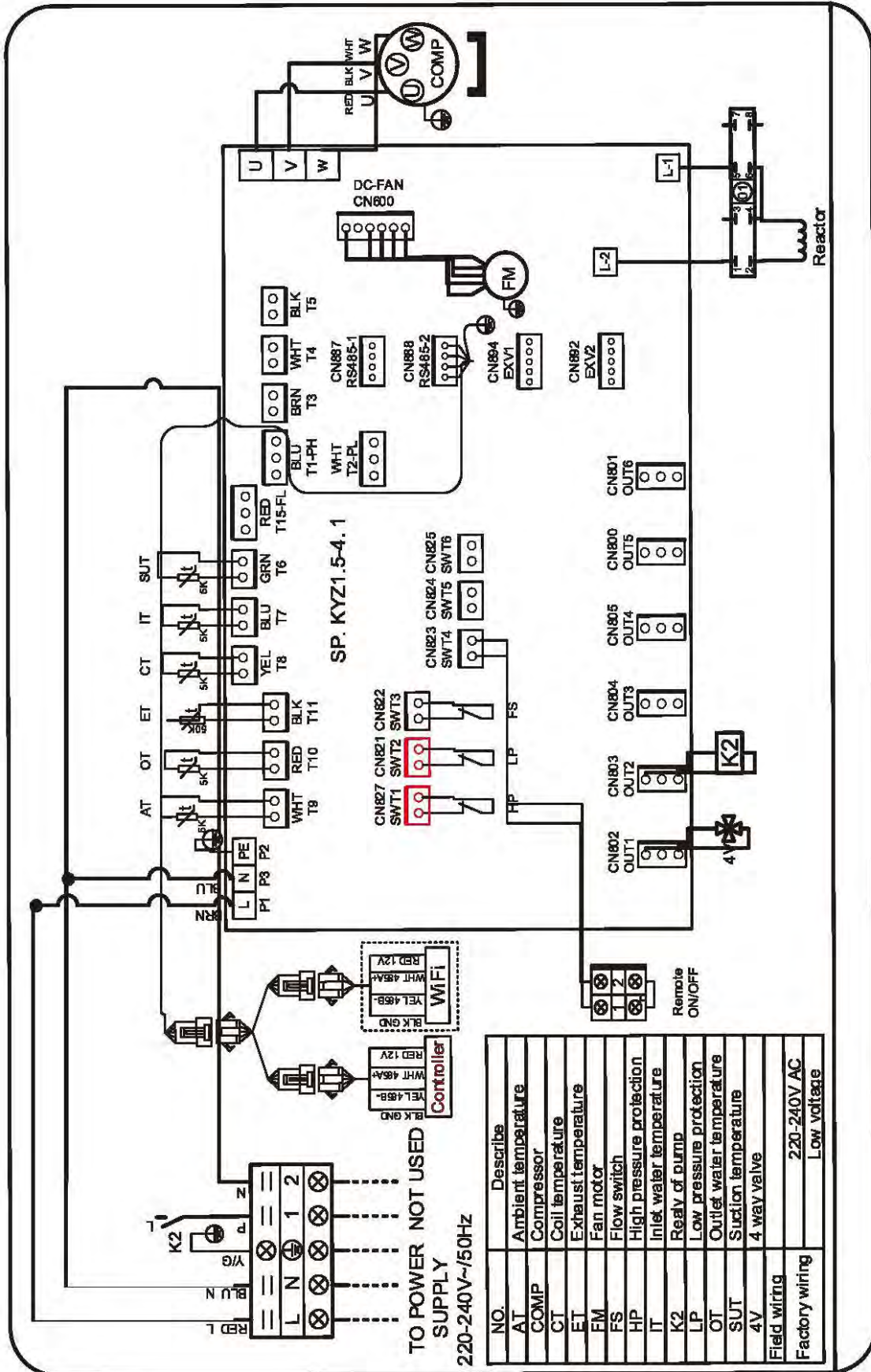
4. Controller Operation

4.11 Troubleshooting list

Easy issue				
No	Code	Meaning	Detecting	Resolution
1	E05	Water way anti-freezing protectionE06	1.Detect the water flow 2.Detect the target temp setting for cool mode 3.Detect the outlet water temp sensor	1.Make sure the water flow normally 2.Correct the parameter setting to make the outlet water temp high than 8°C 3.Replace the outlet water temp sensor
2	E06	Inlet/outlet temp difference too much protection	1.Detect the water flow of the unit 2.Detect the inlet/outlet water temp sensor	1.Make sure the water flow normally 2.Correct the by-pass to make the temp difference smaller than 2°C 3.Replace the inlet/outlet water temp sensor
3	E07	Anti-freezing protection	1.Detect the water flow 2.Detect the outlet water temp sensor	1.Make sure the water flow normally 2.Correct the by-pass to make the temp difference smaller than 2°C 3.Replace the outlet water temp sensor
4	E19	First class anti-freezing Protection in winter	1.Detect the inlet water temp and outlet water temp, and Antifreeze temp is = 4°C or not, under the ambient temp lower than 0°C	1.Make sure the water flow normally 2.Once the inlet water temp higher than8°C or ambient temp higher than 0°C,it will cancel the protection 3.Replace the outlet water temp sensor
5	E29	Second class anti-freezing protection in winter	1.Detect the inlet water temp and outlet water temp, and antifreeze temp is = 2°C or not, under the ambient temp lower than 0°C	1.Make sure the water flow normally 2.Once the inlet water temp higher than15°C or ambient temp higher than 0°C,it will cancel the protection 3.Replace the outlet water temp sensor
Except for the codes above, if it shows other code numbers, please contact the dealer.				

