CLIM8Z@NE Water group

Heat Pump For Spas User and Service Manual



E R32

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Thank you for using our heat pump for the heating of your spa, it will heat your spa water and keep a constant temperature when the ambient air temperature is at -20-43 $^{\circ}$ C

lacksquare ATTENTION: This manual includes all the necessary information about the use and

the installation of your heat pump. The installar must read the manual and attentively follow the

The installer must read the manual and attentively 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 against the manual implies the exclusion of the entire guarantee.

The manufacturer declines any responsibility for the damage caused by people, objects and errors due to the installation against the manual. Any use that isn't in accordance with the origin of its manufacturing will be regarded as dangerous.

#### WARNING:

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

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.) Do not pierce or burn.

Be aware that refrigerants may not contain an odour.

This heat pump shall be installed, operated and stored in a open room larger than 3 m<sup>3</sup>. Note the manufacturer may provide other suitable examples or may provide additional information about the refrigerant odour.

 WARNING: If you power off heat pump, please empty the water in heat pump always during winter time or when the ambient temperature drops below 0°C, or else the titanium heat 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 keep the display controller in a dry area, or close the insulation cover to protect the display controller from being damaged by humidity.

## 1. Specifications

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			Ca Body s	Water	Net weig		Anti-e	IP Gradu	Advised	Minim	Ra		nearing	C))+::;;			nearing.			Proc
Power supply	Refrigerant	Compressor	Cabinet material Body size (W*D*H) (mm)	Water connection (mm)	Net weight/Gross weight (kg)	Noise (dB(A))	Anti-electric shock rate	IP Grade (Water proof rate)	Advised water flow (m³/h)	Minimum fuse current (A)	Rated current (A)	COP	Input power (kW)	Heating capacity (BTU/h)	Heating capacity (kW)	СОР	Input power (kW)	Heating capacity (BTU/h)	Heating capacity (kW)	Product model
230V/1ph/ 50Hz or 60HZ	R32	Rotary	Galvanized steel (painted in dark gray) 850*407*414	φ50	54/66	52-40	-	IPX4	2.7	10	4.4	4.56-7.19	0.89-0.18	15980-6120	4.7-1.8	5.85-13.3	1.12-0.21	21420-8160	6.3-2.4	BWGHP-010

\* Above data are subjects to modification without notice.

15°C, Humidity 70%.

26°C, Humidity 80%.

Remark:

Power supply Condenser

230V/1ph/ 50Hz or 60HZ Titanium tube in PVC shell

Heating\*: Inlet water temperature 26  $^\circ \!\! \mathbb{C}$  , Outlet water temperature 28  $^\circ \!\! \mathbb{C}$  , Dry bulb temperature

Heating\*\*: Inlet water temperature 26  $^\circ \!\! \mathbb{C}$  , Outlet water temperature 28  $^\circ \!\! \mathbb{C}$  , Dry bulb temperature















2.2 Exploded views

# 3. Installation and connection

#### 3.1 Notes

or the installer. The factory only supplies the heat pump. All other components must be provided by the user

#### 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
- 2. Always place the heat pump on a solid foundation and use the provided rubber feet to heat pump.
- ω avoid vibration and noise. 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's location

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 distances.



**Snow Installation Location Reminder** 

When there is heavy snow in the place where the heat pump is used, there must be a highest snow height. See the figure below for details. mounting bracket under the unit, and the height of the bracket must be higher than the



# 3.3 Electrical connection

Note: Earthing is 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 required voltage of the

terminal block below. This allows the water pump or electric heater to be controlled by the An auxiliary electric heater and water pump (max. 5 A / 240 V) can be connected to the It is recommended to connect the heat pump to a circuit with its own fuse or circuit breaker. heat pump. heat pump.



# 3.4 Initial operation

Note: In order to heat the water in the pool (or hot tub), the water pump must be running to cause the water to clrculate 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 water pump. Check for leaks and verify that water is flowing from and to the pool.
- 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.
- When you turn off the water pump, the unit should also turn off automatically, if not adjust the flow switch.
- 5. Allow the heat pump and the water pump to run 24 hours a day until the desired water temperature is reached. The heat pump will stop running at this point. After this, it will restart automatically (as long as the water pump is running) whenever the pool water temperature drops 1 degree below the set temperature.

Depending on the initial temperature of the water in the pool and the air temperature, it may take many hours or even more than one day to heat the water to the desired temperature. A good pool cover can dramatically reduce the required length of time.

