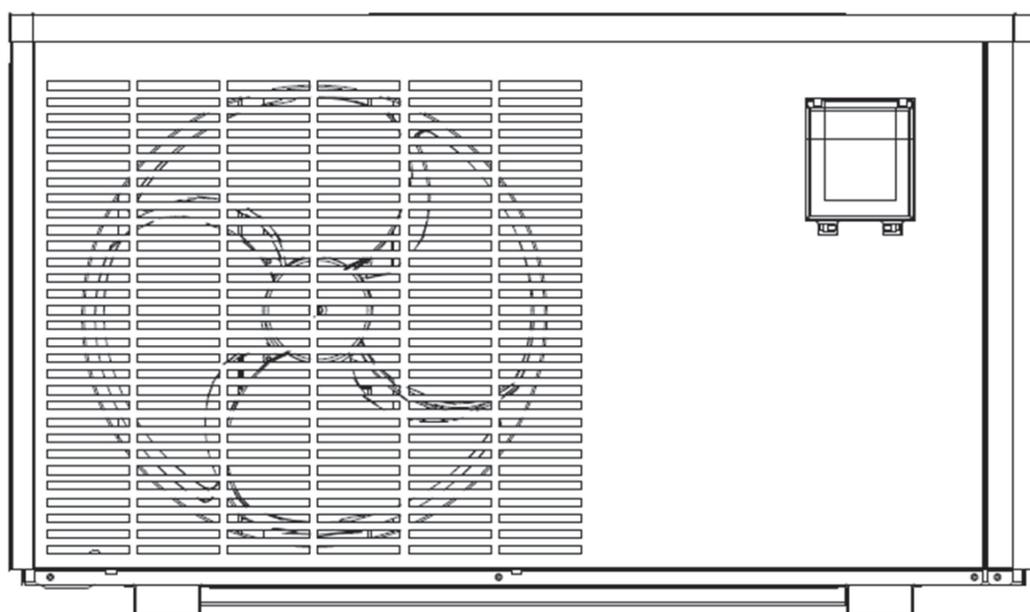


Swimming Pool Heat Pump **Inverboost C**



INSTALLATION
AND USER GUIDE



VERZE 17. 01. 2020 / 17. 01. 2020

EN

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 greenhouse gases in quantities of 5 tons of CO₂ 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 CO₂ equivalent or more, but of less than 50 tons of CO₂ equivalent: at least every 12 months.

Picture of the equivalence CO₂

1. . Load in kg and Tons amounting CO₂.

Load and Tons amounting CO ₂	Frequency of test
From 7 at 75 kg load = from 5 at 50 Tons	Each year

Do no release R32 coolant liquid into the atmosphere. This is a fluoride greenhouse effect gas covered by the Kyoto agreement with a global warming potential (GWP) = 675 - (see the European Community regulations on fluoride greenhouse effect gases Regulation (EU) No 517/2014).

Concerning the Gas R32, 7.40kg amounting at 5 tons of CO₂, 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.

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Thank you for using BRILIX 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 10 to 43°C.



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

- The installer must read the manual and follow the instructions of 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 will invalidate the guarantee.
- The manufacturer declines any responsibility for the damage caused by any third party, object ingress and of the errors due to the installation that do not follow the manual guidelines. Any use that is not as intended by the manufacturer will invalidate the guarantee.

Important notice:

- 1 Please always keep the heat pump in a well ventilated place and away from anything which could cause fire.
- 2 Do not braze or weld the pipe if there is refrigerant inside machine. Please do not charge the gas when in a confined space.
- 3 Please always empty the water in heat pump during winter time or when the ambient temperature drops below 0 °C, or else the Titanium exchanger will be damaged because of being frozen, in such case, your warranty will be lost.
- 4 Please always cut the power supply if you want to open the cabinet to reach inside the heat pump.
- 5 Please keep the display controller in a dry area to protect the display controller from being damaged by humidity.
- 6 Action of filling gas must be conducted by professional with R32 operating license.

1.

