OWNER'S MANUAL

ECOPOWER PRO series

Heat Pump for Air Conditioning Heating and Hot Water Supply

Model:
CH-HP08UIMPZK-P
CH-HP08UIMPZM-P
CH-HP12UIMPZK-P
CH-HP12UIMPZM-P
CH-HP17UIMPZK-P
CH-HP17UIMPZM-P

For proper operation, please read and keep this manual carefully.
Designed by Cooper&Hunter International Corporation, FL Miami, USA

www.cooperandhunter.com

CONTENT

Preface

- In order to provide the customers with high quality, strong reliability and good versatility product, 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 qualified installer or an authorised 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 kind of indoor unit such fan coil, radiator, or floor heating pipe, by provide warm or hot water. One unit of monobloc 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.

This series of heat pump unit owns following features:

1 Advanced controlling
The PC microcomputer 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.

2 Nice appearance
The heat pump is designed with beautiful looking. The monobloc one has the water pump included which is very easy for installation.

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

4 Quiet running
High quality and efficient compressor, fan and water pump is used to ensure the low noise level with insulation.

5 Good heat exchange rate
The heat pump unit use special designed heat exchanger to enhance whole efficiency.

6 Large working range
This series of heat pump is designed to work under different working conditions as low as -30 degrees for heating.

To prevent the users and others from the harm of this unit, and avoid damage on 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
 WARNING	Incorrect operation may result in severe injury or death.
 ATTENTION	Incorrect operation can cause harm to individuals or property damage.

Icon notes

Icon	Meaning
	Actions that are prohibited are indicated by this icon.
	Actions that must be taken are listed here.
	**ATTENTION** (include **WARNING**) Please heed the indicated warnings.

Warning

Installation	Meaning
Professional installer is required.	The heat pump must be installed by qualified personnel to prevent improper installation, which could lead to water leakage, electrical shock, or fire.
Earthing is required	Ensure that the unit and power connections are properly grounded to prevent the risk of electrical shock.

Operation	Meaning
PROHIBITION	DO NOT insert fingers or other objects into the unit's fans or evaporator, as this could result in injury.
Power Shut-Off	In case of malfunction or a strange smell, immediately shut off the power supply to stop the unit. Continuing to operate it may cause an electrical short or fire.

Move and repair	Meaning
Entrust	If the heat pump needs to be moved or reinstalled, please entrust the task to a dealer or qualified person. Improper installation can lead to water leakage, electrical shock, injury, or fire.
Entrust	Users are not allowed to repair the unit themselves, as it may result in electrical shock or fire.
Prohibit	If the heat pump requires repairs, please entrust the task to a dealer or qualified person. Improper handling or repairs can lead to water leakage, electrical shock, injury,or fire.

Do not use means to accelerate the defrosting process or to clean,Other than those recimmended by the manufacturer.

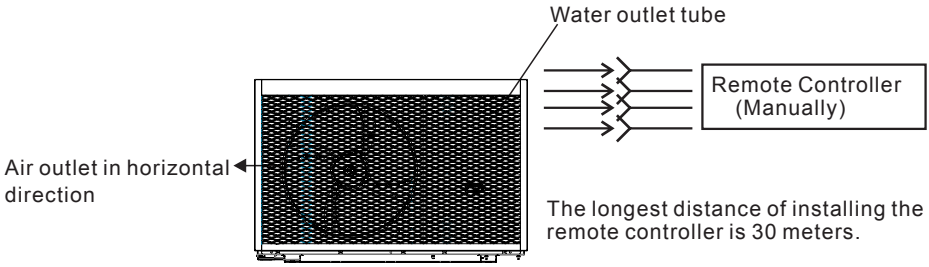
The appliance shall be stored in a room and install In the environment without continuously operating or potential ignition sources (for example:open flames, an operating gas appliance or an operating electric heater or Electric Spark or hot object)

ATTENTION

Installation	Meaning
 Prohibition of Flammable Gas Proximity	The unit can not be installed near any sources of flammable gas. In the event of a gas leakage, a fire may occur.
 Stable Foundation Required	Ensure that the foundation of the heat pump is strong enough to prevent any tilting or falling of the unit.
 Mandatory Installation of Circuit Breaker	A circuit breaker must be installed for the unit. The absence of a circuit breaker can lead to electrical shock or fire.

Operation	Meaning
 Regular Inspection of Installation Foundation	The installation foundation should be inspected periodically (at least once a month) to prevent any deterioration or damage that might cause injury or damage to the unit.
 Power Disconnection During Maintenance	Please switch off the power when cleaning or performing maintenance on the unit.
 Prohibition	The use of copper or iron as a fuse is prohibited. The correct fuse must be installed by a qualified electrician for the heat pump.
 Prohibition	Spraying flammable gas onto the heat pump is prohibited as it may cause a fire.

