

R290 AIR TO WATER HEAT PUMP

Installation and Instruction Manual



waterware.co.nz

CONTENT

1	Preface	
2	Safety Precaution	
	(1) Mark notes	
	(2) Icon Notes · · · · · · · · · · · · · · · · · · ·	
	(3) Warning	
	(4) Attention	
3	Specification	
	(1) Appearance and structure of the heat pump $\cdots \cdots \cdots \cdots \cdots \cdots$	
	(2) The data of unit • • • • • • • • • • • • • • • • • • •	
	(3) Unit dimension · · · · · · · · · · · · · · · · · · ·	
4	Installation · · · · · · · · · · · · · · · · · · ·	
	(1) Application of heat pump • • • • • • • • • • • • • • • • • • •	
	(2) Choose a right heat pump unit ••••••••••••••••••••••••••••••••••••	
	(3) Installation method · · · · · · · · · · · · · · · · · · ·	
	(4) Installation place · · · · · · · · · · · · · · · · · · ·	
	(5) Water loop connection	
	(6) Power supply connection • • • • • • • • • • • • • • • • • • •	
	(7) Location of the unit	
	(8) Transit	
	(9) Trial Running	
5	Operation and Use · · · · · · · · · · · · · · · · · · ·	
	(1) Main interface display and function $\cdots \cdots \cdots$	
	(2) Parameter list and breakdown table • • • • • • • • • • • • • • • • • • •	
	(3) Interface diagram	
6	Appendix	
	(1) Appendix 1 · · · · · · · · · · · · · · · · · ·	
	(2) Appendix 2	
	(2) Appendix 3 • • • • • • • • • • • • • • • • • •	

In order to provide the customers with high quality, strong reliability and good versatility products, this heat pump is produced by strict design and manufacture standards. This manual includes all the necessary information about installation, debugging, discharging and maintenance. Please read this manual carefully before you open or maintain the unit.

The manufacture of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, unnecessary maintenance which is not in line with this manual.

The unit must be installed by qualified personnel.

It is vital that the below instructions are adhered to at all times to keep the warranty.

—The unit can only be opened or repaired by a qualified installer or an authorized dealer.

—Maintenance and operation must be carried out according to the recommended time and frequency, as stated in this manual.

-Use genuine standard spare parts only.

Failure to comply with these recommendations will invalidate the warranty.

Inverter air source water heat pump is a kind of high efficiency, energy saving and environment friendly equipment, which is mainly used for house warming. It can work with any kinds of indoor unit such as fan coil, radiator, or floor heating pipe, by providing warm or hot water. One unit of monoblock heat pump can also work with several indoor units.

The air source water heat pump unit is designed to have heat recovery by using super heater which can provide hot water for sanitary purpose.

2. Safety Instructions

To prevent the users and maintainers from the harm of this unit, and avoid damage to the unit or other property, and use the heat pump properly, please read this manual carefully and understand the following information correctly.

Mark Notes

Mark	Meaning				
	A wrong operation may lead to death or grievous injury on people.				
	A wrong operation may lead to harm people or loss of material.				

Icon Notes

lcon	Meaning
\otimes	Prohibition. What is prohibited will be nearby this icon.
0	Compulsory implement. The listed action needed to be taken.
	ATTENTION (include WARNING) Please pay attention to what is indicated.

Warning

Operation	Meaning			
Prohibition	DO NOT put fingers into the fan and evaporator of the unit, otherwise harm may occur.			
Shut off the power.	When there is something wrong or strange smell, the power supply needs to be shut off to stop the un Continue running may cause short circuit or fire.			

Operation	Meaning			
Prohibition	DO NOT put fingers into the fans and evaporator of the unit, otherwise harm may occur.			
Shut off the power.	When there is something wrong or strange smell, the power supply needs to be shut off to stop the unit. Continue running may cause short circuit or fire.			

Move and Repair	Meaning				
0	When the heat pump needs to be moved or installed again, please entrust dealer or qualified people to carry it out. Improper installation will				
Entrust	lead to water leakage, electrical shock, injury or fire.				
Entrust	It is prohibited to repair the unit by the user himself, otherwise electrical shock or fire may occur.				
Prohibit	When the heat pump needs to be repaired, please entrust dealer or qualified people to carry it out. Improper movement or repair on the unit will lead to water leakage, electrical shock, injury or fire.				

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
The appliance shall be stored in a room and installed in the environment without continuously operating or potential ignition sources (for example: open flames, an operating gas appliance or an operating electric heater or Electric Spark or hot objects

ATTENTION

Installation	Meaning
Installation Place	The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas, fire may occur.
0	Make sure that the basement of the heat pump is strong enough, to avoid any decline or fall down of the unit
Fix the unit.	
•	Make sure that there is circuit breaker for the unit, lack of circuit breaker may lead to electrical shock or fire.
Need circuit breaker.	