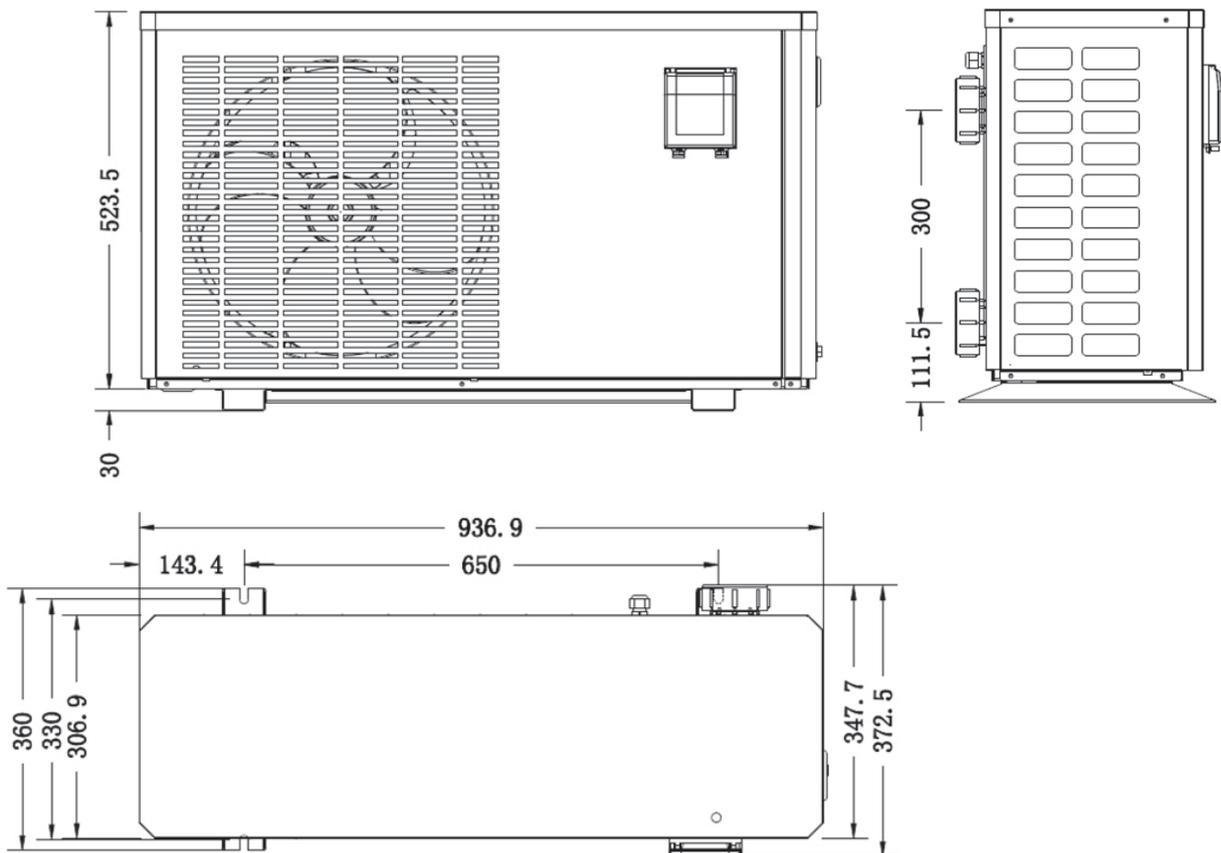
Dimension

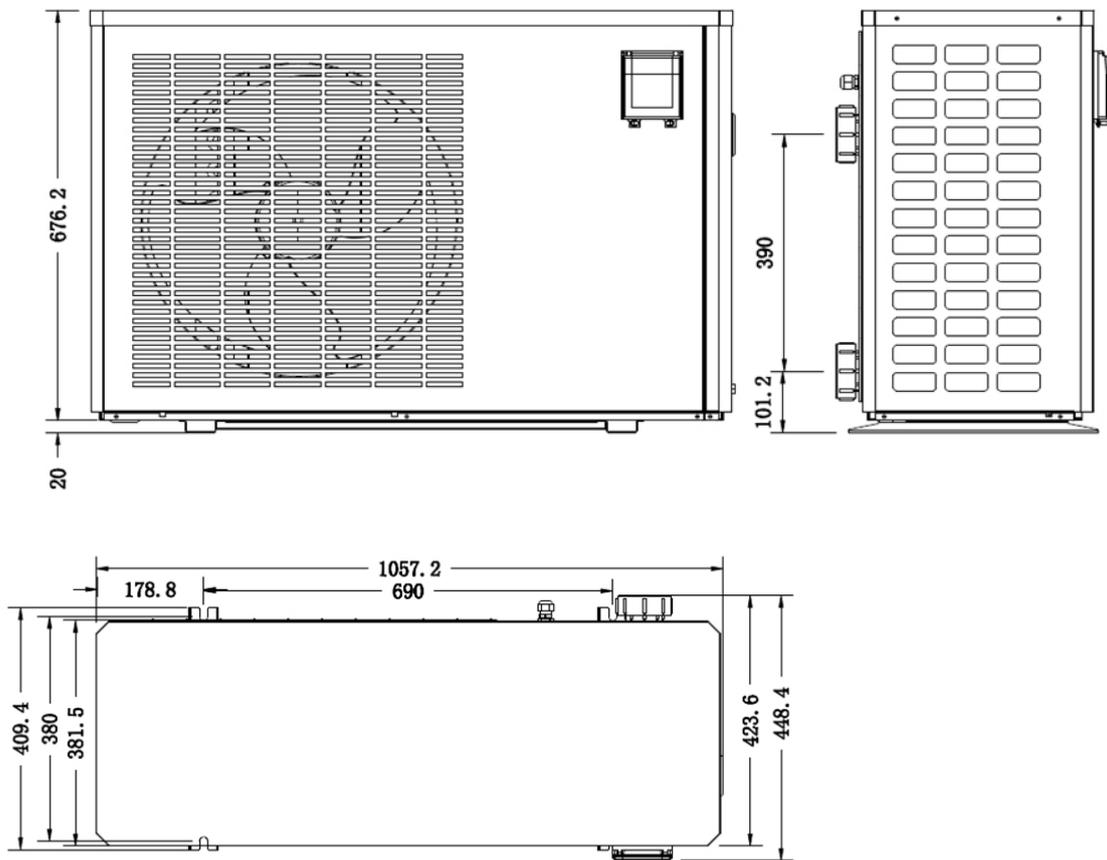
1.1. Included with your Heat Pump

- Water connection assembly 50 mm (pcs: 2)
- User and service manual
- Drain connection (qty: 2)
- Drain hose (qty: 2)
- 10 meters' signal wire
- Waterproof box
- Anti-vibration base (pcs: 4)

1.2. Dimension (unit: mm)

XHPFDPLUS100E





XHPFDPLUS160E

2.

Transport information

2.1. Delivery of the unit

For the transportation, the heat pumps are fixed on the pallet and covered with a cardboard box. To protect from any damage, the heat pump must be transferred in its package.

It is the responsibility of the addressee to notify of any damage incurred during delivery within 48 hours. No responsibility can be taken once the unit has been signed for.

2.2. Stock advice

- The warehouse should be bright, spacious, open, well ventilated, have Fan equipment and no fire source.
- Heat pumps must be stored and transferred in vertical position in its original packaging. If it is not the case, it cannot be operated until a minimum period of 24H has passed before the unit can have the electrical power turned on.

FORBIDDEN

2.3. Transfer to the final position

- 1) During the unpacking of the product and the transfer from the pallet to the final place of installation, it is necessary to maintain the heat pump in a vertical position.
- 2) Smoking and the use of flames are prohibited near R32 machine.
- 3) Water connection are not to be used as load bearing handles. **The manufacturer would not take the responsibility in case of damage to the water pipes.**

Specifications

3.

3.1. Technical data Inverboost heat pumps

CE Standard, R32, Steel Cabinet

Model		XHPFDPLUS100E	XHPFDPLUS160E
* Performance at Air 28°C, Water 28°C, Humidity 80%			
Heating capacity	kW	9-2.3	16-3.8
Power consumption	kW	1.55-0.18	2.67-0.29
C.O.P.		13-5.8	13-6
* Performance at Air 15°C, Water 26°C, Humidity 70%			
Heating capacity	kW	6.6-1.9	11.2-3
Power consumption	kW	1.43-0.27	2.43-0.42
C.O.P.		7.1-4.6	7.2-4.6
* General data			
Compressor type		MITSUBISHI	MITSUBISHI
Voltage	V	220~240V / 50Hz or 60Hz /1PH	
Rated current	A	6,9	11,8
Minimum fuse	A	10	18
Advised pool volume (with pool cover)	m ³	12-33	25-85
Advised water flux	m ³ /h	2,8	4,6
Water pressure drop	Kpa	12	15
Heat exchanger		Twist-titanium tube in PVC	
Water connection	mm	50	
Ventilation type		Horizontal	
Fan speed	ot/min.	500-850	550-850
Noise level(1m)	dB(A)	40-52	41-54
Refrigerant (R32)	g	650	1100
CO ₂ equivalent	Tonne	0,44	0,74
* Dimension/ Weight			
Net weight	kg	56	78
Gross weight	kg	68	83
Net dimension	mm	937*360*554	1057*410*696
Packing dimension	mm	995*405*580	1115*475*720

4.

Accessories and options

4.1. Accessories list



Anti-vibration base,
4 pcs



Draining plug,
2 pcs



Drain hose, 2 pcs



Waterproof box,
1 pc



10M Signal wire,
1 pc



Water connection assembly,
2 sets

4.2. The Kit By-Pass

The By-Pass Kit is the essential accessory for the installation of your heat pump, it is also a tool for the optimization of the heating of the water. The valves allows the optimum flow of water using a manometer to make sure the optimized running of the compressor, see paragraph 5.6 controls of the pressure.

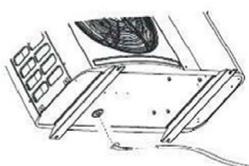


4.3. Accessories Installation



Anti-vibration bases

1. Take out 4 Anti-vibration bases
2. Install them on the bottom of machine.



Draining plug

1. Install the draining plug under the bottom panel
2. Attach the drain hose to the drain connection through which the condensate accumulated in the heat pump base will drain.

Note: Lift the heat pump to install the. Never overturn the heat pump, it could damage the compressor.



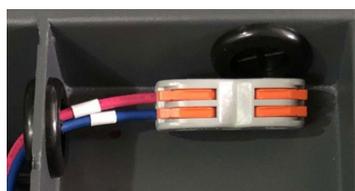
Water Inlet & outlet connection

1. Install the two joints like the picture shows
2. Screw them onto the water Inlet & outlet connection



Mains Cable wiring

1. Open the top cover of the heat pump.
2. Connect the cables in the correct terminal according to electric diagram.



Filtration pump wiring

(Dry contact)

1. Open the top cover of the heat pump.
2. Connect the cables in the correct terminal according to electric diagram.

5.

Location and connection

ATTENTION:

Please observe the following rules when installing the heat pump:

1. Any addition of chemicals must take place in the piping located downstream from the heat pump.
2. Always keep the heat pump upright. If the unit has been held at an angle, wait at least 24 hours before applying mains power to the heat pump.

5.1. 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. Pool water flow

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.

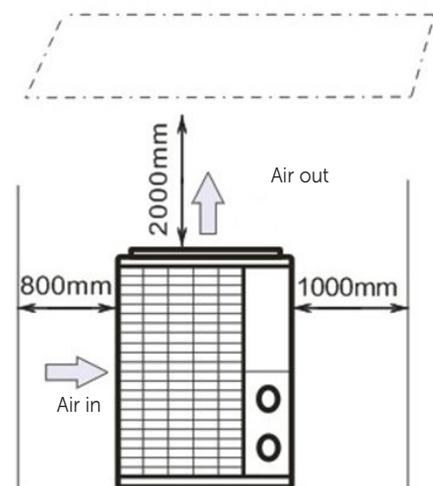
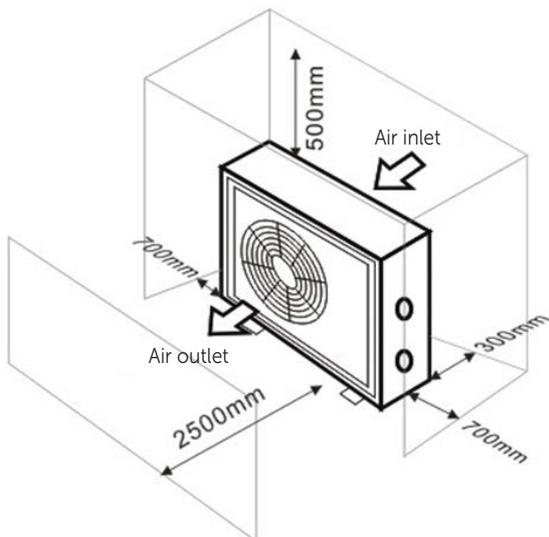
The maximum height at which the heat pump can be installed is 1 metre.

To guarantee the required efficiency, the maximum distance of the pump from the pool circulation pump is 7.5 metres.

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.

