

Installation & Operation Manual

Heat Pump Water Heater

Model: AH-200NH4GHB/ AH-300NH4GHB



Thank you very much for purchasing our product, please keep this installation manual carefully and read this manual carefully before you install heat pump.

Dear Customers

Thank you for selecting our products!

The manual is aimed to let you learn more installation, operation and maintenance of heat pump and provides some important safe information for you. It's quite required to carefully read the whole contents shown in this manual before you install and use heat pump, and please keep this installation manual carefully for purpose of future reference.

CONTENT

• Safety Precautions.....	4
• General Information.....	5
• Part Description.....	9
• Installation of Heat Pump.....	10
• Pipe Line Connection.....	16
• Power Connection.....	21
• Notes of Application.....	23
• Controller Instruction.....	26
• Operation Instruction.....	29
• Pilot run of Heat Pump.....	39
• Maintenance and Solution.....	40
• Environmental Information.....	41
• Wiring Diagram.....	42

Safety Precautions

Please make sure you have read at least one chapter of safety precautions shown in the manual. This part provides quite important safe points for you and please operate it based on safety precautions.

1. Household electrics must have a reliable earth connection.
2. This product must be protected with a residual current device of adequate rating.
3. Do not interfere with any permanent instruction, labels or warning plate attached to the external cover of this heat pump.
4. This product must only be installed by qualified personnel in the mechanical and electrical industry.
5. Always comply with local wiring regulations.
6. Always engage with a trained professional to relocate this product after it has been professionally installed.
7. Maintenance and repair work must only be undertaken by trained and qualified personnel.
8. The electrical connection to this product must be via a 20A RCD/MCB or RCBO with a test button function.
9. The final electrical connection must be via a double pole isolating switch located close to the unit. The isolating switch must never be covered up.
10. A One-way isolating valve must be installed on the cold water supply pipe for maintenance purposes.
11. This appliance should never be used by children.
12. If the power supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified personnel in order to avoid a hazard.
13. Do not operate this heat pump in a wet room such as a bathroom or unless it is housed in a separate cupboard within that room.



R290 Warning

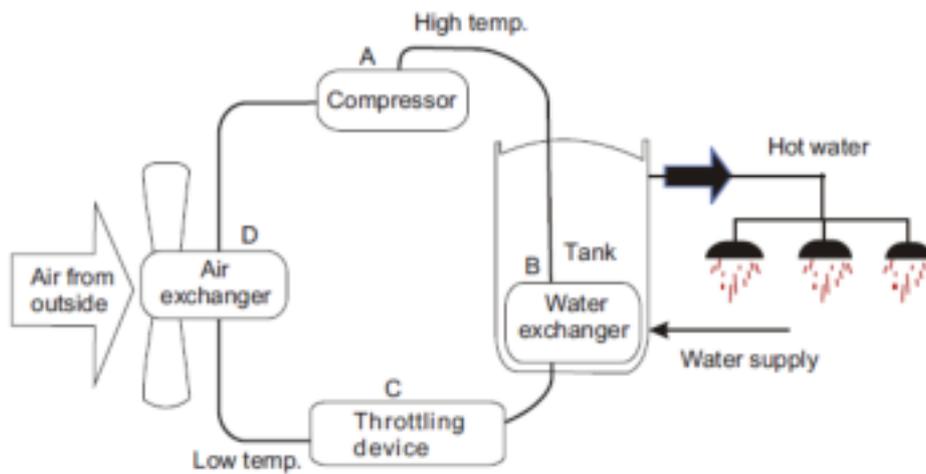
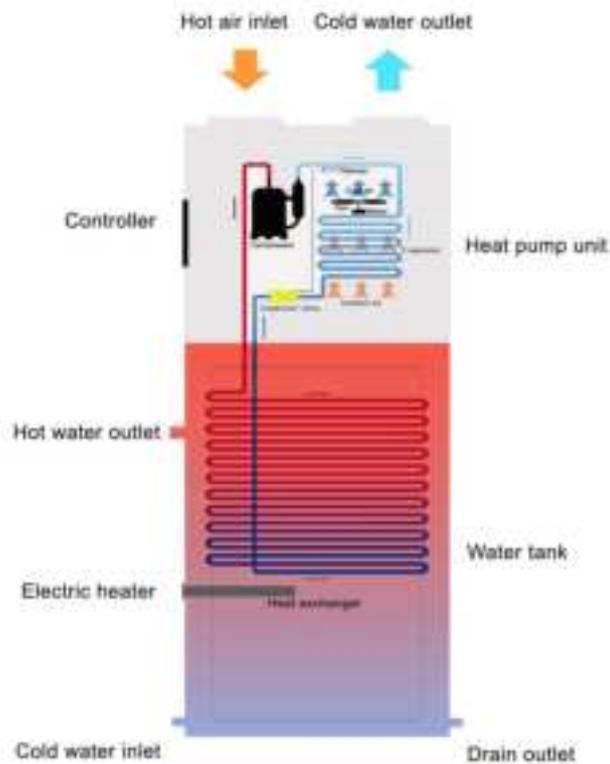
1. This appliance uses R290 (propane) refrigerant, which is a flammable gas and must be serviced by an authorized person.
2. **WARNING** Risk of fire/flammable material. If the refrigerant is leaking, switch off the unit at the mains and contact the service agent.
3. **DO NOT** store chemicals or flammable materials near this appliance.
4. **NEVER** use a flammable spray such as hair spray, paint, etc. near this unit as this may cause a fire.
5. Avoid risk of injury from contact with refrigerant if you notice a leak.
6. If you suspect the refrigerant is leaking then:
Do not smoke.
Do not operate electrical equipment. Isolate the device.
7. End of life recycling
8. The refrigerant must not enter the atmosphere. Only have the refrigerant removed by qualified professional.

General Information

Specifications

Model	Tank Volume	Power supply	reference family size
AH-200NH4GHB	200L	230V/ 50Hz/ 1 phase	2~4 people
AH-300NH4GHB	300L	230V/ 50Hz/ 1 phase	4~8 people

System sketch



3. Features

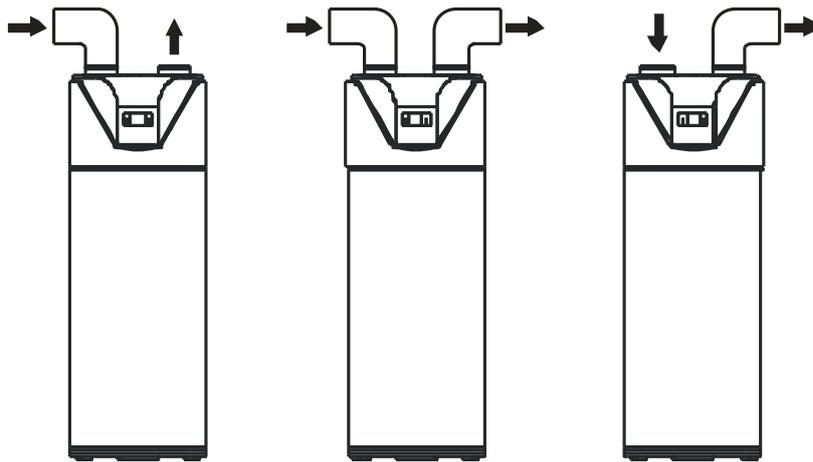
All in one heat pump for sanitary hot water:

- 1) Has complete isolation between water and electricity, without electric shock problem, more safety;

