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PREMIUM POOL HEATING SOLUTION

User and Service manual

Swimming Pool Heat Pump
User and Service manual

INDEX

Thank you for using our swimming pool heat pump for your pool heating, it will heat your pool water and keep the constant temperature when the air ambient temperature is at -12 to 43℃

ATTENTION: This manual includes all the necessary information with the use and the installation of your heat pump.

The installer must read the manual and attentively follow the instructions in implementation and maintenance.
The installer is responsible for the installation of the product and should follow all the instructions of the manufacturer and the regulations in application. Incorrect installation against the manual implies the exclusion of the entire guarantee.
The manufacturer declines any responsibility for the damage caused with the people, objects and of the errors due to the installation that disobey the manual guideline. Any use that is without conformity at the origin of its manufacturing will be regarded as dangerous.

WARNING: Please always empty the water in heat pump during wintertime or when the ambient temperature drops below 0℃, or else the Titanium exchanger will be damaged because of being frozen, in such case, your warranty will be lost.

WARNING: Please always cut the power supply if you want to open the cabinet to reach inside the heat pump, because there is high voltage electricity inside.

WARNING: Please well keep the display controller in a dry area, or well close the insulation cover to protect the display controller from being damaged by humidity.

Regulation (EU) n° 517/2014 of 16/04/14 on fluorinated greenhouse gases and repealing Regulation (EC) n° 842/2006

Leak checks

1. Operators of equipment that contains fluorinated greenhouses gases in quantities of 5 tons of CO_2, equivalent or more and not contained in foams shall ensure that the equipment is checked for leaks.
2. For equipment that contains fluorinated greenhouse gases in quantities of 5 tons of CO_2 equivalent or more, but of less than 50 tons of CO_2 equivalent: at least every 12 months.

Picture of the equivalence CO_2
1. Load in kg and Tons amounting CO_2.

Load and Tons amounting CO_2	Frequency of test
From 7.4 at 74 kg load = from 5 at 50 Tons	Each year

Concerning the Gaz R32, 7.4kg amounting at 5 tons of CO_2, commitment to check each year.
Training and certification

1. The operator of the relevant application shall ensure that the relevant personnel have obtained the necessary
certification, which implies appropriate knowledge of the applicable regulations and standards as well as the necessary competence in emission prevention and recovery of fluorinated greenhouse gases and handling safety the relevant type and size of equipment.

Record keeping

1. Operators of equipment which is required to be checked for leaks, shall establish and maintain records for each piece of such equipment specifying the following information:

a) The quantity and type of fluorinated greenhouse gases installed;
b) The quantities of fluorinated greenhouse gases added during installation, maintenance or servicing or due to leakage;
c) Whether the quantities of installed fluorinated greenhouse gases have been recycled or reclaimed, including the name and address of the recycling or reclamation facility and, where applicable, the certificate number;
d) The quantity of fluorinated greenhouse gases recovered
e) The identity of the undertaking which installed, serviced, maintained and where applicable repaired or decommissioned the equipment, including, where applicable, the number of its certificate;
f) The dates and results of the checks carried out;
g) If the equipment was decommissioned, the measures taken to recover and dispose of the fluorinated greenhouse gases.

2. The operator shall keep the records for at least five years, undertakings carrying out the activities for operators shall keep copies of the records for at least five years.

1. Specifications

1.1 Technical data

Model		ZSXP07i	ZSXP09i	ZSXP11i	ZSXP14i	ZSXP16i
*** Performance at Air 28℃, Water 28℃, Humidity 80%**						
Heating capacity	kW	7-2.2	9-2.3	11-2.9	13.5-3.2	16-3.8
Power consumption	kW	1.25-0.14	1.55-0.14	1.77-0.18	2.26-0.2	2.67-0.23
C.O.P.	W/W	16-5.6	16-5.8	16-6.2	16-6.2	16-6
*** Performance at Air 15℃, Water 26℃, Humidity 70%**						
Heating capacity	kW	4.7-2.5	6.6-1.9	7.9-2	9.5-2.2	11.2-3
Power consumption	kW	1.02-0.35	1.43-0.27	1.72-0.28	2.07-0.31	2.43-0.42
C.O.P.	W/W	7.1-4.6	7.1-4.6	7.2-4.6	7.2-4.6	7.2-4.6
*** General data**						
Compressor type		Inverter Mitsubishi Compressor				
Voltage		220~240V / 50Hz or 60Hz /1PH				
Rated current	A	5.5	6.9	7.9	10.0	11.8
Minimum fuse	A	9	10	12	15	18
Advised water flux	m^3/h	2.5	2.8	3.7	4.0	4.6
Water pressure drop	KPa	12	12	14	15	15
Advised pool volume (with pool cover)	m^3	10-25	12-33	15-60	18-66	25-85
Refrigerant		R410A				
Heat exchanger		Twist-titanium tube in PVC				
Water connection	mm	50mm				
Fan quantity		1				
Ventilation type		Horizontal				
Fan speed	RPM	500-850			550-850	
Noise level(10m)	dB(A)	≤41	≤42	≤42	≤43	≤43
Noise level(1m)	dB(A)	40-50	40-52	40-52	40-54	41-54
*** Dimension**						
Net weight	kg	56	68	73	78	98
Gross weight	kg	68	73	78	83	113
Net dimension	mm	855*325*565		986*352*672		
Packing dimension	mm	930*420*615		1056*426*715		

* Above data are subjects to modification without notice.

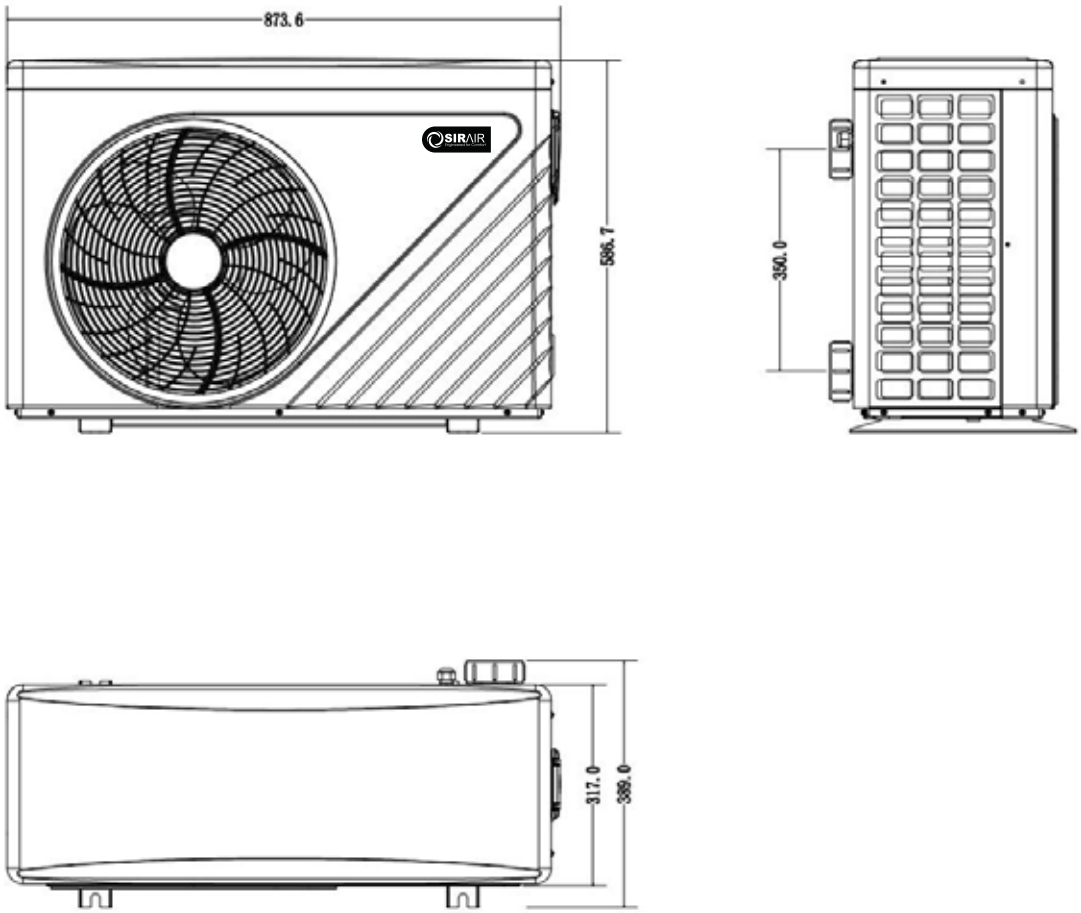
Model		ZSXP20i	ZSXP25iA	ZSXP30i
*** Performance at Air 28℃, Water 28℃, Humidity 80%**				
Heating capacity	kW	19-4.7	24-5.9	28.5-6.8
Power consumption	kW	3.1-0.29	4-0.37	4.75-0.43
C.O.P.	W/W	16-6	16-6	16-6
*** Performance at Air 15℃, Water 26℃, Humidity 70%**				
Heating capacity	kW	14-3.9	17.2-4.5	22.8-5.6
Power consumption	kW	2.78-0.54	3.74-0.63	4.26-0.78
C.O.P.	W/W	7.2-4.6	7.2-4.6	7.2-4.6
*** General data**				
Compressor type		Inverter Mitsubishi Compressor		
Voltage		220~240V / 50Hz or 60Hz /1PH		
Rated current	A	14.0	17.7	21.0
Minimum fuse	A	21	27	34
Advised water flux	m^3/h	5.0	8.0	10.0
Water pressure drop	KPa	18	20	25
Advised pool volume (with pool cover)		55-120	65-130	75-180
Refrigerant		R410A		
Heat exchanger		Twist-titanium tube in PVC		
Water connection	mm	50		
Fan quantity		1		2
Ventilation type		Horizontal		
Fan speed	RPM	450-650		(550-850)*2
Noise level(10m)	dB(A)	≤45	≤46	≤49
Noise level(1m)	dB(A)	41-54	42-60	42-60
*** Dimension**				
Net weight	kg	117	128	130
Gross weight	kg	135	146	148
Net dimension	mm	1040*355*895		1040*355*1295
Packing dimension	mm	1115*485*915		1085*420*1320

* Above data are subjects to modification without notice.

