BEXIE GROUP

Installation and Operation Instructions

Air Source Heat Pump Water Heater

KR20/200DN5W-D8

KR20/200DN5WSC-D8

KR20/250DN5W-D8

KR20/250DN5WSC-D8

KR20/300DN5W-D8

KR20/300DN5WSC-D8

Thanks for choosing our product.

Please read the installation instructions before installation of the appliance.

Please read the operation instructions before commissioning the appliance.

Please observe the safety instructions in the operating manual.

Dear Users,

We sincerely thank you for choosing our air source heat pump water heater. Please note that only the fourth part of this manual can be operated by users, the rest must be done by servicemen, otherwise it will affect the appliance normal usage and performance.

Before you install and use this product, please read this manual carefully, since it will be great helpful for installation and operation and to avoid damage or accident caused by incorrect usage. Thanks in advance for your cooperation.

The information is subject to change without prior notice.

● **Warning**

1. This water heater contains R290 which is a propane based flammable natural refrigerant.
2. If the supply cord is damaged, it must be replaced by qualified servicemen, service agent or similarly qualified persons in order to avoid hazard.
3. This appliance is not intended for use by the persons who(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. Do not let children play the appliance.
4. In order to avoid a hazard due to inadvertent resetting of the thermal cut-out, this appliance 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. The appliance's installation and maintenance must be done by servicemen, users cannot install and maintain by themselves.
6. When the environment temperature is below 0℃, please drain the water out of all the pipes if the appliance is not working or there is no power supply.
7. Use water to clean the evaporator fins regularly, otherwise it will affect the appliance normal operation. Turn off the power when cleaning.
8. Do not use the appliance to heat groundwater, seawater and other hard water, otherwise it will affect the heat transfer performance and damage the heat exchanger, compressor, etc,The product water inlet temperature is not less 1℃.
9. The water may drip from the discharge pipe of the pressure-relief device and that this pipe must be left open to the atmosphere.
10. Details of type and rating of fuse refer to *Part3: Installation*.
11. The appliance shall be installed in accordance with national wiring regulations.
12. The pressure-relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked.
13. 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.
14. Children aged from 3 to 8 years are only allowed to operate the tap connected to the water heater. The pressure ranges of the water tank is 0.15MPa~1.0MPa. a discharge pipe connected to the pressure-relief device is to be installed in a continuously downward direction and in a frost-free environment； WARNING Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
15.The appliance shall be stored in a room without continuously operating ignition sources for example: open flames, an operating gas appliance or an operating electric heater.
do not pierce or burn. be aware that refrigerants may not contain an odour. compliance with national gas regulations shall be observed.
16.Keep ventilation openings clear of obstruction; servicing shall be performed only as recommended

by the manufacturer; unventilated area where the appliance using flammable refrigerants is installed shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard ; the appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation; the appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater). The appliance shall be stored so as to prevent mechanical damage from occurring. Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which
authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
– Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
17.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.
(1) Work procedure
Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.
(2) 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.
(3) 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. nonsparking, adequately sealed or intrinsically safe.
(4) 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.
(5) 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) 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.
(7) 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.
(8) 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 no live electrical components and wiring are exposed whiule charging, recovering or purging the system;that there is continuity of earth bonding. Repairs to sealed components DD.5.1 During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it isabsolutely 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.DD.5.2_ Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage
(9) 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.
(10) 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 ageing or continual vibration from sources such as compressors or fans.
(11) Detection of flammable refrigerants
Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. Leak detection methods The following leak detection methods are deemed acceptable for systems containing flammable refrigerants.Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate

percentage of gas (25 % maximum) is confirmed.Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.If a leak is suspected, all naked flames shall be removed/extinguished.If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

(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 pipework are to take place.

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

DD.12 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

- **ATTENTION**

The damages caused by the above operations are not served under warranty.

Contents

Part 1. The Characteristics and Working Principles

Air source heat pump water heater is one of the most advanced water heater appliances with high energy efficiency. The operational principle of heating is to absorb heat from the air based on the changing state of the refrigerant in the refrigerant system, and then release heat into the water so the storage water temperature increases, so as to supply the hot water.

This product is suitable for domestic, enterprises and institutions, service business and other industries, providing hot water for shower and washing.

■ **Characteristics**

High-Efficiency, Energy-Saving

This product consumes little electric power. It absorbs a large number of free thermal energy from the air with high heat-collecting efficiency and low operational cost. Compared with the traditional electric water heater, the air source heat pump water heater can save energy by 70% or above.

Environmental Friendly

This product consumes natural energy, with no air pollution, no smoke emission and no harmful gas emission. It is zero-pollution and absolutely environmental friendly.

Safe and Reliable

This product operation separates the water and the electricity, excluding any potential safety problems of explosion, combustion, electric shock, poisoning, etc.

Convenient-To-Use

This product has the electricity-assistant heating function, so it is not influenced by cloudy, rainy or snowy weather, no matter day or night.

Intelligent Control

This product has micro-computer unit to control, easy to operate and with automatic memory function when power supply interrupts. It does not need the guarding of a special person. Besides, the electricity-assistant function is also with anti-dry heating and anti-overheating protection.

Stand Wear and Tear

The core component compressor is high-quality with strong reliable performance and long service life.

Compatible with photovoltaic inverter

This product can be connected to photovoltaic inverter, make full use of any overproduction of electricity for free.

This product can use MODBUS protocol. Please see the annex for detailed protocol information.

■ **Working Principles**

1. Working Principles of Air Source Heat Pump Water Heater

The compressor draws refrigerant vapor which is low temperature and low pressure from evaporator and significantly increases the pressure and temperature of vapor. Then the refrigerant will exchange heat with water in the water tank and become liquid state. The water keeps absorbing the heat and the temperature is rising. The high pressure liquid will go through the throttling device to significantly reduce pressure and temperature. Finally the fan draws air through the evaporator and the cold liquid refrigerant absorbs heat from air to become vapor again. The refrigerant will continuously run the above way so as to heat water.

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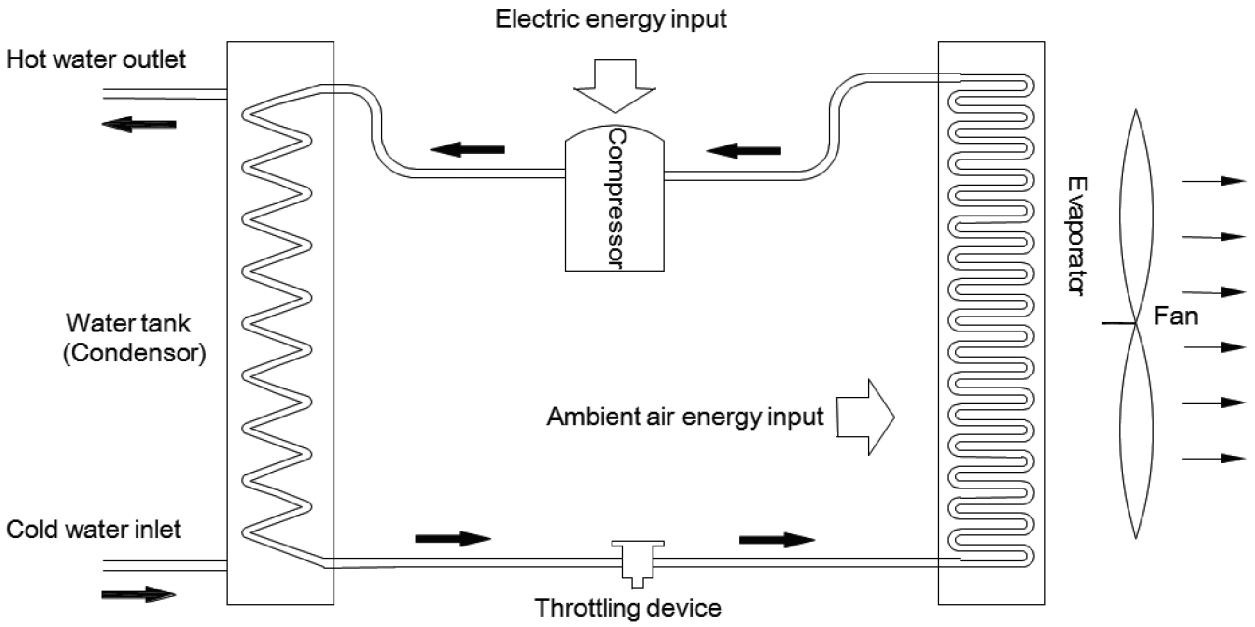

Fig.1 Working principles of air source heat pump water heater

2. Working Principles of Electricity-Assistant Heating

Electric heating tube transfers the electric energy into the thermal energy, from which water will absorb constantly and the temperature rises. When the temperature reaches the setting temperature, the temperature control devices (which is on the PCB board) will shut off power supply automatically, then the electric heating tube stops working. If dry-heating or over-heating phenomenon occurs, the protection device non-self-resetting thermal cut-out will shut off immediately for protection.

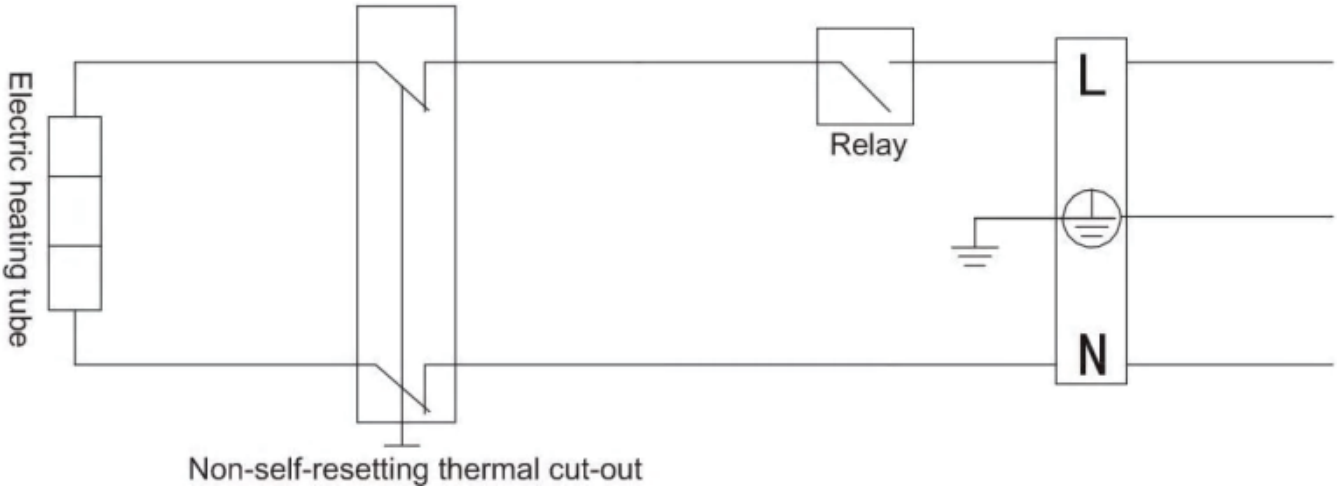

Fig.2 Working principles of electricity-assistant heating

Part 2: Cautions of Using

- Make sure to install Y filter at the water inlet during installation.
- Remove the plug of condensed water outlet and keep it unblocked before using the air source heat pump water heater.
- When finished installation, please check again that the water tank is filled with water before supplying power.
- Before using the appliance, make sure that one PPR connecting pipe which no shorter than 1.5 m has been installed to the water inlet.

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■ **Please check if the following accessories are supplied.**

Accessories Name	QTY	Pic. (Just for reference)	Descriptions
User Manual	1		Please use this part during the installation and using.
Safety Valve	1		Please use this part during the installation.
Photovoltaic Inverter Connecting Cable	1		Please use to connect inverters.
Drainage pipe	1		Connect to drainage connector
Drainage connector	1		Connect to drainage port on the appliance
485 Communication Cable	1		Please use to connect to MODBUS

Note: If the accessories list updates as products improve, there will be no further notice. So please refer to the actual accessories list.

■ **Power Supply Requirement**

● Wiring work should be carried out by official qualified electrician, and all works should follow the national electrical appliance safety requirements.

● The supplying wires for the appliance must have ground wire, which should be connected to the reliable outside ground wire. Besides, the outside ground wire must be effective.

● It must provide the power in line with the rated parameters.

● According to the national requirements for electric appliance, there should be an earth leakage protector for the appliance.

● The appliance should be installed in accordance with national wiring regulations.

● When connecting to the power supply, there should be a minimum 3.5 mm contact separation all-pole circuit breaker.

● If the power plug is broken, to avoid electric shock, it must be replaced by the manufacturer, the maintenance department or other professionals. During the replacement, the neutral wire and the live wire should be corresponded with the neutral wire terminal (N) and the live wire terminal (L), make sure that the connection is reliable.