1. Appearance and structure of the heat pump



2. The data of unit

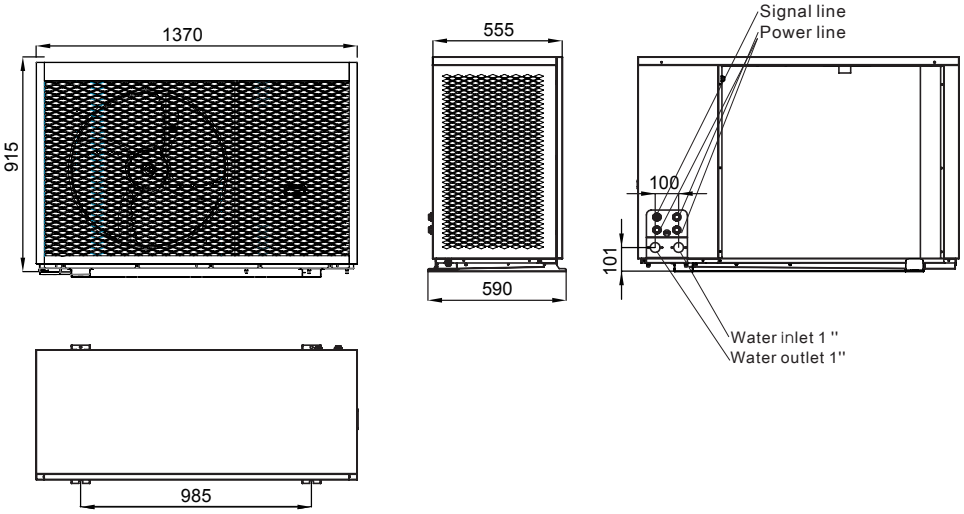
*** REFRIGERANT : R290

Model	/	P20	P40	P40S	P60	P60S
Nominal Heating Capacity (A)	kW	6	12	12	17	17
Heating Capacity Range (A)	kW	1.90-6.38	4.29-12.80	4.46-12.80	6.00-18.50	6.00-18.50
Heating Power Input Range (A)	kW	0.44-1.27	0.70-2.74	0.74-2.74	1.30-5.58	1.30-5.58
Nominal Capacity (B)	kW	6	12	12	17	17
Heating Capacity Range (B)	kW	1.06-6.72	4.35-12.16	4.25-12.16	6.00-18.00	6.00-18.00
Heating Power Input Range (B)	kW	0.65-2.12	0.94-3.80	0.92-3.80	1.80-5.45	1.80-5.45
Nominal Cooling Capacity (C)	kW	6	12	12	17	17
Cooling Capacity Range (C)	kW	2.05-10.05	4.63-17.99	4.63-17.99	6.00-23.00	6.00-23.00
Cooling Power Input Range (C)	kW	0.53-2.62	0.91-5.38	0.91-5.38	1.30-7.30	1.30-7.30
Nominal Cooling Capacity (D)	kW	6	12	12	17	17
Cooling Capacity Range (D)	kW	1.12-6.82	3.44-14.14	3.44-14.14	46129	46130
Cooling Power Input Range (D)	kW	0.57-2.54	1.01-5.14	1.01-5.14	1.7-7.1	1.7-7.2
Max. Power Input	kW	3.5	6.09	6.09	8.74	10.4
Max. Current Input	A	15.5	26.68	8.91	38	15
Power Supply	/	220-240V~/50Hz	220-240V~/50Hz	380-415V/3N~/50Hz	220-240V~/50Hz	380-415/3N~/50Hz
Refrigerant Type	/	R290				
Refrigerant Volume	kg	0.7	1	1	1.3	1.3
Compressor type	/	Rotary				
Compressor Quantity	/	1				
Fan Motor Type	/	DC motor				
Fan Quantity	/	1	1	1	2	2
Sound Pressure (1m)	dB	39	41	42	44	44
Sound Power Level (EN12102)	dB	48	51	51	53	51
Water Connection	inch	1				
Rated Water Flow	m³/h	1.03	2.06	2.06	2.92	2.92
Water Pressure Drop	kPa	12	23	23	40	40
Circulation Pump Head	m	7	7.8	7.8	10.4	10.4
Operating Ambient Temperature	°C	-30~45				
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				

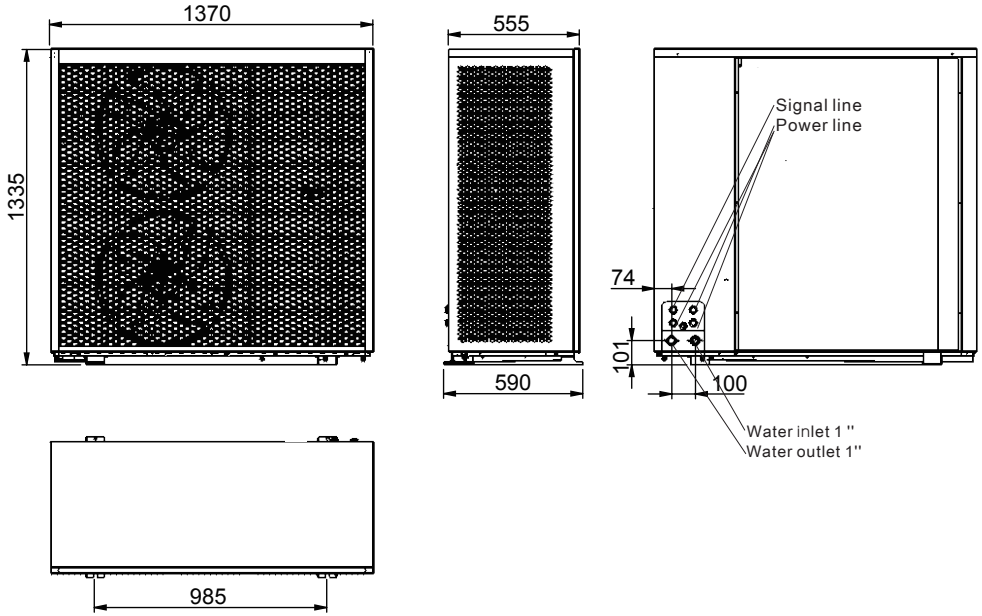
Heating working condition (A): (DB/WB)7°C/6°C. Outlet water temp.35°C.
Heating working condition (B): (DB/WB)7°C/6°C. Outlet water temp.55°C.
Cooling working condition (C): (DB/WB)35°C/24°C, Outlet water temp.18°C.
Cooling working condition (D): (DB/WB)35°C/24°C, Outlet water temp.7°C.
BS EN14511-1-2013 Air conditioner, whole liquid cooling machine, electric compressor.
Part2: Test condition; Part3: Test method; Part4: Related requirements.

3. Unit dimension

Models:CH-HP08UIMPZK-P / CH-HP12UIMPZK-P / CH-HP12UIMPZM-P



Models:CH-HP17UIMPZK-P / CH-HP17UIMPZM-P



Unit features

1. Plate heat exchanger

Utilize the plate heat exchanger, characterized by its compact size and high efficiency.

2.Environmentally Friendly Refrigerant

Employ the new generation of environmentally friendly refrigerant R290, which poses no harm to the ozone layer.

3. Heating in Frigid Environment.

The optimally designed unit can maintain normal heating functionality even when the ambient temperature drops to -30°C.

4. Refrigerant Charging

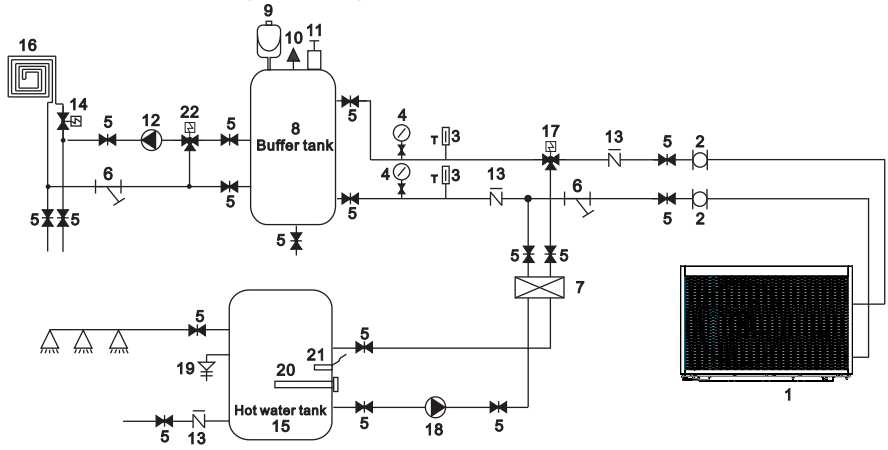
If the machine is not equipped with refrigerant and is charged with nitrogen, then the recharging of the refrigerant needs to be carried out according to the instructions on page 9.

5. Installation Environment

The refrigerant R290 is flammable and explosive. It is prohibited to install the unit in environments with operating or potential ignition sources, including open flames, operating gas appliances, electric heaters, electric sparks, or hot objects.

1 Application of heat pump

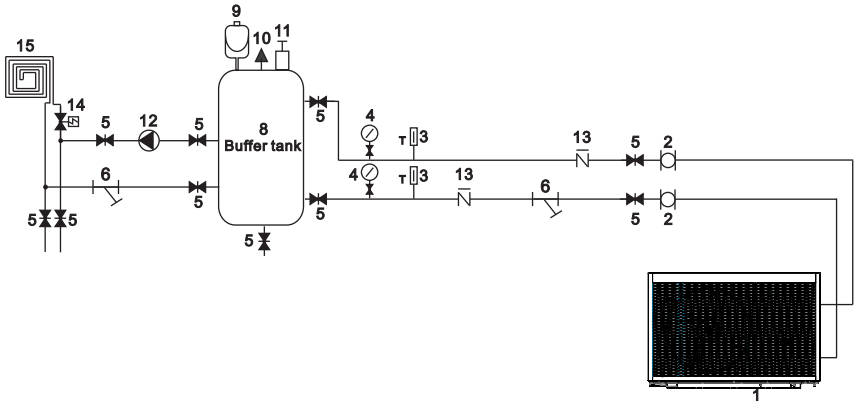
1.1 House Heating/Cooling + Domestic Hot Water



1	Heat pump	10	Relief valve	19	PT valve
2	Flexible pipe	11	Air vent valve	20	Electrical heater
3	Thermometer	12	Water pump for floor heating	21	Hot water sensor
4	Manometer	13	Check valve	22	Mixing valve
5	Shut-off valve	14	Floor heating valve		
6	Y type water filter	15	Hot water tank		
7	Plate heat exchanger	16	Floor heating pipe/fan coil unit		
8	Buffer tank	17	Hot water valve		
9	Expansion tank	18	Hot water pump		

Remark:Item 17, 18, 20, 21 can be connected with heat pump.

