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AquaBoost

ENDHWDP100

ENDHWDP200X

ENDHWDP300X

Installation and Operating Manual

Domestic hot water heat pump

Smarte Energie. Für Alle.





Innovative, trustworthy, experienced

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Purpose

The expertise and enthusiasm for good ideas and solutions that drive our society forward in the field of energy transition are a powerful force behind ENVIRON..

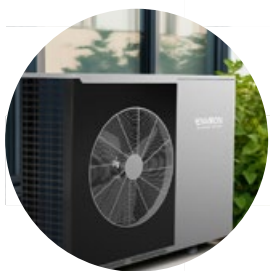
Smart solutions for society's energy supply.



Vision

Our vision is to make a future possible — through our expertise, products, and services — in which everyone has access to energy that is affordable, high-quality, and intelligent.

A world full of energy through smart solutions.



Mission

Our mission is to provide society with affordable and sustainable solutions for generating, storing, and using energy — based on our products, expertise, and values.

Developing smart energy technology for everyone:
Affordable. Honest. Sustainable.



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Installation and Operating Manual

Purpose and contents of the manual	6
Related attention	7
Permitted use	7
General safety guidelines	8
General characteristics	13
Overview of the unit	14
Installation	16
Appliance operation	27
Wifi functionality manual	35
Maintenance and periodical controls	40
Environmental protection	41
Troubleshooting	41
Disposal requirements	41
Technical Characteristics	42
Working limits of heat pump	43
Wiring diagram	44
Annex I: Refrigerant handling instructions	45

Smarte Energie. Für Alle.



1. Purpose and contents of the manual

This manual provides essential information for the installation, operation, and maintenance of the units, aimed at helping operators use the equipment efficiently, even without prior knowledge of the apparatus.

This manual describes the equipment's specifications at the time of its market release. It may not include subsequent technological updates made by the company to enhance performance, ergonomics, safety, and functionality. As such, the company is not obligated to update manuals for earlier versions of the equipment.

It is strongly recommended that users adhere to the instructions in this manual, particularly those related to safety and routine maintenance.

1.1 Conservation of the manual

The manual should be kept as a reference for the appliance, stored in a dry, safe place, and made accessible to all users who may need it for guidance on proper operation.

The company reserves the right to make changes to its products and manuals without being required to update earlier versions. It is not responsible for any errors resulting from printing or transcription.




Any updated copies or sections of the manual provided by the manufacturer should be stored alongside the original. For any additional information regarding the manual or the operation and maintenance of the appliance, the company is available to assist.

1.2 Symbols used in the manual

The manual should be kept as a reference for the appliance, stored in a dry, safe place, and made accessible to all users who may need it for guidance on proper operation.

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Any updated copies or sections of the manual provided by the manufacturer should be stored alongside the original. For any additional information regarding the manual or the operation and maintenance of the appliance, the company is available to assist.

	of the Indicates equipment. actions that could be hazardous to people and/or interfere with the proper operation
	Indicates operations that are not allowed.
	Indicates important instructions that the operator must follow to ensure the proper and safe operation of the equipment. It also includes general notes.



Caution: Risk of fire due to flammable materials

Service activities must strictly follow the manufacturer's recommendations. Repairs or maintenance that require specialized expertise should only be carried out under the guidance of a professional trained in the handling of flammable refrigerants.

	WARNING	This symbol indicates the appliance uses flammable refrigerants. Leakage of refrigerants exposed to an external ignition source could cause a fire hazard.
	CAUTION	This symbol signifies that the operating manual must be thoroughly read.
	CAUTION	This symbol denotes that only trained personnel should handle this equipment, referring to the installation manual as a guide.
	CAUTION	This symbol indicates service technicians should use the installation manual as a reference while handling the equipment.
	CAUTION	This symbol signifies that information such as the installation or operating manual is available for consultation.

2. Related attention

This appliance can be used by children aged from 8 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.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The appliance shall be installed in accordance with national wiring regulations.
- Do not use means to accelerate the defrosting process or to dean, other than those recommended by the manufacturer.
- 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 odor.
- Compliance with national gas regulations shall be observed.
- A notice that servicing shall be performed only as recommended by the manufacturer.
- A warning that 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 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 authorizes their competence to handle refrigerants safely in accordance with an industry recognized 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.
- The manual shall contain specific information for service personnel who shall be instructed to undertake the following when servicing an appliance that employs a flammable refrigerant.
- This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons".
- The A-weighted sound pressure level is below 70 dB.

3. Permitted use

- The company accepts no liability, either contractual or non-contractual, for any damages to persons, animals, or property resulting from incorrect installation, adjustment, maintenance, misuse, or failure to fully read and understand the information provided in this manual.
- These units are intended solely for water heating. Any other application is considered improper and prohibited unless explicitly authorized by the manufacturer.
- The installation location, as well as the hydraulic and electrical systems, should be determined by a qualified system designer, who must consider both technical requirements and any applicable local regulations or specific permits.
- All work must be carried out by qualified and experienced personnel who are familiar with the applicable regulations in the respective country.



4. General safety guidelines

Before operating the units, all users must be fully familiar with the equipment's functions and controls and should read and understand the information provided in this manual.