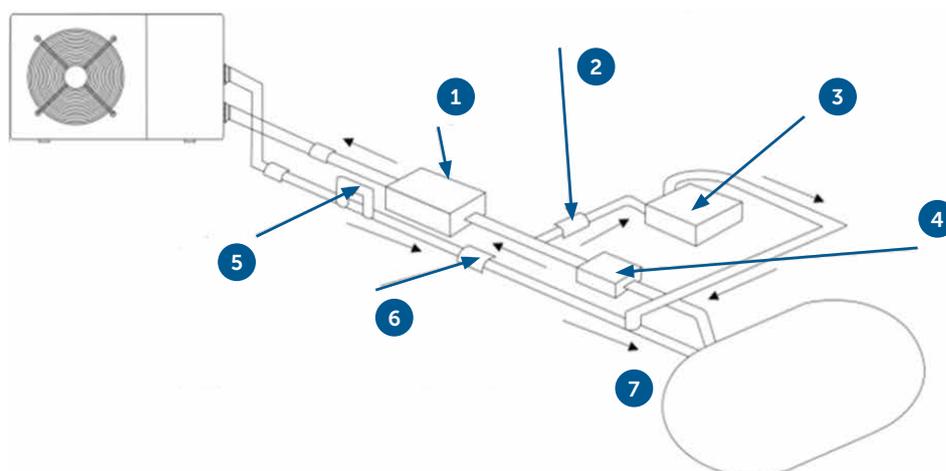
See the drawing below for minimum dimensions



5.2. Check-valve installation

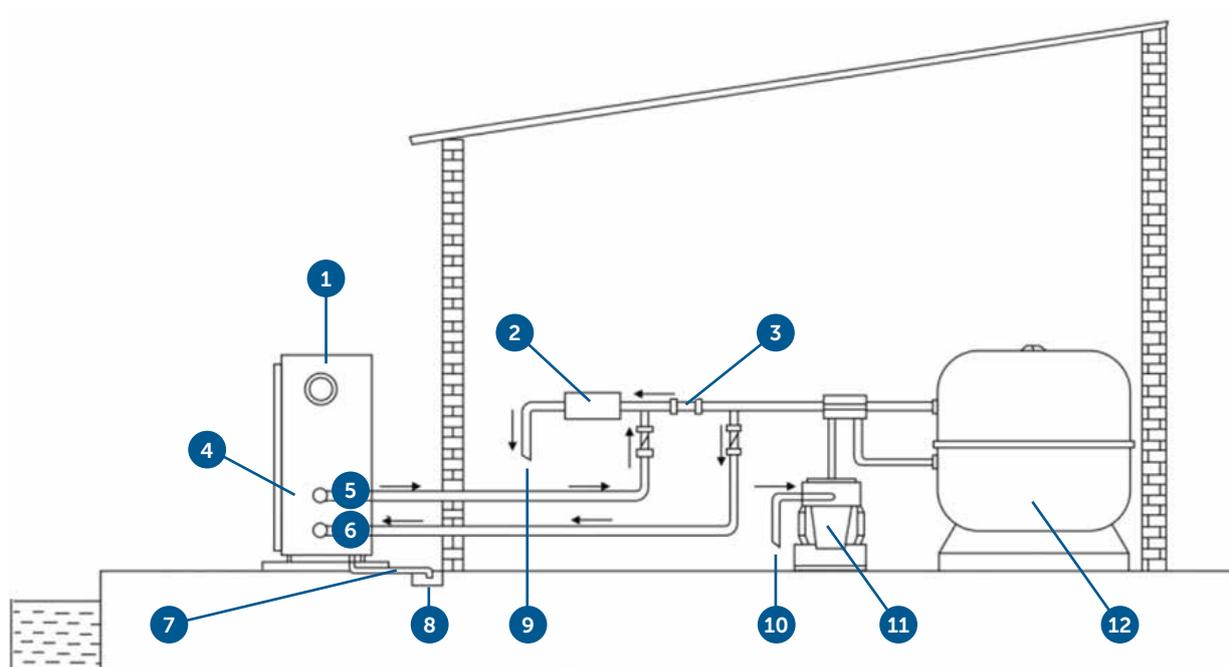
NOTE

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.



Item	Product description
1	Filter
2	Check-valve
3	Chlorinator
4	Water Pump
5	P-trap
6	Check-valve
7	In-linw Chlorinator or Brominator

5.3. Typical arrangement



Item	Product description
1	Heat pump
2	Water processor
3	Side connection valve
4	Power cable inlet
5	Outlet
6	Inlet
7	Condensed water draining pipe
8	Draining nozzle
9	Discharge water pool
10	Pool water inlet
11	Water pump
12	Filter

Note: This arrangement is only an illustrative example

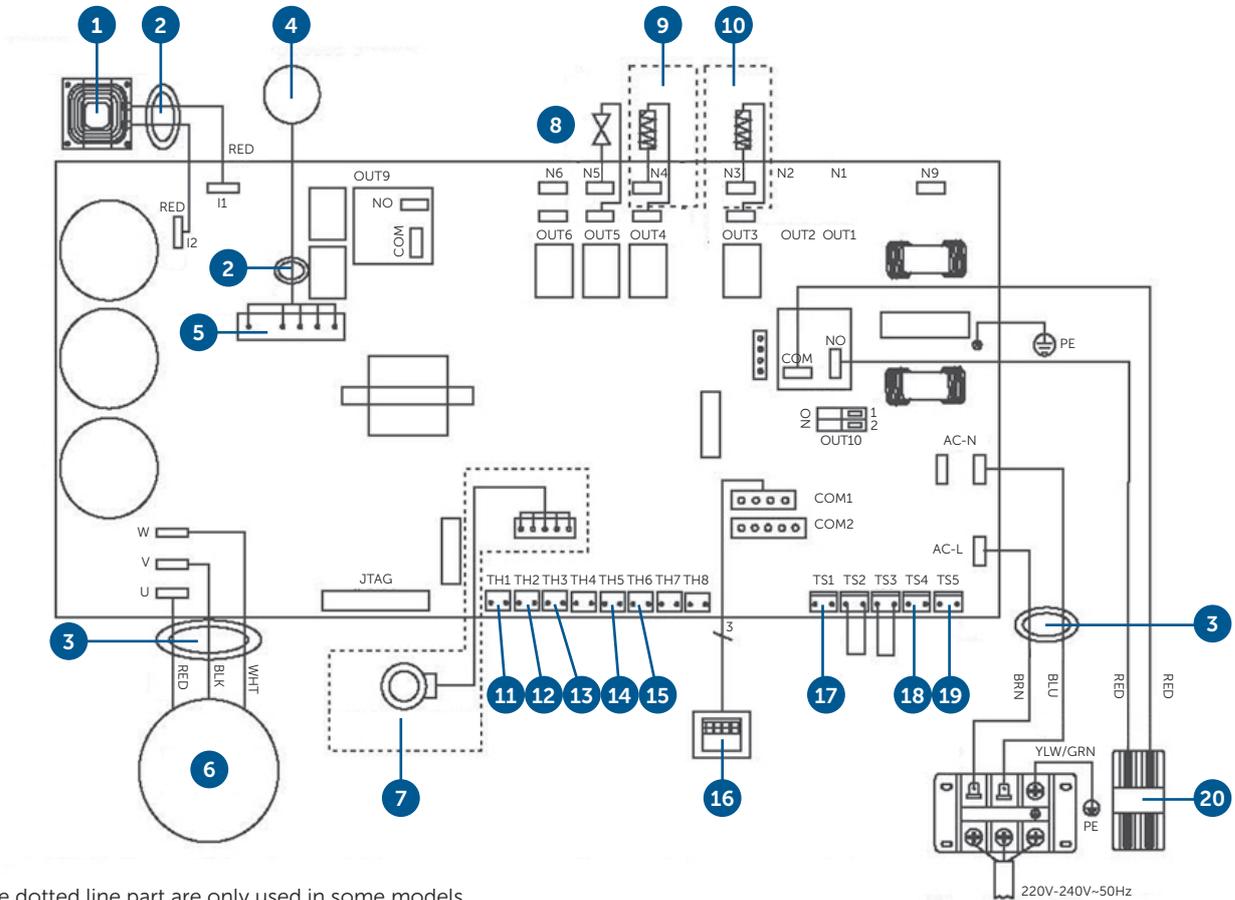
NOTE

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

ATTENTION:

In order to heat the water in the pool (or hot tub), the filtration 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.

Model: XHPFDPLUS100E/XHPFDPLUS160E



*The dotted line part are only used in some models

Item	Description
1	Reactor
2	Magnet ring WHT
3	Magnet ring BLK
4	FAN
5	FAN 2
6	Compressor
7	Electronic Expansion Valve
8	4-Way valve coil
9	Base Electric heater
10	Crankshaft electric heating

Item	Description
11	Ambient temperature
12	Coil temperature
13	Exhaust temperature
14	Water out temperature
15	Water in temperature
16	Wire controller
17	Water flow switch
18	High pressure switch
19	Low pressure switch
20	Switch (pump)

NOTE:

- (1) Above electrical wiring diagram only for your reference, please subject machine posted the wiring diagram.
- (2) The swimming pool heat pump must be connected ground wire well, although the unit heat exchanger is electrically isolated from the rest of the unit. Grounding the unit is still required to protect you against short circuits inside the unit. Bonding is also required.

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.

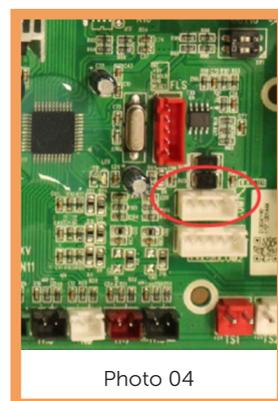
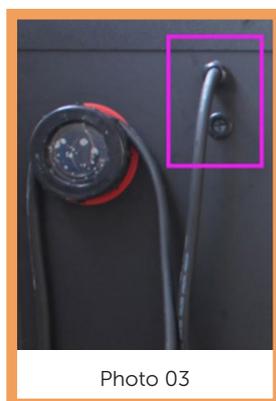
6.1. Electrical protection

The power supply for the heat pump must come, preferably, from an exclusive circuit with regulatory protection components (30mA differential protection) and a magneto-thermal switch.

