Hisense

TECHNICAL & SERVICE MANUAL

Version: 3.1

For Heat Pump Water Heater

MODEL:

AH-80NH4GEB00
AH-100NH4GFB00
AH-150NH4GGB00

Contents

1. Safety Considerations..... 3
2. Product Specifications..... 11
3. Model Introduction..... 13
4. Product Picture and Drawing..... 14
   4-1. Product Overview..... 14
   4-2. Product Dimensions..... 15
5. Installation Instruction..... 16
   5-1. Recommended installation tools..... 16
   5-2. Accessories..... 16
   5-3. Water Pipe Connect Instructions..... 17
   5-4. Selection of installation site..... 18
   5-5. Installation drawings..... 19
   5-6. Air connection..... 20
   5-7. Thermal Expansion..... 21
   5-8. Installing Condensate Drain Lines..... 21
   5-9. Connecting the Water Supply..... 22
   5-10. Making Electrical Connections..... 23
   5-11. Safety Controls..... 24
   5-12. Insulation Blanket Kits..... 24
   5-13. Test Running..... 25
   5-14. Disposal requirements..... 26
   5-15. Wiring diagrams..... 26
   5-16. Refrigerant Flow System..... 27
6. The Performance Parameters..... 28
   6-1. The Performance Curves..... 28
7. Function Operation..... 30
   7-1. Operation Range..... 30
   7-2. Display Panel Instruction & Function..... 31
8. Electrical Characteristics..... 35
   8.1Temperature Sensor..... 35
9. Trouble Shooting..... 40
10. Disassembly Guidelines..... 41

1. Safety Considerations

IMPORTANT!
Please Read Before Starting

READ ALL INSTRUCTIONS BEFORE USE

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and follow all safety messages.

This is the safety alert symbol.

This symbol alerts you to potential hazards that can kill or injure you and others.

All safety messages will follow the safety alert symbol and either the word DANGER, WARNING or CAUTION. These words mean:

You may be slightly injured or cause damage to the product if you do not follow instructions.

You may be killed or seriously injured if you do not follow instructions.

This indicates that the failure to follow the instructions will cause serious injury or death.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what may happen if the instructions are not followed.

To reduce the risk of explosion, fire, death, electric shock, injury or scalding to persons, instructions in this manual must be followed.

Be sure to fully understand the user’s manual before you install and operate this appliance. If you have any difficultly in understanding or following the instructions in this manual, or have any questions, contact an authorized service center or the local electric utility.

WARNING

To reduce the risk of explosion, fire, death, electric shock, scalding or injury to persons when using this product, follow basic precautions, including the following:

Children in the Household:

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.

Children should be supervised to ensure that they do not play with the appliance.

Take care so that children may not step on the product. Otherwise, children may be seriously injured due to falling down.

For use in Europe:

This appliance can be used by children aged from 3 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

Children aged from 3 to 8 years are only allowed to operate the tap connected to the water heater.

Installation

- To reduce the risk of severe injury or death, follow all installation instructions.
- Be sure your appliance is properly installed in compliance with local codes and the provided installation instructions.
- Do not replace any part of your water heater and use only original accessories and spare parts unless it is specifically recommended in this manual.
- Do not turn on the electrical power to water heater unless the tank is completely full of water.
- Never attempt to operate this appliance if it is damaged, malfunctioning, partially disassembled, or has missing or broken parts.
- When the product is soaked (flooded or submerged) in water, contact an Authorized Service Center for repair before using it again.
- Moving or installation of the appliance requires two or more people.
- Turn off the power by opening the circuit breaker or removing the fuses before installing.
- Even if the water heater thermostat is set to relatively low, hot water has the potential for scalding.

To reduce the risk of scalding, thermostatic mixing valves are recommended.

- Keep packing materials out of the reach of children. Packaging material can be dangerous for children. There is a risk of suffocation.
- Destroy the carton, plastic bag, and other packing materials after the appliance is unpacked.

Children might use them for play. Cartons covered with rugs, bedspreads, or plastic sheets can become airtight chambers.

- Connect to a properly rated, protected, and sized power circuit to avoid electrical overload.

R290 WARNING

RISK OF FIRE

⚠ DANGER

This Heat Pump Water Heater contains R290 refrigerant.
Risk of fire/flammable materials.
Only authorized personnel may service this unit.

1. WARNING Risk of fire/flammable material. If the refrigerant is leaking, switch off the unit at the mains and contact the service agent.
2. DO NOT store chemicals or flammable materials near this appliance.
3. NEVER use a flammable spray such as hair spray, paint, etc. near this unit as this may cause a fire.
4. Avoid risk of injury from contact with refrigerant if you notice a leak.
5. If you suspect the refrigerant is leaking then: (1) Do not smoke. (2) Do not operate electrical equipment. Isolate the device.
6. The refrigerant must not enter the atmosphere. Only have the refrigerant removed by qualified professional.
7. Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
8. The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater.)
9.Do not pierce or burn.
10.Be aware that refrigerants may not contain an odour.
11.Spaces where refrigerant pipes shall be compliance with national gas regulations.
12.Servicing shall be performed only as recommended by the manufacturer.
13.The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
14.All working procedure that affects safety means shall only be carried by competent persons

Precautions for using R290 refrigerant

In addition, pay attention to the following points:

1. Transport of equipment containing flammable refrigerants Compliance with the transport regulations
2. Marking of equipment using signs Compliance with local regulations
3. Disposal of equipment using flammable refrigerants Compliance with national regulations
4. Storage of equipment/appliances The storage of equipment should be in accordance with the manufacturer's instructions.
5. Storage of packed (unsold) equipment Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.

The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

6. Information on servicing

6-1 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.

6-2 Work procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of flammable gas or vapour being present while the work is being performed.

6-3 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.

6-4 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.

6-5 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.

6-6 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.

6-7 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.

6-8 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.
6-9 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.
7. Repairs to sealed components
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.
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 working on them.
8. 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.
9. 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.
10.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.
11.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.
12.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.
13.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.
14.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.
15.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.
16.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 shutoff 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.

Explanation of symbols displayed on the product:

	**WARNING**	This symbol shows that this Heat Pump Water Heater uses a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire
	**CAUTION**	This symbol shows that the operation manual should be read carefully.
	**CAUTION**	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
	**CAUTION**	This symbol shows that information is available such as the operating manual or installation manual.

2. Product Specifications

Model			AH-80NH4GEB00	AH-100NH4GFB00	AH-150NH4GGB00
Photo			Without Inner Coil 	Without Inner Coil 	Without Inner Coil 
Power supply		V-ph-Hz	220-240/1/50	220-240/1/50	220-240/1/50
Volume of mixed water at 40 °C(1)		L	94	110	180
Declared load profile(1)		/	M	M	L
Energy efficiency class(1)		/	A+	A+	A+
Water heating energy efficiency(1)		%	110	115	120
Annual electricity consumption(1)		kWh	470	440	815
COP_{DHW}(1)		W/W	2.75	2.7	3.0
Heating up time(1)		h:min	5.18	6.53	9.63
Daily electricity consumption(1)		kWh	2.147	2.214	3.853
Sound pressure level (indoor)		dBA	40	40	40
Sound power level (indoor)		dBA	47	47	47
Max water temperature		°C	65	65	65
Thermostat temperature setting(1)		°C	50	50	52
Protection rating		IP	X4	X4	X4
Setting temperature range		°C	20~65	20~65	20~65
Running air temperature range		°C	-7~43	-7~43	-7~43
Max power input		W	1500	1500	1500
Max current input		A	6.5	6.5	6.5
Dimension	Dimension (WxDxH)	mm	540 × 565 ×1,170	540 × 565× 1,280	540 × 565× 1,620
	Packing (LxWxH)	mm	580 × 630× 1,337	580 × 630× 1,447	580× 630 × 1,787
	Net/Gross weight	kg	63/80	66/83	76/95
Refrigerant	Type	/	R290	R290	R290
	Charged volume	g	148	148	148
	TCO2Eq	tonnes	0.000444	0.000444	0.000444
	Reasonable refrigerant escape	g/year	≤ 0.5	≤ 0.5	≤ 0.5
Refrigerant design pressure	Low/High	MPa	0.9/2.7	0.9/2.7	0.9/2.7
Rated power input	Electric heater	W	1200	1200	1200
	Heat pump	W	205	205	205
Rated current input	Electric heater	A	5.2	5.2	5.2
	Heat pump	A	0.89	0.89	0.89
Max Heating Capacity	Electric heater	W	1200	1200	1200
	Heat pump	W	950	950	950
Tank	Rated capacity	L	80	99	148
	Material	/	Enamel steel tank	Enamel steel tank	Enamel steel tank
	Max pressure	bar	8	8	8
	Cathodic protection	/	Mg anode electronic anode rod	Mg anode electronic anode rod	Mg anode electronic anode rod
	Insulation thickness	mm	50	50	50
	Condenser type	/	Flat Micro channel	Flat Micro channel	Flat Micro channel
	Condensor material	/	Aluminium	Aluminium	Aluminium
Air circuit	Fan type	/	Centrifugal	Centrifugal	Centrifugal
	Air flow rate	m^3/h	280	280	280

