

Swimming Pool Heat Pump XHP



INSTALLATION AND USER GUIDE



Read the instructions

VERZE 01 / REVIZE: 4. 10. 2016

Illustrative photo

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Thank you for choosing our product and for your trust in our company. To ensure that you can fully enjoy the product, please read these instructions carefully and strictly follow the user guide so as not to damage the device and to avoid unnecessary injuries.

1. Specification

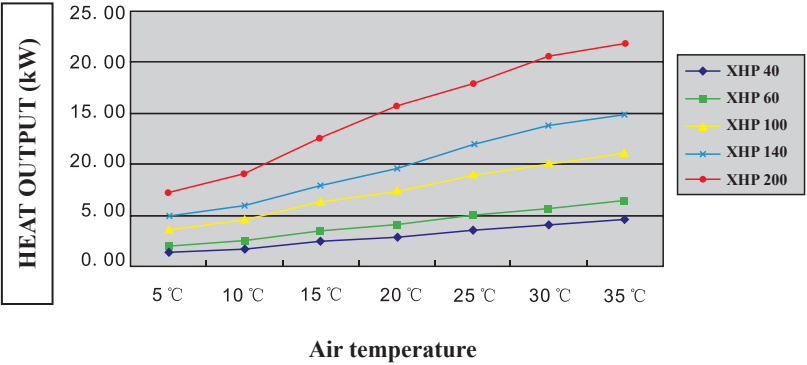
1.1 Horizontal EU design, R410A ,HEATING AND COOLING

Models	XHP 40	XHP 60	XHP 100	XHP 140	XHP 160	XHP 200
* Capacity at 25 °C/Water27 °C						
Heat Output (kW)	3,5	5	9	12	15	18
Power Consumption (kW)	0,56	0,8	1,44	1,92	2,4	2,88
COP	6,25	6,25	6,25	6,25	6,25	6,25
* Capacity at 15 °C/Water 27 °C						
Heat Output (kW)	2,56	3,65	6,57	9	9,45	13,5
Power Consumption (kW)	0,61	0,81	1,42	1,95	2,01	2,72
COP	4,2	4,5	4,6	4,6	4,7	5,0
Voltage (V)	220–240 V					
Rated Current (A)	2,8	4,1	6,7	9,3	9,6	14,2
Advised Fuse (A)	10	10	20	20	20	35
* Water data						
Advised pool volume (m³)	0-15	0-20	25-40	35-60	55-80	60-90
Advised water flux (m³/h)	4,2	4,2	6	8,4	9	10,2
Water pipe in-out spec (mm)	50					
* General Data						
Compressor	rotary					
Air flow	horizontal					
Condenser	titanium in PVC					
Cooling function	x	√	√	√	√	√
Noise level at 10 m (dB(A))	39	39	40	43	43	44
Noise level at 1 m (dB(A))	48	48	48	52	52	53
Water pressure (kPa)	12	12	15	15	15	16
Refrigerant (kg)	0,6	0,62	1,1	1,3	1,4	2,2
* Net Dimension						
Net Weight (mm)	750/290/500	930/350/550	930/350/550	1000/360/620	1045/410/695	1045/410/695
Čistá hmotnost (kg)	36	37	50	61	63	98
Packing Dimension (mm)	850/330/540	1060/380/590	1060/380/590	1120/380/660	1165/430/740	1165/430/740
Gross weight(kg)	39	40	53	65	67	110

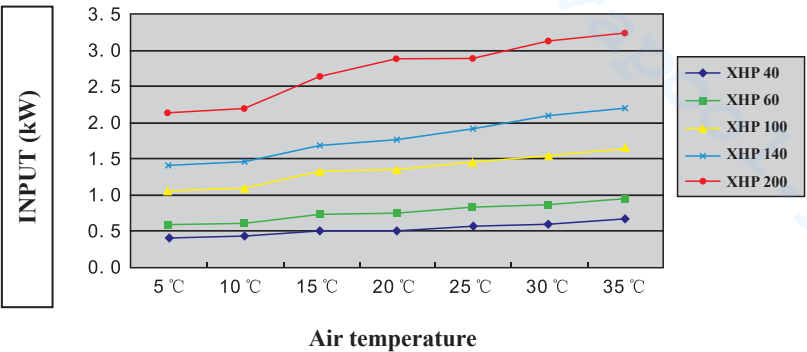
The above mentioned data subject to change without notice.

