

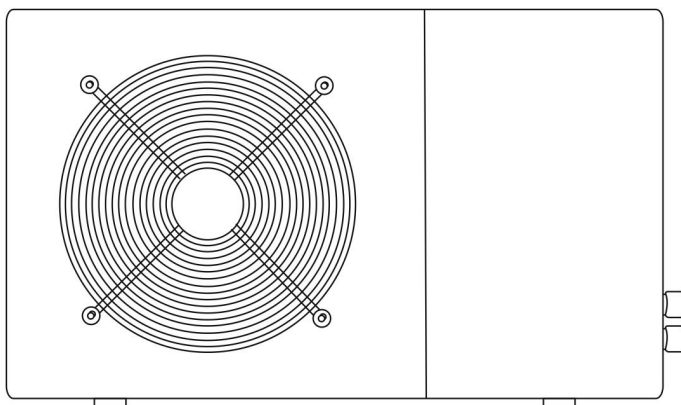
hydro-pro inverter

7024515	Hydro-Pro Heat pump ABS 230V Inverter type Inverter 07 horizontal,R32
7024516	Hydro-Pro Heat pump ABS 230V Inverter type Inverter 11 horizontal,R32
7024517	Hydro-Pro Heat pump ABS 230V Inverter type Inverter 14 horizontal,R32
7024518	Hydro-Pro Heat pump ABS 230V Inverter type Inverter 16 horizontal,R32
7024519	Hydro-Pro Heat pump ABS 230V Inverter type Inverter 19 horizontal,R32
7024520	Hydro-Pro Heat pump ABS 230V Inverter type Inverter 24 horizontal,R32
7024521	Hydro-Pro Heat pump ABS 400V Inverter type Inverter 24T horizontal,R410A
7024522	Hydro-Pro Heat pump ABS 230V Inverter type Inverter 29 horizontal,R32
7024523	Hydro-Pro Heat pump ABS 400V Inverter type Inverter 29T horizontal,R410A

INVERBOOST+ Tech

Swimming Pool Heat Pump

User and Service manual



English • French • Dutch • German • Polish • Danish

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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 2 to 30 kg load = from 5 to 50 Tons	Each year

Concerning the Gaz R410a, 2.39kg amounting at 5 tons of CO₂, commitment to check each year.

Concerning the Gaz R32, 7.41kg 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.**

hydro-pro inverter

Swimming Pool Heat Pump

User and Service manual

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Thank you for using hydro-pro inverter 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°C



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 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.

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.

- Please always keep the heat pump in the ventilation place and away from anything which could cause fire.
- Don't weld the pipe if there is refrigerant inside machine. Please keep the machine out of the confined space when make gas filling.
- Action of filling gas must be conducted by professional with R32 operating license.

1. Specifications

1.1 Technical data hydro-pro inverter pool heat pumps

Model		Inverter 07	Inverter 11	Inverter 14	Inverter 16
Item No.		7024515	7024516	7024517	7024518
* Performance at Air 28℃, Water 28℃, Humidity 80%					
Heating capacity	kW	7-2.2	11-2.9	14-3.2	16-3.8
Power consumption	kW	1.25-0.17	1.77-0.22	2.26-0.25	2.67-0.29
C.O.P.		13-5.6	13-6.2	13-6.2	13-6
* Performance at Air 15℃, Water 26℃, Humidity 70%					
Heating capacity	kW	4.7-2.5	7.9-2	9.5-2.2	11.2-3
Power consumption	kW	1.02-0.35	1.72-0.28	2.07-0.31	2.43-0.42
C.O.P.		7.1-4.6	7.2-4.6	7.2-4.6	7.2-4.6
Compressor type		Inverter Compressor			
Voltage	V	220~240V / 50Hz /1PH			
Rated current	A	5.5	7.9	10.0	11.8
Minimum fuse	A	9	12	15	16
Advised pool volume	m ³	10-25	15-60	18-66	25-85
Advised water flux	m ³ /h	2.5	3.7	4.0	4.6
Water pressure drop	Kpa	12	14	15	15
Heat exchanger		Twist-titanium tube in PVC			
Water connection	mm	50			
No. of Fan		1			
Ventilation type		Horizontal			
Fan speed	RPM	500-850			
Power input of Fan	W	6-35	22-82	22-82	32-110
Noise level(10m)	dB(A)	≤ 41	≤ 42	≤ 43	≤ 43
Noise level(1m)	dB(A)	40-51	40-52	40-54	41-54
Refrigerant		R32			
Net weight	kg	54	68	73	78
Gross weight	kg	66	73	78	83
Net dimension	mm	1009*370*559	1068*450*709		
Packing dimension	mm	1095*430*705	1130*470*850		

* Above data is subject to update without prior notice.

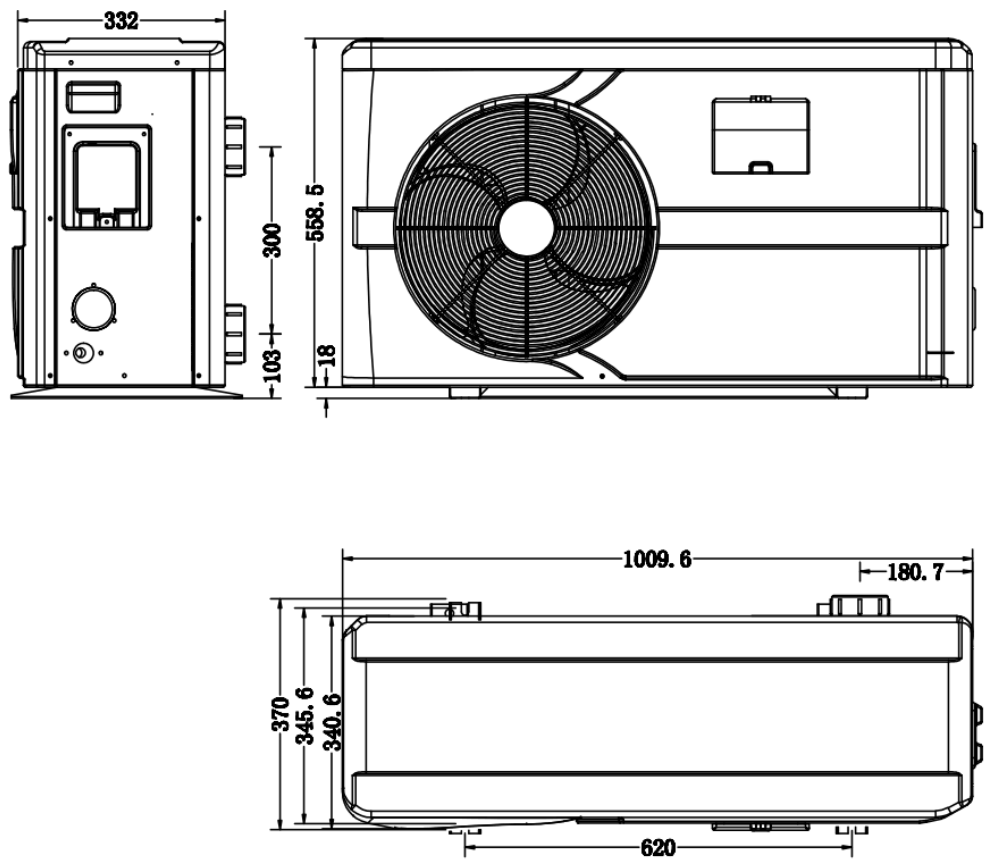
1.2 Technical data hydro-pro inverter pool heat pumps

Model		Inverter 19	Inverter 24	Inverter 24T	Inverter 29	Inverter 29T
Item No.		7024519	7024520	7024521	7024522	7024523
* Performance at Air 28℃, Water 28℃, Humidity 80%						
Heating capacity	kW	19-4.7	25.5-5.9	25.5-5.9	30-6.8	30-6.8
Power consumption	kW	3.17-0.36	4.25-0.45	4.25-0.45	5-0.52	5-0.52
C.O.P.		13-6	13-6	13-6	13-6	13-6
* Performance at Air 15℃, Water 26℃, Humidity 70%						
Heating capacity	kW	14-3.9	18.6-4.5	18.6-4.5	23.7-5.6	23.7-5.6
Power consumption	kW	2.78-0.54	4.04-0.63	4.04-0.63	5.15-0.78	5.15-0.78
C.O.P.		7.2-4.6	7.2-4.6	7.2-4.6	7.2-4.6	7.2-4.6
Compressor type		Inverter Compressor				
Voltage	V	220~240V / 50Hz or 60Hz /1PH		380V / 50Hz or 60Hz /3PH	220~240V / 50Hz or 60Hz /1PH	380V / 50Hz or 60Hz /3PH
Rated current	A	14.0	17.7	6.9	21.0	8.2
Minimum fuse	A	21	27	10	34	13
Advised pool volume (with pool cover)	m³	55-120	65-130	65-130	75-180	75-180
Advised water flux	m³/h	5.0	8.0	8.0	10.0	10.0
Water pressure drop	Kpa	18	20	20	25	25
Heat exchanger		Twist-titanium tube in PVC				
Water connection	mm	50				
No. of Fan		1	2			
Ventilation type		Horizontal				
Fan speed	RPM	450-650	(550-850)*2			
Power input of Fan	W	35-130	(32-110)*2			
Noise level(10m)	dB(A)	≤ 45	≤ 46	≤ 46	≤ 49	≤ 49
Noise level(1m)	dB(A)	41-56	42-58	42-58	42-60	42-60
Refrigerant		R32		R410A	R32	R410A
Net weight	kg	98	117	117	128	128
Gross weight	kg	113	135	135	146	146
Net dimension	mm	1133*444*872	1066*452*1283			
Packing dimension	mm	1140*480*1010	1130*515*1430			