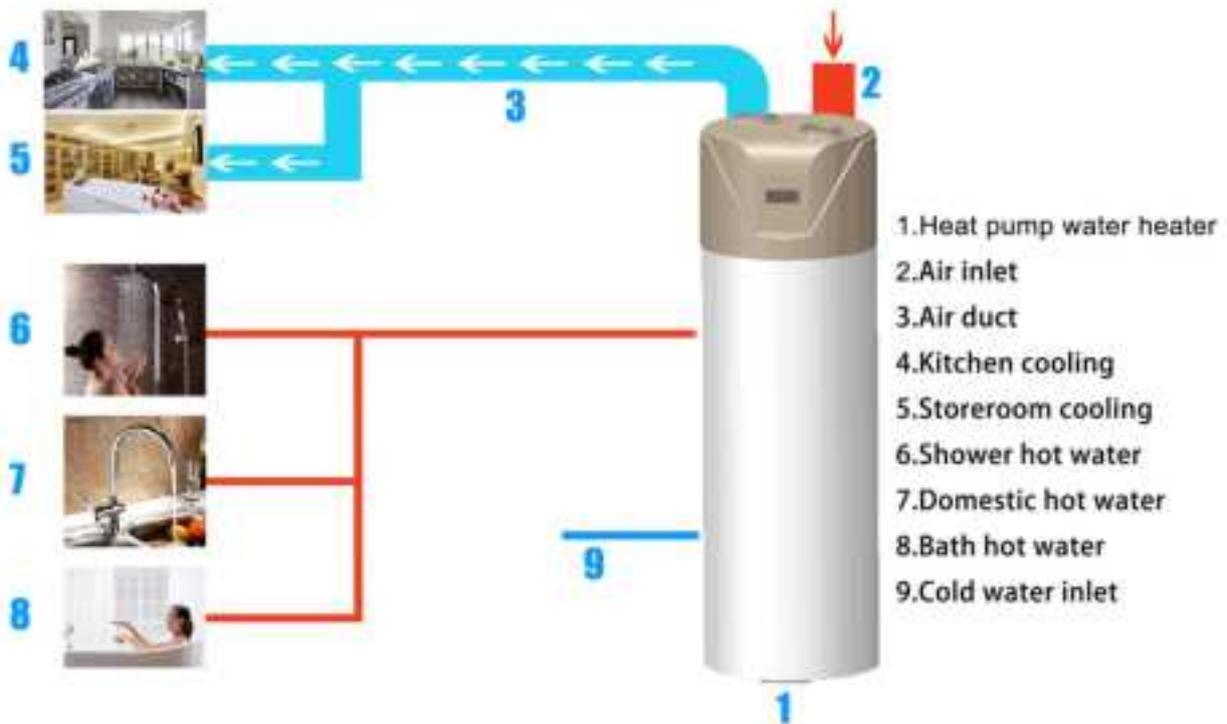
- 2) No fuel tubes and storage, no potential danger from oil leakage, fire, explosion, and so on;
- 3) The condenser coil is wrapped outside the tank, it is external coil or microchannel, do not in contact with water directly, more safety and health;



- 4) The maximum outlet water temp.: 75°C. The system makes the water be heated stably and quickly with innovative heating methods of combination the electric heating and heat pump heating properly;
- 5) Automatic start-up and shutdown, automatic defrosting by revising refrigerant cycle to save the extra operation;
- 6) Unit absorbs heat from outdoor air and produce heat water, the co-efficiency can be 3.5~4. (Under the condition A20/15°C, W15/55°C);
- 7) Within the temp. range from -7°C to 43°C, the unit will not be affected by night, cloudy sky, rain even snow weather;
- 8) Flexible installation achieved by long air inlet and outlet duct;



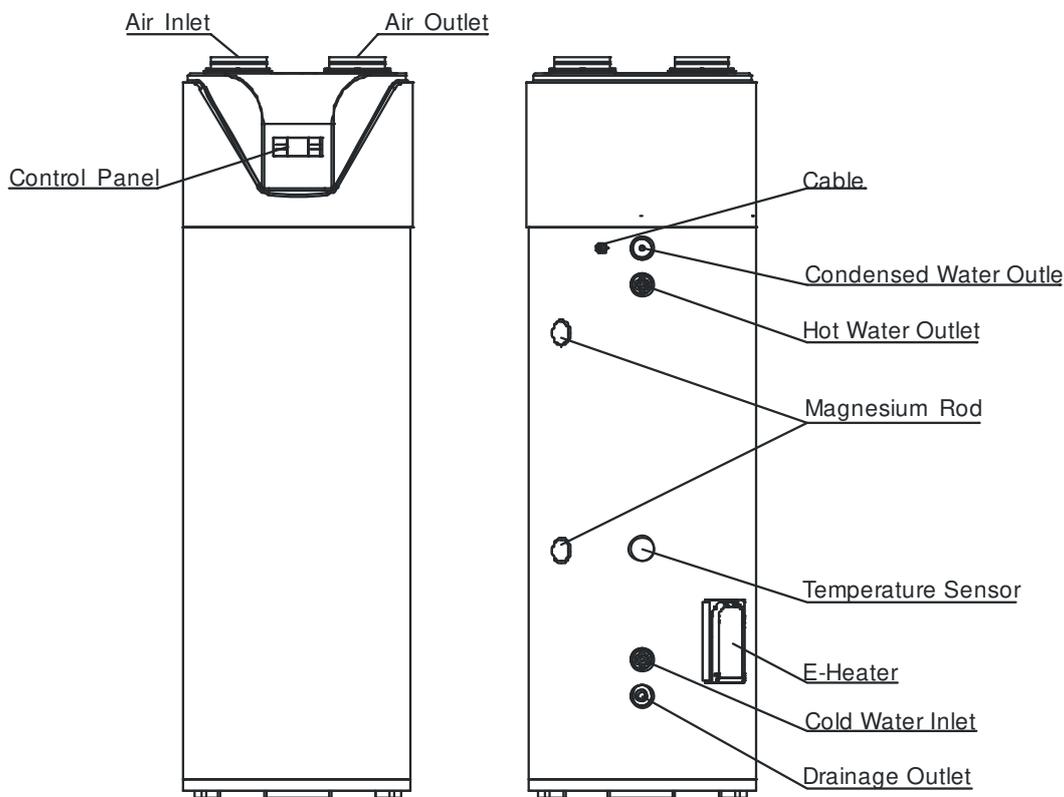
4. Application sketch



5. Specifications

Model No.	AH-200NH4GHB	AH-300NH4GHB
Power Supply	220-240V/1/50Hz	220-240V/1/50Hz
Heating Capacity (kW)	2.69	2.69
Rated Hot water produce (L/H)	55	55
COP	4.00	4.00
Default set HP water temp. °C	55	55
Rated Power Input (KW)	0.66	0.66
ERP Label Level	A++	A++
Max Power Input (KW)	3.0	3.0
Rated Current (A)	3.0	3.0
Max Current (A)	15	15
Backup Electric Heater (W)	1500	1500
Waterproof level	IPX1	IPX1
Water Inlet/Outlet connector	3/4 inch	3/4 inch
Rated water tank water pressure	0.85Mpa	0.85Mpa
Refrigerant	R290/380g	R290/380g
Net Dimension(mm)	Φ620*1672	Φ620*1937
Package Dimension(mm)	700*700*1790	700*700*2050
Net / Gross Weight (Kg)	100/115	120/135
Noise (Sound pressure dB)	48	48
Working temp. range (°C)	-7 ~ 43	-7 ~ 43
Heating Capacity and COP at Air 20°C/15°C, Water Temp. from 15°C to 55°C ERP Label Level at Air 20°C/15°C according to EN16147		

Parts Description



NOTE

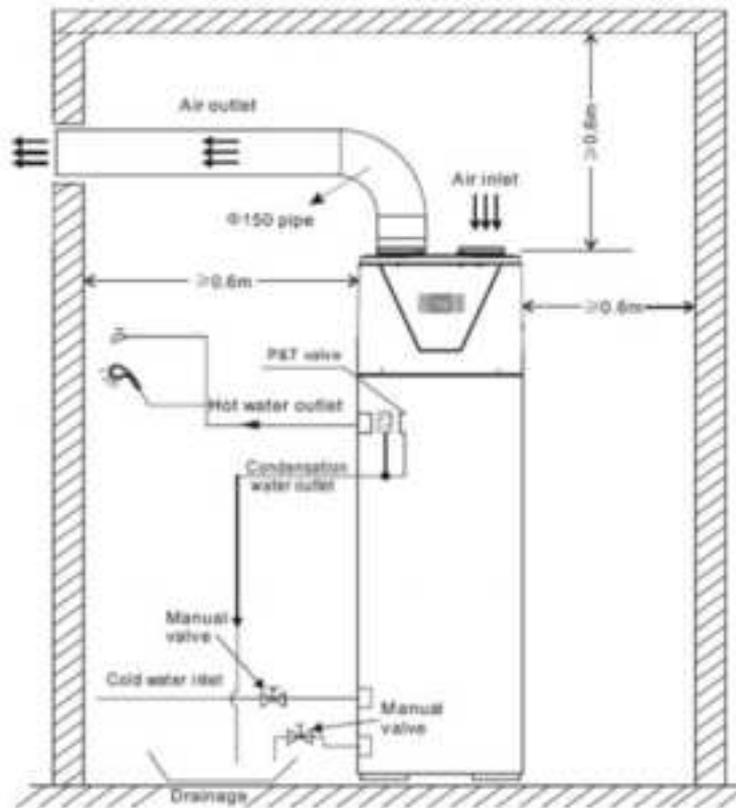
All the pictures in this manual are for explanation purpose only. They may be slightly different from the heat pump water heater you purchased (depend on the model). Please refer to the real sample instead of the pictures of this manual.

Installation of Heat Pump

1. Choose a place

- 1) This product is suitable for an indoor utility room or plantroom.