1.2 House Heating/Cooling（includes Buffer tank）



1	Heat pump	7	Plate heat exchanger	13	Check valve
2	Flexible pipe	8	Buffer tank	14	Floor heating valve
3	Thermometer	9	Expansion tank	15	Floor heating pipe/fan coil unit
4	Manometer	10	Relief valve		
5	Shut-off valve	11	Air vent valve		
6	Y type water filter	12	Water pump for floor heating		

2 Choose a right heat pump unit

1. Based on the local climate conditions, construction characteristics, and insulation level, calculate the required cooling/heating capacity per square meter.
2. Determine the total capacity required for the building.
3. Select an appropriate heat pump model according to the total capacity requirement. Typically, the heat pump's capacity should be 1.05 times or greater than the calculated heating requirement to ensure optimal energy-saving performance during operation.

Heat pump features are as follows:

- Cooling Mode

The heat pump operates within an ambient temperature range of 10~45 °C. It is recommended to set the target outlet water temperature between 7~25 °C.

- Heating Mode

The heat pump operates within an ambient temperature range of -30~45 °C. It is recommended to set the target outlet water temperature between 15~80 °C. Please note that higher water temperatures result in lower energy efficiency. The maximum allowable target outlet water temperature is 80 °C.

- Unit Application

This inverter air-source water heat pump is suitable for spaces such as houses, offices, and hotels that require independent heating or cooling, with the capability for zoned temperature control.

3 Installation method

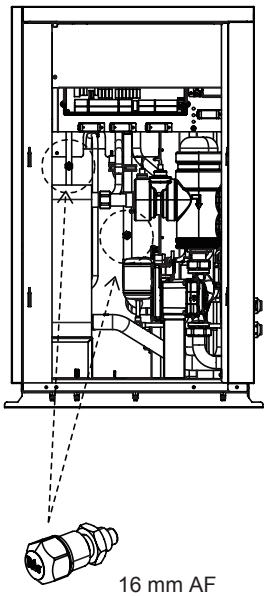
The heat pump can be installed onto the concrete basement by expansion screws, or onto a steel frame with rubber feet which can be placed on the ground or housetop. Make sure that the unit is placed horizontally.

4 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 area should be free from heat radiation and open flames.
- A cover 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.
- Choose a location that is free from strong winds.
- A water channel is necessary around the heat pump to drain the condensation water.
- There must be sufficient space around the unit for maintenance
- The location should be far from operating or potential ignition sources, such as open flames, operating gas appliances, electric heaters, electric sparks, or hot objects.

5 Refrigerant charge

If the machine is not equipped with refrigerant and is charged with nitrogen, then the recharging of the refrigerant needs to be carried out according to the steps below.



5.1 Preparations

5.1.1 Please ensure a well-ventilated environment while charging the refrigerant.

5.1.2 Avoid open flames or potential sources of fire.

5.1.3 Disconnect the power supply to the heat pump.

5.1.4 Carefully check the heat pump's nameplate and charge according to the specified amount labeled.

5.2 Nitrogen Gas Pressure Check

Check the pressure of the nitrogen gas inside the system. The heat pump is pre-charged with about 30 Bar of nitrogen gas. Before charging the refrigerant, ensure there is still high-pressure nitrogen present; otherwise, identify and check for leakage points. (Use a spanner to remove seal nuts**.** If high-pressure gas is expelled, the heat pump is not leaking.)

5.3 Nitrogen Gas Release

Use a 16mm inner hexagon spanner to open valve and release all the nitrogen gas inside the system.

5.4 Vacuuming the System

Connect a vacuum pump to valve and run it until the absolute pressure falls below 30Pa or it has been operating for more than one hour.

5.5 Refrigerant Charging

Ensure the refrigerant is in a liquid state when charging and adhere strictly to the labeled amount.

5.6 Sealing the System

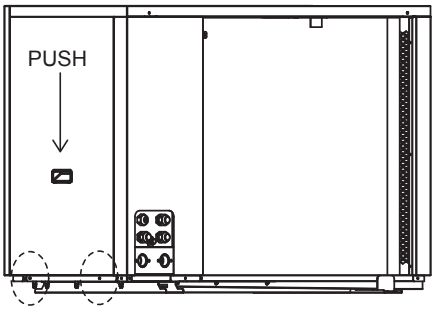
After charging is complete, tighten seal nuts**.**

6 Panel Removal

6.1 Service Panel

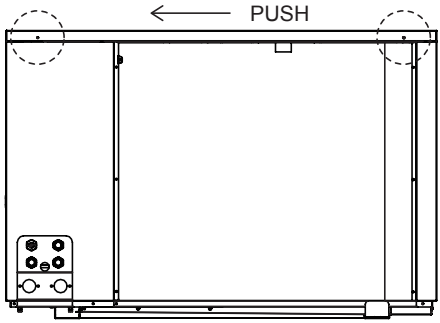
1. Remove 2*screws at the locations shown in the left-side figure.
2. Pull the service panel down to remove it.

Note: There is no need to remove the top cover before disassembling the service panel.



6.2 Top Cover

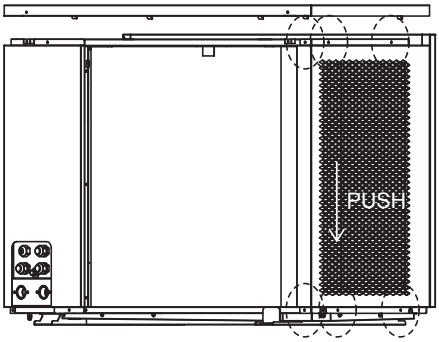
1. Remove 2*screws at the locations shown in the left-side figure.
2. Lift the top cover off toward the service panel.



6.3 Left Protective

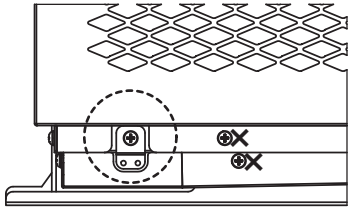
Note: The top cover must be removed prior to this operation.

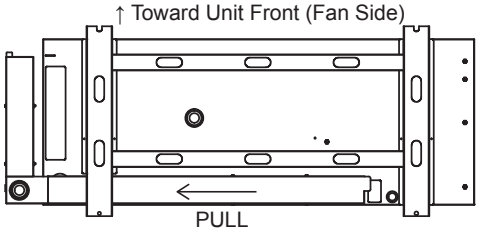
1. Remove 6*screws at the locations shown in the left-side figure.
2. Pull the left protective down to remove it.