	It is strictly prohibited to remove or tamper with any safety device. Do not remove the grilles on the fan outlet or the top cover
	The use of this equipment by children or unassisted disabled persons is prohibited.
	Do not touch the appliance while barefoot or with wet or damp body parts.
	Do not pull, detach, or twist the electrical cables connected to the unit, even if it is disconnected from the power supply.
	Do not stand on the device, sit on it, or lean against any part of the equipment.
	Do not spray or pour water directly onto the device.
	Do not dispose of, abandon, or leave packaging materials (such as cardboard, staples, plastic bags, etc.) within reach of children, as they may pose a potential hazard.
	Any routine or non-routine maintenance must be performed only when the equipment is turned off and disconnected from the power supply.
	The plastic cover may only be removed by qualified personnel.
	Do not insert your hands, screwdrivers, wrenches, or other tools into the moving parts of the equipment.
	The equipment supervisor and maintenance personnel must receive appropriate training to perform their tasks safely.
	Operators must know how to use personal protective equipment and be familiar with the accident prevention guidelines outlined in national and international laws and regulations.




4.1 Workers health and safety

The European Community has adopted several directives regarding workplace health and safety, including Directives 89/391/CEE, 89/686/CEE, 2009/104/CE, 86/188/CEE, and 77 /576/CEE. Employers are required to implement these provisions and ensure that employees comply with them.

	Do not modify or replace any parts of the equipment without the explicit consent of the manufacturer. The manufacturer shall not be held responsible for any consequences resulting from unauthorized actions.
	Using components, expendable materials or spare parts that are not approved by the manufacturer and/or listed in this manual may be hazardous to operators and/or cause damage to the equipment.
	The operator's workspace must be kept clean, organized, and free from obstacles that may hinder movement. Adequate lighting should be provided to ensure the operator can perform tasks safely. Insufficient or overly bright lighting can pose risks.
	Ensure that workspace are always properly ventilated, and that exhaust systems are functioning, in good condition, and compliant with applicable legal requirements.

4.2 Personal safety equipments

When operating and maintaining the units, it is advised to wear the following personal protective equipment.

	Protective clothing: Maintenance personnel and operators must wear protective clothing that meets the applicable safety standards. In areas with slippery floors, safety shoes with non-slip soles must be worn.
	Gloves: Protective gloves must be worn during maintenance or cleaning operations.
	Mask and Goggles: Respiratory protection (mask) and eye protection (goggles) should be worn during cleaning and maintenance procedures.


4.3 Safety symbols

The unit is equipped with the following safety signs, which must be followed:

	General hazards
	Risk of electric shock
	Presence of moving organs
	Presence of surfaces that may cause injury

4.4 Refrigerant safety data sheet

Excerpt from the Safety Data Sheet in accordance with Regulation (EC) No. 1907 /2006 (REACH), as amended by Regulation (EU) 2015/830.

Denomination:	General hazards	
Reference of SDS	Risk of electric shock	
Identification of the substance/mixture and of the company/enterprise		
1.1. Product identifier		
Chemical name:	Presence of moving organs	
	CAS number: 74-98-6	
	CE number: -	
	Index number: -	
Registration number:	-	
Chemical formula:	C3H8	
1.2. Relevant identified uses of the substance or mixture and uses advised against		
Identified uses:	Refrigerant	
Hazards identification		
2.1. Classification of substance or mixture		
Regulation (EC) No 1272/2008 classification		
Physical hazards	Gases under pressure: Liquefied gas	
Indications of danger	May explode if heated	
Health hazards	Asphyxia	
	Rapid evaporation can cause frostbite	
	May cause cardiac arrhythmia.	
First aid measures		
4.1. Description of first aid measures		
General information:	Do not give anything to an unconscious person. Seek immediate medical assistance.	

Inhalation:	Move the victim to a clean area while wearing a self-contained breathing apparatus.
	Keep the patient calm and warm.
	If breathing stops, proceed with artificial respiration.
	Do not administer adrenaline or similar substances.
Eye contact:	Rinse carefully with plenty of water for at least 15 minutes and seek medical attention.
Ingestion:	Ingestion is considered an unlikely route of exposure.
Skin contact:	In case of freezing.
	rinse with water for at least 15 minutes.
	Apply sterile gauze. Immediately remove contaminated clothing.

4.2. Most important symptoms and effects, both acute and delayed

High concentrations can lead to asphyxia, with symptoms such as loss of mobility and/or consciousness. Victims may not be aware of their asphyxiation.

Low concentrations may have a narcotic effect, causing symptoms like dizziness, headache, nausea, and loss of coordination.

Fire prevention measures

5.1. Fire extinguishing media

Suitable extinguishing media:	Water spray.
Unsuitable extinguishing media:	Do not attempt to extinguish the fire with water jets.

5.2. Special hazards from the substance or mixture

Specific hazards:	Exposure to flames may cause the unit to rupture or explode due to increased pressure.
Hazardous combustion products:	When burned, the primary products are carbon dioxide and water. Carbon monoxide is produced in the case of incomplete combustion.

5.3. Recommendations for firefighters

Specific methods:	Coordinate firefighting based on the surrounding fire. Exposure to flames and heat may cause the unit to rupture; fight from a safe distance. Do not discharge contaminated firefighting water into the sewer. If possible stop product leakage. If possible, use water spray to disperse the fumes.		
Special protective firefighters:	equipment	For	Use self-contained breathing apparatus. Standard protective clothing and equipment for firefighters include . EN 137 - Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask. EN 469: Protective clothing for firefighters. EN 659: Protective gloves for firefighters.