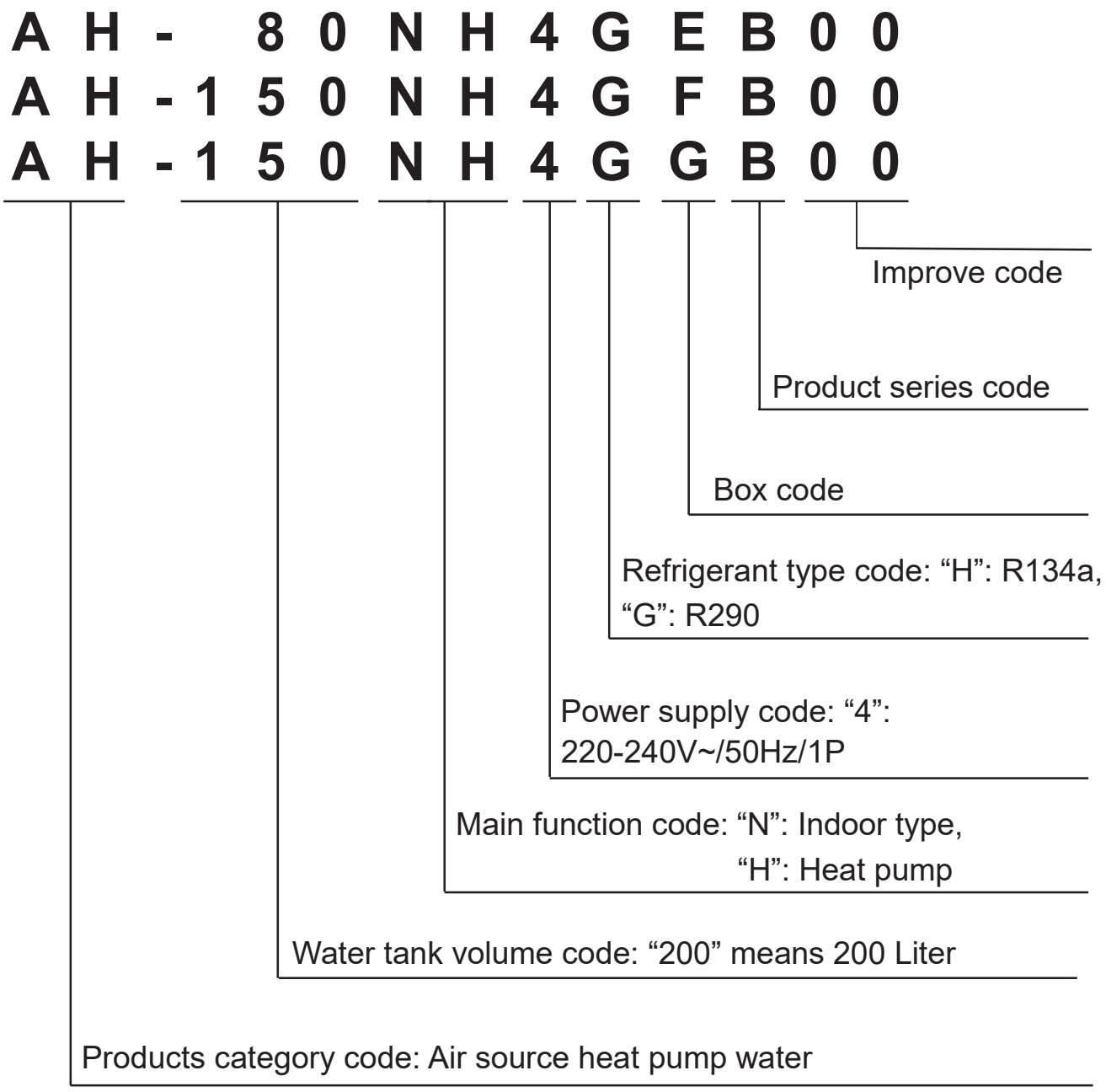
	Duct diameter	mm	160	160	160
	Max. available static pressure	Pa	40	40	40
Fan motor	Model	/	ZKFP-34-10-1	ZKFP-34-10-1	ZKFP-34-10-1
	Type	/	DC	DC	DC
	Brand	/	Welling	Welling	Welling
	Output/input	W	34/-	34/-	34/-
	Capacitor	μF	/	/	/
	Number of fan speeds	/	-	-	-
	No. of poles	/	10P	10P	10P
	Speed	RPM	1000	1000	1000
Compressor	Model	/	WHP00950PSV-F3BUN	WHP00950PSV-F3BUN	WHP00950PSV-F3BUN
	Type	/	Rotary	Rotary	Rotary
	Brand	/	HIGHLY	HIGHLY	HIGHLY
	Capacity	W	974	974	974
	Input	W	236	236	236
	Rated current(RLA)	A	1	1	1
	Locked rotor Amp (LRA)	A	7	7	7
	Thermal protector position	/	/	/	/
	Capacitor	μF	12	12	12
Evaporater coil	Number of rows	/	2	2	2
	Tube pitch(a)× row pitch(b)	mm	19.05*16.5	19.05*16.5	19.05*16.5
	Fin spacing	mm	1.5	1.5	1.5
	Fin type	/	Louvered fin	Louvered fin	Louvered fin
	Tube outside dia.and type	/	φ 5	φ 5	φ 5
	Evaporator material	/	Copper	Copper	Copper
	Coil length × height × width	mm	370×359×38.5	370×359×38.5	370×359×38.5
	Number of circuits (in-out)	/	2-2	2-2	2-2
Inner Coil	Surface	㎡	/	/	/
	Material	/	/	/	/
	Max pressure	bar	/	/	/
Throttle type	Throttle type	/	EEV	EEV	EEV
Water pipeline	Water inlet pipe	inch	1/2 inch (F)	1/2 inch (F)	1/2 inch (F)
	Water outlet pipe	inch	1/2 inch (F)	1/2 inch (F)	1/2 inch (F)
	Drainage pipe	inch	1/2 inch (F)	1/2 inch (F)	1/2 inch (F)
	Solar circulating inlet	inch	/	/	/
	Solar circulating outlet	inch	/	/	/
Qty'per 20' /40' /40'HQ		pcs	36/76/152	36/76/76	36/76/76

Note 1: Values obtained with heat source temperature of 7/6°C (DB/WB), storage tank ambient temperature of 20°C, inlet water temperature of 10°C (according to EN 16147).

Note:

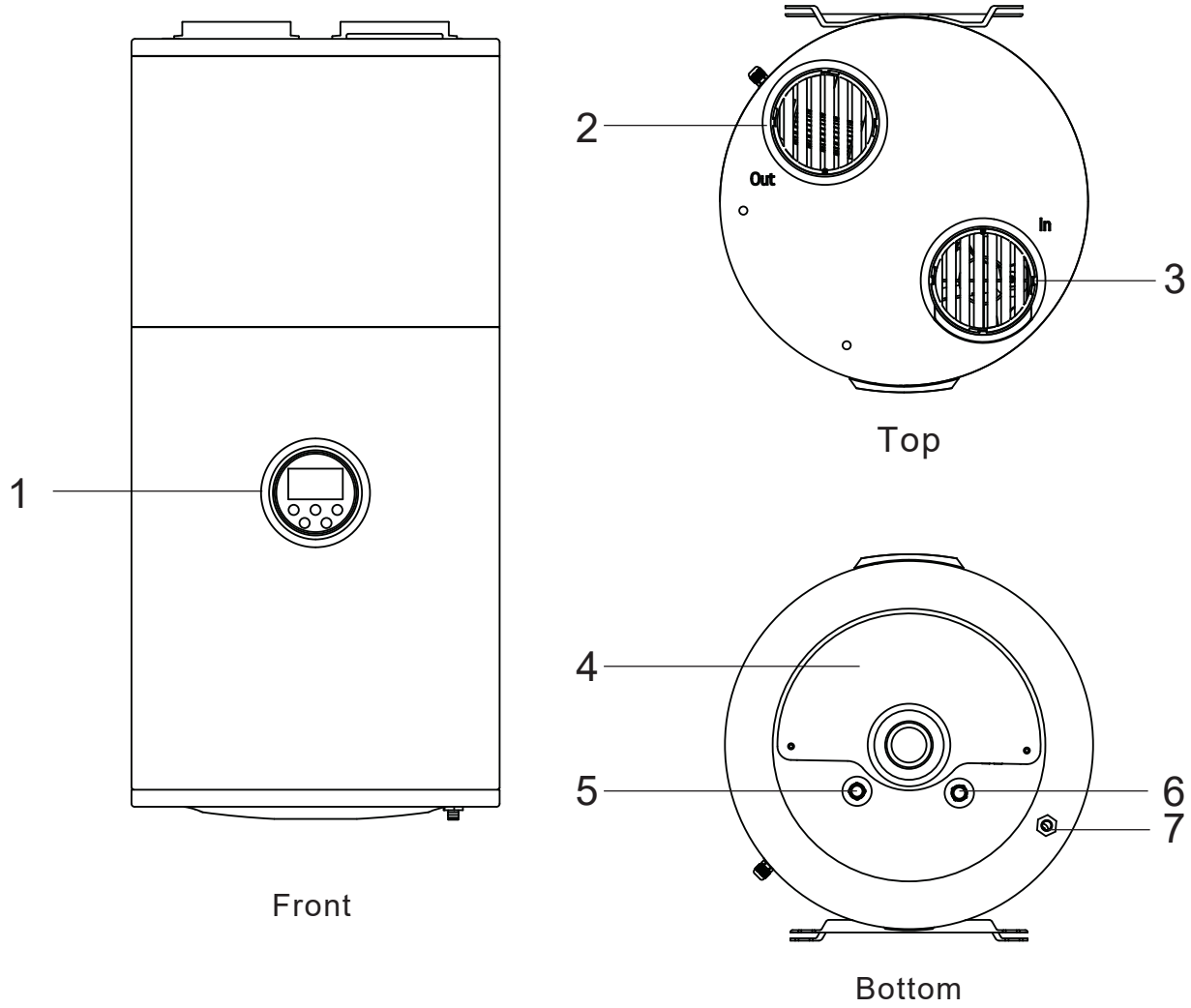
This table just is for reference, when relate parameters is different from actual specification, please use the parameters of the actual specification which you can get from the product manager.

3. Model Introduction



4. Product Picture and Drawing

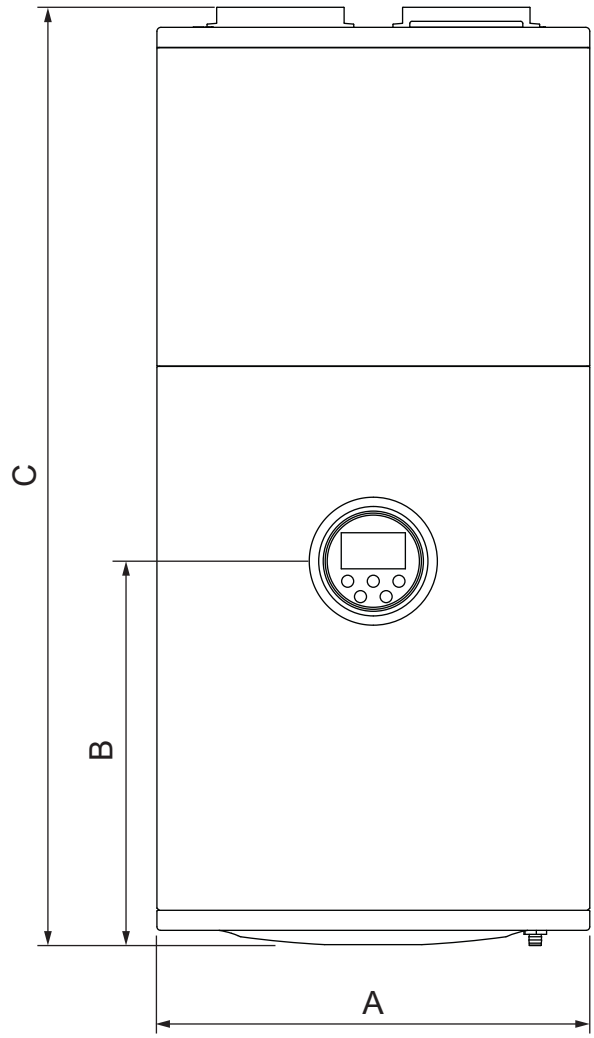
4-1. Product Overview



Note：Overview for reference, subject to actual product

Code	Name	Code	Name
1	Display	5	Hot outlet
2	Air outtake vents	6	Cold inlet
3	Air intake vents	7	Condensate drain
4	Maintenance cover		

4-2. Product Dimensions



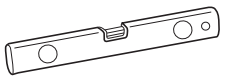
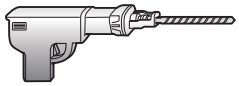
Model	A (mm)	B (mm)	C (mm)
80L	Φ540	460	1170
100L	Φ540	570	1280
150L	Φ540	910	1620

Note:

The specific installation shall be based on the physical product.