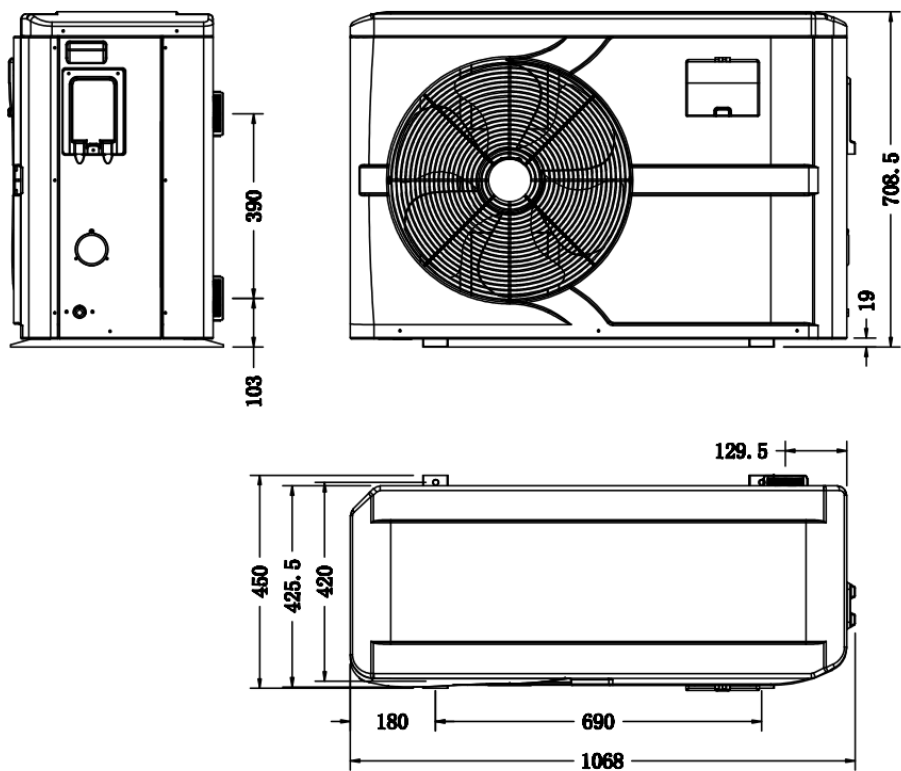
* Above data is subject to update without prior notice.

2. Dimension (mm)

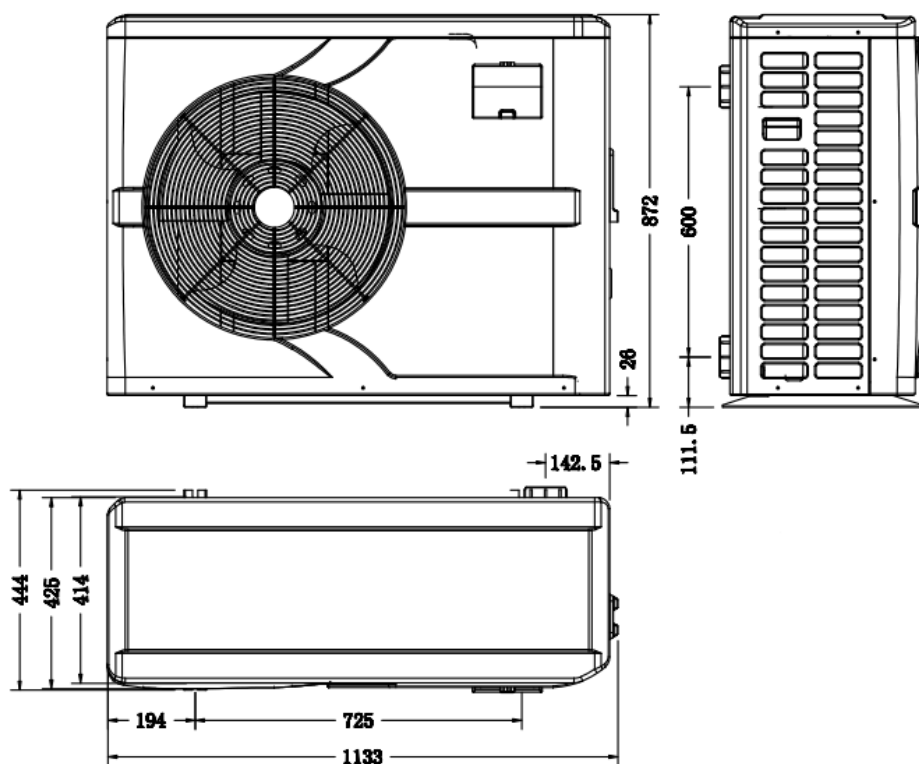
Model Inverter 7



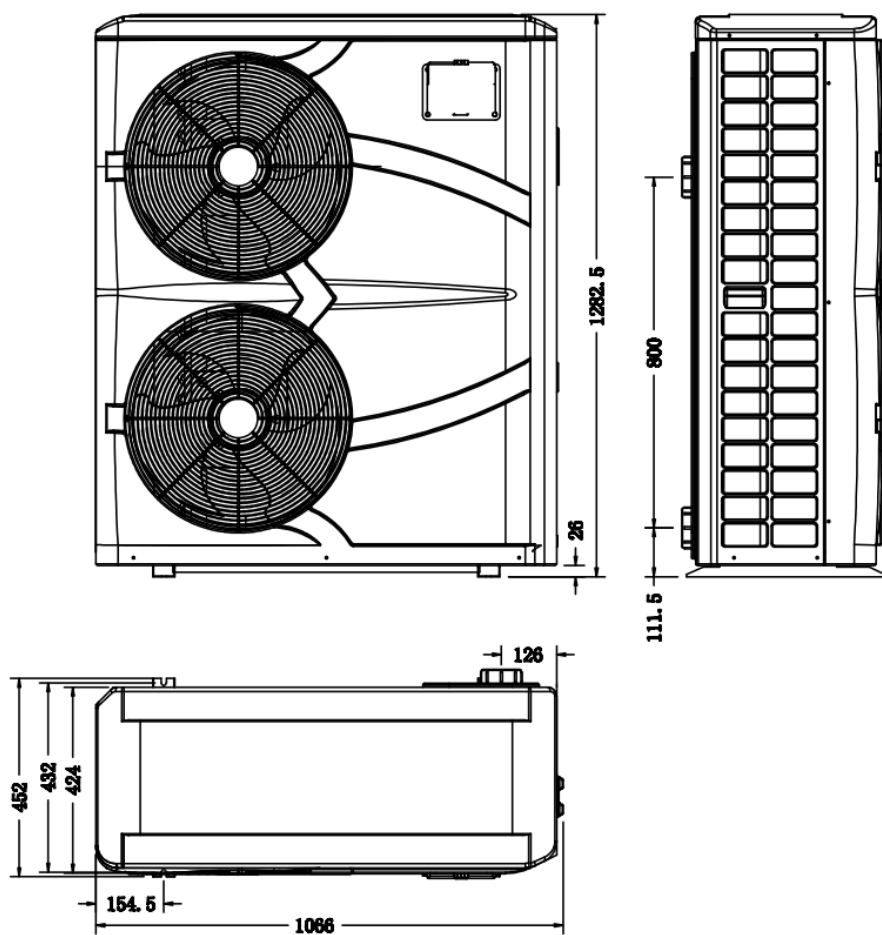
Model Inverter 11/14/16



Model Inverter 19



Model Inverter 24/24T/29/29T



3. Installation and connection

3.1 Notes

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:

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. Install a bypass if the water flow from the swimming pool pump is more than 20% greater than the allowable flow through the heat exchanger of the heat pump.
3. Always place the heat pump on a solid foundation and use the included rubber mounts to avoid vibration and noise.
4. Always hold the heat pump upright. If the unit has been held at an angle, wait at least 24 hours before starting the heat pump.