2. Dimension

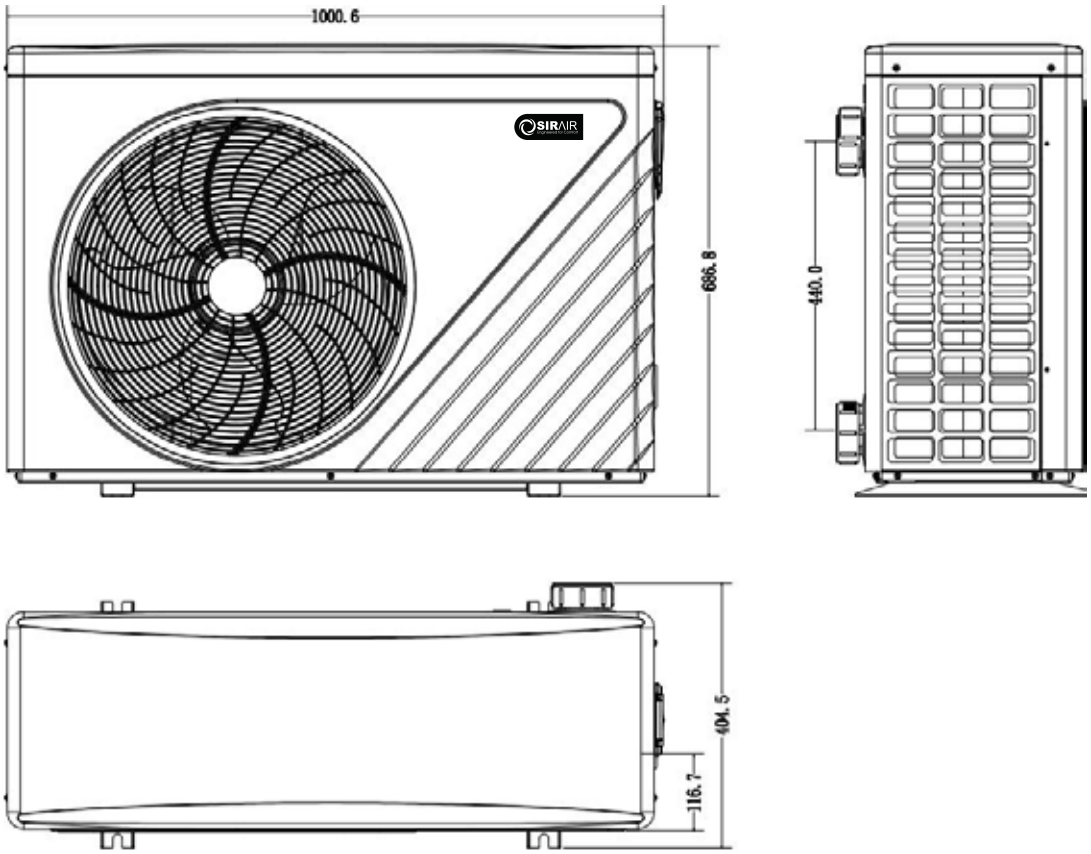
2.1 ZSXP07i / ZSXP09i

Unit : mm



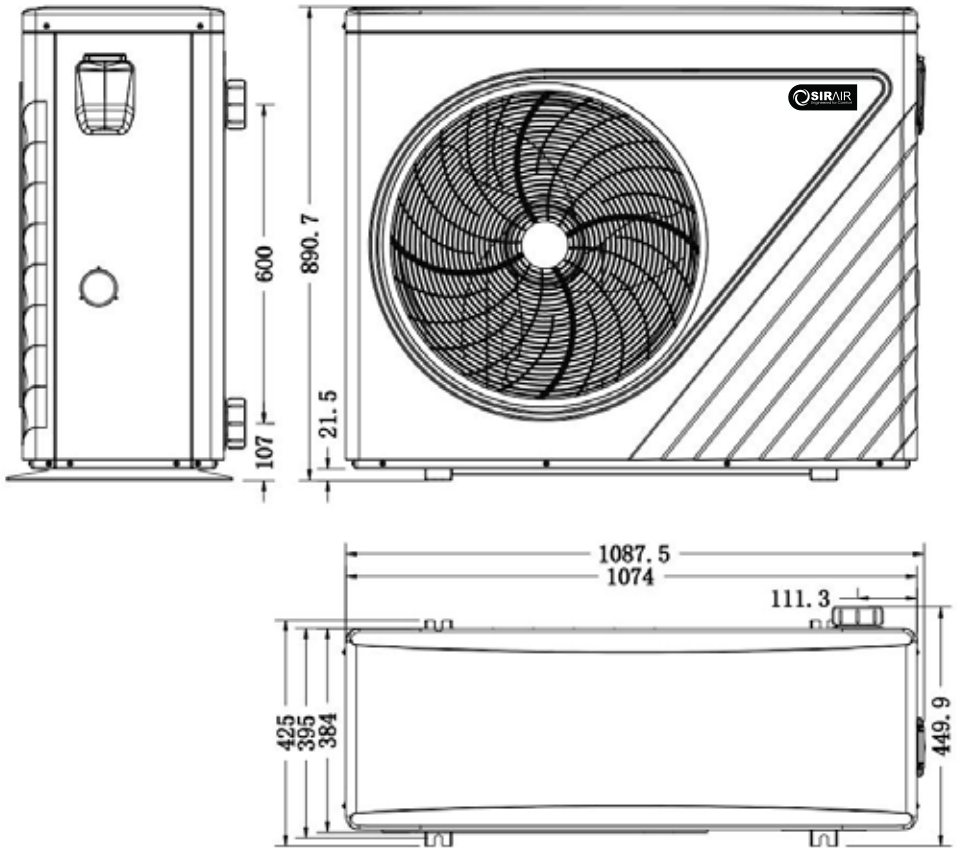
2.2 ZSXP11i/ ZSXP14i/ ZSXP16i

Unit : mm



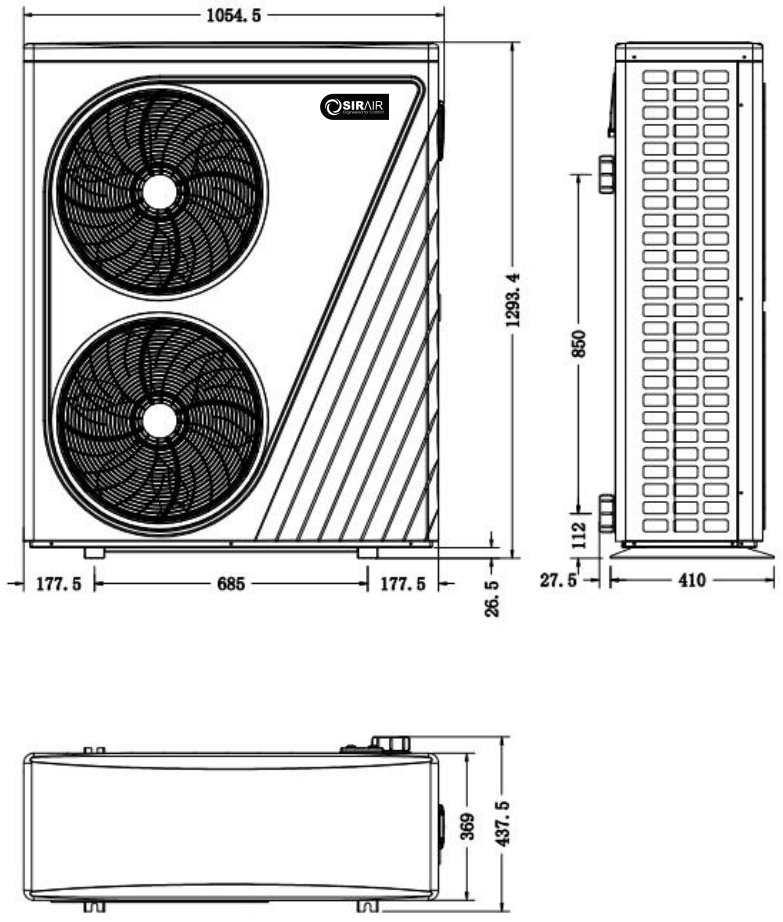
2.3 ZSXP20i / ZSXP25iA

Unit : mm



2.4 ZSXP30i

Unit : mm



3. Installation and connection

3.1 Notes

The factory supplies only the heat pump itself. All other components, including a bypass if necessary, must be provided by the user or the installer.

Attention:

Please observe the following rules when installing the heat pump:

1. Any dosing of chemicals must take place in the piping located **downstream** from the heat pump.
2. Install a bypass in all installations.
3. Always place the heat pump on a solid foundation and use the included rubber mounts to avoid vibration and noise.
4. Always keep the heat pump upright. If the unit has been held at an angle, wait at least 24 hours before starting the heat pump.

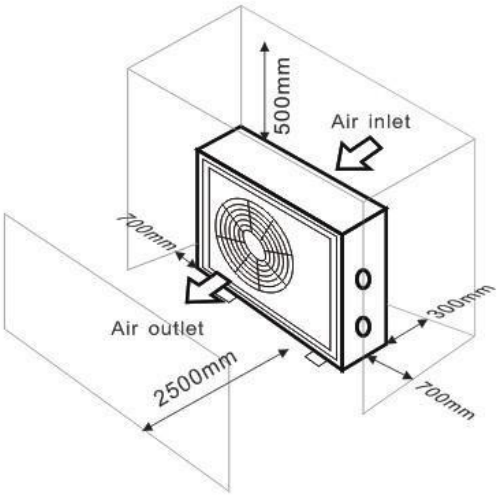
3.2 Heat pump location

The unit will work properly in any desired location as long as the following three items are present:

1. Fresh air – 2. Electricity – 3. Swimming pool filters

The unit may be installed in virtually any **outdoor** location as long as the specified minimum distances to other objects are maintained (see drawing below). Please consult your installer for installation with an indoor pool. Installation in a windy location does not present any problem at all, unlike the situation with a gas heater (including pilot flame problems).

ATTENTION: Never install the unit in a closed room with a limited air volume in which the air expelled from the unit will be reused, or close to shrubbery that could block the air inlet. Such locations impair the continuous supply of fresh air, resulting in reduced efficiency and possibly preventing sufficient heat output. See the drawing below for minimum dimensions.



3.3 Distance from your swimming pool

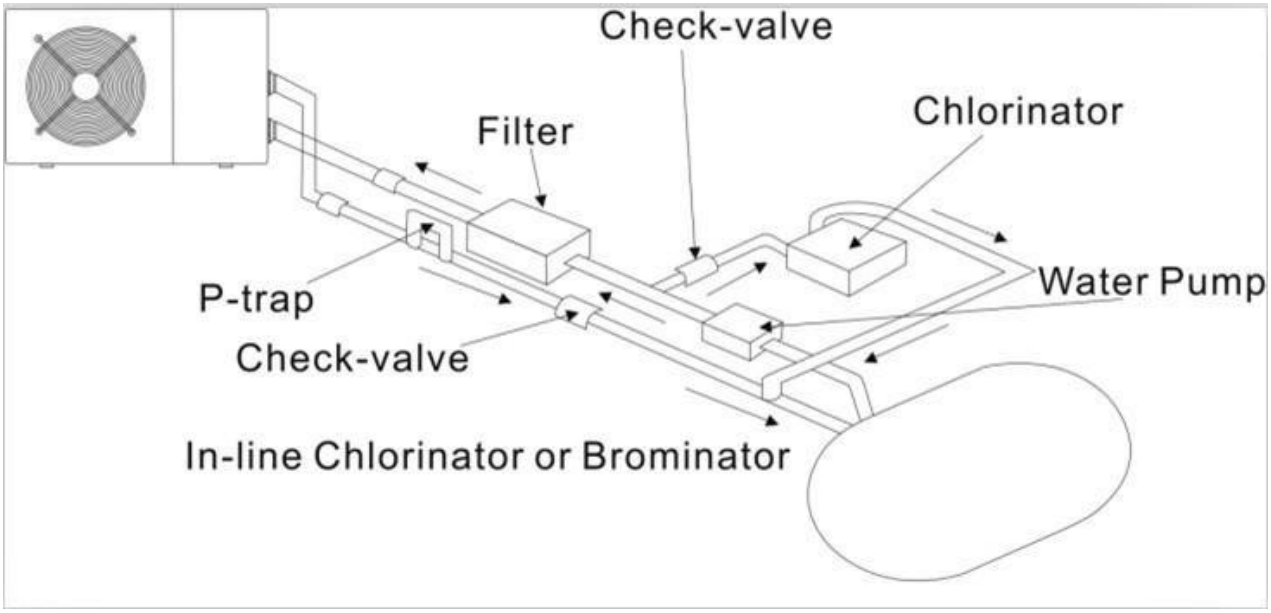
The heat pump is normally installed within a perimeter area extending 7.5 m from the swimming pool. The greater the distance from the pool, the greater the heat loss in the pipes. As the pipes are mostly underground, the heat loss is low for distances up to 30 m (15 m from and to the pump; 30 m in total) unless the ground is wet or the groundwater level is high. A rough estimate of the heat loss per 30 m is 0.6 kWh (2,000 BTU) for every 5 ºC

difference between the water temperature in the pool and the temperature of the soil surrounding the pipe. This increases the operating time by 3% to 5%.

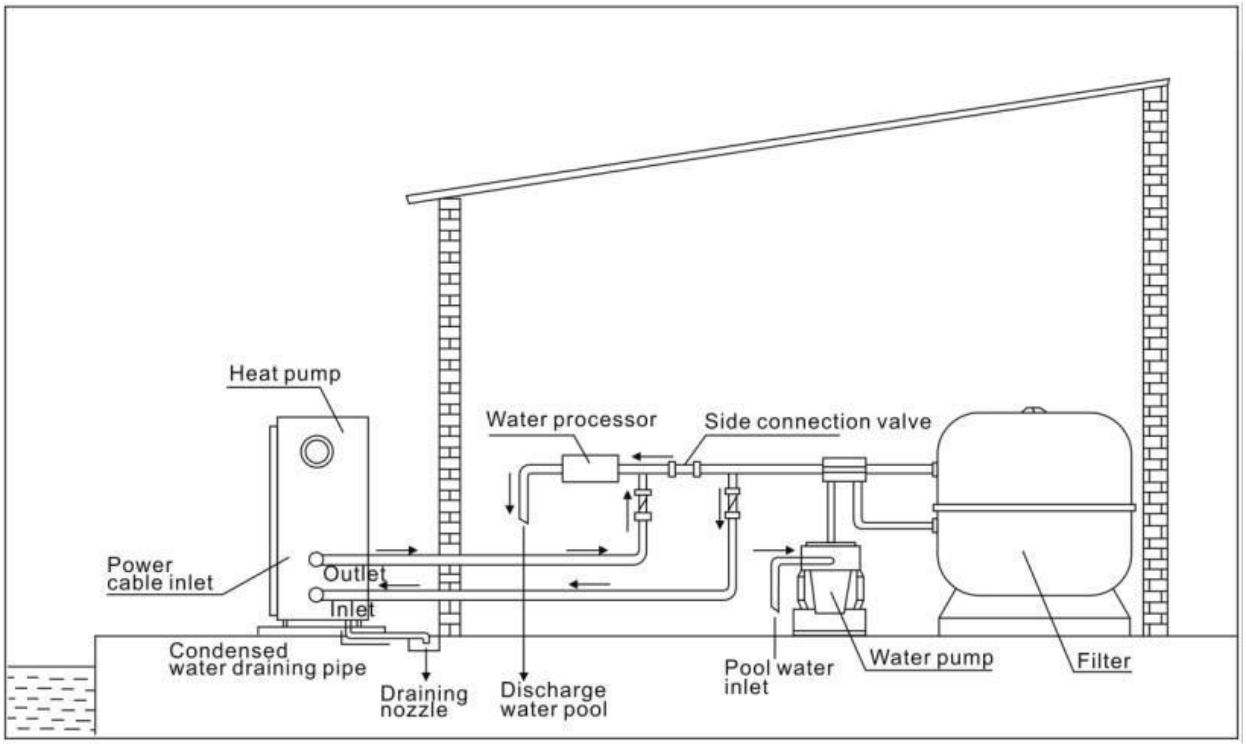
3.4 Check-valve installation

Note: If automatic dosing equipment for chlorine and acidity (pH) is used, it is essential to protect the heat pump against excessively high chemical concentrations which may corrode the heat exchanger. For this reason, equipment of this sort must always be fitted in the piping on the **downstream** side of the heat pump, and it is recommended to install a check-valve to prevent reverse flow in the absence of water circulation.

Damage to the heat pump caused by failure to observe this instruction is not covered by the warranty.

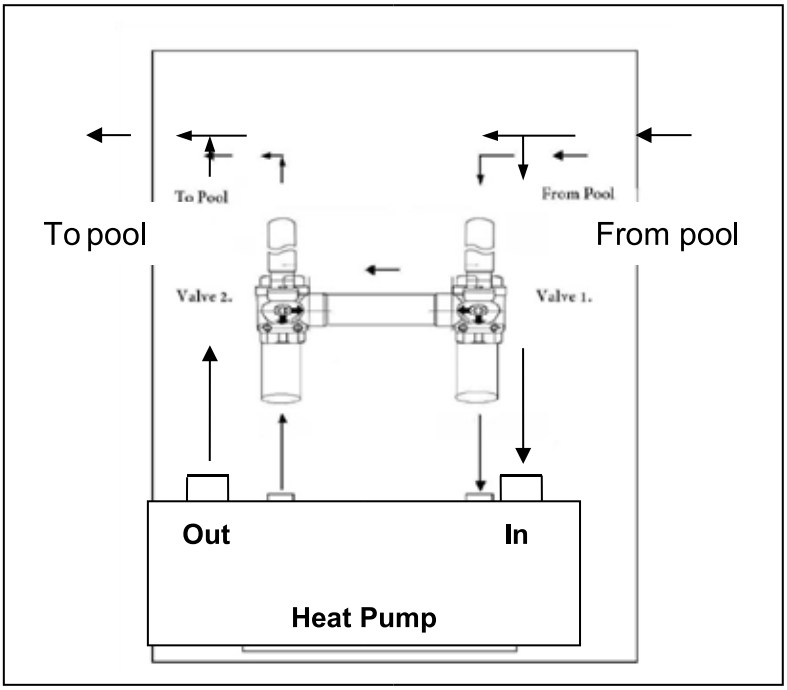


3.5 Typical arrangement



Note: This arrangement is only an illustrative example.

3.6 Adjusting the bypass



Use the following procedure to adjust the bypass:

1. Open Valve 1 & 2 half way.
2. Close valve 2 until control shows NO Or EE3 screen.
3. Slowly open Valve 2 until pool Temp shows on screen.
4. If it shows 'ON' or 'EE3' on display, it means the water flow into heat pump is not enough, then you need adjust the valves to increase the water flow through the heat pump.

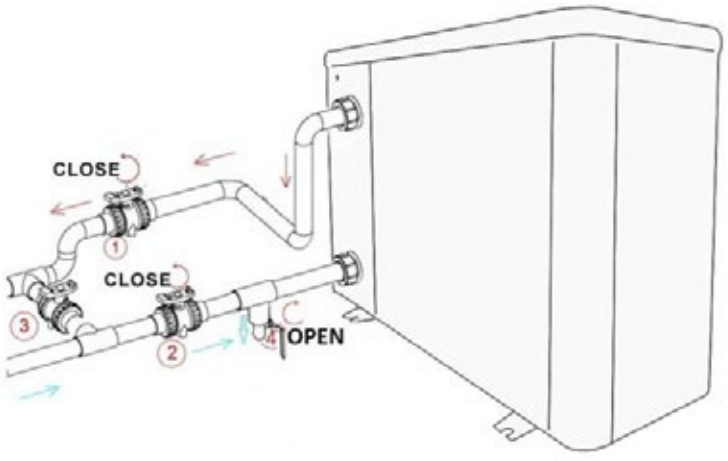
Must not have Valves open Full.

How to get the optimum water flow:

Please turn on the heat pump under heating function, firstly close the by-pass then open it slowly to start the heat pump (the heat pump can't start running when the water flow is insufficient).

Continue to adjust the by-pass, at the meantime to check the Inlet water temp. & Outlet water temp, it will be optimum when the difference is around 2 degrees.

Drain out the water in winter for the units without drainage outlet in heat exchanger



Turn off the heat pump and be sure that it disconnected power

Turn off the water pump

- Close the valves 1 and 2
- Open the valve 4

Allow water to drain out over a long period until heat pump is fully drained.

NOTE: It need to close the valve 4 before turn on the heat pump.

3.7 Electrical connection

Note: Although the heat pump is electrically isolated from the rest of the swimming pool system, this only prevents the flow of electrical current to, or from the water in the pool. Earthing is still required for protection against short-circuits inside the unit. Always provide a good earth connection.

Before connecting the unit, verify that the supply voltage matches the operating voltage of the heat pump. It is recommended to connect the heat pump to a circuit with its own fuse or circuit breaker and to use the appropriate wiring.
Connect the electrical wires to the terminal block marked ' POWER SUPPLY '.
A second terminal block marked 'WATER PUMP ' is located next to the first one. The filter pump (max. 5 A / 240 V) can be connected to the second terminal block here. This allows the filter pump operation to be controlled by the heat pump.