4. Controller Operation

4.12 Wiring diagram

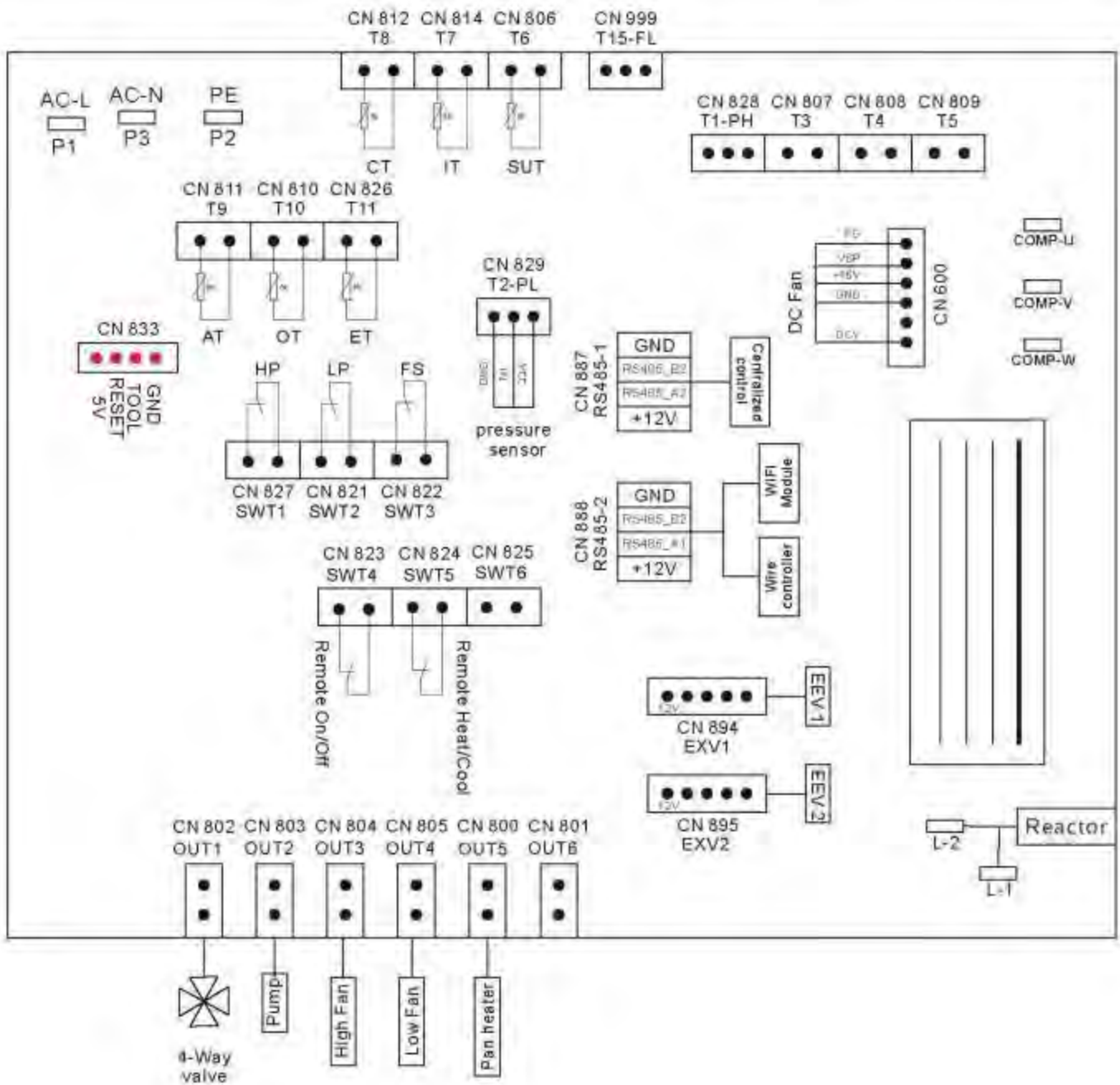


4. Controller Operation

No.	Description
Load:	
COMP	Compressor
FM	Fan motor
4V	Four way valve
Reactor	Reactor for inverter driver board
Controller	Operation display for unit
K2	Relay for circulation pump
Switch	
HP	High pressure switch
LP	Low pressure switch
FS	Flow switch
Remote ON/OFF	Remote ON/OFF switch
Temperature sensor	
AT	Ambient temperature sensor
IT	Inlet water temperature sensor
OT	Outlet water temperature sensor
CT	Coil temperature sensor
SUT	Suction temperature sensor
ET	Exhaust temperature sensor
RS485 port function	
RS485-1	For centralized control
RS485-2	For controller
Line description	
—	Field wiring
—	Factory wiring 220V~240V AC
—	Factory wiring 12V DC