6.4 Condensate Pan Removal

1. Remove 1*screw at the location shown in the left-side figure.
2.Pull the pan assembly straight out.





7 Water loop connection

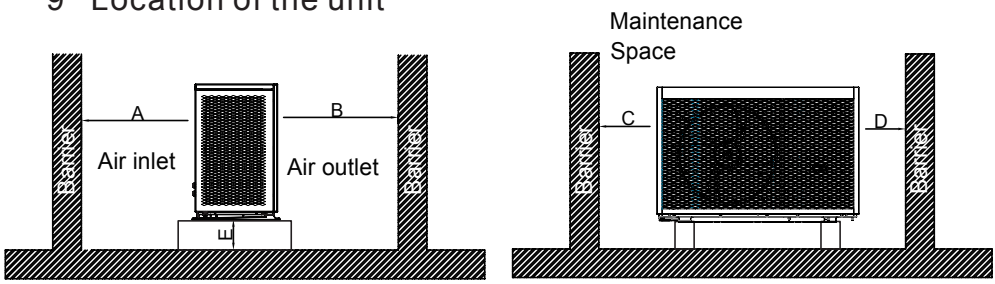
Please pay attention to the matters below when connecting the water pipe :

- Try to minimize the resistance to water flow within the piping.
- The piping must be clean and free from dirt and obstructions. A water leakage test must be conducted to ensure there are no leaks before proceeding with the insulation.
- Note that the pipe must undergo pressure testing separately. DO NOT test it concurrently with the heat pump.
- An expansion tank must be installed at the highest point of the water loop, and the water level in the tank should be at least 0.5 meters higher than the highest point of the water loop.
- The flow meter is installed inside the heat pump; ensure the wiring and functionality of the switch are normal and controlled by the controller.
- Try to prevent air from remaining inside the water pipe; there must be an air vent at the highest point of the water loop.
- A thermometer and pressure meter must be installed at the water inlet and outlet to facilitate easy inspection during operation.

8 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 an external water pump is required, please also insert its power supply cable through the wire access point and connect it to the water pump terminals.
- If an additional auxiliary heater needs to be controlled by the heat pump controller, the relay (or power supply) of the auxiliary heater must be connected to the relevant output on the controller.

9 Location of the unit



The picture shows the location of horizontal air outlet unit.

Attention

Requirements
A>500mm ; B>1500mm ;
C>1000mm ; D>500mm ; E>100mm.

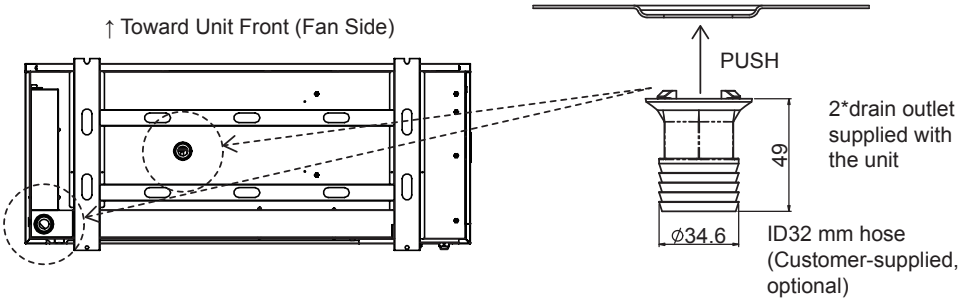
The minimum ventilation distance in diagram.

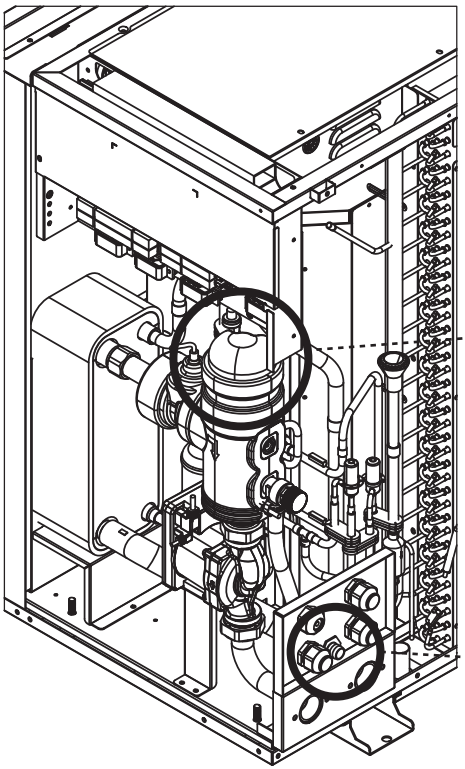
10 Pre-Startup Preparation

10.1 Drain Outlet

1. Install the unit onto the mounting base.
2. Insert the drain outlet (2*drain outlet supplied with the unit) into the drain outlet on the basepan and push up until it clicks into place.

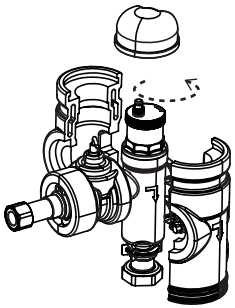
Note: It's recommended to connect a water pipe with an ID32 mm to the Drain.



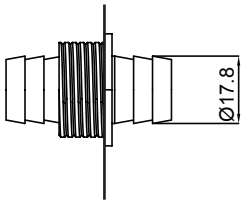


10.2 Pressure Relief Valve

1. Disassemble the Front Rear and Top-side EPP Covers.
2. Loosen the Exhaust Nut on the top of the Pressure Relief Valve to facilitate exhaust.

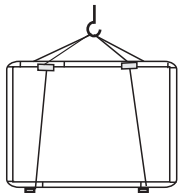


10.3 Relief Valve Outlet
1. It is recommended to connect a drain pipe with an ID16 mm.



11 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)



Picture 1

WARNING

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

12 Trial Running

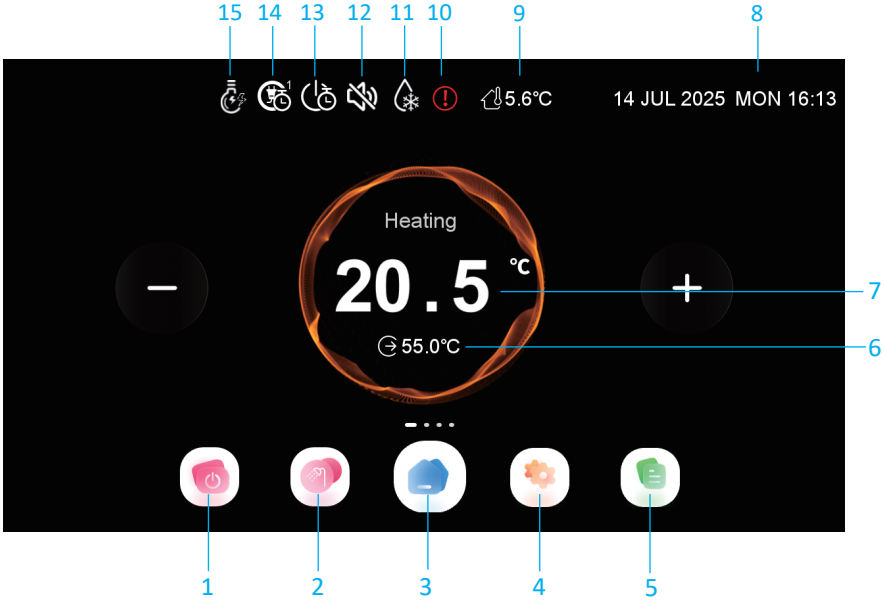
Inspection before trial running

- Check the indoor unit and verify that the pipe connection is correct and the relevant valves are open.
- Inspect the water loop to ensure that the expansion tank contains sufficient water, the water supply is adequate, and the loop is filled with water without any air present. Additionally, ensure good insulation is applied to the water pipe.
- Examine the electrical wiring. Confirm that the power voltage is normal, the screws are tightened, the wiring aligns with the diagram, and the grounding is connected properly.
- Review the heat pump unit, including all screws and components, to ascertain they are in good condition. Upon powering on, observe the indicators on the controller for any failure signs. Connect the gas gauge to the check valve to monitor the system's high (or low) pressure during the trial run.