3.8 Initial operation

Note: In order to heat the water in the pool (or hot tub), the filter pump must be running to cause the water to circulate through the heat pump. The heat pump will not start up if the water is not circulating.

After all connections have been made and checked, carry out the following procedure:

(1) Switch on the filter pump. Check for leaks and verify that water is flowing from and to the swimming pool.

(2) Connect power to the heat pump and press the On/Off button ⏻ on the electronic control panel. The unit will start up after the time delay.

(3) After a few minutes, check whether the air blowing out of the unit is cooler.

(4) When the filter pump is turned off, the unit should also turn off automatically, if not, then adjust the flow switch.

(5) Let the unit and the pool pump run 24 hours a day until the water reaches the desired temperature. On reaching the chosen set temperature, the heat pump stops, when the pool temperature drops more than 2 ° C, the heat pump restarts (if filtration is active).

Depending on the initial temperature of the water in the swimming pool and the air temperature, it may take several days to heat the water to the desired temperature. A good swimming pool cover can dramatically reduce the required length of time.

Water Flow Switch:

It is equipped with a flow switch for protecting the HP unit running with adequate water flow rate. It will turn on when the pool pump runs and shut it off when the pump shuts off. If the pool water level is higher than 1 m above or below the heat pump's automatic adjustment knob, your dealer may need to adjust its initial start-up.

Time delay - The heat pump has a built-in 3-minute start-up delay to protect the circuitry and avoid excessive contact wear. The unit will restart automatically after this time delay expires. Even a brief power interruption will trigger this time delay and prevent the unit from restarting immediately. Additional power interruptions during this delay period do not affect the 3-minute duration of the delay.

3.9 Condensation

The air drawn into the heat pump is cooled by the operation of the heat pump to heat the pool water, which may cause condensation on the fins of the evaporator. The amount of condensation may be as much as several litres per hour at high relative humidity. This is sometimes mistakenly regarded as a water leak.

3.10 Operating modes for optimal use

POWERFUL: Used primarily at the beginning of the season because this mode allows for very rapid temperature rise.

SMART: The heat pump has completed its primary task, in this mode; the heat pump is in a position to maintain the pool water in an energy efficient manner. By automatically adjusting speed of compressor and fan the heat pump delivers a higher efficiency.

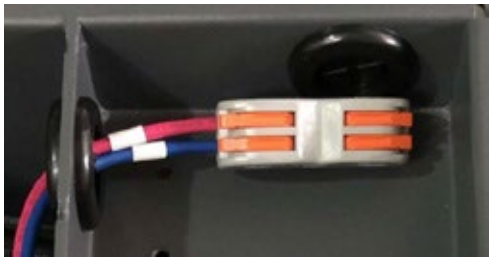
SILENT: In the summer months when the heat output is minimal required, the heat pump in this mode is even more economic. Added benefit; when the heat pump heats. It does so with minimal noise.

4. Accessories

4.1 Accessories list

 Anti-vibration base, 4 pcs	 Winter cover 1pc
 Draining jet, 2 pcs	 Water drainage pipes, 2 pcs

4.2 Accessories Installation

	**Anti-vibration bases** 1. Take out 4 Anti-vibration bases 2. Put them one by one on the bottom of machine like the picture.
	**Water Inlet & outlet junction** 1. Use the pipe tape to connect the water Inlet & outlet junction onto the heat pump 2. Install the two joints like the picture shows 3. Screw them onto the water Inlet & outlet junction
	**Mains Cable wiring** 1. Open the cover of the electric box inside the machine 2. Connect the cables in the correct terminal according to electric diagram.
	**Filtration pump wiring (Dry contact)** 1. Open the cover of the electric box inside the machine 2. Connect the cables in the correct terminal according to electric diagram.

4.3 Connection to pilot the water pump

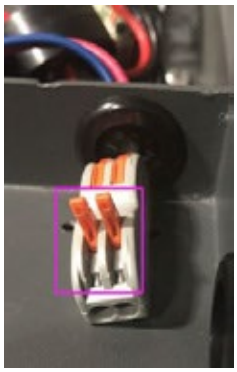


Photo 1

Photo 2

Photo 3

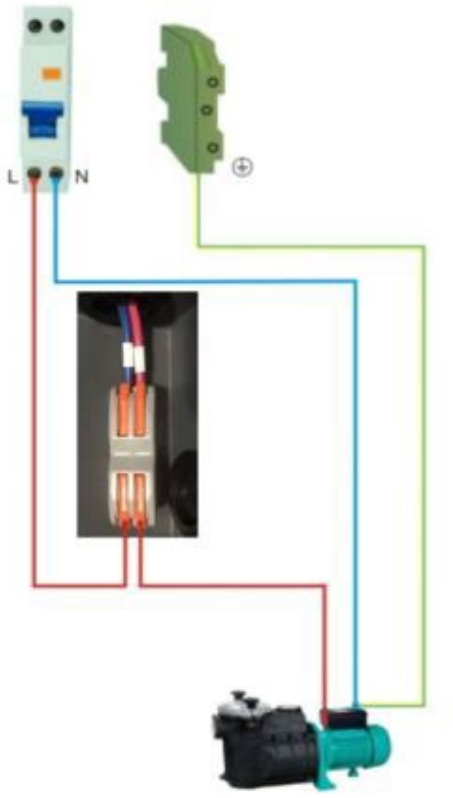


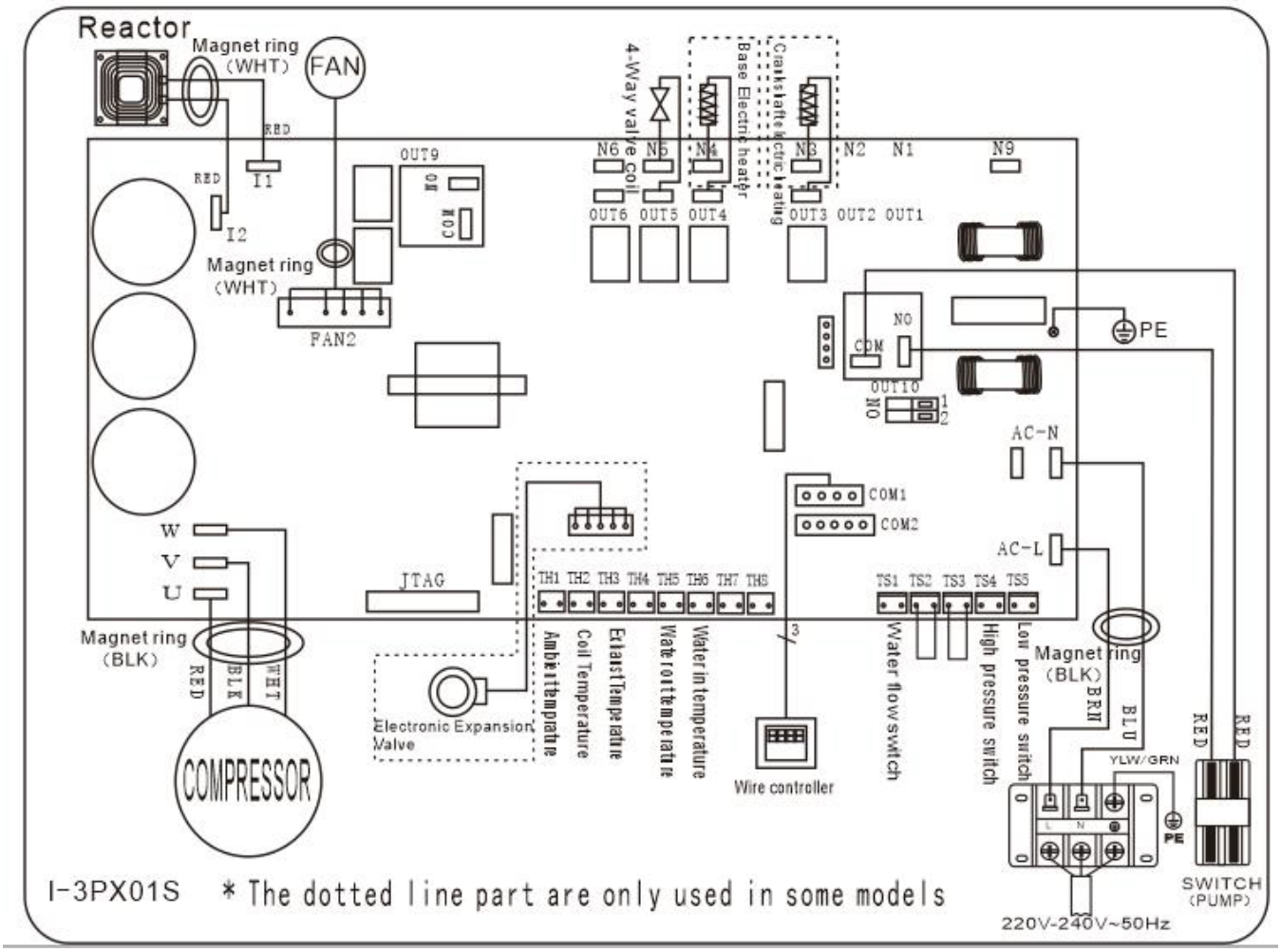
Photo 4

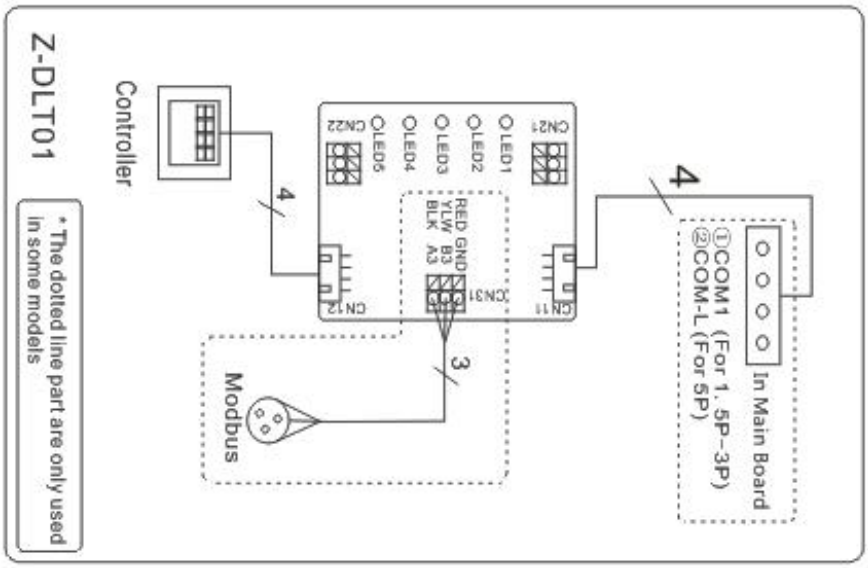
- Open the button upwards as (Photo 1)
- Fix the dry contact wiring through the two holes as (Photo 2 & Photo 4)
- Press down the button and tighten the wiring as (Photo 3)

5. Electrical Wiring

5.1 SWIMMING POOL HEAT PUMP WIRING DIADRAM

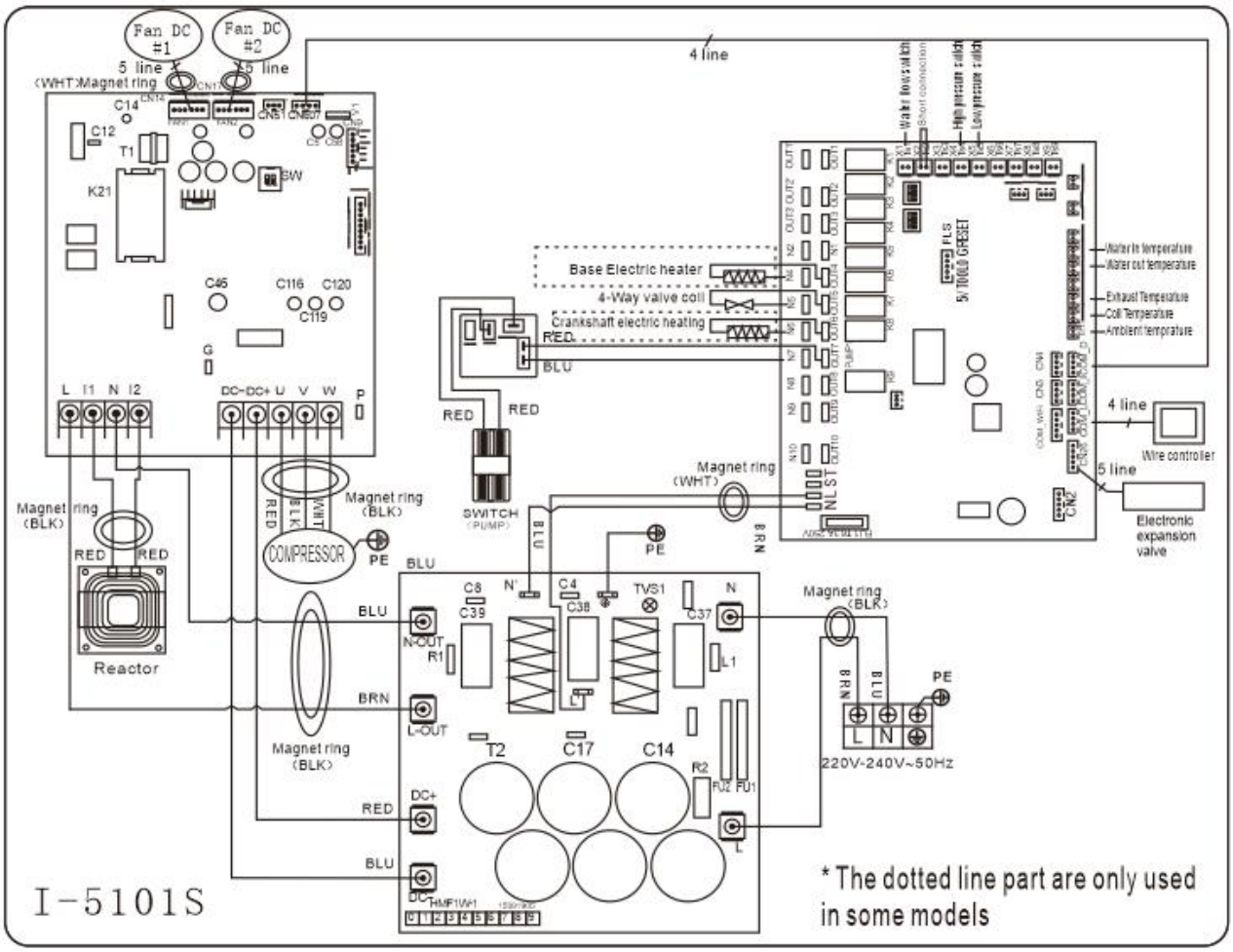
ZSXP07i/ ZSXP09i/ZSXP11i/ ZSXP14i/ ZSXP16i/ ZSXP20i/ ZSXP25iA

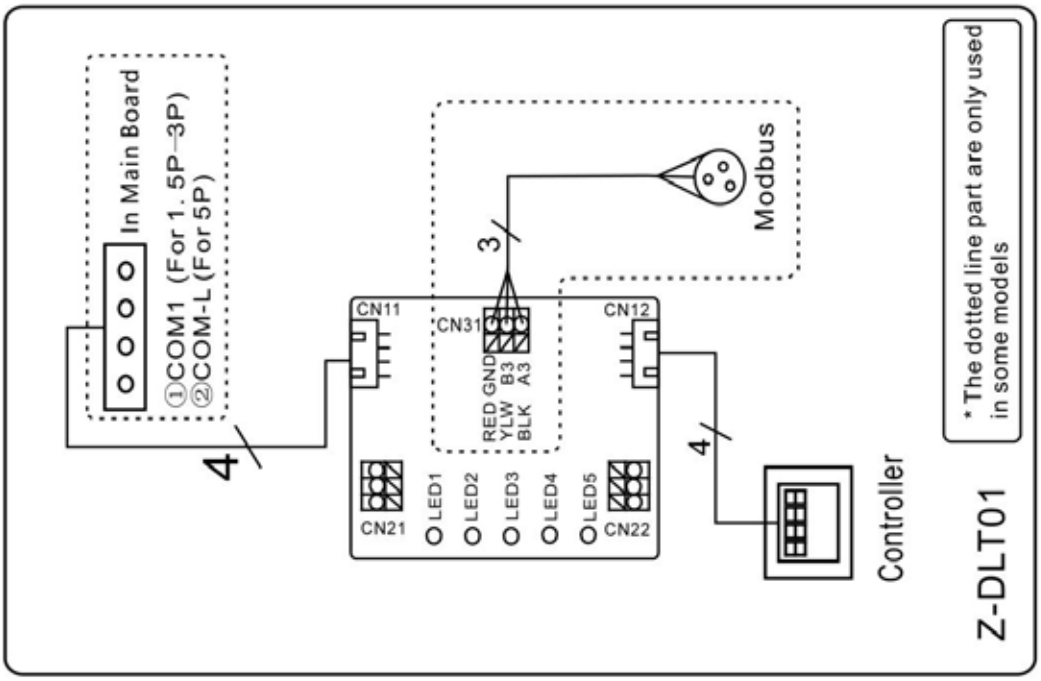




5.2 SWIMMING POOL HEAT PUMP WIRING DIADRAM

ZSXP30i





NOTE:

(1)Above electrical wiring diagram for your reference.