Operation	Meaning
Check the installation basement.	Please check the installation basement regularly (once <u>a</u> month), to avoid any decline or damage too the basement, which may hurt people or damage the unit.

Switch off the power.	Please switch off the power when cleaning or maintaining			
Prohibition	It is prohibited to using copper or iron as fuse. The right fuse must be fixed by electrician for the heat pump.			
Prohibition	It is prohibited to spray the flammable gas to the heat pump, as it may cause fire.			

3. Features

This series of heat pump unit owns following features:

3.1. Advanced Controlling

The PC micro-computer based controller is available for the users to review or set the running parameters of the heat pump. Centralized controlling system can control several units by PC.

3.2. Nice Appearance

The heat pump is designed with beautiful looking. The monoblock one has the water pump included which is very easy for installation.

3.3. Flexible Installation

The unit has a smart structure with compact body, just as simple outdoor installation is needed.

3.4. Quiet Running

The heat pump unit use a special designed heat exchanger to enhance whole efficiency.

3.5. Good Heat Exchange Rate

The heat pump unit use a special designed heat exchanger to enhance whole efficiency.

3.6. Large Working Range

This series of heat pump is designed to work under different working conditions as low as -15 degrees for heating.

1. Appearance and structure of the heat pump



Air outlet in horizontal ← direction

The longest distance of installing the remote controller is 200 meters.

Remote Controller (Manually)

Water outlet tube

2. The data of unit

*** REFRIGERANT: R290

Model		HPR6HT	HPR13HT	HPR20HT
Heating Capacity	kW	3.10~8.90	5.40~14.95	8.00~22.00
Heating Power Input	kW	0.65~2.10	1.05~3.85	1.60~6.90
Cooling Capacity	kW	1.20~5.72	3.60~10.50	4.20~15.00
Cooling Power Input	kW	0.65~2.40	1.12~4.47	1.80~7.30
Hot Water Capacity	kW	3.92~10.68	6.50~18.50	10.00~27.00
Hot Water Power Input	KW	0.78~2.47	1.27~4.65	1.90~7.10
Max Power Input	KW	3.0	5.30	7.5
Max Current Input	А	13.5	24.5	35.0
Power Supply		220-240V~/50Hz	220-240V~/50Hz	220-240V~/50Hz
Compressor Quantity		1	1	1
Compressor Model		Rotary	Rotary	Rotary
Fan Quantity		1	1	2
Fan Power Input	W	150	170	75
Fan Rotate Speed	RPM	600	600	600
Water Pump Input	W	60	60	160
Noise	dB(A)	38~52	39~52	42~54
Water Connection	inch	1	1	1
Water Flow Volume	m3/h	1.0	1.7	2.9
Internal Water Pressure Drop	kPa	20	30	45
Water Head	m	5.0	5.5	6.9
Unit Net Dimensions (L/W/H)	mm	See drawings of the heat pump		
Unit Shipping Dimensions (L/W/H)	mm	see data on the package		
Net Weight	kg	see data on the nameplate		
Shipping Weight	kg	see data on the package		

Cooling working condition:(DB/WB)35°C/24°C, (Outlet/Inlet) 7°C/12°C. Heating working condition:(DB/WB) 7°C/6°C. (Outlet/Inlet) 35°C/30°C. Hot Water working condition:(DB/WB): 20°C/15°C,water tank temperature circulation form 15°C to 55°C 。

BS EN 14511-1-2013 Air conditioner, whole liquid cooling machine, electric compressor. Part2: Test condition ; Part3:Test method ; Part4:related requirements. 3. Unit dimension

Models:HPR6HT





Models:HPR13HT

975 1287





Models:HPR20HT





Installation place

- The unit can be installed on any place outdoor which can carry heavy machine such as terrace, housetop, ground and so on.
- The location must have good ventilation.
- The place is free from heat radiation and other fire flame.
- A pall is needed in winter to protect the heat pump from snow.
- There must be not obstacles near the air inlet and outlet of the heat pump.
- A place which is free from strong air blowing.
- There must be water channel around the heat pump to drain the condensing water.
- There must be enough space around the unit for maintenance.
- A place which is far away operating or potential ignition sources (for example:open flames, an operating gas appliance or an operating electric heater or Electric Spark or hot object)

Installation method

The heat pump can be installed onto the concrete basement by expansion screws, or onto a steel frame with rubber feet which can be placed on the ground or housetop. Make sure that the unit is placed horizontally.

Water loop connection

Please pay attention to below matters when the water pipe is connected:

- Try to reduce the resistance to the water from the piping.
- The piping must be clear and free from dirty and blocks. Water leakage test must be carried out to ensure there is no water leaking. And then the insulation can be made.
- Attention that the pipe must be tested by pressure separately. DO NOT test it together with the heat pump.
- There must be expansion tank on the top point of the water loop, and the water level in the tank must be at least 0.5 meter higher than the top point of the water loop.
- The flow switch is installed inside of the heat pump, check to ensure that the wiring and action of the switch is normal and controlled by the controller.
- Try to avoid air stayed inside of the water pipe, and there must be air vent on the top point of the water loop.
- There must be thermometer and pressure meter at the water inlet and outlet, for easy inspection during running.