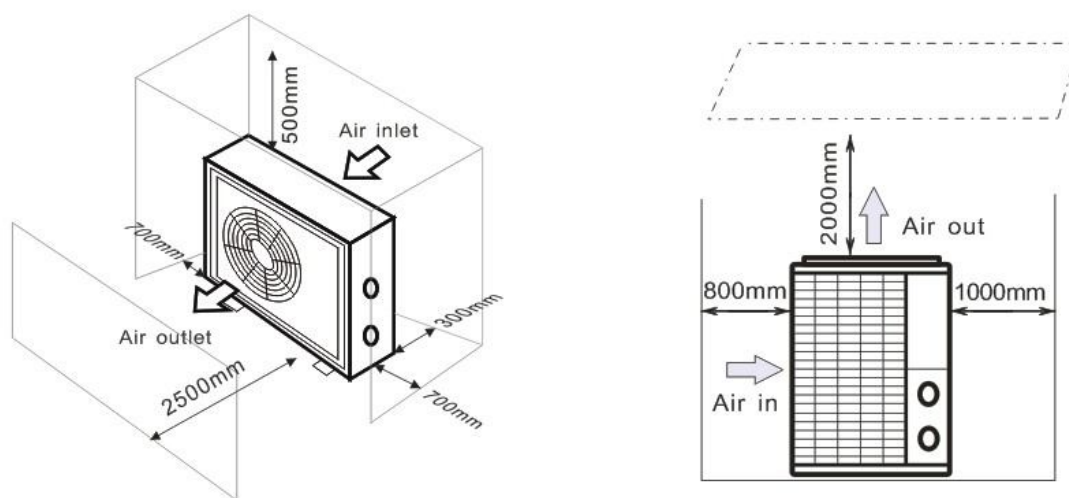
3.2 Heat pump placement

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

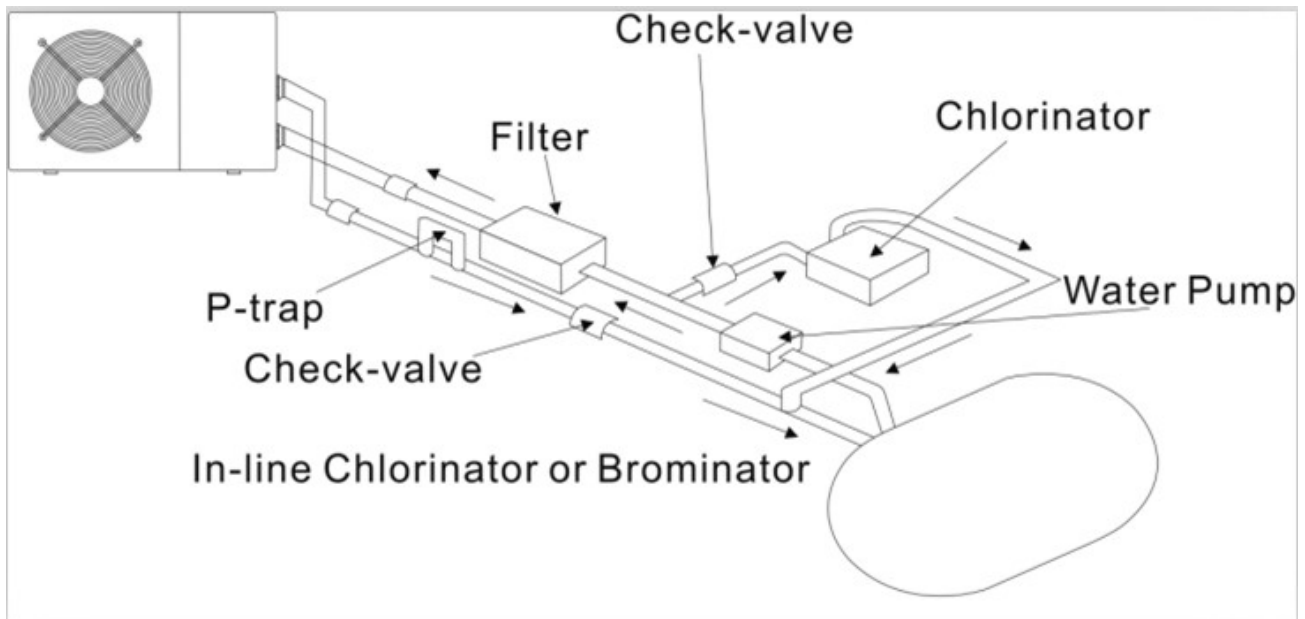
The heat pump is normally installed within a perimeter area extending 7.5 m from the swimming pool. The greater the distance from the pool, the greater the heat loss in the pipes. As the pipes are mostly underground, the heat loss is low for distances up to 30 m (15 m from and to the pump; 30 m in total) 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 °C 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%.

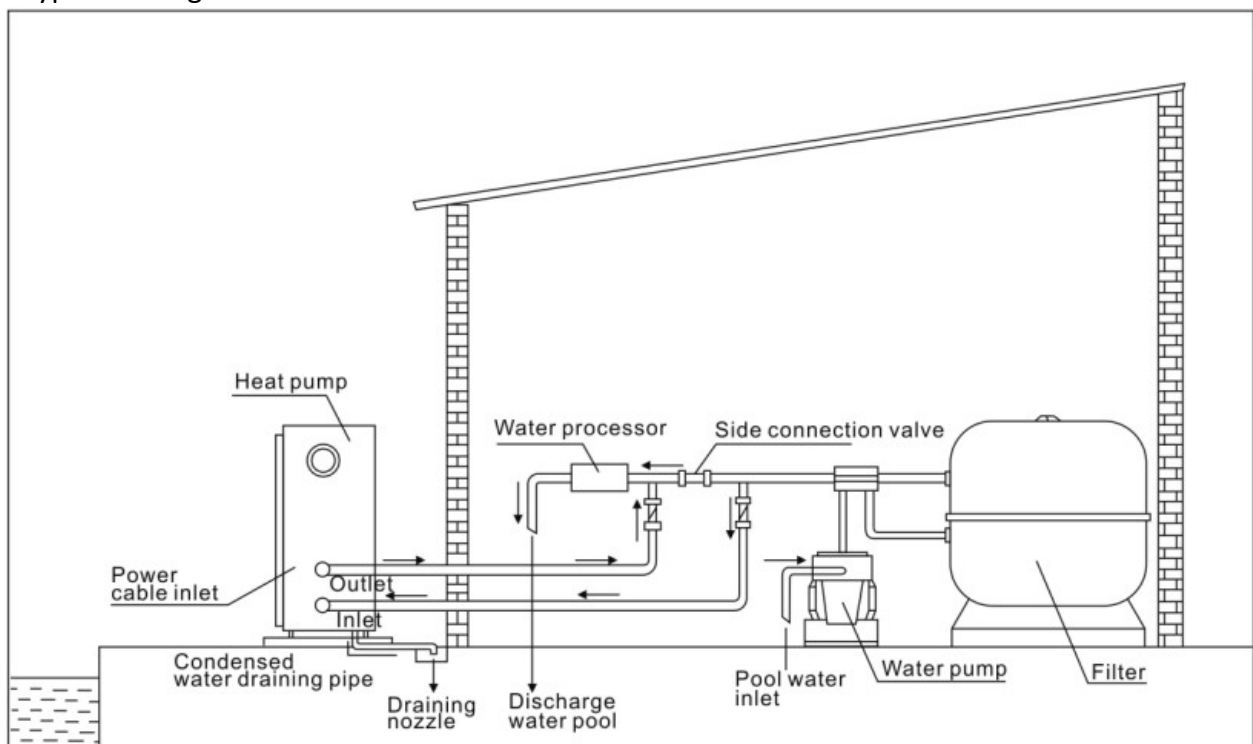
3.4 Check-valve installation

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.

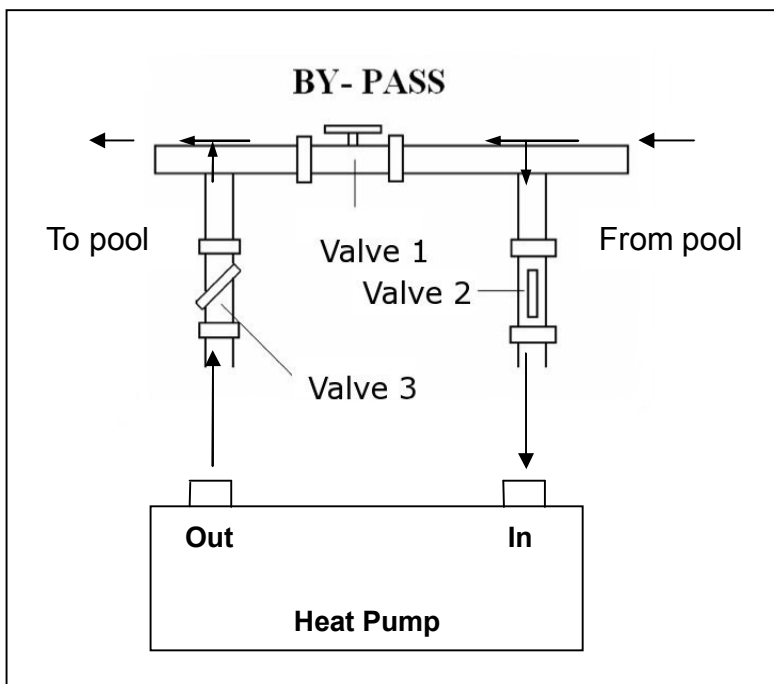


3.5 Typical arrangement



Note: This arrangement is only an illustrative example.

3.6 Adjusting the bypass



Use the following procedure to adjust the bypass:

1. Valve 1 wide open. Valve 2 & valve 3 closed.
2. Slowly open valve 2 & valve 3 by half, then close the valve 1 slowly to increase the water flow to valve 2 & valve 3.
3. 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.

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 machine 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 degree.

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 (slow type; curve D) and to use adequate 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 switch(24V) can be connected to the second terminal block here. This allows the filter pump operation to be controlled by the heat pump or the extra dry contact.

Note: In the case of three-phase models, swapping two phases may cause the electric motors to run in the reverse direction, which can lead to damage. For this reason, the unit has a built-in protective device that breaks the circuit if the connection is not correct. If the red LED above this safety device lights up, **you must swap the connections of two of the phase wires.**

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 expires .
3. After a few minutes, check whether the air blowing out of the unit is cooler.
4. When turn off the filter pump , the unit should also turn off automatically , if not, then adjust the flow switch.

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 higher than 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.

3.9 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. This is sometimes mistakenly regarded as a water leak.

3.10 Operating modes for optimal use

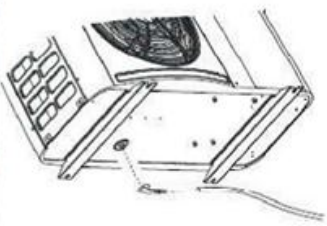
- **POWER:** Used primarily at the beginning of the season because this mode allows very rapid temperature rise
- **SMART:** The heat pump has completed its primary task, in this mode; the heat pump is in a position to maintain the pool water in an energy efficient manner. By automatically adjusting speed of compressor and fan the heat pump delivers a better return.
- **SILENT:** In the summer months when the heat output is minimal required, the heat pump in this mode is even more profitable. Added benefit; when the heat pump heats. It goes with minimal noise load.

4. Accessories

4.1 Accessories list

 Anti-vibration base, 4 pcs	 Draining jet, 2 pcs	 Cover, 1 pc
 10M Signal wire, 1 pc	 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.
 	Draining jet 1. Install the draining jet under the bottom panel 2. Connect with a water pipe to drain out the water. Note: Lift the heat pump to install the jet. Never overturn the heat pump, it could damage the compressor.