(2)The swimming pool heat pump must be connected earthed, although the unit heat exchanger is electrically isolated from the rest of the unit. Grounding the unit is still required to protect against short circuits inside the unit. Bonding is also required.

(3)It is recommended that your pool filtration pump and your heat pump are wired independently.

Disconnect: A disconnect means (circuit breaker, fused or un-fused switch) should be located within sight of and readily accessible from the unit. This is common practice on commercial and residential heat pumps. It prevents remotely-energizing unattended equipment and permits turning off power at the unit, while the unit is being serviced.

6. Display Controller Operation

6.1 Guide for operation

6.2 The keys and their operations

6.2.1  button

Press  to start the heat pump unit.

Press  to stop the heat pump unit.

6.2.2  and  button

Water temperature setting:

Press  or  to set the water temperature directly.

Press  and  at the same time to check water in temperature, water out temperature and set temperature.

6.2.3  button

Press  to change the working mode, Powerful, silent and smart. The default mode is smart mode.

6.2.4  button

Press  for 2 seconds to enter secondary page.

Press  and  to select the functions and press  to enter.

6.2.5  Heating/Cooling/Auto mode

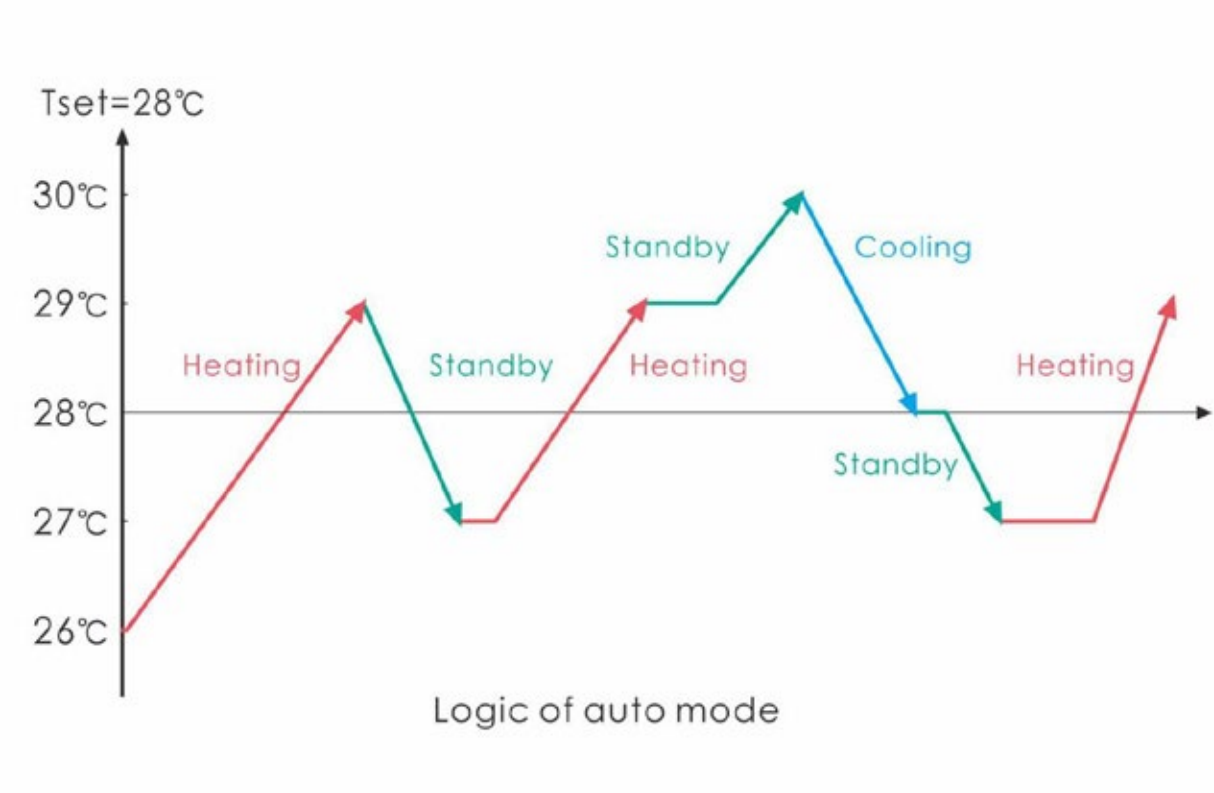
Select  and press  to enter, press  and  to choose Heating/ Cooling/ Auto mode, press  again to exit. The default mode is Heating mode.

Working mode	Set temperature range
Heating/Auto	6-41℃
Cooling	6-35℃

Logic of auto mode

T1=Water inlet temperature /T set= set temperature=28℃

NO	Condition	Current working Status	Water inlet Temperature	Working mode
1	When the heat pump starts	Startup	T1≤27℃	Heating mode
	When the heat pump is running	Heating mode	T1≥29℃, last for 3 minutes	Standby
		Standby	T1≥30℃	It switches to cooling mode
		Cooling mode	T1=28℃, last for 3 minutes	Standby
		Standby	T1≤27℃, last for 3 minutes	It switches to heating mode
2	When the heat pump starts	Startup	27℃<T1≤29℃	Heating mode
	When the heat pump is running	Heating mode	T1≥29℃, last for 3 minutes	Standby
		Standby	T1≥30℃	It switches to cooling mode
		Cooling mode	T1=28℃, last for 3 minutes	Standby
		Standby	T1≤27℃, last for 3 minutes	It switches to heating mode



6.2.6 Parameter checking

Select and press to enter, press and to check d0-d11 value.

Code	Condition	Scope	Remark
d0	IPM mould temperature	0-120℃	Real testing value
d1	Inlet water temp.	-9℃～99℃	Real testing value
d2	Outlet water temp.	-9℃～99℃	Real testing value
d3	Ambient temp.	-30℃～70℃	flash if Real value<-9
d4	Frequency limitation code	0,1,2,4,8,16	Real testing value
d5	Piping temp.	-30℃～70℃	flash if Real value<-9
d6	Gas exhaust temperature	0℃～C5℃ (125℃)	Real testing value
d7	Step of EEV	0～99	N*5
d8	Compressor running frequency	0～99Hz	Real testing value
d9	Compressor current	0～30A	Real testing value
d10	Current fan speed	0-1200 (rpm)	Real testing value
d11	Error code for last time	All error code	

Remark:
d4: Frequency limitation code,
0: No frequency limit;
1: Coil pipe temperature limit;
2: Overheating or overcooling frequency limit;
4: Drive Current frequency limit;
8: Drive voltage frequency limit;
16:Drive high temperature frequency limit

6.2.7 Parameter setting

Select and press to enter, press and to choose P0-P18 value and press to set.

Note: Long press for 15s to set P14, P18.

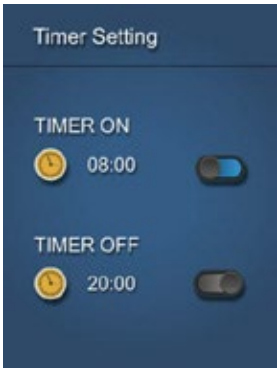
Code	Name	Scope	Default	Remark
P0	Mandatory defrosting	0-1	0	0: Default normal operation 1: mandatory defrosting.
P3	Water pump	0-1	0	1:Always running; 0:Depends on the running of compressor
P7	Water temp. calibration	-9～9	0	Default setting: 0
P14	Restore to factory settings	0-1	0	1-Restore to factory settings，0- default（restore P0、P3、P7、P8、P9、P10、P11 to factory setting)
P16	Product code	/	/	Depend on the machine
P18	Mode	0-1	0	1—Heating only，0—Heating/Cooling/Auto mode

6.2.8 Error code

Select and press to check the error code. If the HP is normal, button is invalid. For example,

6.2.9 Time setting/Timer setting

Select and press to enter, press again to Timer on/Timer off setting.



Press to enter and and to select Timer on or Timer off.

Press to select on/off and press or to set the time. Press to save the setting.

Long press for 5 seconds to set the current time.

Water pump logic:

1. **Parameter setting : P3=0 : Water pump is related to compressor's operation to start or stop.**

When heat pump turns on, filtration pump will start first and then fan motor and compressor.

	Condition	**Example**	**Water pump working logic**
Heating mode	T1≥Tset-0.5 ℃, last for 30 minutes	T1≥27.5℃, last for 30 minutes	Filtration pump will enter standby mode for 1 hours and will not start except after manual power off and restart. Compressor and fan motor stops first and filtration pump will stop after 5 mins.
Cooling mode	T1≦Tset+0.5 ℃, last for 30 minutes	T1≦28.5℃, last for 30 minutes	

1 hour later	**Condition**	**Example Tset=28℃**	**Water pump working logic**
Filtration pump will start to run for 5 mins to detect the water in temp.	T1>Tset-1℃	T1>27℃	Filtration pump will enter standby mode for another **1 hours** and will not start except after turning off the hp and restart.
	T1≤Tset-1℃	T1≤27℃	Heat pump will start again until it meets the condition of standby.
	T1<Tset+1℃	T1<29℃	Filtration pump will enter standby mode for another **1 hours** and will not start except after turning off the hp and restart.
	T1≥Tset+1℃	T1≥29℃	Heat pump will start again until it meets the condition of standby.

Note: If the water volume of the swimming pool is small, water temp reaches T1≥Tset+1℃ and last for 5 mins, heat pump will stop first and then filtration pump stops, but it will not entry standby mode for 1 hour. If water temp drops to T1≤Tset-1, heat pump will start again.

2. While P3=1: When the heat pump is on (running or standby), filtration pump will always be on.

NOTE :

Tset = Tseting water temperature

For example : Tset = 28℃ Tseting water temperature in your pool heat pump

Tset-1 = less 1℃ than Tseting temperature

Tset- 1 = 28-1=27℃

Tset+1= more 1℃ than Tseting temperature

Tset+ 1 = 28+1=29℃

7. Troubleshooting

7.1 Error code display on wire controller

Error Code	Malfunction	Reason	Solution
EE 01	High pressure failure TS4	1. Ambient temperature is too high 2. Water temperature is too high 3. Water flow is too low 4. Fan motor speed is abnormal or fan motor is damaged under cooling mode 5. Gas system jammed 6. High pressure wire is loose or damaged 7. Too much refrigerant	1. Choose the silent mode. 2. Check the water flow or filtration pump 3. Check the fan motor under cooling mode, replace a new one if it is abnormal. 4. Check and repair the refrigerating system 5. Reconnect the high pressure wire or replace a new high pressure switch 6. Check and repair the refrigerating system
EE 02	Low pressure failure TS5	1. EEV has blocked or pipe system is jammed 2. Fan motor speed is abnormal or fan motor is damaged under heating mode 3. Gas leakage 4. Low pressure wire is loose or damaged	1.Check the EEV and piping system Check the motor 2. Check the fan motor under heating mode, replace a new one if it is abnormal 3. Check refrigeration system or check the pressure value through the high-pressure gauge. 4. Reconnect the low pressure wire or replace a new low pressure switch
EE 03 or 'ON'	Water flow failure TS1	1. The wiring of water flow switch is loose or water flow switch damaged 2. No/Insufficient water flow.	1. Check the wiring of water flow switch or change a new one. 2. Check the filtration pump or the waterway system if there is air or jammed inside
EE 04	Over heating protection for water temperature (d2- TH5) in heating mode	1. Low water flow 2. Water flow switch is stuck and the water supply stops 3. TH5 outlet water temperature sensor is abnormal 4. The difference of outlet water temperature and set temperature is 7℃ or above in heating mode	1. Check the water flow switch if it works well 2. Check the filtration pump or the waterway system if there is air or jammed inside 3. Check TH5 outlet water temperature sensor or replace a new one. 4. Change the set temperature.
EE 05	d6-TH3 Exhaust too high protection	1. Lack of gas 2. Low water flow 3. Piping system has been blocked 4. Exhaust temp. sensor failure d6-TH3 1. 5. Ambient temperature is too high	1. Check the pressure gauge, and fill with some gas if it is lack of gas 2. Check the filtration pump or the waterway system if there is air or jammed inside 3. Check the piping system if there was any block 4. Change a new exhaust temp. sensor d6-TH3 5. Check whether the current ambient

			temp. and water temp. are beyond the running temp. of the machine
EE 06	Controller failure	1. Signal is not well connected or damaged 2. Controller failure	1. Stop the power supply and restart. 2. Re-connect the signal wire or replace a new one 3. Replace a new controller
EE 07	Compressor current protection	1. The compressor current is too large instantaneously 2. Wrong connection for compressor phase sequence 3. Compressor accumulations of liquid and oil lead to the current becomes larger 4. Compressor or driver board damaged 5. The water flow is abnormal 6. Power fluctuations within a short time	1.Check if the power in the normal range 2. Check the compressor 3. Check the compressor phase 4. Check the phase sequence connection 5. Check the waterway system and filtration pump 6. Check mains power input
EE 08	Communication failure between controller and main board	1. Signal wire is not well connected or damaged 2. Controller failure 3. Driving failure	1. Stop the power supply and restart. Re-connect the signal wire or replace a new one 2. Check the controller or replace a new one 3. Check the driving system or update it. 4. Check the driving system or update it.
EE 09	Communication failure between Main control board and Driving board	1. Poor connection of communication wire 2. PCB failure 3. The wire is damaged	1. Stop the power supply and restart. 2. Reconnect the communication wire or replace a new one 3. Check the wirings according to the electric diagram 4. Replace a new PCB
EE 10	VDC voltage too high protection	1. Line voltage is too high 2. Driver board is damaged.	1. Check whether the power supply is normal 2. Change driver board or main board
EE 11	IPM module protection	1. Data mistake 2. Wrong compressor phase connection 3. Compressor liquid and oil accumulation lead to the current becomes larger 4. Compressor or driver board damaged	1. Program error, turn off electricity supply and restart after 3 minutes 2. Change driver board 3. Check compressor sequence connection
EE 12	VDC voltage too low protection	1. Data mistake 2. Wrong compressor phase connection 3. Compressor liquid and oil accumulation lead to the current becomes larger 4.Poor heat dissipation of drive module or high ambient temperature 5. Compressor or driver board damaged	1. Program error, turn off electricity supply and restart after 3 minutes 2. Check compressor sequence connection 3. Check the pressure of system by pressure gauge 4. Check if the ambient and water temperature is over high 5. If it is the refrigerant system failure, send it to the service center 6. Change driver board