Power supply connection

- Open the front panel, and open the power supply access.
- The power supply must go through the wire access and be connected to the power supply terminals in the controlling box. Then connect the 3-signal wire plugs of the wire controller and main controller.
- If the outside water pump is needed, please insert the power supply wire into the wire access also and connect to the water pump terminals.
- If an additional auxiliary heater is need to be controlled by the heat pump controller, the relay (or power) of the aux-heater must be connected to the relevant output of the controller.

Location of the unit



The picture shows the location of horizontal air outlet unit.

Attention	
Requirements A>500mm;B>1500mm; C>1000mm;D>500mm	

The minimum ventilation distance in diagram 1.

9 Transit

When the unit need to be hung up during installation, a 8 meters cable is needed, and there must be soft material between the cable and the unit to prevent damage to the heat pump cabinet. (See picture 1)









DO NOT touch the heat exchanger of the heat pump with fingers or other objects !

10 Trial Running

Inspection before trial running

- Check the indoor unit, and make sure that the pipe connection is right and the relevant valves are open.
- Check the water loop, to ensure that the water inside of the expansion tank is enough, the water supply is good, the water loop is full of water and without any air. Also make sure there is good insulation for the water pipe.
- Check the electrical wiring. Make sure that the power voltage is normal, the screws are fastened, the wiring is made in line with the diagram, and the earthing is connected.
- Check the heat pump unit including all of the screws and parts of the heat pump to see if they are in good order. When power on, review the indicator on the controller to see if there is any failure indication. The gas gauge can be connected to the check valve to see the high pressure(or low pressure) of the system during trial running.

Trial running

- Start the heat pump by press " 🔟 " key on the controller. Check whether the water pump is running, if it runs normally there will be 0.2 MPa on the water pressure meter.
- When the water pump runs for 1 minutes, the compressor will start. Hear whether there is strange sound from the compressor. If abnormal sound occurs please stop the unit and check the compressor. If the compressor runs well please look for the pressure meter of the refrigerant.
- Then check whether the power input and running current is in line with the manual. If not please stop and check.
- Adjust the valves on the water loop, to make sure that the hot(cool) water supply to each door is good and meet the requirement of heating(or cooling).
- Review whether the outlet water temperature is stable.
- The parameters of the controller are set by the factory, it is not allowed to change then by user himself.



1. Main interface display and function



Key number	Key name	Key function
1	On and off	Click this key to switch ON or OFF Red represents ON, while white represents OFF
2	Lock screen	You can perform various operations on the display when the lock is open, but you cannot operate the display when the lock is closed. After locking the screen, press the screen lock button and enter the password "22" to unlock the screen.
3	Mode key	Hot water mode, heating mode, cooling mode, hot water+heating mode or hot water+cooling mode can be selected by pressing this key.
4	Temperature setting	Click this key to set the target temperature
5	Timer setting	Click this key to set the timer. White represents not enabled, while green represents enabled
6	Setup key	Click this key to check the unit status, time, factory parameter, temperature curve, timer setting and Mute setting

lcon	Function
7	Fault icon: This icon will be displayed when the unit fails ,then the display will enter Failure record interface after tapping this icon
8	Defrosting icon: This icon will be displayed when the unit enters the defrosting function.
9	Electric heater icon: This icon will be displayed when the unit enters the electric heater mode.
10	Water flow icon: Display the current water flow (note: when H31=0, the icon is not displayed)
1)	Mode&temp.&power timer icon: This icon will be displayed when enters this timer
12	Ambient temperature: Display the current ambient temperature.
13	SG Ready Icon: This icon will be displayed when enters SG Ready, SG Ready includes five modes: Solar Sleep Mode, Solar Low Mode, Solar Medium Mode, Solar High Mode, Normal Mode
(4)	Running mode icon: representing the unit is currently running in hot water mode. There are five modes, namely: heating, cooling, hot water, hot water + cooling, hot water + heating
15	DHW temperature: The unit is in DHW mode when this icon is shown, otherwise this icon is not shown.
16	Room temperature icon: Display the current room temperature. (note: when H25=2,it shows buffer tank temperature; when H25=0/3, the icon is not shown.)

1.1 On and off

As the main interface shows

(1) In shutting down interface (on/off key is in gray status), press on/off key can start up the machine.



(2) Note: In starting up interface (on/off key is in red status), press on/off key can shut down the machine.

1.2 Mode switch



In the main interface, there are five modes can be selected after tapping the mode key.