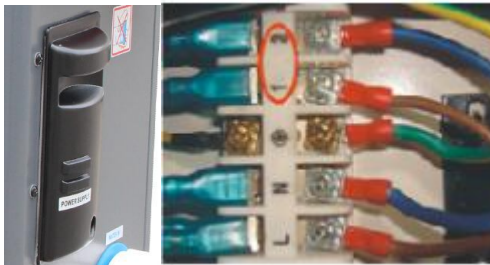
Water Inlet & outlet junction

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



Cable wiring

1. Open the terminal cover
2. Fix the power supply wire on joints



Water pump wiring

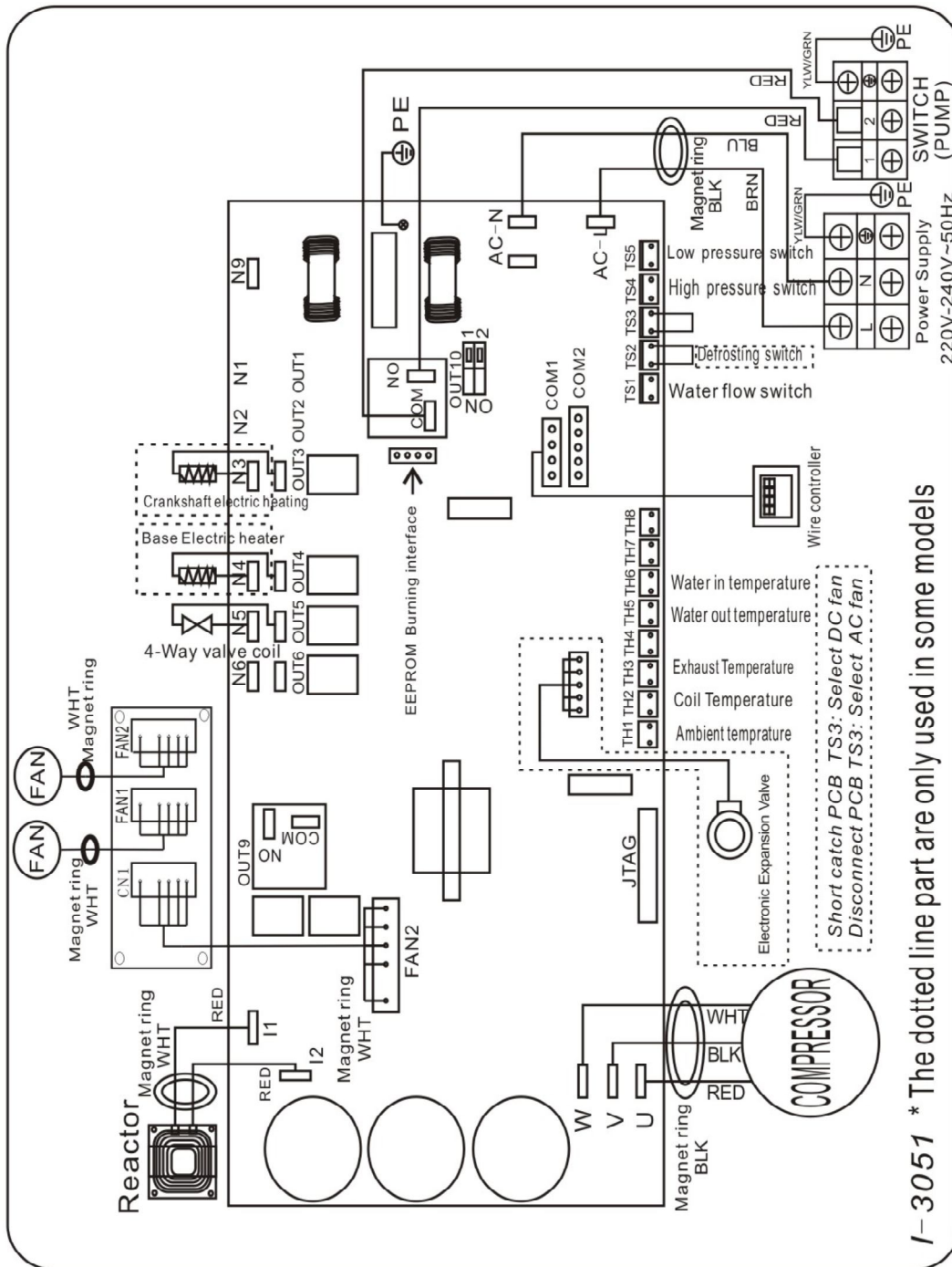
1. Open the terminal cover
2. With the connector 1 and 2 you can pilot the water filtration through the timer of the filtration (dry contact)

Inverter 7/11/14/16/19



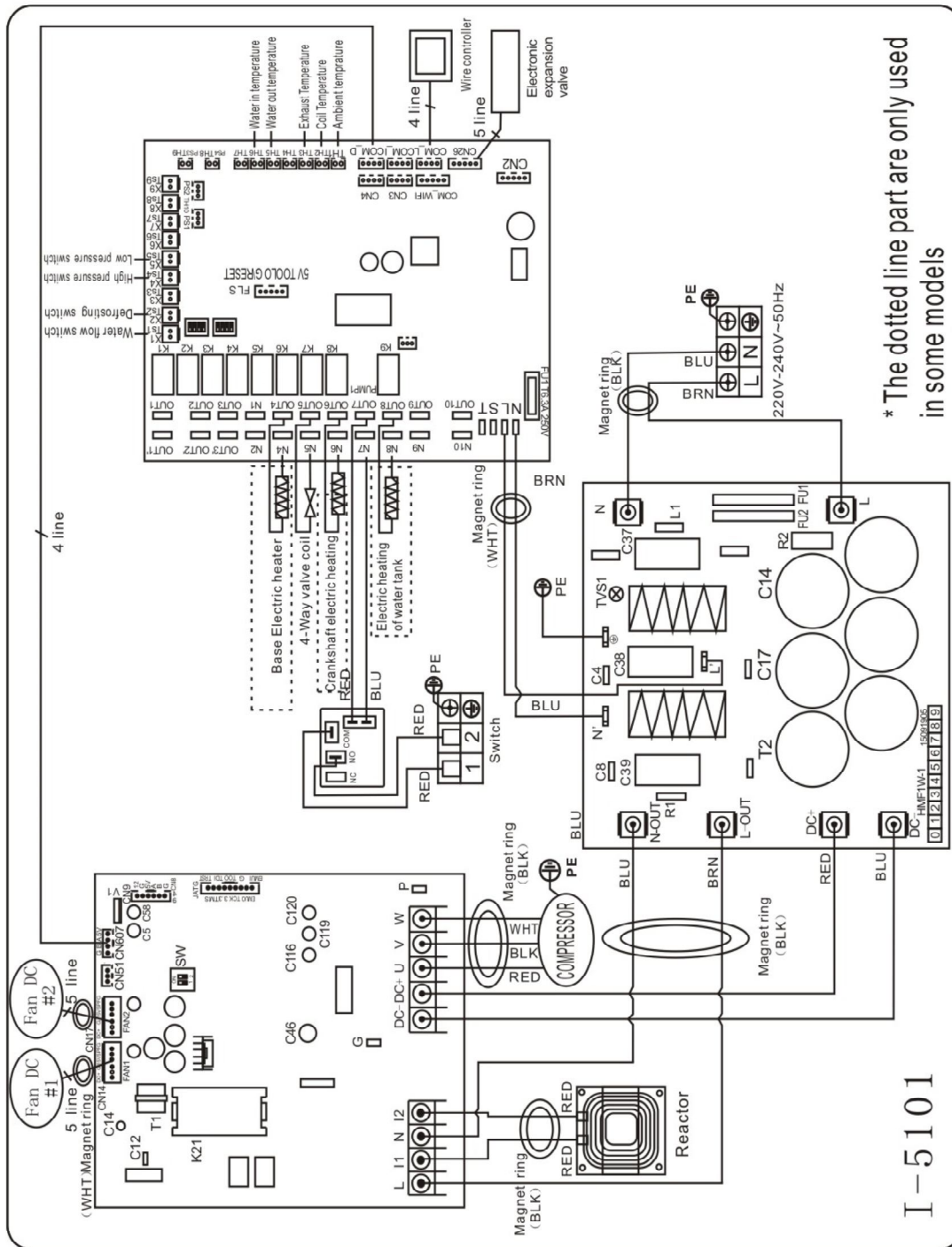
5.2 SWIMMING POOL HEAT PUMP WIRING DIADRAM

Inverter 24

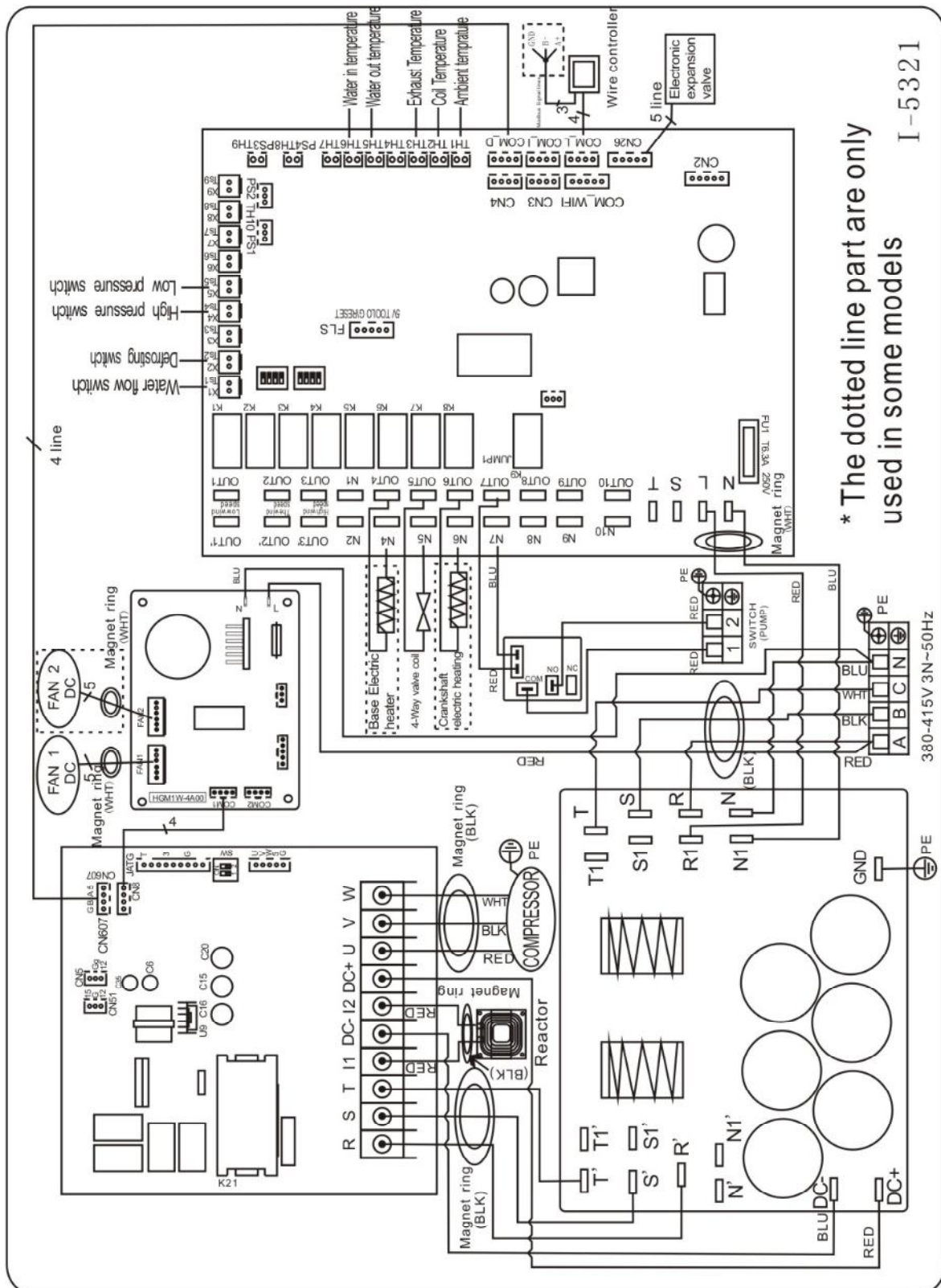


5.3 SWIMMING POOL HEAT PUMP WIRING DIADRAM

Inverter 29



Inverter 24T/29T



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.
- (3) It is recommended that your pool filtration pump and your heat pump are wired independently. Wiring your pool pump into the heat pump will result in your filtration being switched off once the pool water has reached temperature.
- Only wire the pool pump through the heat pump if you have a pool pump for heating only that is independent to your pool filtration system.