- The electrical installation must be carried out by a specialized professional (electrician) in accordance with the standards and regulations in force in the country of installation.
- The heat pump circuit must be connected to a safety earth circuit at the terminal block.
- The cables must be properly installed to prevent interference.
- The pump is intended for connection to a general power supply with earth connection.
- Section of the cable; This section is indicative and should be checked and adapted according to the needs and conditions of use.
- The tolerance of acceptable voltage variation is +/- 10% during operation.

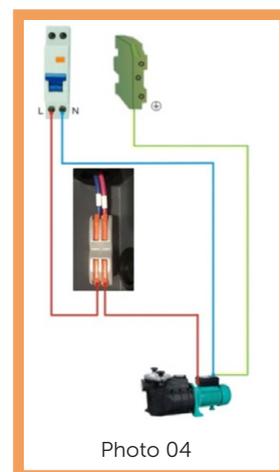
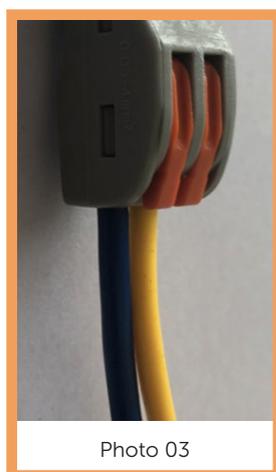
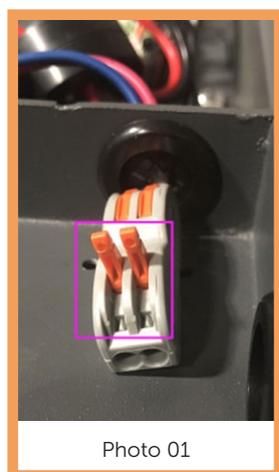
The connections must be dimensioned according to the power of the device and the state of installation.

6.2. Installation of the display deportee



- The end with plug connects with the control panel (photo1)
- The other end of the signal wire. (photo2)
- Open the top cover of the heat pump, connect the end of signal wire through the cable ring. (photo3)
- Insert the wiring into the designated position (code:COM 1 or COM-L) on the PC board. (photo4)

6.3. Connection to pilot the water pump



- 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)

7.1. 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 filtration 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 expires (see below).
3. After a few minutes, check whether the air blowing out of the unit is cooler.
4. When turn off the filtration pump, the unit should also turn off automatically, if not, then adjust the flow switch.
5. Allow the heat pump and the filter pump to run 24 hours a day until the desired water temperature is reached. The heat pump will stop running at this point +1°C. After this, it will restart automatically (as long as the filtration pump is running) whenever the swimming pool water temperature drops 1 degree below the set temperature (for example, if you set the temperature 28°C, the heat pump will stop when the temperature at 29°C. While it will restart when the temperature of the water down to 27°C)

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.

NOTE

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 filtration pump runs and shut it off when the pump shuts off. If the pool water level higher than 1 m above or below the heat pump's automatic adjustment knob, your dealer may need to adjust its initial startup.

1 m above or below the heat pump's automatic adjustment knob, your dealer may need to adjust its initial startup.

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.

7.2. Condensation

The air drawn into the heat pump is strongly cooled by the operation of the heat pump for heating 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. The condensate will drain from the bottom of the heat pump. This is sometimes mistakenly regarded as a heat exchanger leak.

7.3. Pressure gauge display (R32)

Examine the pressure gauge which indicates the refrigerant gas pressure of the unit, the below table shows the normal value of the gas pressure (R32) when the machine is in power off or running conditions.

Unit Condition	Power Off			
Ambient (°C)	-5~5	5~15	15~25	25~35
Water temp (°C)	/	/	/	/
Pressure gauge (Mpa)	0,59~0,85	0,85~1,18	1,18~1,59	1,59~2,1

Unit Condition	Running				
Ambient (°C)	/	/	/	/	/
Water temp (°C)	10~15	15~20	20~25	25~30	30~35
Pressure gauge (Mpa)	1,1~1,6	1,3~1,8	1,5~2,1	1,7~2,4	1,9~2,7

7.4. Display Controller Operation



NOTE: When the heat pump connects to the power, the LED display shows a code for 3 seconds which indicates the heat pump model.

7.4.1. button

Press  to start the heat pump unit, the LED display shows the desired water temperature for 5 seconds, then shows the inlet water temperature and the operation mode.

Press  to stop the heat pump unit and show "OFF".

Notice: During the parameter checking and setting, press the  to quick-exit and save the current setting .

Press  again to turn on/off the machine.

7.4.2. button

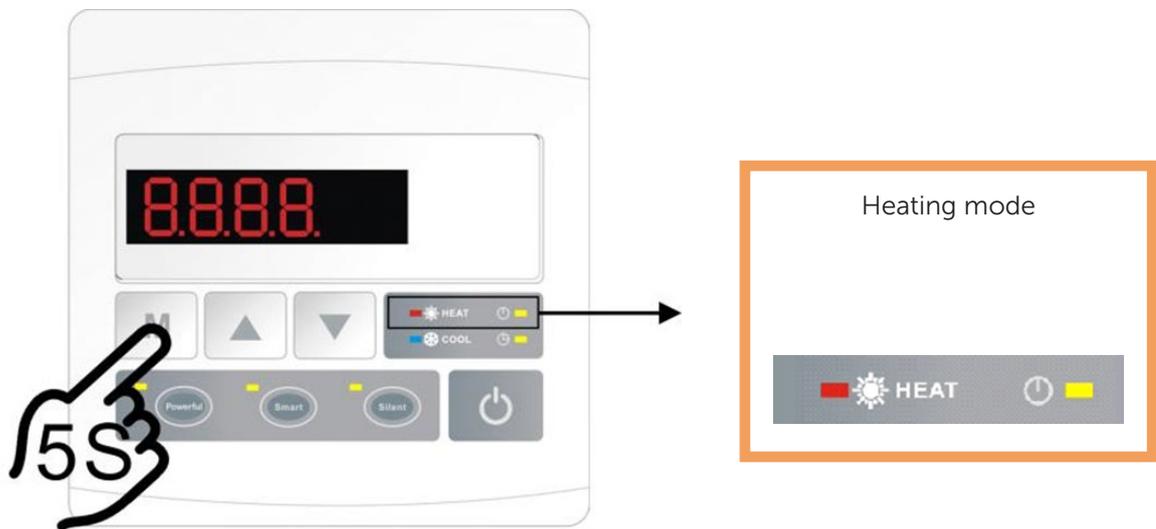
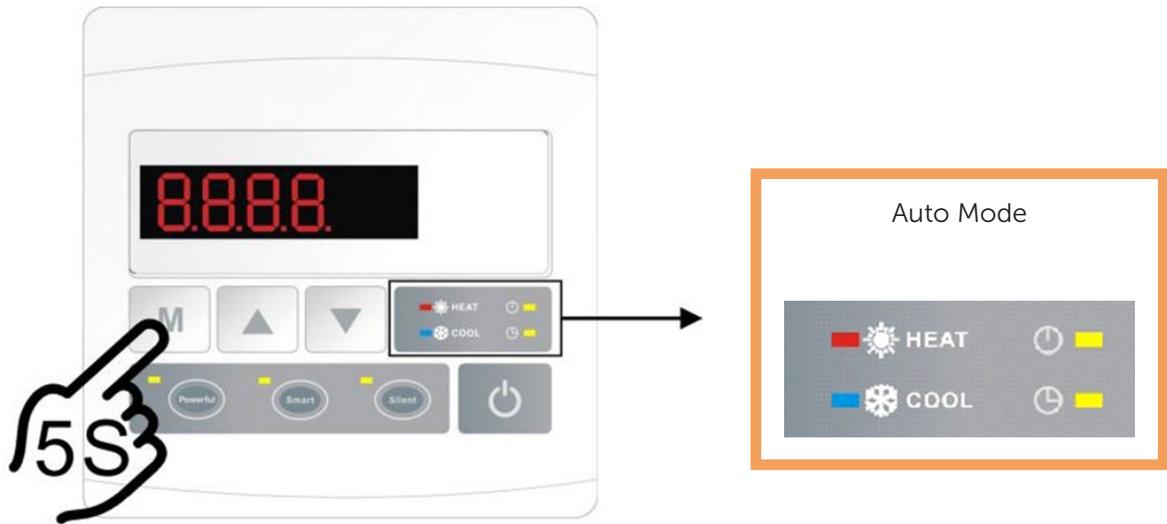
Automatic mode:

There are 3 modes for the unit, Heating only, Auto mode (heating and cooling switch), Cooling only.