4. Controller Operation

4.13 Description for integrated driver board

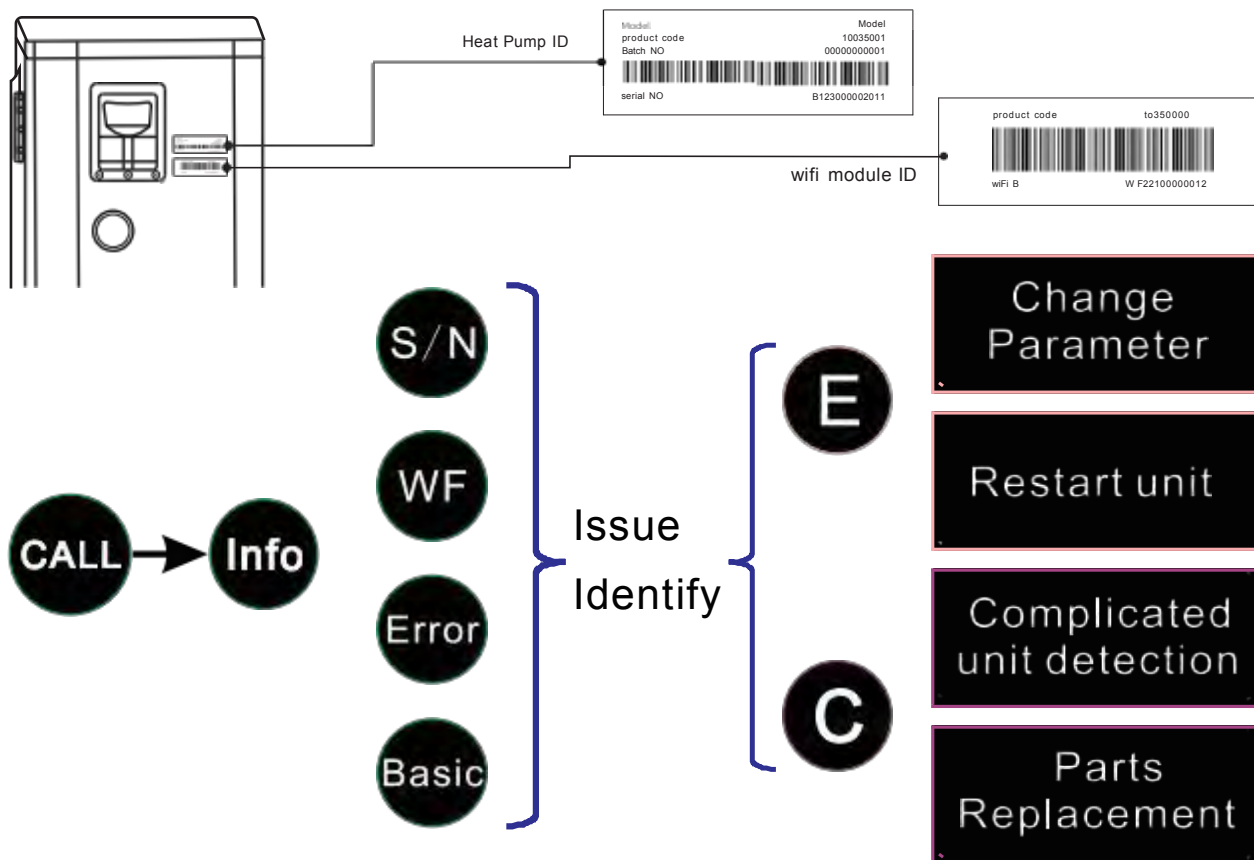


4. Controller Operation

No.	Description.
P1	For power input cable L 220V AC
P2	For power input cable N 220V AC
P3	For power input cable grounding wire
OUT 1	Power supply 220V AC for 4 way valve
OUT 2	Power supply 220V AC for circulation water pump
U-V-W	Output for compressor
CN 600	Output for fan motor
L-1	Connect to reactor
L-2	Connect to reactor
T2-PL	For pressure sensor
T6	For suction temperature sensor
T7	For inlet water temperature sensor
T8	For coil temperature sensor
T9	For ambient temperature sensor
T10	For outlet water temperature sensor
T11	For exhaust temperature sensor
SWT1	High pressure switch
SWT2	Low pressure switch
SWT3	Water flow switch
SWT4	Remote ON/OFF switch
SWT5	Remote heat/cool switch
RS485-1	For centralized controller(BMS system)
RS485-2	For wire controller on the unit

5. After-service and Maintenance

5.1 Standard after-service process



Standard Afterservice process:

1. When there is something wrong with the unit, pls get some informations on the unit , so that the dealer can confirm the problem and give you solution in time.

- ①. Series number/Bar code number of the unit. Series number is the ID of the unit;
- ②. WF code number/Mac code number, WF code is the Id of the WiFi module, so if the unit is with WiFi module, let customer connect the WiFi module to the network, so we can check data of the unit from the platform;
- ③ The error code pics or videos showed in the display;
- ④ If there is no error code show in the display ,pls share basic information such as the issue pics or videos;

2. After the dealer get those information, they will identify the issue as easy issue or the complicated issue according to the troubleshooting list;

- ①. Easy issue: you can solve it by restarting the unit or changing the parameters by the display;
- ②. Complicated issue: you need to ask the engineer to go thereto do the complicated detection or parts replacement.