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.

5.5 Installation of the display departee

Photo(1)



Photo(2)



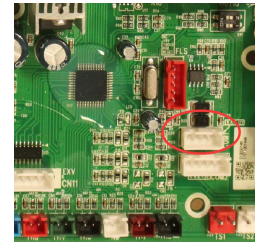
Photo(3)



Photo(4)

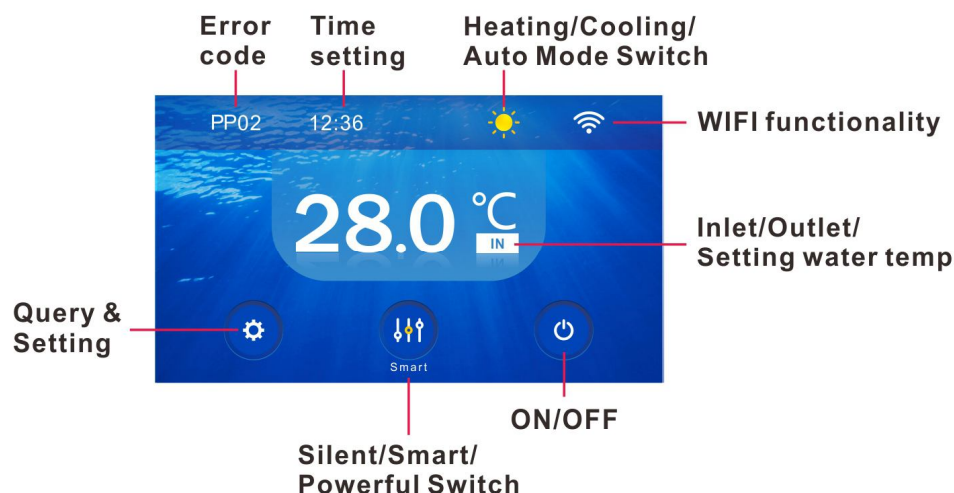


Photo(5)



- The side with plug connects with the control panel (photo1)
- The other side of the signal wire. (photo2)
- Open the wiring panel and put the side without plug through the electrical box. (photo3,4)
- Insert the wiring into the designated position (code:COM 1 or COM-L) on the PC board. (photo5)

6. Main interface



6.1. The Icon definition and operation

6.1.1 Click the  to turn on or off the heat pump

6.1.2 Click  to switch the working mode:  Heating mode(setting range from 15°C-41°C),  Cooling mode(setting range from 6°C-35°C),  Auto mode(setting range from 6°C-41°C) .

The heating icon  flashes under defrosting mode.

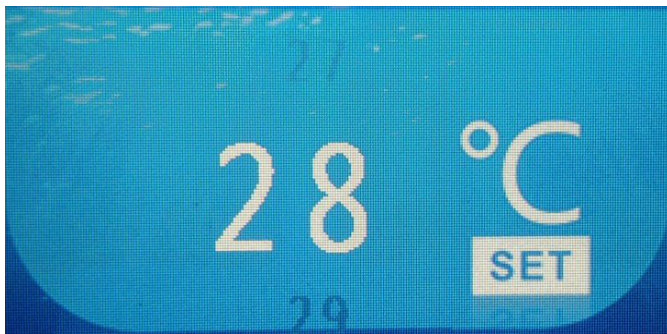
6.1.3 Click  to switch the running mode.

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

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

6.1.4 Click the water temp. zone, IN, OUT and SET will display in order by each click.

You can set the desired water temperature by sliding up and down the digits (6-41) when SET temp. shows.



6.1.5 Click  to set the time, it could be automatically synchronized with the network time if network connection.

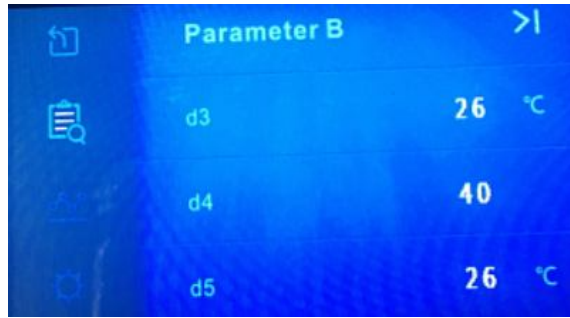
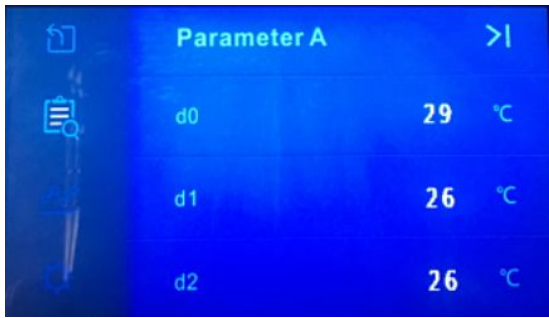
6.1.6. If error code occurs, it will display at the upper left.

6.1.7 If it is connected to WIFI module, upper right  icon will be long bright.

6.2 Click  to enter the Parameter query or setting, Temp & COP curve, Timer ON/OFF and Error code.

6.2.1 Parameter query 

There are four interfaces (Parameter A-D) including d0 to d11, which is listed as below. Click  from the screen's top & right side to switch to next parameter interface.

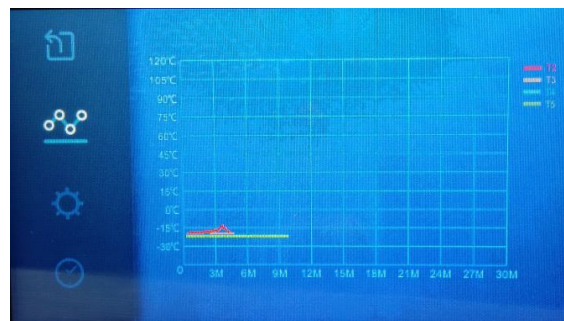
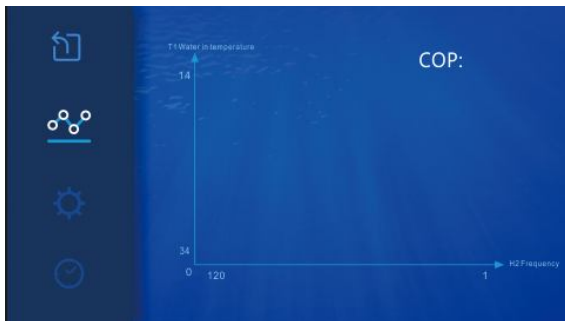


Code	Condition	Scope	Remark
d0	IPM mould temperature	0-120℃	Real testing value
d1	Inlet water temp.	-9℃～99℃	Real testing value
d2	Outlet water temp.	-9℃～99℃	Real testing value
d3	Ambient temp.	-30℃～70℃	Real testing value
d4	Frequency limitation code	0,1,2,4,8,16	Real testing value
d5	Piping temp.	-30℃～70℃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

6.2.2 Temp & COP curve



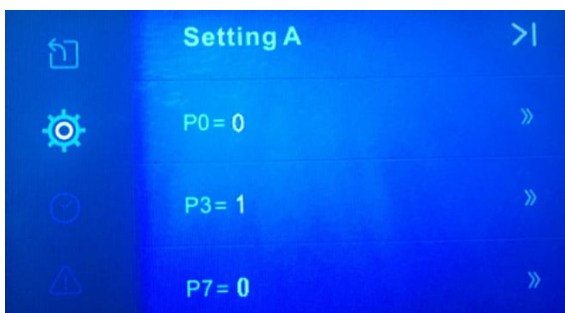
Click  to check the Temp & COP curve. Only after the heat pump runs 4 minutes under heating mode, COP curve can be showed;



6.2.3 Parameter setting

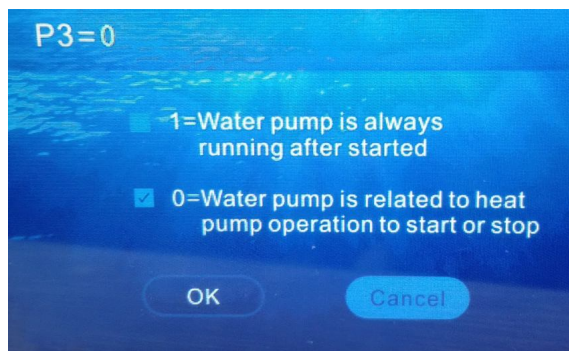


There are also four interfaces (Parameter A-D) as below pictures shows. Page up or down same as parameter query.





For example, click of P3, it will go to next setting interface.



Its default value is '0'. If you want the water pump not to start or stop together with the compressor, and always running, you can select the option "1", then click 'OK'. So the P3 value will be changed to '1'.