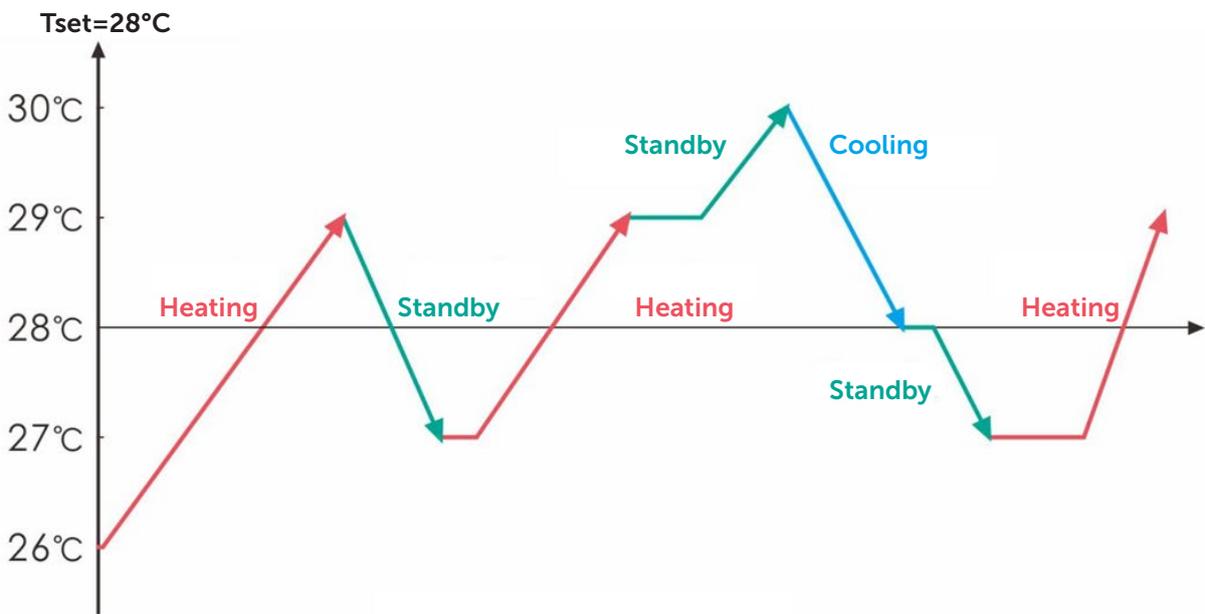
You can switch Heating only and Auto mode by pressing  for 5 seconds, no matter the unit is on or off. (default: Smart mode).

Press  for 5 seconds again to exit automatic mode and switch to heating mode (default: Smart mode)

Note: Under Automatic mode, it is useless to set parameter P1 .



Operation logic of Auto Mode:



Logic of auto mode

7.4.3. Button



and

Lock / Unlock the display:

Hold and for 5 seconds to lock/unlock the display.

Water temperature setting:

Press or to set the water temperature directly.

Parameter checking:

Press first, then press to check the " User parameter from d0 to d11

Code	Condition	Scope	Remark
d0	IPM mould temperature	0-120°C	Real testing value
d1	Inlet water temp.	-9°C~99°C	Real testing value
d2	Outlet water temp.	-9°C~99°C	Real testing value
d3	Ambient temp.	-30°C~70°C	Real testing value
d4	Frequency limitation code	0,1,2,4,8,16	Real testing value
d5	Piping temp.	-30°C~70°C	Real testing value
d6	Gas discharge temperature	0°C~C5°C (125°C)	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,

1: Coil pipe temperature limit,

4 Drive Current frequency limit

16: Drive high temperature frequency limit.

0: No frequency limit,

2: Overheating or overcooling frequency limit

8: Drive voltage frequency limit

Press first, then press to check/adjust the User parameter from P0 to P7

If needed, press second, then press or to adjust the current parameter.

(for example: Press first, then press to enter parameter P7 checking, and press second, then press or to adjust the parameter P7 Inlet water temp. Correction from -9 to 9.)

Code	Name	Scope	Default	Remark
P0	Mandatory defrosting	0-1	0	0: Default normal operation 1: mandatory defrosting.
P1	Working mode	0-1	1	1:Heating mode, 0:cooling mode,
P2	Timer on/off	0-1	0	1 Timer on/off is under function. 0 Timer on/off is out of function (The setting of P5 and P6 won't work)
P3	Water pump	0-1	0	1: Always running; 0: Depends on the running of compressor
P4	Current time	HH:MM	00:00	0-23:0-59
P5	Timer on	HH:MM	00:00	0-23:0-59
P6	Timer off	HH:MM	00:00	0-23:0-59
P7	Water temp. calibration	-9~9	0	Výchozí nastavení: 0

NOTE: Under defrosting mode, P0=1. After defrosting finished, it will be automatic enter Normal mode, P0=0.

7.4.4. System reset function

Press  and  in 10s, the system will reset and display "0000" on the controller.

7.4.5.



Symbol of heating, the light will be on when it is in operation.
When defrosting, the light will flash.

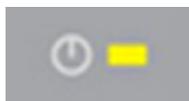
7.4.6.



Symbol of cooling, the light will be on when it is in operation.

Note: When parameter P1 is on checking/adjusting,  and  will be flashing at the same time.

7.4.7.



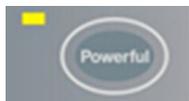
Symbol of automatic stop, the light will be on when it is in operation.

7.4.8.



Symbol of automatic start, the light will be on when it is in operation.

7.4.9.



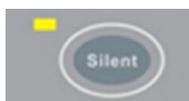
Press this button, the light will be flash, the heat pump will operate in 'Full output' only.

7.4.10.



While you choose the Smart, the heat pump will just operate in 'Medium output' and 'Full output'
When in 'Medium output', the light of Smart will flash.
When in 'Full output', the lamp of Smart is lit, the lamp of Powerful will be flash.

7.4.11.



While you choose the Silent, the heat pump will just operate in 'Medium output' and 'Small output'
When in 'Small output', the lamp of Silent will flash.
When in 'Medium output', the lamp of Silent is lit, the lamp of Smart will flash.

7.5. Filtration pump logic

Option 1; P3=0 Filtration pump is related to heat pump operation to start and stop.

Filtration pump starts 60s before compressor, filtration pump start 30s and then the water flow switch detect flow. Before the heat pump enters into Standby mode, the compressor stops first and after 5 minutes filtration pump stops.

Mode	Condition	Example	Water pump working logic	
Heating mode	P3=0, T1≥Tset-0,5°C, last for 30 minutes	P3=0, T1≥27,5°C, čeká 30 minut	1. Then it enters into standby mode for 1 hour (It will not restart except turn it on manually.)	2. After 1 hour, the filtration pump will restart for 5 minutes. If the T1≤27°C, the heat pump will start to work until T1≥27.5°C and last for 30 minutes to go into standby
Cooling mode	P3=0, T1≤Tset+0,5°C, čeká 30 minut	P3=0, T1≤28,5°C, last for 30 minutes	1. Then it enters into standby mode for 1 hour (It will not restart except turn it on manually.)	2. After 1 hour, the filtration pump will restart for 5 minutes. If it tests T1≥29°C, the heat pump will start to work until T1≤28.5°C and last for 30 minutes to go into standby

Option 2; P3=1 Filtration pump is always on, P2=0 the timer function is no active

Under condition P3=1, when T1≥Tset+1°C (T1≥29°C) last for 3 minutes, heat pump will be in standby, while filtration pump is always on.

Under option 2, with activation of the timer; P2=1 to start and stop the filtration pump according the programming of the P4 (time), P5 (Timer ON) and P6 (Timer OFF)

Condition for the heat pump start, timer ON actives;

When the timer reaches the set time of TIMER ON, the filtration pump will start and after 5 minutes the heat pump start. The heat pump stays in stop if the water in temperature is ≥ Tset+1°C, before the TIMER OFF, the filtration still activated.

Condition to stop the heat pump, timer OFF actives;

Before the TIMER OFF, the heat pump stops and the filtration is still activated. When timer reaches the set time of the TIMER OFF, the heat pump will stop and after 5 minutes the filtration pump stops.

NOTE:

Tset = Tsetting water temperature, for example: Tset = 28°C Tsetting water temperature in your pool heat pump