5. After-service and Maintenance

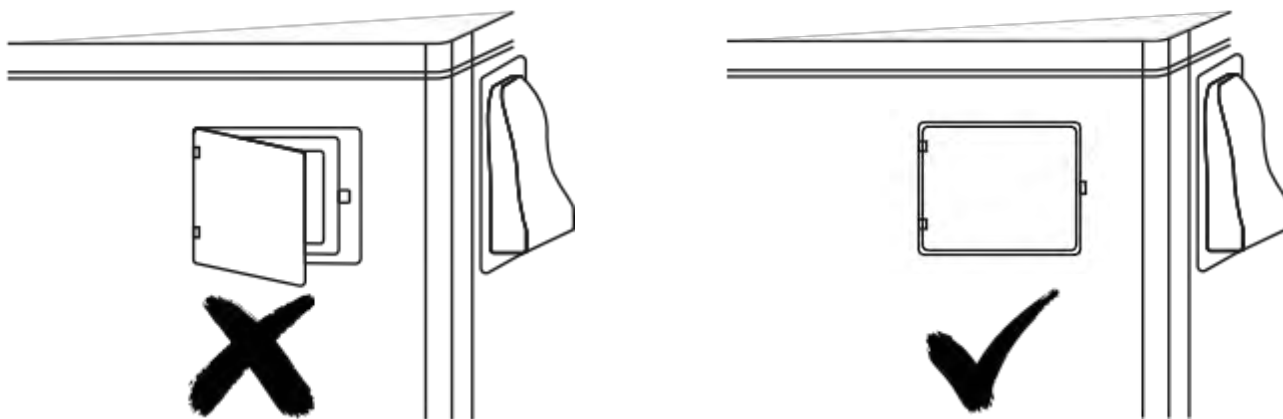
5.2 Maintenance

Name	Maintenance	Repair
Compressor	<ol style="list-style-type: none"> 1. Detect the resistance of the connector on the compressor. 2. Check the electrical box of the compressor whether is CR=CS=RS 	<ol style="list-style-type: none"> 1. Ensure that the surface of the parts and pipelines is clean and dry: The oil stains on the surface of the weldment can be cleaned with acetone, alcohol and other organic solutions. In addition, hot alkaline solutions can also get good results in removing oil stains. Do not use hydrochlorofluorocarbons (HCFCs), 1,1,1-trichloroethane (C₂H₃Cl₃), trichloroethylene (C₂HCl₃), dichloroethane (CH₃CHCl₂), trichloromethane (CHCl₃), bromopropane (C₃H₇Br) cleaning agent treatment. 2. Vacuum for at least 60 minutes, the vacuum limit should be below 38pa 3. Use neutral flame for welding, uniform welding 4. Post-welding treatment <ol style="list-style-type: none"> ①. After welding, use a wet towel to remove the oxide scale on the surface of the weldment, especially after the brass and copper are welded, clean the surface of the weldment with clean water or sandpaper, and apply anti-rust oil to prevent the surface from being corroded and producing patina; ②. After the secondary welding, scouring pad/sandpaper should be used to polish the surface of the weldment and coated with anti-rust oil to prevent the surface from being corroded and causing patina. ③. When the weld is severely blackened, use scouring pad/sandpaper to polish the surface of the weldment and apply anti-rust oil to prevent the surface from being corroded and causing patina; 5. Inspection after welding <ol style="list-style-type: none"> a. The surface of the weld joint is bright, the fillet is even, and the smooth arc is excessive. b. The joints have no defects such as over-burning, severe surface oxidation, rough welding seams, and welding corrosion. c. The welding seam has no pores, slag inclusion, cracks, weld bumps, pipe mouth clogging, etc. d. After the parts are welded into the complete machine, no refrigerant leakage is allowed at the weld.
Heat exchanger	<ol style="list-style-type: none"> 1. Check the connector of the inlet/outlet whether is sealed without leaking. 2. To clean the water way filter in every 3 months. 3. If you don't use the unit in winter, please drain out the water from the heat exchanger in order to prevent freezing in winter. 	
EEV	<ol style="list-style-type: none"> 1. Detect the electronic coil of the EEV whether is tighten. 	
4 way valve	<ol style="list-style-type: none"> 1. Detect the electronic coil of the 4 way valve whether is tighten. 	
Electrical box	<ol style="list-style-type: none"> 1. Check the electrical box whether is sealed without entering water. 2. Detect all the wires connection of the components whether is tighten. 3. Detect the relay or the AC Contactor on the unit whether is good. 	<ol style="list-style-type: none"> 1. The wiring connection must be tight and follow the wiring diagram 2. The Strong electric wires and weak electric wires must be laid out separately and cannot be bundled together 3. The installation of the electric control box must be sealed and no water can enter
High/low pressure switch	<ol style="list-style-type: none"> 1. Detect the wire connection on the switch whether is tighten. 	
Temp sensor	<ol style="list-style-type: none"> 1. Detect the wire connection on the temp whether is tighten 2. Detect the temp sensor whether is still inside the insulation cotton 	

5.2.1 Daily maintenance

a. Waterproof cover protection

Due to the display is not water proof and it cannot stay under high temperature. So please remember to close the water proof box after you operate the display every time.



b. Insect-proof inspection

Due to the insect/animal problem, they can climb into the unit from the handle which is for connecting the power supply cable.

So pls remember to install the wire sheath back on the handle after you install the power supply cable for the unit.