Measures in case of accidental leakage

6.1. Personal precautions, protective equipment and emergency procedures

Individual precautions:	Attempt to stop the leakage and evacuate the area. If the atmosphere is not breathable, use self-contained breathing apparatus to enter the affected area. Ensure proper ventilation. Prevent contamination of sewers, basements, excavations, and areas where accumulation may pose a danger. Follow the local emergency plan. Stay upwind and evacuate civilians to safe areas.
Environmental precautions:	Volatile
Cleaning methods:	Volatile

Handling and storage

7.1. Safe-handling precautions

Safe use of the product:	<p>The product must be handled in accordance with standard industrial hygiene and safety practices. Only trained and qualified personnel should handle pressurized gases.</p> <p>Do not smoke while handling the product.</p> <p>Use only equipment specifically designed for the product and suitable for the operating pressure and temperature. If in doubt, contact the supplier.</p> <p>Do not inhale the gas.</p> <p>Avoid releasing the product into the atmosphere.</p> <p>Ensure adequate ventilation and/or suction is in place.</p> <p>Do not use open flames or electric heating to increase internal pressure.</p> <p>Do not remove or alter the supplier identification labels.</p> <p>A mixture of air and R290 cannot be used for pressure testing.</p>
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When mixed with air, an explosive mixture is formed. Its explosion limit (volume fraction) is usually between 2.1% and 9.5%.

Storage: Keep the unit away from incompatible products such as: explosive, flammable materials, Organic peroxide

Exposure control / Individual protection

8.1. Exposure controls

Protection of eyes:	<p>Use total protective glasses.</p> <p>Protective goggles must be worn during refilling operations.</p> <p>EN 166 - Personal eye protection.</p>
Protection of hands:	<p>Protective gloves should be worn when handling gas containers.</p> <p>EN 388 - Protective gloves against mechanical risks.</p>
Generic protection:	<p>Safety shoes must be worn when handling containers.</p> <p>EN ISO 20345 - Personal protective equipment - Safety footwear.</p>
Respiratory protection:	<p>In oxygen-deficient environments, a breathing apparatus or a mask with an air supply system must be used.</p> <p>EN 137 - Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask.</p>
Generic protection:	<p>Safety shoes must be worn when handling containers.</p> <p>EN ISO 20345 - Personal protective equipment - Safety footwear.</p>
Hygiene measures:	<p>Do not smoke.</p>

8.2 Environmental exposure controls

Refer to local regulations for restrictions on atmospheric emissions.
Please consult the section on specific gas treatment and disposal methods.

Physical and chemical properties

9.1. Basic information about the Physical and Chemical properties.

Aspect:	It is a colorless gas at room temperature and pressure, and can be converted into a liquid under low temperature or high pressure conditions.
Odor:	Pure propane is odorless, but in order to be easy to detect when leaking, substances such as methyl mercaptan with a special odor are usually added.
Olfactory threshold:	The olfactory threshold is subjective and inadequate to warn of overexposure.
Melting point	-187.7 °C
Boiling point:	-42.1 °C
Ignition point:	flammable
Critical temperature °C	96.67 °C
Relative density, gas (air= 1):	1.56
Water solubility:	62.4 mg/l

9.2. Other information	
Gas/vapor more heavier than air. May accumulate in confined spaces, particularly at or below ground level.	
Stability and reactivity	
Stability:	Stable under normal storage and handling conditions. However, it is highly flammable and can react violently with strong oxidizers.
Incompatible materials:	Strong oxidizing agents (such as chlorine, bromine, and potassium permanganate). Avoid contact with these substances to prevent fire or explosion hazards. Refer to ISO 11114 standard for further information on material compatibility.
Hazardous decomposition products:	When burned, it mainly produces carbon dioxide (CO ₂) and carbon monoxide (CO). In case of incomplete combustion, small amounts of carbon particles may also be generated.
Dangerous reactions:	The product is highly flammable in contact with air under normal conditions of temperature and pressure. Its flammable range in air is approximately 2.1% - 9.5% (by volume). Any source of ignition, such as open flames, sparks, or high - temperature surfaces, can cause it to ignite and may lead to an explosion.
Toxicological information	
Acute toxicity:	LC50 (inhalation, 4 hours, rat): > 567,000 ppm (parts per million) EC50 (48 hours, Daphnia magna): > 930 mg/L LC50 (96 hours, Fish): > 450 mg/L It should be noted that although the acute toxicity is relatively low, R290 is a flammable gas and has asphyxiation and anesthetic properties.
Local effects:	Concentrations substantially above the TLV (1000 ppm) value may cause narcotic effects. Inhalation of decomposition products in high concentration may cause shortness of breath (lung oedema)
Long-term toxicity:	Did not show carcinogenic, teratogenic or mutagenic effects on animal experiments. Can cause cardiac arrhythmia. Limit threshold for cardiac sensitivity: 312975 mg/m ³ . Limit threshold for anesthetic effects: 834600 mg/m ³
Ecological information	
Not easily biodegradable. Not considered to be bioaccumulative due to its low log Kow (log Kow < 4). Although it has high volatility, in case of large - scale or continuous leakage, it may still pose a risk of soil and groundwater pollution as it could accumulate in soil pores and potentially migrate with soil moisture into groundwater. Not classified as PBT or vPvB.	
12.1. Other adverse effects	
Effects on the ozone layer	None. R290 (propane) does not contain halogen elements such as chlorine and bromine, so it has no destructive effect on the ozone layer.
Global Warming Potential GWP (CO ₂ =1):	Approximately 1. The GWP of propane is very low.
Effects on global warming	Although R290 itself has a low GWP, if it is combusted or discharged in large quantities, the resulting carbon dioxide can contribute to the greenhouse effect.
Disposal considerations	
13.1. Waste treatment methods	
Gas Recovery:	Refer to the supplier's specific gas recovery program. This is the preferred approach as it not only helps in preventing unnecessary emissions but also allows for potential reuse of the gas. Avoid any form of direct discharge of R290 into the atmosphere. Direct release can contribute to greenhouse gas emissions and pose significant safety risks due to its flammable nature.
Safe Discharge Location	Ensure that R290 is not discharged in areas where its accumulation can lead to dangerous situations. This includes confined spaces, near ignition sources, or areas with poor ventilation. Propane can form explosive mixtures with air in certain concentrations, so careful consideration of the discharge location is crucial.
Regulatory Compliance	Strictly adhere to all emission limits set by local environmental regulations and any specific authorizations you may have obtained. These limits are in place to protect the environment and public safety. Regularly check for updates to these regulations to ensure ongoing compliance.
Additional Disposal Guidance	For more comprehensive and detailed information on suitable disposal methods, consult the EIGA Code of Practice Doc 30 "Disposal of gases" You can access this document at http://www.eiga.org . This resource provides industry- recognized best practices for the proper handling and disposal of gases like R290.