### Water Flow Switch:

It is equipped with a flow switch to prevent the heat pump of running with inadequate water flow rate. It will turn on when the pool pump runs and shuts off when the pump shuts off. If the pool water level is more than 1m 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.

### 3.5 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 liters per hour at high relative humidity. This is sometimes mistakenly regarded as a water leak.



#### NOTE

4. Electrical Wiring

(1)The above electrical wiring diagrams are only for your reference, please subject the heat pump to the posted wiring diagram.

(2)The heat pump must be earthed well. Earthing the unit is still required to protect you against short circuits inside the unit.

**Disconnect:** A disconnector (circuit breaker, fused or un-fused switch) should be located within sight of and easily 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 to the unit while the unit is being serviced.

# 5. Controller's Operations

No.

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LED Display Controller

### 5.1 Overview

The controller is specially designed for the heat pump, with features as below:

- Heating and cooling mode;
- Could show and change the running and setting parameters of the system, easy for user to install and test;
- With automatic protection and fault warning function;
- With strong system protection function, like compressor delay protection, high pressure, low pressure, sensor protection, water flow detect, and etc.;
- The communication distance between the heat pump unit and wire controller should be less than 100 meters. The communication port is RS485;
- Strong anti-interference, stable performance.

## 5.2 Basic Model of System Control Chart © System Chart



### Control Principle

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- The heat pump runs according to the wire controller's order
- The wire controller could change the running parameters and send the running parameters to the heat pump
- The heat pump could detect the running condition and send the information or fault to the wire controller

### 5.3 Wire Controller



### O Basic Icons

- 1. When it's under heating mode, CHEAT turns on
- 2. When it's under cooling mode, COOL turns on
- 3. When it's under defrosting mode, HEAT turns on and twinkles
- When it's under off status, the display shows the current time

# Key Operating Instruction

# 1) "Key On/Off

- When it's in other interface, press this button shortly, it will go back to the main interface.
- In the main interface, press this key to turn on/off
- ۲ In the main interface, press this key for 5 seconds to set the timer, when hour on nixie tube flashes, you can set hour of "Timer on", the corresponding icon of "Timer

setting, press key "Mode"to go to set hour of "Timer off", the corresponding icon of shortly to go to set minute of "Timer on", press "2, 2" to set minute. When finish on" flashes, press "  $\blacktriangle$  ,  $\overleftarrow{}$  " to set hour. When finishing setting, press key " M "

shortly to go to set minute of "Timer off", press "▲, ▼" to set minute. After setting "Timer off" flashes, press "🏊 🔽" to set hour. After setting finished, press key " M "

press key "  $^{\mathrm{M}}$  " and return to the main interface, if the relative light is on, it means

that the corresponding timer is set successfully

### ✓ Timer Cancel

 $\textcircled{\timestyle}$  When the time on Timer on and "Timer off" is same, timer is canceled.

At the interface of setting "Timer on" or "Timer off", press key " and the for ③When the relative light is off, it means this timer is canceled. 5seconds, "Timer on"or "Timer off" can be canceled individually

## 2) " M " Key Mode

- When the heat pump is on, press this key shortly, you can shift different modes: cooling function will only be available when the actual water temperature is lower heating mode, cooling mode (When the heat pump is powered by the spa, the
- When the heat pump is off, press this key shortly to set the time, 4 nixie tubes are than set temperature on the spa controller).

twinkling, at this time, press key " M " shortly to set the hour, press key "  $\blacktriangle$  ,  ${f T}$  "to

set the hour. When finishing, press key "  ${
m M}$  " shortly again to set the minute.

When finishing, press key " M "to return to the main interface.

### 3) " A Key Plus

- When the heat pump is on, in the main interface, press this key to increase the setting temperature.
- When it's in manual frequency mode, in the home page, press this key to increase the setting frequency

#### 4 • Key Minus

- When the heat pump is on, in the main interface, press this key to decrease the setting temperature.
- When it's in manual frequency mode, in the home page, press this key to decrease the setting frequency

- <u>თ</u> " Key "POWERFUL"
- When the heat pump is on, press this key shortly to go into powerful mode.

#### <u></u> " Key "SMART"

- When the heat pump is on, press this key shortly to go into smart mode
- Under off status, press this key for 5 seconds to change the temperature unit between  $^\circ\!\!C$  and  $^\circ\!\!F$  .

#### 5 " Key "SILENT"

• When the heat pump is on, press this key to go into silent mode.