2. Performance curves

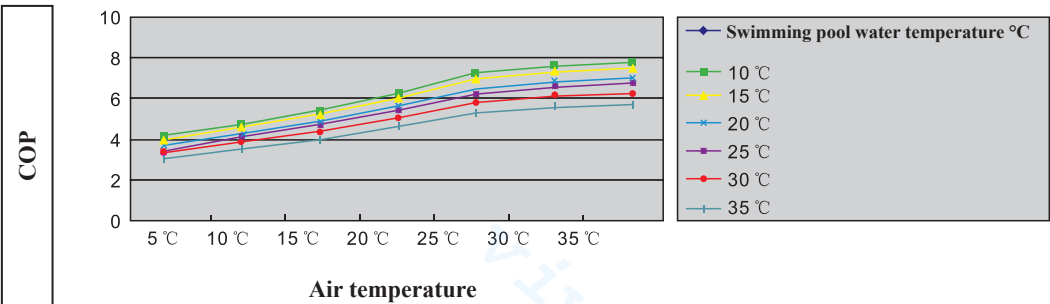
HEAT OUTPUT CURVE



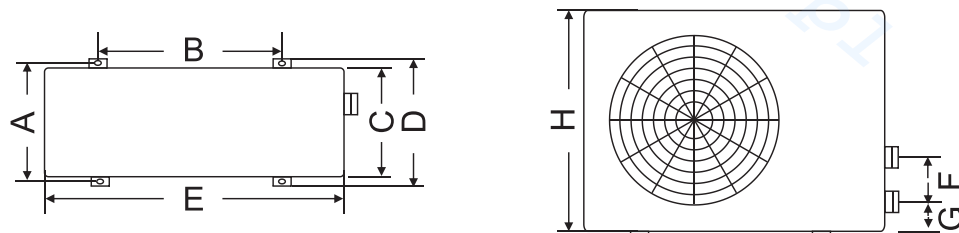
INPUT curve



COP curve



3. Dimensions

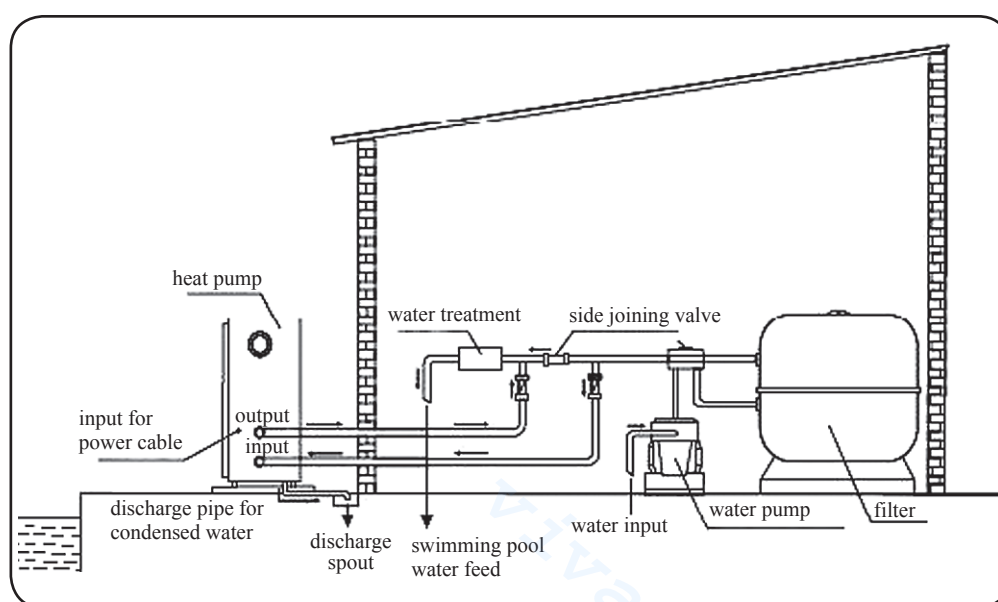


Models	XHP 40	XHP 60	XHP 100	XHP 140	XHP 160	XHP 200
A	290	330	330	330	410	380
B	410	650	650	655	690	690
C	265	286	286	306	366	366
D	290	360	360	360	410	410
E	750	935	935	1005	1046	1045
F	210	230	230	340	390	500
G	83	82	82	82	82	83
H	500	521	521	590	676	828

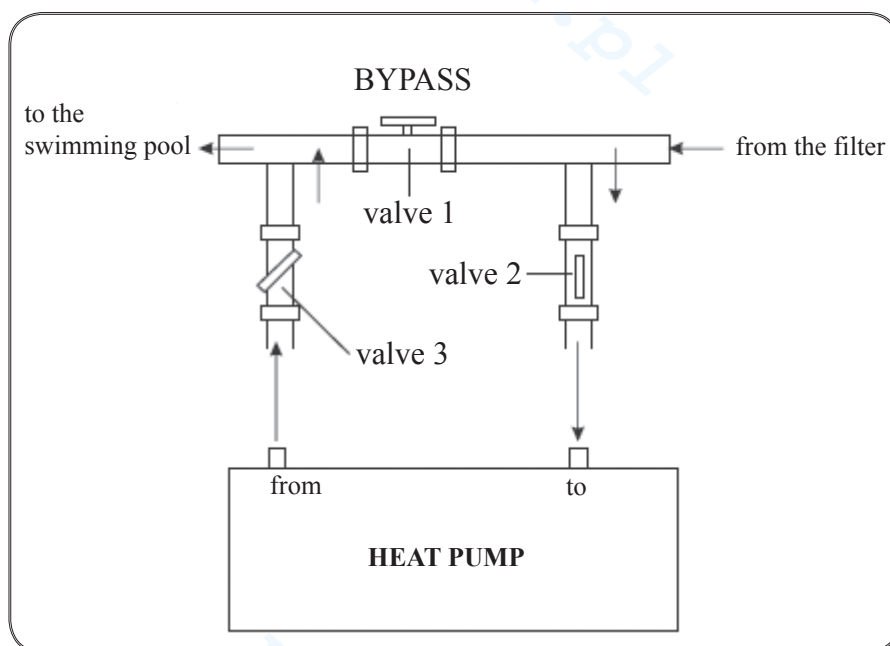
Unit: mm

4. Installation

4.1 Installation illustration



Discharge connection



NOTE: The manufacturer delivers only the heat pump system. Other items shown in the illustration are other necessary components of the water system provided by users or suppliers.

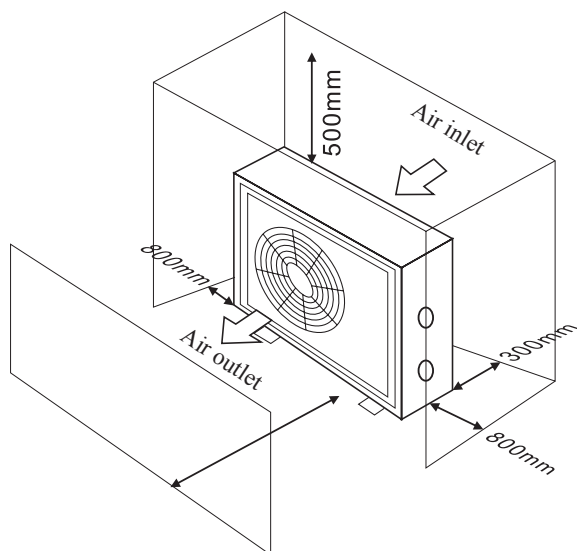
**ATTENTION:**

Please follow the steps below to put the heat pump into operation for the first time:

1. Open the valves to let water into the system.
2. Make sure there is no water leaking in the connections.
3. Run the heat pump with the circulating pump in operation.

4.2 Selection of the installation position

- It is recommended to install the heat pump in a sunny, spacious and well ventilated place.
- Its position has to guarantee the smooth circulation of air (the location of the air inlet is shown in the diagram below).
- When operated, the heat pump can produce a substantial amount of water condensate and therefore it is necessary to take its occurrence into account.
- The installation base has to be firm enough to ensure smooth operation of the device.
- Make sure the device, when installed, is situated vertically, without any inclination.
- Do not install the device in places where there is contamination, corrosive gas or where dirt or fallen leaves accumulate.
- The heat pump must not be installed in the vicinity of an environment with an inflammable or explosive atmosphere with common fire hazards.
- Maintain the distances from obstacles as indicated with arrows in the next figure.

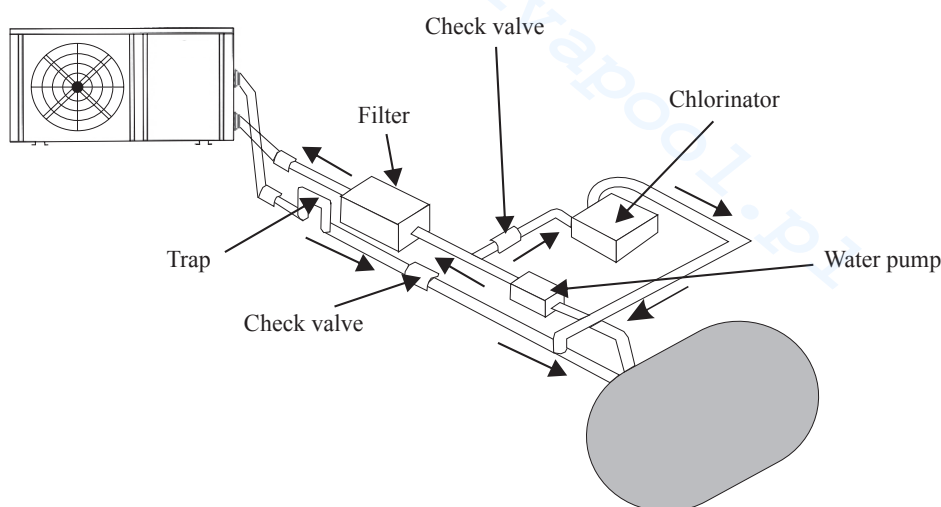


- The swimming pool heat pump is usually installed near the swimming pump at a maximum distance of 7.5 metres. If installed beyond this limit, the technology system (pipes) can cause higher heat losses. Most pipes are installed underground, and although the technology system (pipes) must be provided with thermal insulation, all tunnels and surrounding soil will still receive the heat, unless the ground is wet or the water level is high. A very rough estimate of heat losses for 30 metres (15 metres to and from the pump = 30 metres in total) amounts to 0.6 kW per hour (2,000 BTU) per 5°C of the water temperature difference in the swimming pool and the ground around the technology (pipes), which increases the run time by 3 to 5%.
- To achieve the best exchange of heat of the heat pump system, ensure normal water flow according to the specifications.