6.2.4 Users' parameter setting codes

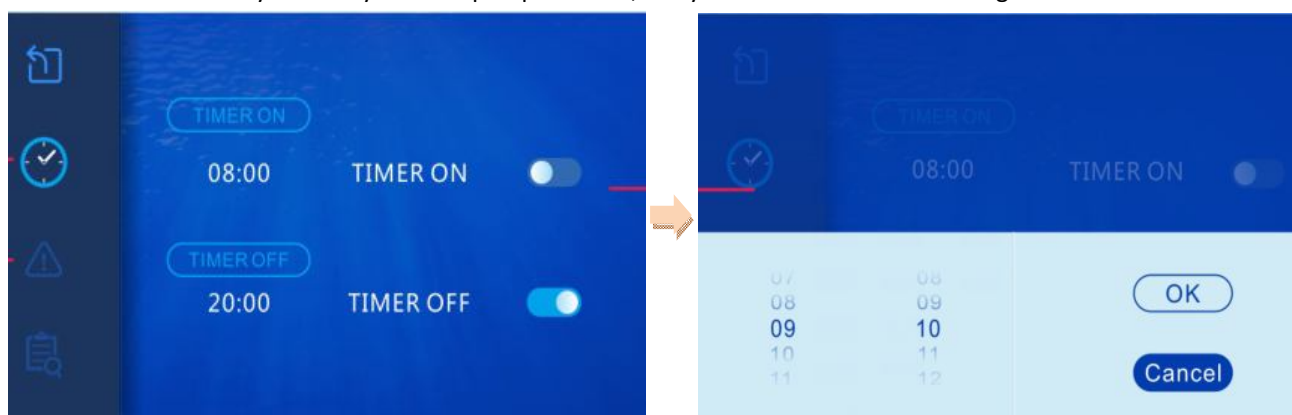
Code	Description	Scope	Default value	Remarks
P0	Forced defrost selection	0-1	0	1:Forced defrosting mode. 0:Normal mode.Once forced defrost exits, P0 automatically turns to 0.
P3	Water pump running selection	0-1	0	1: Always running 0: Depends on the running of compressor
P7	T1 Water in temp.calibration setting	-9~9	0	T1 Water in temp.calibration setting, normally no need to set this parameter,keep default value 0 .
P14	Reset Factory Parameter	0-1	0	0: Default 1: Reset factory parameter (P0, P3, P7etc)
P16	Model Code			Sent from PCB



6.2.5 Timer ON/OFF

Firstly, slide the spot from the left to the right to activate the Timer OFF (for example)

Then set the time that you want your heat pump to be off, lastly click 'OK' to save the setting and exist.

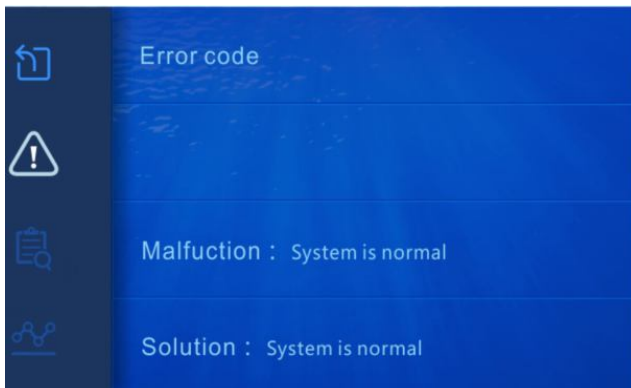


6.2.6 Error code



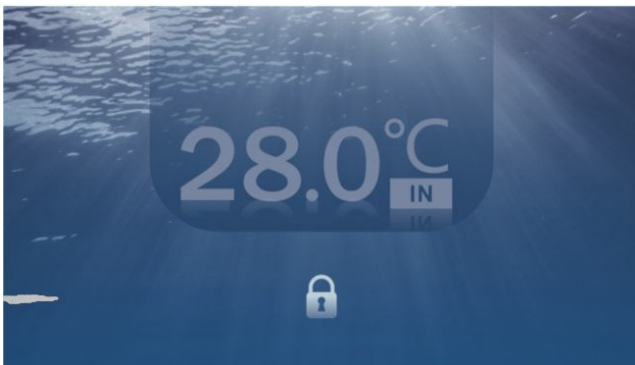
If there is no error code, it will display 'system is normal'.

If error occurs, this interface will display its accordingly code and solution.



In the query and setting interface or setting interface, if there is no operation for 10s, it will automatically turn to the main interface. Or you could click  to exit the query and setting interface.

Besides, if there is no operation in 3 min in the main interface, it will go to sleep mode.



Click  to unlock the sleep mode and wake up the main interface.

7. Troubleshooting

7.1 Error code display on LED wire controller

Error Code	Malfunction	Reason	Solution
EE 01	High pressure failure	1. High pressure switch in bad connection or failure 2. Ambient temperature is too high 3. Water temperature is too high 4. Water flow is too low 5. Fan motor speed is abnormal or fan motor has damaged	1. Check the wiring for high pressure switch or change a new one 2. Check the water flow or water pump 3. Check the fan motor 4. Check and repair the piping system
EE 02	Low pressure failure	1. Low pressure switch in bad connection or failure 1. EEV has blocked or pipe system is jammed 2. Motor speed is abnormal or motor has damaged 3. Gas leakage	1. Check the wiring for low pressure switch or change a new one 2. Check the EEV and piping system - Check the motor 3. Through the high pressure gauge to check the pressure value
EE 03or 'ON'	Water flow failure	1. Water flow switch is in bad connection 2. Water flow switch is damaged 3. No/ Insufficient water flow.	1. Check the wiring for water flow switch 2. Change the water flow switch 3. Check the water pump or the waterway system
EE 04	Over heating protection for water temperature (T2) in heating mode	1. Low water flow 2. Water flow switch is stuck and the water supply is cut off 3. T2 sensor is abnormal	1. Check the water way system 2. Check the water pump or water flow switch 3. Check T2 sensor or change another one
EE 05	Exhaust temperature (T6) too high protection	1. Lack of gas 2. Low water flow 3. Piping system has been blocked 4. Exhaust temp. Sensor failure	1. Check the high pressure gauge, if too low, fill with some gas 2. Check the waterway system and water pump 3. Check the piping system if there was any block 4. Change a new exhaust temp. sensor
EE 06	Controller malfunction	1. Wire connection is not good or damaged signal wire 2. Controller failure	1. Check and re-connect the signal wire 2. Change a new signal wire 3. Turn off electricity supply and restart machine 4. Change a new controller
EE 07	Compressor current protection	1. The compressor current is too large momentary 2. Wrong connection for compressor phase sequence	1. Check the compressor 2. Check the waterway system 3. Check if the power in the normal range

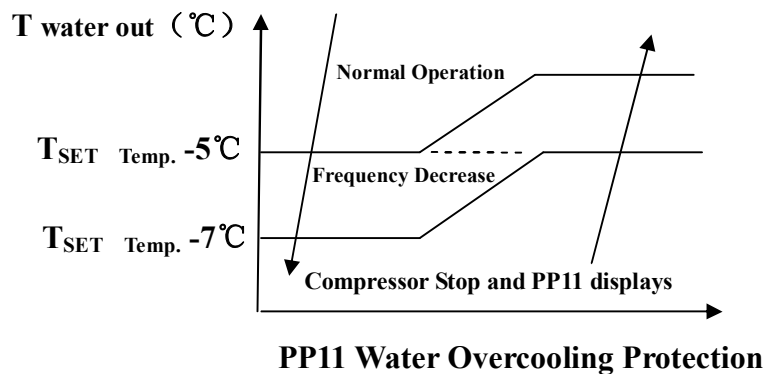
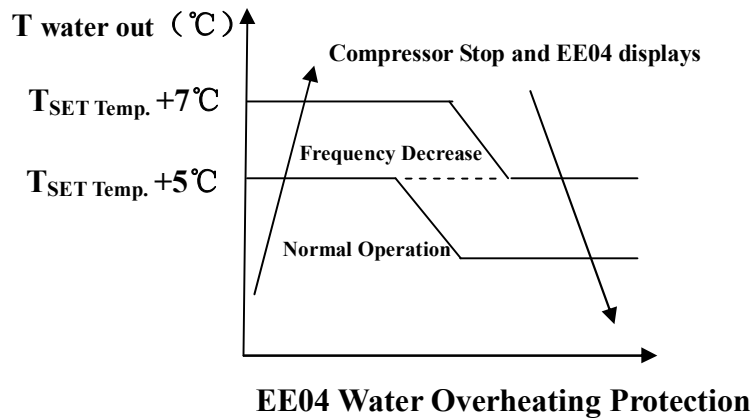
		3. Compressor accumulations of liquid and oil lead to the current becomes larger 4. Compressor or driver board damaged 5. The water flow is abnormal 6. Power fluctuations within a short time	4. Check the phase sequence connection
EE 08	Communication failure between the controller and the main board	1. Poor signal wire connection or damaged signal wire 2. Controller malfunction	1. Check and re-connect the signal wire 2. Change a new signal wire 3. Turn off electricity supply and restart machine 4. Change a new controller
EE 09	Communication failure between Main board and driver board	1. Poor connection of communication wire 2. The wire is damaged	1. Check the wire connection 2. Change a new wire
EE 10	VDC voltage too high protection	1. Mother line voltage is too high 2. Driver board is damaged.	1. Check if the power is in the normal range 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. Mother line voltage is too low 2. Driver board is damaged.	1. Check if the power is in the normal range 2. Change driver board
EE 13	Input current over high protection.	1. The compressor current is too large momentary 2. The water flow is abnormal 3. Power fluctuations within a short time 4. Wrong PFC inductor	1. Check the compressor 2. Check the waterway system 3. Check if the power is in the normal range 4. Check if the correct PFC inductor is used
EE 14	IPM module thermal circuit is abnormal	1. Output abnormality of IPM module thermal circuit 2. Fan motor is abnormal or damaged 3. Fan blade is broken	1. Change a driver board 2. Check if the motor speed is too low or fan motor damaged, change another one 3. Change another fan blade