5. General characteristics

The hot water heat pump is one of the most cost-effective systems for heating water in residential or small business applications. By utilizing free, renewable energy from the air, this unit offers high efficiency with low operational costs. Its performance can be up to 3 to 4 times more efficient than traditional gas boilers or electric water heaters.

5.1 Flexibility and benefits of unit installation

- **Waste Heat Recovery:** The unit can be installed in areas with abundant waste heat, such as kitchens, boiler rooms, or garages. This placement enhances energy efficiency, even at low outdoor temperatures during winter.
- **Hot Water and Dehumidification:** Ideal for laundry or clothing rooms, the unit not only produces hot water but also helps lower the room temperature and reduce humidity.
- **Storage Room cooling:** The unit can be placed in the storage areas where its low temperature helps keep food fresh.
- **Hot Water and Fresh Air Ventilation:** Perfect for spaces like garages, gyms, or basements, the unit generates hot water while simultaneously cooling the room and providing fresh air.
- **Ecological and Economical Heating:** An efficient and cost-effective alternative to both fossil fuel boilers and heating systems, the unit utilizes renewable energy from the air, consuming significantly less energy.
- **Multiple Functions:** Thanks to its special air inlet and outlet design, the unit offers versatile installation options. It can function not only as a heat pump but also as a fresh air blower, dehumidifier, or energy recovery device.

i

The unit is primarily designed as a heat pump for domestic hot water (DHW) production. Any additional benefits, such as ambient cooling, dehumidification, or waste heat recovery, should be considered secondary features. These functions cannot be precisely controlled. Performance data will therefore be provided exclusively in relation to the water heating function.

5.2 Compact design

The unit is specifically designed to provide hot water for domestic use or small commercial applications. Its compact structure and sleek design are intended to facilitate easy and convenient installation in indoor spaces.

5.3 Available Accessories

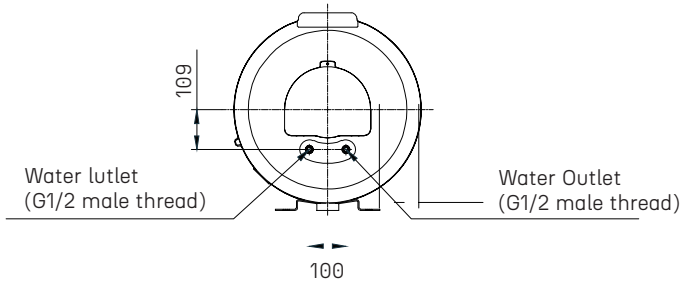
The following accessories are available:

- Vibration damper supports for floor installation.