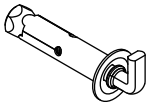
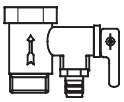
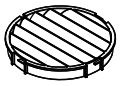
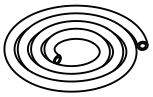
5. Installation Instruction

5-1. Recommended installation tools

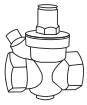
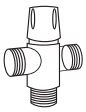
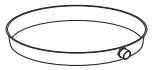
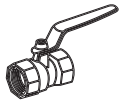
Name	Figure	Name	Figure
Screw driver		Teflon tape	
Spanner		Gradient	
Multi-meter		Electric screwdriver & Drill bit	

5-2. Accessories

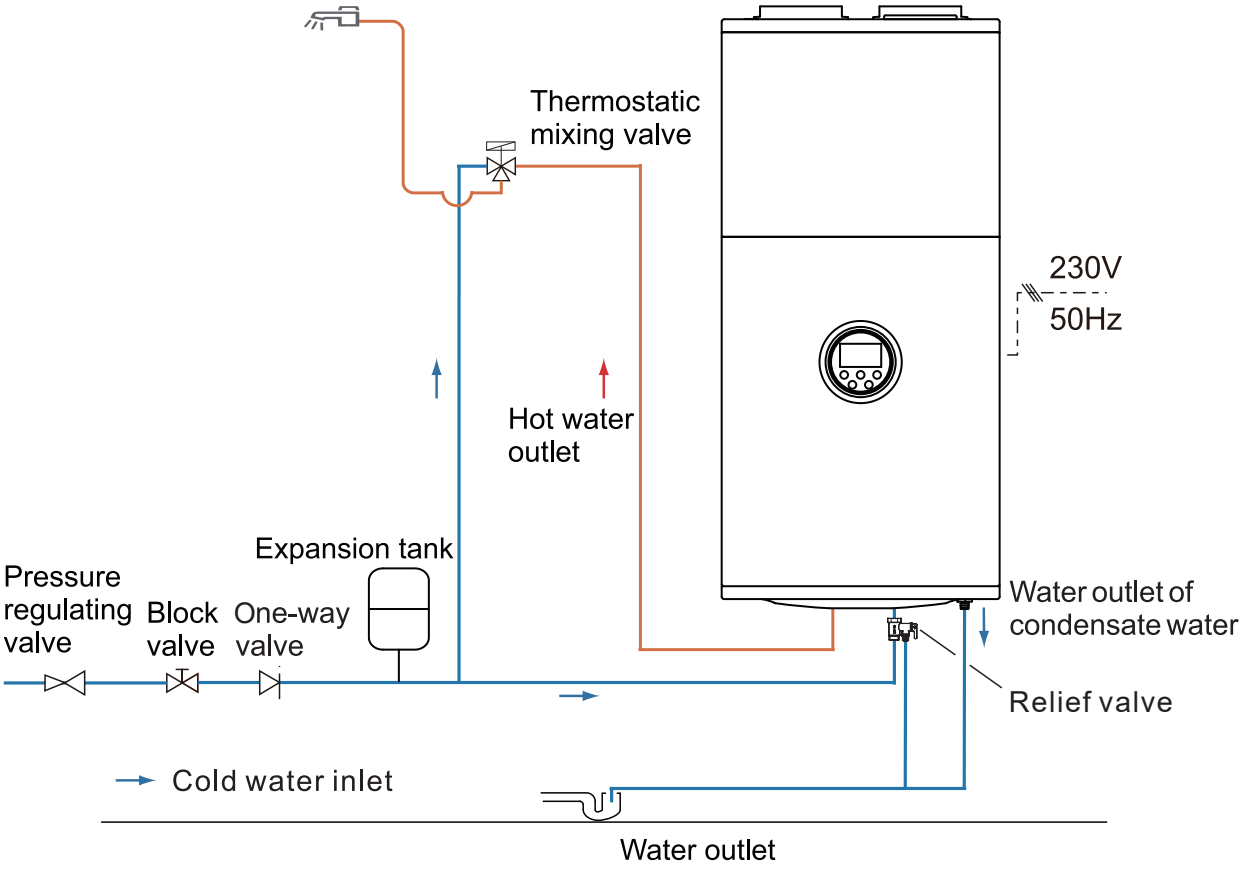
Included accessories (supply by factory):

Name	Figure	Name	Figure
M10-120 Expansion anchor bolts	 (x4)	Hose clamp	 (x1)
Relief valve	 (x1)	G 1/2" Dielectric union	 (x2)
Wind deflector	 (x2)	Adjusting screw	 (x2)
"M3" Screw	 (x2)	Hose	 (x1)

Recommended accessories (User purchase):

Name	Figure	Name	Figure
Pressure reducing valve		Thermal expansion tank	
Thermostatic mixing valve		Drain pan	
Shut-off valve			

5-3. Water Pipe Connect Instructions

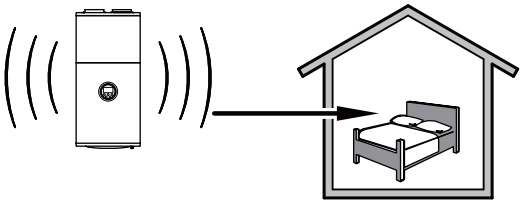


* In closed system, connect a thermal expansion tank to cold water supply line.
  See “Thermal Expansion” Section.

* If copper piping is used, The dielectric unions must be installed at the water connections.

5-4. Selection of installation site

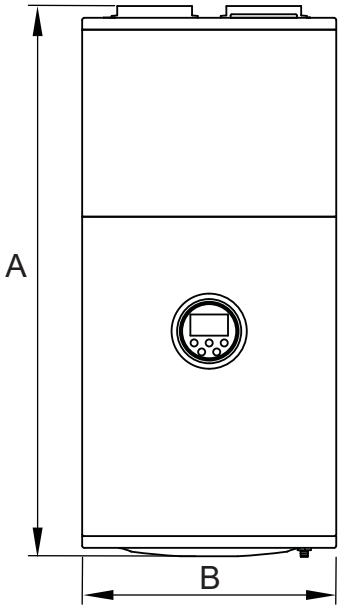
1. The install location is stable and level.
   Air flow can flow in and out freely, which is affected by outdoor air to a minimum extent.
2. The surface can support the the filled weight of the Heat Pump Water Heater and the condensate water can be drained freely.
3. Select a location where the Heat Pump Water Heater noise does not bother the home owners or neighbors.
4. There is sufficient space left for installation and maintenance.
5. There is no strong electromagnetic interference around that may affect control functions.
6. There are no corrosive vapors such as aerosol sprays, stain removers or household chemicals near the install location.
   These vapors may cause corrosion to the machine and it's fittings which may cause corrosion of the machine and its fittings.
7. Considerations have been made to prevent connected water pipes from freezing.

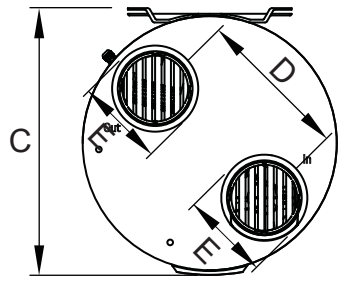


Keep an adequate distance between the working heat pump and the resting places.

Fasten the product using the brackets to a load-bearing wall. Avoid installing the product on walls subject to strong vibrations or pulsations.

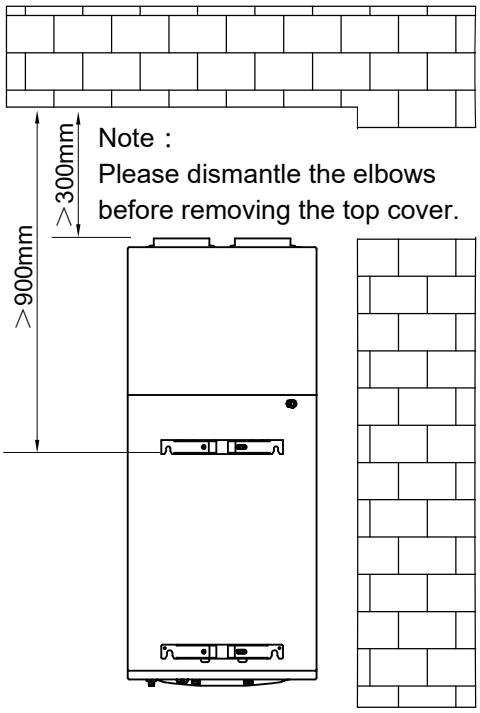
Installation dimensions





Model	A	B	C	D	E
80L	1170mm	540mm	565mm	328mm	159mm
100L	1280mm	540mm	565mm	328mm	159mm
150L	1620mm	540mm	565mm	328mm	159mm

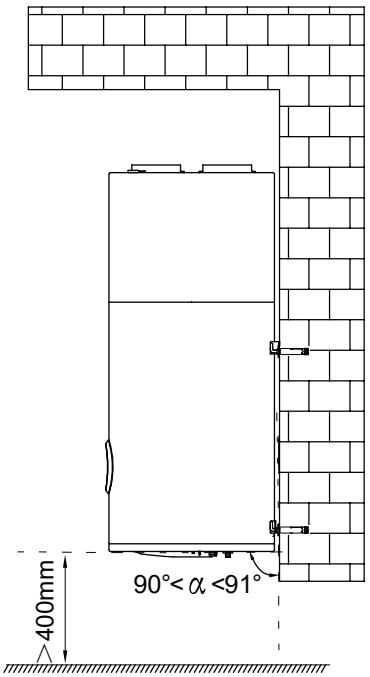
5-5. Installation drawings



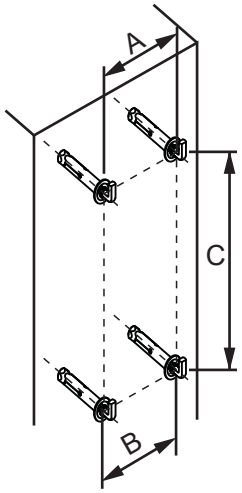
Note：
Please dismantle the elbows before removing the top cover.

Minimum room size: 6m²

Installation angle referto the following diagrams



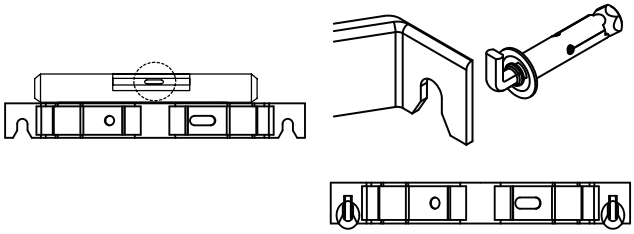
Note: These two expansion bolts can support 200kg weight at least . Please use the expansion bolts adapted to your wall material.



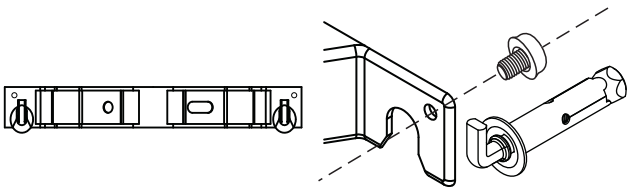
Model	A	B	C
80L	308mm	300mm	475mm
100L	308mm	300mm	585mm
150L	308mm	300mm	385mm

To facilitate correct assembly of the product, refer to the installation templateshown on the packaging box.