EE 15	Temperature of IPM module is too high	1. Output exception of IPM module thermal circuit 2. Motor is abnormal or damaged 3. Fan blade is broken	1. Change a driver board 2. Check if the fan motor speed is too low or fan motor damaged, change another one 3. Change another fan blade
EE 16	PFC module protection	1. Output exception of PFC module 2. Motor is abnormal or damaged 3. Fan blade is broken 4. Input voltage leap, input power is abnormal	1. Change a driver board 2. Check if the motor speed is too low or fan motor damaged, change another one 3. Change another fan blade 4. Check the input voltage
EE 17	DC fan motor failure	1. DC motor is damaged 2. Main board is damaged 3. The fan blade is stuck	1. Detect DC motor, replace with a new one 2. Change a new main board 3. Find out the barrier and work it out
EE 18	PFC module thermal circuit is abnormal	The driver board is damaged	1. Change a new driver board 2. Check if the fan motor speed is too low or fan motor damaged, change another one
EE 19	PFC module high temperature protection	1. PFC module thermal circuit output abnormal 2. Motor is abnormal or damaged 3. Fan blade is broken 4. The screw in the driver board is not tight	1. Change a new driver board 2. Check if the motor speed is too low or fan motor damaged, change another one 3. Change another fan blade 4. Check if the screw is loose
EE 20	The input power failure	Power supply voltage fluctuates too much	Check whether the voltage is stable
EE 21	Software control exception	1. Compressor run 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. Enter correct program
EE 22	Current detection circuit failure	1. Voltage signal abnormal 2. Driver board is damaged	1. Check the main board or change a new one 2. Change a new driver board
EE 23	Compressor startup failed	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 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 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 T3 or T5 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. Turn off electricity supply and restart it 2. Change a new main board
PP 01	Inlet water temperature sensor failure	1. The sensor failure or short circuit 2. The wiring of sensor is loose	1. Re-fix the wiring of the sensors 2. Change the sensor
PP 02	Outlet water temperature sensor failure	1. The sensor failure or short circuit 2. The wiring of sensor is loose	1. Re-fix the wiring of the sensors 2. Change the sensor
PP 03	Heating piping sensor failure	1. The sensor failure or short circuit 2. The wiring of sensor is loose	1. Re-fix the wiring of the sensors 2. Change the sensor
PP 04	Gas return sensor failure	1. The sensor failure or short circuit 2. The wiring of sensor is loose	1. Re-fix the wiring of the sensors 2. Change the sensor
PP 05	Ambient temperature sensor failure	1. The sensor failure or short circuit 2. The wiring of sensor is loose	1. Re-fix the wiring of the sensors 2. Change the sensor
PP 06	Exhaust piping sensor failure	1. The sensor failure or short circuit 2. The wiring of sensor is loose	1. Re-fix the wiring of the sensors 2. Change the sensor
PP 07	Antifreeze protection in Winter	Ambient temperature or water inlet temperature is too low	Normal protection
PP 08	Low ambient temperature protection	1. Beyond the scope of using environment 2. Sensor abnormality	1. Stop using, beyond the scope of using 2. Change the sensor
PP 10	Piping temperature too high protection under cooling mode	1. Ambient temperature is too high or the water temperature is too high in cooling mode 2. Refrigeration system is abnormal	1. Check the scope of using 2. Check refrigeration system
PP 11	Water temperature (T2) too low protection under cooling mode	1. Low water flow 2. T2 temperature sensor abnormal	1. Check water pump and waterway system 2. Change T2 temperature sensor

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 below:

Mode	Water out temperature	Setting 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)

Water pump running logic and error code 'ON'.

There are two options for water pump running.

Option 1: Water pump starts or stops in relation to heat pump operation.

Water pump starts 60s before compressor, water pump start 30s and then detect the water flow switch. When the heat pump enters standby mode, water pump will stop 60s after compressor stops. Water pump will restart to running for 3 min then stop when the standby time is over 2 hours.

HP working mode	Condition (Tset: Setting water temp. T1: Inlet water temp.)	Example: Tset = 28°C,	Water pump working logic
Heating mode	$T1 > Tset - 1$, and last for 30 min	$T1 > 27^{\circ}\text{C}$, last for 30 minutes	Water pump will enter standby mode for 2 hours and will not start except turn off power supply and restart. Heat pump will restart 3 minutes after the water pump exit the standby mode to detect the water temp. T1 again.
Cooling mode	$T1 < Tset + 1$, And last for 30 min	$T1 < 29^{\circ}\text{C}$, last for 30 minutes	Water pump will enter standby mode for 2 hours and will not start except turn off power supply and restart. Heat pump will restart 3 minutes after the water pump exit the standby mode to detect the water temp. T1 again.

In this case, it is unnecessary to deal with Error code 'ON' if 'ON' occurs in water pump's 2 hours standby period.

Option 2

No matter when the heat pump is on (running or standby), water pump will always be running.

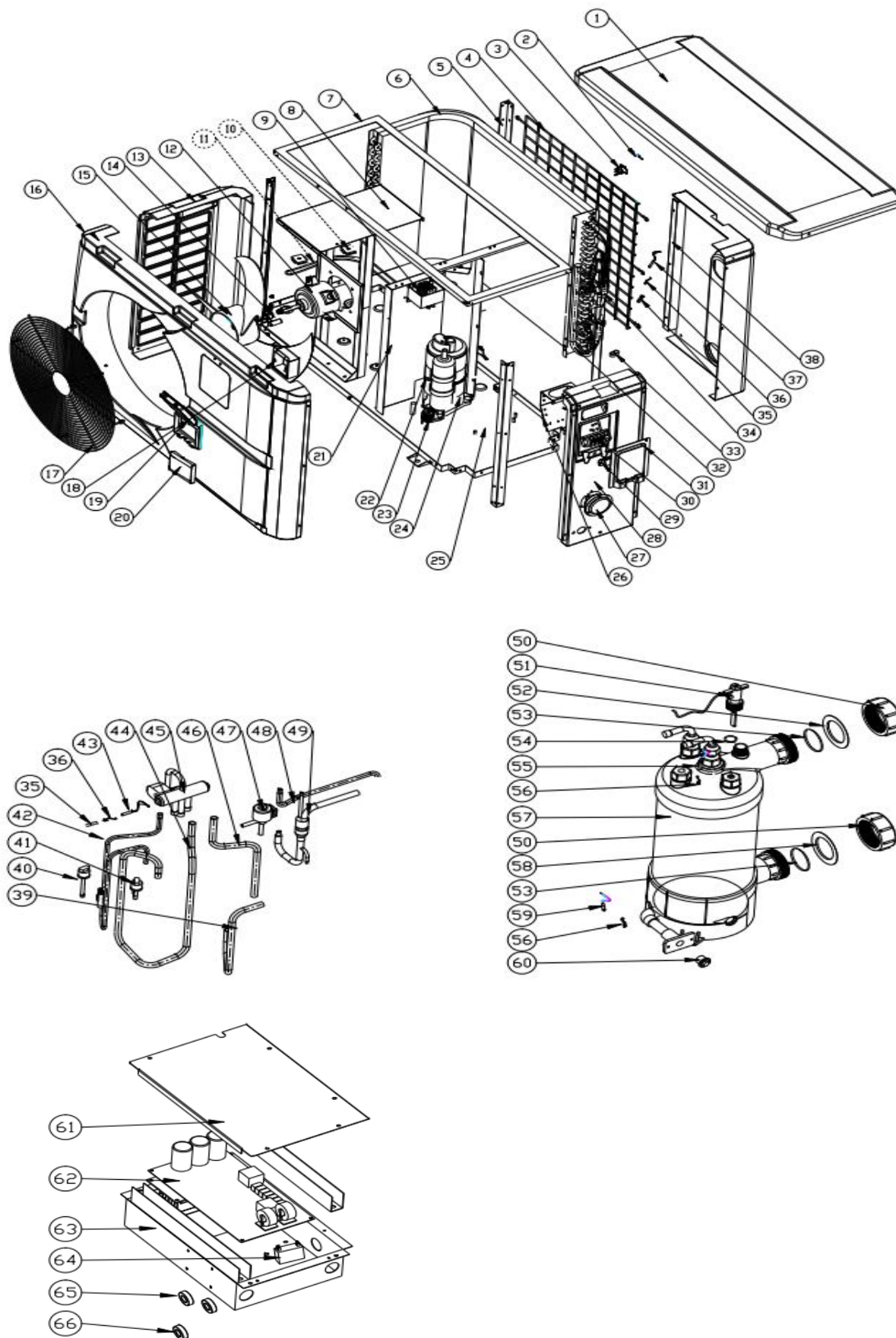
Water pump will run for 1 minute after manually turn off.

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.