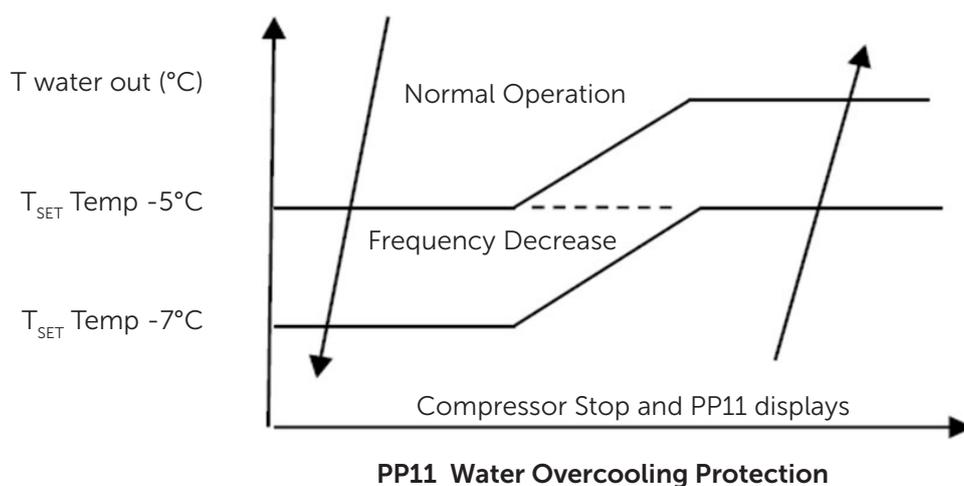
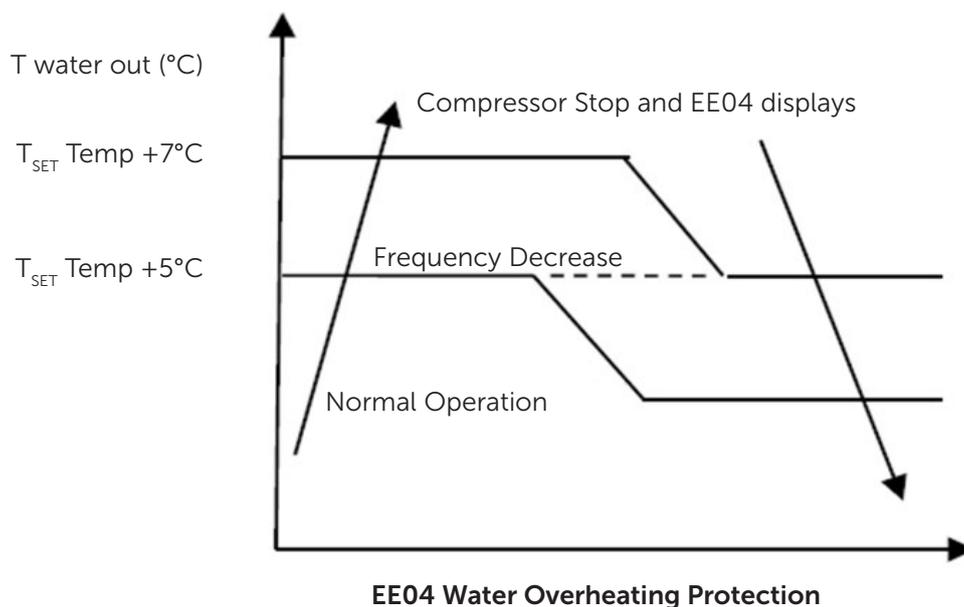
Tset-0.5 = less 0.5°C than Tsetting temperature, Tset- 0.5 = 28-0.5=27.5°C

Tset+0.5= more 0.5°C than Tsetting temperature, Tset+ 0.5 = 28+0.5=28.5°C

7.6. Protection of the unit

Remarks:

1. In heating mode, if the water out temperature is higher than the set temperature over 7°C, 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°C, LED controller displays PP11 for water over-cooling protection.



For example as below:

Mode	Output water temperature	Set Point temperature	Condition	Malfunction
Heating mode	36°C	29°C	$T_{out} - T_{set} \geq 7^{\circ}\text{C}$	EE04 Overheating protection for water temperature (T2)
Cooling mode	23°C	30°C	$T_{set} - T_{out} \geq 7^{\circ}\text{C}$	PP11 Too low protection for water temperature (T2)

8.1. Error code display on LED wire controller

Malfunction	Error code	Reason	Solution
Inlet water temperature sensor failure d1-TH6	PP01	<ol style="list-style-type: none"> 1. The sensor in open or short circuit 2. The wiring of sensor is loose 	<ol style="list-style-type: none"> 1. Check or change the sensor 2. Re-fix the wiring of the sensors
Outlet water temperature sensor failure d2-TH5	PP02	<ol style="list-style-type: none"> 1. The sensor in open or short circuit 2. The wiring of sensor is loose 	<ol style="list-style-type: none"> 1. Check or change the sensor 2. Re-fix the wiring of the sensors
Heating piping sensor failure d5-TH2	PP03	<ol style="list-style-type: none"> 1. The sensor in open or short circuit 2. The wiring of sensor is loose 	<ol style="list-style-type: none"> 1. Check or change the sensor 2. Re-fix the wiring of the sensors
Ambient temperature sensor failure d3-TH1	PP05	<ol style="list-style-type: none"> 1. The sensor in open or short circuit 2. The wiring of sensor is loose 	<ol style="list-style-type: none"> 1. Check or change the sensor 2. Re-fix the wiring of the sensors
Exhaust piping sensor failure d6-TH3	PP06	<ol style="list-style-type: none"> 1. The sensor in open or short circuit 2. The wiring of sensor is loose 	<ol style="list-style-type: none"> 1. Check or change the sensor 2. Re-fix the wiring of the sensors
Antifreeze protection in Winter	PP07	Ambient temperature or water inlet temperature is too low	<ol style="list-style-type: none"> 1. Check the d1 and d3. (d1 inlet water temp., d3 outlet water temp.) 2. Normal protection
Low ambient temperature protection	PP08	<ol style="list-style-type: none"> 1. Out of the normal operating ambient temperature for this machine by checking d3 2. Sensor abnormality d3-TH1 	<ol style="list-style-type: none"> 1. Stop using, beyond the scope of using 2. Change the sensor
Piping temperature too high protection under cooling mode T3-TH2	PP10	<ol style="list-style-type: none"> 1. Ambient or the water temperature is too high in cooling mode 2. Refrigeration system is abnormal 3. Pipe temperature sensor(TH2) failure 	<ol style="list-style-type: none"> 1. Check the ambient temperature 2. Check refrigeration system 3. Change the pipe temperature sensor (TH2)

Malfunction	Error code	Reason	Solution
T2-TH5 water temp. Too low protection under cooling mode	PP11	<ol style="list-style-type: none"> 1. Low water flow 2. Outlet water temperature sensor d2-TH5 abnormal 3. The difference of outlet water temperature and set temperature is 7°C or above in cooling mode 	<ol style="list-style-type: none"> 1. Check filtration pump and waterway system 2. Change outlet water temperature sensor d2-TH5 3. Change the set temperature.
High pressure failure TS4	EE01	<ol style="list-style-type: none"> 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 jamed 6. High pressure wire is loose or damaged 7. Too much refrigerant 	<ol style="list-style-type: none"> 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
Low pressure failure TS5	EE02	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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
Water flow failure TS1	EE03 Or „ON“	<ol style="list-style-type: none"> 1. The wiring of water flow switch is loose or water flow switch damaged 2. No/Insufficient water flow. 	<ol style="list-style-type: none"> 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 jamed inside
Over heating protection for water temperature (d2- TH5) in heating mode	EE04	<ol style="list-style-type: none"> 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°C or above in heating mode 	<ol style="list-style-type: none"> 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.

Malfunction	Error code	Reason	Solution
d6-TH3 Exhaust too high protection	EE05	<ol style="list-style-type: none"> 1. Lack of gas 2. Low water flow 3. Piping system has been blocked 4. Exhaust temp. sensor failure d6-TH3 5. Ambient temperature is too high 	<ol style="list-style-type: none"> 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 jamed 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
Controller failure	EE06	<ol style="list-style-type: none"> 1. Signal is not well connected or damaged 2. Controller failure 	<ol style="list-style-type: none"> 1. Stop the power supply and restart. 2. Re-connect the signal wire or replace a new one 3. Replace a new controller
Compressor current protection	EE07	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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
Communication failure between controller and main board	EE08	<ol style="list-style-type: none"> 1. Signal wire is not well connected or damaged 2. Controller failure 3. Driving failure 	<ol style="list-style-type: none"> 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.
Communication failure between Main control board and Driving board	EE09	<ol style="list-style-type: none"> 1. Poor connection of communication wire 2. PCB failure 3. The wire is damaged 	<ol style="list-style-type: none"> 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

Malfunction	Error code	Reason	Solution
VDC voltage too high protection	EE10	<ol style="list-style-type: none"> 1. Line voltage is too high 2. Driver board is damaged. 	<ol style="list-style-type: none"> 1. Check whether the power supply is normal 2. Change driver board or main board
IPM module protection	EE11	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 refrigeration system failure, send it to the service center 6. Change driver board
VDC voltage too low protection	EE12	<ol style="list-style-type: none"> 1. Mother line voltage is too low 2. Driver board is damaged. 	<ol style="list-style-type: none"> 1. Check if the power is in the normal range 2. Change driver board
Input current over high protection.	EE13	<ol style="list-style-type: none"> 1. The compressor current is too large momentary 2. The water flow is abnormal 3. Power fluctuations within a short time 4. Wrong reactor 	<ol style="list-style-type: none"> 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.
IPM module thermal circuit is abnormal	EE14	<ol style="list-style-type: none"> 1. Output abnormality of IPM module thermal circuit 2. Fan motor is abnormal or damaged 3. Fan blade is broken 	<ol style="list-style-type: none"> 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
IPM module temperature too high protection	EE15	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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

Malfunction	Error code	Reason	Solution
PFC module protection	EE16	<ol style="list-style-type: none"> 1. Output exception of PFC module 2. Fan motor is abnormal or damaged 3. Fan blade is broken 4. Input voltage leap, input power is abnormal 	<ol style="list-style-type: none"> 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. 3. Change the fan blade 4. Check the input voltage
DC fan motor failure	EE17	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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
PFC module thermal circuit is abnormal	EE18	The driver board is damaged	<ol style="list-style-type: none"> 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
PFC module high temperature protection	EE19	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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
Input power failure	EE20	The supply voltage fluctuates too much	Check whether the voltage is stable
Software control exception	EE21	<ol style="list-style-type: none"> 1. Compressor runs out of step 2. Wrong program 3. Impurity inside compressor causes the unstable rotate speed 	<ol style="list-style-type: none"> 1. Check the main board or change a new one 2. Update the correct program 3. Check the refrigeration system