● Note: It is not allowed to disconnect or take apart the ground wire of power supply under any circumstances. It is prevented to use damaged wires and switches and it should be replaced immediately once it is damaged.

■ **Safety Instruction**

● The appliance is designed to offer hot water to the users, only applied to the described usage.

● Do not use or store gasoline or other flammable, explosive gases or liquids near the appliance, otherwise it may cause dangers.

● For your personal and other people's safety, please do not put anything near the air outlet or air inlet vents of the appliance.

● Children are not allowable to play with the appliance in order to avoid dangers.

● Please turn off the power when doing repair and maintenance in order to avoid accidents.

● Please observe the relevant environmental regulations when using and reusing refrigerant. Do not allow refrigerant to be discharged near flames, power or sparks. Use the refrigerant R290a. It is flammable refrigerant so care must be taken when working on the system. Because it's a natural refrigerant it does does not have a destructive impact on the ozone layer

● Before working on parts of the refrigerant circuit, remove the refrigerant to ensure work safety.

Use R290a for maintenance purposes. It contains propane so no smoking around the system during

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service and repair.

● Install the safe care to the water inlet and outlet.

■ To Change the Installation Site

● If you need to change the installation site, please contact your dealer or the local customer service department.

Part 3: Installation

■ Basic Installation Tools and Materials Needed

Name	QTY	Usage
Pipe wrench	2 pcs	To connect the water pipes.
Straight screwdriver, Phillips screwdriver	1 pc per each	To disassemble the housing cover and connect wires.
Wire scissor or stripper	1 pc	To trim thread and strip wire.
Ball valve	1 pc	To connect the tank inlet water pipes.
Water pipe, Flexible joint	Depend on the actual need	Choose PPR pipes or PAP pipes.
Hot water pipe, Insulation material	Depend on the length of the hot water pipe	To insulate.

■ Dimensions

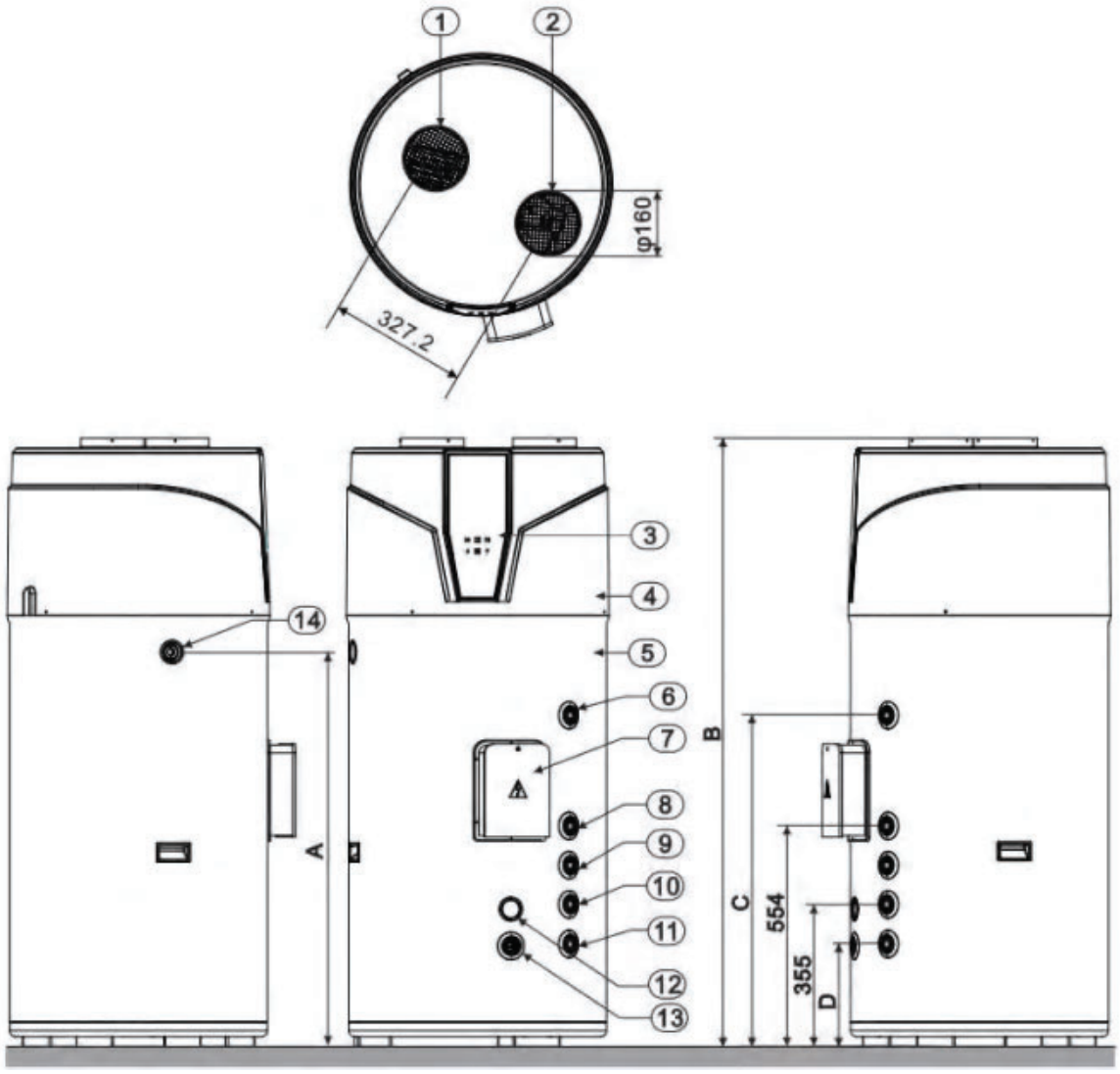

Fig.3.1 Appliance layout and dimensions(KR20/200DN5W-D8, KR20/200DN5WSC-D8)

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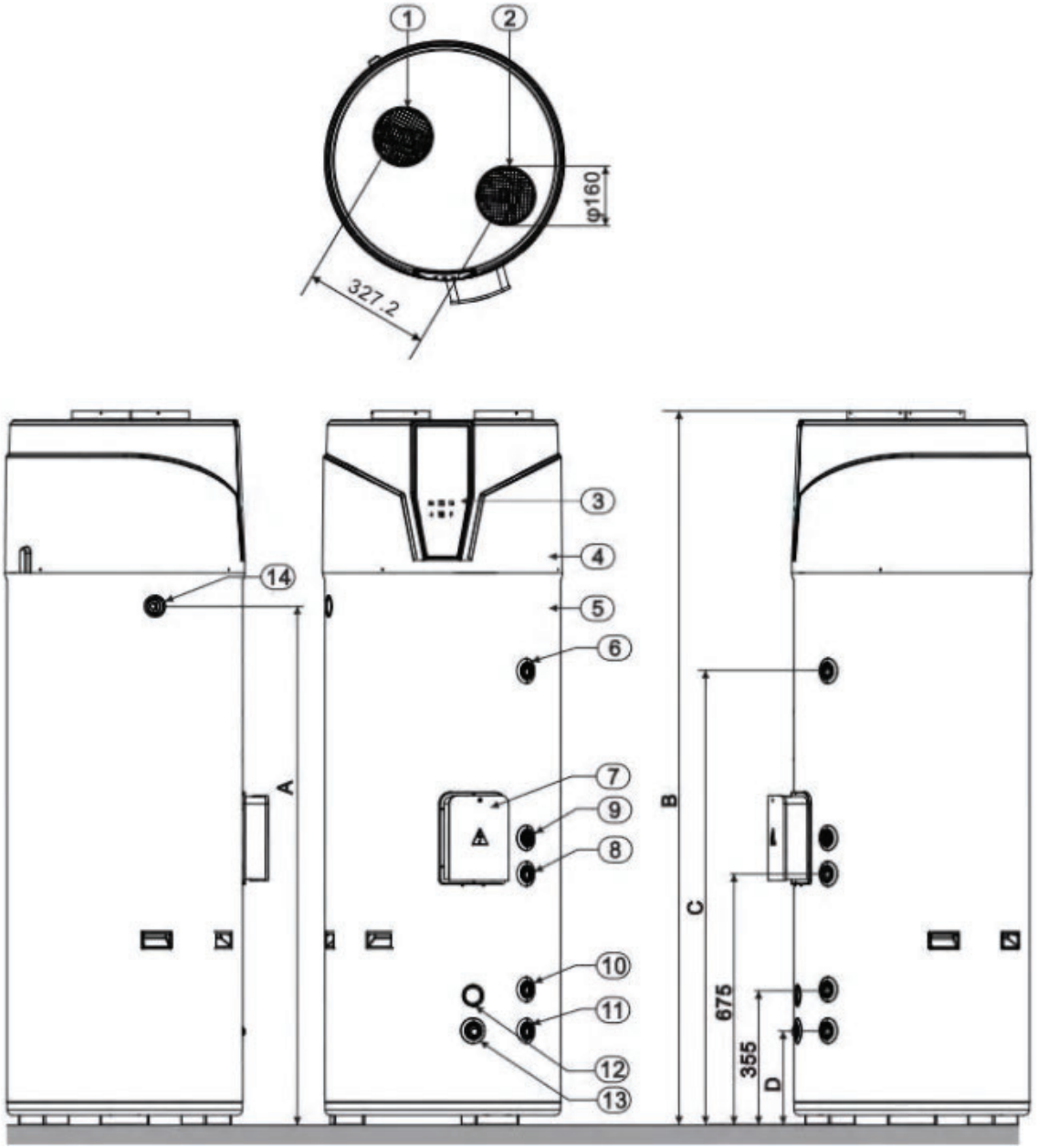

Fig.3.2 Appliance layout and dimensions
(KR20/250DN5W-D8, KR20/250DN5WSC-D8, KR20/300DN5W-D8, KR20/300DN5WSC-D8)

Part names:

1. Air outlet – ϕ 160mm 2. Air inlet – ϕ 160mm 3. Control panel 4. Housing cover 5. Water tank – 300 litre/250 litre /200 litre 6. Hot water outlet –G 3/4" F 7. Electrical box (containing non-self-resetting thermal cut-out, electric heating element and electronic anode) 8. Solar energy inlet –G 3/4" F (Without KR20/200DN5W-D8, KR20/250DN5W-D8 and KR20/300DN5W-D8)	9. Recirculation mouth- G 3/4" F 10. Solar energy outlet –G 3/4" F (Without KR20/200DN5W-D8, KR20/250DN5W-D8 and KR20/300DN5W-D8) 11. Cold water inlet –G 3/4" F 12. Magnesium rod 13. Sewage water outlet –G 3/4" F 14. Condensate outlet –G 1/2" F

A	KR20/200DN5W-D8	990mm
	KR20/200DN5WSC-D8	990mm
	KR20/250DN5W-D8	1220mm
	KR20/250DN5WSC-D8	1220mm
	KR20/300DN5W-D8	1430mm
	KR20/300DN5WSC-D8	1430mm
B	KR20/200DN5W-D8	1530mm
	KR20/200DN5WSC-D8	1530mm
	KR20/250DN5W-D8	1770mm
	KR20/250DN5WSC-D8	1770mm
	KR20/300DN5W-D8	1970mm
	KR20/300DN5WSC-D8	1970mm
C	KR20/200DN5W-D8	836mm
	KR20/200DN5WSC-D8	836mm
	KR20/250DN5W-D8	1043mm
	KR20/250DN5WSC-D8	1043mm
	KR20/300DN5W-D8	1250mm
	KR20/300DN5WSC-D8	1250mm
D	KR20/200DN5W-D8	255mm
	KR20/200DN5WSC-D8	255mm
	KR20/250DN5W-D8	255mm
	KR20/250DN5WSC-D8	255mm
	KR20/300DN5W-D8	255mm
	KR20/300DN5WSC-D8	255mm

Note: All the pictures in this manual are for explanation purpose only. They may be slightly different from the appliance you purchased (depend on model). The actual appearance shall prevail.

■ Installation Instructions

1. Appliance Moving

● This appliance is quite heavy so that it requires two or more people to move and install, or it may cause in personal injury or other accidents.

● Please transfer the appliance as its delivery status, do not disassemble it by yourself.

● In order to avoid scratches and deformation on the surface, please add protection board over the surface of the appliance where may contact hard objects directly.

● Be careful not to touch the fan with your hand or other objects.

● Do not transfer the appliance with inclination over 45°. Do not lay the appliance flat on the floor.