TOP BRACKET



LOWER BRACKET

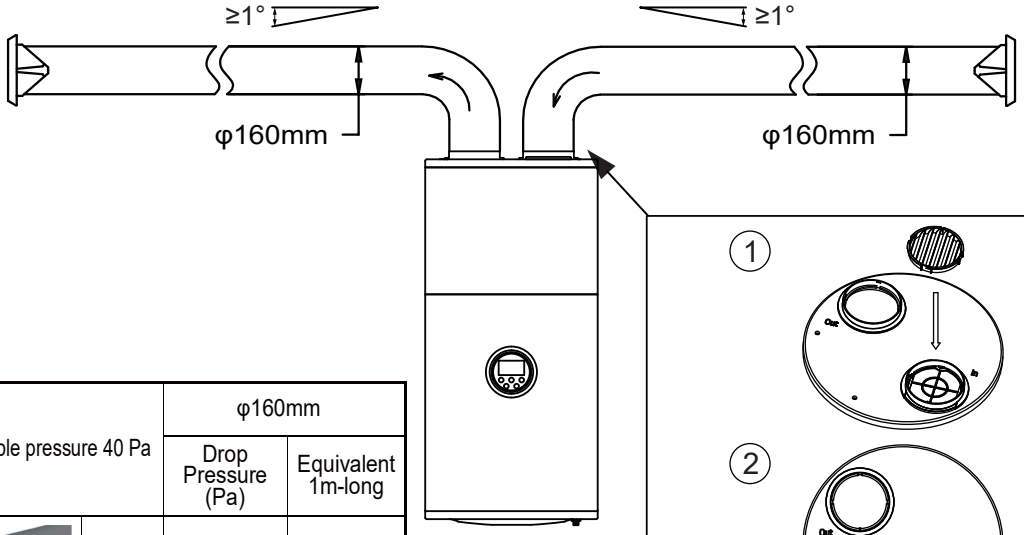


After the installation is completed, it is necessary to use a level ruler to check whether the support is maintained in a horizontal state.

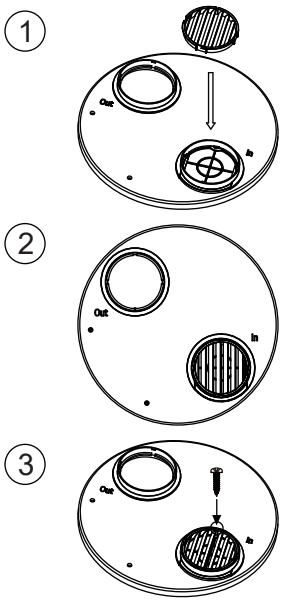
Note:

Please leave sufficient distance for easy disassembly of the magnesium rod and electric auxiliary heater.

5-6. Air connection



Available pressure 40 Pa		φ160mm	
		Drop Pressure (Pa)	Equivalent 1m-long
	Smooth tube	1.9/1 meter	1
	Bellows	3.6/1 meter	2
	Elbow	7.0/unit	4
	Air grid	9.0/unit	5



The grilles at the air outlet are installed in the same way.

⚠WARNING

If the user intends to install the air duct, it is recommended not to install the grille, because the installation of the grille will affect the air flow in and out, affecting the energy efficiency of the machine;If the user does not install the air duct, you must install a grille, which canprevent foreign objects from entering the machine.

- Install diameter 160mm duct.
- Pressure drops from duct must be lower than or equal to the static pressure of the fan.
- If the pressure drops out of range, the performance of the Heat Pump Water Heater will be impaired.

As shown in the installation method above. To ensure machine performance, the maximum length of the air duct should not exceed 7m(Bellows tube) and 13m(Smooth tube)

In this case, the performance will not be guaranteed.

It is recommended that an air grille with a mosquito net be installed at the air inlet of the air guide duct. Ventilation area not less than 150cm².

5-7. Thermal Expansion

Determine if a check valve is present on the inlet water line. Check with your local water utility. A check valve located in cold water inlet line will create a “closed water system”.

As water is heated, it creates an increase in pressure within the water system because the increased volume of water doesn’t have a place to go.

Referred to as “thermal expansion”, the rapid pressure increase can quickly reach the safety setting of the relief valve.

This will cause the relief valve to open during each heating cycle. We recommend installing an expansion tank to control thermal expansion.

Connect the thermal expansion tank to the cold water supply line (see Installation Instructions).
For additional information, contact installing contractor, plumbing inspector, or water supplier.

5-8. Installing Condensate Drain Lines

NOTE

- When making drain fitting connections to the drain tubing, DO NOT overtighten. Overtightening fittings could crack or damage the condensate drain pan.
- Condensate from this unit is not acidic.

The condensate drain lines and connections to the drain piping must meet state and local codes.

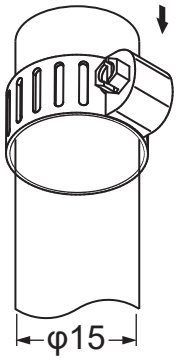
Do not reduce the drain line size to less than the condensate connection size provided.

Ensure that the condensate drain lines maintain a downward slope for proper drainage.The slope of the drainage pipe should be ≥1:100 (10mm drop per meter).

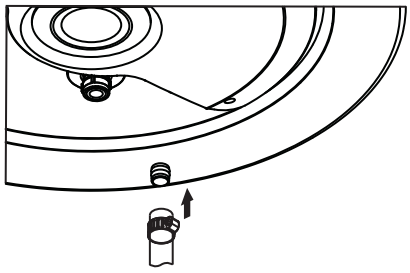
The drain line should be insulated to prevent condensation from forming on the outside of the drain line.

If no floor drain is available or the drain is above the level of the condensate line, then a common condensate pump with a capacity no less than 7.5 L per day must be installed.

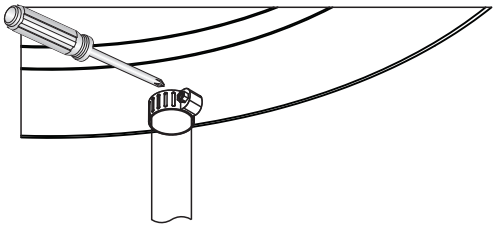
1 Put the hose band into the pipe.



2 Insert hose into condensing pipe port.



3 Use a screwdriver to lock the throat band tightly.



5-9. Connecting the Water Supply

NOTE

- DO NOT directly solder or braze to hot or cold water connections. If sweat connections are used, sweat tubing to adapter before installing the adapter to the hot or cold water connections on heater. Any heat applied to the water supply fittings will permanently damage the internal plastic lining in these ports.

* The maximum pressure in cold water supply line is 0.8 MPa. If the supply water is greater than 0.8 MPa, install a pressure reducing valve.
* Connect the water for filling or refilling the heating system as specified by EN1717/ EN 61770 to avoid contamination of drinking water by return flow.

Temperature setting range-with heater (°C)	35 - 75
Maximum and minimum water operating pressure (MPa)	- / 0.8

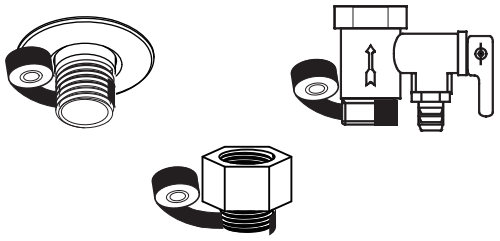
Refer to “Installation Instructions” for suggested typical installation.

1 Check the type of water pipes in your home. Use fittings adequate for the type of pipe in your home.

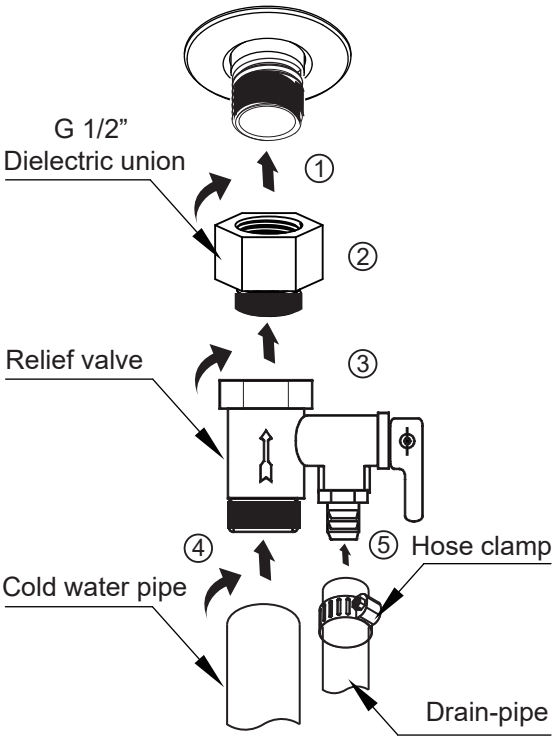
If cooper piping used, The water heater should always be connected dielectric connections to avoid corrosion caused by electric currents common in copper water pipes.

For ease of disconnecting the water heater for service or replacement, the installation of unions is recommended on the water connections.

2 Apply Teflon tape on the G end to prevent leaking.



3 Connect cold and hot water supply using 1/2” G.



4 Install a relief valve in the cold water line near the water heater.

5 Install the insulation on the cold and hot water pipes. Insulating hot water pipe can increase energy efficiency.

To Fill the Water Heater

⚠ WARNING

Do not turn on the electrical power to water heater unless the tank is completely full of water. The water heater warranty does not cover damage or failure resulting from operation with empty or partially empty tank.

1 Turn on the cold water supply.

2 Open each hot water faucet slowly and allow the water to run until it flows with a full stream.

3 Let the water run full stream for a few minutes.

5-10. Making Electrical Connections

⚠ WARNING

Disconnect all power before working on any electrical connections.

⚠ WARNING

The ground connection is mandatory.

⚠ WARNING

Never supply power to heating element directly. Heating element is installed on the product.(230 V, 1.2 kW)

NOTE

- All wiring must conform to European and national standards, and must be protected by a 30 mA RCD(Residual current device).
- Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

The water heater must be permanently powered by electricity to ensure correct operation of the impressed current titanium anode (ICCP).

Do not turn on power until water heater is completely filled.

The Heat Pump Water Heater can only be connected and operated on a single-phase 230 VAC grid.