- (1) Tapping hot water mode icon (1), then the display will change to this mode interface;
- (2) Tapping heating mode icon (2), then the display will enter this mode interface;

(3) Tapping cooling mode icon (3), then the display will switch to this mode interface;

(4) Tapping hot water+heating mode icon ④, then the display will go into hot water+heating mode interface;

(5) Tapping hot water+cooling mode icon (5), then the display will come to hot water+cooling mode interface.

Note: a) If the machine model you purchased has no cooling function, the key of cooling mode will not be displayed.

b) If the machine model you purchased has no hot water function, the key of hot water mode function will not be displayed.

1.3 Setting of target temperature



Take hot water + cooling mode for example:

Tapping (1), the wire controller back to main interface;

Tapping 2, the target temp. of hot water can be set by pop-up keyboard;

Tapping (3), the target temp. of cooling mode can be set by pop-up keyboard.

Note: When room temperature control, click the room temperature display in the main interface to enter the room target temperature setting interface.

1.4 Unlock screen

After locking screen, click " 10 rop up the following screen. Enter password "22" to unlock.



1.5 Timer setting



Click the timer setting key to enter the timer setting and the interface displays as follows:

Y		
	On/Off Timer	Warm Water Cir. Control
		2

1.5.1 Timer On/Off



In the time setting interface, click the button, the interface displays as follows:



Note: Click (1) to set the day of the week, click (2) to enable the Timing switch function, click (3) to select the time period to turn on the Timing switch.

1.5.2 Warm Water Cir. Control



In the time setting interface, click the button, the interface displays as follows:



Same operation as Timer on/off function. Click (1) to set the day of the week, click (2) to enable the Timing switch function, click (3) to select the time period to turn on the Timing switch.

1.6 Setup

Click the setup key to enter the setup and the interface display is shown as follows:



Key number	Key name	Key function	
1	Operating mode	Click this key to view the current operating parameters of the unit.	
2	Electric heater	Click this key to turn on the unit Electric heater. When $R35 \neq 0$, the icon displays.	
3	Smart Grid	Click this key to enter Smart Grid	
(4)	Factory parameter	Click the key and enter the password to enter the factory parameter settings and status parameters interface.	
5	System time setting	Click this key to set the system time.	
6	Mute setting	Click this key to set the unit mute function mode. When H22=1, the icon displays.	
0	Curve key	Click this key to view the temperature curve.	

1.6.1 State



In the setup interface, tapping operating mode button (1), then the interface displays as follows:

State			
N	Unit State	ON	
Y	Present Mode	Hot Water	
	Inlet Water Temp.	45.5℃	
	Outlet Water Temp.	45.5℃	/
	DHW Temp.	45.5℃	
	Ambient Temp.	10.5℃	

1.6.2 Electric Heater



In the setup interface, tapping Electric heating button 2, then the interface displays as follows:



1.6.4 Clock



In the setup interface, tapping system time setting button 5, then the interface displays as follows: (1)



Key number	Key name	Key function	
1	Return key	Click this key to return to the setup interface.	
2	Up key	Click this key to increase the value.	
3	Down key	Click this key to decrease the value.	
4	Cannel key	Click this key to cancel the current settings and return to the settings page.	
5	Enter key	Click the key to determine the setting, and the system will be automatically calibrated if it is incorrect.	

Note:

When the temperature unit is ${}^\circ\!\!\mathbb{C}$, the time format is displayed as "day-month-year hour:minute :second".

When the temperature unit is $\ensuremath{\mathbb{T}}$, the time format is displayed as "month-day-year hour:minute :second".

1.6.5 Silent Timer



In the setup interface, tapping Mute Timer button (6), then the interface displays as follows:



Key number	Key name	Key function	
1	Fast-silent	Click this key to enter fast-silent	
2	Silent timer	Click this key to enter silent timer	

1.6.5.1 Fast-Silent

The fast-silent function is unsettable when the fan is off.

The fast-silent function is settable when the fan is on.



Reans the unit is in silent state, 🔯 means the unit is in normal state.

1.6.5.2 Silent Timer



In the silent mode interface, tapping Mute Timer button 2, then the interface displays as follows:



Note: Click 1 to set silent timer start hour, click 2 to set silent timer start minute, click 3 to set silent timer close hour, click 4 to set silent timer close minute, then click 5 and 6 to enable or disable the silent mode.

1.6.6 Curve



In the setup interface, tapping Curve button $\overline{\mathbb{O}}$, then the interface displays as follows:



This curve function records the water inlet temperature and water outlet temperature;
Temperature data is collected every five minutes and the 12 sets of temperature data are saved every hour. Timekeeping is made from the latest data saving, if the power is disrupted when the time is less than 1 hour (12 sets), the data during such period will not be saved.
Only curve for power-on status is recorded, and that for power-off will not be saved;
The value of the abscissa indicates the time from the point on the curve to the current time point. The leftmost point on the first page (0 on the abscissa) is the latest temperature record;
Temperature curve record is provided with power-down memory function.