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2. Selection and fixation of Installation position

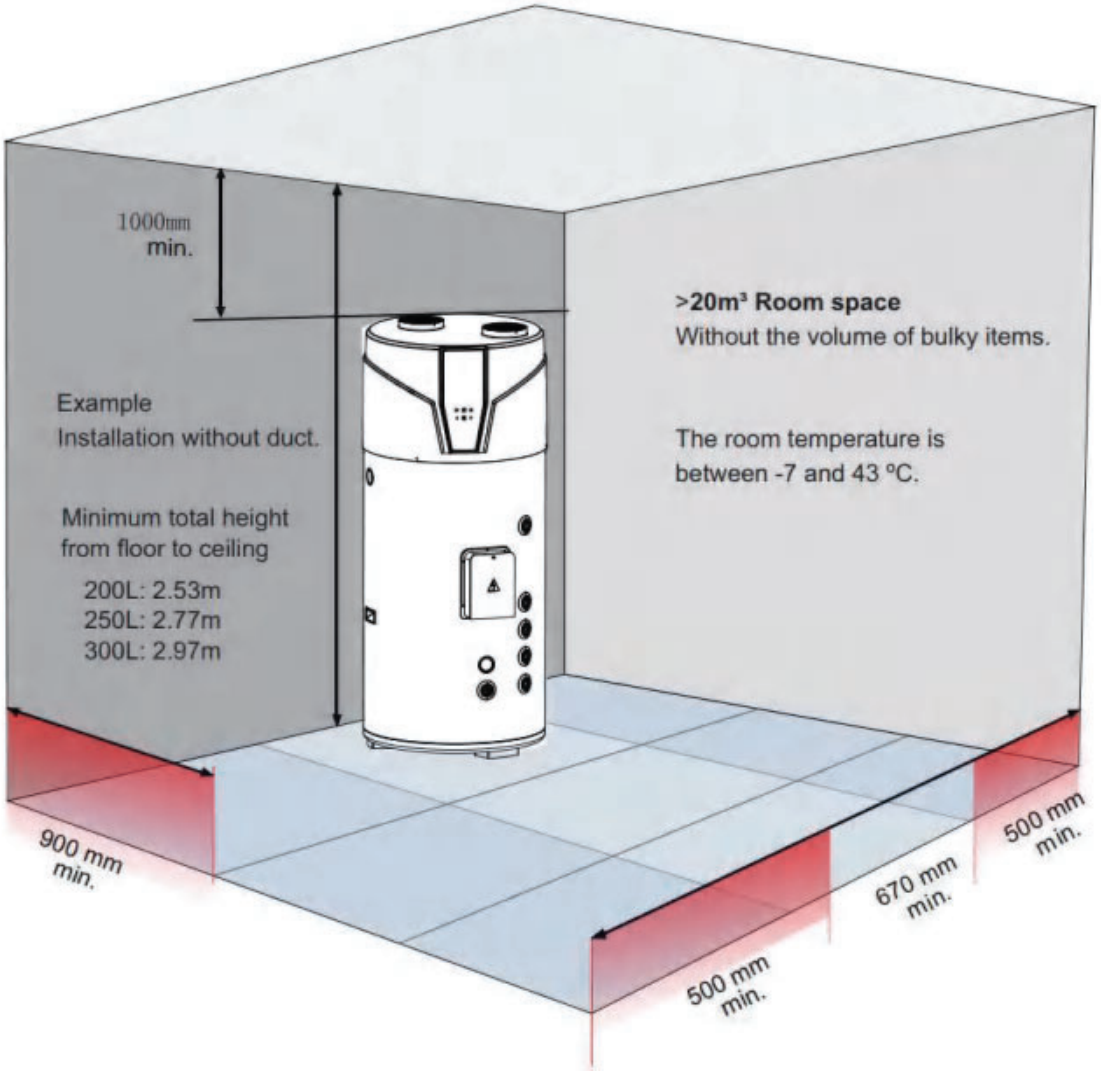

Fig.4 Recommended installation and maintenance space

● The appliance should be installed indoor. It is not allowed to install the appliance outdoor or in the humid places.

● If the appliance is installed in the place vulnerable to rain, it is essential to take the necessary water-resistant measures to prevent rain entering into the internal components, otherwise the components may be eroded easily and cause physical danger.

● The appliance must be installed on a solid wall. In order to drain condensate water from evaporate smoothly, the inclination angle to the floor should no more than 5°.

● Select a place where there has good ventilation and the air outlet should avoid facing the wind direction. There should be no obstacles at the air inlet and air outlet.

● Select a place where water pipes and electric power can be easily connected.

● Select a place where water drained out of the relief valve will not splash on the wood floor or furniture.

● Reserve space for installation and maintenance shown as Fig.4.

3. Air Duct Connection

The appliance is designed to connect duct that can provide additional practical function as described below. For the case of the appliance connected with duct, the diameter of the duct must ⩾ 160 mm. The total length, typically using flexible plastic duct, should not exceed the maximum length of

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6m.

Upon connect duct, portion airflow will lose, which will lead to capacity decreased in the system.

● **Example 1.**

The appliance installed in garage/outhouse can refresh air. Inlet air from internal duct, outlet air ducted to outdoor. Total length≤6m.

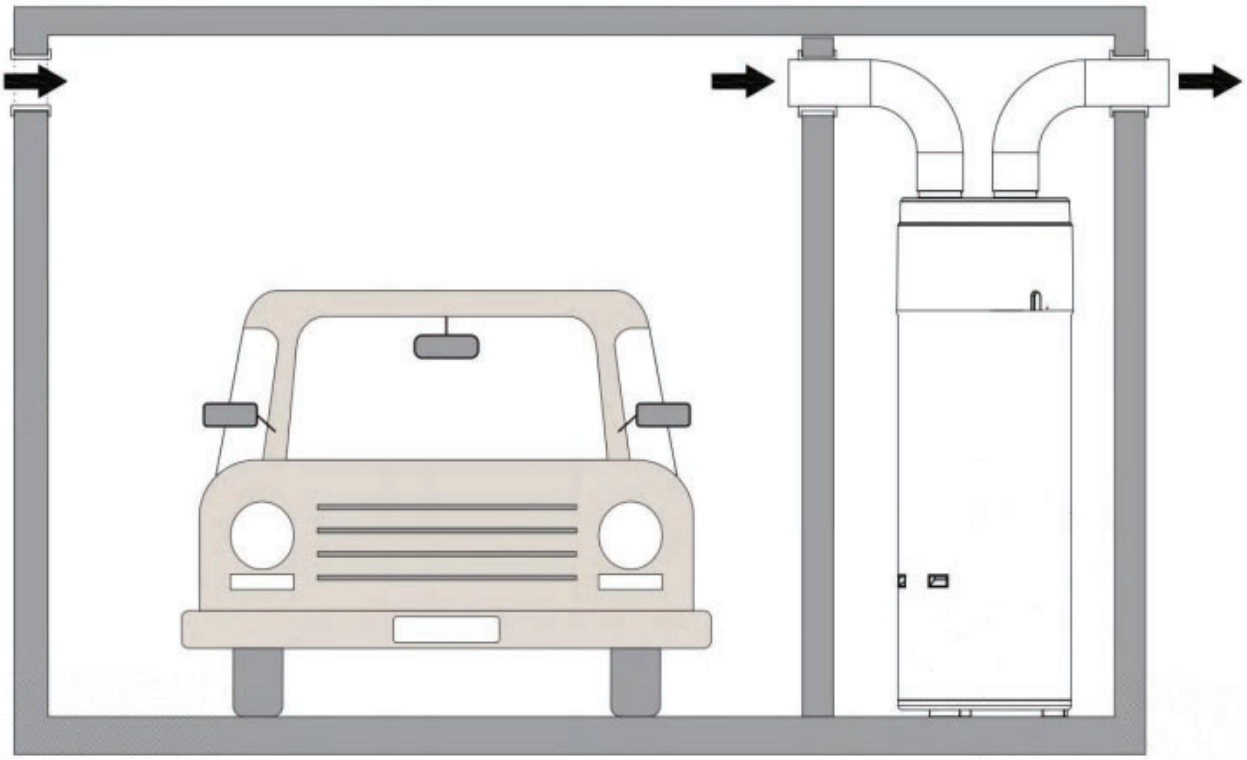

Fig.5.1

● **Example 2.**

The appliance installed in utility room can dehumidify air and dry clothes effectively. Inlet air from room without duct, outlet air ducted to outdoor. Air outlet duct length≤6m.

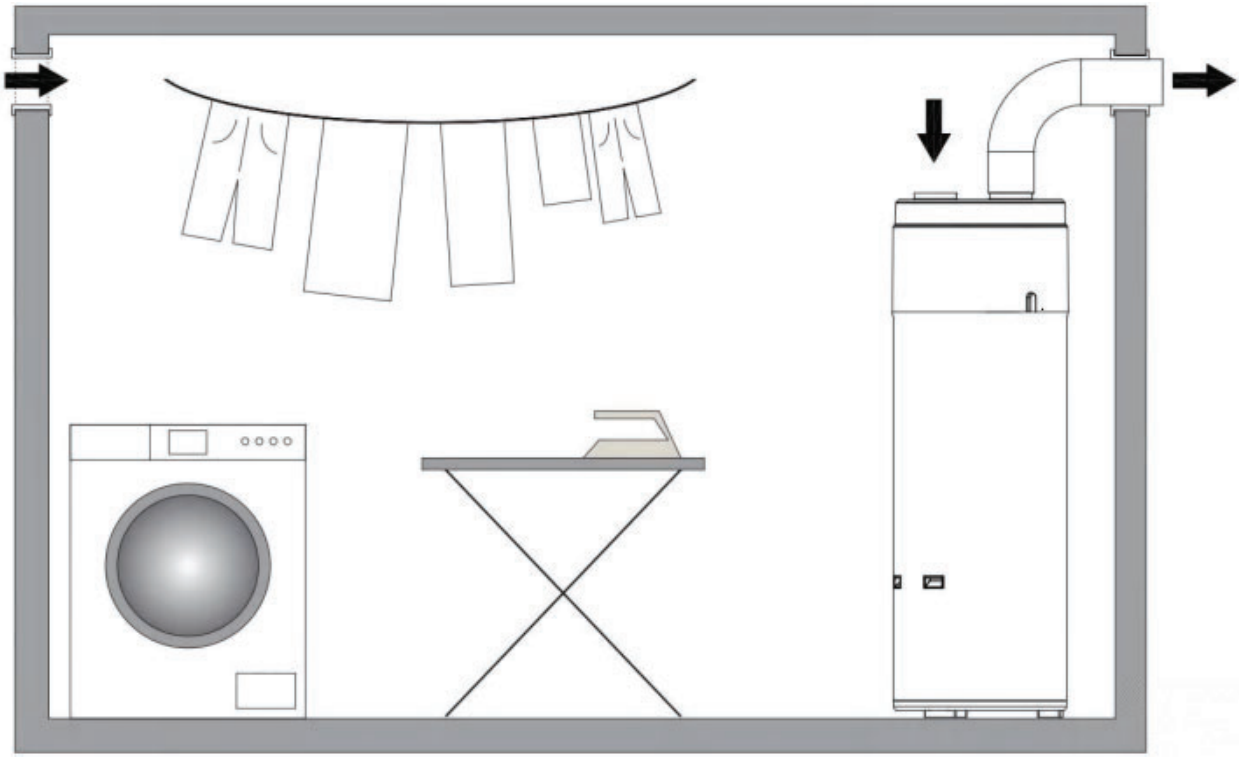

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Fig.5.2

● **Example 3.**

The appliance installed in balcony or semi-enclosed space can charge cool and fresh air into room. Inlet air from outdoor without duct, outlet air ducted to room. Air outlet duct length≤6m.