EE 13	Input current over high protection.	1. Mother line voltage is too low 2. Driver board is damaged.	1. Check if the power supply is in the normal range 2. Change driver board
EE 14	IPM module thermal circuit is abnormal	1. The compressor current is too large momentary 2. The water flow is abnormal 3. Power fluctuations within a short time 4. Wrong reactor	1. Check the compressor if it works normally 2. Check the waterway system 3. Check if the power is in the normal range 4. Check if the reactor is used correctly.
EE 15	IPM module temperature too high protection	1. Output abnormity of IPM module thermal circuit 2. Fan motor is abnormal or damaged 3. Fan blade is broken	1. Check if the motor speed is too low or fan motor is damaged, replace it by a new one. 2. Replace a new driver board 3. Change the fan blade if it is broken
EE 16	PFC module protection	1. Output exception of IPM module thermal circuit 2. Fan motor is abnormal or damaged 3. Fan blade is broken 4.The screw on driver board is loose	1. Check the main board or replace the driver board 2. Check if the motor speed is too low or fan motor is damaged, replace it by a new one if any failure. 3. Change the fan blade if it is broken 4. Check the screw on driver board
EE 17	DC fan motor failure	1. DC motor is damaged 2. For the tri-phase check if the neutral is connected 3. Main board is damaged 4. The fan blade is stuck	1. Detect DC motor for mono phase machine, replace a new one if any failure 2. Check the wiring connection for tri-phase machine 3. Check the board, replace a new driver board or main board if any failure 4. Check if there is any barrier in front of fan blade and remove it
EE 18	PFC module thermal circuit is abnormal	The driver board is damaged	1. Check if the motor speed is too low or fan motor is damaged, replace it by a new one. 2. Change a new driver board
EE 19	PFC module high temperature protection	1. PFC module thermal circuit output abnormal 2. Fan motor is abnormal or damaged 3. Fan blade is broken 4. The screw in the driver board is not tight	1. Check the main board or replace the driver board 2. Check if the motor speed is too low or fan motor is damaged, replace it by a new one if any failure. 3. Change the fan blade if it is broken 4. Check the screw on driver board
EE 20	Input power failure	The supply voltage fluctuates too much	Check whether the voltage is stable
EE 21	Software control exception	1. Compressor runs out of step 2. Wrong program 3. Impurity inside compressor causes the unstable rotate speed	1. Check the main board or change a new one 2. Update the correct program 3. Check the refrigeration system
EE 22	Current detection circuit failure	1. Voltage signal abnormal 2. Driver board is damaged	1. Change a new main board 2. Change a new driver board

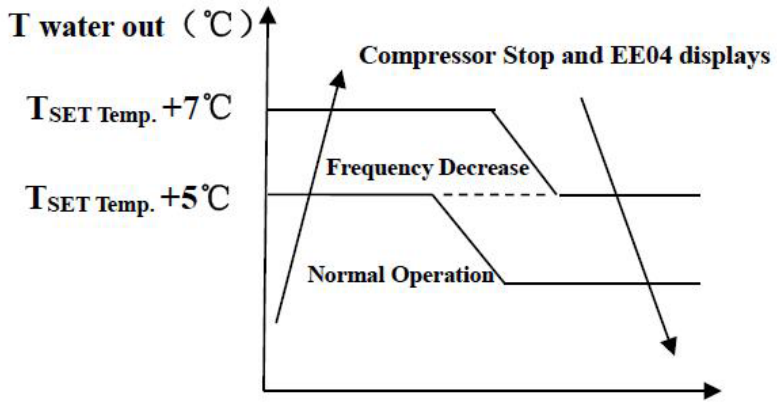
		3. Main board failure	
EE 23	Compressor start failure	1. Main board is damaged 2. Compressor wiring error or poor contact or unconnected 3. Liquid accumulation inside 4. Wrong phase connection for compressor	1. Check the main board or change a new one 2. Check the compressor wiring according to the circuit diagram 3. Check the compressor or change a new one
EE 24	Ambient Temperature device failure on Driver board	Ambient Temperature device failure	Change driver board or main board
EE 25	Compressor phase failure	Compressors U, V, W are just connected to one phase or two phases.	Check the actual wiring according to the circuit diagram
EE 26	Four-way valve reversal failure	1. Four-way valve reversal failure 2. Lack of refrigerant (no detect when TH2 or TH1 malfunction)	1. Switch to Cooling mode to check the 4-way valve if it has been reversed correctly 2. Change a new 4-way valve 3. Fill with gas
EE 27	EEPROM data read malfunction	1. Wrong EEPROM data in the program or failed input of EEPROM data 2. Main board failure	1. Re-enter correct EEPROM data 2. Change a new main board
EE 28	The inter-chip communication failure on the main control board	Main board failure	1. Stop electricity supply and restart it 2. Change a new main board
PP 01	Inlet water temperature sensor failure d1-TH6	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor 2.Re-fix the wiring of the sensors
PP 02	Outlet water temperature sensor failure d2-TH5	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor 2.Re-fix the wiring of the sensors
PP 03	Heating piping sensor failure d5-TH2	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor 2.Re-fix the wiring of the sensors
PP 05	Ambient temperature sensor failure d3-TH1	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor 2.Re-fix the wiring of the sensors
PP 06	Exhaust piping sensor failure d6-TH3	1. The sensor in open or short circuit 2. The wiring of sensor is loose	1. Check or change the sensor 2.Re-fix the wiring of the sensors
PP 07	Antifreeze protection in Winter	Ambient temperature or water inlet temperature is too low	1. Check the d1 and d3. (d1 inlet water temp., d3 ambient temp.) 2. Normal protection
PP 08	Low ambient temperature protection	1. Out of the normal operating ambient temperature for this machine by checking d3	1. Stop using, beyond the scope of using 2.Change the sensor

		2. Sensor abnormality d3-TH1	
PP 10	Piping temperature too high protection under cooling mode d5-TH2	1. Ambient or the water temperature is too high in cooling mode 2. Refrigeration system is abnormal 3. Pipe temperature sensor(TH2) failure	1. Check the ambient temperature 2. Check refrigeration system 3. Change the pipe temperature sensor (TH2)
PP 11	Over low protection for outlet water temperature in cooling mode	1. Low water flow 2. Outlet water temperature sensor d2-TH5 abnormal 3. The difference of outlet water temperature and set temperature is 7℃ or above in cooling mode	1. Check filtration pump and waterway system 2. Change outlet water temperature sensor d2-TH5 3. Change the set temperature.
EE 06	Controller failure	1. Signal is not well connected or damaged 2. Controller failure	1. Stop the power supply and restart. 2. Re-connect the signal wire or replace a new one 3. Replace a new controller

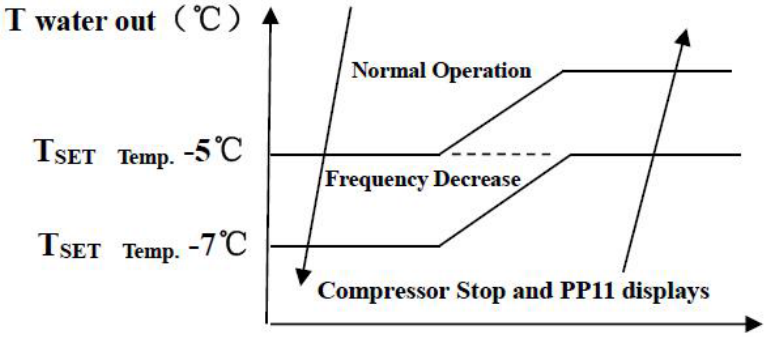
Remarks:

1. In heating mode, if the water out temperature is higher than the set temperature over 7℃, LED controller displays EE04 for water over-heating protection.

2. In cooling mode, if the water out temperature is lower than the set temperature over 7℃, LED controller displays PP11 for water over-cooling protection.



EE04 Water Heating Protection



PP11 Water Cooling Protection

For example below:

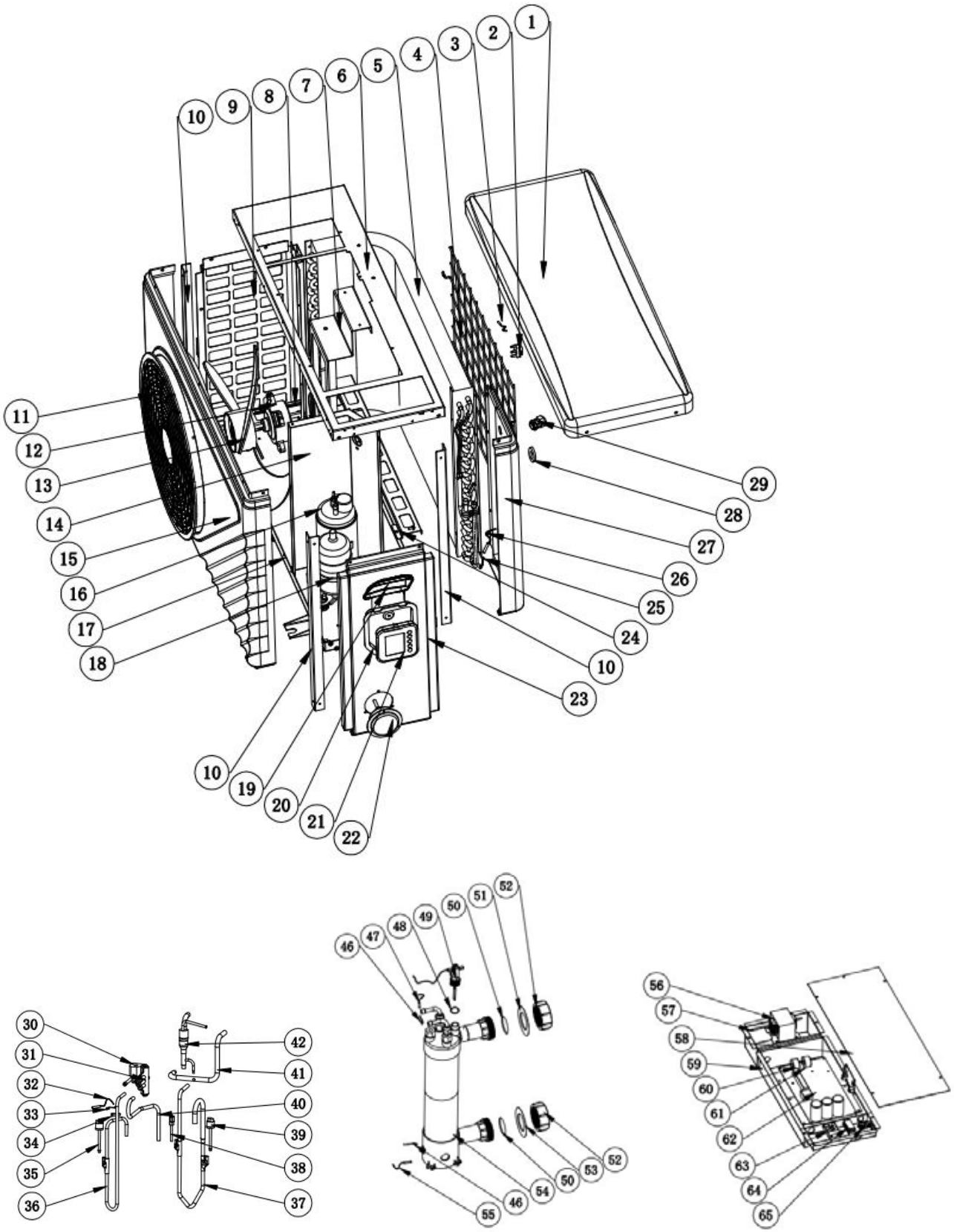
Mode	Water out temperature	Setting temperature	Condition	Malfunction
Heating mode	36℃	29℃	Tout - Tset ≧ 7℃	EE04 Overheating protection for water temperature (d2)
Cooling mode	23℃	30℃	Tset - Tout ≧ 7℃	PP11 Too low protection for water temperature (d2)

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

Malfunctions	Observing	Reasons	Solution
Heat pump is not running	LED wire controller no display.	No power supply	Check cable and circuit breaker if it is connected
	LED wire controller. displays the actual time.	Heat pump under standby status	Startup heat pump to run.
	LED wire controller displays the actual water temperature.	1. Water temperature is reaching to setting value, HP under constant temperature status. 2. Heat pump just starts to run. 3. Under defrosting.	1. Verify water temperature setting. 2. Startup heat pump after a few minutes. 3. LED wire controller should display "Defrosting".
Water temperature is cooling when HP runs under heating mode	LED wire controller displays actual water temperature and no error code displays.	1. Choose the wrong mode. 2. Figures show defects. 3. Controller defect.	1. Adjust the mode to proper running 2. Replace the defect LED wire controller, and then check the status after changing the running mode, verifying the water inlet and outlet temperature. 3. Replace or repair the heat pump unit
Short running	LED displays actual water temperature, no error code displays.	1. Fan NO running. 2. Air ventilation is not enough. 3. Refrigerant is not enough.	1. Check the cable connections between the motor and fan, if necessary, it should be replaced. 2. Check the location of heat pump unit, and eliminate all obstacles to make good air ventilation. 3 Replace or repair the heat pump unit.
Water stains	Water stains on heat pump unit.	1. Concreting. 2. Water leakage.	1. No action. 2. Check the titanium heat exchanger carefully if it is any defect.
Too much ice on evaporator	Too much ice on evaporator.		1. Check the location of heat pump unit, and eliminate all obstacles to make good air ventilation. 2. Replace or repair the heat pump unit.