- 2) Please ensure there is adequate space for installation and maintenance. It is recommended a head height of 300mm is required.
- 3) The Air inlet and outlet vents final connections to be done in insulated flexible ducting with less than 0.5mtr duct length.
- 4) The product is to be installed in a dry and free from humidity location.
- 5) Support surface must be flat (horizontal angle must not be more than 2°), and can hold the products weight when filled with water. Please refer to the technical data sheet for the products weight.
- 6) Please select a suitable location for the exhaust air vent to the outside. Always insulate the exhaust air ducting to avoid condensation when operational.
- 7) Please ensure there is access to the removal front panel for maintenance.
- 8) Always allow extra room for pipe connections and power cables.
- 9) Always refrain from installing on a surface with loose coverings as the product may make a vibrating noise when operating.



▲ NOTE

- **Note1:** If the product is installed in a location where there is a possibility of frost, then all precautions must be taken to ensure all pipework is sufficiently insulated.
- **Note2:** The following locations are not recommended as suitable installation locations of the product.
 - a. Areas containing toxic gases or mineral oils.
 - b. The place existing strong electromagnetic wave;
 - c. The place existing the evaporation of acid or alkaline gas;

2. Transporting the product.

- 1) This exhaust air heat pump is heavy and requires at least two people to lift it with the assistance of lifting equipment.
- 2) It is always recommended to lift the product with all its packaging in place.
- 3) Always wear PPE when lifting the product.
- 4) Avoid lifting at the angle greater than 75°.



The system uses a flammable gas, therefore:

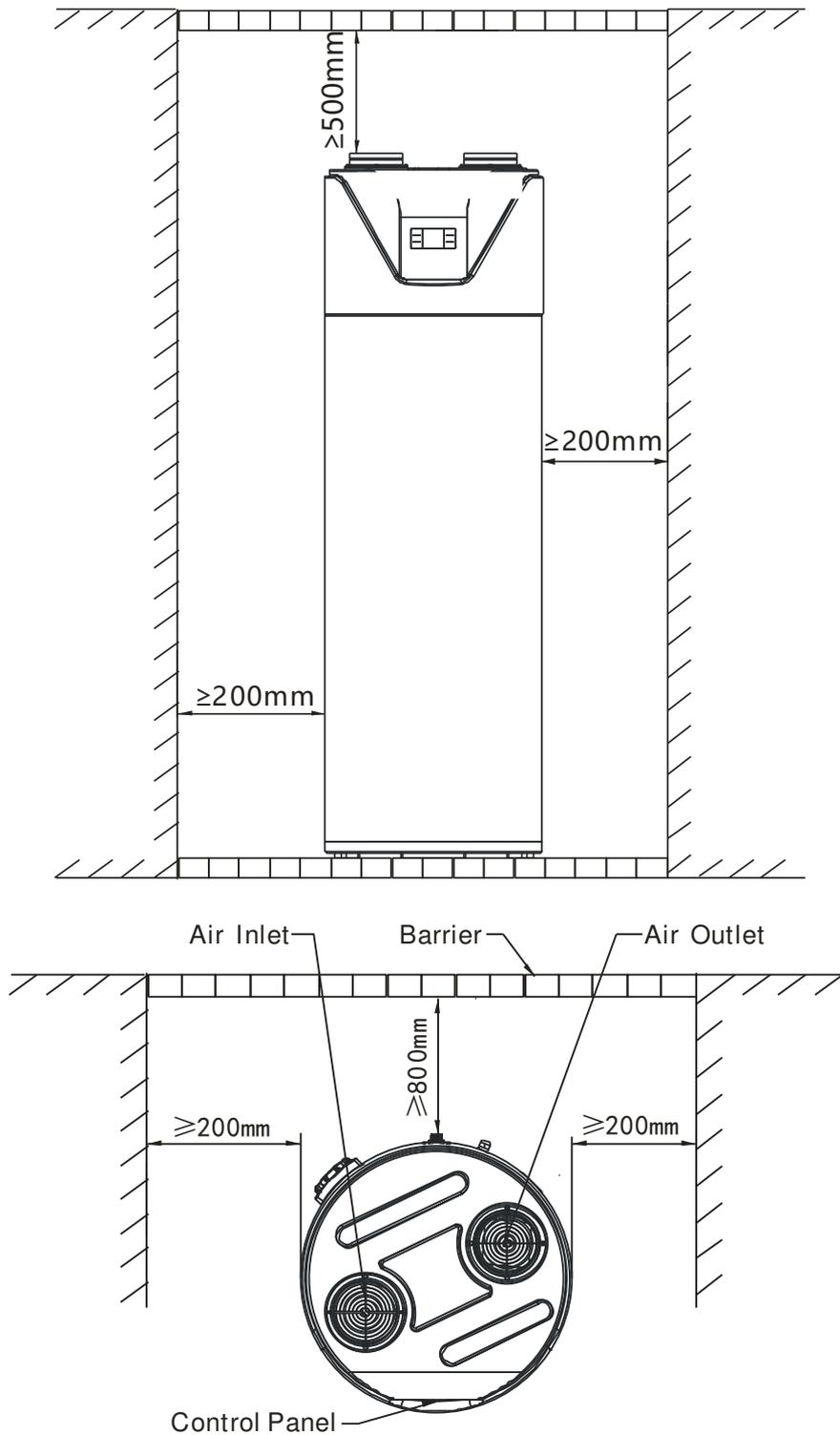
The appliance should not be stored or transported in an area with an ignition source (eg. open flame).

- Do not pierce or burn the appliance.
- Be aware that the refrigerant may not cause an odour



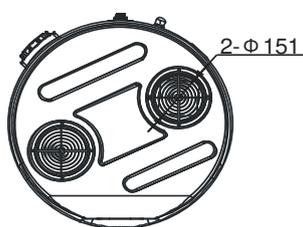
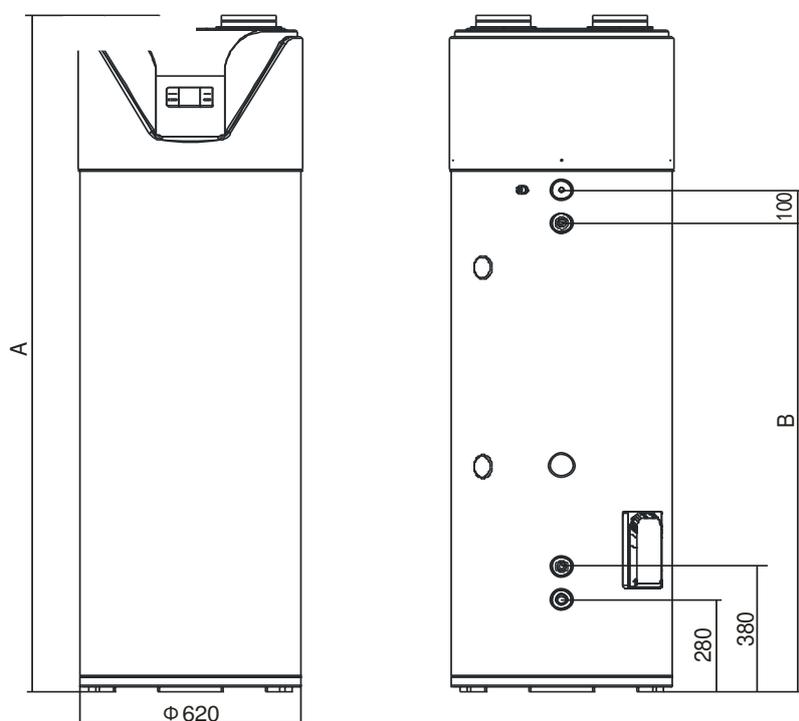
3. The Installation of Heat Pump

1) Please leave enough space to install and maintain.



2) If heat pump installed in the basement, indoor or other airtight space, please note exhausting or intake circulation between surrounding air and outdoor air; The air duct total length should be equal or less than 6 meters, and the duct diameter should be equal or more than 150 mm.