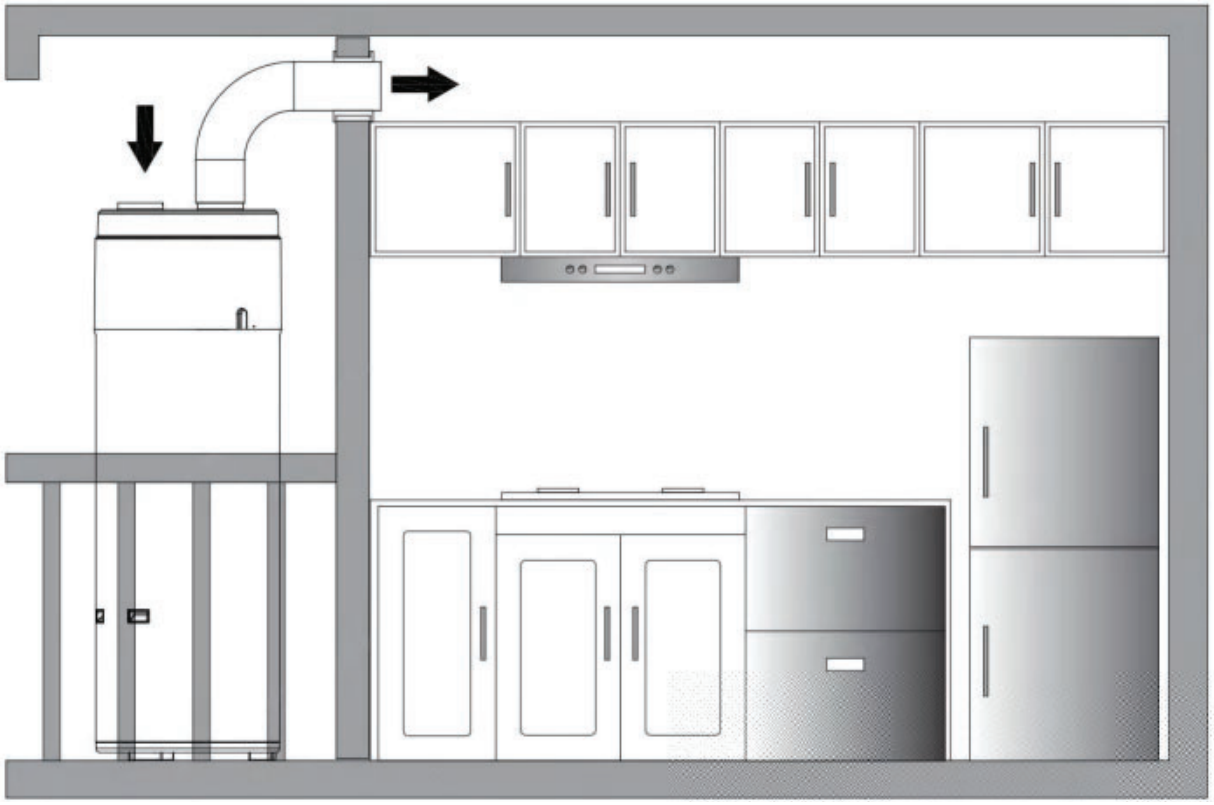

Fig.5.3

4. Installation/Usage Requirements (Please refer to the installation diagrams)

● The appliance should be placed vertical and stable. The water pipes, water filter, and one-way safety valve should be installed in accordance with the national standards.

● Water filling: Turn on the water outlet and water inlet valve. When there is water comes out of the outlet means the water tank is full. You can switch on the heater after that.

●The water quality should meet the following standards:

Item	Limitation	Item	Limitation
PH	6.5 to 8.5	Manganese	< 5 mg / L
Total Hardness	< 150 mg / L	Chlorides	< 250 mg / L
TDS (Total Dissolved Solids)	< 500 mg / L	Iron	< 0.5 mg / L
Calcium	< 10 mg / L	Sodium	< 100 mg / L

● If you remove the sediment dirt of the inner water tank regularly, it will improve the working efficiency. Sewerage/drainage method: turn off the power and inlet water valve, open one of the water outlet and sewage valve, and then the sewage and sediment will come out. Turn off the sewage valve until discharge of the water finishes.

5. Pipeline System Connection

The appliance has an internal indirect coil that is available for connection to an external water heating system where applicable, such as a solar energy system as shown below.

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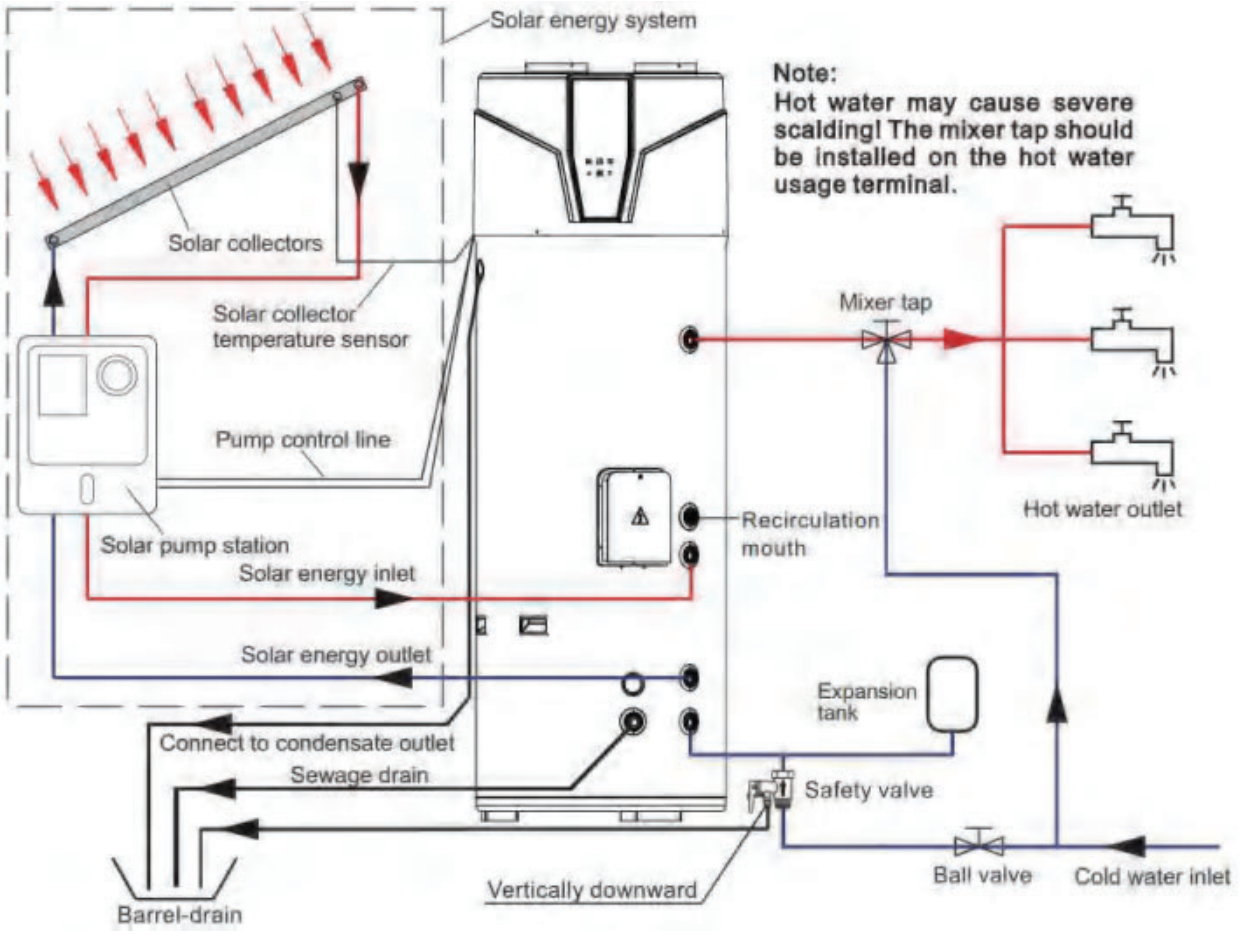

Fig.6 Pipeline system connection

1. During the installation of the product, the safety valve in the attachment should be installed in the waterway, otherwise the product may be abnormal during use;
2. The user can install the expansion tank in the appropriate position according to the installation habits and waterway characteristics. The recommended selection reference of the expansion tank is as follows:

Note: According to the user's waterway volume and pipe length, the selected expansion tank model may need to be adjusted, based on actual needs.

type of product	expansion tank	Expansion tank withstand
KR20/200DN5W-D8	12L	0.8
KR20/200DN5WSC-D8	12L	0.8
KR20/250DN5W-D8	15L	0.8
KR20/250DN5WSC-D8	15L	0.8
KR20/300DN5W-D8	18L	0.8
KR20/300DN5WSC-D8	18L	0.8

ATTENTION

● Do not use iron pipe to install the appliance. The water pipeline system should adopt new pipes that can meet drinking water standards, such as CPVC/PPR pipe or PB. Please do not use smelly PVC pipe.

● Install the water pipes, connectors and other parts according to above figure. If the installation environment is under 0℃, all pipes should be with insulation treatment.

● Please keep the condensate water outlet and safety valve outlet clean and unblocked.

●Condensing pipe should be able to drain water smoothly, condensing pipe must be installed from high to low, without turning upward.

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6. Pipeline Connection Instructions

(1) Installation requirements of water inlet pipes

Screw thread is 3/4" BSP F. The lifetime of pipes and pipe components cannot be shorter than the lifetime of the appliance, and they should be able to withstand high temperature of 80℃, so as to avoid damage.

(2) Installation requirements of safety valve connection pipes

Screw thread of inlet side is 3/4'' BSP M and the outlet side is 3/4'' BSP F. Make sure the water can flow out of the safety valve and the drainage outlet should be installed straight downwards. After finishing installation, please make sure that drainage hose connected to the safety valve's drainage outlet should be maintain downward and stay open to the frost-free environment.

(3) The pressure ranges of the water tank is 0.15MPa~1.0MPa. If the water inlet pressure is always lower than 0.15MPa and in order to get higher water flow to meet water consumption requirement, you need to add a booster pump at the water inlet so as to keep the water pressure no lower than 0.15MPa; if the water inlet pressure is always higher than 0.5MPa, you need to add a reducing valve of 0.5MPa at water inlet pipe so as to make sure the safety use of the tank.

(4) Connecting the condensate discharge pipe

a. Observe the locally applicable rules and regulations on condensate discharge.

b. Connect the drainage connector with the product condensate drain port

c. Assemble one end of the condensate drain pipe with the drainage connector

d. Connect the other end with the atmosphere to the floor drain pipe to ensure that the entire condensate drain pipe is smooth and there is no foreign matter blocked in the pipe.

e. The condensate pipe is tilted downward, do not have any knots.

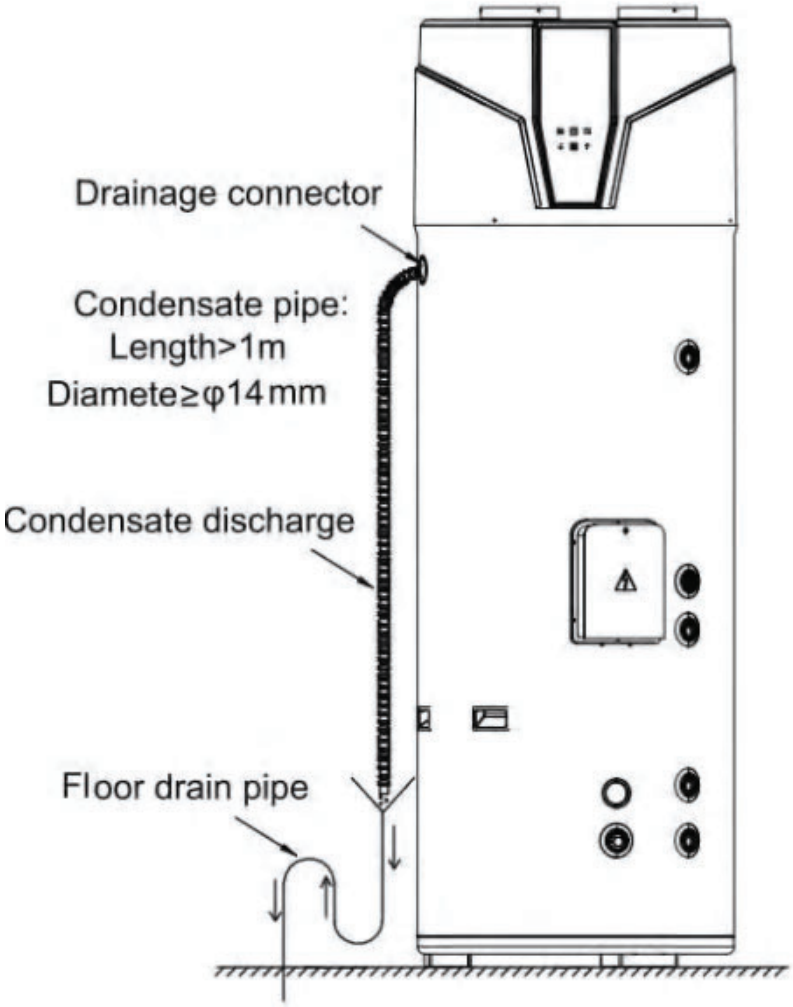

Fig.7 Connection of condensate drainage pipe

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7. Electrical Wiring

● This appliance should use specified power cord, which should be required as below. The voltage of power should be suitable with the rated voltage requirement.

● The power supply circuit should have ground wire, which should be connected with outside ground effectively.

● Wiring connection must be done by professional technical person and operate strictly according to the electrical diagram.

●Set up earth leakage protection according to the relevant national electrical equipment standards.

●Install all-pole circuit breaker with minimum 3 mm contact separation.

●Double check the electrical circuit before connecting to the power supply.