The electrical installation will include:

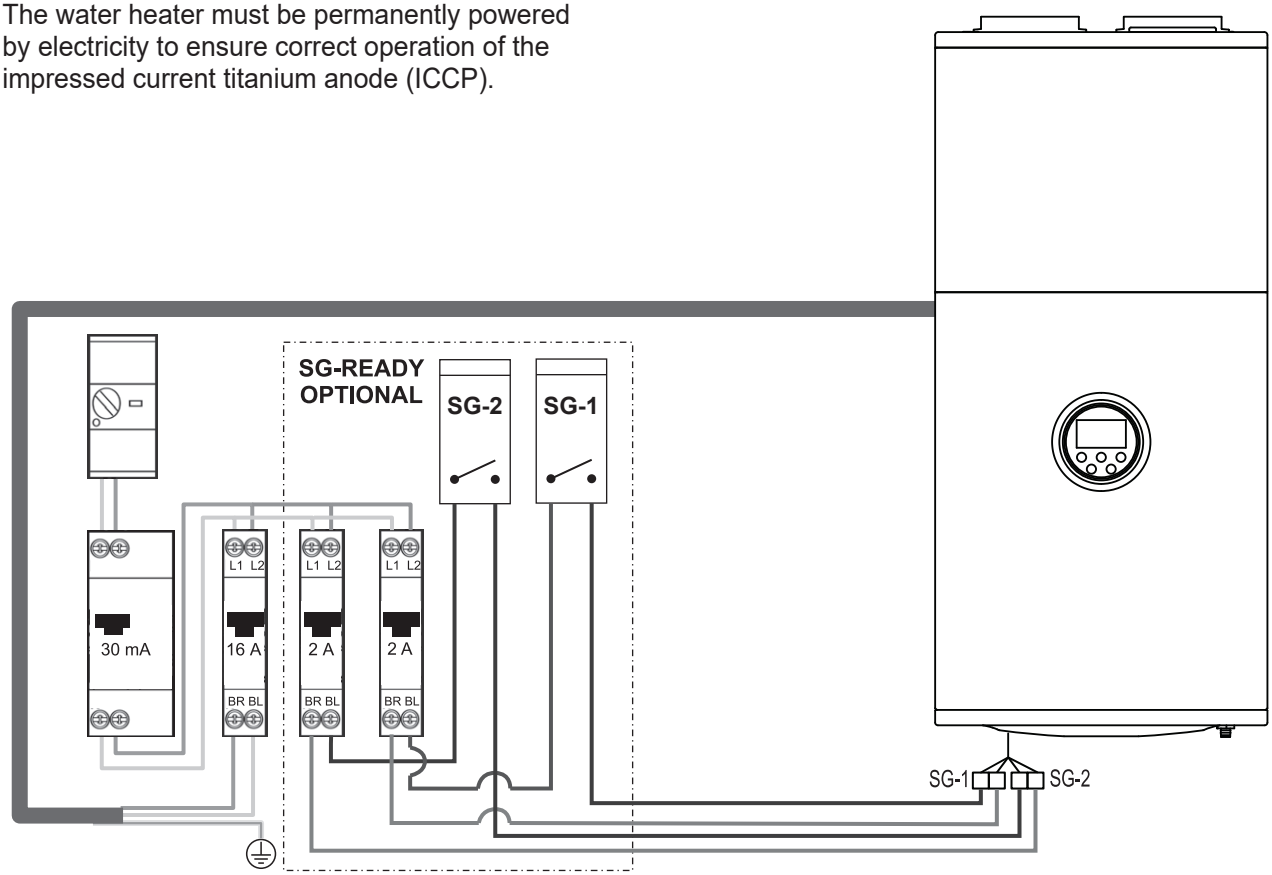
- The installation of a residual current device (RCD) having a rated residual operating current not exceeding 30 mA is advisable.
- The rating of the residual current device (RCD) to be installed

The supply cord cannot be disconnected from the product.

The supply cord cannot be replaced. If the cord is damaged the Heat Pump Water Heater should be scrapped.

⚠ CAUTION

In order to avoid a hazard due to inadvertent resetting of the thermal cut-out, this Heat Pump Water Heater must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.



5-11. Safety Controls

> **⚠ CAUTION**
>
> **You must have a qualified person investigate the cause of the high temperature condition and take corrective action before placing the water heater in service again.**

There is temperature limiting control(ECO) that is located above the upper heating element. If the water temperature becomes excessively high, the temperature limiting control(ECO) shuts off the power to the heating elements.

Once the control opens, it must be reset manually.

To reset temperature limiting control(ECO):

1 Turn off the power by opening the circuit breaker or removing the fuses.

2 Remove the front decor and upper element cover.

3 Press the red ECO RESET button.

5-12. Insulation Blanket Kits

External insulation blanket, available to the general public, for water heater is not necessary.

The manufacturer's warranty does not cover any damage or failure caused by installing or using any type of unauthorized energy-saving or other devices.

The manufacturer is not responsible for any injury or loss resulting from the use of such unauthorized devices.

> **⚠ CAUTION**
>
> **If local codes require application of any external insulation blanket kit to water heater, it will require careful attention so as not to restrict the proper function and operation of this Heat Pump Water Heater:**
>
> - DO NOT block the air openings of the water heater.
> - DO NOT cover or attempt to relocate the information or warning labels attached to the water heater.
> - DO NOT cover the control panel, drain valve, and junction box.
> - Inspect the blanket frequently.

5-13. Test Running

Location

- Sufficient room for air exchange and periodic service.
- Floor is strong enough to support water heater.
- Indoor and protected from high corrosive elements.
- Close to the area of heater water demand.
- Over 1 °C.
- Area free of flammable liquids and gases.

Drain valve

- Drain valve properly installed.

One-way valve

- One-way valve properly installed.
- Discharge line maintains a downward slope and runs to adequate drain.
- Discharge pipe protected from freezing.

Condensate Drain

- Drain lines maintain a downward slope and run to adequate drain.

Water supply

- Tank is completely full of water.
- Remove air from water heater and piping.
- Water connections tight and free of leakage but DO NOT overtighten.
- If cooper piping used, connect the dielectric unions to prevent corrosion.
- Flexible water connections recommended.

Wiring

- Power supply voltage agree with rating voltage on data plate.
- Proper size of branch circuit wire and fusing or circuit breaker.
- Unit properly grounded.

△Operation Test

1. Before Operation Test

(1) Do not switch on power before installation is finished completely.

(2) Electric wiring must be connected correctly and securely.

(3) All the impurities such as scraps and thrums must be cleared from the unit.

2. Operation Test Method

(1) Switch on power and press “ON/OFF” button on the display panel to start the operation.

(2) Press MODE button to select the mode to check whether the operation is normal or not.

(3) Press MODE button to select the “Fast mode”, wait for the water heater to run for 10 minutes, observe the temperature rise on the display to check whether the device is working properly.

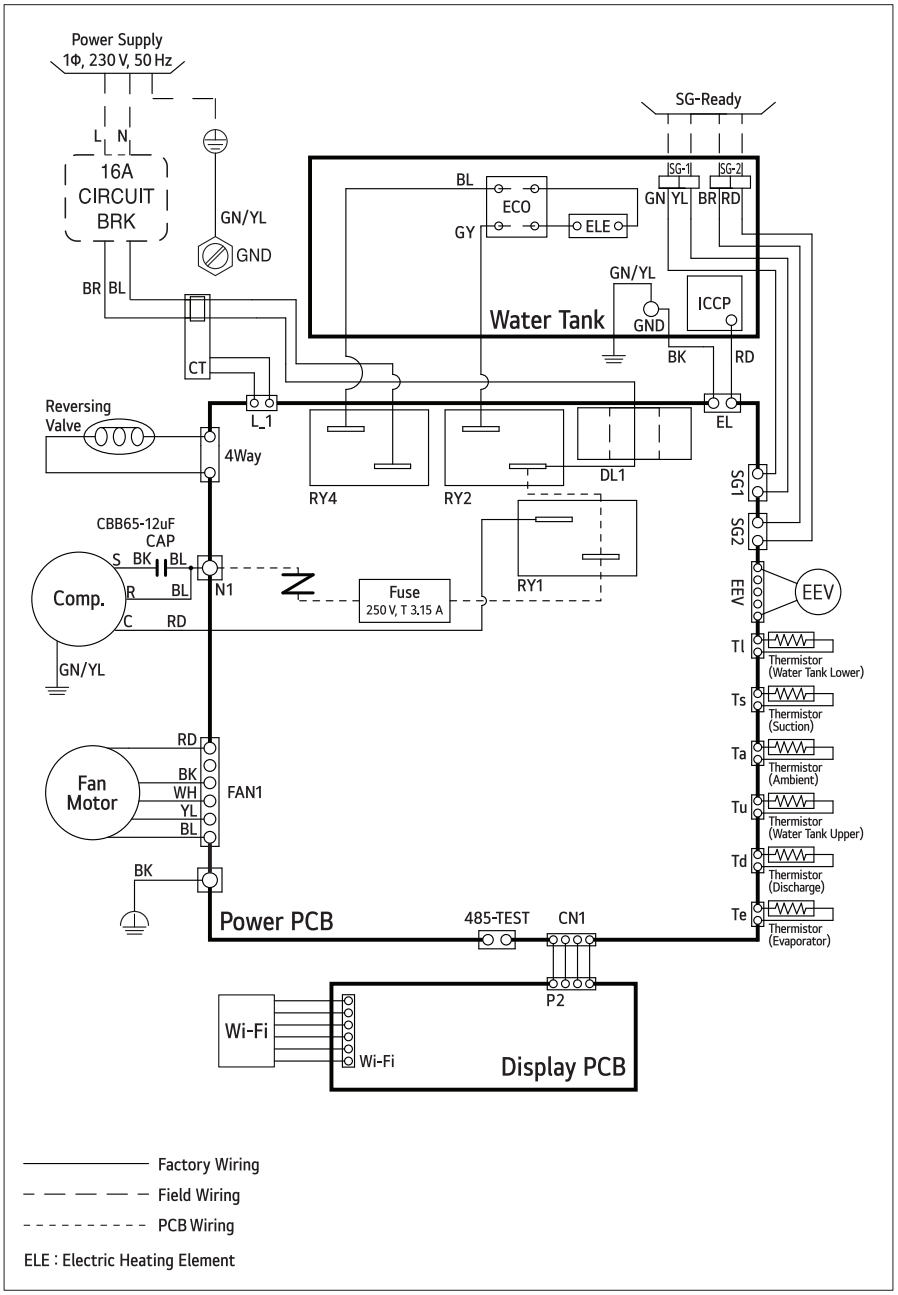
5-14. Disposal requirements

This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

5-15. Wiring diagrams

Warning:

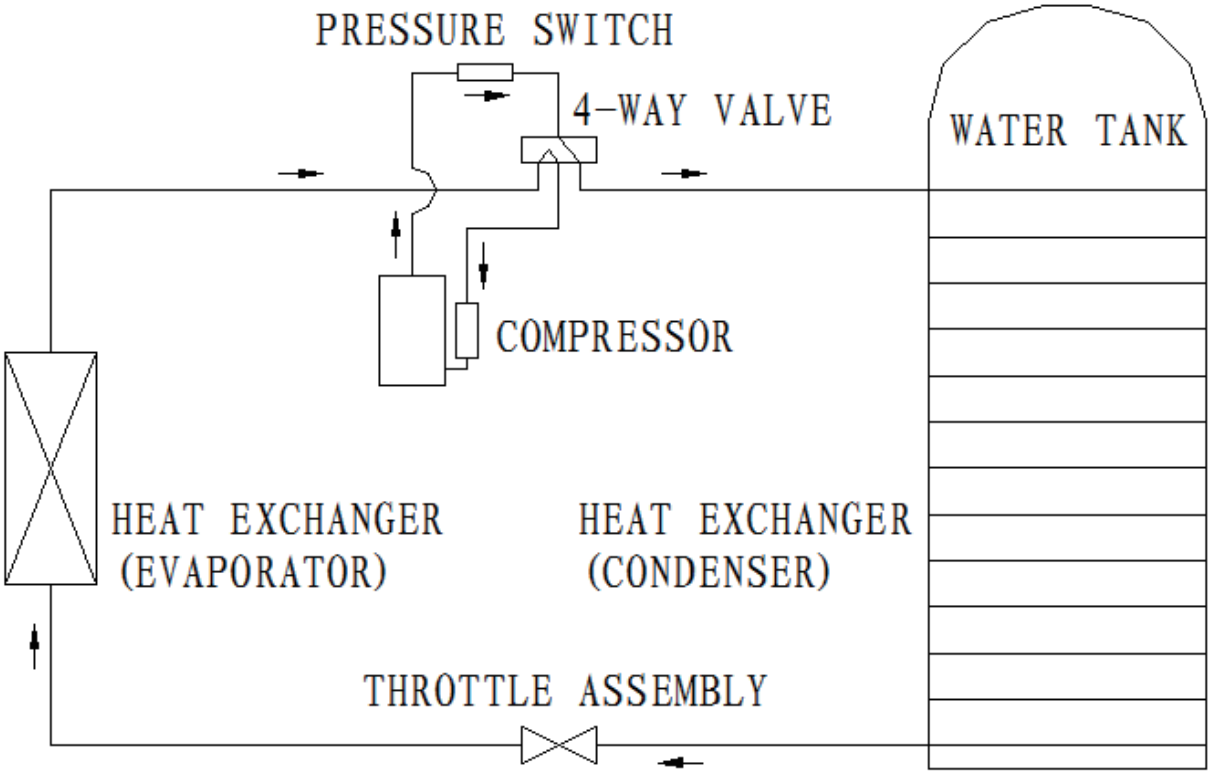
Before obtaining access to terminals, all supply circuits must be disconnected, the details please refer to the wiring diagram.