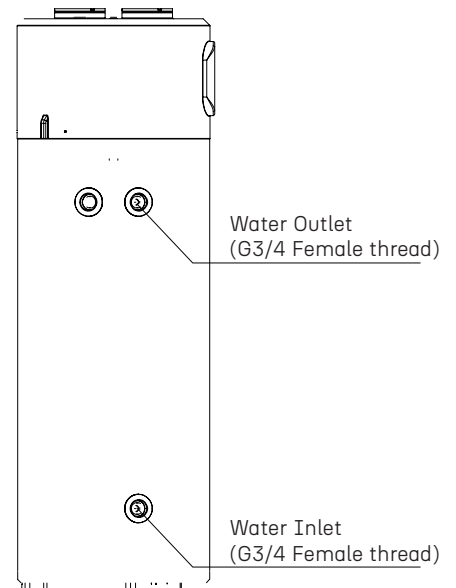
6. Overview of the unit

6.1 Hydraulic connections

Wall-mounted heat pump

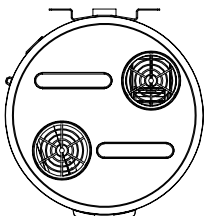
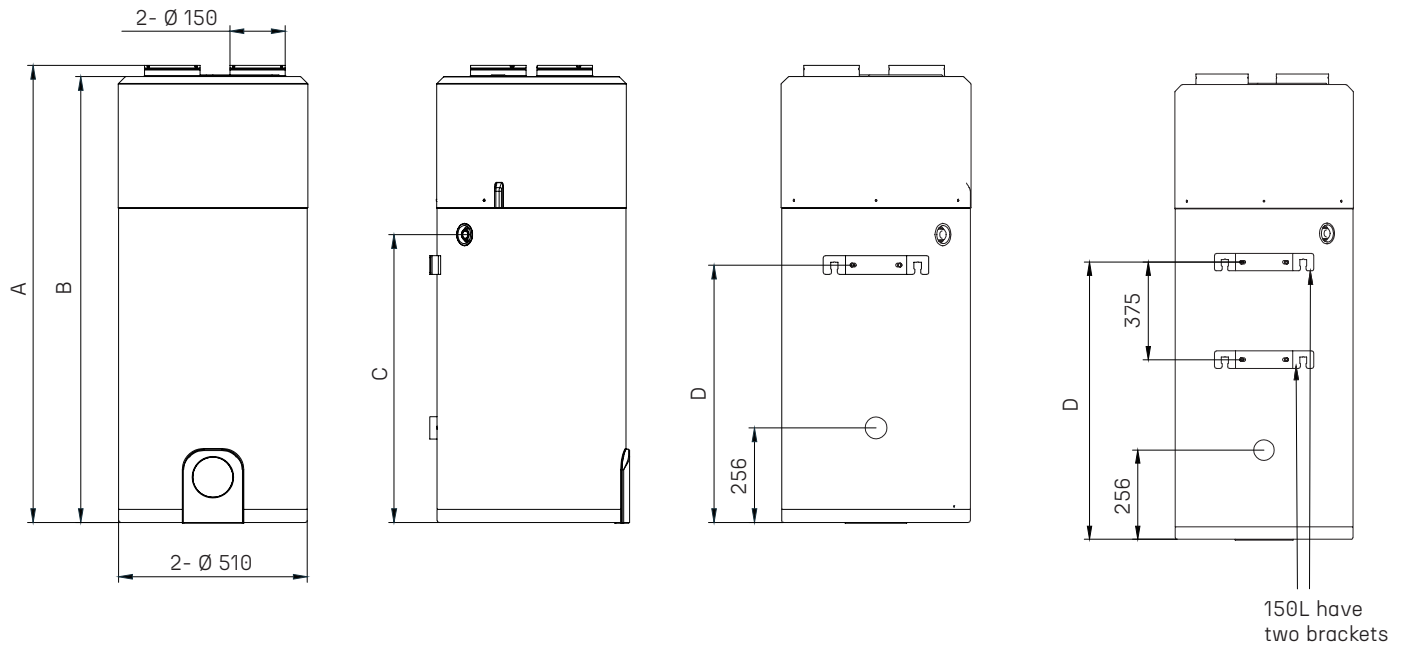


Floor-standing heat pump



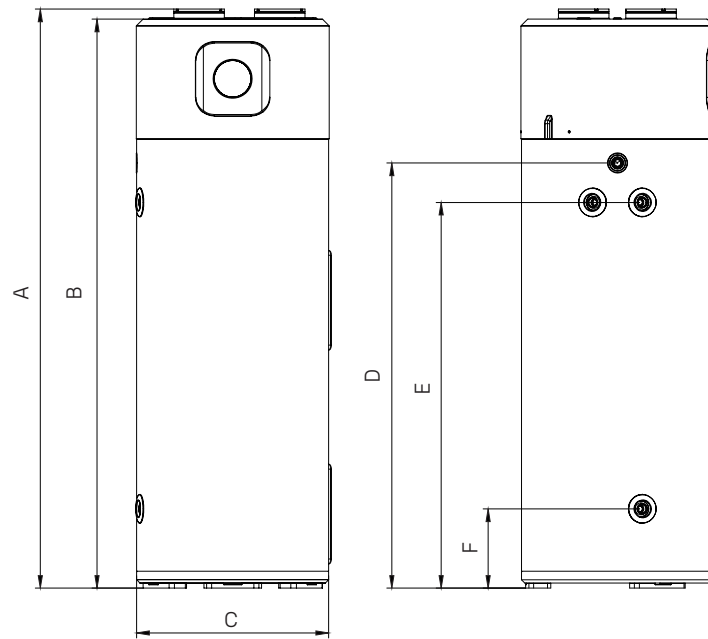
6.2 Dimension

6.2.1. Wall-mounted heat pump (Enamel)

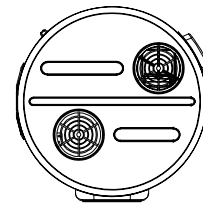


Model	A	B	C	D
100 L	1240	1206	778	696

6.2.2. Floor-standing heat pump



Model	A	B	C	D	E	F
200 L	1720	1690	Ø 570	1268	1124	146
300 L	1926	1896	Ø 650	1474	1313	166



7. Installation



WARNING: All operations outlined below must be performed by QUALIFIED PERSONNEL.

7.1 Generality

When installing or servicing the unit, it is essential to strictly follow the instructions outlined in this manual, adhere to all specifications indicated on the labels attached to the unit, and take all necessary precautions. Failure to comply with the guidelines in this manual may result in hazardous situations.