●Do not disconnect or disassemble the ground wire, or use broken cables and switches under any circumstances. If you find out any breakage, the power cord must be replaced as soon as possible.

(1) Earth Leakage Protection

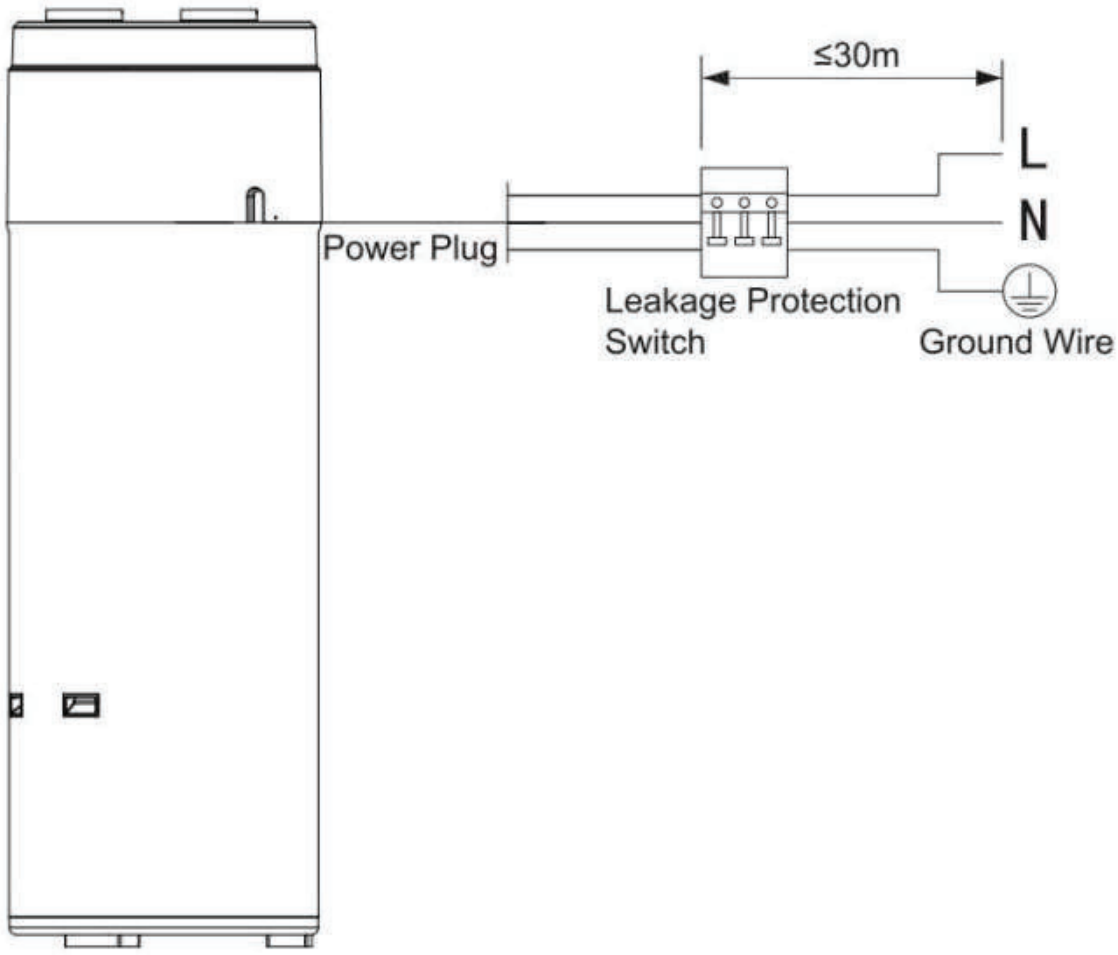

Fig.8 Earth leakage protection

(2) Power Specifications

Power	Power Cord Diameter (mm2)		Manual Switch (A)		Earth Leakage Protection
	Neutral Wire/Live Wire (Length≤30m)	Ground Wire	Capacity	Fuse	
220-240VAC~ 50Hz	≥1.5	≥1.5	20	15	30mA Below 0.1 sec

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8. Photovoltaic Function Connection

This appliance provides the function to use the energy from photovoltaic system as option. Users can choose to use this function if a photovoltaic system is installed.

The photovoltaic function is activated when an on/off signal is established between the two wires of the photovoltaic inverter cable. This function can make full use of any overproduction of electricity and it increases the water temperature until it reaches the heat pump default temperature 65℃.

Connection instructions are as follows:

(1) Remove screws from the housing cover and lift up the housing cover.

(2) Separate the connecting plugs between main control board and display, and then remove the housing cover.

(3) Remove screws from electric control box cover and remove the cover of electric control box.

(4) One end of the photovoltaic inverter connecting cable is inserted in the reserved position of the main control board, the other end is connected to the photovoltaic inverter. And then install back the electric control box cover.

(5) Connect back the plugs between main control board and display, install back the housing cover.

(6) After the line is connected, the value of special parameter S8 needs to be adjusted to "1" to enable photovoltaic function. See the instructions for related operations. The display will indicate "H4" when this function is enabled.

9. Commissioning

(1) Before commissioning

- The appliance should be installed and completed correctly.
- Piping and wiring should be correct.
- Power supply voltage should match with the rated voltage.
- Drainage should work smoothly.
- The insulation should be complete.
- The ground wire should be properly connected.
- There should not be any obstacles at the air inlet and air outlet orifices.
- Make sure the water tank is filled with water.

(2) Operation with power

- Make sure all the control switches are normal as well as all function buttons are good.
- Observe if hot water system works properly and the temperature of outlet water is normal or not.
- When the safety valve is working, please check if it can drain out water successfully.
- There is no any abnormal vibration or sound during the appliance operation.

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10. Wiring Diagram

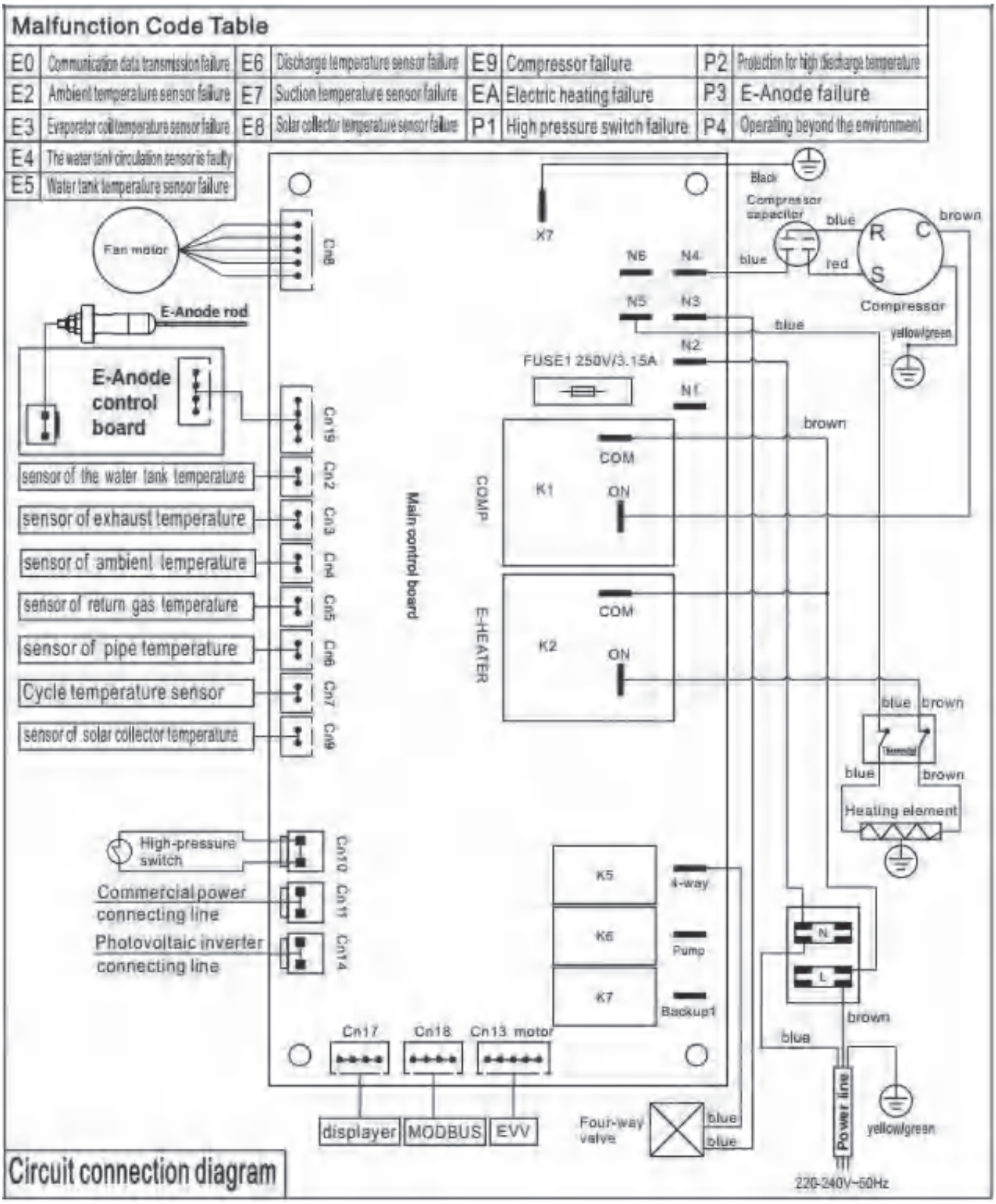

Fig.9 Series Wiring diagram

Type and rating of fuse: cartridge fuse-link, 3.15AL250V.

ATTENTION

This diagram is for reference only. When the content of the above diagram differs from that on the appliance, please refer to the electrical diagram in the electric control box of the appliance.

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■ Technical Parameters

Model		KR20/200DN5W-D8 、KR20/200DN5WSC-D8	
Operational mode		Heat pump, Automatic and Boost mode	
Power supply		220-240V~ 50Hz	
Max. power input (under boost mode)		2180W	
Max. current input (under boost mode)		9.5A	
Heat pump	Max. power input	680W	
	Refrigerant	R290/150g	
	Declared load profile	L	
	Heating up time(2/1℃)	9:21 (h:min)	
	Heating up time(7/6℃)	7:05 (h:min)	
	Heating up time(14/13℃)	6:05 (h:min)	
	COP_{DHW}(2/1℃)	2.678	
	COP_{DHW}(7/6℃)	3.244	
	COP_{DHW}(14/13℃)	3.663	
	Energy efficiency(2/1℃)	110.9%	
	Energy efficiency(7/6℃)	134.5%	
	Energy efficiency(14/13℃)	152.3%	
	Energy efficiency class(7/6℃)	A^+	
	Mixed water at 40℃(7/6℃)	251.4L	
	Max. outlet water temp.	65℃ (default 52℃)	
	Operating temp. range	-7℃～43℃	
Electric heating	Rated power input	1500W	
	Max. outlet water temp.	75℃	
Max. operating pressure for refrigerant circuit (discharge side/suction side)		2.8MPa/0.6MPa	
Storage tank	Rated capacity	200L	
	Max. operating Pressure	1.0MPa	
	Water inlet/outlet	DN20	
	Solar energy inlet/outlet	DN20	
Anti-electric shock class		Class I	
Sound power level		52dB (A)	
Net weight(kg)		100	110
Dimensions(mm)		Φ662*1530	

Note (1): Product installation conditions :DB/WB:20℃/15℃;
Heat source working conditions :
DB/ WB: 2℃/1℃; DB/ WB: 7℃/6℃;DB/ WB: 14℃/13℃.
(2):Inlet water temperature of 10 ℃, outlet water temperature of 52 ℃, according to EN 16147:2017, (EU) NO 814-2013.
(3): Sound power level tested with air duct, according to EN 12102-1-2017, ISO 3744:2010.