4.3 The position of chemical elements in the system is also fundamental to the service life of the heater.

If an automatic chlorination or bromination system is used, a trap must be installed downstream of the heater. A water seal must be installed between the chlorinator and the heater to prevent chlorine from returning into the heat pump (see the following figures).

Pressure chlorination or bromination

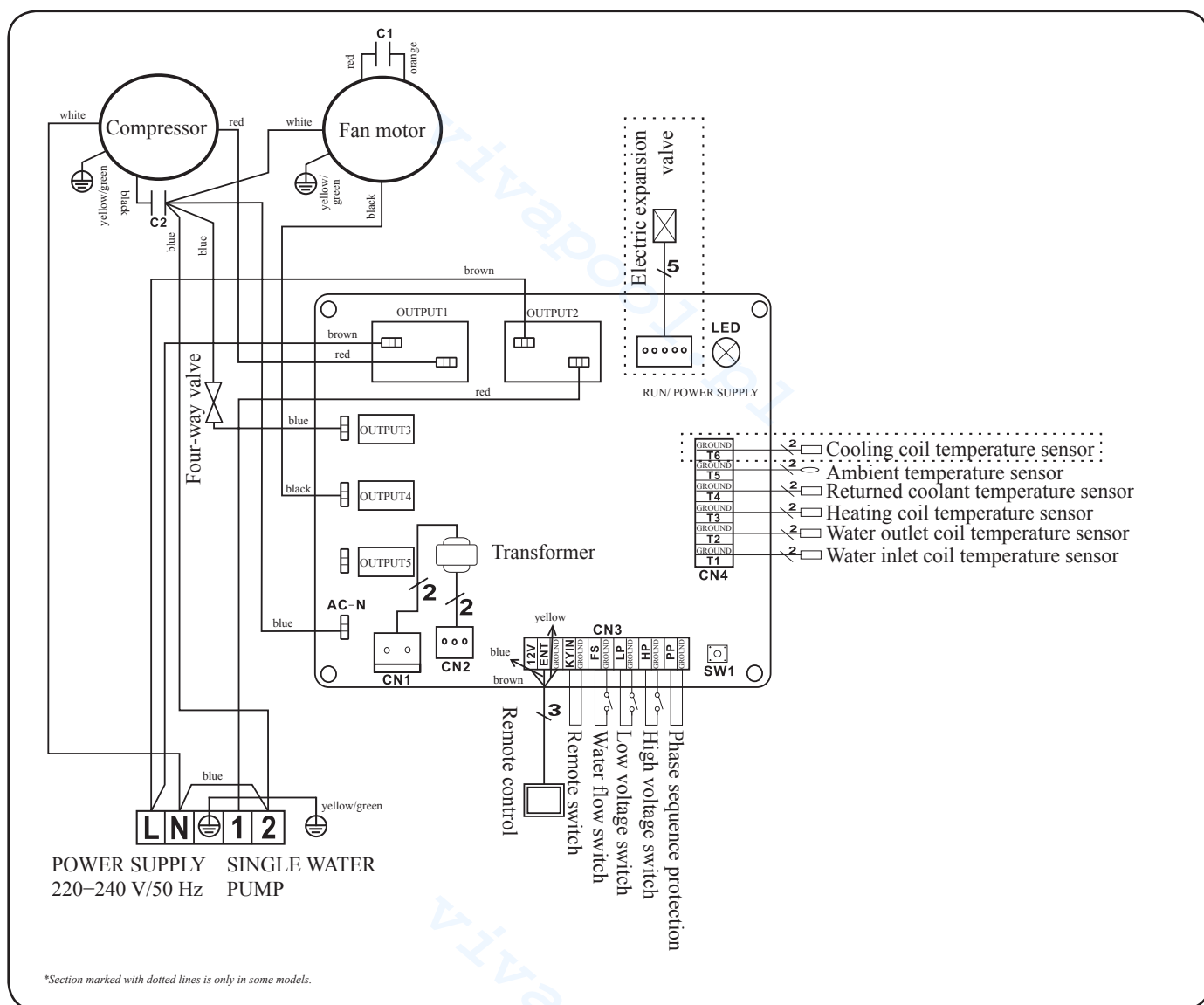


5. Electrical connection

5.1 Connection diagram for the swimming pool heat pump

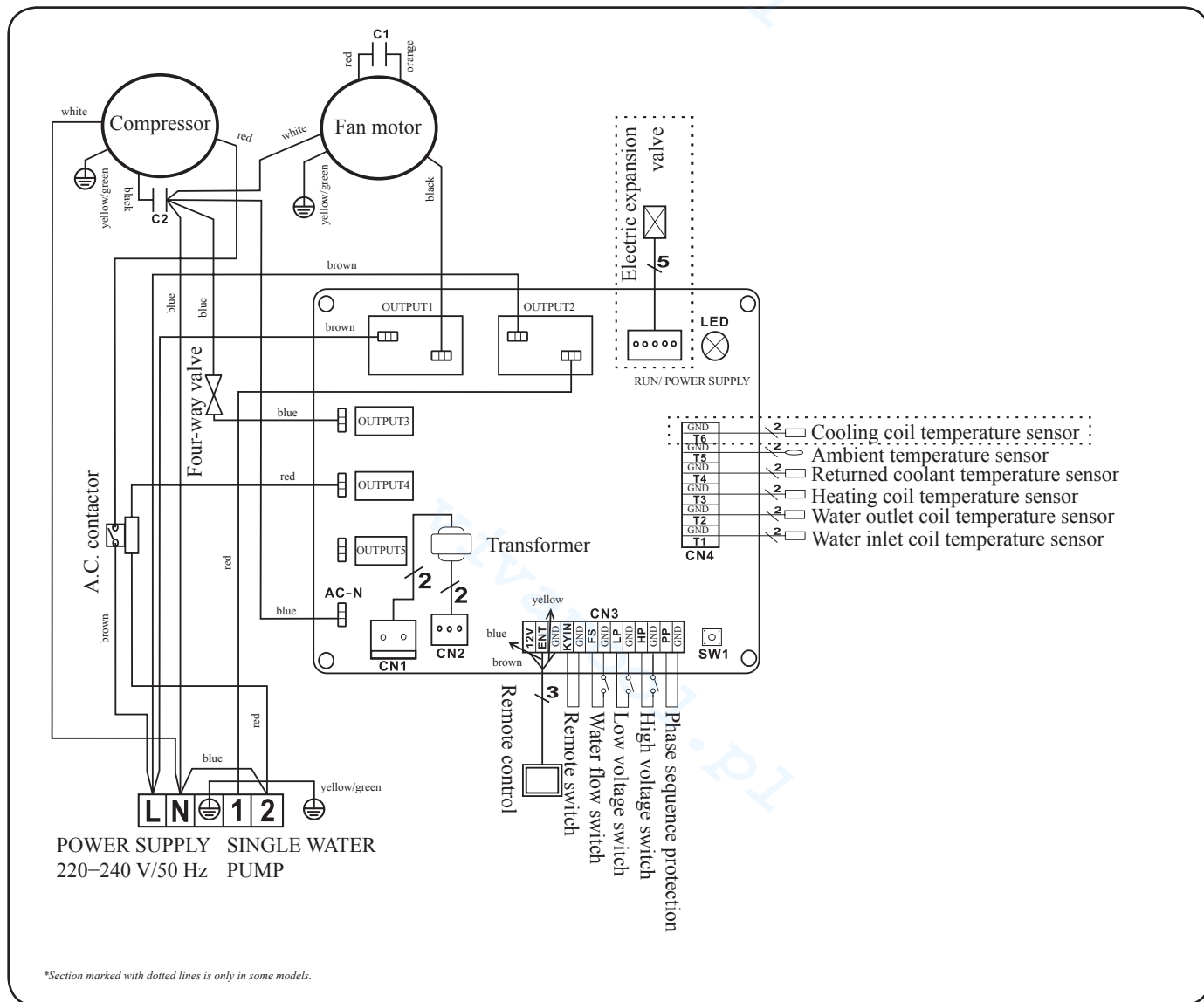
XHP 40, XHP 60, XHP 100

IMPORTANT: The installation and connection of this device to the power supply can only be provided by a person that has the electrical qualifications in accordance with Decree No. 50/1978 Coll. Although the heat pump is electrically insulated from the rest of the unit, this fact only prevents the passage of electrical current to or from the water in the swimming pool. It is still necessary to earth the unit, to prepend the circuit breaker with the current value according to the type of heat pump and current protector with residual current 0.03 A. Before connecting the heat pump, check whether the electrical mains voltage corresponds to the operating voltage of the heat pump.