5. After-service and Maintenance

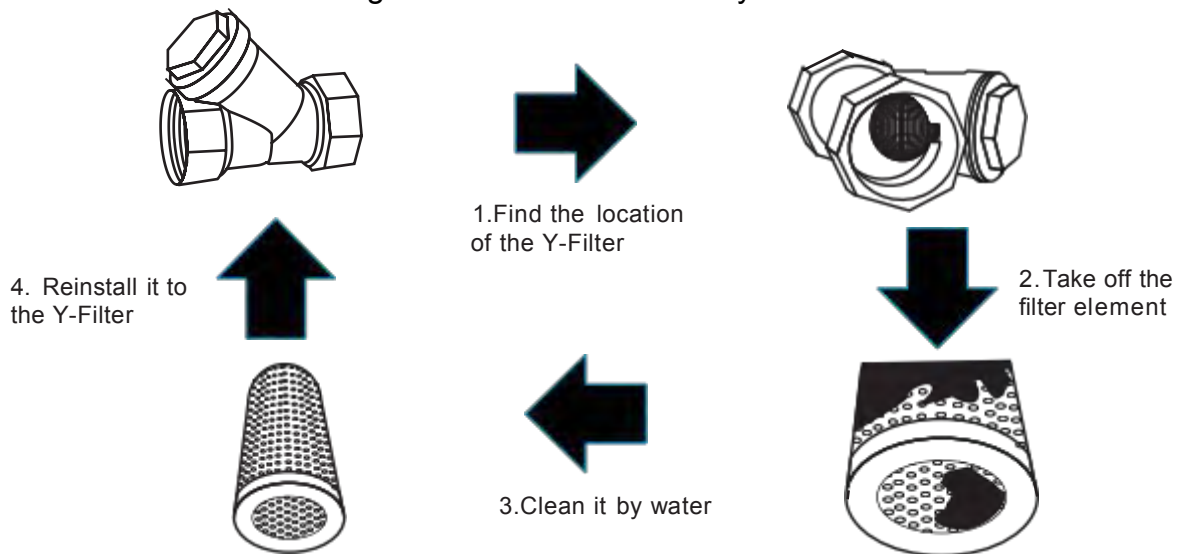
5.2.2 Regular maintenance

a. Y filter cleaning

The main reason for the high pressure protection is less water flow.

Then the unit has run for a period of time, the Y-filter would be dirty and it would reduce the water flow to the unit.

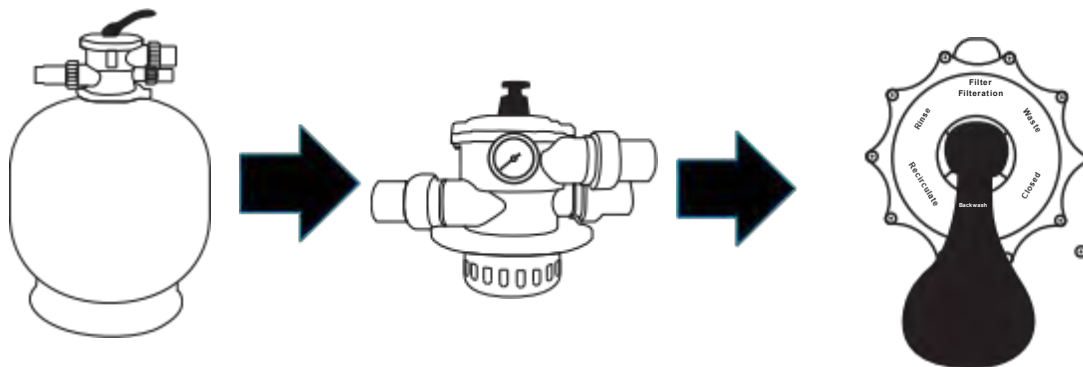
So we advice to clean the filtering net from the Y-filter every month.



b. Sand filter system cleaning

The second reason for the less water flow is that the sand filter is dirty and blocked. How we know when we should clean the sand filter?

Answer: when the pressure of the sand filter is more than 1bar, it means the sand filter is blocked inside and you have to clean it.