Press key "for 5 seconds, and enter into the unit status parameter inquiry,

DC fan motor actual rotate speed	14(E)
Compressor actual rotate speed	13(D)
DC bus voltage	12(C)
Radiator temp	11(B)
Compressor current	10(A)
Assistant EEV steps	60
Main EEV steps	80
Inner coil temp	07
Outer coil temp	06
Suction temp	05
Discharge temp	04
Ambient temp	03
Outlet water temp	02
Inlet water temp	01
Descriptions	Inquiry Code
	7

# 8) Starting Electric Heater Manually

Press keys " " + " at the same time for 5 seconds to turn on/off the electric heater manually.

# 9) Enforced Defrosting

- When the conditions of entering enforced defrosting are met, press" "and" "at the same time for 5 seconds, then it enter into enforced defrosting mode.
- When entering into defrosting, heating mode icon" HEAT appears. When

exiting from defrosting, mode icon recover to normal display.

# 10) Recover to Factory Default

By button operation: press keys" +" at the same time for 5 seconds and enter into user parameters mode, the current parameter is return temperature.

Then press keys" """ """ "at the same time for 5 seconds and wired controller recovers to factory default. At this time, buzzer will alarm twice continuously, and all parameters recover to factory default.

# 11) System parameter setting

- Press "Image of the second to enter the password interface for setting the
- parameters. Then press "  $bar{m}$  " or "  $bar{m}$  " to enter the password. Press "  $bar{m}$  " to

change the digit of the password. After finishing the last digit, press "  $\dot{M}$  " to confirm the password.

# 6. System Parameters:

Parameter Code	Parameter Name	Set Range	Factory Setting
	Return Difference for	1~18°C(2~36°F)	
	Target Water Temp.		
2	Set Temp. in Cooling Mode	8°C~35°C(46~95°F)	
ω	Set Temp. in Heating Mode	5°C-40°C(41-104°F)	
4	Compensation Value of Inlet Water Temp.	-5°C~15°C(-9-30°F)	
υ <b>ι</b>	Defrosting Cycle	20MIN~90MIN	
6	Defrosting Start Temp.	-9°C~-1°C(16~30°F)	
7	Defrosting Time	5MIN~20MIN	
8	Temp.to Quit Defrosting	1°C~40°C(33~104°F)	
9	Difference between	0°C~15°C(0~30°F)	
	Ambient Temp. and Coil Temp.		
	to Start Defrosting		
10	Ambient Temp.to Start	0°C-20°C(32-68°F)	
	Defrosting		

17	16	15	14	d(13)	12	11
Manual Steps of Electronic Expansion Valve (Set Value*10=Actual Steps)	Electronic Expansion Valve's Working Mode	Electronic Expansion Valve's Min. Steps(Set Value*10=Actual Steps)	Electronic Expansion Valve's Steps during Defrosting ( Set Value*10=Actual Steps)	Exhaust Gas Temp. of Electronic Expansion Valve	Overheat Degree in Smart/ Powerful Mode	Electronic Expansion Valve's Working Cycle
2~45	0 Manual/1 Auto	5~15	2~45	70°C~125°C(158~257°F)	-5°C~10°C(-9~20°F)	205-905
35		10	Depends on Actual Model	95°C(203°F)	Depends on Actual Model	305

18	Overheat Degree in Cooling Mode	-5°C~10°C(-9~20°F)
19	Reserved	-
20	Electronic Expansion Valve's	0=Water Temperature
	Working Mode When Cooling	1=Supercooling
21	Water Pump's Working Mode	1= Non Stop/2= Stop
	When Target Temperature Reached	3=Intermittent
22	Fan's Working Mode	0=Auto/ 1= Manual
23		0-99
	Fan's Manual Control Speed	(Set
	(Set Value*10=Actual Speed)	Speed)
		1
24	Ambient Temp. to Start	-20°C~20°C(-4~68°F)
	Auxiliary Electric Heater	_
25	Auxiliary Heating	0 Non/1 Yes
	Function in Defrosting	
	Mode	

Note: In the above table, the actual value of the electronic expansion valve and the air speed is 10 times of the parameter displayed value. For example, when the P20 defrost expansion valve opening degree shows 30, the actual value at this time is 300 steps; when P30 fan manual rotation speed shows 80, the actual value at this time is 800. When the value is more than 100, A represents for 10, B represents for 11, C represents for 12, and D represents for 13.