1.7 Fault interface

Click the fault icon on the main interface and the interface displays as follows:



- 1:Fault code
- 2:Fault name
- $\textcircled{3:Occurrence time of the fault, Day and month hour: minute: second lf the current temperature is ``F', Month and day hour: minute: second temperature is ``F', month and day hour: minute: second hour: minute: second$
- ④:Click this key to clear all fault records, enter the date of the day into the OK screen.

Confirm to Clear? Yes No	
	Confirm to Clear? Yes No

2. Parameter list and breakdown table

2.1 Electronic control fault table

It can be judged according to the remote controller failure code and troubleshooting.

Protect/fault	Fault display	Reason	Elimination methods
Inlet Water Temp. Sensor Fault	P01	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Outlet Water Temp. Sensor Fault	P02	The temp. sensor is broken or short circuit	Check or change the temp. sensor
DHW Tank Sensor Fault	P03	The temp. sensor is broken or short circuit	Check or change the temp. sensor
AT Sensor Fault	P04	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Suction Temp. Sensor Fault	P17	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Heating Returning Water Temp. Sensor Fault	P013	The temp. sensor is broken or short circuit	Check or change the temp. sensor
DHW Returning Water Temp. Sensor Fault	P018	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Heating Leaving Water Temp. Sensor Fault	P023	The temp. sensor is broken or short circuit	Check or change the temp. sensor
DHW Leaving Water Temp. Sensor Fault	P028	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Room Temp. Sensor Fault	P42	The temp. sensor is broken or short circuit	Check or change the temp. sensor
EVI Inlet Sensor Fault	P101	The temp. sensor is broken or short circuit	Check or change the temp. sensor
EVI Outlet Sensor Fault	P102	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Distributor Tube Temp. Sensor Fault	P152	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Coil Temp. Sensor Fault	P153	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Exhaust Temp. Sensor Fault	P181	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Overhigh Exhaust Temp.	P182	The compressor is overload	Check whether the system of the compressor running normally
Anti-freezing Temp. Sensor Fault	P191	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Mix Tube Outlet Water Temp. Sensor Fault	P02a	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Buffer Tank Temp. Sensor Fault	P03a	The sensor is broken or short circuit	Check or change the temp. sensor
Pressure Sensor Fault	PP11	The pressure sensor is broken or short circuit	Check or change the pressure sensor or pressure
High Pressure Sensor Fault	PP12	The pressure sensor is broken or short circuit	Check or change the pressure sensor or pressure
Low AT Protection	TP	The ambient temp. is low	Check the ambient temp value
No Cooling at Low AT Protection	тс	The temp. sensor is incorrectly- -detected or the temp. sensor is lower- -than the set value A30	Check or change the temp. sensor
Electric Heater Overheat Fault	E04	The electric-heater protection switch is broken	Check whether the electric heater runs at the temperature above 150°C for a long time
Excess Temp. Diff. Between Inlet & outlet	E06	Water flow is not enough and low differential pressure	Check the pipe water flow and whether water system is jammed or not
Communication Fault	E08	Communication failure between wire controller and main board	Check the wire connection between remote wire controller and main board

Protect/fault	Fault display	Reason	Elimination methods
Primary Anti-freezing Fault	E19	The ambient temp. is low	Check the ambient temp value
Secondary Anti-freezing Fault	E29	The ambient temp. is low	Check the ambient temp value
Insufficient Defrosting Water Flow Alarm	E030	The unit flow rate is less than the minimum flow value of the unit.	Check or change waterway systems to provide unit flow
Flow Switch Fault	E032	No water/little water in water system	Check the pipe water flow and water pump
Overhigh Outlet Water Temp.	E065	No water/little water in water system	Check the pipe water flow and water pump
Low Outlet Water Temp. Temp. Fault	E071	No water/little water in water system	Check the pipe water flow and water pump
Fan Motor 1 and PCB Communication Fault	E081	Speed control module and main board communication fail	Check the communication connection
Fan Motor 2 and PCB Communication Fault	E082	Speed control module and main board communication fail	Check the communication connection
Display and PCB Communication Fault	E084	The wire controller software is not match the mainboard software	Check the wire control software number and the mainboard software number
Communication Fault with Hydraulic Module	E08c	Hydraulic Module and mainboard communication fail	Check the communication connection
HP Fault	E11	The high-pressure switch is broken	Check the pressure switch and cold circuit
LP Fault	E12	The low-pressure switch is broken	Check the pressure switch and cold circuit
Anti-freezing Fault	E171	Use side water system temp. is low	1.Check the water temp. or change the temp. sensor 2.Check the pipe water flow and whether water system is jammed or not
Fan Motor1 Fault	F031	1. Motor is in locked-rotor state 2. The wire connection between DC-fan motor module and fan motor is in bad contact	1.Change a new fan motor 2.Check the wire connection and make sure they are in good contact
Fan Motor2 Fault	F032	1. Motor is in locked-rotor state 2. The wire connection between DC-fan motor module and fan motor is in bad contact	1.Change a new fan motor 2.Check the wire connection and make sure they are in good contact
Zone 1 Room Temp. Sensor Fault	P105	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Zone 2 Room Temp. Sensor Fault	P106	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Zone 2 Mixing Temp. Sensor Fault	P107	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Abnormal Adjustment of Mixing Valve	E122	1. Mixing Valve is incorrectly connected; 2. Mixing Valve is damaged;	1. Plug and unplug terminals; 1. Replace the Mixing Valve;
Zone 1 Thermostat Communication Fault	E08g	1. Thermostat not connected 2. Thermostat failure 3.Wrong parameter setting	1. Check the wiring connection between the thermostat and the unit 2. Replace the thermostat 3.Check the parameters
Zone 2 Thermostat Communication Fault	E08h	1. Thermostat not connected 2. Thermostat failure 3.Wrong parameter setting	1. Check the wiring connection between the thermostat and the unit 2. Replace the thermostat 3.Check the parameters
Low Water Flow Protection	E035	Water flow is too low	Increased water flow