Upon receiving the unit, immediately inspect its condition. The unit left the factory in perfect condition; any damage should be reported to the carrier and documented on the Delivery Note prior to signing.

The company must be notified of the damage within 8 days. The customer should provide a written report along with photographs for any significant damage.



Please note that all installation diagrams in this chapter are for reference purposes only. The correct installation setup must be assessed on a case-by-case basis by the installer.

7.2 Safety instruction

To prevent injury to users, others, or property damage, the following instructions must be strictly followed. Failure to adhere to these instructions may result in harm or damage.

The unit should only be installed when it complies with local regulations, codes, and standards. Verify the main voltage and frequency before installation.

The following safety precautions must always be observed:

- Carefully read the **WARNING** section before installation.
- Ensure all safety precautions are followed as they contain critical safety information.
- After reading these instructions, keep them in an accessible location for future reference.

7.2.1. Warnings



The unit must be securely installed to prevent noise and vibrations: Improper installation may cause the unit to fall, resulting in potential injury. The installation surface should be level and capable of supporting the unit's weight, ensuring stable operation without excessive noise or vibrations.

When installing the unit in a small room, ensure adequate ventilation to prevent asphyxiation due to refrigerant leakage.

Always use the provided or specified components for installation: The use of faulty parts could result in injury due to potential hazards such as fire, electric shock, or the unit falling.






Do not remove the labels from the unit: These labels serve as important warnings and reminders, and keeping them intact helps ensure safe operation.

Indoor Installation Is mandatory: The unit must not be installed outdoors, in areas exposed to rain, or in locations accessible to water sources.

It Is recommended to install the unit In a location free from direct sunlight and other heat sources: If this is no possible, please ensure the installation is covered to protect it.

Ensure that there are no obstacles around the unit to allow for proper airflow and maintenance access ..

7.2.2. Cautions

	Do not install the unit in areas where flammable gas leaks may occur. If gas accumulates around the unit, it could result in an explosion.
	Never clean the unit while it is powered on. Always turn off the power before cleaning or servicing the unit.
	To disconnect the appliance, either remove the plug from the socket or turn off the main switch if installed upstream of the unit.
	Never pull the power cord to remove the plug from the socket.
	Ensure the unit is powered off, unplugged, or the external switch is turned off before cleaning or servicing.
	If the unit is used without an air ejection duct, verify that the installation room has a minimum volume of 10m ³ and adequate ventilation. Note that the expelled air temperature is 5-10°C lower than the inlet air, so uncontrolled air can significantly lower the room temperature.
	Do not operate the unit if there are abnormal sounds or smells. Shut off the power supply immediately to avoid potential electrical shock or fire.
	The unit contains moving parts. Exercise caution around them, even when the unit is turned off.
	Do not insert fingers or objects into the fan or evaporator.
	Be cautious when working near the compressor's head and exhaust piping, as they can reach high temperatures.
	The aluminum fins are sharp and can cause serious injuries. Handle with care.

7.3 Handling of the unit


The unit should be stored and handled in its shipping packaging in an upright position, and it should be empty of water. During transport (provided it is handled with care) and storage, it is recommended not to exceed an inclination angle of 30 degrees (45° for short periods). The ambient temperature for storage should range from -7°C to +45°C.

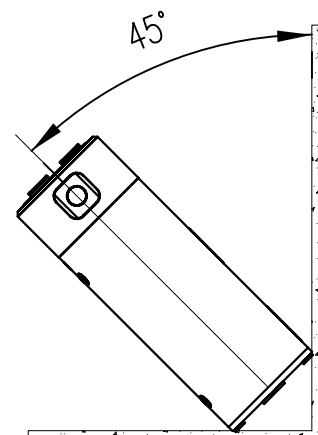
7.3.1. Handling of the unit with forklift

When using a forklift for handling, the unit must remain securely mounted on the pallet. The lifting speed should be kept to a minimum. Due to its top-heavy design, the unit must be properly secured to prevent tipping over. To avoid any damage, the unit should be placed on a flat, level surface.

7.3.2. Manual handling of the unit

For manual handling, a wooden pallet can be used. Ropes or lifting straps may also be utilized, ensuring the unit is not tilted or overturned. The maximum permissible tilt angle is 45°, with the unit ideally kept in a vertical position. If the unit must be transported in an inclined position (with a maximum tilt angle of 45° for a short period), it should be allowed to rest for at least one hour after reaching its final position before being powered on.

	Due to its high center of gravity and low tipping moment, the unit must be properly secured to prevent overturning.
	The unit's cover is not designed to withstand stress and should not be used for transport.