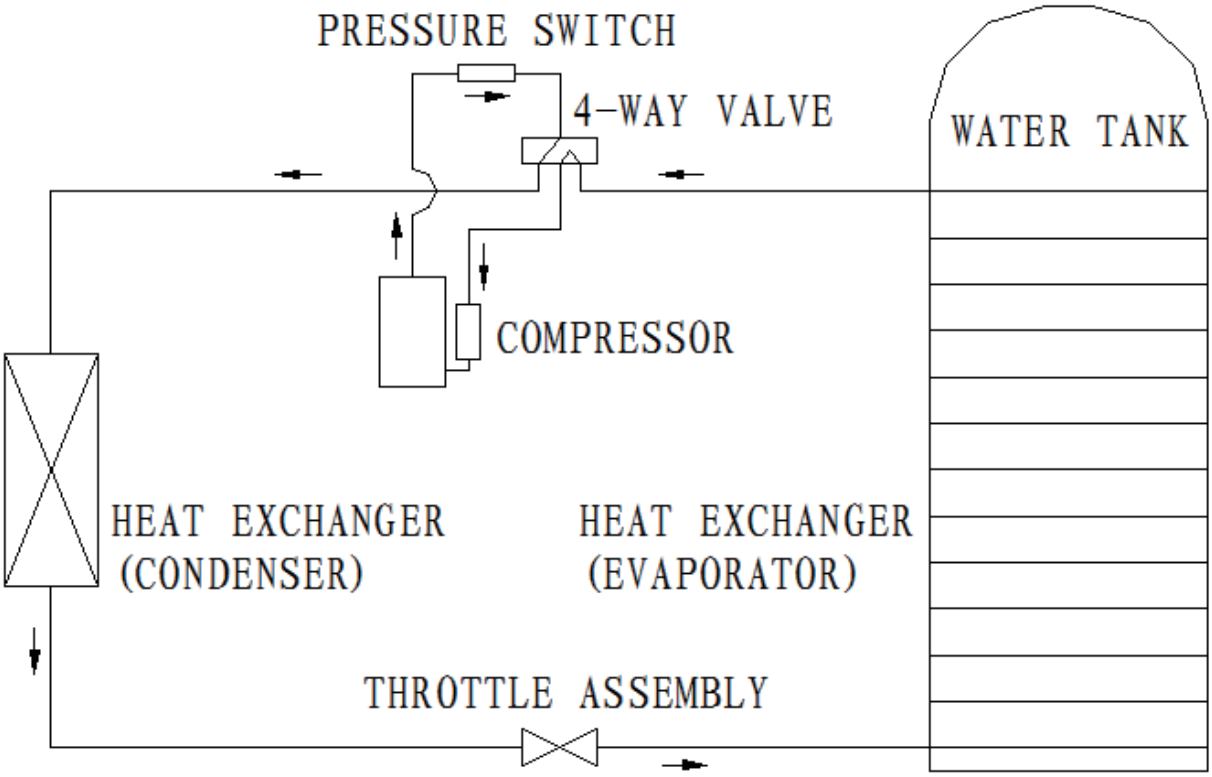
Model	SW
80L	1 2 3 4 OFF OFF OFF OFF
100L	ON 1 2 3 4 OFF OFF OFF
150L	ON 1 2 3 4 OFF OFF OFF

***Note: Switch off the power supply before making any changes to DIP switch settings.**

5-16. Refrigerant Flow System



Process of heating water



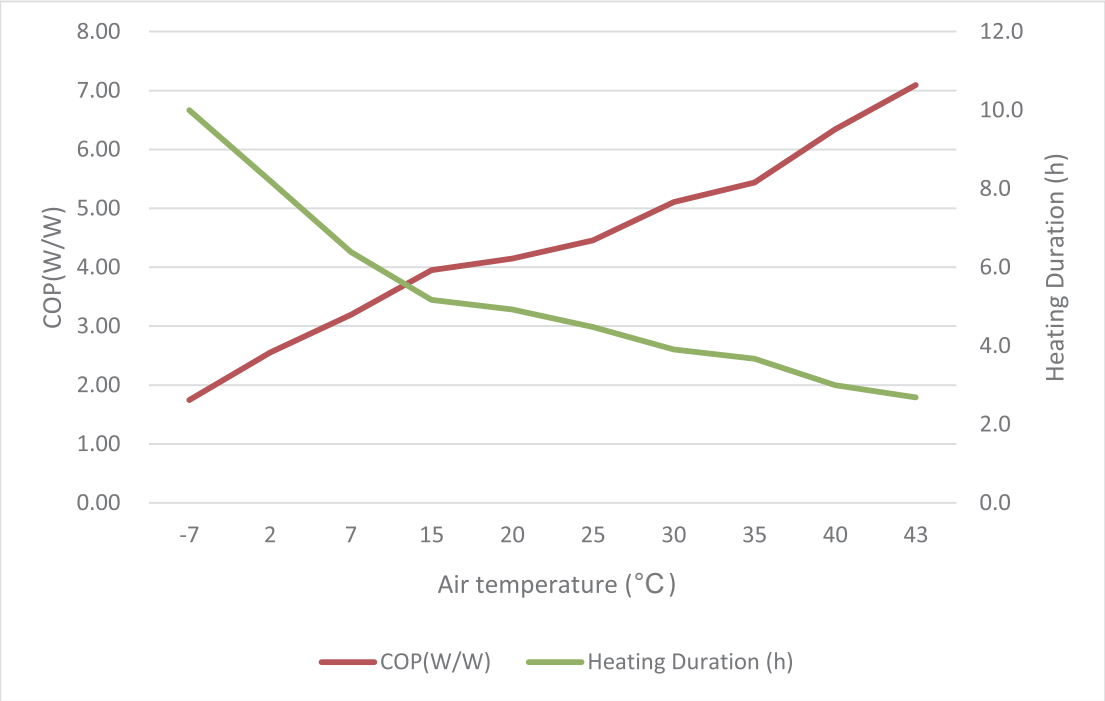
Defrosting process

6. The Performance Parameters

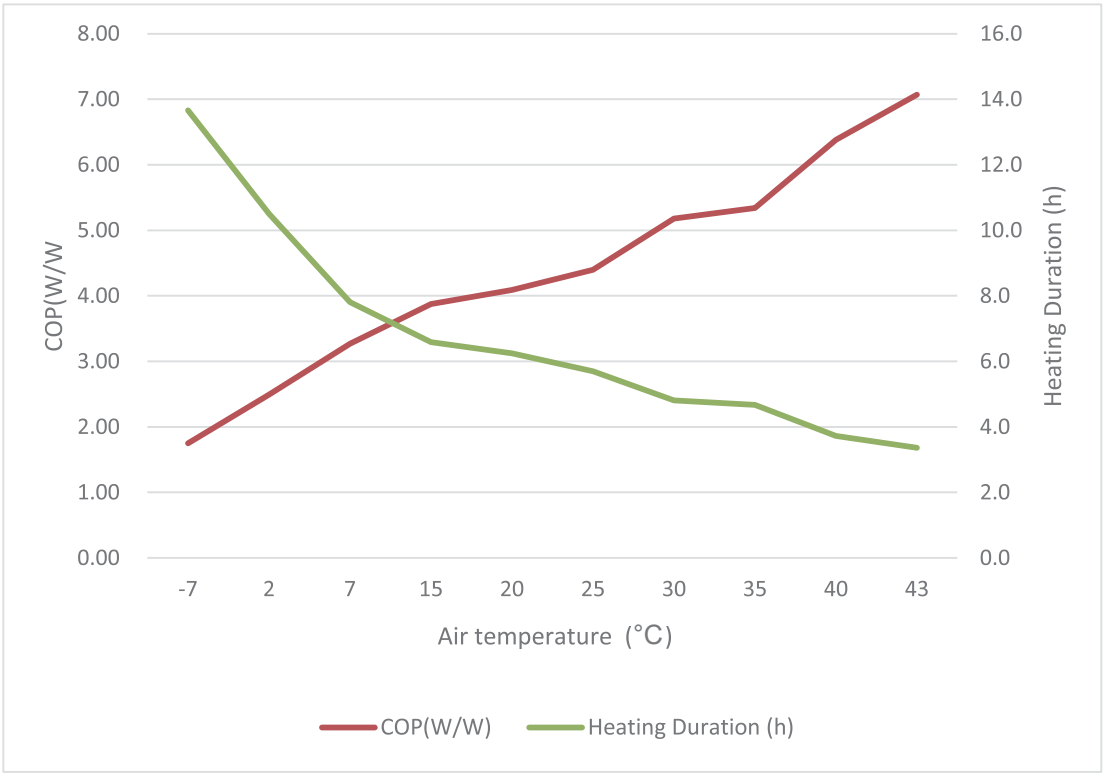
6-1. The Performance Curves

The performance curve under ECO mode (water temperature variation from 10°C to 55°C) are as follows:

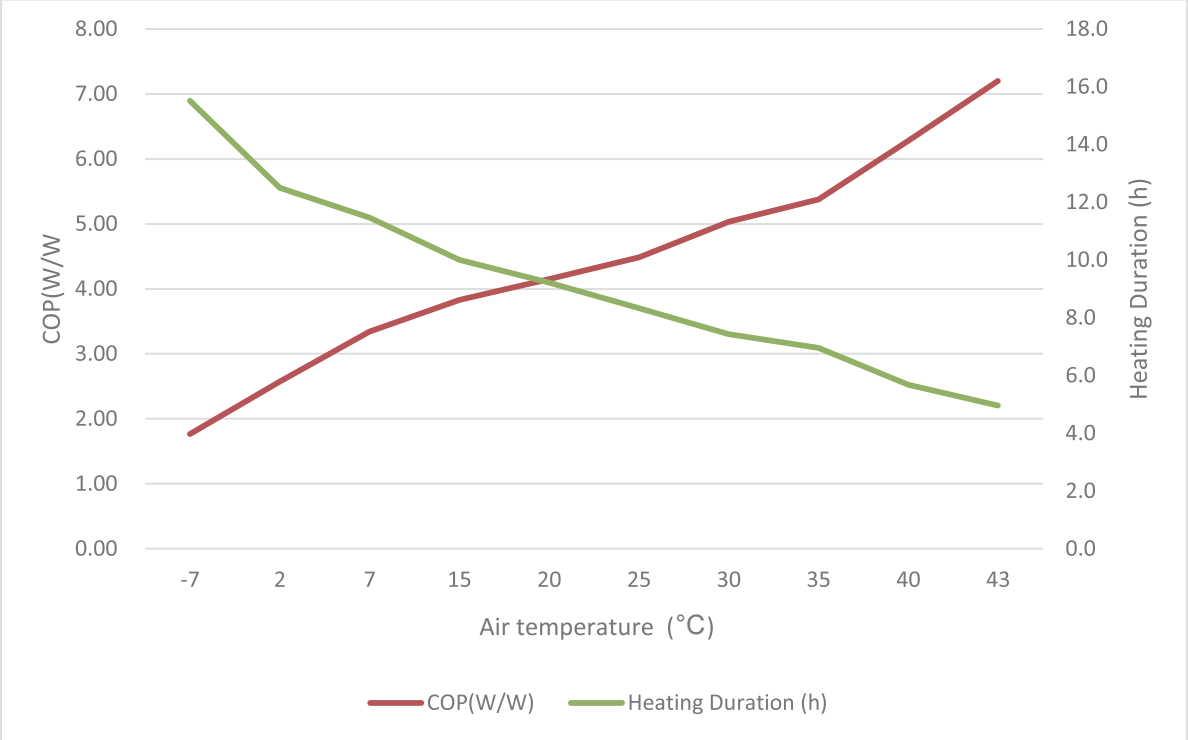
AH-80NH4GEB00



AH-100NH4GFB00



AH-150NH4GGB00



7. Function Operation

7-1. Operation Range

minimum and Maximum water setting temperatures (°C)	20 / 65
minimum and Maximum water operating pressure (MPa)	- /0.8
minimum and Maximum environmental operating temperatures (°C)	-7 ~43

***Note**: The maximum pressure in cold water supply line is 0.8 MPa. If the supply water is greater than 0.8MPa, install a pressure reducing valve.*

7-2. Display Panel Instruction & Function

Display Panel Instruction

FUNCTION & LOCK

Used to set the auxiliary function.
Used to exit the lock mode by pressing it for 3 seconds.

MODE

Press this button to select the operation mode.

UP

Used to increase the temperature value.
Used to increase the modify parameter value.
Used to navigate up the parameter code .

DOWN

Used to decrease the temperature value.
Used to decrease the modify parameter value.
Used to navigate down the parameter code.

MODE + UP

Used to enter the parameter setting mode by pressing them together for 3 seconds.

POWER

Pressing this button will start the appliance when it is powered-off or stop it when it is in operation.
Used to confirm the modify parameter value.

POWER + DOWN

Used to connect to the Wi-Fi by pressing them together for 3 seconds.

Note:
In the power-off state, the POWER button light is on, displaying water temperature or fault messages.
In the power-on state, all button lights are on, displaying water temperature or fault messages.
If no operation occurs within approximately 3 minutes, the buttons will lock, preventing all buttons from being operated, and all buttons light is off except FUNCTION button. You can press the FUNCTION button for about 3 seconds to exit the lock mode. When any button is pressed in lock mode, the buzzer sounds three times, and the FUNCTION button flashes. After 5 seconds, the alert status exits and then returns to the lock status.

Indication symbols on LED:

Auto mode indicator	ECO mode indicator	Fast mode indicator	E-Ht mode indicator
Disinfection indicator	Vacation indicator	Timer indicator	Ventilation indicator
Alarm indicator	Wi-Fi indicator		
Smart grid indicator	Photovoltaic power supply indicator		
Antifreeze indicator	Solar water heating indicator		

Display temperature
Display error code
Display time
Display parameters

Note: Each mode and relevant function will be further specified in following pages.

Function Instruction

Indicator	Mode / Function	Indicator description
	Auto mode	Automatically adjust the operation of the heat pump and electric heater based on the water temperature and ambient temperature. This mode provides relatively low power consumption and high heating capacity. When setting or running the Auto mode, the light will be on, otherwise it will be off.
	ECO mode	Operate in the most economical mode according to the water temperature and ambient temperature. This mode minimizes the power consumption and the longer heating time may be needed. When setting or running the ECO mode, the light will be on, otherwise it will be off.
	FAST mode	Simultaneously start the heat pump and electric heater operation. This mode provides the highest heating capacity. When setting or running the Fast mode, the light will be on, otherwise it will be off.
	E-Ht mode	Operates the electric heater independently for rapid heating when ambient temperature is extremely low. When setting or running the E-Ht mode, the light will be on, otherwise it will be off.
	Ventilation function	This function can activate the circulation ventilation. When setting/running the Ventilation function, the light will flash/stay on, otherwise it will be off.
	Vacation function	In this function, the tank temperature will be maintained at 25°C and will start heating and the disinfection function one day before the set time. When setting/running the Vacation function, the light will flash / stay on, otherwise it will be off.
	Timer function	This function allows you to set the water heater to turn on at specific time periods. When setting the current time or Timer function, the light will flash, otherwise it will be off.
	Disinfection function	The water in the tank is disinfected by being heated. When setting/running the Disinfection function, the light will flash / stay on, otherwise it will be off.
	Antifreeze	This function can prevent the water temperature in the tank from approaching 0°C. When entering the Antifreeze function, the light will stay on, otherwise it will be off. Antifreeze Function activates automatically below 5°C. Ensure power supply in freezing conditions.
	Alarm	When the indicator is lit, it indicates that a malfunction has occurred in the water heater, and during this period, protective measures are implemented, causing the device to stop operating. When a fault is detected, the light will stay on, otherwise it will be off.
	Wi-Fi	Wi-Fi enabled (only if present). Light on: connected; flash: connecting; off: failed to connect.
	Smart grid	When the indicator is lit, it indicates that the smart grid is in effect (only if present). Light on: the smart grid is in effect; off: no smart grid or the appliance is turned off.

⚠ WARNING

Manual disinfection heats water to 75°C. Avoid direct contact to prevent scalding.

△Parameter Instruction

Set parameter

Press the MODE and UP buttons together for about 3 seconds in the power-on or power-off state.

In the parameter setting mode, press the UP or DOWN button to select the parameter code. Next, press the FUNCTION button to enter the specific parameter setting. Adjust the parameter value by pressing the UP or DOWN button. When you have finished adjusting the specific parameter, press the FUNCTION button to confirm and exit the specific parameter setting page. Code meaning see the attached table A

Press the MODE or POWER buttons to exit the parameter setting mode.

If there is no activity for more than 1 minutes, the appliance will automatically exit the parameter setting mode.

Table A

Code	Description	Default	Unit	Range
C00	Automatic Antifreeze Function	OFF	/	ON/OFF
C01	Startup interval of back water pump (unconfigure)	120	min	30~600
C02	Running time of back water pump (unconfigure)	2	min	1~10
C03	Disinfection function	ON	/	ON/OFF
C04	Water temp of manual disinfection	75	°C	63~75
C05	Water temp of automatic disinfection	63	°C	63~75
C06	Interval days of disinfection	14	days	7~21
C07	Smart grid function	OFF	/	ON/OFF
C08	Water temp (when smart grid is activated and the system operates in non-high-priced heating mode)	60	°C	55~75
C09	Water temp (when smart grid is activated and the system operates in high-priced heating mode)	52	°C	35~65
C10	Solar water heating function	OFF	/	ON/OFF
C11	Solar pump start temperature difference (solar energy system outlet temperature minus water tank temperature)	7	°C	0~20
C12	Solar pump shutdown temperature difference (solar energy system outlet temperature minus water tank temperature)	4	°C	0~20
C13	Target temp for vacation mode	25	°C	15~45
C14	Electric heater	ON	/	ON/OFF
C15	Remote switch	OFF	/	ON/OFF
C16	Shutdown at low temp	OFF	/	ON/OFF
C17	Reserved	OFF	/	ON/OFF
C18	Reserved	OFF	/	ON/OFF
C19	The maximum water tank temperature that the solar energy system can reach for heating	75	°C	55~75

Parameter query function

Press MODE and DOWN buttons together for about 3s enter the Parameter query function.

In Parameter query function, press UP or DOWN button to select the parameter code, then press POWER button to enter the specific parameter page. Code meaning see the attached table B.

Press MODE or FUNCTION buttons or no operating for more than 1 minute will exit the parameter query function.

Table B

Code	Name	Unit	Description
A00	Water tank temp	°C	/
A01	Upper tank temp	°C	/
A02	Lower tank temp	°C	/
A03	Ambient temp	°C	/
A04	Coil temp of external heat exchanger	°C	/
A05	Suction temp	°C	/
A06	Exhaust temp	°C	/
A07	Back water temp	°C	/
A08	Temp of solar water heating	°C	/
A09	Compressor operating frequency	Hz	/
A10	Target frequency of compressor	Hz	/
A11	Fan speed	rpm	/
A12	Current opening of EEV	step	/
A13	Target superheat of suction	°C	/
A14	Compensation value of water temp	°C	/
A15	Return difference of water temp(when turn on compressor)	°C	/
A16	Maximum temp of water tank in heat pump mode	°C	/
A17	Compressor operating current	A	The actual current value is one tenth of the displayed current value
A18	Fault information	/	00:None;Press “  ” or “  ” to turn the page for more information.
A19	Software version	/	

8. Electrical Characteristics

8-1. Temperature Sensor

Parameter table attached:

1.THE PARAMETER OF THE AMBIENT SENSOR, THE PARAMETER OF THE COIL SENSOR , THE PARAMETER OF THE SUCTION SENSOR , THE PARAMETER OF THE BACKWATER SENSOR:
（R(0°C)=10KΩ±2% , B25/50=3950K±2%）

Temperature(°C)	Resistance(k)		Temperature(°C)	Resistance(k)		Temperature(°C)	Resistance(k)
-20	96.858		14	16.496		48	3.874
-19	91.498		15	15.741		49	3.728
-18	86.456		16	15.024		50	3.588
-17	81.715		17	14.344		51	3.454
-16	77.255		18	13.699		52	3.326
-15	73.060		19	13.086		53	3.203
-14	69.111		20	12.504		54	3.086
-13	65.396		21	11.951		55	2.973
-12	61.898		22	11.426		56	2.865
-11	58.605		23	10.926		57	2.762
-10	55.504		24	10.452		58	2.663
-9	52.583		25	10.000		59	2.568
-8	49.831		26	9.570		60	2.476
-7	47.238		27	9.162		61	2.389
-6	44.793		28	8.772		62	2.305
-5	42.488		29	8.402		63	2.224
-4	40.314		30	8.049		64	2.147
-3	38.263		31	7.713		65	2.073
-2	36.328		32	7.393		66	2.002
-1	34.501		33	7.088		67	1.933
0	32.891		34	6.797		68	1.867
1	31.149		35	6.519		69	1.804
2	29.608		36	6.255		70	1.743
3	28.153		37	6.002		71	1.685
4	26.778		38	5.761		72	1.629
5	25.478		39	5.532		73	1.575
6	24.248		40	5.312		74	1.523
7	23.085		41	5.102		75	1.473
8	21.984		42	4.902		76	1.425
9	20.941		43	4.711		77	1.378
10	19.954		44	4.528		78	1.334
11	19.019		45	4.354		79	1.291
12	18.132		46	4.186		80	1.250
13	17.292		47	4.027		81	1.210