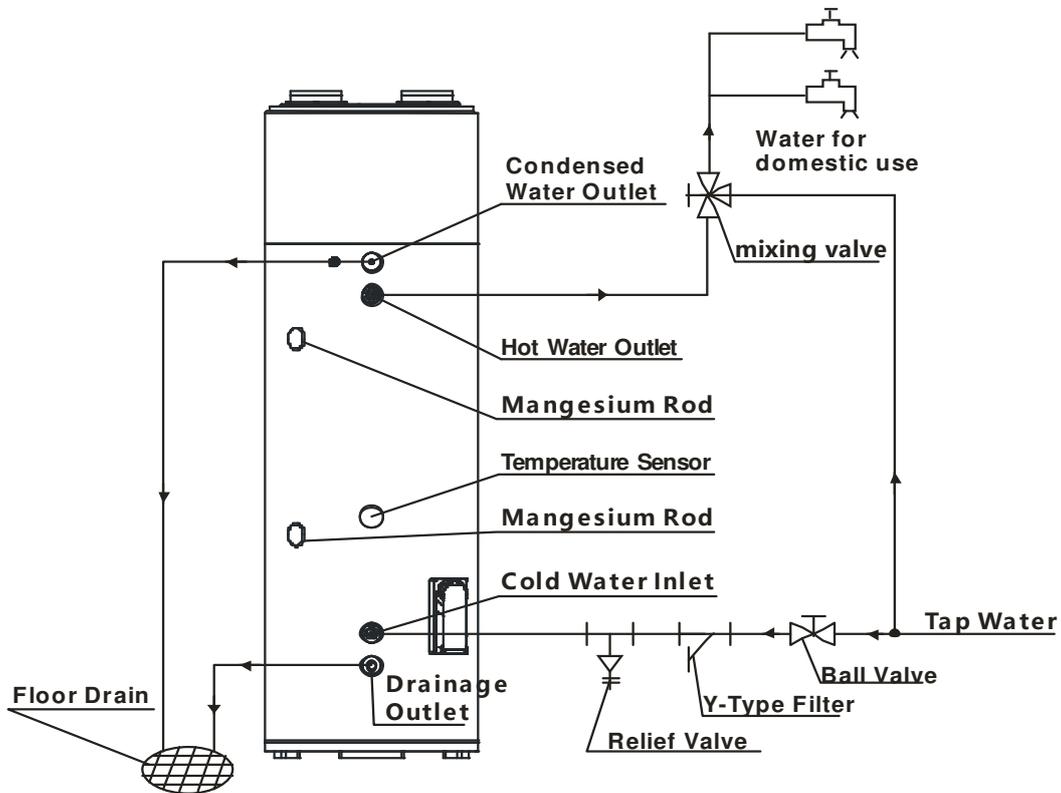
4. Products External Dimension



Model	Dim.(mm)	A	B
AH-200NH4GHB		1672	1142
AH-300NH4GHB		1937	1281

Pipe Line Connection

1. Pipe Line Connection Diagram

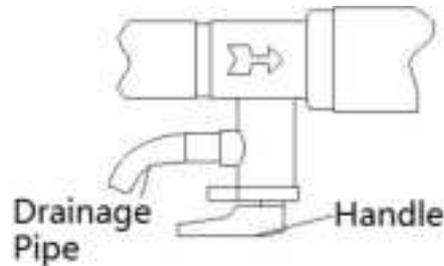


2. Water Pipe Installation Instructions

- 1) Please don't use iron pipe connect to heat pump, please use CPVC pipe, PPR pipe or PB pipe;
- 2) Please according to the drawing shows to install the water pipes, connectors etc., if the ambient temp. is below 0 °C, proper insulation must be taken.
- 3) Water inlet/outlet size is G3/4", external thread;
- 4) The water pipe's work life should not less than heat pump's work life;
- 5) Relief valve is G1/2", 0.8 MPa, after installation, must sure that the drainage pipe which connect with the relief valve, is not blocked;

 NOTE

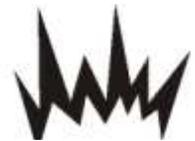
- The relief valve need to be pulled one time every six months for purpose of taking calcium carbonate out and ensuring no obstacle, outlet temp. of drainage port may be high, please be careful;



- Drainage pipe must be taken precautions to prevent it from freezing..

 CAUTION

- Do not hold down the handle of safety valve;
- Do not knock down safety valve;
- Do not plug the drainage port;
- Excretion pipe must be connected with a open drainage port.



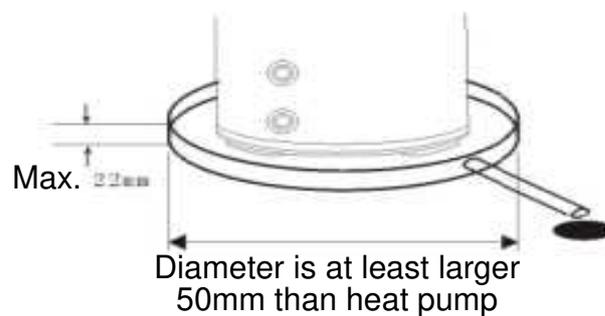
Explosion Danger

6) After finished all pipeline, open up the valve controlled cold water inlet and the valve controlled hot water outlet to fill water into tank, you can stop when you find water overflows from water outlet, then inspect all pipeline and make sure have no water leakage.

7) When intake pressure is below 0.15MPa, a booster pump needed to be installed to connect with inlet water pipe for purpose of obtaining larger water capacity, which can make sure intake pressure is less than 0.15MPa; When intake pressure is

greater 0.65MPa, the relief valve needed to be installed to connect with inlet water pipe for purpose of keeping your water tank into a long-term working state;

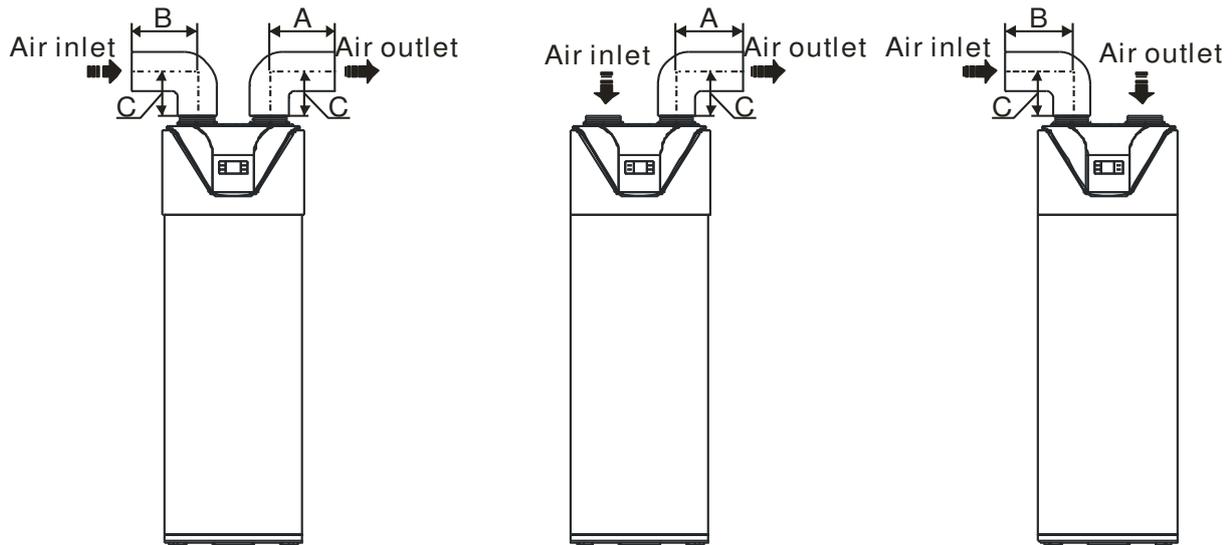
8) During heat pump running, condensed water droplets may be formed, drainage water port may be unexpectedly blocked, which can make surface of equipment drop water out, to ensure your normal life and yourself equipment, we suggest water tray, please take reference to the below chart.



NOTE

When used for the place where the temp. is below 0°C, If installed the heat pump outdoor, please take precaution to protect water pipe according to local minimum temp. to prevent frozen or damage water pipe.

3. Air Duct Installation Instructions



① Air inlet and outlet with duct
($A+B \leq 6m$)

② Only air outlet with duct
($A \leq 6m$)

③ Only air inlet with duct
($B \leq 6m$)

1). Scheme ② It is recommended to install unit by this way in the winter where there is other heat source in the room. (The heat pump is installed in room)

2). Scheme ③ It is recommended to install unit by this way in summer that could charge fresh cold air into room. (The heat pump is installed in room)

3). It is recommended installing the unit by only air outlet with duct (Scheme ②) in summer that could charge fresh cold air into room. (The heat pump is installed outdoor);

4). It is recommended installing the unit by only air inlet with duct Scheme ③ in winter where there is other heat source in the room. (The heat pump is installed outdoor);

5). Duct description:

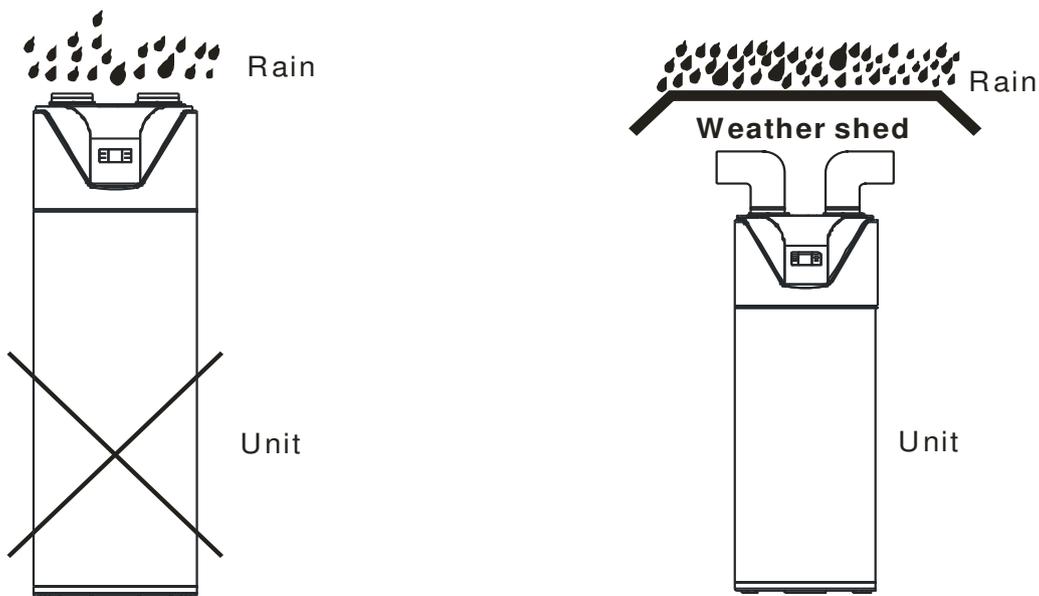
Duct description	Round duct	Rectangle duct	Other shaped duct
Dimension (mm)	Φ150	150×150	Refer to

Straight-line pressure drop (Pa/m)	≤2	≤2	above data
Straight-line length (m)	≤6	≤6	
Bent pressure drop (Pa)	≤2	≤2	
Bent's quantity	≤4	≤4	

6). The resistance of duct will decrease air-flow-rate, which will lead to capacity of unit decreased, the duct total length should be no more than 6m or the maximum static pressure should within 20Pa, and the quantity bending should be no more than three;

7). For unit air outlet with duct, when unit operating, condensate will be generated around outside of duct, please pay attention to the drainage work, we suggest to wrap the thermal insulated layer around outside if the duct;

8). It is recommended to install the unit in the indoor space. It is not allowed to install the unit at outdoor or exposed to rain;



9). In terms of the main unit connect with canvas reaching to outdoor, a reliable water-resistant measure must be conduct on the duct, resist water drop into internal of the main unit;

10). Filter should be installed at the unit inlet, if the air inlet is not connected with duct. In terms of the unit with duct, filter should be put on the position of duct inlet.

Power Connection

NOTE

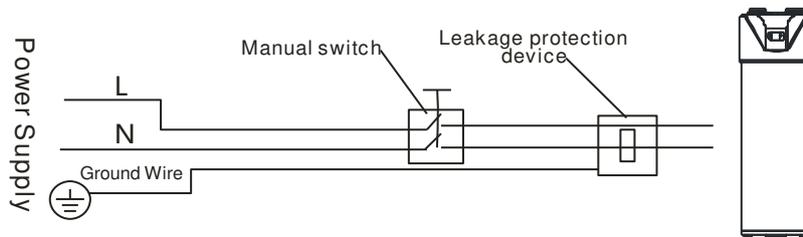
- The equipment must be Applied specific power supply, supply voltage must comply with rated voltage;
 - Power supply circuit must be fitted with ground wire, and ground wire of power supply must be reliably connected with external ground wire;
 - The operation must be worked by professional personnel based on circuit diagram;
 - Set up leakage protection device well according to the National Technical Standard for electrical equipment;
-

1. Power Specification

Model \ Item	Power supply	The finest wire diameter (mm ²)		Manual switch (A)		Leakage protection device
		Size (continuous length ≤ 30m)	Ground wire	Capacity	Fuse	
AH-200NH4G HB	230V/50Hz					Below 30mA 0.1sec
AH-300NH4G HB		≥2.5	≥Φ1.0mm	≥20	20	

Remark: Please directly connect power supply wire with user’s plug when use the heat pump.

2. Leakage Protection



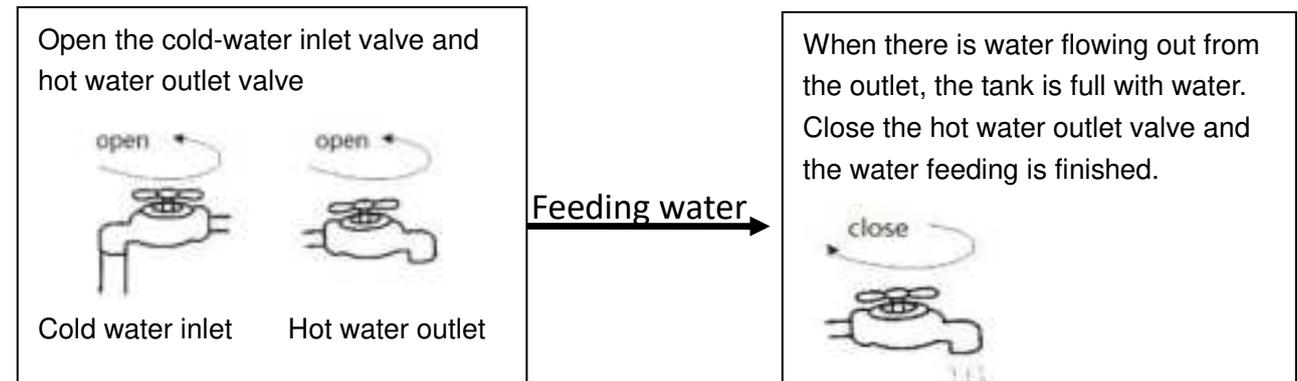
WARNING

- The external power supply box must be installed leakage protection device based on above figure for purpose of your safe;
- The equipment can be used unless you have confirmed ground wire reliably;

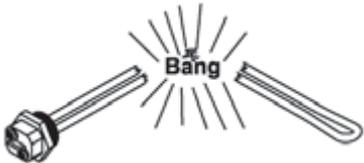
Notes of Application

1. When using the unit, please operate to the following order:

- 1) Feeding water: when use the unit for the first time (or reuse it after the tank is empty), before connect the unit with power, please make sure the tank is full of water. Water feeding method (as below picture)

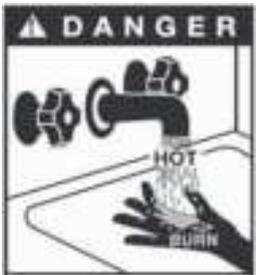


Operation without water in water tank may result in the damage of auxiliary E-heater. Due to such damage, manufacturer will not be liable for any damages caused by this issue.

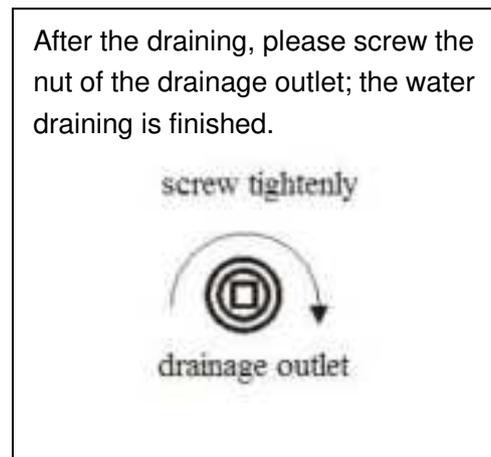
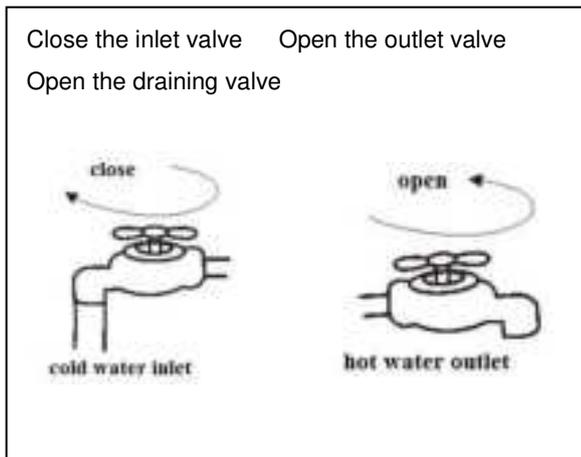


- 2) Plug in with power on then the screen is brightening. The user can realize different models by clicking the relative button on the screen (see next page);

Water temperature over 50°C can have burn risk for cause burns for children, disabled and elders. Feel water before bathing or showering. Water temperature limiting valves are recommended.



- 3) Water draining: before cleaning or moving the unit, please drain out the water in the water heater. The draining method as below picture:



Instruction of operation

1. Control system specifications

1) Operating condition

- Voltage: 230V ~ ±10%, 50Hz ±1Hz.
- Ambient temp.: -7 ~ +43 °C
- Storage temp.: -20 ~ +75 °C
- Relative humidity: 0 ~ 95%RH
- temp. accuracy: ±1 °C

2) Main function

- Display the pool temp. and setting temp., and also can query the coil temp., ambient temp. and exhaust temp. and so on.
- Power cut memory function. When power cut, the clock will still work.