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Model		KR20/250DN5W-D8、KR20/250DN5WSC-D8	
Operational mode		Heat pump, Automatic and Boost mode	
Power supply		220-240V~ 50Hz	
Max. power input (under boost mode)		2180W	
Max. current input (under boost mode)		9.5A	
Heat pump	Max. power input	680W	
	Refrigerant	R290/150g	
	Declared load profile	L	
	Heating up time(2/1℃)	11:03 (h:min)	
	Heating up time(7/6℃)	9:44 (h:min)	
	Heating up time(14/13℃)	7:35 (h:min)	
	COP_{DHW}(2/1℃)	3.009	
	COP_{DHW}(7/6℃)	3.272	
	COP_{DHW}(14/13℃)	3.774	
	Energy efficiency(2/1℃)	125.0%	
	Energy efficiency(7/6℃)	135.9%	
	Energy efficiency(14/13℃)	157.2%	
	Energy efficiency class(7/6℃)	A^+	
	Mixed water at 40℃(7/6℃)	250L	
	Max. outlet water temp.	65℃ (default 52℃)	
	Operating temp. range	-7℃～43℃	
Electric heating	Rated power input	1500W	
	Max. outlet water temp.	75℃	
Max. operating pressure for refrigerant circuit (discharge side/suction side)		2.8MPa/0.6MPa	
Storage tank	Rated capacity	250L	
	Max. operating Pressure	1.0MPa	
	Water inlet/outlet	DN20	
	Solar energy inlet/outlet	DN20	
Anti-electric shock class		Class I	
Sound power level		52dB (A)	
Net weight(kg)		111	126
Dimensions(mm)		Φ662*1770	

Note (1): Product installation conditions :DB/WB:20℃/15℃;
Heat source working conditions :
DB/ WB: 2℃/1℃; DB/ WB: 7℃/6℃;DB/ WB: 14℃/13℃.
(2):Inlet water temperature of 10 ℃, outlet water temperature of 52 ℃, according to EN 16147:2017, (EU) NO 814-2013.
(3): Sound power level tested with air duct, according to EN 12102-1-2017, ISO 3744:2010.

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Model		KR20/300DN5W-D8、KR20/300DN5WSC-D8	
Operational mode		Heat pump, Automatic and Boost mode	
Power supply		220-240V~ 50Hz	
Max. power input (under boost mode)		2180W	
Max. current input (under boost mode)		9.5A	
Heat pump	Max. power input	680W	
	Refrigerant	R290/150g	
	Declared load profile	XL	
	Heating up time(2/1℃)	13:58 (h:min)	
	Heating up time(7/6℃)	10:43 (h:min)	
	Heating up time(14/13℃)	9:14 (h:min)	
	COP_{DHW}(2/1℃)	3.156	
	COP_{DHW}(7/6℃)	3.485	
	COP_{DHW}(14/13℃)	3.926	
	Energy efficiency(2/1℃)	129.2%	
	Energy efficiency(7/6℃)	142.7%	
	Energy efficiency(14/13℃)	160.9%	
	Energy efficiency class(7/6℃)	A^+	
	Mixed water at 40℃(7/6℃)	129L	
	Max. outlet water temp.	65℃ (default 52℃)	
	Operating temp. range	-7℃～43℃	
Electric heating	Rated power input	1500W	
	Max. outlet water temp.	75℃	
Max. operating pressure for refrigerant circuit (discharge side/suction side)		2.8MPa/0.6MPa	
Storage tank	Rated capacity	300L	
	Max. operating Pressure	1.0MPa	
	Water inlet/outlet	DN20	
	Solar energy inlet/outlet	DN20	
Anti-electric shock class		Class I	
Sound power level		52dB (A)	
Net weight(kg)		121	136
Dimensions(mm)		Φ662*1970	

Note (1): Product installation conditions :DB/WB:20℃/15℃;
Heat source working conditions :
DB/ WB: 2℃/1℃; DB/ WB: 7℃/6℃;DB/ WB: 14℃/13℃.
(2):Inlet water temperature of 10 ℃, outlet water temperature of 52 ℃, according to EN 16147:2017, (EU) NO 814-2013.
(3): Sound power level tested with air duct, according to EN 12102-1-2017, ISO 3744:2010.

ATTENTION

The parameters in the above table are only for reference. When the contents of this table differ from those of the nameplate on the appliance, please refer to the nameplate.

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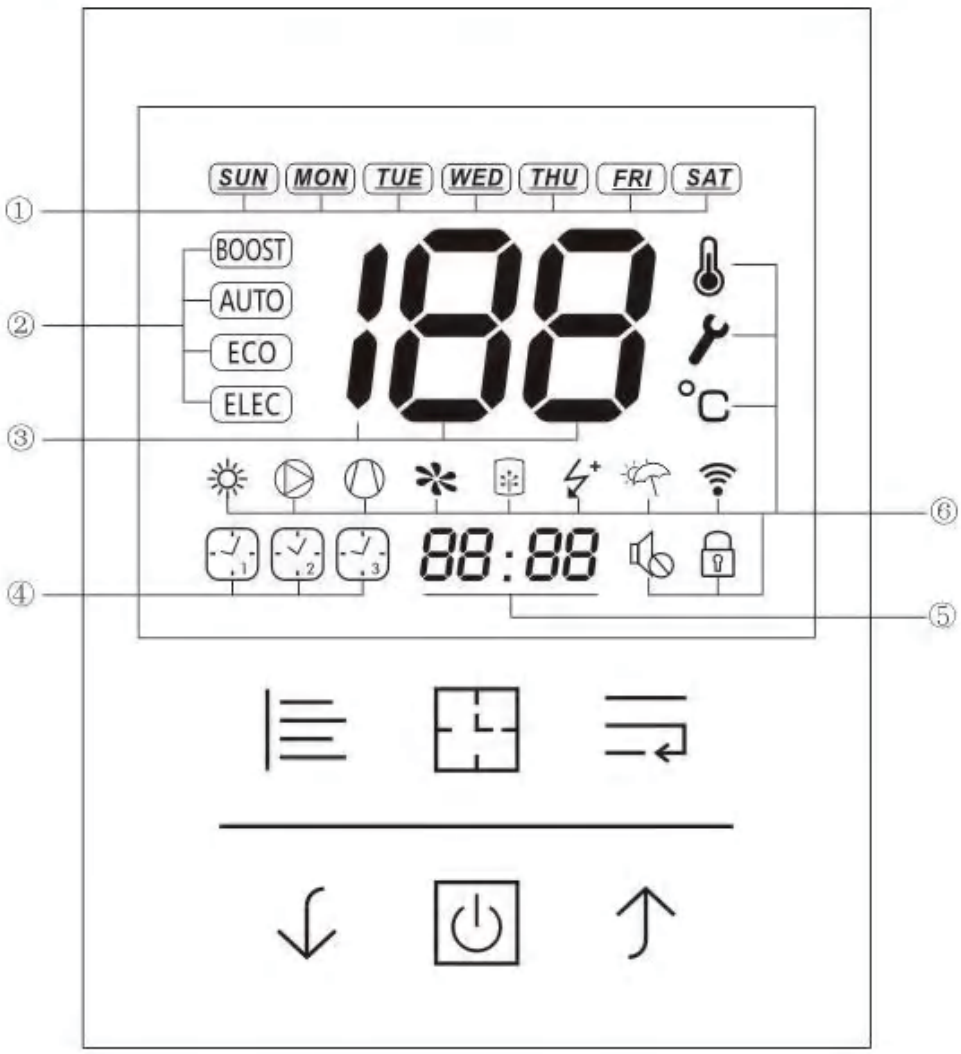
Part 4: Operation instructions of control panel

■ Displays and buttons



1. Display icon illustration

① Week area

SUN:	Sunday icon	Light up means actual week
MON:	Monday icon	Light up means actual week
TUE:	Tuesday icon	Light up means actual week
WED:	Wednesday icon	Light up means actual week
THU:	Thursday icon	Light up means actual week
FRI:	Friday icon	Light up means actual week
SAT:	Saturday icon	Light up means actual week

② Working mode area

BOOST:	Boost mode icon	Light up means product is under boost mode.
AUTO:	Automatic mode icon	Light up means product is under automatic mode.
ECO	Heat pump mode icon	Light up means product is under heat pump mode.
ELEC:	Assistance icon	Light up means product is under electric heater mode

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③ Temperature area

When heat pump is running, it displays actual tank water temperature.

When set desired water temperature, it displays the desired water temperature.

When there is faulty, it displays error code.

When heat pump running in special cycle, it displays special cycle code.

④ Timer area

When the timer is turned on, the timer icon will light up, or else it will turn off.

⑤ Time area

When heat pump is running, it displays actual time.

When setting time, it displays target time.

⑥ Special icon area

Temperature icon	Light up means the temperature area is display tank water temperature
Service icon	Light up means there is faulty on the system
Temperature measurement icon	Light up means the measurement of temperature
Photovoltaic icon	Light up means the photovoltaic cycle is activated Light flash means the photovoltaic cycle is running
Water pump icon	Light up means the water pump cycle is activated Light flash means the water pump cycle is running
Compressor icon	Light up means the compressor is running
Fan icon	Light up means the fan is running
Electronic anode icon	Light up means the electronic anode is working
Electric heater icon	Light up means the electric heater is running
Holiday icon	Light up means the holiday function is activated
Wi-Fi icon	Light up means Wi-Fi is connected
Silent icon	Light up means the unit is under silent function
Lock icon	Light up means the buttons are locked

2. Operation button illustration

Set mode button	To set mode, parameters, functions
Timer button	To set or turn on/off timer
Functions button	To Set parameters and functions
Add/ reduce button	To add or reduce number, or scroll down/up
Switch on/off button	To switch on/off heat pump

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■ Operation instruction

1. To switch on/off heat pump

From home page, press button to switch on/off heat pump.

When heat pump is running, temperature area displays actual tank water temperature, time area displays actual time, mode area displays operation mode.

When heat pump is standby, temperature area displays actual tank water temperature, time area displays “stby”.

2. To set desired water temperature

When heat pump is running, press or to enter water temperature setting page.

Then press or to change setting.

Waiting for 10s or press to save setting and return to home page.

3. To set operation mode

When heat pump is running, from home page， press button to set working mode.

There are four modes which are **BOOST ,AUTO, ECO,ELEC**.

Boost mode: Heating water by the heat pump and electric heater will heat at the same time, temperature range 28℃-75℃.

Auto mode: Water temperature can be set from 28-75°C. By default, the unit heats water under heat pump mode. When water temp. reaches 60°C, electric heater activates and heat pump mode exits. User can also adjust electric heater activation temperature by changing the "SG" parameter (range: 28-60°C).

Eco mode: Only heating water by the heat pump, temperature range 28℃-65℃.

Elec mode: Only heating water by the electric, temperature range 28℃-75℃.

First power on defaults to ECO mode, The key sequence is **ECO-ELEC -BOOST-AUTO**.

4. To set timer on/off

The buttons on the control panel which is used for set timer on for heat pump.

User can program up to three different timers to schedule heating. When a timer is active, the unit will operate in Auto mode. During the scheduled "ON" to "OFF" period, the unit will automatically reheat the water if the temperature drops before the period ends to maintain the set temperature.

Note: By default, timer1 is from 05:00 to 08:00, timer2 is from 10:00 to 14:00, and timer3 is from 17:00 to 21:00.

Setting the Timers:

Timer 1: Under standby status long Press → → The "ON" icon will display, Press or button to change the start time → Press → The "OF" icon will display, press or button to change the end time → Press → 188 temperature area flashing, Press or button to change the target temperature for this timer.

Note: Press and hold to save and active timer1, user can also Press briefly and move to the Timer 2 setup.Appointment period 2: next appointment period 1.

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Timer 2: Press → → The "ON" icon will display, Press or button to change the start time → Press → The "OF" icon will display, press or button to change the end time → Press → temperature area flashing, Press or button to change the target temperature for this timer.

Note: Press and hold to save and active timer1 and timer2, user can also Press briefly and move to the Timer 3 setup.

Timer 3: Press → → The "ON" icon will display, Press or button to change the start time → Press → The "OF" icon will display, press or button to change the end time → Press → temperature area flashing, Press or button to change the target temperature for this timer. → Press , 3 timers setting completed, return to home page.

Cancel appointment function: Press and hold enter appointment settings, press and hold once more, all appointment periods can be cancelled.

Note: During the appointment setting process, if the confirm button is not pressed and no buttons are operated for 30 seconds, the screen will enter the power saving display and automatically exit the appointment setting. The appointment parameters set will not be recorded.

5. To set time and week

1) To set time

When the appliance is running, from home page, press button to enter time setting page, hour start flash, press or button to adjust hour setting.

Then press button, minutes start flash, press or button to adjust minutes setting.

Then press button to confirm and switch to week page.

2) To set week

Then press button ,When enter week page , week start flashing, press or button to adjust week setting , Then press button to confirm and return to home page.

6. Lock/unlock buttons

When the control panel is locked, icon light up, press for 3s to unlock, icon will light off.

When the control panel is unlocked, icon light off, press for 3s to lock, icon will light up.

Without any operation for 3 minutes, the buttons will lock automatically, icon will light up.

7. Sleep and wake up of the screen

When the unit is switched off and there is no faulty on the system, without any press in 60s, the screen will sleep.

Press any button or there is any faulty on the system, it will wake up.

8. Speaker

When switch on the power, the speaker will make noise.

When short press button the speaker will make noise.

When there is faulty on the system the speaker will not make noise.

9. Special cycle

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1) Anti-legionella cycle

When the anti-legionella function is activated, it show **H1** on in the temperature display zone (always bright), clock zone shows current temperature of water tank.