Sand filter function explanation

1. Filter:
Normal filtering function

2. Backwash:
Drain the dirt accumulated in the filter

3. Rinse:
Drain the dirt in the sewer pipe

4. Waste:
Drain water without filtering the filter

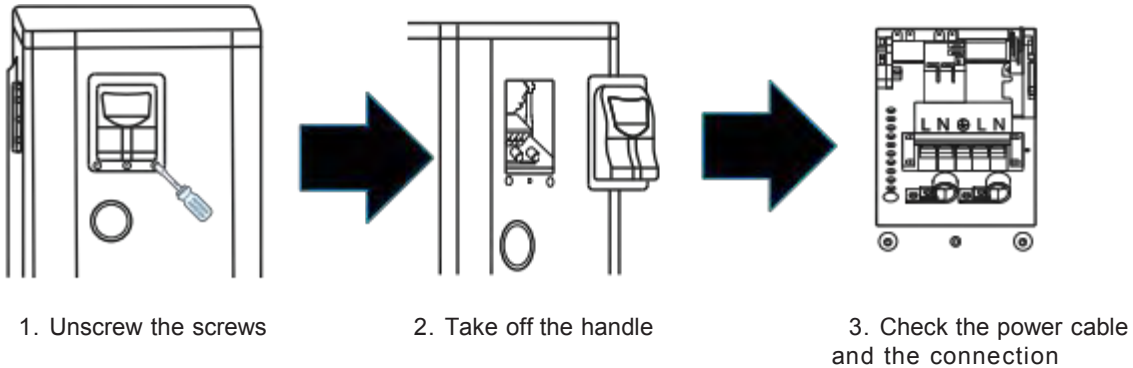
5. Recirculate:
Circulating the water without filtering

6. Closed:
Closed the filter

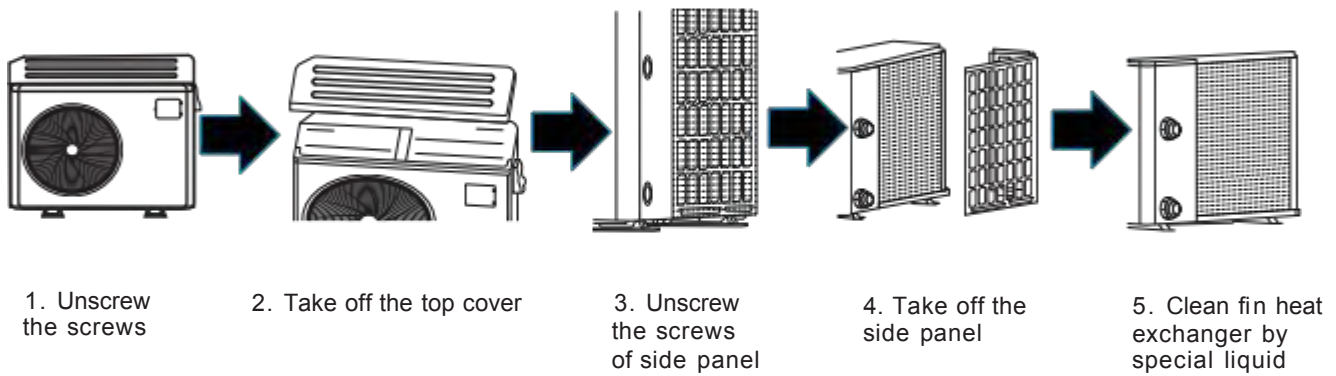
5.After-service and Maintenance

c.Power cable inspection

We advise that you should check whether the power supply cable is well and the connection whether is normal.



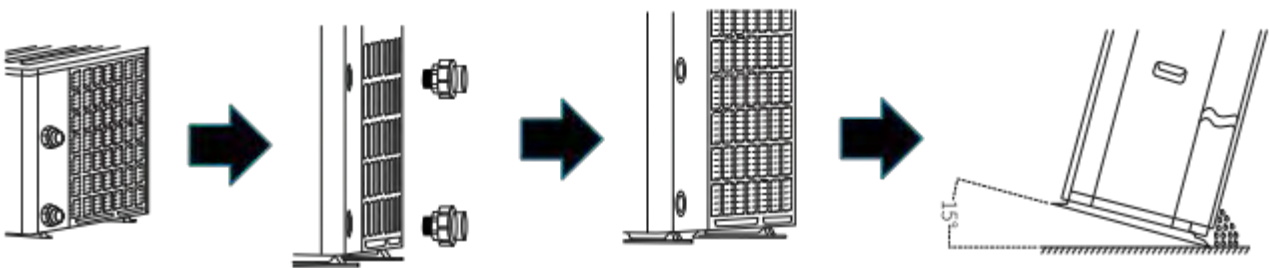
d.Fit heat exchanger cleaning



e.Titanium heat exchanger protection in winter

Unit without power supply in winter sand filter cleaning.

To avoid the risk of freezing problem of the titanium heat exchange in winter, so we advise to drain out the water from the titanium heat exchanger before you power off the unit. If you have the unit cover, please install it to protect the unit from the ice.



To make sure the power supply to the unit is normal.

And we advice to connect the circulation pump on our unit so that the unit will start the circulation pump to circulate the water automatically once the inlet water temp lower than 4 °C or start the unit in heating mode to heat up the water to avoid the freezing problem of the titanium heat exchanger.