- Timing on/off. Key-Lock Function
- Automatic defrosting. Forced to defrost. Anti-freezing function
- Large LCD display.
- Has perfect protection function.
- The error code display and query
- When there is no wire controller or wire controller is broken, the system can recognize it, and control the heat pump to run automatically.

2. Wire controller and operation



Controller Instruction

symbol	status	meaning
	Constantly bright	heat pump is on
	Extinguished	Heat pump is off
	Constantly bright	NA (only for water cycle unit)

	Constantly bright	at heating mode
	Constantly bright	need repair
	Constantly bright	auto mode (factory default set is manual mode,F63=0)
	Extinguished	Currently in manual set temp. state
	Extinguished	this unit is a refrigerant connection heat pump (Bright means water connection heat pump)
	Constantly bright	heat pump is on and at defrosting
	Flashing	Heat pump is on and at defrost delay
	Flashing	heat pump is off and at refrigerant recovery status
	Constantly bright	electric heater is on for quick heating
	Flashing	electric heater is on for disinfection
	Constantly bright	current water temp. in the tank
	Constantly bright	Setting target water temp.
	Constantly bright	current outlet water temp.
	Constantly bright	current inlet water temp.
	display	Display actual water temp., set water temp. and fault code
	Constantly bright	Currently showing Celsius temp.
	display	Show real time
	display	Timer function is on
	display	Currently in the timing working hours
	Flashing	set start time for working period
	display	Currently at boot time, non-working time
	Flashing	end time of current set working time
1	Constantly bright / Extinguished	Timing working period 1, always on when set, at other conditions are off.
2	Constantly bright / Extinguished	Timing working period 2, always on when set, at other conditions are off.
3	Constantly bright / Extinguished	Timing working period 3, always on when set, at other conditions are off.
	Constantly bright	start timing water return function
	Flashing	start manual water return function
	Extinguished	turn off water return (timing/manual) function
	display	Currently the return water is in regular timing working period
	Flashing	Current set start time of backwater working time
	display	Currently the return water is in the non-working hours
	Flashing	Currently set end time of water return period
1	Constantly bright / Extinguished	Timing zero cold water period 1, always on when setting, at other conditions are off.
2	Constantly bright /	Timing zero cold water period 2, always on when setting, at

	Extinguished	other conditions are off.
	Constantly bright	The button is locked
	Constantly bright	The controller is connected to the router

Instruction of the buttons

	button		instruction
1	Power/ exit button		1. Press and hold for 1 second to turn on/off. 2. In the query state, click this button to return to the main interface.
2	up		1. Press at main interface to set the temp.. 2. Press and hold for 3 seconds in the power on/off state to enter the query state. 3. In the query status, press and check status 4. At parameter set status, press to modify parameters
3	down		1. Press at main interface to set the temp.. 2. Press and hold for 3 seconds in the power on/off state to enter the query state. 3. In the query status, click to status query 4. Under parameter setting state, click parameter to modify
4	Mode button		NA (only for water cycle unit.)
5	time		1. In the main interface, press to enter the clock setting, and press to switch time "hour" and "minute". 2. In the main interface, press and hold for 3 seconds to start (and enter the timing time setting) / turn off the timing mode.
6	set		1. Under the main interface, press to switch between automatic/manual temp. control mode. 2. In the main interface, press and hold for 3 seconds to enter factory parameter interface(engineers)
7	Button combination	 +" 	at main interface when ON, press and hold for 3 seconds to turn on/off quick heating
		 +" 	at main interface when ON, press and hold for 3 seconds to turn on/off defrosting
		 +"	Within 5 minutes after power-on, at the main interface of shutdown, press and hold for 10 seconds to

			enter/exit refrigerant charging or recycling mode
		“  ”+“  ”+“  ”	Under the main interface, press and hold for 10 seconds to turn on/off the “disinfection” function manually (Parameter 66=1 is valid)
		“  ”+“  ” +“  ”+“  ”	Within 5 minutes after power-on, press and hold for 5 seconds to restore the factory parameter settings.

3. Operation Instruction

1) turn ON/OFF the heat pump

When the controller is in the normal display state, press “” button for more than 1 second to switch the controller to the power on or off state. When heat pump is ON, “” lights up and is normally controlled. When heat pump is off, “” does not light up and the controller stops controlling output. The controller can display and operate normally in the power on state and off state. When the controller is powered on for the first time, it is in the off state. Then from the 2nd time, the state will be same as last time before power off.

2) Set the water temp.:

Power on when the unit standby, press “” or “” key to enter the water temp. setting state. Then starts to display the setting symbol and display the corresponding water temp. set according to the current heating mode. When the water temp. is set,

press the “^” or “v” button to increase or decrease the water temp. setting value; Press and hold the “^” or “v” button for more than 1 second to quickly increase or decrease the water temp. setting. Press and release the “⏻” button immediately or no button operation in 5 seconds, controller will exits the modification and return to the normal display state. When the parameter value is modified, it will flash for 2 seconds and then return to the normal display state.

4)Real time clock settings:

In the main interface, click the “🕒” button to enter the real-time clock setting interface; In the real-time clock interface, press the “🕒” button, the hour part of the number flashes, press “^” or “v”, you can Set the hour of the clock; when the hour part is set, press the “Time” button again, the number of minutes will flash, press “^” or “v” to set the minute of the real time clock; After the minute part is set, press the “🕒” button again to confirm the real-time clock setting and return to the main interface;

In the real-time clock setting interface, if there is no button operation for 5 seconds, the current real-time clock setting value is confirmed, and the main interface is returned;

In the real-time clock setting interface, press the “⏻” button to confirm the current real-time clock setting value and return to the main interface.

5) Timing work settings:

Press and hold the “” button for 3 seconds in the main interface to enable or disable the timed working mode. When the timed working mode is enabled, enter the timed period setting. Press and release “” to switch the hour and minute of the start time and end time of the three time slots in sequence., The value is flashing when switching to the corresponding value of the certain time slot. At the same time, “ON” or “OFF” symbol flashes, Press “^” or “v” to increase or decrease the corresponding value. After setting the timed period, click the “switch” button or no button operation in 15 seconds, the changes can be saved and returned to the normal display state.

When the timing control mode is enabled, the corresponding symbols are displayed in the working period (ON) and the non-working period (OFF) respectively. In the power-on state, heating is performed only during the set working period, and the rest of the time is not heating. When the start time and end time of a certain working period are the same, it is regarded as canceling the timing period. When all timed periods are cancelled, it is considered to be in working hours throughout the day. If the start time of a certain working period is greater than the end time, the end time is considered to be the next day. The three time periods default to 05:00~07:00, 16:00~18:00, 20:00~00:00.

6) Forced quick heating:

When following conditions are met at the same time: the controller is in the normal display state and heat pump is in the power-on state.

Heat pump needs to be in the working period after the timing control is enabled.

The current heating mode is met and the temp. condition for continuing heating is satisfied, No other alarms that do not allow "quick heating" occur.

Press "M" + "^" button at the same time for more than 5 seconds, the "quick heat" function can be activated or deactivated. The icon lighting "" indicates that the electrical heating is working.

7) Query running status:

When the main interface of the power on or off is displayed, press and hold the "^" or "V" button for more than 3 seconds to enter the running status query interface;

Click the "^" or "V" button to view each status;

Click the "" button or automatically return to the normal display state without any button operation in 30 seconds.

After entering the view mode, the last viewed data code and its corresponding value are displayed as below table. (the default is "00" after power-on).

Description	Code	Remark
Fluorine cycle-factory default set	00	1 = fluorine cycle heatpump
High pressure switch	01	0 = disconnect; 1 = close
Low pressure switch	02	0 = disconnect; 1 = close
Water flow switch	03	0 = disconnect; 1 = close
EEV value	04	Measured value
Evaporator coil sensor	05	Measured value

ambient temp. sensor	06	Measured value
absorption temp. sensor	07	Measured value
exhaust temp. sensor	08	Measured value
inlet water temp. (tank water temp.)	09	Display value = measured value + compensation value
outlet water temp. (return water temp.)	10	Display value = measured value + compensation value
compressor	11	0 = stop; 1 = running
4-way valve	12	0 = stop; 1 = running
high-speed fan	13	0 = stop; 1 = running
low-speed fan	14	0 = stop; 1 = running
electric heater	16	0 = stop; 1 = running

9) Key lock:

When the controller is in the normal display state, the button is locked when there is no button operation for more than 60 seconds. Press any button at this time to unlock.