2. THE PARAMETER OFCOMPRESSOR EXHAUST TEMPERATURE SENSOR

（R25°C=10KΩ±2%，B25/50=3950K±2%）

Temperature(°C)	Resistance(k)	Temperature(°C)	Resistance(k)	Temperature(°C)	Resistance(k)
-20	96.858	27	9.162	74	1.523
-19	91.498	28	8.772	75	1.473
-18	86.456	29	8.402	76	1.425
-17	81.715	30	8.049	77	1.378
-16	77.255	31	7.713	78	1.334
-15	73.060	32	7.393	79	1.291
-14	69.111	33	7.088	80	1.250
-13	65.396	34	6.797	81	1.210
-12	61.898	35	6.519	82	1.171
-11	58.605	36	6.255	83	1.134
-10	55.504	37	6.002	84	1.099
-9	52.583	38	5.761	85	1.064
-8	49.831	39	5.532	86	1.031
-7	47.238	40	5.312	87	1.000
-6	44.793	41	5.102	88	0.969
-5	42.488	42	4.902	89	0.940
-4	40.314	43	4.711	90	0.991
-3	38.263	44	4.528	91	0.884
-2	36.328	45	4.354	92	0.857
-1	34.501	46	4.186	93	0.832
0	32.891	47	4.027	94	0.807
1	31.149	48	3.874	95	0.783
2	29.608	49	3.728	96	0.760
3	28.153	50	3.588	97	0.738
4	26.778	51	3.454	98	0.717
5	25.478	52	3.326	99	0.696
6	24.248	53	3.203	100	0.676
7	23.085	54	3.086	101	0.657
8	21.984	55	2.973	102	0.638
9	20.941	56	2.865	103	0.620
10	19.954	57	2.762	104	0.603
11	19.019	58	2.663	105	0.586
12	18.132	59	2.568	106	0.570
13	17.292	60	2.476	107	0.554
14	16.496	61	2.389	108	0.539

Temperature(°C)	Resistance(k)		Temperature(°C)	Resistance(k)		Temperature(°C)	Resistance(k)
15	15.741		62	2.305		109	0.524
16	15.024		63	2.224		110	0.510
17	14.344		64	2.147		111	0.496
18	13.699		65	2.073		112	0.483
19	13.086		66	2.002		113	0.470
20	12.504		67	1.933		114	0.457
21	11.951		68	1.867		115	0.445
22	11.426		69	1.804		116	0.433
23	10.926		70	1.743		117	0.422
24	10.452		71	1.685		118	0.411
25	10.000		72	1.629		119	0.400
26	9.570		73	1.575		120	0.390

3. THE PARAMETER OF WATER TANK TEMPERATURE SENSOR

(R(25°C)=10KΩ±2% , B25/50=3950K±2%)

Temperature(°C)	Resistance(k)	Temperature(°C)	Resistance(k)	Temperature(°C)	Resistance(k)
-30	173.246	5	25.478	40	5.312
-29	163.331	6	24.248	41	5.102
-28	154.003	7	23.085	42	4.902
-27	145.23	8	21.984	43	4.711
-26	136.98	9	20.941	44	4.528
-25	129.222	10	19.954	45	4.354
-24	121.928	11	19.019	46	4.186
-23	115.069	12	18.132	47	4.027
-22	108.621	13	17.292	48	3.874
-21	102.559	14	16.496	49	3.728
-20	96.858	15	15.741	50	3.588
-19	91.498	16	15.024	51	3.454
-18	86.456	17	14.344	52	3.326
-17	81.715	18	13.699	53	3.203
-16	77.255	19	13.086	54	3.086
-15	73.06	20	12.504	55	2.973
-14	69.111	21	11.951	56	2.865
-13	65.396	22	11.426	57	2.762
-12	61.898	23	10.926	58	2.663
-11	58.605	24	10.452	59	2.568
-10	55.504	25	10	60	2.476
-9	52.583	26	9.57	61	2.389
-8	49.831	27	9.162	62	2.305
-7	47.238	28	8.772	63	2.224
-6	44.793	29	8.402	64	2.147
-5	42.488	30	8.049	65	2.073
-4	40.314	31	7.713	66	2.002
-3	38.263	32	7.393	67	1.933
-2	36.328	33	7.088	68	1.867
-1	34.501	34	6.797	69	1.804
0	32.891	35	6.519	70	1.743
1	31.147	36	6.255	71	1.685
2	29.608	37	6.002	72	1.629
3	28.153	38	5.761	73	1.575
4	26.778	39	5.532	74	1.523

Temperature(°C)	Resistance(k)		Temperature(°C)	Resistance(k)		Temperature(°C)	Resistance(k)
75	1.473		86	1.031		98	0.713
76	1.425		87	0.999		99	0.692
77	1.378		88	0.968		100	0.669
78	1.334		89	0.939		101	0.652
79	1.291		90	0.91		102	0.633
80	1.25		91	0.882		103	0.615
81	1.21		92	0.855		104	0.597
82	1.171		93	0.83		105	0.58
83	1.134		94	0.805			
84	1.099		95	0.781			
85	1.064		96	0.757			
86	1.031		97	0.735			

9. Trouble Shooting

Error Code Table

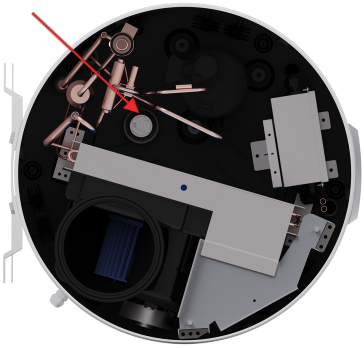
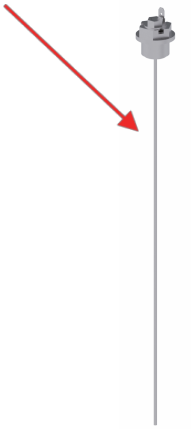
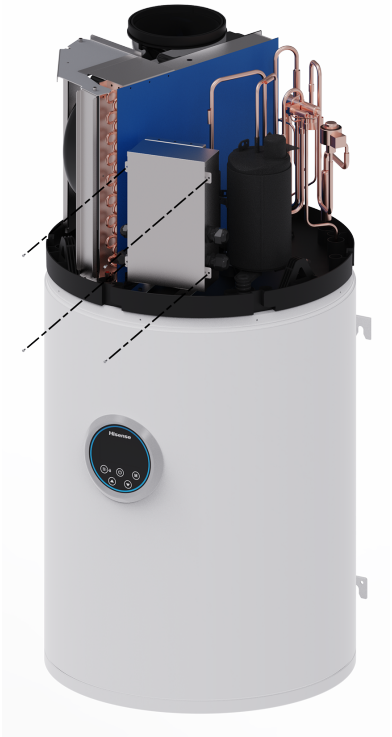
When the unit has the following trouble, the 7-segment tube of the display board will show the error code as the following, and system will light the alarm indicator. Error code and water temperature display in turn.

Code	Description	The root cause maybe one of the following
Er01	Coil temperature sensor fault (Check connections or replace sensor)	a. The coil temperature sensor connect loose; b. The coil temperature sensor is failure; c. The driver board is failure.
Er02	Exhaust temperature sensor fault (Verify sensor placement or system airflow)	a. The exhaust temperature sensor connect loose; b. The exhaust temperature sensor is failure; c. The driver board is failure.
Er14	Ambient temperature sensor in trouble	a. The ambient temperature sensor connect loose; b. The ambient temperature sensor is failure; c. The main control board is failure.
Er20	Fan motor run abnormally	a. The connection of the fan motor is loose; b. There are something block the fan; c. The fan motor is failure; d. The driver board is failure.
Er21	Compressor overload protection	a. The compressor exhaust temperature sensor connect loose b. The refrigerant of the unit is not enough.
Er50	Communication failure between the main control and display board	a. The connection between the display board and control board is loose; b. The power of the display board is failure c. The display board or main control board is failure.
Er51	Suction temperature sensor in trouble	a. The suction temperature sensor connect loose; b. The suction temperature sensor is failure; c. The driver board is failure.
Er52	Both the ambient temperature sensor and coil temperature sensor are faulty	a. The coil temperature sensor and ambient temperature sensor connect loose; b. The coil temperature sensor and ambient temperature sensor is failure; c. The driver board and main control board is failure.
Er53	The temperature sensor in upper water tank and lower water tank both in trouble	a. The temperature sensor connect loose simultaneously; b. The temperature sensor is failure simultaneously; c. The main control board is failure.
Er59	The water level switch protection	a. The water level switch fails; b. The connection of the water level switch is loose; c. The condensate pipeline is blocked.
Er60	Protection against leakage	a. The leakage protection device fails; b. The connection of the Leakage protection device is loose; c. The measured value of leakage current exceeds the limit.
Er61	Upper water temperature sensor failure	a. The temperature sensor connect loose; b. The temperature sensor is failure; c. The main control board is failure.
Er62	Lower water temperature sensor failure	a. The temperature sensor connect loose; b. The temperature sensor is failure; c. The main control board is failure.

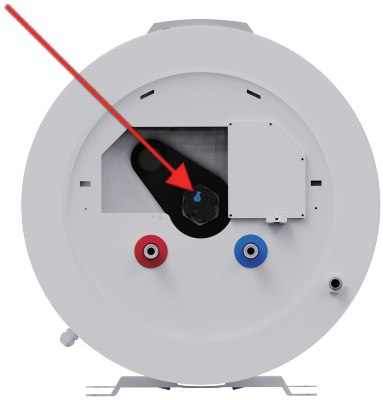
10. Disassembly Guidelines

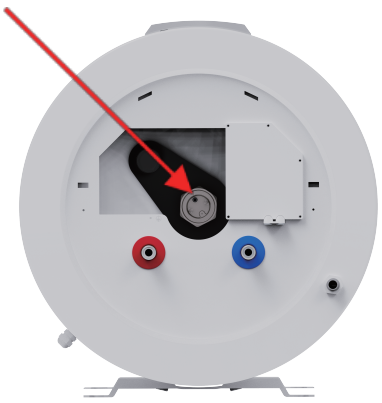
Before disassembling, please disconnect the power supply. If you need to replace electronic anode rod and electric heating tube, please first drain the water from the water heater.

Step	Picture	Introduce
1. *Remove the top panel air duct and the top panel.*		Remove the top panel air duct, loosen the two screws on the top panel, and remove the top panel.
2. *Remove the upper cover*		Loosen the screw as shown in thediagram, rotate the upper cover and lift it up.

3. *Replace the electronic anode rod.*	Protective cover  Electronic anode rod 	Take the protective cover from above, and replace the electronic anode rod.
4. *Remove the cover of the electrical box*		loosen the screw as shown in the diagram and remove the cover of the electrical box,

5. *Maintain the control board*	Electrical control board 	After removing the cover of the electrical box, the control board can be maintained.

6. Remove the maintenance cover		Loosen the screw as shown in thediagram, and remove the maintenance cover.
7. Remove the thermostat	Thermostat 	Remove the thermostat.

8. Replace the electric heating tube.	Electric heating tube 	Replace the electric heating tube.