Trial running

- Activate the heat pump by pressing the "____" key on the controller. Check the water pump's operation; if functioning normally, the water pressure meter will indicate 0.2 MPa.
- After the water pump has run for 1 minute, the compressor will initiate. Listen for any unusual sounds emanating from the compressor. In case of abnormal noises, cease operation and inspect the compressor. If the compressor is running smoothly, proceed to check the refrigerant pressure meter.
- Subsequently, confirm that the power input and running current conform to the specifications detailed in the manual. If discrepancies are noted, halt the operation and investigate the issue.
- Adjust the valves in the water loop to guarantee the hot (or cold) water supply to each unit meets the heating (or cooling) requirements.
- Assess the stability of the outlet water temperature.
- The controller's parameters are preset by the manufacturer; unauthorized alterations by the user are prohibited.

1. Main interface display and function



	Name	Description of operation
1	On/off	Power ON/OFF button, color indicates ON and gray indicates OFF
2	Mode	Click to choose the mode: DHW, heating, cooling, cooling+DHW, heating+DHW
3	Main	Click to back to the main interface
4	Setting	Click to enter the function setting interface
5	User interface	Click to enter the user setting interface
6	Current temp	Display according to H25, and the tank temp is displayed when the hot water mode is selected
7	Target temp	Display the current mode target temp,adjustable
8	System time	Display the current real-time time
9	AT	Display the ambient temp
10	Fault icon	Display when the unit fails,click to enter the real-time fault interface
11	Defrosting icon	Display when the unit is defrosting
12	Mute icon	Display when the unit is mute
13	Power timer	Display when the power on/off timer is enabled
14	Schedule icon	Display when the schedule timer is enabled
15	SG Ready icon	Display SG current mode icon

Remark:
1. The target temp. cannot be set when the device is shut down.
2. If the device enter the AT Compensation and Schedule, the target temp. cannot be set and the corresponding text prompts are displayed.

Operation and Use

1.1 Mode switch

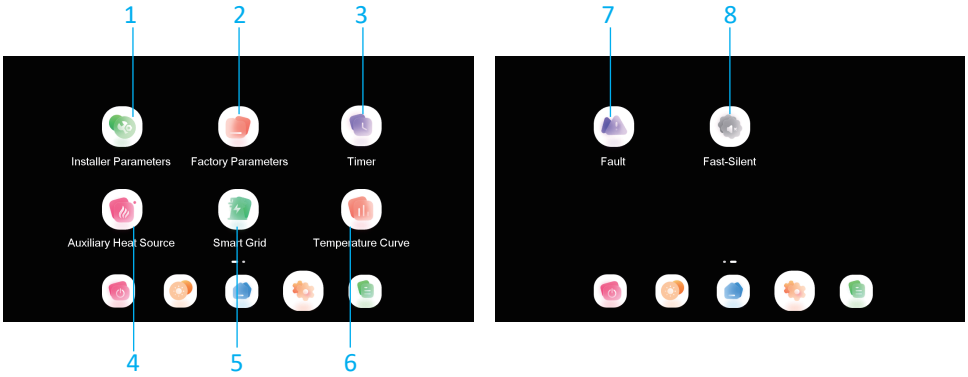
Click on the icon to switch to the corresponding selection mode, after setting automatically return to the main interface.

The mode setting screen is displayed according to the H05 and H28 parameters, with up to 5 modes selectable.

- H05=0&H28=0, only heating is displayed;
- H05=1& H28=0, heating and cooling is displayed;
- H05=0&H28=1, heating and DHW, heating + DHW is displayed;
- H05=1&H25=1, 5 modes are displayed;
- H28=2, only DHW is displayed.

2. Function setting

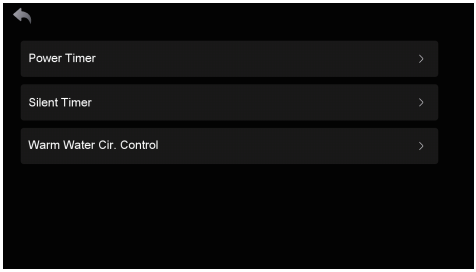
Click the button in the main interface to enter the setting interface.



No.	Name	Description of operation
1	Installer Parameters	The interface is for installers
2	Factory Parameters	Click the key and enter the password to enter the factory parameter settings and status parameters
3	Timer	Click to enter the timer setting ineterface
4	Auxiliary Heat Source	Click to enter the auxiliary heat function interface
5	Smart Grid	Click to enter the SG function interface
6	Temperature Curve	Click to the temp. curve interface
7	Fault	Click to view the fault interface
8	Fast-Silent	Click to mute

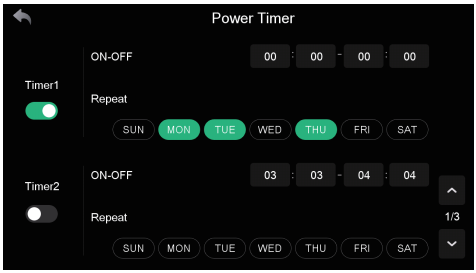
2.1 Timer function

Click the button in the setting interface to enter the timer function interface.



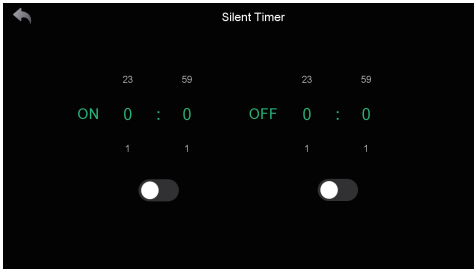
2.1.1 Power Timer function

This is the power on/off timer for the device. Up to 6 different timers are supported to adjust the operation of the device to your needs. Each timer allows you to select the number of days of the week that it will run.



Remark:
The time is set in 24-hour format and supports hour and minute settings across days.

2.1.2 Silent Timer function

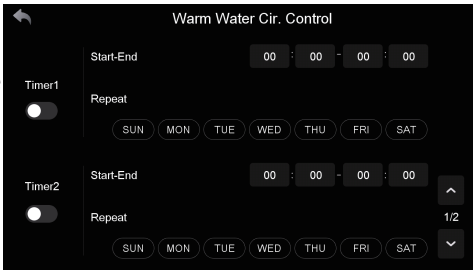


The silent feature minimizes noise levels by limiting compressor and fan speeds.
Select the silent start time on the left side of the screen. Select the silent end time on the right side of the screen, which resumes normal operation.

Don't forget to activate the timer by pressing the switch on the buttom of the screen.

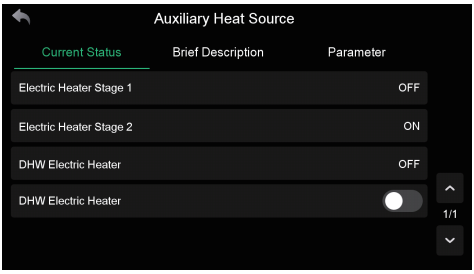
2.1.3 Warm Water Cir. Control function

Up to 3 different timers are supported to adjust the operation of the device to your needs. Each timer allows you to select the number of days of the week that it will run.



2.2 Auxiliary Heat function

Click the button in the setting interface to enter the auxiliary heat function interface.