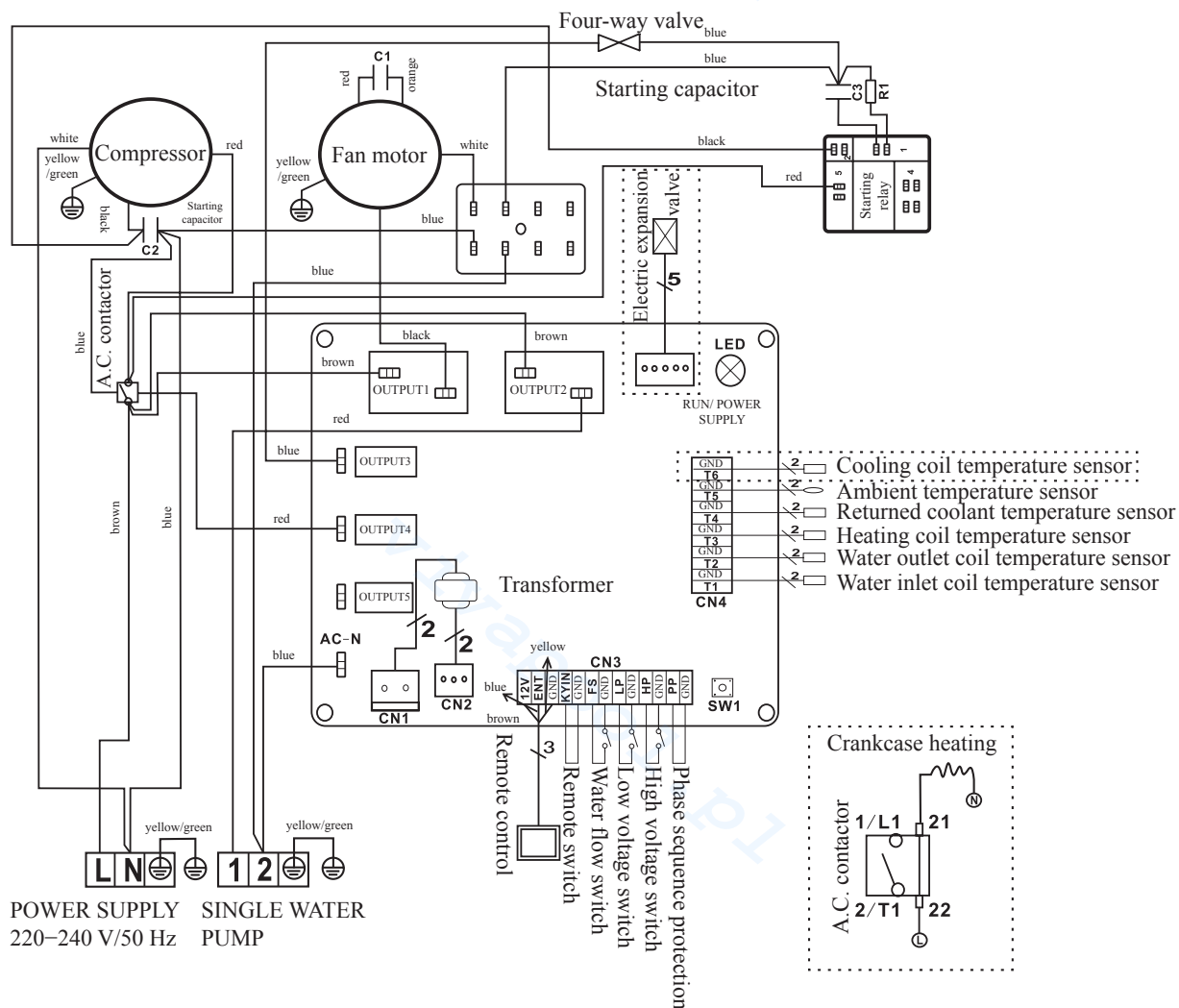
5.2 Connection diagram for the swimming pool heat pump

XHP 140



5.3 Connection diagram for the swimming pool heat pump

XHP 200



*Section marked with dotted lines is only in some models.

NOTE:

1. The above mentioned connection diagrams are for information only; please use the diagrams delivered together with the device.
2. The swimming pool heat pump has to be well earthed, although the heat exchanger unit is electrically insulated from the rest of the unit. In spite of that, it is still necessary to earth the unit to protect yourself against short-circuits inside the unit.

DISCONNECTION: A disconnecter for the unit (circuit breaker or switch with or without a fuse) must be in sight and easily accessible. This is a standard requirement applicable to both commercial and residential heat pumps. It prevents the unattended device from being remotely activated and allows for disconnection of the unit from the power supply during its maintenance.

6. Initial heat pump start-up and its winterization

NOTE: Please make sure that the filtration pump is running and provides the corresponding level of water flow.