After connected with power, to prevent bacteria from growing in the water in the tank, if the water temperature is not up to 70℃ in a certain period(168h), it will be heated to 70℃ once.

Note: Anti-legionella cycle can be activated or deactivated on control panel, default is deactivated, refer to configuring parameters table.

2) Anti-freeze cycle

When the anti-freeze function is activated, it show **H2** on in the temperature display zone (always bright), clock zone shows current temperature of water tank.

If detect ambient air≤5℃ when heat pump is standby, heat pump will heating automatically to keep tank water between 20℃-28℃.

Note: Anti-freeze cycle can be activated or deactivated on control panel, default is activated, refer to configuring parameters table.

3) Photovoltaic cycle

When the photovoltaic function is activated, icon will turn on. When heat pump is running with photovoltaic power, icon flash and it show **H4** on in the temperature display zone (always bright), clock zone shows current temperature of water tank.

When the system signal of the photovoltaic inverter and water temperature in the tank is less than 60℃, heat pump will heat up water until 65℃.

Note: Photovoltaic cycle can be activated or deactivated on control panel, default is deactivated, refer to configuring parameters table.

4) E-Anode function

When the E-Anode function is activated, icon will turn on. The appliance is equipped with a magnesium anode, the E-Anode (impressed current anode) is optional.

Note: E-Anode function can be activated or deactivated on control panel, default is activated, refer to configuring parameters table. This function is optional.

5) Holiday function

When the holiday function is activated, icon will turn on. from home page, long press button, temperature area start flashing, press or button to setting Vacation days. Continue to press button key to confirms and return to home page.

If you want to exit the settings : long press button, temperature area start flashing, again long press button to confirm and return to home page.

Note: During the holiday mode function, ensure that the Anti-freeze and E-Anode anode functions are normal.

6) Solar pump circulation cycle

When the solar pump circulation function is activated, icon will turn on. When the solar pump is running icon will flash.

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When Solar collector temperature≥30℃, and solar collector temperature≥tank water temperature +7℃， Water tank temperature is less than 60℃， start the solar pump.

Regular shutdown conditions (any one of them met will result in immediate shutdown)： When Solar collector temperature＜30℃， or solar collector temperature≥120℃， or solar collector temperature ≤tank water temperature +4℃， Or Water tank temperature ≥ 60℃， stop the solar pump.

Continuously detect solar collector temperature and tank water temperature.

High-temperature protection mechanism：

When the collector temperature is ≥ 100℃:

- Break the conventional shutdown conditions and force a restart
- Continue operation until the temperature ≤ 95℃

Status indication：

▶ Icon remains on: The cycle function is activated and ready for use.

▶ Icon flashes: The pump is in operation.

▶ Icon goes off: The system is turned off.

Note: Solar pump circulation cycle can be activated or deactivated on control panel, **default is deactivated**, refer to configuring parameters table. This function is optional.

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Wi-Fi connection and operation instruction

When Wi-Fi function is activated， icon will turned on.

Note: Wi-Fi function can be activated or deactivated on control panel, **default is activated**, refer to configuring parameters table. This function is optional.

1. APP installation and connect to the appliance

1.1 Download and install “Tuya smart” APP from Google Play Store or IOS APP Store (Fig4.1).

Fig.4.1

1.2 Smart phone connect to Wi-Fi.
1.3 Energize the appliance and keep on standby status.
1.4 Open Tuya APP, then click **Add device** (Fig4.2) to scan for appliance automatically. Press **Go to add** (Fig4.3) after find the appliance. And then press **Done** (Fig4.4) to complete the connection.

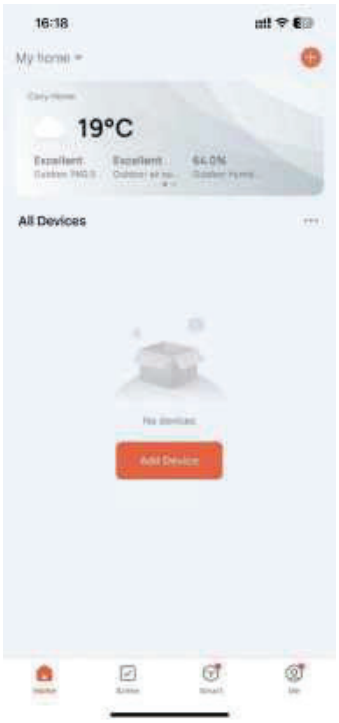

Fig4.2

Fig4.3

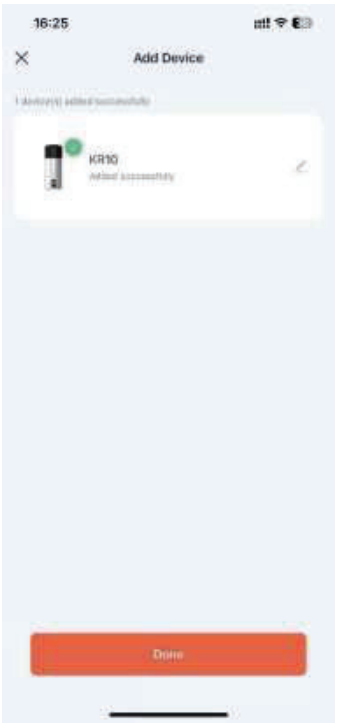

Fig4.4

1.5 If the APP cannot find any appliance. Click **Scan** (Fig4.5) change to auto scan page. Scan the QR code below (Fig4.6)， Click **Add** (Fig4.7) change to Reset the device page,then follow the prompts on the app to complete the network distribution。

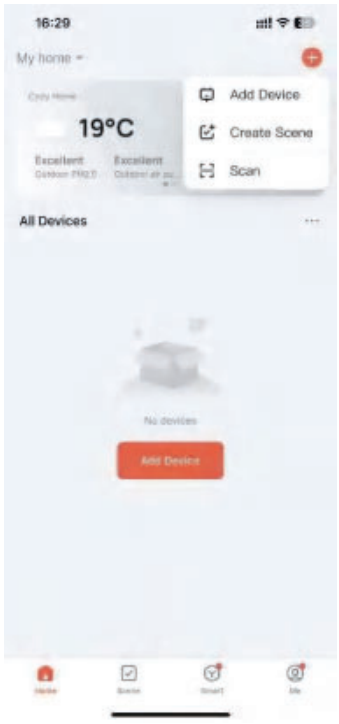

Fig4.5

Fig4.6

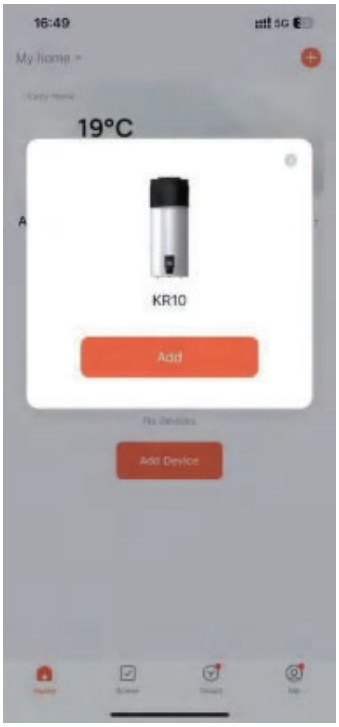

Fig4.7

2. APP operation.

2.1 Enter home page

After the appliance is connected to Wi-Fi, the appliance will be displayed on APP (Fig4.8).

Press the appliance icon to enter the home page (Fig4.9).

The home page is display the operation mode, current water temperature and desired water temperature set point.

2.2 Change the desired water temperature set point

Slide the **temperature bar** (Fig4.9) on home page to change the set point directly.

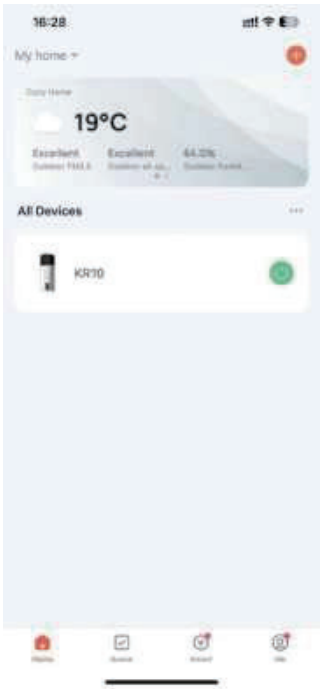

Fig4.8

Fig4.9

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2.3 Mode setting

Press **Mode** button to enter mode page (Fig4.10). There are four modes available, AUTO, BOOST, ECO, and ELEC. Press any mode button to activate that mode. E-heater start temp can only be set in AUTO mode.

2.4 Function settings

Press **Setting** button to enter function settings page (Fig4.11).The functions include Anti-legionella function, water cycle function, Solar pump function, Antifreeze function, Holiday function, Electronic anode, Unit switching .

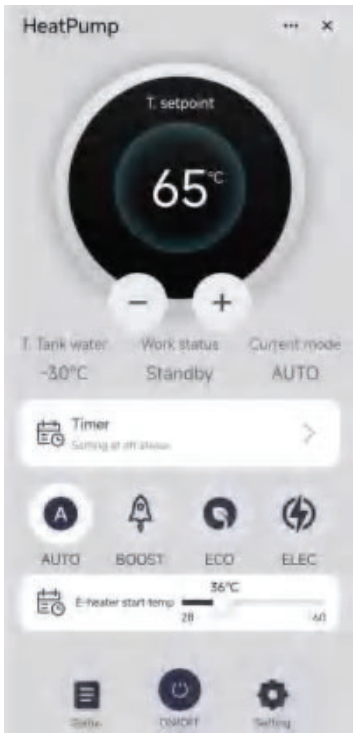

Fig4.10

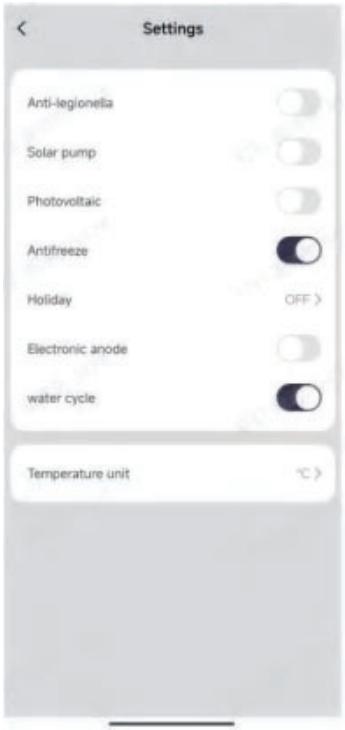

Fig4.11

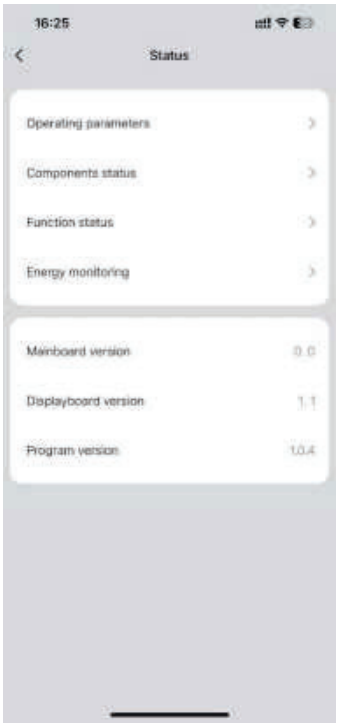

Fig4.12

2.5 Status.

Press **Status** button to enter Status page (Fig4.12). The query include Operating parameters, Components status, Function status , Energy monitoring , Mainboard version , Displayboard version, Program version.

2.6 Timer settings

Press **Timer settings** button to enter Timer settings page (Fig4.13) when the device is power off. There are three timers available .Turn on/off the timer by press the switch.

Press any timer to change time set (Fig4.14).

2.7 Fault page

If there is any fault on the appliance, it will be displayed on the home page (Fig4.15).