10) High temp. disinfection function

3.1. Manual disinfection mode:

While the controller is in normal display state, press and hold the “M”+“^”+“√” button for more than 5 seconds at the same time, the heater symbol flashes to indicate that it enters the manual disinfection mode. At this time, the electric heater is started to heat the water to 75°C, And the water temp. is maintained at 70 to 75°C for 30 minutes, then the disinfection mode will be automatically exited.

After starting the manual disinfection function, press and hold the “M” + “^” + “v” button for 5 seconds or more at the same time to exit the manual disinfection mode.

When the water temp. setting value is $\geq 75^{\circ}\text{C}$, the disinfection function is not activated.

3.2. Automatic disinfection mode:

If the water temp. setting value is $< 75^{\circ}\text{C}$, the controller operation time reaches 7 days, the controller enters the automatic disinfection mode. Once the automatic disinfection mode exits, time begins from zero then wait for next cycle.

When the ambient temp. is $\geq 20^{\circ}\text{C}$, the electric heater is started at 1:00 am to start disinfection;

When the ambient temp. is $< 20^{\circ}\text{C}$, the electric heater is started at 15:00 pm to start disinfection;

After the automatic disinfection function is activated, the disinfection symbol flashes.

At this time, the electric heater is started to heat the water to 75°C . And the water temp. is maintained at 70 to 75°C for 30 minutes, then the disinfection mode will be automatically exited.

When the water temp. setting value is $\geq 75^{\circ}\text{C}$, the disinfection function is not activated.

5. Malfunctioning of the unit and alarm/error codes

When an error occurs or the protection mode is set automatically, the circuit board and the wired controller will both display the error message.

Error code	Description
02E	Gas exhaust temp. too high
03E	high-pressure switch failure
04E	low-pressure switch failure
09E	communication failure
11E	evaporator coil temp. sensor failure
12E	ambient temp. sensor failure
13E	Refrigerant exhaust temp. sensor failure
14E	water inlet temp. sensor failure
15E	tank temp. sensor failure
16E	/
17E	Refrigerant return temp. sensor failure
18E	water outlet temp. sensor failure

1). "02E" high exhaust temp. failure:

After the compressor starts running for 1 minute, when the exhaust gas temp. is detected to be higher than or equal to the exhaust high temp. protection value by 110°C for 10 consecutive seconds, an high exhaust temp. alarm occurs and the compressor stops. At this time, controller shows high temp. fault alarm code "02E". When the exhaust temp. drops back to 90°C, the alarm is released and the normal temp. control function is restored.

If high temp. fault protection appears 3 times within half an hour, the controller will lock the protection. And the compressor will be locked in the shutdown protection state. At this time, only the shutdown and restarting can unlock the compressor.

2). "03E" high pressure failure:

After the compressor is started, if the high-pressure switch is detected to be in the off state for 10 seconds, the compressor immediately stops running. At this time, the controller displays the high-pressure fault alarm code "03E". If the high-pressure switch is restored, error code will not occur. And if no other protection or locking occurs, the compressor is restarted after 3 minutes.

If high-pressure fault protection appears 3 times within 1 hour, the controller will lock the protection, and the compressor will be locked in the shutdown protection state. At this time, only the shutdown and restarting can unlock the compressor.

3). "04E" Low pressure fault:

After the compressor running for 5 minutes, if the low-pressure switch is detected to be in the off state for 10 consecutive seconds, the compressor immediately stops running. At this time, the controller displays the low-pressure fault alarm code "04E".

If the low-pressure switch is restored, error code does not occur. If no other protection or locking occurs, the compressor is restarted after 3 minutes.

If low-pressure fault protection appears 3 times within 1 hour, the controller will lock the protection. And the compressor will lock in the shutdown protection state. At this time, only the shutdown and restarting can unlock the compressor. The low-pressure switch is not detected during the defrosting.

4). "09E" communication failure:

“09E” is displayed when the communication between the main control board and the wire controller is abnormal or the data line is not connected normally. “--:--” is displayed when the valid clock cannot be obtained. And the communication indicator of the main control board flashes. The buzzer sounds when an alarm occurs. Press any key to silence the alarm.

5). Temp. sensor failure: “11E”, “12E”, “13E”, “14E”, “15E”, “17E”, “18E”,
Check firstly if the sensor failure or connection wire failure; or probably the main board failure. Then replace the failure parts or call the engineer for help.

Note: Heat pump will stop once the water tank temp. sensor or outlet water temp. sensor or ambient temp. sensor is faulty.

When absorb or exhaust or evaporator coil or water return temp. sensor is faulty, electric heater is allowed to operate.

When the water tank or ambient temp. sensor are faulty, electric heating operation is not allowed.

6). Low ambient temp. protection:

When the ambient temp. is $\leq -9\text{ }^{\circ}\text{C}$, the compressor is prohibited from running.

When the ambient temp. is $\geq -7^{\circ}\text{C}$, normal operation is resumed, this protection has no fault display.

5. Factory Parameters List (Type R290 All-in-one heat pump water heater)

These parameters are factory programming. Which can only be checked or adjusted by professional engineers.

Code	Description	Range	Unit	Default	Remark
F01	Set target heating temp.	15~55	°C	55	adjustable
F02	Set target cooling temp. (NA for DHW)	7~ 30	°C	12	Factory
F03	Water temp. control difference	1~15	°C	5	Factory
F04	Heating temp. setting range selection 0: 15~55; 1: 15~75 2: 15~60; 3: 15~40;	0~3	/	0	Factory: R134:F04=1; R290:F04=0;
F05	Temp. setting deviation in automatic mode	-10~20	°C	0	Factory
F08	Max. water tank temp. limited when only heat pump	30~75	°C	60	Factory
F09	HP Lowest working ambient temp.	-15~5	°C	-7	Factory
F10	Auxiliary E- heater starting ambient temp.	-10~35	°C	5	Factory
F11	Water tank temp. Sensor calibration value	-20~20	°C	0	Factory
F12	Outlet water temp. Sensor calibration value	-20~20	°C	0	Factory
F13	Auto fast heating mode: 0=ON; 1=Forbidden	0~1	/	1	Factory
F14	Auto fast heating temp. difference	2~70	°C	40	Factory
F15	(Between setting temp. and real water temp.)	50~99	°C	68	Factory
F16	Warning high temp.	2~15	°C	5	Factory
F20	Defrosting period	1~90	Min	40	Factory
F21	Defrost time each time	6~90	Min	10	Factory
F22	Defrosting max. ambient temp.	0~50	°C	12	Factory
F23	Defrosting starting coil temp.	-30~30	°C	-3	factory
F24	Defrosting stopping coil temp.	0~50	°C	18	Factory
F25	Defrosting temp. Difference between ambient temp. and coil temp.	0~15	°C	10	factory
F26	Before defrosting, the compressor continually	0~40	Min	6	factory
F30	Turn off fan motor ambient temp. point	10~40	°C	25	factory
F32	Turn off fan motor exhaust temp. point	10~125	°C	100	Factory
F33	Turn on fan motor exhaust temp. difference	1~50	°C	5	factory
F35	High speed and low speed transfer water tank temp.	10~60	°C	48	factory
F36	Water tank temp. when turn off fan motor	15~75	°C	52	Factory
F37	Coil temp. when turn off fan motor	10~30	°C	18	Factory
F38	Set value of coil temp. when the fan restart	0~15	°C	7	factory

Heat Pump Water Heater

F40	Low pressure switch setting: 0: alarm when switch on; 1: alarm when switch off; 2: forbidden;	0~2	/	2	factory
F43	Low voltage fault detection delay	0~60	Min	3	Factory
F44	High pressure switch setting: 0: alarm when switch on; 1: alarm when switch off; 2: forbidden。	0~2	/	1	factory
F45	Low/high voltage faults auto recovered Max times	0~10	/	3	factory
F47	Water flow switch setting: 0: Switch on when water flow is failure; 1: Switch off when water flow is failure; 2: Forbidden	0~2	/	2	Factory
F50	EEV control cycle	20~90	Sec.	30	factory
F51	Target superheat (ambient temp. >15°C)	-8~15	°C	1	factory
F52	Expansion valve allows exhaust temp.	70~120	°C	92	factory
F53	Defrost expansion valve setting	20~450	P	400	Factory
F54	Minimum opening of expansion valve (ambient temp. >=5 °C)	80~250	P	100	Factory
F55	Expansion valve manual/automatic selection 0: automatic; 1: manual	0~1	/	0	factory
F56	Number of manual steps of expansion valve	20~450	P	350	factory
F60	Exhaust high temp. protection value	50~110	°C	100	factory
F61	Water tank temp. compensation type: 0 = automatic, 1 = cancel.	0~1	/	0	Factory
F62	Cooling/Heating selection mode 0: cooling; 1: heating	0~1	/	1	factory
F63	System working mode 0: manual mode; 1: automatic mode	0~1	/	0	factory
F66	electric disinfection function 0: disabled; 1: enable	0~1	/	1	factory
F68	Low temperature anti-freezing function 0: disabled; 1: enable	0~1	/	1	Factory
F70	Password for accessing the menu. 0 indicates cancel password	0~999	/	0	factory
F92	Celsius/Fahrenheit option 0: Celsius; 1: Fahrenheit (reserved)	0~1	/	0	factory
F93	Enable "ventilation" function: 0: the heat pump is preferred; 1: ventilation priority	0~1	/	0	Factory