THE START-UP PROCEDURE is completed after installation, so follow the steps below:

1. Switch on the filtration pump, check whether any water is leaking out and check the flow of water through the system.
2. Connect the power supply to the heat pump and then press the ON/OFF button. After several seconds, the heat pump should start up.
3. After the heat pump has been running for a few minutes, check whether the air coming out of its side is cooler (by 5 to 10°C).
4. When you switch off the filtration pump, the heat pump should also automatically switch off. If this is not the case, adjust the switch setting.
5. Let the heat pump and the swimming pool pump operate for 24 hours a day until the required water temperature is achieved. After the set temperature is achieved, the heat pump switches itself off. The unit automatically restarts (if the heat pump is working) if the water temperature in the swimming pool drops by more than 1°C.

Water flow switch:

The heat pump is equipped with a flow switch, which guarantees the functioning of flow. The flow switch controls the sufficient amount of water passing through the heat pump. This switch puts the heat pump out of operation if the water flow is too low in order to prevent the components of the heat pump from being damaged.

Time delay:

The heat pump is equipped with a built-in 3-minute protection against restart. Time delay control is an integral part of the control circuit, which limits restart cycles and contactor clicking.

Time delay automatically restarts the heat pump approximately 3 minutes after each interruption of the control circuit. Even a short power failure will activate the 3-minute restart delay and prevent the unit from activating before the expiry of a period of 3 minutes.

6.1 Heat pump 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. 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.
4. 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 3.

6.2 Starting up the heat pump again after winter

Before starting the heat pump after winter, first check the technological system (pipes) for passage through. Also check whether or not the technological parts show any mechanical or other damage.

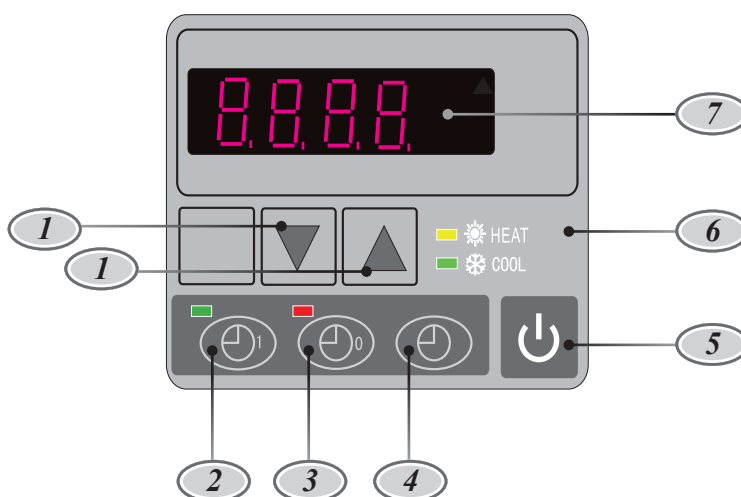
1. First check whether or not there are any pollutants in the pipes and whether or not there are any structural problems.
2. Check whether or not the connection parts for water intake and outlet are properly secured to the heat pump.
3. Start up the filtration pump in order to start the flow of water to the heat pump.
4. Reconnect the power supply to the heat pump and switch it on. Fully open valves 2 and 3 of the bypass. Keep the circulating pump running until it is full of water. On initial startup, there is bound to be air present in the technology.

7. Setting operating data


7.1 Heating only operation

7.2 Control display functions

1. up and down arrows
2. timer on button
3. timer off button
4. clock button
5. on/off button
6. operating mode display
7. LED display



7.3 How to identify the operating parameters (in the event of switching off the heat pump, the LED display shows real time)

- (1) press the  button for 5 seconds and enter the operating parameters interface
- (2) in this interface, use the up and down arrows to check the parameters
- (3) the temperature of the incoming water (in “on” state) or time (in “off” state) appears on the LED display after 8 seconds
- (4) press the up or down arrows in the current mode to change the water temperature setting both in the on and off states
- (5) if the pump is running, the LED display shows the temperature of the incoming water and the current mode



Parameter 0

setting the temperature for the incoming water in cooling mode 8 to 35°C, (default setting is 28°C)



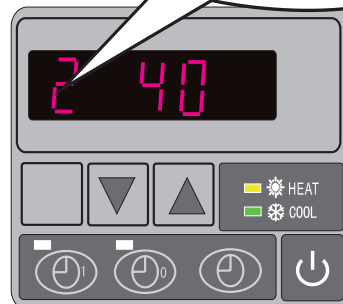
Parameter 1

setting the temperature for the incoming water in heating mode 15 to 40°C, (default setting is 28°C)



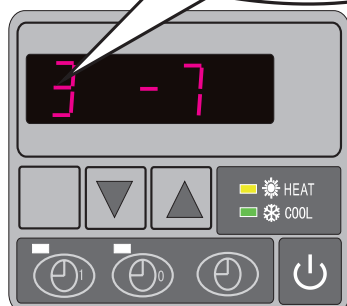
Parameter 2

total operating time for the compressor after defrosting 30 to 90 minutes, (default setting is 40 minutes)



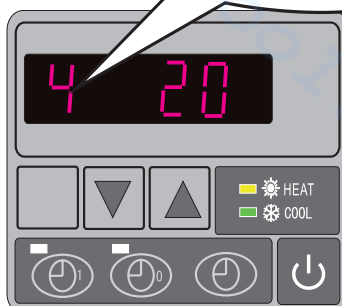
Parameter 3

conditions for activating the defrosting function -30 to 0°C, (default setting is -7°C)



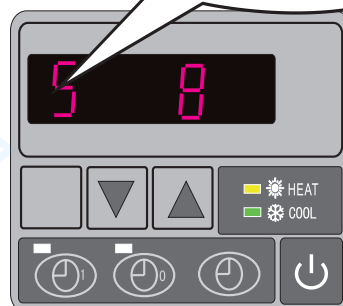
Parameter 4

conditions for deactivating the defrosting function 2 to 30°C, (default setting is 20°C)



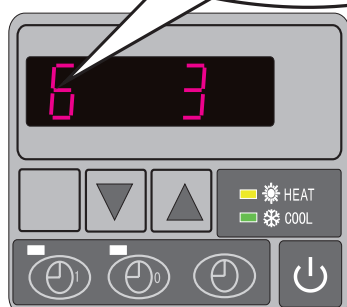
Parameter 5

defrosting function deactivation time 1 – 12 minutes, (default setting is 8 minutes)



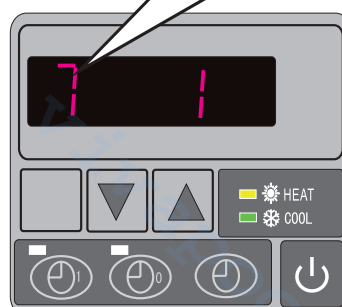
Parameter 6

mode 0: cooling, 1: heating and cooling, 2: heating and cooling and auxiliary heating, 3: heating, (default setting 3 heating)



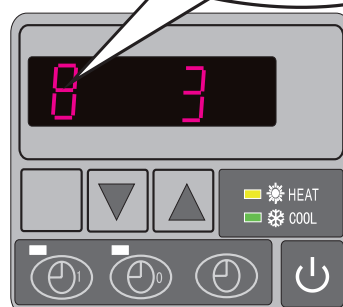
Parameter 7

selecting the electronic expansion valve mode 0 and 1, (default setting 1 – automatic)