8. Exploded Diagram

8.1 Model : ZSXP07i

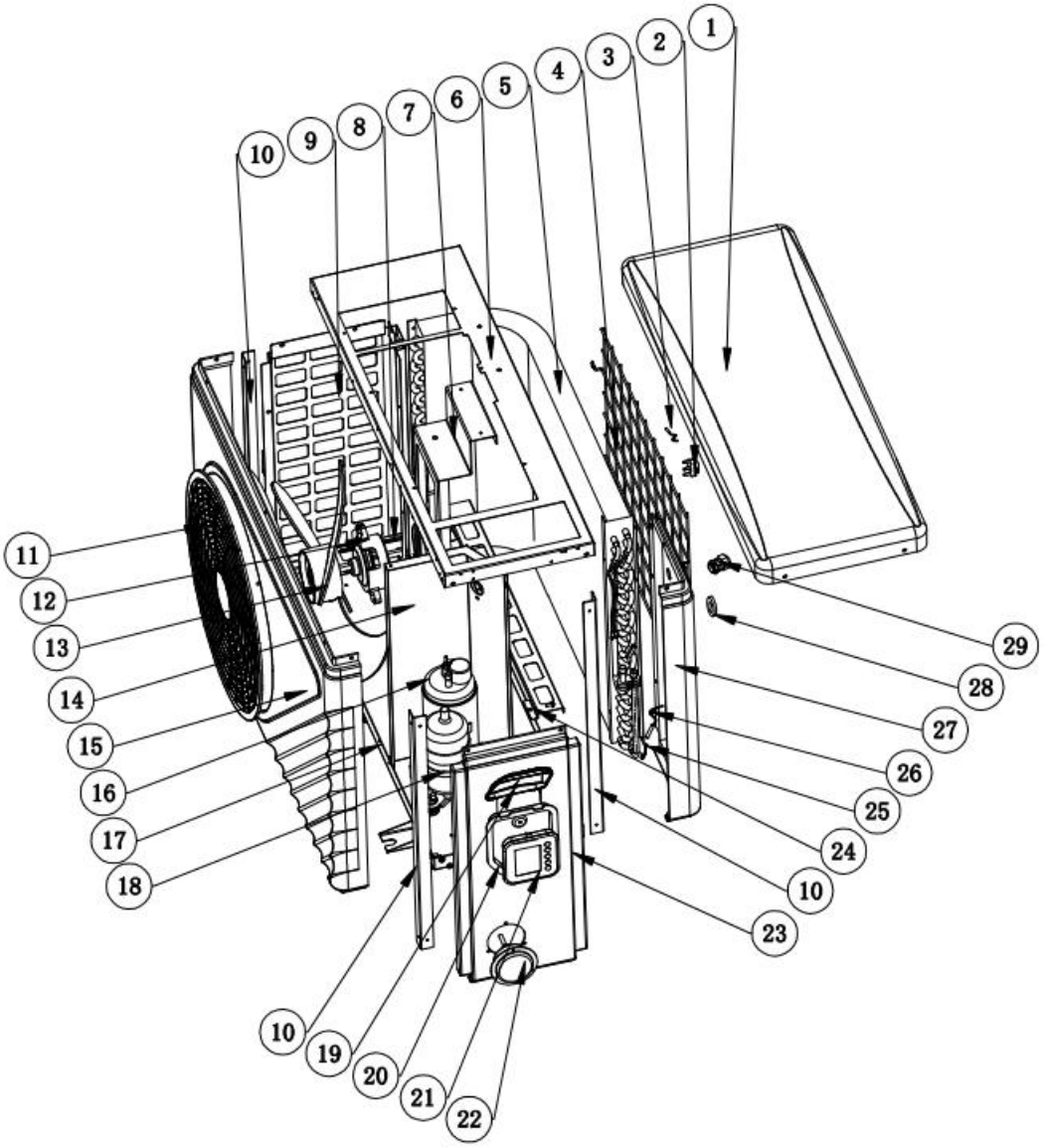


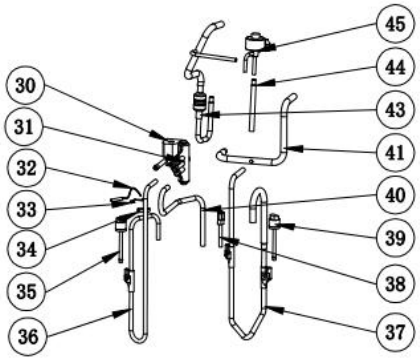
8.1 spare part list

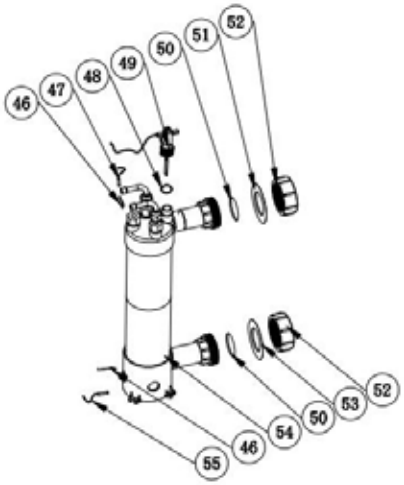
Model : ZSXP07i

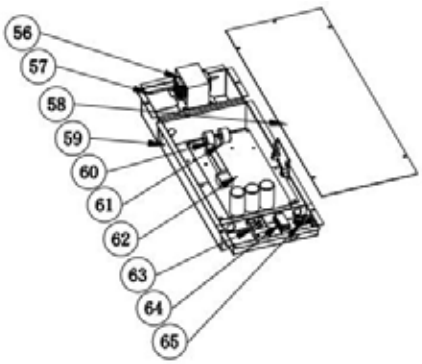
No	Part name	No	Part name
1	Top cover	34	Sensor holder
2	Ambient temp. sensor clip	35	High pressure switch
3	Ambient temp. sensor	36	Discharge pipe
4	Back grill	37	Gas return piping
5	Evaporator	38	Gas valve
6	Top frame	39	Low pressure switch
7	Fan motor bracket	40	Pipe (4-way valve to evaporator)
8	Evaporator support	41	Pipe(4-way valve to heat exchanger)
9	Left panel	42	Pipe(Heat xchanger to capillary)
10	Pillar	46	Sensor clip
11	Fan grid	47	Water outlet temp. sensor
12	Fan motor	48	Rubber ring
13	Fan blade	49	Water flow switch
14	Isolation panel	50	PVC cover
15	Front panel	51	Red rubber ring
16	Compressor	52	Water connection sets
17	Base tray	53	Blue rubber ring
18	Compressor heating belt	54	Titanium heat exchanger
19	Controller box cover	55	Water inlet temp. sensor
20	Controller box	56	Reactor
21	Controller	57	Reactor box
22	High pressure gauge	58	Electrical box cover
23	Right panel	59	Electrical box
24	Evaporator support	60	Magnet ring
25	Clip	61	Magnet ring
26	Evaporator temperature sensor	62	PCB
27	Back panel	63	3-ways terminal block
28	Wire ring	64	clip
29	Wire connector	65	2-ways terminal block
30	Four-way valve	34	Sensor holder
31	Four-way valve coil	35	High pressure switch
32	Evaporator temperature sensor	36	Discharge pipe
33	Sensor clip		

8.2 Model : ZSXP09i









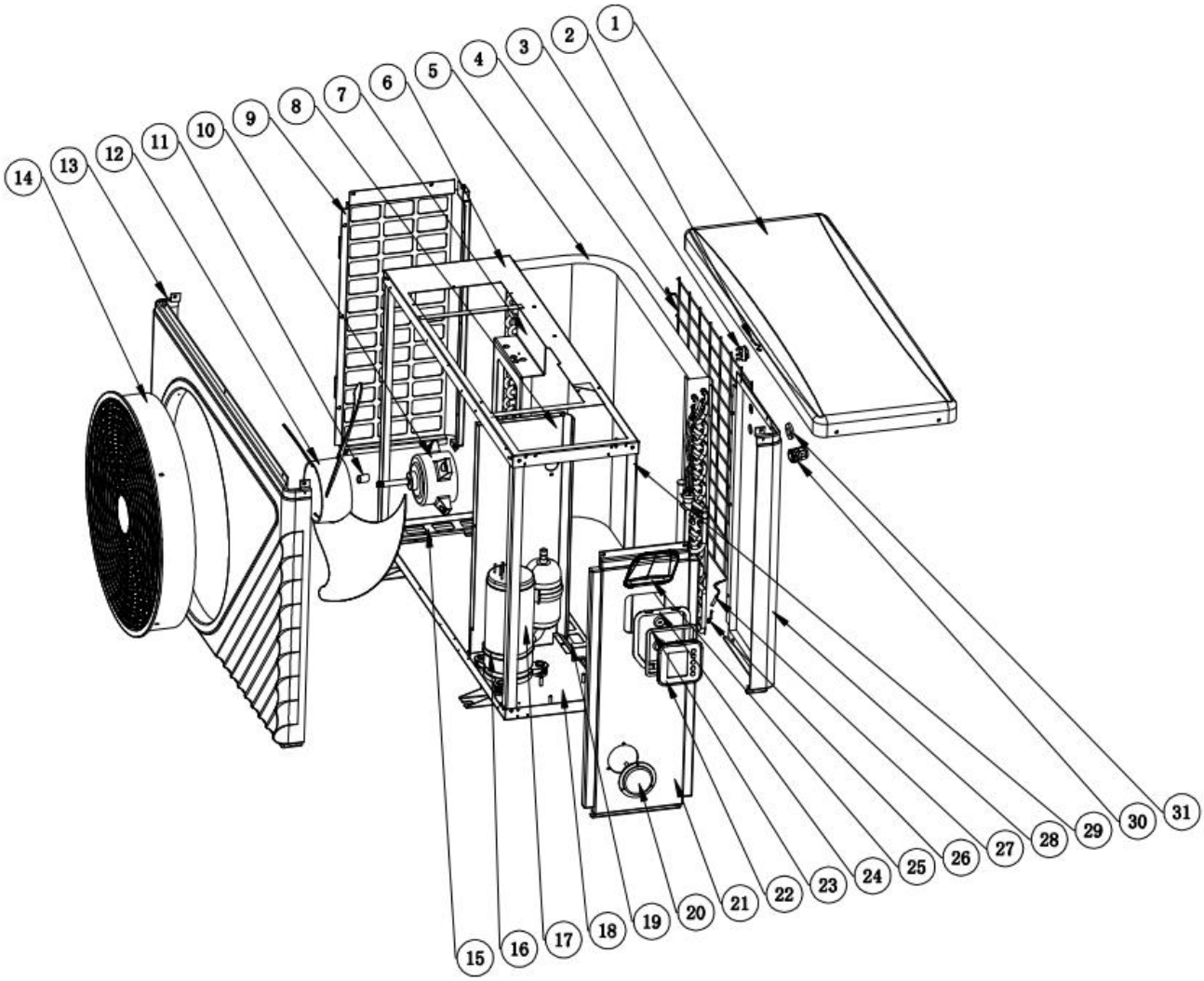
8.2 Spare part list

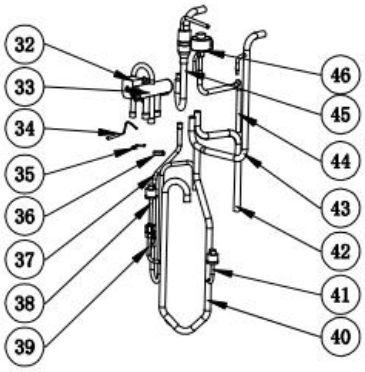
Model : ZSXP09i

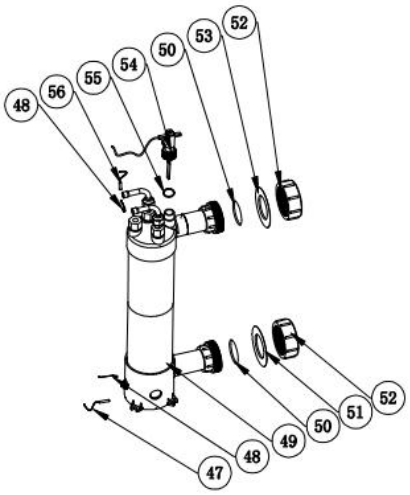
No	Part name	No	Part name
1	Top cover	33	Sensor clip
2	Ambient temp. sensor clip	34	Sensor holder
3	Ambient temp. sensor	35	High pressure switch
4	Back grill	36	Discharge pipe
5	Evaporator	37	Gas return piping
6	Top frame	38	Pin valve
7	Fan motor bracket	39	Low pressure switch
8	Evaporator support	40	Pipe(4-way valve to evaporator piping)
9	Left panel	41	Pipe(4-way valve to exchanger)
10	Pillar	43	Pipe(Exchanger to EEV)
11	Fan grid	44	Tube
12	Fan motor	45	EEV
13	Fan blade	46	Sensor clip
14	Isolation panel	47	Water outlet temp. sensor
15	Front panel	48	Rubber ring
16	Compressor	49	Water flow switch
17	Base tray	50	PVC cover
18	Compressor heating belt	51	Red rubber ring
19	Controller box cover	52	Water connection sets
20	Controller box	53	Blue rubber ring
21	Controller	54	Titanium heat exchanger
22	High pressure gauge	55	Water inlet temp. sensor
23	Right panel	56	Reactor
24	Evaporator support	57	Reactor box
25	Clip	58	Electrical box cover
26	Discharge temp. sensor	59	Electrical box
27	Back panel	60	Magnet ring
28	Wire ring	61	Magnet ring
29	Wire connector	62	PCB
30	Four-way valve	63	3-ways terminal block
31	Four-way valve coil	64	clip
32	Evaporator temperature sensor	65	2-ways terminal block