Malfunction	Error code	Reason	Solution
Current detection circuit failure	EE22	<ol style="list-style-type: none"> 1. Voltage signal abnormal 2. Driver board is damaged 3. Main board failure 	<ol style="list-style-type: none"> 1. Change a new main board 2. Change a new driver board
Compressor start failure	EE23	<ol style="list-style-type: none"> 1. Main board is damaged 2. Compressor wiring error or poor contact or unconnected 3. Liquid accumulation inside 4. Wrong phase connection for compressor 	<ol style="list-style-type: none"> 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
Ambient Temperature device failure on Driver board	EE24	Ambient Temperature device failure	Change driver board or main board
Compressor phase failure	EE25	Compressors U, V, W are just connected to one phase or two phases.	Check the actual wiring according to the circuit diagram
Four-way valve reversal failure	EE26	<ol style="list-style-type: none"> 1. Four-way valve reversal failure 2. Lack of refrigerant (no detect when TH2 or TH1 malfunction) 	<ol style="list-style-type: none"> 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
EEPROM data read malfunction	EE27	<ol style="list-style-type: none"> 1. Wrong EEPROM data in the program or failed input of EEPROM data 2. Main board failure 	<ol style="list-style-type: none"> 1. Re-enter correct EEPROM data 2. Change a new main board
The inter-chip communication failure on the main control board	EE28	Main board failure	<ol style="list-style-type: none"> 1. Stop electricity supply and restart it 2. Change a new main board

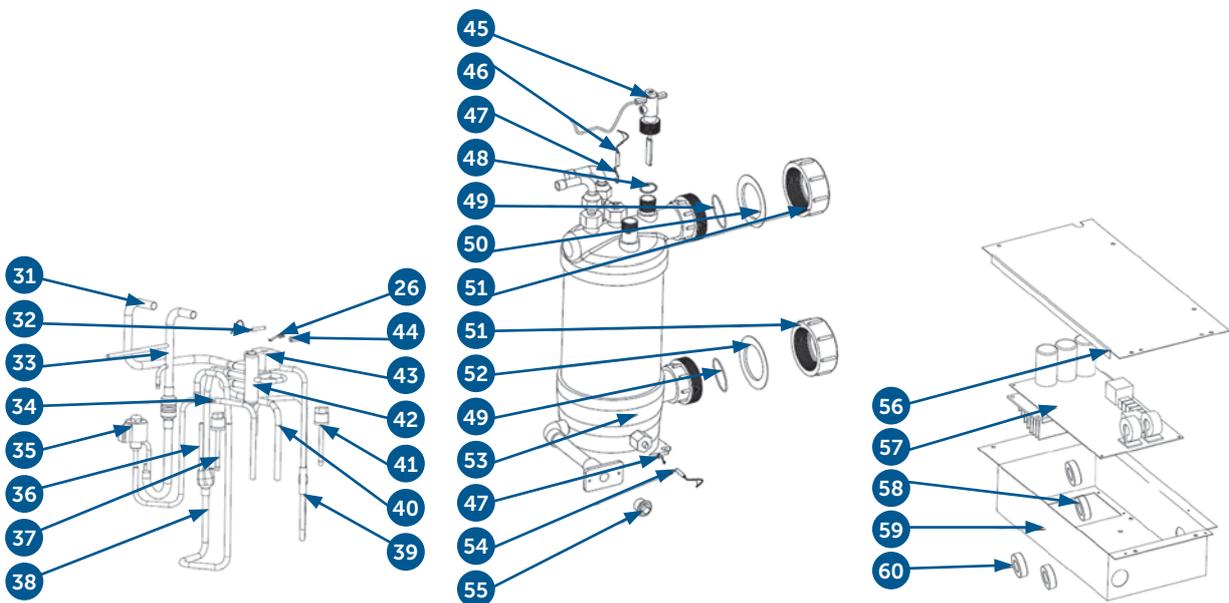
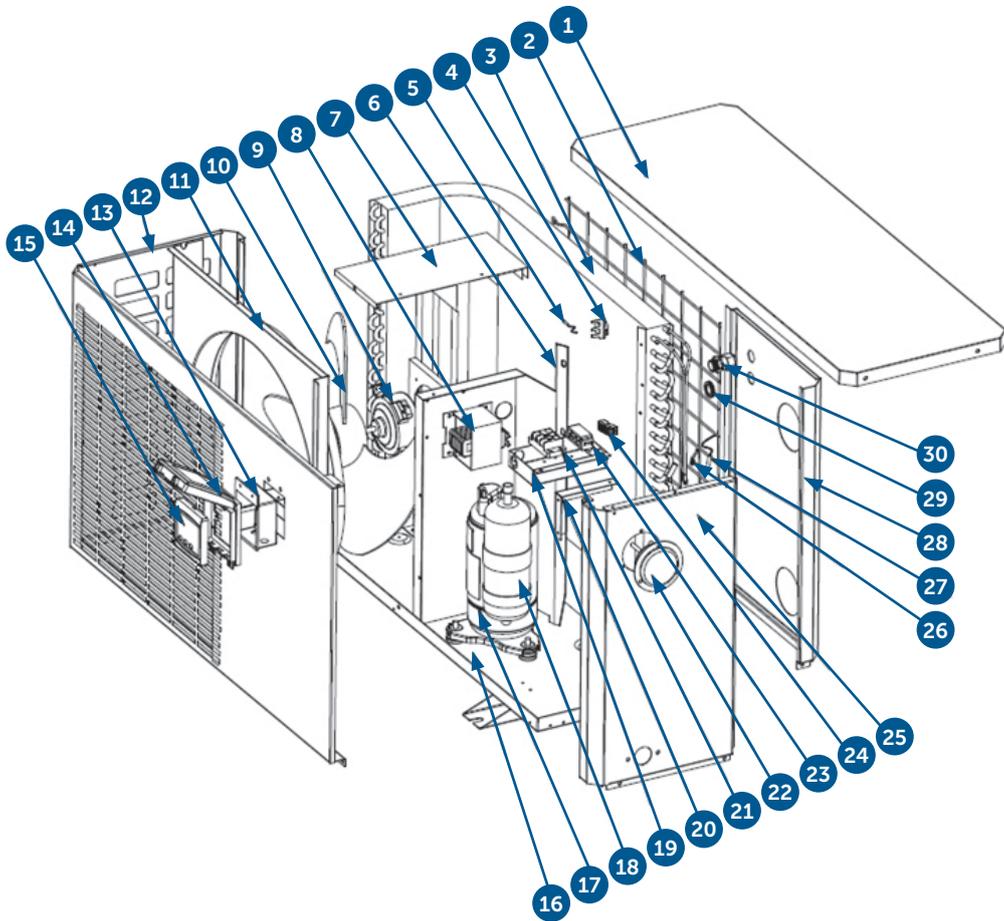
8.2. Other Malfunctions and Solutions (No display on LED wire controller)

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.	<ol style="list-style-type: none"> 1. Water temperature is reaching to setting value, HP under constant temperature status. 2. Heat pump just starts to run. 3. Under defrosting. 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Choose the wrong mode. 2. Figures show defects. 3. Controller defect. 	<ol style="list-style-type: none"> 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.	<ol style="list-style-type: none"> 1. Fan NO running. 2. Air Fan is not enough. 3. Refrigerant is not enough. 	<ol style="list-style-type: none"> 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 Fan. 3 Replace or repair the heat pump unit.
Water stains	Water stains on heat pump unit.	<ol style="list-style-type: none"> 1. Concreting. 2. Water leakage. 	<ol style="list-style-type: none"> 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.		<ol style="list-style-type: none"> 1. Check the location of heat pump unit, and eliminate all obstacles to make good air Fan. 2. Replace or repair the heat pump unit.

9.