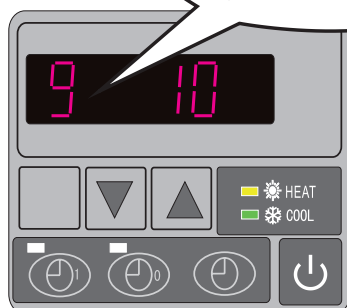


Parameter 8

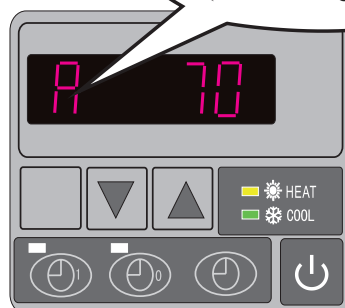
heat target for super performance in the range of -15 to 15°C, (default setting 3°C)



Parameter 9
 heat target for super
 performance -15 to 15°C,
 (default setting 10°C)

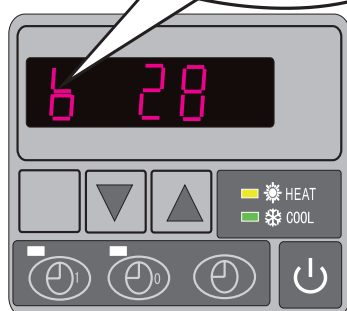


Parameter A
 manual setting of the interval for the
 electronic expansion valve 18 to 94,
 (default setting 70 (*5))

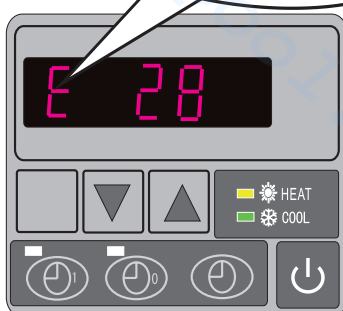


7.4 How to identify the current mode?

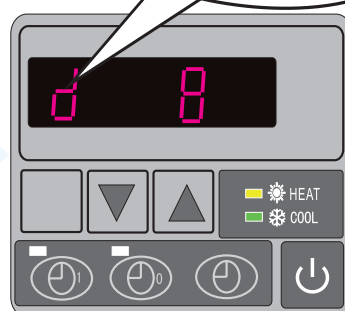
Parameter B:
 temperature of incoming water



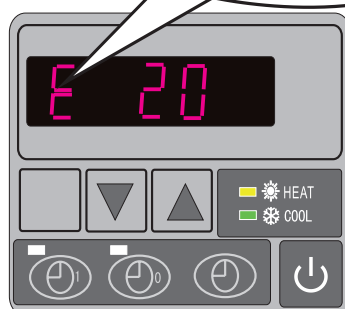
Parameter C:
 temperature of outgoing water



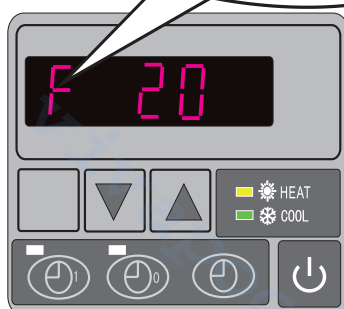
Parameter D:
 capacitor temperature



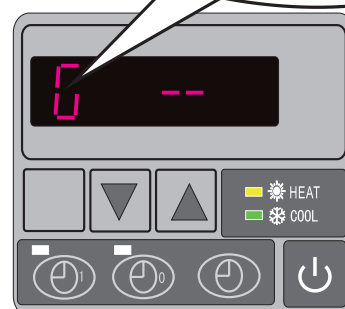
Parameter E:
 temperature of returned gas

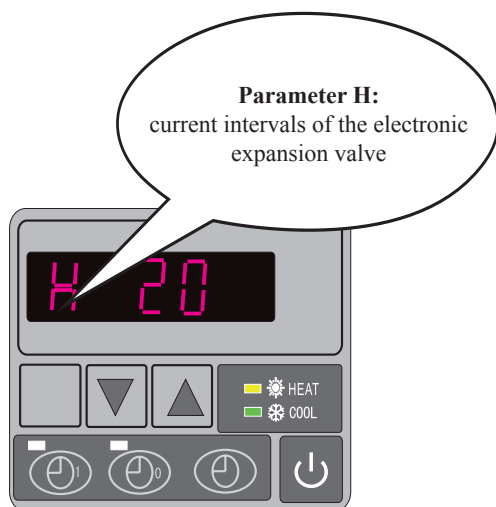


Parameter F:
 ambient temperature



Parameter G:
 capacitor temperature in cooling



**NOTE:**

1. press the up or down arrow to check the temperature of incoming water, temperature of outgoing water, capacitor temperature, temperature of returned gas, ambient temperature, current intervals of the electronic expansion valve
2. when the heat pump is off, the display shows current time


7.5 Setting the water temperature

In the current mode, press the up or down arrows to set the water temperature, even if the heat pump is off.

7.6 Setting the locking function





Press the up and down arrow simultaneously to lock the setting. To unlock the setting, press the arrows again simultaneously.

7.7 Setting the clock





Press the  button to set the clock and use the up and down arrows to select the values.

To save this setting, press the  button again

7.8 Setting the activation of the timer

Press the  button to set the time for switching on the heat pump and press the up or down arrow to set the interval timing. To save this setting, press the  button again. If the LED of this  button is on, then press the  button to cancel the setting of the timer.

7.9 Setting the deactivation of the timer

Press the  button to set the time for switching off the heat pump. Press the up and down arrows to set the time for the switch-off and press the  button to save this setting. If the LED of this  button is on, then press the  button to cancel the setting of the timer.



ATTENTION:

- It is necessary to check the heat pump operation parameters after the installation and before the first use.
- When the heat pump is running, the LED display shows the temperature of incoming water.
- If you switch off the heat pump using the On/Off button on the control LED display, thus putting the heat pump into the STANDBY mode, the LED display will show the clock.
- The water temperature may be adjusted when the heat pump is running. Other parameters may only be changed when the heat pump is in the STANDBY mode.

Parameter	Meaning	Range	Factory setting	Notes
0	Setting the temperature of incoming water in cooling mode	15–35°C	28°C	Adjustable
1	Setting the temperature of incoming water in heating mode	15–35°C	28°C	Adjustable
2	Defrost cycle	30–90 min	40 min	
3	Conditions for activating the defrosting function	–30 to 0°C	–7°C	
4	Conditions for deactivating the defrosting function	2 to 30°C	20°C	
5	Defrost termination time	1 to 12 min	8 min	
6	Mode: 0 cooling, 1 heating and cooling, 2 heating and cooling + auxiliary electric heating, 3 heating	0–3	3 (heating)	
7	Electronic expansion valve mode selection	0–1	1 (automatic)	
8	Rapid mode for target heating	–15 to 15°C	3°C	
9	Rapid mode for target cooling	–15 to 15°C	–2 °C	
A	Intervals for manual adjustments of the electronic expansion valve	18–94	70	
B	Temperature of incoming water	–9 to 99°C		Accurate value setting
C	Temperature of outgoing water	–9 to 99°C		Accurate value setting
D	Capacitor temperature in the heating mode	–9 to 99°C		Accurate value setting
E	Temperature of returned gas	–9 to 99°C		Accurate value setting
F	Ambient temperature	–9 to 99°C		Accurate value setting
G	Capacitor temperature in the cooling mode	–		
H	Actual intervals of the electronic expansion valve	N*5		Accurate value setting

NOTES:

1. If the heat pumps stops for 30 seconds, the filtration pumps shuts down automatically, if connected.
2. You can also control the filtration pump via the control LED display, provided that the filtration pump is properly connected to the heat pump via the “PUMP” terminal.
3. In the event of using a 3-phase pump, a special 3-phase converter should be used.