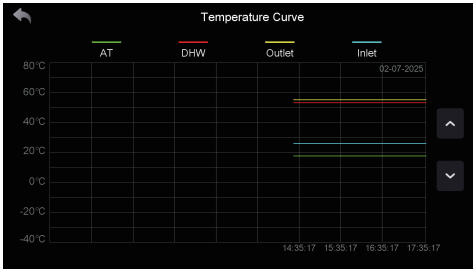


- Current Status: Displays three electric heating on/off states, and manual electric heating control parameters;
- Brief Description: Display the current AT. temp. and description of the conditions which the auxiliary heat source is turned on;
- To use the electric heater function, press the "Parameters" key, enter the code "22" and set the relevant parameters.

2.3 Temp. Curve

Click the button in the setting interface to enter the curve recording interface.

• This curve function records the water inlet temp, outlet temp, DHW temp and AT temp
• Temp data is collected and saved every 5 munites and save up to 30 days of data
• Only curve for power-on status is recorded, and that for power-off will not be saved
• Temp curve record is provided with power-down memory function
• The value of the abscissa indicates the time from the point on the curve to the current time point.The rightmost point on the first page is the latest temp record. Page up and down to view historical data



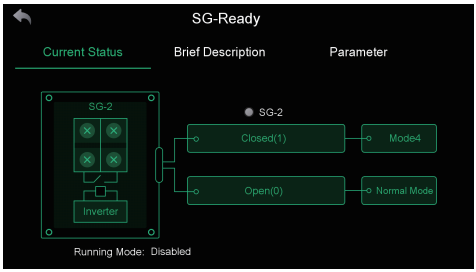
2.4 Smart Grid function

Click the button in the setting interface to enter the SG function interface.

Through one or two contacts, the device receives information on available energy (from the PV system or the electricity supplier) and selects one of the 5 modes based on this information:

- Mode 1: Hibernation, where the heat pump is forced into standby. Standard mode is entered when continuous SG02 is in demand;
- Mode 2: Low energy mode with a maximum operating power of SG03 (when energy is insufficient or too expensive);
- Mode 3: Energy saving mode with maximum operating power SG04;
- Mode 4: Temperature Increasing Cooling/Heat Storage Mode. The heat pump target temp is raised according to SG05/SG06/SG07 and the electric heating is switched on according to SG08. (When energy consumption is low, the appliance can select a higher temp target to speed up heating and provide more domestic hot water);
- Normal Mode: Unit operates normally without power limitations and electric heater.

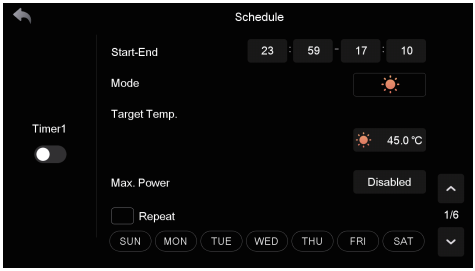
- To use the SG Ready function, press the “Parameters” key, enter the code “22” and select the number of contacts to be used (1 or 2) in the SG01 parameter.
- The 1st contact (SG-1) is defined as Remote On/Off; the 2nd contact (SG-2) is defined as Remote Heating/Cooling Switch.



SG01=1

2.4 Schedule function

Click the button to enter the schedule function interface.



Support up to 6 different timers are supported to adjust the operation of the device to your needs. You can set the following:

- Start and end time
- Run mode
- Target temp
- Maximum power consumption
- Number of days the timer will run

2.5 Fault interface

Click the button in the setting interface to enter the fault interface, If the fault recovers, it is no longer displayed.

Detailed information on the faults and their solutions can be found in the fault table at the end of the manual.

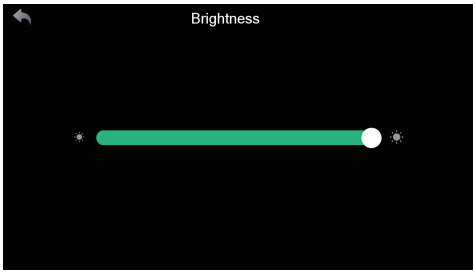
2.6 Unit state function

Click the button in the main interface to enter customer function configuration menu.

Name	Description of operation
System Time	Click to set the system time
Language	Click to change the language
Brightness	Click to adjust screen brightness
About	Display information about the device software
State	Turn the page to view all status parameters. Parameters are grouped by label according to the first letter of their code

2.7 Brightness

Click the button in the project interface to enter the mute timer interface.



- Initialized brightness of 100, when the user set up after the set value to save, the next time the power or off the screen light according to the set brightness display.
- The screen will be darkened after 30s without operation, and then turn off the screen after 5min, and then light up after turning off the screen to return to the main interface.

3. Error Code Instruction

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	TC	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 ℃ 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 mainboard	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

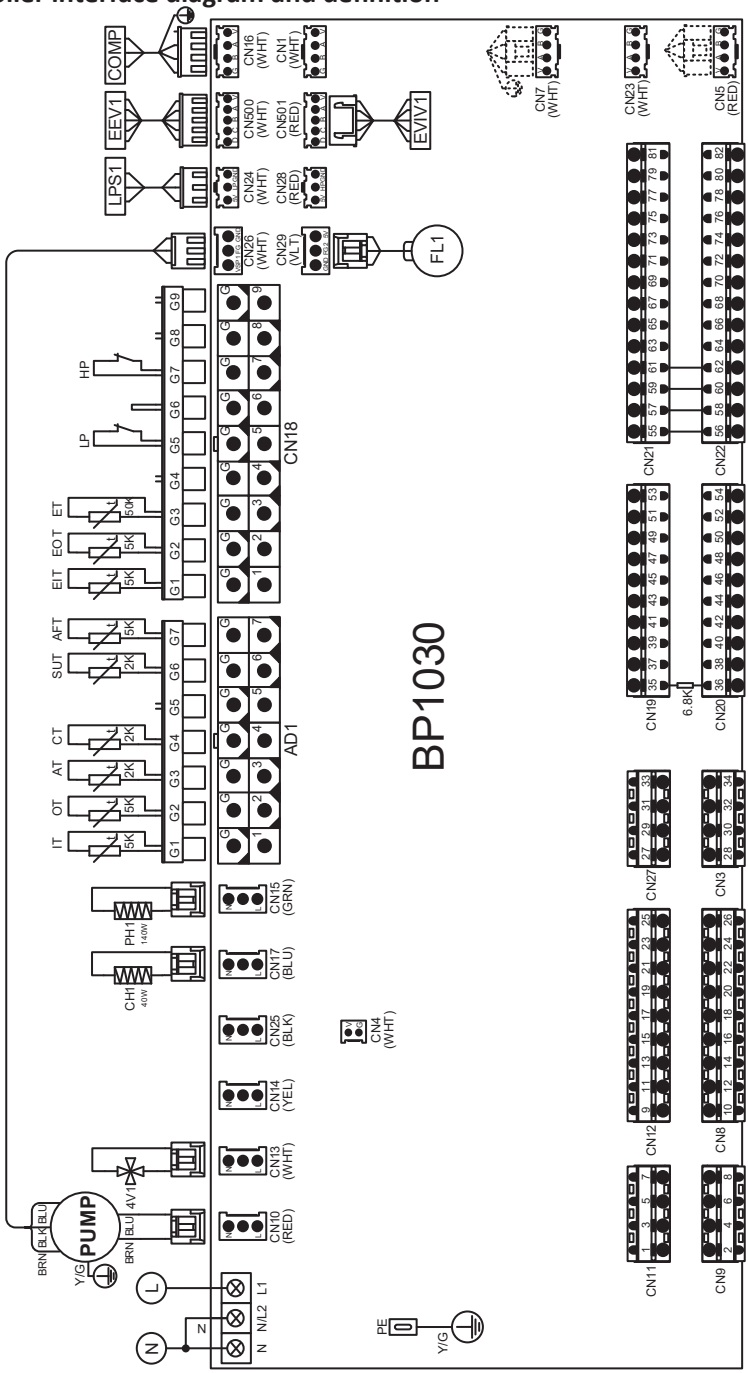
Protect/fault	Fault display	Reason	Elimination methods
DHW Electric Heater Overheat Fault	E042	Overload protection switch disconnected when the electric heating of the hot water tank was activated	Check the wiring of the electric heating overload switch in the hot water tank for proper connection and the condition of the overload switch
Overhigh Outlet Water Temp. after Electric Heater	E07a	High temperature detected at the water outlet of the electric heating during activation	1. Verify if the water outlet temperature of the electric heating exceeds 70°C; 2. Check the wiring of the temperature sensor at the outlet of the electric heating for proper connection
Communication Fault with Indoor Unit	E08i	No successful communication detected with the indoor unit for 70 continuous seconds when the indoor unit control is enabled	1. If no indoor unit is present, modify parameters to disable indoor unit control; 2. If there is an indoor unit, inspect the communication wiring between the indoor unit and the heat pump for proper connection
Communication Fault with Consumption Module	E08j	No successful communication detected with the consumption module for a continuous period of time when the consumption module control is enabled	1. If no consumption module is present, modify parameters to disable consumption module control; 2. If there is a consumption module, inspect the communication wiring between the consumption module and the heat pump for proper connection
Water Pressure Sensor Fault(for IDU)	E034	Short circuit or open circuit detected by the indoor unit's water pressure sensor	1. Inspect the integrity of the indoor unit's water pressure sensor; 2. Check if the voltage at the water pressure sensor port is within the range of 0.5 to 4.5 volts
Temp. & Humidity Sensor Fault	T5T	The temp. sensor is broken or short circuit	Check or change the temp. sensor
External Ambient Temp. Sensor Fault	T5Z	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Cooling not allowed due to big temp. diff. between indoor& outdoor temp.	T5S	When dew point control is enabled, outdoor temperature < indoor temperature - DP3, heat pump temporarily disables cooling mode	1. Wait for the indoor temperature to drop, or the outdoor temperature to rise, and the fault will be recovered automatically; 2. Set parameter DP3 to adjust the alarm value for the indoor/outdoor temperature difference; 3. Disable the dew point control function (set DP1=0)