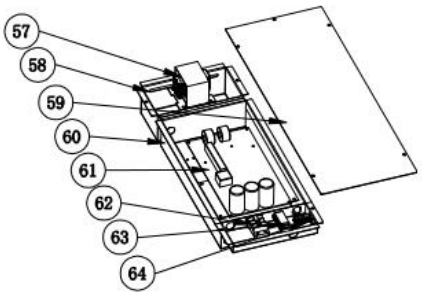
8.3 Spare part list

Model : ZSXP11i/ ZSXP14i/ ZSXP16i









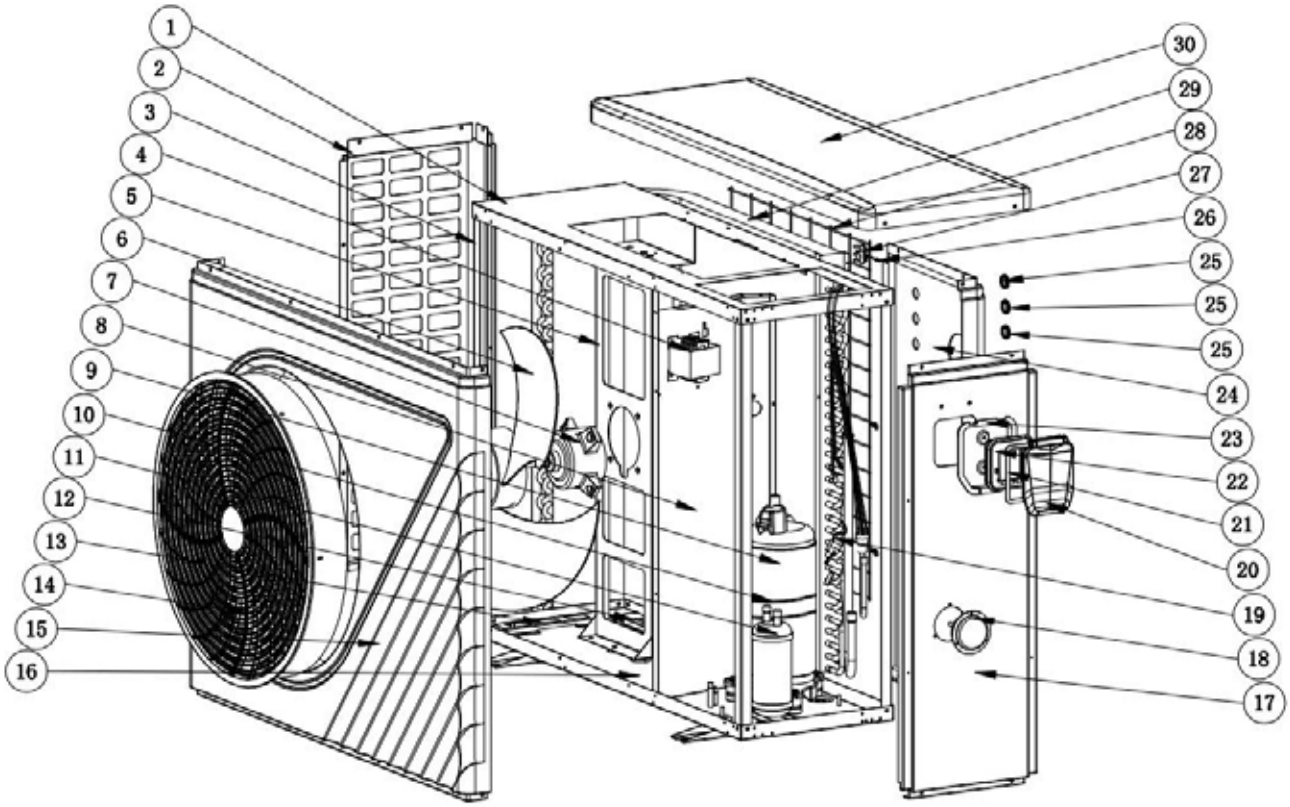
8.3 Spare part list

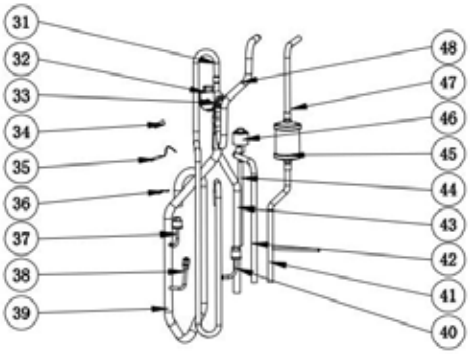
Model : ZSXP11i/ ZSXP14i/ ZSXP16i

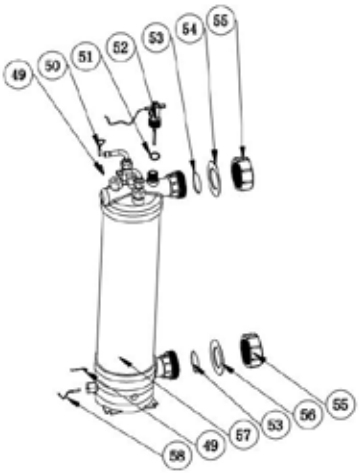
No	Part name	No	Part name
1	Top cover	33	4-way valve coil
2	Ambient temp. sensor	34	Evaporator temperature sensor
3	Ambient temp. sensor clip	35	Clip
4	Back grill	36	Sensor holder
5	Evaporator	37	Discharge pipe
6	Top frame	38	High pressure switch
7	Fan motor bracket	39	Gas valve
8	Isolation panel	40	Low pressure switch
9	Left panel	41	Gas return piping
10	Fan motor	42	Pipe(4-way valve to evaporator piping)
11	Fan motor holder	43	Pipe(4-way valve to exchanger)
12	Fan blade	44	Pipe(EEV to Distribution piping)
13	Front panel	45	Pipe(Exchanger to EEV)
14	Fan grid	46	EEV
15	Evaporator support	47	Water inlet temp. sensor
16	Compressor heating belt	48	Exchanger temperature sensor clip
17	Compressor	49	Titanium heat exchanger
18	Base tray	50	PVC cover
19	Evaporator support	51	Blue rubber ring
20	High pressure gauge	52	Water connection sets
21	Right panel	53	Red rubber ring
22	Controller	54	Water flow switch
23	Sponge	55	Rubber ring
24	Controller box	56	Water outlet temp. sensor
25	Controller box cover	57	Reactor
26	Clip	58	Reactor box
27	Discharge temp. sensor	59	Electrical box cover
28	Back panel	60	Electrical box
29	Pillar	61	PCB
30	Wire connector	62	3-ways terminal block
31	Wire ring	63	clip
32	Four-way valve	64	2-ways terminal block

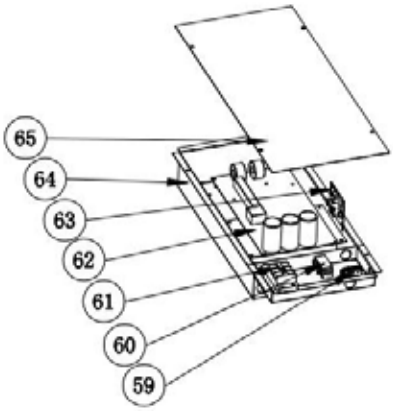
8.4 Spare part list

Model : ZSXP20i/ ZSXP25iA









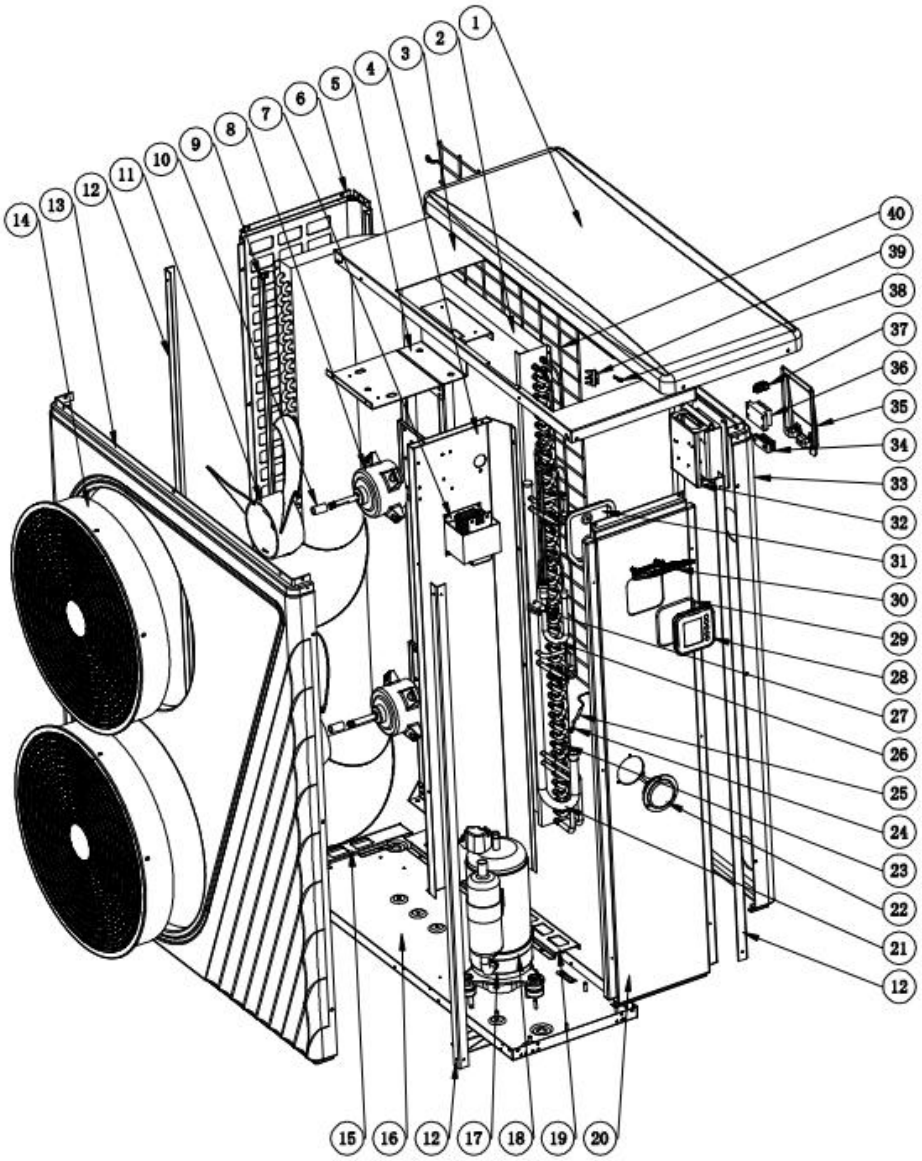
8.4 Spare part list

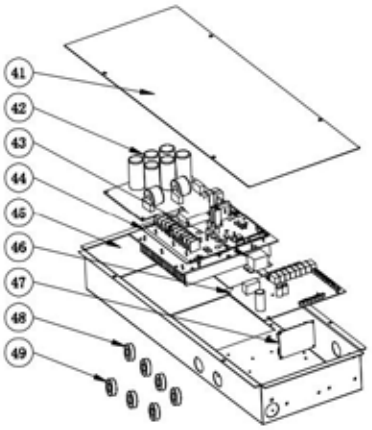
Model : ZSXP20i/ ZSXP25iA

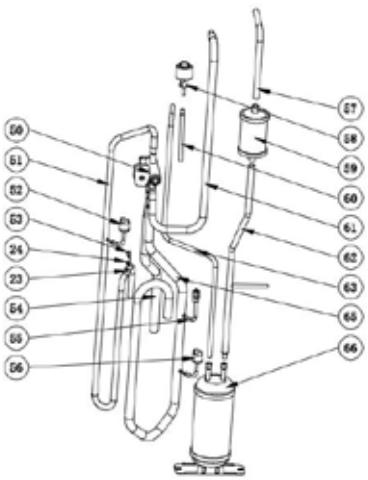
No	Part name	No	Part name
1	Top frame	34	Sensor holder
2	Left panel	35	Discharge temp. sensor
3	Pillar	36	clip
4	Reactor	37	Low pressure switch
5	Fan motor bracket	38	Pin valve
6	Fan blade	39	Gas return piping
7	Fan motor	40	High pressure switch
8	Isolation panel	41	Filter to storage tank
9	Compressor	42	EEV to Distribution piping
10	Compressor heating belt	43	4-way valve to evaporator piping
11	Liquid storage tank	44	Liquid storage tank to EEV
12	Evaporator support	45	Filter
13	Evaporator support	46	EEV
14	Fan grid	47	Pipe (Exchanger to filter)
15	Front panel	48	Pipe (4-way valve to exchanger)
16	Base tray	49	Pipe (Exchanger temperature sensor clip)
17	Right panel	50	Water outlet temp. sensor
18	High pressure gauge	51	Rubber ring
19	Evaporator temperature sensor	52	Water flow switch
20	Controller box cover	53	Rubber ring on water connection
21	Sponge	54	Red rubber ring
22	Controller	55	Water connection set
23	Controller box	56	Blue rubber ring
24	Back panel	57	Titanium heat exchanger
25	Wire ring	58	Water inlet temp. sensor
26	Ambient temp. sensor	59	2-ways terminal block
27	Ambient temp. sensor clip	60	clip
28	Back grill	61	3-ways terminal block
29	Evaporator	62	PCB
30	Top cover	63	WIFI module
31	Discharge pipe	64	Electrical box
32	4-way valve coil	65	Electrical box cover
33	Four-way valve		

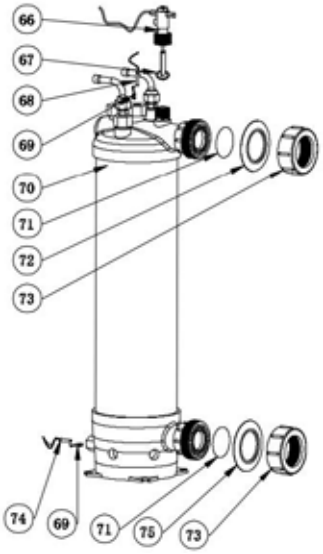
8.5 Spare part list

Model : ZSXP30i









8.5 Spare part list

Model : ZSXP30i

No	Part name	No	Part name
1	Top cover	39	Ambient temp. sensor clip
2	Evaporator	40	Back grill
3	Top frame	41	Electrical box cover
4	Isolation panel	42	Filter board
5	Fan motor bracket	43	Relay
6	Left panel	44	PCB
7	Reactor	45	Electrical box
8	Fan motor	46	Driver board
9	Left panel	47	WIFI module
10	Fan motor holder	48	Magnet ring(Black)
11	Fan blade	49	Magnet ring(White)
12	Pillar	50	Four-way valve
13	Front panel	51	Discharge pipe
14	Fan grid	52	High pressure switch
15	Evaporator support	53	Discharge temp. sensor
16	Base tray	54	Pipe (4-way valve to evaporator piping)
17	Compressor	55	Gas valve
18	Compressor heating belt	56	Low pressure switch
19	Evaporator support	57	Pipe (Exchanger to filter)
20	Right panel	58	EEV
21	Evaporator pipe	59	Dehydrator filter
22	High pressure gauge	60	Pipe (EEV to Distribution piping)
23	Sensor holder	61	Pipe (4-way valve to exchanger)
24	Sensor clip	62	Pipe (Filter to storage tank)
25	Evaporator temperature sensor	63	Pipe (Liquid storage tank to EEV)
26	Evaporator Distribution piping	64	Gas return piping
27	Rubber block	65	Liquid storage tank
28	Controller	66	Water flow switch
29	Rubber ring on water connection	67	Rubber ring on exchanger connection
30	Controller box	68	Water outlet temp. sensor
31	Controller box cover	69	Exchanger temperature sensor clip
32	Terminal board	70	Titanium heat exchanger
33	Back panel	71	PVC cover
34	clip	72	Red rubber ring
35	Terminal board cover	73	Water connection set
36	3-ways terminal block	74	Water inlet temp. sensor
37	2-ways terminal block	75	Blue rubber ring
38	Ambient temp. sensor		

9. Maintenance

(1) You should check the water supply system regularly to avoid the air entering the system and occurrence of low water flow, because it would reduce the performance and reliability of HP unit.

(2) Clean your pools and filtration system regularly to avoid the damage of the unit as a result of the dirty of clogged filter.

(3) You should discharge the water from bottom of water pump if HP unit will stop running for a long time (specially during the winter season).

(4) In another way, you should check the unit is water fully before the unit start to run again.

(5) After the unit is conditioned for the winter season, it is recommended to cover the heat pump with special winter heat pump.

(6) When the unit is running, there is all the time a little water discharge under the unit.

10.Wifi instruction

10.1. Heat-Pump with WIFI function

Thank you for using our heat pump with WIFI function, you can remote control your pool heat pump from your smart phone. The controller information could syncs to “Alsavo Pro” APP via an internet connection (WIFI or 3G/4G). For the first time connection, your smart phone and the WIFI controller must be under the same WIFI network. From then on, your smart phone can use the 3G/4G network to control pool heat pump remotely.

By “Alsavo Pro” APP, you can turn heat pump on or off, adjust water temperature, change mode, set time and timer on/off, check malfunction right at your finger tips.

”Alsavo pro” APP is compatible with Android system (6.10 version or above) and IOS system (8.0 version or above). Currently 10 languages (English, Swedish, French, Spanish, Italian, Czech, Polish, German, Russian, Chinese) available. Several heat pumps with WiFi controller could connect to one phone’s app, and several phones’ app could connect one heat pump.

10.2. “Alsavo Pro” APP operation

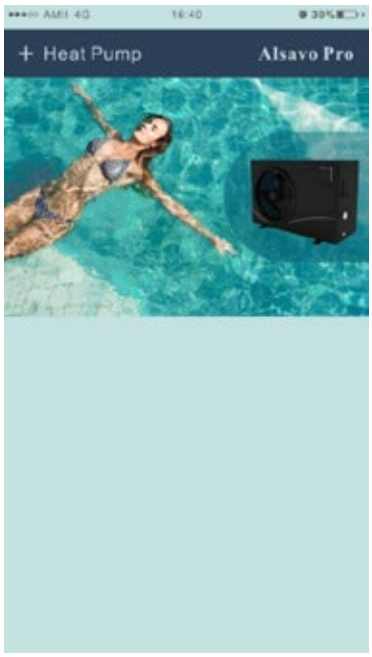
2.1 Firstly, please download ”Alsavo Pro” APP from App store or Google play in your smart phone.

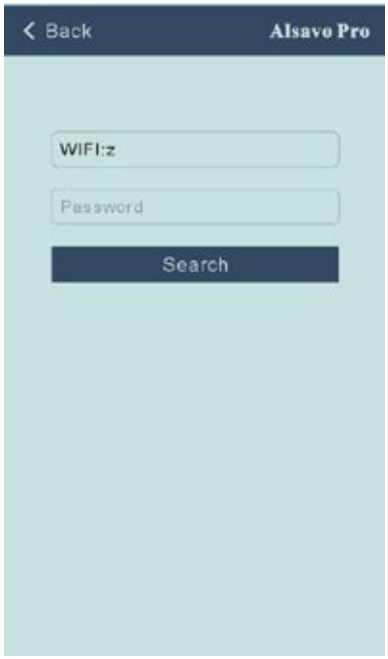
2.2 Open “Alsavo Pro” APP, click “+” on the upper left and select “New device”. Then Click “Next” and enter the current WIFI password to connect. Press "⏻" 5S on the display no matter it’s ON or OFF. Or you can press "⏻" 5S on the controller first, then enter the current WIFi password. The WIFI icon  in the controller will flash, lastly long light. If the connection fails, the APP will indicate “Failed to connect device”.