8. Troubleshooting

8.1 Error codes shown on the controller with LED display

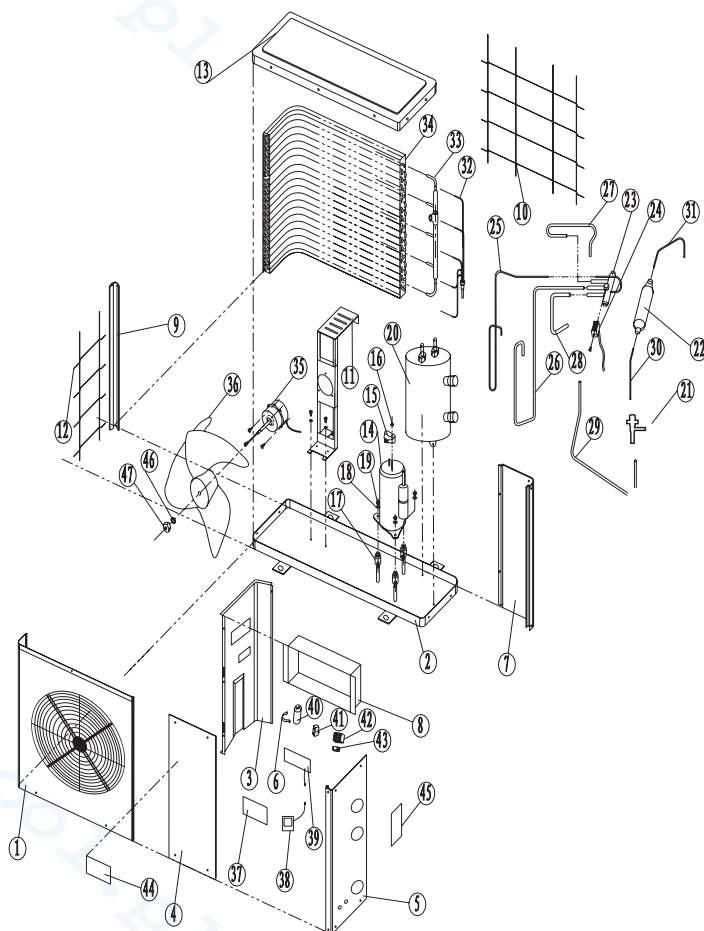
Fault	Cable controller	Cause	Solution
Defect to the temperature sensor for incoming water	PP1	The sensor is either open or short-circuited.	Check or replace the sensor.
Defect to the temperature sensor for outgoing water	PP2	The sensor is either open or short-circuited.	Check or replace the sensor.
Defect to the sensor for capacitor heating	PP3	The sensor is either open or short-circuited.	Check or replace the sensor.
Defect to the sensor for returned gas	PP4	The sensor is either open or short-circuited.	Check or replace the sensor.
Defect to the sensor for ambient temperature	PP5	The sensor is either open or short-circuited.	Check or replace the sensor.
Too large temperature difference between the inlet and outlet of water	PP6	Insufficient water flow or too low pressure difference.	Check the volume of water flow and whether or not the water passes through.
Too low temperature of outgoing cooling water	PP7	Insufficient water flow	Check the volume of water flow and whether or not the water passes through.
First stage of the frost protection system	PP7	The ambient temperature or the temperature of incoming water is too low.	The pump will run automatically during the first stage of the frost protection system.
Second stage of the frost protection system	PP7	The ambient temperature or the temperature of incoming water is too low.	The heat pump will start heating during the second stage of the frost protection system.
Defect to the sensor for cooling capacitor	PP8	The sensor is either open or short-circuited	Check or replace the sensor.
Protection against high pressure	EE1	1. Too much coolant 2. Insufficient air flow	1. Remove the excess coolant from the heat pump system. 2. Clean the air exchanger.
Protection against low pressure	EE2	1. Lack of coolant 2. Insufficient flow 3. Clogged filter or capillary tubes	1. Check the gas for leakage, add the coolant. 2. Clean the air exchanger. 3. Change the filter or replace the capillary tubes.
Defect to the sensor for water flow	EE3	No water / lack of water	Check the volume of water flow and the pump.
Wrong power supply connection (for 3-phase unit)	EE4	Wrong or incorrect connection	Check the connection and power supply cable.
Inlet and outlet temperature difference error	EE5	Insufficient water flow or too low pressure difference	Check the volume of water flow and whether or not the water passes through.
Communication error	EE8	Wrong connection of cables	Check the connection of cables.