Frequency conversion board fault table:

Protect/fault	Fault display	Reason	Elimination methods
IPM Overcurrent Fault	F00	IPM Input current is large	Check and adjust the current measurement
Comp. Driver Fault	F01	Lack of phase, step or drive hardware damage	Check the measuring voltage check frequency conversion board hardware
Pre-Charge Failure	F03	The PFC circuit protection	Check the PFC switch tube short circuit or not
DC Power Bus Overvoltage Fault	F05	DC bus voltage>Dc bus Overload-voltage protection value	Check the input voltage measurement
DC Power Bus Undervoltage	F06	DC bus voltage <dc bus<br="">Underload-voltage protection value</dc>	Check the input voltage measurement
AC Power Undervoltage Fault	F07	The input voltage is low, causing the input current is low	Check the input voltage measurement
AC Power Overcurrent Fault	F08	The input voltage is too high, more than outage protection current RMS	Check the input voltage measurement
Input Power Voltage Sampling Fault	F09	The input voltage sampling fault	Check and adjust the current measurement
DSP and PFC Communication Fault	F12	DSP and PFC connect fault	Check the communication connection
DSP and Comp. Driver Communication Fault	F11	DSP and Inverter board communication failure	Check the communication connection
Comp. Driver and PCB Communication Fault	F151	DSP and Mainboard communication failure	Check the communication connection
IPM Overheat Fault	F13	The IPM module is overheat	Check and adjust the current measurement
Comp. Overcurrent Fault	E051	The compressor is overload	Check whether the system of the compressor running normally
Input Power Lacking Phase Fault	F15	The input voltage lost phase	Check and measure the voltage adjustment
IPM Current Sampling Fault	F18	IPM sampling electricity is fault	Check and adjust the current measurement
Comp. Driver Temp. Sensor Fault	F17	The transducer is overheat	Check and adjust the current measurement
IGBT Power Device Overheat Alarm	F20	The IGBT is overheat	Check and adjust the current measurement
Comp. Weak Magnetic Alarm	F16	Compressor magnetic force is not enough	Check and adjust the current measurement
AC Input Current Frequency Decrease Alarm	F22	Input current is too large	Check and adjust the current measurement
EEPROM Alarm	F23	MCU error	Check whether the chip is damaged Replace the chip
Destroyed EEPROM & No Activated Fault	F24	MCU error	Check whether the chip is damaged Replace the chip
Input Power Current Sampling Fault	F25	The V15V is overload or undervoltage	Check the V15V input voltage in range 13.5V~16.5V or not
IGBT Overheat Fault	F26	The IGBT is overheat	Check and adjust the current measurement
Comp. Current Frequency Decrease Alarm	F33	The compressor current frequency reduction	Check and adjust the current measurement
AC Power Overvoltage Fault	F10	Input voltage>Input Overload- -voltage protection value	Check whether the input voltage is higher than 265V
Compressor Lacking Phase Fault	F14	The compressor lost phase	Check whether compressor cables are connected properly and reliably
EEPROM Fault	F29	Failed to read the memory chip	Check the frequency conversion board
Overspeed Fault	F21	The compressor is running abnormally	Check whether the compressor cable is nor- -mal and whether the compressor is blocked

Operation and Use

Protect/fault	Fault display	Reason	Elimination methods
Driver (Fan)Temp.Sensor Fault	F120	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Driver (Fan)IPM Overheat Fault	F106	The fan IPM drive plate has poor heat dissipation	Check heat dissipation conditions
Driver (Fan) External Overcurrent Fault	F105	The fan IPM hardware running current is too large	Check whether the fan is blocked
Driver (Fan) Power Lacking Phase Fault	F101	The fan lost phase	Check whether fan cables are connected properly and reliably
Driver (Fan) Current Sampling Fault	F112	Fan sampling electricity is fault	Check whether the fan drive plate is abnormal
Driver (Fan) Start Fault	F102	The fan fails to start	Check whether the fan is blocked
Driver (Fan) Internal Overcurrent Fault	F113	The fan software running current is too large	Check whether the fan is blocked
Driver (Fan) overspeed Fault	F109	The fan speed is too high	Check whether the fan drive board is abnormal