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 Underload-voltage protection value	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
AC Power Overvoltage Fault	F10	Input voltage>Input Overload--voltage protection value	Check whether the input voltage is higher than 265V
DSP and Comp. Driver Communication Fault	F11	DSP and Inverter board communication failure	Check the communication connection
DSP and PFC Communication Fault	F12	DSP and PFC connect fault	Check the communication connection
IPM Overheat Fault	F13	The IPM module is overheat	Check and adjust the current measurement
Compressor Lacking Phase Fault	F14	The compressor lost phase	Check whether compressor cables are connected properly and reliably
Input Power Lacking Phase Fault	F15	The input voltage lost phase	Check and measure the voltage adjustment
Comp. Weak Magnetic Alarm	F16	Compressor magnetic force is not enough	Check and adjust the current measurement
Comp. Driver Temp. Sensor Fault	F17	The transducer is overheat	Check and adjust the current measurement
IPM Current Sampling Fault	F18	IPM sampling electricity is fault	Check and adjust the current measurement
IGBT Power Device Overheat Alarm	F20	The IGBT is overheat	Check and adjust the current measurement
Overspeed Fault	F21	The compressor is running abnormally	Check whether the compressor cable is nor--mal and whether the compressor is blocked
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
EEPROM Fault	F29	Failed to read the memory chip	Check the frequency conversion board
Comp. Current Frequency Decrease Alarm	F33	The compressor current frequency reduction	Check and adjust the current measurement
Compressor Type Code Fault	F060	Incorrect selection of compressor model code	Contact the supplier to obtain the correct model code
Driver (Fan) Power Lacking Phase Fault	F101	The fan lost phase	Check whether fan cables are connected properly and reliably

Protect/fault	Fault display	Reason	Elimination methods
Driver (Fan) Start Fault	F102	The fan fails to start	Check whether the fan is blocked
Driver (Fan) External Overcurrent Fault	F105	The fan IPM hardware running current is too large	Check whether the fan is blocked
Driver (Fan)IPM Overheat Fault	F106	The fan IPM drive plate has poor heat dissipation	Check heat dissipation conditions
Driver (Fan) overspeed Fault	F109	The fan speed is too high	Check whether the fan drive board is abnormal
Driver (Fan) Current Sampling Fault	F112	Fan sampling electricity is fault	Check whether the fan drive plate is abnormal
Driver (Fan) Internal Overcurrent Fault	F113	The fan soft ware running current is too large	Check whether the fan is blocked
Driver (Fan)Temp. Sensor Fault	F120	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Comp. Driver and PCB Communication Fault	F151	DSP and Mainboard communication failure	Check the communication connection
Comp. Overcurrent Fault	E051	The compressor is overload	Check whether the system of the compressor running normally

4. Controller interface diagram and definition



NO.			Function
CN 11 / CN 9	1	L	Circulation Pump
	2	N	
	3	L	Hot Water Pump
	4	N	
	5	L	Water Pump For Zone 1 Radiator
	6	N	
	7	L	Water Pump For Zone 2 Floor Heating
	8	N	
CN 12 / CN 8	9	L	Pan Heater
	10	N	
	11	L	Electric Heater Stage 1
	12	N	
	13	L	Electric Heater Stage 2
	14	N	
	15	L	DHW Electric Heater
	16	N	
	17	Signal	3 Way Valve For DHW
	18	N	
	19	L	
	20	N	
	21	L	3 Way Valves For Cooling
	22	N	
	23	Signal	
	24	N	
	25	L	Remote Alarm
	26	N	
CN 27 / CN 3	27	Open	/
	28	N	
	29	Close	
	30	N	
	31	Open	Mixing Valve For Zone 2
	32	N	
	33	Close	
	34	N	
CN 19 / CN 20	35	AI	Tank Temperature
	36	GND	
	37	AI	Buffer Tank Temperature
	38	GND	
	39	AI	Zone 1 Room Temperature / Passive Switch Signal For Zone 1 Thermostat
	40	GND	
	41	AI	Zone 2 Room Temperature / Passive Switch Signal For Zone 2 Thermostat
	42	GND	
	43	AI	The Outlet Water Temp. After Mixing For Zone 2
	44	GND	
	45	T	Sensor Of Relative Humidity
	46	5V	
	47	H	
	48	GND	
	49	0-10 V	/
	50	GND	
	51	AI	/
	52	GND	
	53	AI	External Ambient Temperature
	54	GND	

NO.			Function
CN 21 / CN 22	55	DI	Electric Overheat Protection
	56	GND	
	57	DI	Remote On/Off
	58	GND	
	59	DI	Heat/Cool On/Off
	60	GND	
	61	DI	DHW On/Off
	62	GND	
	63	DI	Remote Heat/Cool
	64	GND	
	65	DI	SG-1
	66	GND	
	67	DI	SG-2
	68	GND	
	69	0-10 V	0-10V Output
	70	GND	
	71	A 2	Centralized Controller
	72	12 V	
	73	B 2	
	74	GND	
	75	A 3	Thermostat
	76	12 V	
	77	B 3	
	78	GND	
	79	A 1	/
	80	12 V	
	81	B 1	
	82	GND	