Exploded view

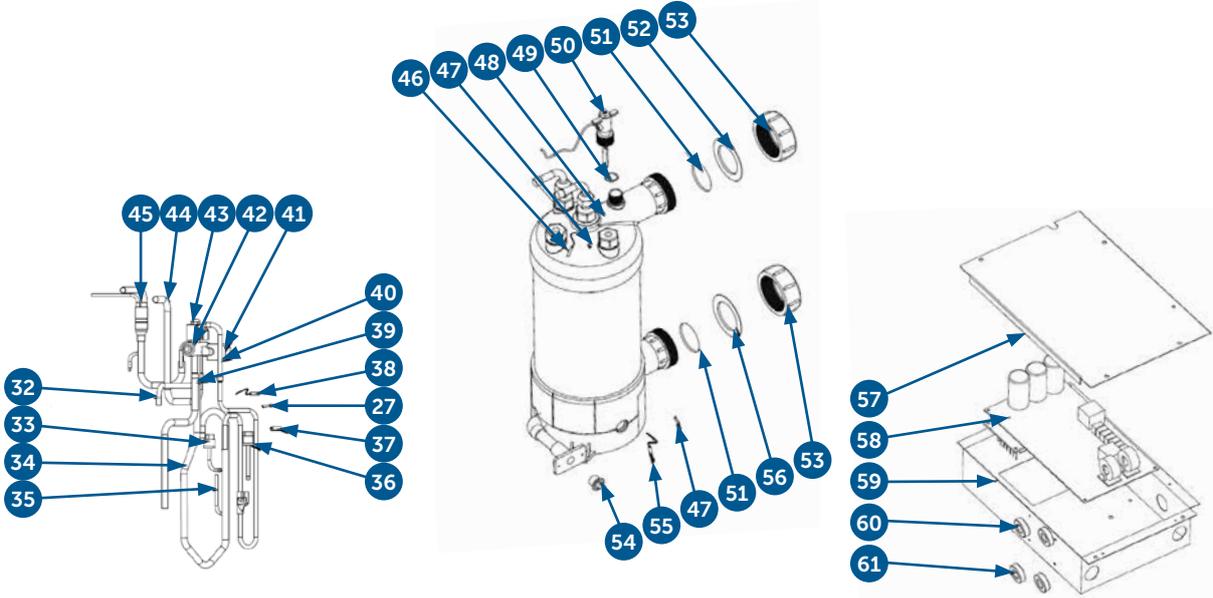
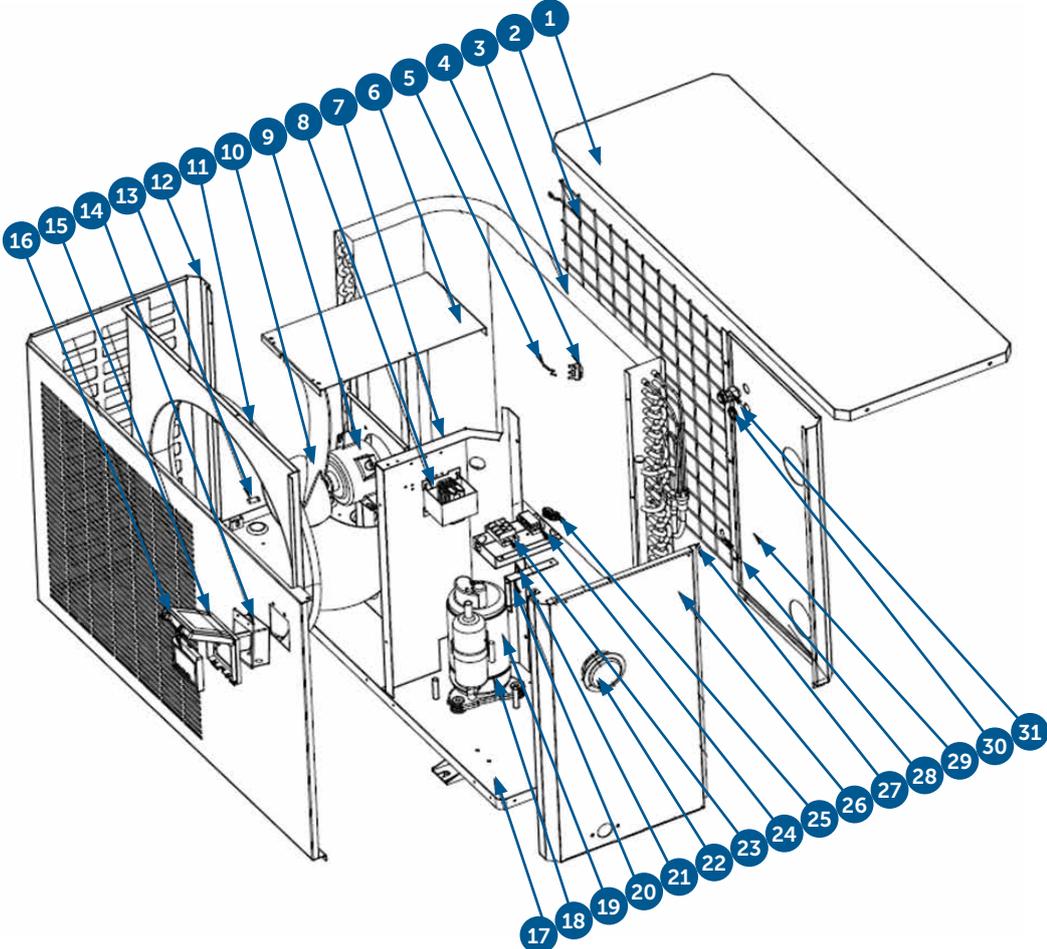
Model: XHPFDPLUS100E



NO	Spare parts
1	Top cover
2	Back grill
3	Evaporator
4	Ambient temp. sensor clip
5	Ambient temp. sensor d5-TH1
6	Isolation panel
7	Fan motor bracket
8	Reactor
9	Fan motor
10	Fan blade
11	Front ventilation panel
12	Front panel
13	Controller box cover
14	Waterproof controller box
15	Controller
16	Base tray
17	Compressor heating resistor
18	Compressor
19	Wiring box
20	Wiring box support
21	3-ways terminal block
22	High pressure gauge
23	Clip
24	2-ways terminal block
25	Right side panel
26	Clip
27	Evaporator temperature sensor d3-TH2
28	Back panel
29	Cable ring
30	Cable connector

NO	Spare parts
31	Tube
32	Discharge temp. sensor d6-TH3
33	Tube
34	Tube
35	EEV
36	Gas tube
37	Low pressure switch
38	Gas return piping
39	Discharge pipe
40	Tube
41	High pressure switch
42	4-way valve
43	4-way valve coil
44	Sensor casing pipe
45	Water flow switch
46	Water outlet temp. sensor d2-TH5
47	Exchanger temperature sensor clip
48	Sealing ring
49	Rubber ring on water connection
50	Red rubber ring
51	Water connection sets
52	Blue rubber ring
53	Titanium heat exchanger
54	Water inlet temp. sensor d1-TH6
55	Drainage plug
56	Electric box cover
57	PCB
58	Magnet ring
59	Electric box
60	Magnet ring

Model: XHPFDPLUS160E



NO	Spare parts
1	Top cover
2	Back grill
3	Evaporator
4	Ambient temp. sensor clip
5	Ambient temp. sensor d5-TH1
6	Fan motor bracket
7	Isolation panel
8	Reactor
9	Fan motor
10	Fan blade
11	Front panel
12	Front ventilation panel
13	DC fan motor case
14	Controller box cover
15	Waterproof box
16	Controller
17	Base tray
18	Compressor heating resistor
19	Compressor
20	Wiring box support
21	Wiring box
22	High pressure gauge
23	3-ways terminal block
24	Clip
25	2-ways terminal block
26	Right side panel
27	Clip
28	Evaporator temperature sensor d3-TH2
29	Back panel
30	Cable ring
31	Cable connector

NO	Spare parts
32	Tube
33	Low pressure switch
34	Gas return pipe
35	Gas tube
36	High pressure switch
37	Sensor casing pipe
38	Discharge temp. sensor d6-TH3
39	Tube
40	Discharge pipe
41	4-way valve coil
42	4-way valve
43	EEV
44	Tube
45	Tube
46	Water outlet temp. sensor d2-TH5
47	Exchanger temperature sensor clip
48	Titanium heat exchanger
49	Sealing ring
50	Water flow switch
51	Rubber ring on water connection
52	Red rubber ring
53	Water connection sets
54	Drainage plug
55	Water inlet temp. sensor d1-TH6
56	Blue rubber ring
57	Electric box cover
58	PCB
59	Electric box
60	Magnet ring
61	Magnet ring

10.

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.
- (3) Only a qualified technician is authorized to operate the cooling system pressure.
- (4) In another way, you should check the unit is water fully before the unit start to run again.
- (5) Check the water levels before the unit start after a long break in usage.
- (6) During the operation of the device, condensate may drain from the bottom, especially from the drain hose. This is normal.
- (7) For winter, it is recommended to disconnect the heat pump and leave it in a room with above-zero temperatures, together with other technologies.

11.

Winterization

IMPORTANT:

If essential measures to prepare the heat pump for winter are not taken, the heat pump could be damaged, which will void the warranty.

The heat pump, filtration pump, and all installed technology of the swimming pool must not be exposed to temperatures below the freezing point. It is necessary to remove all water from this whole system (technology), especially the heat and circulating pump, in an appropriate manner.

WE RECOMMEND DOING THE FOLLOWING:

1. Disconnect the power supply to the heat pump.
2. Close the water inlet to the heat pump: completely close valves 2 and 3 in the bypass.
3. Disconnect the connection parts of the heat pump for intake and outlet of water and allow the water to drain from the heat pump.
4. Warning: Unscrew the water drain bolt from the bottom of the heat pump to drain the water from the heat exchanger completely. Avoiding this step may result in the heat exchanger being damaged – torn, which is not covered by the warranty.
5. In the winter season, it is recommended to fit the disconnected heat pump in a place where temperatures will not fall below freezing point. Warning: always make sure that the water is fully drained from the heat pump.
6. Loosely reconnect the connection parts for water intake and outlet to/from the heat pump in order to avoid any pollutants being deposited in the pipes. This is only the case when you have no possibility to store the heat pump according to item 5.

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export@albixon.com
www.ALBIXON.com

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