2.2 Parameter list

Meaning	Default	Remarks
Cooling target temperature set point	12 ℃	Adjustable
Heating the target temperature set point	45 ℃	Adjustable
Hot water target temperature set point	55 ℃	Adjustable

3. Interface diagram

3.1 Wire control interface diagram and definition



Sign	Meaning
V	12V (power+)
А	485A
В	485B
G	GND(power-)

Operation and Use

3.2 Controller interface diagram and definition



Main board of the input and output interface instructions below

Number	Sign	Meaning
01	AI/DI01	Inlet Water Temp.
02	AI/DI02	Outlet Water Temp.
03	AI/D103	Coil Temp.
04	AI/DI04	Ambient Temp. (AT)
05	AI/D105	Suction Temp.
06	AI/D106	Antifreeze Temp.
07	AI/D107	Zone 1 room temp./Zone 1-P
08	AI/DI08	DHW Tank Temp.
09	AI/DI09	Room Temp. /Buffer Tank Temp.
10	AI/DI10	EVI Inlet Temp.
11	AI/DI11	EVI Outlet Temp.
12	AI/DI12	High Pressure Switch
13	AI/DI13	Low Pressure Switch
14	AI/DI14	Flow Switch
15	AI/DI15	Zone 2 Water Temp. after Mixing
16	AI/DI16	Remote Switch/SG-1
17	Al/17 (50k)	DHW Switch/Zone 2 room temp./Zone 2-P
18	AI/18 (50K)	Exhaust Temp.
19	0~5V_IN1	Transformer Current 1
20	0~5V_IN2	Transformer Current 2
21	0~5V_IN3	Transformer Current 3
22	0~5V_IN4	Low Pressure
23	DIN_1	Heating & Cooling Function Switch
24	DIN_2	Heating / Cooling Mode Switch
25	PWM_IN1	Water Flow Rate
26	PWM_IN2	Reserved
27	PWM_OUT1	Heating & Cooling Function Switch Output
28	PWM_OUT2	Heating / Cooling Mode Switch Output
29	0~10V OUT1	Mixing valve output
30	0~10V OUT2	Reserved
31	+5V	5V output
32	+12V	12V output
33	CN1	EEV Steps
34	CN2	EVI EEV Steps
35	CN3	Reserved
36	CN4	Reserved
37	CN300	Program port
39	IP5 1	5 inch color diaplay/DC fan speed regulation module/
		Frequency conversion board/Hydraulic module
39	JP5_2	Centralized control communication port
40	JP5_3	DTU/WIFI/Thermostat 1/Thermostat 2
41	R001	Compressor

Operation and Use

42	R002	Zone 2 Mixing valve Open
43	R003	Zone 2 Mixing valve Closed
44	R004	Main Circulation Pump
45	R005	DHW Pump
46	R006	4-way valve
47	R007	Electric Heater Stage 1
48	R008	Electric Heater Stage 2
49	R009	Hot water 3-way valve
50	RO10	Crankcase Heater
51	R011	Bottom Plate Heater
52	R012	Cooling 3-Way Valve
53	R013	DHW Electric Heater
54	R014	Zone 1 pump
55	R015	Zone 2 pump
56	JP9	12V input
57	CN7	Reserved
58	P_FB2	Reserved
59	P_FB1	Reserved
60	P2_DO	Reserved
61	P1_DO	Reserved

Note:

JP5_1 represents +12V, 485_A1, 485_B1, GND on the JP5 terminal; JP5_2 represents +12V, 485_A2, 485_B2, GND on the JP5 terminal; JP5_3 represents +12V, 485_A3, 485_B3, GND on the JP5 terminal.

Appendix 1、Caution & Warning

- 1. The unit can only be repaired by qualified installer centre personnel or an authorised dealer. (for Europe market)
- 2. This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. (for Europe market)
 - Children should be supervised to ensure that they do not play with the appliance.
- 3. Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
- 4. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person in order to avoid a hazard.
- 5. Directive 2002/96/EC (WEEE): The symbol depicting a crossed-outwaste bin that is underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste, must be taken to a recycling centre for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.
- 6. Directive 2002/95/EC (RoHs): This product is compliant with directive 2002/95/EC (RoHs) concerning restrictions for the use of harmful substances in electric and electronic devices.
- 7. The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas , fire can be occur.
- 8. Make sure that there is circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.
- 9. The heat pump located inside the unit is equipped with an over-load protection system. It does not allow for the unit to start for at least 3 minutes from a previous stoppage.
- 10. The unit can only be repaired by the qualified personnel of an installer center or an authorized dealer. (for North America market)
- 11. Installation must be performed in accordance with the NEC/CEC by authorized person only. (for North America market)
- 12. USE SUPPLY WIRES SUITABLE FOR 75℃.
- 13. Caution: Single wall heat exchanger, not suitable for potable water connection.