NO.		Multiplexed Ports	Option	Parameter Setting
CN 19 / CN 20	39 / 40	RT1 	Zone 1 Room Temp.	Z01=1/3
			Passive Switch Signal For Zone 1 Thermostat	Z01=7/9
	41 / 42	RT2 	Zone 2 Room Temp.	Z01=2/3
			Passive Switch Signal For Zone 2 Thermostat	Z01=8/9

NO.		Function	
	CN10	PUMP	PUMP
	CN13	4V	4 Way Valve
	CN14	/	Reserved
	CN25	/	Reserved
	CN17	CH	Crankcase Heater
	CN15	PH	Pan Heater
AD1	G1	IT	Inlet Water Temperature
	G2	OT	Outlet Water Temperature
	G3	AT	Ambient Temperature
	G4	CT	Coil Temperature
	G5	/	Reserved
	G6	SUT	Suction Temperature
	G7	AFT	Anti-Freeze Temperature
CN18	G1	EIT	EVI Inlet Gas Temperature
	G2	EOT	EVI Outlet Gas Temperature
	G3	ET	Exhaust Temperature
	G4	/	Reserved
	G5	LP	Low Pressure Protection
	G6	/	Reserved
	G7	HP	High Pressure Protection
	G8	/	Reserved
	G9	/	Reserved
	CN26	PUMP	PUMP Feedback
	CN24	LPS	Low Pressure Sensor
	CN500	EEV	Electronic Expansion Valve
	CN16	COMP	Compressor
	CN29	FL	Flow meter
	CN28	/	Reserved
	CN501	EVIV	Electronic Expansion Valve For EVI
	CN1	/	Reserved
	CN7	Display	Display
	CN23	/	Reserved
	CN5	DTU/WIFI	DTU/WIFI

6. MAINTENANCE AND INSPECTION

- Check the water supply device and the release often. You should avoid the condition of no water or air entering into system, as this will influence unit's performance and reliability. You should clear the pool/spa filter regularly to avoid damage to the unit as a result of the dirty of clogged filter.
- The area around the unit should be dry, clean and well ventilated. Clean the side heating exchanger regularly to maintain good heat exchange as conserve energy .
- The operation pressure of the refrigerant system should only be serviced by a certified technician .
- Check the power supply and cable connection often,. Should the unit begin to operate abnormally, switch it off and contact the qualified technician.
- Discharge all water in the water pump and water system ,so that freezing of the water in the pump or water system does not occur. You should discharge the water at the bottom of water pump if the unit will not be used for an extended period of time. You should check the unit thoroughly and fill the system with water fully before using it for the first time after a prolonged period of no usage.
- Checks to the area
  Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.
- Work procedure
  Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.
- Work procedure
  Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.
- General work area
  All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.
- General work area
  All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.
- Checking for presence of refrigerant
  The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.
- Presence of fire extinguisher
  If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

- No ignition sources

  No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

- Ventilated area

  Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere. prolonged period of no usage.

- Checks to the area

  Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system. prolonged period of no usage.

- Checks to the refrigeration equipment

  Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance.

  The following checks shall be applied to installations using flammable refrigerants:

  The charge size is in accordance with the room size within which the refrigerant containing parts are installed;

  The ventilation machinery and outlets are operating adequately and are not obstructed;

  If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

  Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

  Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

- Checks to electrical devices

  Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

  Initial safety checks shall include:

  . That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;

  . That there no live electrical components and wiring are exposed while charging, recovering or purging the system;

  . That there is continuity of earth bonding.

- Repairs to sealed components

  1) During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

  2) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

  Ensure that apparatus is mounted securely.

  Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

  NOTE: The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to

- Repair to intrinsically safe components

  Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

  Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

  Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

- Cabling

  Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

- Detection of flammable refrigerants

  Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

- Leak detection methods

  The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.

  Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

  Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

  If a leak is suspected, all naked flames shall be removed/ extinguished.

  If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

6. MAINTENANCE AND INSPECTION

Removal and evacuation

When breaking into the refrigerant circuit to make repairs or for any other purpose conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

. Remove refrigerant;
. Purge the circuit with inert gas;
. Evacuate;
. Purge again with inert gas;
. Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be "flushed" with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.

Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available. working on them.

Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

6. MAINTENANCE AND INSPECTION

- Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.
b) Isolate system electrically.
c) Before attempting the procedure ensure that:
. Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
. All personal protective equipment is available and being used correctly;
. The recovery process is supervised at all times by a competent person;
. Recovery equipment and cylinders conform to the appropriate standards.
d) Pump down refrigerant system, if possible.
e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
f) Make sure that cylinder is situated on the scales before recovery takes place.
g) Start the recovery machine and operate in accordance with manufacturer's instructions.
h) Do not overfill cylinders. (No more than 80 % volume liquid charge).
i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

- Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.

Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

- The safety wire model is 5*20_10A/250VAC,And must meet the explosion-proof requirements

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-out waste 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	MCB	Creepage protector	Signal line
No more than 10A	2×1.5mm^2	1.5mm^2	20A	30mA less than 0.1 sec	n×0.5mm^2
10~16A	2×2.5mm^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	2×10mm^2	10mm^2	63A	30mA less than 0.1 sec	
40~63A	2×16mm^2	16mm^2	80A	30mA less than 0.1 sec	
63~75A	2×25mm^2	25mm^2	100A	30mA less than 0.1 sec	
75~101A	2×25mm^2	25mm^2	125A	30mA less than 0.1 sec	
101~123A	2×35mm^2	35mm^2	160A	30mA less than 0.1 sec	
123~148A	2×50mm^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	2×95mm^2	95mm^2	280A	30mA less than 0.1 sec	

2. Three phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	3×1.5mm^2	1.5mm^2	20A	30mA less than 0.1 sec	n×0.5mm^2
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	
63~75A	3×25mm^2	25mm^2	100A	30mA less than 0.1 sec	
75~101A	3×25mm^2	25mm^2	125A	30mA less than 0.1 sec	
101~123A	3×35mm^2	35mm^2	160A	30mA less than 0.1 sec	
123~148A	3×50mm^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	3×95mm^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. Corrosion 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 (HCO_3^-)	<70 70-300 >300	24h	+ + +	+ + +	+ + +	0 + 0/+	+ + +	+ + +
Sulfate (So_4^{2-})	<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	+ + +	+ + +
pH	<6.0 6.0-7.5 7.5-9 >9	24h	0 + + +	0 + + +	0 + + +	0 0 + 0	+ + + +	0 + + +
Ammonium (NH_4^+)	<2 2-20 >20	24h	+ + +	+ + +	+ + +	+ 0 -	+ + +	+ + +
Chloride (Cl^-)	<10 100-200 200-300 >300	unlimited	+ 0 - -	+ + + -	+ + + +	+ + + 0/+	+ + + +	+ + + -

Appendix 4 Accessories List

No.	Item Description	Qty.
1	Rubber Foot	×4
2	Thermistor	×2
3	Carton	×3
4	PE Foam (EPE)	×1
5	Packing Belt	×4
6	Accessory Bag	×1
7	4-core Connection Cable	×1
8	PE Foam (EPE)	×1
9	Drain Nozzle	×2
10	PE Foam (EPE)	×1
11	DTU	×1
12	Connection line (with DTU)	×1

Note:

Note:

*Cooper&Hunter is constantly working on improvement by pouring their products, so what information given in this manual, may be changed- without prior notice to consumers.

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