Pilot run of heat pump

Please confirm the followings before pilot run of heat pump

1. The heat pump has been finished well;
2. Assemble pipe and wire are all correct;
3. Drain water is smooth;
4. Insulation materials are complete;
5. Ground wire is installed well;
6. Power voltage is equivalent to rated voltage of heat pump;
7. Inlet and outlet air port have no obstacle;
8. Air attached to water pipe is drained out, and all valve have been opened;
9. Leakage protection device works well;
10. Input water pressure is less than 0.15Mpa;

Maintenance and Solution**1. Maintenance**

- 1). Frequently check power plug and sockets and make sure both of them have been connected well and reliably, and have no over-heating effect;

2). When not used for a long time, especially where temp. is below 0°C , water filled in the water tank must be drained out to prevent from damaging inner tank;

(Operation shown the above contents)

3). To make heat pump to keep a long-term and high efficiency working state, we suggest you should clean inner tank up every half a year to remove accumulated sediment, please obey the following rules to clean inner tank:

(1). Turn off power supply of heat pump;

(2). Turn off cold water inlet valve, and open up hot water tap water;

(3) Connect drainage water with drain outlet through a soft pipe;(temp. resist of drainage pip is less than 93°C , if drainage pipe do not meet demands, please turn on cold water inlet valve, and turn on hot water tap water until water is not hot);

(4). Turn on drainage water port of heat pump, clean water tank attached to inner tank up, if needed, you will wash inner tank for many times to clear sediment;

(5). Turn off drainage water port, re-fill water into inner tank and recover power supply;

4). Each device has been matched with one anode rod, and anode rod will be slowly consumed during the process of protecting inner tank and extending use life. Under some water circumstance, anode rod and water can rise reaction, hot water will be quickly corroded and rise leakage when anode rod has been used up. We suggest check insulation materials every one year, if anode rod is used up, you can inquiry local server center or specific technical department to change a new one;

- 5). Used for enough hot water where we suggest user turn down set temp., which can reduce heat loss and avoid incrustation, meanwhile this work can help you save more electric energy and extend use life;
- 6). Filter should be cleaned up every one month to make sure heating effect;
- 7). If used for those regions which the temp. is below 0°C, you can take suitable measures to protect pipes in case the heat pump is installed outdoors for purpose of protecting connection pipe and keeping your normal life;

2. Trouble shooting

This section provides useful information for diagnosing and correcting certain troubles which may occur. Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

NOTE: WHEN CARRYING OUT AN INSPECTION ON THE SWITCH BOX OF THE UNIT, ALWAYS MAKE SURE THAT THE MAIN SWITCH OF THE UNIT IS SWITCHED 'OFF'.

The guidelines below might help to solve your problem.

Trouble	Reason	Solution
The outlet water is cold;	The plug is not plugged properly.	Plug in properly.
The screen is dark	The temp. controller is on the lowest temp. control state; The temp. controller is damaged; The circuit board of the indicator lamp is damaged.	Set the temp. of the controller in higher state. Inform the service man.
No water out from the hot	The tap water is cut off;	Waiting for the restore of the tap water.

water outlet	The water pressure is too low; The tap water inlet valve is closed.	Wait and use when the water pressure is raised. Open the tap water inlet valve.
Water leakage	Bad tightness in the connecting points between pipes.	Improve the tightness of the connecting points

Environmental Information

This equipment contains fluorinated greenhouse gases covered by the Kyoto Protocol. It should only be serviced or dismantled by professional trained personnel.

This equipment contains R290 refrigerant in the amount as stated in the specification. Do not vent R290 into the atmosphere: R290, is a fluorinated greenhouse gas with a Global Warming Potential (GWP) = 20.

Dismantling of the unit, treatment of the refrigerant, of oil and of other parts must be done in accordance with relevant local and national legislation.

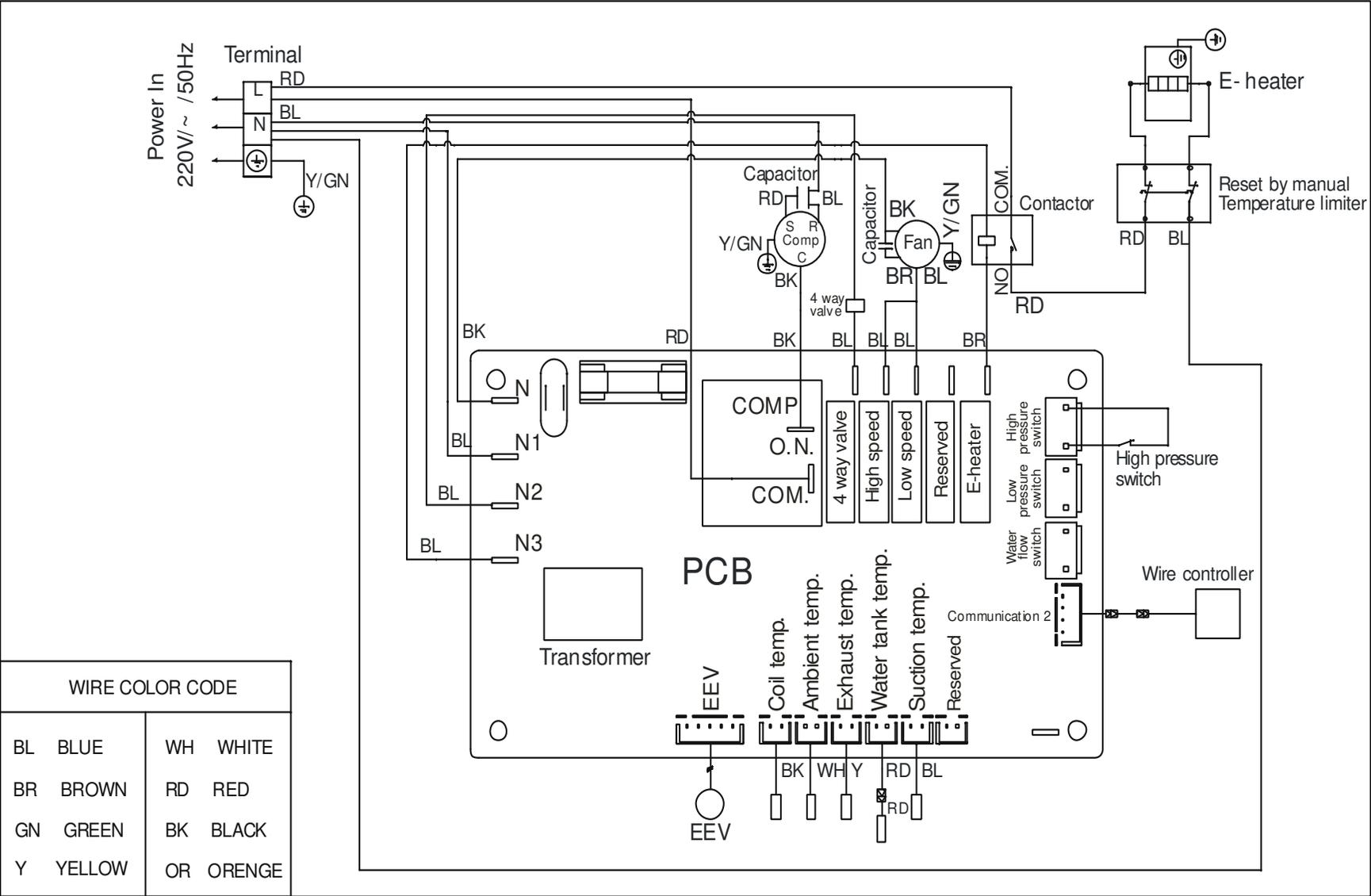
Do not try to dismantle the system yourself: the dismantling of the system, treatment of the refrigerant, of oil and other parts must be done by a qualified installer in accordance with relevant local and national legislation.

Units must be treated at a specialized treatment facility for re-use, recycling and recovery. By ensuring that this product is disposed off correctly, you will help to prevent potential negative consequences for the environment and human health.

Please contact the installer or local authority for more information.

Wiring Diagram

Please refer to the wiring diagram on the electric box.



WIRE COLOR CODE

BL	BLUE	WH	WHITE
BR	BROWN	RD	RED
GN	GREEN	BK	BLACK
Y	YELLOW	OR	ORANGE

----- END -----