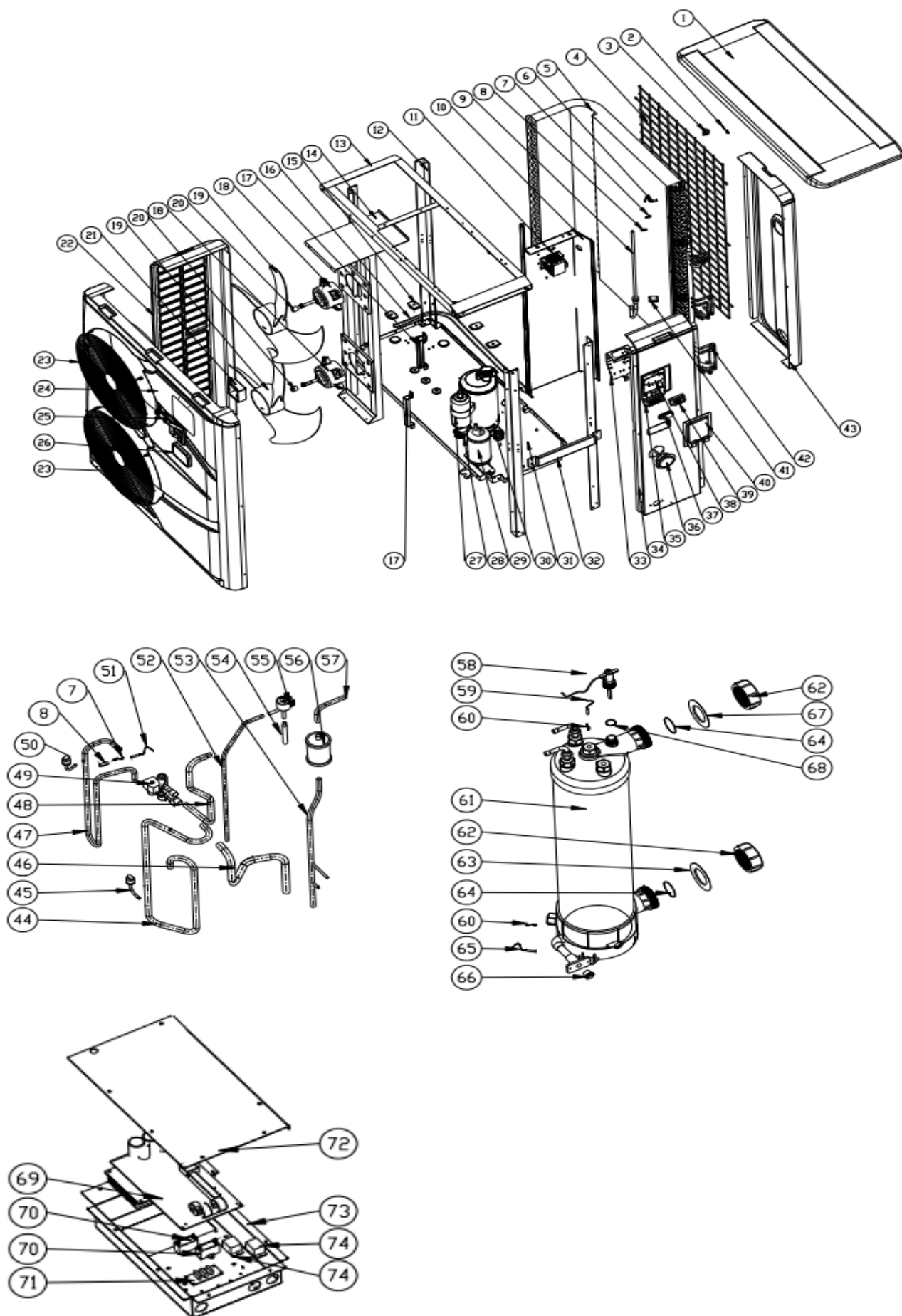
8. Exploded Diagram and Maintenance

Model Inverter 16



NO	Spare parts	NO	Spare parts
1	Top cover	34	Distribution piping
2	Ambient temp. sensor	35	Sensor casing pipe
3	Clip	36	Clip
4	Back grill	37	Coil temp. sensor
5	Pillar	38	Back panel
6	Evaporator	39	Pipe (4-way valve to exchanger)
7	Upper frame	40	High pressure switch
8	Fan motor bracket	41	Low pressure switch
9	Reactor	42	Exhaust pipe
10	Clip	43	Exhaust temp. sensor
11	Evaporator Heating Belt	44	Back gas piping
12	Fan motor	45	4-way valve
13	Left panel	46	Pipe (4-way valve to Gas collect)
14	DC motor casing tube	47	EEV
15	Fan blade	48	Pipe (EEV to Distribution)
16	Front panel	49	Pipe (Titanium exchanger to EEV)
17	Ventilation grid	50	Water connection
18	Controller box	51	Water flow switch
19	Water proof cover	52	Red rubber ring
20	Controller	53	O' ring
21	Isolation panel	54	Sealing ring for water flow switch
22	Compressor heating belt	55	Water outlet temp. sensor
23	Anti-vibration hammer	56	Clip
24	Compressor	57	Titanium heat exchanger
25	Base tray	58	Blue rubber ring
26	Terminal panel	59	Water inlet temp. sensor
27	Pressure gauge	60	Drainage plug
28	Right panel	61	Electric box cover
29	Clip	62	PCB
30	5-position terminal	63	Electric box
31	Terminal cover	64	N/A
32	Gas collecting piping	65	Magnetic ring
33	Rubber fixing block	66	Magnetic ring

Model Inverter 24



NO	Spare parts	NO	Spare parts
1	Top cover	38	Terminal panel Bracket
2	Ambient temp. sensor	39	Water pump 3-position terminal
3	Clip	40	Terminal cover
4	Back grill	41	Rubber fixing block
5	Evaporator	42	Gas collecting piping
6	Coil temp. sensor	43	Back panel
7	Clip	44	Back gas piping
8	Sensor casing pipe	45	Low pressure switch
9	Distribution piping	46	Pipe (4-way valve to Gas collect)
10	Isolation panel	47	Exhaust pipe
11	Reactor	48	Pipe (4-way valve to exchanger)
12	Pillar	49	4-way valve
13	Upper frame	50	High pressure switch
14	Fan motor bracket	51	Exhaust temp. sensor
15	Clip	52	Pipe (Liquid reservoir to EEV)
16	Evaporator Heating Belt	53	Pipe (Filter to Liquid reservoir)
17	Bracket for panel	54	Pipe (EEV to Distribution)
18	Fan motor	55	EEV
19	Fan blade	56	Filter
20	DC motor casing tube	57	Pipe (Titanium exchanger to filter)
21	Controller box	58	Water flow switch
22	Left panel	59	Water outlet temp. sensor
23	Ventilation grid	60	Clip
24	Front panel	61	Titanium heat exchanger
25	Water proof cover	62	Water connection
26	Controller	63	Blue rubber ring
27	Compressor	64	O' ring
28	Anti-vibration hammer	65	Water inlet temp. sensor
29	Liquid reservoir	66	Drainage plug
30	Compressor heating belt	67	Red rubber ring
31	Base tray	68	Sealing ring for water flow switch
32	Handle	69	PCB
33	Terminal panel	70	N/A
34	Right panel	71	Board
35	Power supply 3-position terminal	72	Electric box cover
36	Pressure gauge	73	Electric box
37	Clip	74	N/A

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 heat exchanger if HP unit will stop running for a long time (especially 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 cover.
- (6) When the unit is running, there is all the time a little water discharge under the unit.

10. Warranty and returns

10.1 Warranty

LIMITED WARRANTY

Thank you for purchasing a heat pump from us.

This warranty covers manufacturing and material defects in all components for a period of two years after the date of purchase.

This warranty is limited to the original purchaser in the retail sector. It is not transferable, and it is not applicable to products that have been removed from their original installation location. The liability of the manufacturer is limited to the repair or replacement of defective components and does not include the cost of labour for removing and replacing the defective component(s), the cost of transporting component(s) from or to the factory, or costs associated with other materials necessary for carrying out repairs. This warranty does not cover any defects attributable to the following causes:

1. Installation, operation or maintenance of the product other than in accordance with the guidelines and/or instructions in the Installation and Operation Manual supplied with the product.
2. Faulty or deficient work performed on the product by an installer.
3. Failure to maintain the correct chemical balance in the swimming pool [**pH between 7.0 and 7.8; total alkalinity (TA) between 80 and 150 ppm; free chlorine concentration between 0.5 and 1.2 mg/l; total dissolved solids (TDS) less than 1,200 ppm; maximum salt concentration 8 g/l**].
4. Improper use, modification, accident, fire, flood, lighting strike, rodents, insects, negligence, neglect, or force majeure.
5. Deposits, freezing, or other conditions that impair proper water flow through the product.
6. Operating the product with a flow rate outside the published minimum and maximum specifications.
7. Use of components or accessories not designed or made for this product.
8. Chemical contamination of the air used by the product or improper use of decontaminating chemicals, such as the addition of decontaminating chemicals through the skimmer or in the pipes or lines located upstream of the heat pump and the cleaning hose.
9. Overheating, improper electrical connections, improper power supply, secondary damage attributable to defective O-rings, diatomaceous filters or filter cartridges, or damage caused by putting the pump into operation in the absence of sufficient water.

LIMITATIONS ON LIABILITY

This is the sole warranty provided by the manufacturer. Nobody is authorised to grant other warranties in our name.

THIS WARRANTY REPLACES ALL OTHER EXPLICITLY GRANTED OR IMPLICIT WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY FORM OF IMPLICIT WARRANTY OF SUITABILITY FOR A PARTICULAR PURPOSE OR FITNESS FOR SALE. WE EXPLICITLY DISAVOW ANY LIABILITY FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL LOSS OR DAMAGE OF A PUNITIVE NATURE RESULTING FROM THE VIOLATION OF AN EXPLICITLY GRANTED OR IMPLICIT WARRANTY.

This warranty gives you specific legal rights, which may vary depending on the country.

WARRANTY CLAIMS

To ensure prompt handling of your warranty claim, please contact your dealer and provide the following information to the dealer: proof of purchase, model number, serial number and date of installation. The installer will contact the factory to obtain instructions regarding the procedure for making warranty claims and to find out the location of the closest service centre.

All returned components must be marked with a **RMA number** so that it can be determined whether they are covered by the warranty.

10.2 RMA request form

Company:				Date:	
Street address:					
City/town:		Postal code:		Country:	
Contact:				Phone:	
	E-mail:			Fax:	

Contact:		Date:	
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Reserved for internal use			
RMA no.:			
Assigned by:		Date:	

Reason for return:

Copy of customer invoice included? ☐

RMA request accompanied by other documents? ☐	
Description of the documents:	

Model no.:		Invoice no.:	
Serial number:		Invoice date:	
Problem:			

Warranty repair policy

1. Shipping costs for returned products must be paid in advance. All shipping costs associated with a return shipment are borne by you.
2. Products may be sent back to us only after prior approval by the company. Return shipments for which approval has not been given by the company will be sent back, with all shipping costs to be borne by you.
3. We will replace or repair the products and return them to you free of charge using the shipping service of your choice.
4. If you choose express shipment (by a shipping service selected by you), you are responsible for paying the shipping costs.

Return procedure

1. Before requesting an RMA number from us, please check whether you have properly observed the installation and use instructions in the manual.
2. Contact our RMA department by phone and ask for an RMA request form.
3. Ensure that **all** fields of the RMA request form are fully completed.
4. In the case of returns during the warranty period, please include the customer copy of your original sales invoice.
5. Send the RMA request form, the sales invoice and any other relevant documents (photos, etc.) to us or provide them by e-mail. An RMA number will be assigned to you within 24 hours after we receive the necessary documents. We may refuse to assign you an RMA number if the information mentioned in points 3 and 4 above is missing.
6. **The RMA number must be marked clearly on the shipping label of the package and noted on the shipping documents.**

7. All products received by us that lack labels or that have incorrect, incomplete or unreadable labels will be refused, with return shipping costs to be borne by you.
8. All packages delivered to us with clearly visible damage will be refused immediately.
9. Before returning products, please check that the products you intend to return to us are the same as the products for which an RMA number was issued. If the received products do not match the products registered under the assigned RMA number, we will return all of the products at your expense.
10. No return shipments at all will be accepted without an RMA number. Absolutely no exceptions to this rule are allowed.
11. **An RMA number remains valid for just 21 calendar days after it is assigned. We reserve the right to refuse to accept products returned to us if they are received more than 21 days after the date when the RMA number was assigned.**

Products not covered or no longer covered by the warranty

The customer is responsible for paying shipping and repair costs. The estimated repair costs will be advised after the problem(s) with the returned products have been diagnosed.

The minimum charge of a diagnosis is €50.00.

MegaGroup Trade Holding BV

Doornhoek 4205 – 5465 TG Veghel – The Netherlands

P.O. Box 430 – 5460 AK Veghel

– The Netherlands

<http://www.bosta-bevo.com>

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