Appendix 2, Cable specification

1. Single phase unit

Nameplate maximum current	Phase line	Earth line	МСВ	Creepage protector	Signal line
No more	2×1 5mm2	1 5mm2	204	20mA loss than 0.1 and	
than 10A	2/(1.011111	1.511111-	20A	SomA less man 0.1 sec	
10~16A	$2 \times 2.5 \text{mm}^2$	2.5mm ²	32A	30mA less than 0.1 sec	
16~25A	2×4mm ²	4mm ²	40A	30mA less than 0.1 sec	
25~32A	2×6mm ²	6mm ²	40A	30mA less than 0.1 sec	
32~40A	$2 \times 10 \text{mm}^2$	10mm ²	63A	30mA less than 0.1 sec	
40~63A	$2 \times 16 \text{mm}^2$	16mm ²	80A	30mA less than 0.1 sec	n×0.5mm ²
63~75A	$2 \times 25 \text{mm}^2$	25mm ²	100A	30mA less than 0.1 sec	
75~101A	$2 \times 25 \text{mm}^2$	25mm ²	125A	30mA less than 0.1 sec	
101~123A	$2 \times 35 \text{mm}^2$	35mm ²	160A	30mA less than 0.1 sec	
123~148A	$2 \times 50 \text{mm}^2$	50mm ²	225A	30mA less than 0.1 sec	
148~186A	2×70mm ²	70mm ²	250A	30mA less than 0.1 sec	
186~224A	$2 \times 95 \text{mm}^2$	95mm ²	280A	30mA less than 0.1 sec	

2. Three phase unit

Nameplate maximum current	Phase line	Earth line	МСВ	Creepage protector	Signal line
No more					
than 10A	3×1.5mm ²	1.5mm ²	20A	30mA less than 0.1 sec	
10~16A	3×2.5mm ²	2.5mm ²	32A	30mA less than 0.1 sec	
16~25A	3×4mm ²	4mm ²	40A	30mA less than 0.1 sec	
25~32A	3×6mm ²	6mm ²	40A	30mA less than 0.1 sec	
32~40A	3×10mm ²	10mm ²	63A	30mA less than 0.1 sec	
40~63A	3×16mm ²	16mm ²	80A	30mA less than 0.1 sec	n×0.5mm ²
63~75A	$3 \times 25 \text{mm}^2$	25mm ²	100A	30mA less than 0.1 sec	
75~101A	$3 \times 25 \text{mm}^2$	25mm ²	125A	30mA less than 0.1 sec	
101~123A	$3 \times 35 \text{mm}^2$	35mm ²	160A	30mA less than 0.1 sec	
123~148A	$3 \times 50 \text{ mm}^2$	50mm ²	225A	30mA less than 0.1 sec	
148~186A	3×70mm ²	70mm ²	250A	30mA less than 0.1 sec	
186~224A	$3 \times 95 \text{mm}^2$	95mm ²	280A	30mA less than 0.1 sec	

When the unit will be installed at outdoor, please use the cable which can against UV.

Appendix 3 Water quality requirements

1.Corrosi resistance of stainless steel and brazed materials in tap water at room temperature

Attention: +: Good corrosion resistance under normal conditions 0: There may be corrosion problems

-: Not recommended

		Plate material		Brazing material				
Moisture	Concen- tration	Time limit	AISI 304	AISI 316	254 SMO	Cuprum	Nickel	SS
Alkalinity (HCO₃ ⁻)	<70 70-300 >300	24h	+ + +	+ + +	+ + +	0 + 0/+	+++++	+ + +
Sulfate (So₄²·)	<70 70-300 >300	unlimited	+ + +	+ + +	+ + +	+ 0/- -	+ + +	+ + +
HCO ₃ ⁻ /SO ₄ ²⁻	>1.0 <1.0	unlimited	+ +	+ +	+ +	+ 0/-	+ +	+ +
Electrical conductivity	<10 10-500 >500	unlimited	+ + +	+ + +	+ + +	0 + 0	+ + +	+ + +
рН	<6.0 6.0-7.5 7.5-9 >9	24h	0 + + +	0 + + +	0 + + +	0 0 + 0	+++++++	0 + + +
Ammonium (NH₄⁺)	<2 2-20 >20	24h	+ + +	+ + +	+ + +	+ 0 -	+ + +	+ + +
Chloride (Cl ⁻)	<10 100-200 200-300 >300	unlimited	+ 0 - -	+ + + -	+ + + +	+ + + 0/+	+ + + +	+++++

Note:	

Note:	

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