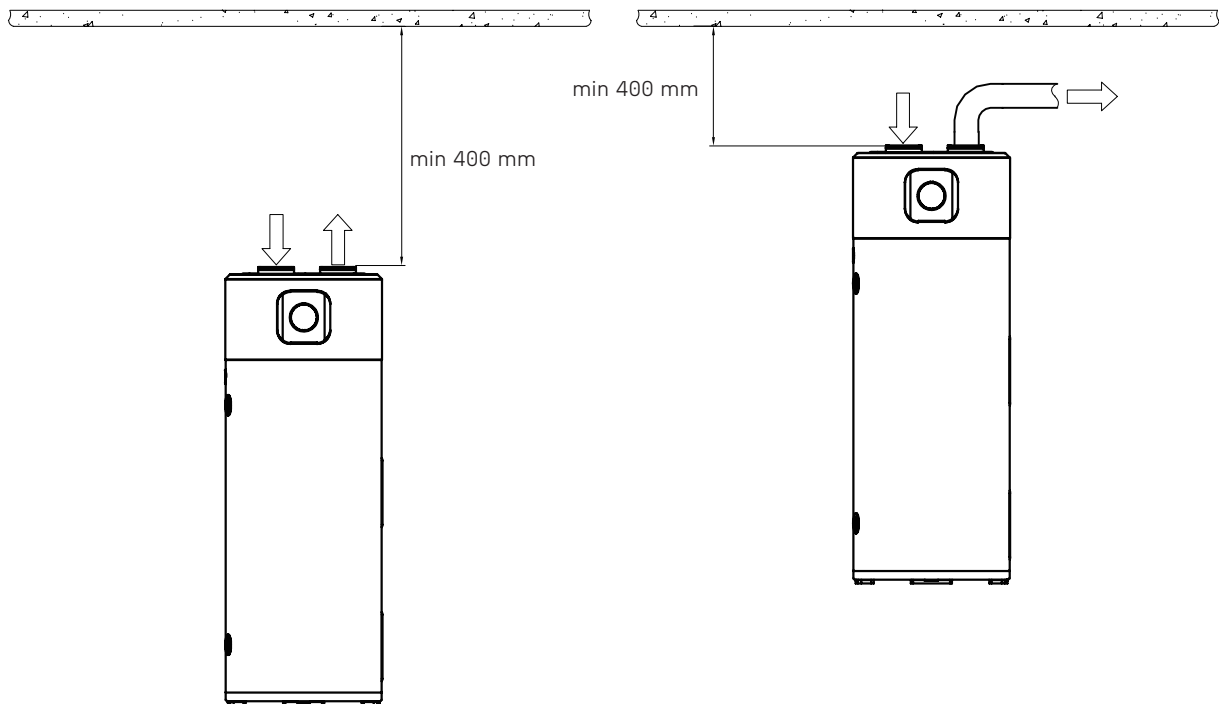


7.4 Required service space

The minimum space required for servicing and maintenance tasks on the unit is specified below. Additionally, recirculation of exhaust air must be prevented, as neglecting this could lead to poor performance or activation of safety controls. For these reasons, it is essential to observe the following clearances.

i	Connecting the air inlet and/or outlet pipes will reduce the airflow and capacity of the heat pump unit.
	Please note that the unit's performance may be reduced if the air inlet is connected to a duct drawing air from outside, due to the low temperatures in winter and high temperatures in summer. The optimal operating ambient temperature is 20°C.

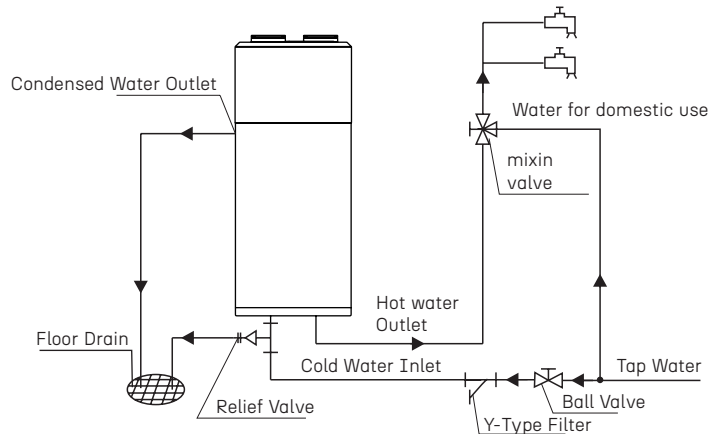
Please note that the unit is designed so that components requiring maintenance are accessible from the front. It is recommended to keep the spaces on both the left and right sides clear to facilitate the removal of the unit and ease maintenance tasks.



	The maximum allowable duct length is for inlet and outlet together less than 2 m.
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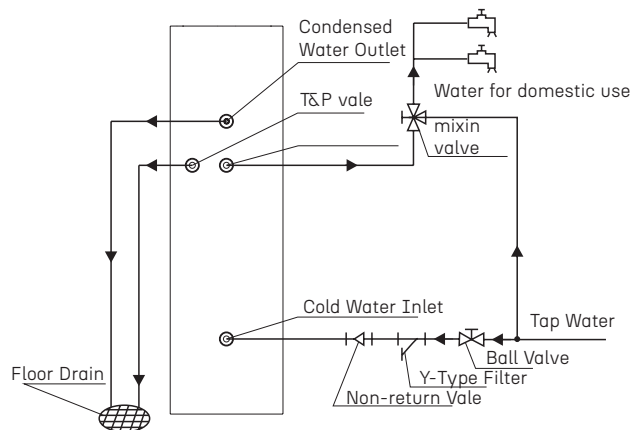
7.5 Installation overview

7.5.1. Wall-mounted heat pump



1. The inlet of this heat pump water heater must be equipped with a filter and a safety check valve (the safety valve is included in the heat pump accessory kit). Failure to do so may result in negative or excessive pressure within the water tank, leading to tank damage.
2. This water tank is designed for water pressure 0.85 MPa. It is recommended to manually open the check rod of the safety check valve every 1-2 months to force drainage and pressure relief, preventing valve failure due to scaling.
3. The water tank must be securely fixed (e.g., by installing tank straps) to avoid tipping.
4. If the ambient temperature falls below 2°C and the heat pump will remain unused for an extended period, drain all water from the pipelines and the tank, then disconnect the power supply.
5. Inspect the magnesium rod in the water tank every 2-3 years. Contact after-sales personnel for replacement. Always disconnect the heat pump power supply when the tank is empty.
6. Regularly clean scale deposits inside the water tank to ensure hygienic water quality.