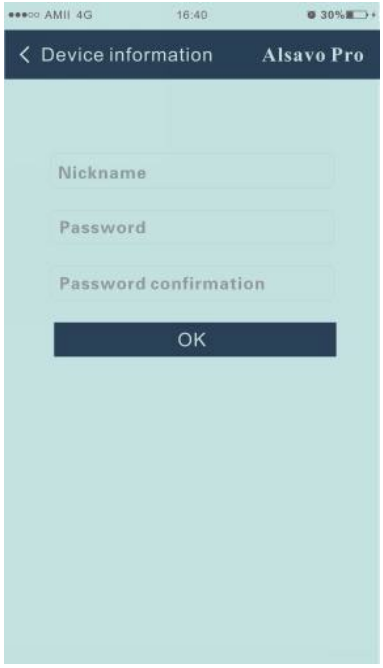
"Nickname and password" interface only appear one time when a new heat pump is connected successfully. You can name and add encrypt this unit. (This interface may be missing if the wifi network is not stable. You will miss the chance to name and encrypt it. In this case, default password “123456” is available.)

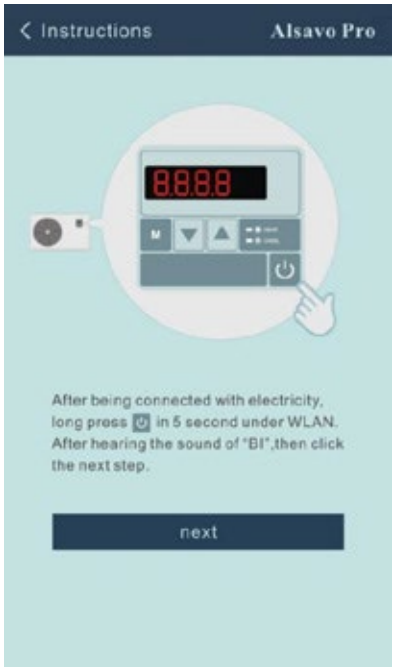
If someone’s APP is in the same WIFI network as yours, this APP could automatically identify your heat pump. And he can operate your heat pump after inputting your password.

Alsavo Pro



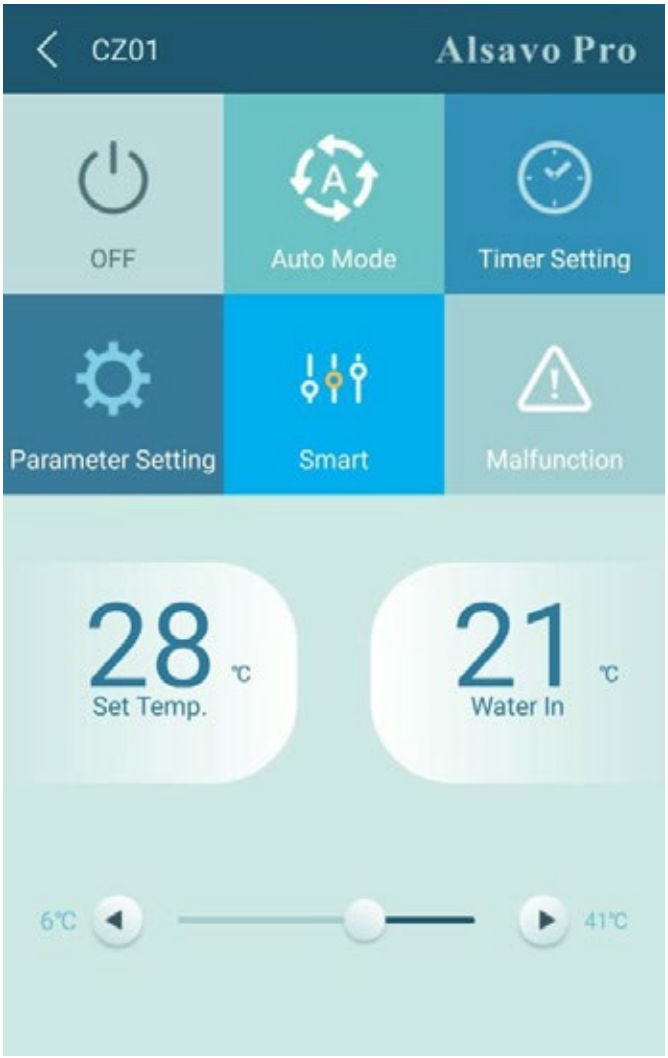






Press and hold 5 second until is flashing

10.3. The main interface



Click “  ” to turn on or off heat pump.

2) Switch mode

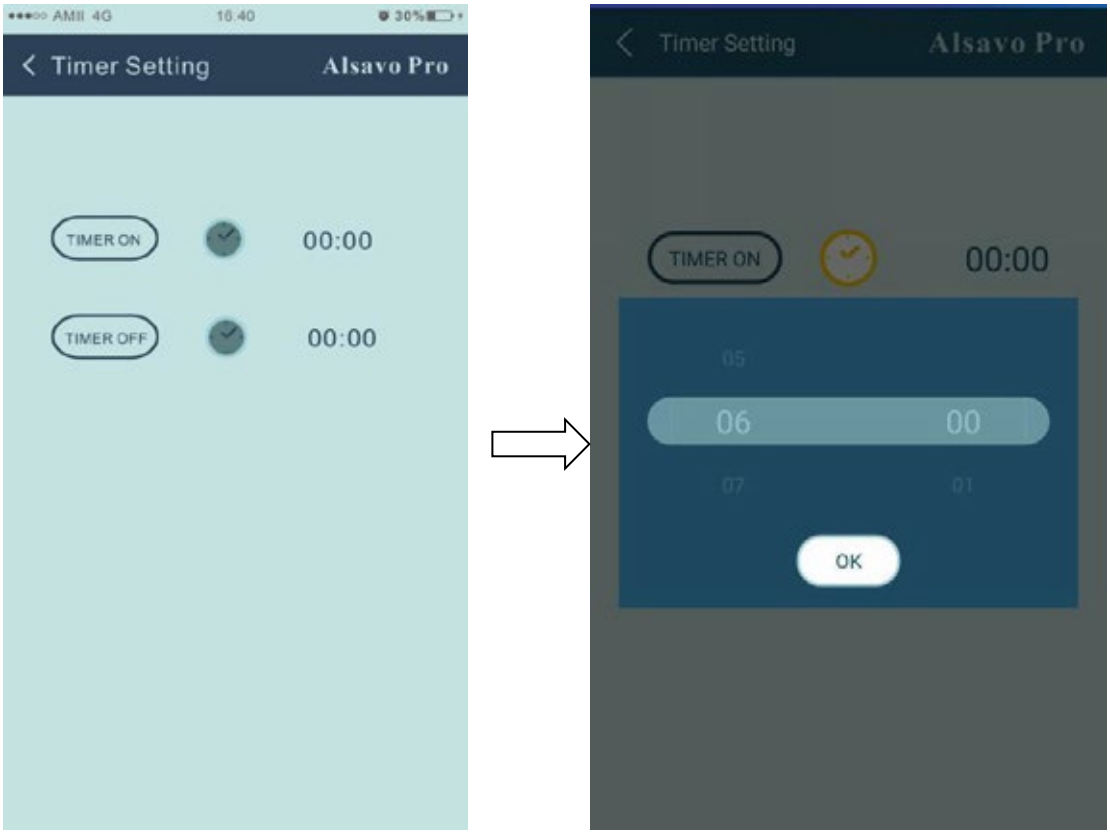
There are there modes (Auto mode, cooling or heating) for the inverter unit. Click its icons to switch

(Auto mode  , heating  , cooling )

3) Timer setting

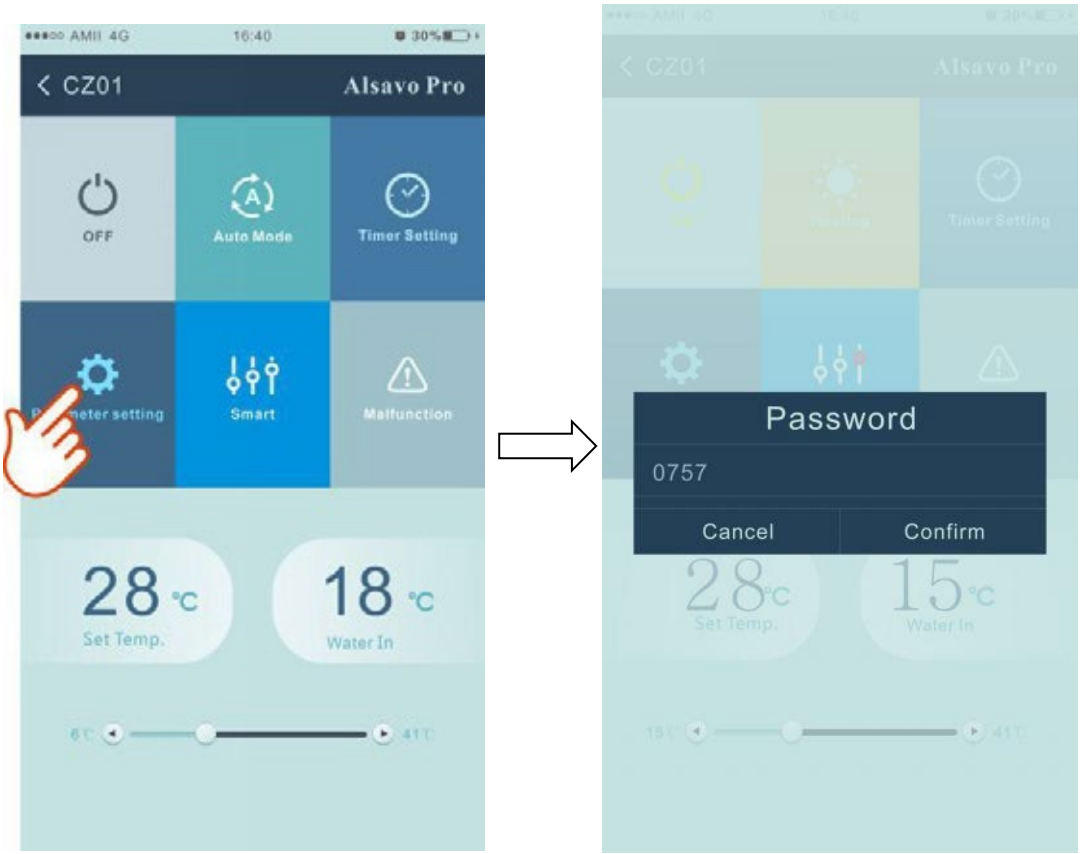
Click  , it turns  . Timer on and off will be activated together. Then choose desired time in “timer on” and “timer off”, lastly click “OK” to confirm.

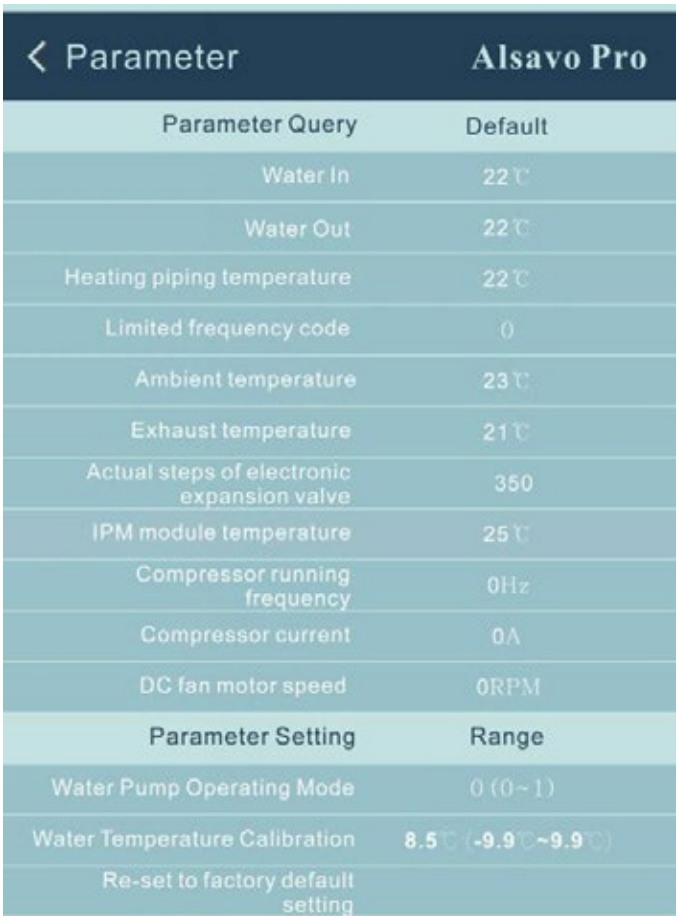
Click“  ” again to cancel.



4) Parameter checking and setting

Click Parameter  , then enter the password “0757”.





5)Parameter setting:

1. There are 2 modes optional for water pump operation (1: Always running, 0: Depends on the running of compressor)
2. Inlet water temperature calibration. (-9.0 to 9.0℃)
3. Temperature unit: ℃ or ℉.
4. When you want to reset to factory default setting, tips as below pop up .

6)Switch running modes

In heating or cooling mode, there are 3 running modes(Silent, Smart, Powerful) for options

While in Auto mode, its default running mode is Smart.

7) Malfunction

If error occurs, the malfunction icon  turns red  . Click it to check the error.

< Malfunction **Alsavo Pro**

Error code	Malfunction
PP01	Inlet water temperature sensor failure
PP02	Outlet water temperature sensor failure
PP03	Heating coil pipe sensor failure
PP04	Gas return sensor failure
PP05	Ambient temperature sensor failure
PP06	Exhaust temperature sensor failure
PP07	Anti-freezing protection in Winter
PP08	Low ambient temperature protection
PP10	Coil pipe temperature too high protection under Cooling mode
PP11	T2 too low water temperature protection under cooling mode
EE01	High pressure failure
EE02	Low pressure failure
EE03	Water flow failure
EE04	Water temperature overheating protection under heating mode
EE05	Exhaust temperature too high failure
EE06	Controller malfunction or communication failure
EE07	Compressor current protection
EE08	Communication failure between controller and PCB
EE09	Communication failure between PCB and driver board
EE10	VDC Voltage too high protection
EE11	IPM Module protection
EE12	VDC Voltage too low protection
EE13	Input current too strong protection
EE14	IPM module thermal circuit is abnormal
EE15	IPM module temperature too high protection
EE16	PFC module protection
EE17	DC fan failure
EE18	PFC module thermal circuit is abnormal
EE19	PFC module high temperature protection
EE20	Input power failure
EE21	Software control failure
EE22	Current detection circuit failure
EE23	Compressor start failure
EE24	Ambient temperature device failure on Driving board
EE25	Compressor phase failure
EE26	4-way valve reversal failure
EE27	EEPROM data reading failure in Transfer board
EE28	The inter-chip communication failure on the main control board

8) Temperature setting

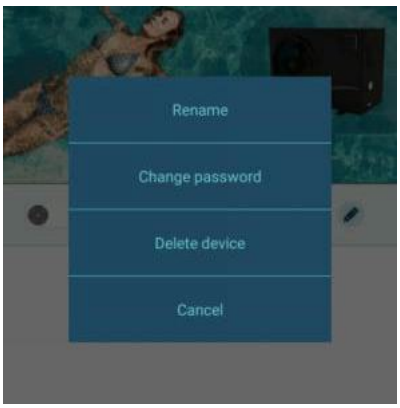
You can set the target water temperature by adjusting the slider or press “ ” or “ ”. The setting water temperature on the controller display correspondingly changes after letting go. When the setting water temperature on the display changes, it will be synchronously updated to the APP.

9)Check device information

In the main interface, click the upper right “Alsavo Pro”. The Device information will show up.

10) Revise the heat pump info in the homepage

Click “ ” , you could rename, change its password and delete the device.

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