8.2 Other faults and solutions (with no display on the controller with LED)

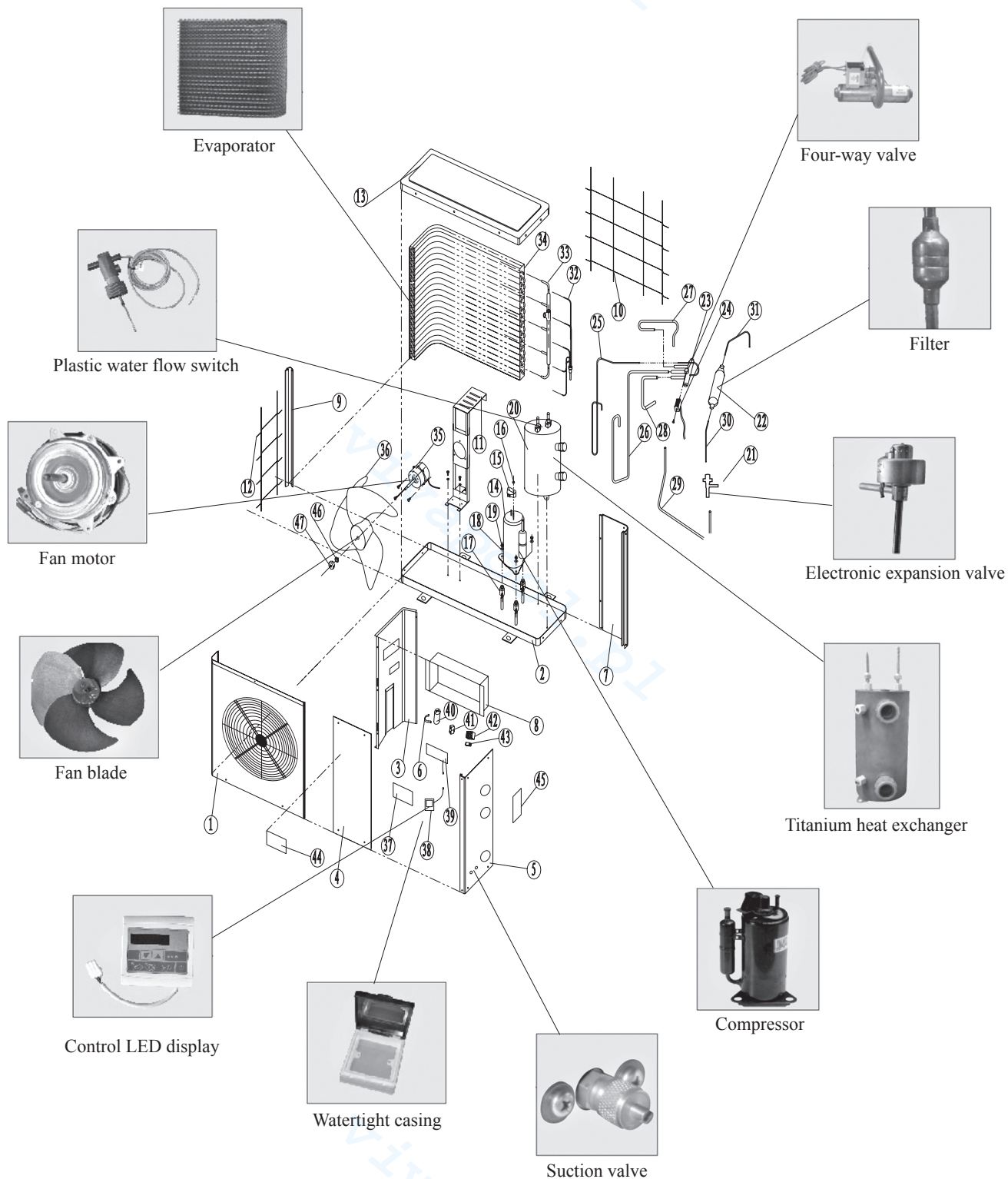
Fault	Display	Cause	Solution
The heat pump is not working	The LED display shows nothing.	No power supply	Check the connection of the cable and the circuit breaker.
	The LED display shows the current time.	The heat pump is in the standby mode.	Start up the heat pump.
	The LED display shows the actual water temperature.	1. The water temperature reaches the set value; the heat pump is in the constant temperature mode. 2. The heat pump has just started up. 3. Defrosting is in progress.	1. Check the setting of the water temperature. 2. Start up the heat pump after several minutes. 3. The LED display should show "defrosting".
There is a drop in water temperature when the pump is running in the heating mode.	The LED display shows the water temperature, but no error code.	1. Incorrect mode is selected. 2. The values indicate a fault. 3. Controller failure	1. Correct the running mode. 2. Replace the defective cable controller with the LED display, then check the condition after the change of the running mode, and check the inlet and outlet water temperature. 3. Replace the defective main controller.
Short run	The LED display shows the water temperature, but no error code.	1. The fan is not running 2. Insufficient air ventilation 3. Lack of coolant	1. Check the cable connections between the motor and the fan, and replace them, if necessary. 2. Check the location of the heat pump unit and remove any obstruction preventing from good air ventilation. 3. Replace or repair the heat pump unit.
Water pollution	Water pollution on the heat pump unit	1. Water leakage	1. Carefully check the titanium heat exchanger for damage.
Too much ice on the evaporator	Too much ice on the evaporator	1. Insufficient air ventilation 2. Lack of coolant	1. Check the location of the heat pump unit and remove any obstruction preventing good air ventilation. 2. Replace or repair the heat pump unit.

9. Schematic representation and list of parts

Num	Component name	Num	Component name
1	ventilation panel	25	air outlet hose
2	base	26	air return hose
3	central panel	27	titanium tube to the four-way valve E
4	front panel	28	air collection tube from the four-way valve C to the capacitor
5	side panel	29	tube from the capillary tubes to the liquid separator
6	capacitor terminal	30	tube from the filter to the capillary tubes
7	rear panel	31	tube from the filter to the titanium tube
8	terminal board	32	liquid separator assembly
9	rear support rod	33	air connection tube assembly
10	rear grid	34	capacitor
11	motor console	35	fan motor
12	side grid	36	fan blade
13	top cover	37	wiring diagram
14	compressor	38	control panel
15	compressor cover	39	controller
16	nut	40	compressor capacitor
17	shock-proof gasket	41	fan capacitor
18	compressor gasket	42	cable terminals
19	nut	43	cable clamp
20	titanium heat exchanger in PVC	44	logo
21	electronic expansion valve	45	name plate
22	filter	46	spring washer
23	Four-way valve	47	nut
24	four-way valve connection		



10. Spare parts 1





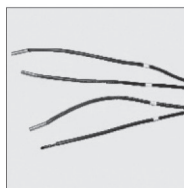
10. Spare parts 2



manometer



fan motor capacitor



temperature sensors



high pressure valve



low pressure valve

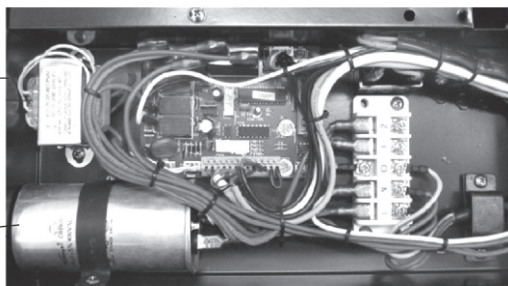


control unit

11. Cabling diagram (example – XHP 60)

Transformer

Compressor capacitor



Panel (main controller)

12. Replacement of parts



Filter



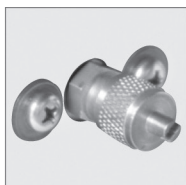
Electronic expansion valve



High pressure valve



Low pressure valve



Suction valve



Manometer

IMPORTANT WARNING:

The components of the heat pump can only be replaced and repaired by a specialized company or an authorized service centre.

Do not attempt to remove any defects yourself. There is a risk of electrical accident or other hazards.

The device and its components are under constant pressure.

INSTRUCTIONS FOR REPLACEMENT:

1. It is necessary to remove all the coolant from the heat pump unit before replacing/changing the manometer, filter, high/low pressure valve, suction valve and the electronic expansion valve.
2. The replacement can only be carried out when the internal pressure of the system equals the normal atmospheric pressure.
3. After the filter, high/low pressure valve, suction valve or the electronic expansion valve has been replaced/changed, silver-solder the connection.
4. Test the gas for leakage under high pressure. (For testing purposes, it is recommended to fill the heat pump unit with the N₂ gas.)
5. After the high-pressure test has been completed, suck the gas out of the heat pump unit.
6. Then refill it with the coolant in the volume as indicated in the unit specifications.
7. Use the detector to recheck the gas for leakage.
8. Complete the replacement and then check the operating data by starting up the unit.

**Warranty terms and conditions**

The warranty conditions are governed by your supplier's trade and warranty terms and conditions.

Safe disposal of the product after its service life

After its service life is over, have the product disposed of ecologically by a specialized company.

**Claims and servicing**

Claims are governed by applicable consumer protection legislation. In the event a fault cannot be rectified, please contact your supplier in writing.

Date.....

Supplier

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