# 7. Troubleshooting

7.1 System protection/error indication

Error code	Error descriptions	Solutions
Er 03	water flow failure	Check water flow /switch
Er 04	winter anti-freezing	Water pump will run automatically
		for first grade antifreeze
Er 05	high pressure failure	1. Discharge redundant
	×	refrigerant from heat pump gas
		system
		2.Clean the water exchanger or
		water fifter
Er 06	low pressure failure	1.Check if there is any gas
		leakage ,re-fill the refrigerant
		2.Replace the filter or capillary
Er 09	communication failure between Display	1. Check if the communication
	and PCB	connection wire between display
		and PCB is disconnected or has
		poor contact. Change the wire or

		2. Check if PCB or display is
		damaged. Change the
		corresponding part if yes.
Er 10	communication failure of frequency	Change PCB.
	conversion module(alarm when	
	communication between display and	
	PCB are disconnected)	-
Er 12	excessive exhaust temp protection	1. Replace the compressor
		discharge temperature sensor.
		2. Reconnect or clean compressor
		discharge temperature sensor and
		wrap it with insulation tape.
		Replace the controller or PC Board.
타 15	Water inlet temperature failure	Check or change the sensor
Er 16	external coil temperature failure	Check or change the sensor
Er 18	exhaust temperature failure	Check or change the sensor
Er 19	DC Fan motor failure	1. Check if DC fan motor is
		damaged. Change it if damaged.
		2. Check if DC fan motor output
		port on PCB has output. Change
		PCB if no output.
Er 20	Abnormal protection of frequency	Solve it according to the subsidiary
	conversion module	error codes in the following table.
Er 21	ambient temperature failure	Check or change the sensor
Er 23	too low cooling outlet water temp	Check whether the water flow or
	protection	water system is jammed or not
Er 27	water outlet temperature failure	Check or change the sensor

E20 fault will display the following error codes at the same time, the error codes will switch every 3 seconds. Among them, error codes 1-128 are display in priority. When error codes 1-128 don't appear, then error codes 257-384 can show. If two or more error codes appear at the same time, then display error codes accumulation. For example, 16 and 32 occur at the same time, display 48.

0

Er 42

internal coil temperature failure

 Check whether the thermal relay is damaged, if so, replace.
 Check or change the sensor Check or change the sensor Check whether the water flow or water system is jammed or not 1. Check if the incoming voltage supply is too low, if so, repair. 2. Check if the compressor is overloaded and repair.

Er 35

Compressor current protection

Er 29

Return gas temperature failure

Too high heating outlet water temperature protection

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

LED wire shows	LED wire controller		Check whather cable and circuit
shows			A DESCRIPTION OF THE PARTY OF T
		No power supply	
no display	ay		
LED wire	LED wire controller	Heat pump under standby	Starting heat nume to run
displays	displays the actual time	status	
Heat pump is		1. Water temperature is	
not running		reaching set value, heat	1. Verify water temperature setting
LED win	LED wire controller	pump under constant	2. Startup heat pump after a few
displays	displays the actual	temperature status	minutes
water te	water temperature	2. Heat pump just starts to	3. LED wire controller should display
		run	"Defrosting"
		3. Under defrosting	
			1. Adjust the mode
_			2. Replace the defect LED wire
		1. Chose the wrong mode	controller, and then check the status
_	uispiays actual water	2. Figures show defects	after changing the running mode,
Ū	temperature and no enor	3. Controller defect	verifying the water inlet and outlet
	spidys		temperature
			<ol><li>Replace or repair the heat pump</li></ol>

Too much ice T on evaporator e	water stains P	Short running te
Too much ice on evaporator	Water stains on heat pump unit	LED displays actual water temperature, no error code displays
	1. Concreting 2. Water leakage	<ol> <li>Fan NOT running</li> <li>Not enough air ventilation</li> <li>Not enough refrigerant</li> </ol>
<ol> <li>Check the location of heat pump, and eliminate all obstacles to assure a good air ventilation</li> <li>Replace or repair the heat pump</li> </ol>	<ol> <li>No action</li> <li>Check the titanium heat exchanger carefully if it shows any defects</li> </ol>	<ol> <li>Check the cable connections between the motor and fan, if necessary, they should be replaced</li> <li>Check the location of the heat pump, and eliminate all obstacles to assure a good air ventilation</li> <li>Replace or repair the heat pump</li> </ol>

### 8. 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 the heat pump.

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

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

(4) On any other moment, you should check if the unit has enough water before the unit starts to run again.

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

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

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