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Fig4.13

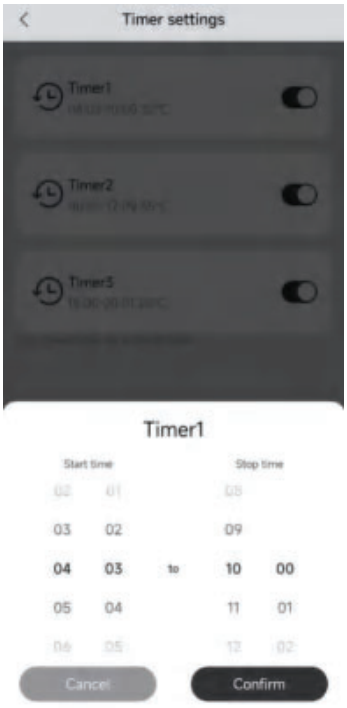

Fig4.14

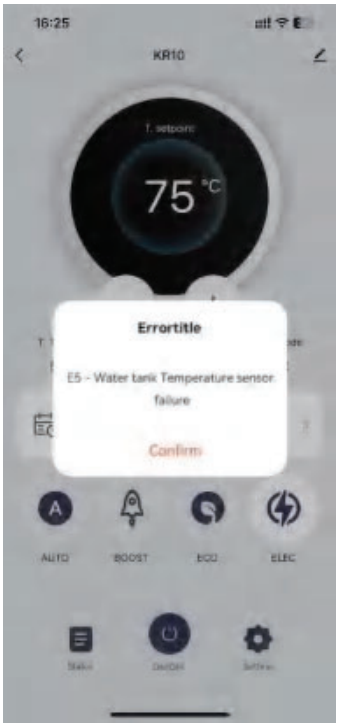

Fig4.15

■ **Parameters for reading out and configuring**

1. Reading out parameters

From home page, press button for 3s to enter parameters page.

Temperature area display parameter code, clock area display value.

Press or button to scroll down/up.

Press button or button or without any operation within 30 seconds, the system will return to the home page.

List of parameters refer to table below:

Parameter No	Description	Range	Remark
F0	Discharge temperature	0~130℃	Display "--" when faulty
F1	Ambient temperature	-30~100℃	Display "--" when faulty
F2	Evaporator coil temperature	-30~100℃	Display "--" when faulty
F3	Suction temperature	-30~100℃	Display "--" when faulty
F4	Open pulse of EEV		Display the opening
F5	Controller version No.		
F6	PCB version No.		
F7	Solar collector temperature	0~150℃	Display "--" when faulty
F8	Compressor current		Display "--" when faulty
F9	Fan speed		Display "--" when faulty
F10	Four way valve status		Display "--" when faulty

2. Configuring parameters

From home page, press and button at the same time for 3s to enter into parameter configuring page.

Temperature area display parameter code, clock area display value.

Press or button and adjust the data of special parameters.

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Press button for confirmation or scroll to next parameter.

Press button or button or without any operation within 30 seconds, the system will return to the home page.

List of parameters can be configured refer to table below:

Parameter No	Description	Range	Default
S0	Defrost exit temperature	5~30 ℃	20
S1	Defrost cycle	10~90 minutes	45
S2	Defrost operation time	5~18 minutes	10
S3	Correction for tank water temperature	-5~5 ℃	0
S4	Tank water temperature differential	2~12 ℃	5
S5	Defrost enter temperature	-10~5 ℃	-10
S6	Status of anti-freeze	0-deactivate,1-activate	1
S7	Status of anti-legionella	0-deactivate,1-activate	0
S8	Photovoltaic /SG access function	00： deactivate 01： PV activate 10： Smart Grid activate 11: Smart Grid+PV activate	0
S9	Tset for timer 1	40~75 ℃	50
SA	Tset for timer 2	40~75 ℃	65
Sb	Tset for timer 3	40~75 ℃	65
Sc	Status of solar pump	0-deactivate,1-activate	0
SE	Status of E-Anode	0-deactivate,1-activate	1
SF	Status of Wi-Fi	0-deactivate,1-activate	1
SG	E-heater activation temp	28~60 ℃	60
SH	Water recirculation	0-deactivate,1-activate	0
SL	Water recirculation temp.	20~50 ℃	40
Sn	Water recirculation temp. difference	2~12 ℃	5

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Part 5: Repair and Maintenance

When using the air source heat pump water heater, please check the operation state regularly. If it can provide long-term and effective maintenance, the appliance operation reliability and service span will be improved.

1. Clean the water filter regularly and make sure that the water within the system is clean, avoiding damages due to the blocking of water filter.
2. All safety protection devices have been set correctly and completely in the factory, so please do not adjust on yourself.
3. The appliance should be kept in clean and dry places with good ventilation so as to achieve good heat exchange. Please clean the filter regularly according to different extent of the environmental pollution.
4. To ensure the long-term work efficiency, it is recommended to drain the inner water out totally and clean one time every six months, remove accumulative sediment during the operation.
5. Please check regularly whether the power supply and the wiring of electrical system of the product are firm or not, whether the electrical components have any abnormal phenomenon or not. If there is any problem, please ask your local dealer or contact us to replace and repair the appliance.
6. Please check whether the safety valve of water system is working properly or not, so as not to affect the heating capacity and the reliability of the operation.
7. If you shut down the appliance for a long time, please remove the water in pipes system and the tank, then cut off the power and put a protection cover. Before re-operating the appliance, please conduct a comprehensive examination of the system first, fill with water and then restart the appliance.
8. Each appliance is equipped with an anode rod to protect the water tank from corrosion, but the anode rod will also be corroded slowly. The corrosion rate depends on the local water quality. We recommend that you check the anode rod once a year and change a new one if the anode rod runs out. Please contact the dealer or special technical center about detailed information.
9. To the regions where temperature is below 0℃, please be sure to insulate the water inlet and outlet pipes. If necessary, install pipe heating device to avoid pipes freezing.
10. When the appliance is breakdown and the user cannot solve the problem, please contact the local service center or dealer to send servicemen to repair the appliance promptly.

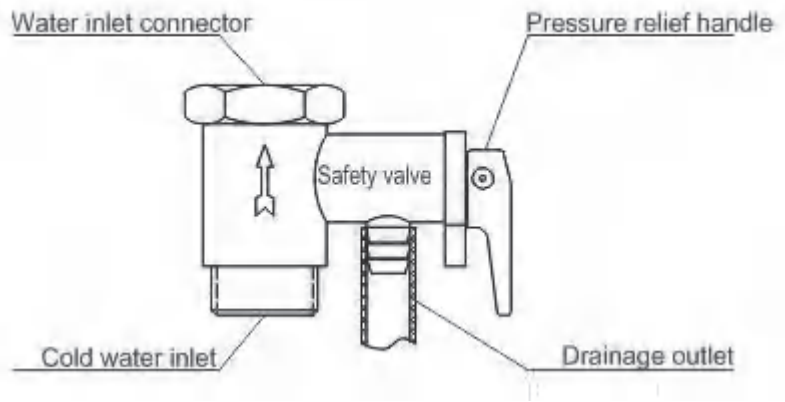

Fig.8 Safety valve

●The pressure relief handle of safety valve should be pulled once every six months to remove the deposit calcium and confirm the device is not clogged. Its outlet water temperature may be high, so be careful to avoid scalding.

●The water may drip from the discharge pipe of the pressure-relief device and that this pipe must be left open to the atmosphere.

● In case of that drainage hose freezes in winter, which causes accident, please handle the drainage hose with insulation protection.

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Part 6: Common Failures and Solutions

Table 1 Failure Code Table

Failure Code	Failure Name	Reason	Solution
P1	High pressure switch failure	1.High pressure switch is broken. 2. Refrigerant is too much. 3. There is non-condensable gas in the refrigerant system.	1.Replace the high pressure switch. 2. Eliminate excess refrigerant. 3. Eliminate non-condensable gas.
P2	Protection for high discharge temperature	1. Refrigerant is not enough. 2. There is non-condensable gas in the refrigerant system.	1.Increase the amount of refrigerant. 2.Eliminate non-condensable gas.
P3	E-Anode failure	1.Wire lose；	1.Connet the wire again；
P4	Operaling beyond the enbironment	Operaling beyond the enbironment	The ambient temperature meets the working requirements
E0	Communication data transmission failure	An open or short circuit between circuit board and display.	1. Fix the connection line. 2. Replace the connection line or display.
E2	Ambient Temperature sensor failure	1. The connecting wire of sensor is open circuit or short circuit； 2.The senor is broken；	1. Repair the wire. 2. Replace the sensor.
E3	Evaporator coil Temperature sensor failure	1. The connecting wire of sensor is open circuit or short circuit； 2.The senor is broken；	1. Repair the wire. 2. Replace the sensor.
E4	The water tank Circulation sensor is faulty	1. The connecting wire of sensor is open circuit or short circuit； 2.The senor is broken；	1. Repair the wire. 2. Replace the sensor.
E5	Water tank Temperature sensor failure	1. The connecting wire of sensor is open circuit or short circuit； 2.The senor is broken；	1. Repair the wire. 2. Replace the sensor.
E6	Discharge Temperature sensor failure	1. The connecting wire of sensor is open circuit or short circuit； 2.The senor is broken；	1. Repair the wire. 2. Replace the sensor.
E7	Suction temperature sensor failure	1. The connecting wire of sensor is open circuit or short circuit； 2.The senor is broken；	1. Repair the wire. 2. Replace the sensor.

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E8	Solar collector temperature sensor failure	1. The connecting wire of sensor is open circuit or short circuit; 2.The senor is broken;	1. Repair the wire. 2. Replace the sensor.
E9	Compressor malfunction	1.Damaged connecting wire; 2.Compressor damaged;	1. Repair the wire. 2.Replace the compressor.
EA	Electric heating failure	1.Damaged connecting wire; 2. Electric heater damaged;	1. Repair the wire. 2. Replace the electric heater.

Table 2 Common Failures

Failure Description	Reason	Solution
The appliance does not work.	1. Power failure. 2. Power cord is loose. 3. Control power fuse is broken.	1. Turn off the power switch and check the power. 2. Find out the problem and fix it. 3. Replace the fuse.
The appliance has low heating capacity.	1. Refrigerant is insufficient. 2. Water pipe's thermal insulation performance is poor. 3. Dry filter is clogging. 4. The heat exchanger with air has poor cooling.	1. Check if there is leakage and note the standard quantity of refrigerant. 2. Strengthen water system insulation function. 3. Replace the dry filter. 4. Clean heat exchanger with air.
The compressor does not work.	1. Power supply or the controller is broken. 2. The compressor's contactor fails. 3. The wire is loose. 4. The compressor's overheating protection works.	1. Find out the reason and solve it accordingly. 2. Replace the contractor. 3. Find out the loose point and fix it. 4. Identify the reason of overheating and then turn on the appliance after trouble shooting.
The compressor works noisily.	1. Internal components are damaged. 2. Frozen oil is not enough.	1. Replace the compressor. 2. Add enough frozen oil.
The fan does not work.	1. The capacitor is broken. 2. The screw is loose. 3. The motor is broken.	1. Replace the capacitor. 2. Tighten the screw. 3. Replace the motor.
The appliance does not produce heat, while the compressor is working.	1. Refrigerant spreads out totally. 2. The compressor is broken.	1. Check if there is leakage and fulfill the standard quantity of refrigerant. 2. Replace the compressor.
Discharge pressure is too high.	1. Refrigerant is too much. 2. Fluorine-way system contains non-condensable gas.	1. Expel excessive refrigerant. 2. Exclude non-condensable gas.
Suction pressure is too low.	1. Dry filter is blocked. 2. Refrigerant is too little.	1. Replace the dry filter. 2. Check if there is leakage and fix it.
Non-Unit Failure	1) There is water flow out of the drainage outlet of the safety valve: When producing hot water, the cold water within the appliance is heated and expands, so there is water flow out of the drainage outlet of the drain valve, which is normal case. However, if there is water extruding continuously, that means the safety valve loses efficacy. You should stop using the appliance and replace the safety valve as soon as possible. 2) The duration for heating a whole tank's water becomes longer:	

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	When the temperature is quite low in winter (e.g. 0℃), the heat pump's performance of producing hot water will not be as good as usual, so the duration for heating a whole tank's water becomes longer.

ATTENTION

If the appliance remains abnormal after you check as above, please contact the local service center or dealer to send servicemen to repair the appliance promptly. Try to avoid the fuse fusing or the leakage protector turning on and off back and forth.

Manual- reset thermostat operation guide:

First,disconnect the power supply of the heat pump product→Using a screwdriver to disassemble the electric box →The black reset button of the thermostat will protrude outward when it is protected →The black reset button of the thermostat can be pressed to reset→Assemble the electrical box again.

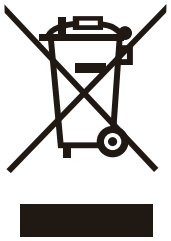
Thermostat black reset button

Part 7: After-Sales Service

Dear User:

We sincerely express our gratitude to you for using our brand products. Our company follows the target that "quality first, customer top". For the purpose of serving you the best in a long term, please fill the user information in the custom info card, and thanks for your cooperation. If some exceptional conditions happen to the air source heat pump water heater, please check and solve it according to “table 1 of malfunction code” and “table 2 of common malfunctions”. If you still cannot solve it, please contact our company's special maintenance center.

You can also directly contact the after-sales service center and inform us the following information:
(1) Product's name, model number and purchase date;
(2) Detailed information about the malfunction;
(3) Your contact information including address and name.

	Correct Disposal of this product
	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.

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