7.5.2. Floor-standing heat pump





1. The inlet of this heat pump water heater must be equipped with a filter and a safety check valve (the safety valve is included in the heat pump accessory kit). Failure to do so may result in negative or excessive pressure within the water tank, leading to tank damage.
2. This water tank is designed for water pressure 0.85 MPa. It is recommended to manually open the check rod of the safety check valve every 1-2 months to force drainage and pressure relief, preventing valve failure due to scaling.
3. The water tank must be securely fixed (e.g., by installing tank straps) to avoid tipping.
4. If the ambient temperature falls below 2°C and the heat pump will remain unused for an extended period, drain all water from the pipelines and the tank, then
5. disconnect the power supply.
6. Inspect the magnesium rod in the water tank every 2-3 years. Contact after-sales personnel for replacement. Always disconnect the heat pump power supply when the tank is empty.
7. Regularly clean scale deposits inside the water tank to ensure hygienic water quality.

7.6 Hydraulic connections

The hydraulic connections must be made in accordance with national and local regulations. The pipes can be constructed from multilayer pipe, polyethylene, or stainless steel, and must be capable of withstanding a minimum of 100°C and 10 bar pressure. Pipe selection should be based on the required water flow and the system's hydraulic pressure drops. All pipes should be insulated with closed-cell material of appropriate thickness. The unit should be connected to the piping using flexible joints. The following components should be included in the piping system:

- Y-shaped metallic filter (to be installed on the inlet pipe) with a mesh size no larger than 1mm.
- Automatic charging group (3 bar recommended) if the water supply pressure exceeds 5.5 bar.
- Hydraulic safety group (8 bar).
- Manual gate valves to isolate the unit from the hydraulic circuit.
- Manual gate valve on the inlet pipe to allow discharge of the unit if necessary.
- Thermometers for wells to monitor the system's temperature.
- Expansion tanks, safety valves, and air vents as indicated in the following installation diagrams.

	Perform the connections making sure that weight of the pipes do not overload the unit.
	Check the water hardness, which should not be below 12°f. With particularly hard water, It's recommended the use of a water softener so that the residual hardness is no more than 20°f and no less than 15°f.
	WARNING: When it's possible, connect the pipes to the hydraulic connections always using the system button against button.
	WARNING: Unit water Inlet pipe have to be In correspondence with the blue connection, otherwise the unit malfunction could occur.
	WARNING: It is compulsory to install on the WATER INLET connection a metallic filter with a mesh not larger than 1 mm. Should the filter not be Installed, the warranty will no longer be valid. The filter have to be kept clean, so make sure that it is clean after the unit has been installed, and then check it periodically.
	Perform the drainage/piping work according to the Installation instruction. If there Is a defect In drainage /piping work, water could leak from the unit and household goods could get wet and be damaged.
	The hot water needs to mix with cold water for terminal usage, too hot water (over 50°C) in the heating unit may cause Injury. It's recommended the use of anti-scald valves.
	The water may drip from the discharge pipe of the pressure-relief device and that this pipe must be left open to the atmosphere.
The pressure-relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked.	
	The diagrams are to be considered only for Indication purpose. It Is always required the study of the specific installation context and the approval of the system by a qualified heating engineer designer.

7.6.1. Water connections

Please pay attention to the following points when connecting the water loop pipe:

1. Minimize the water loop resistance wherever possible.
2. Ensure the pipe is clear of any obstructions, with smooth water flow. Check the pipe carefully for any leaks, and then insulate the pipe appropriately.
3. Install the hydraulic safety group on the water inlet.
4. Install an appropriately sized expansion tank to accommodate volume fluctuations.
5. Select the nominal pipe diameter based on the available water pressure and the expected pressure drop in the piping system.
6. Flexible water pipes may be used. Ensure that all materials in the piping system are compatible to prevent corrosion damage.
7. During pipe installation, take care to prevent contamination of the piping system.

7.6.2. Water loading

If the unit is being used for the first time or after the tank has been emptied, ensure that the tank is filled with water before powering on the unit.

- 1) Thoroughly clean the system.
- 2) Open the cold water inlet and hot water outlet valves.
- 3) Begin filling the tank with water. When water flows steadily from the hot water outlet, the tank is full.
- 4) Close the hot water outlet valve to complete the water filling process.



ATTENTION: Operating the unit without water in the tank may cause damage to the auxiliary electric heater.

7.6.3. Unload of water from the tank

If the unit requires cleaning or maintenance, the tank should be emptied. This can be done through the water supply inlet connection or via a manual shut-off valve, as recommended at the start of this section (installation of the manual shut-off valve is the responsibility of the user/installer).

- 1) Close the cold water inlet valve.
- 2) Open the hot water outlet valve and the manual drain valve.
- 3) Begin draining the water.
- 4) Once the tank is empty, close the manual drain valve.

7.7 Electrical connections

Ensure that the power supply matches the unit's nominal electrical specifications (voltage, phases, frequency) as indicated on the technical label. The appliance is supplied with a power cord and Schuko plug; it is prohibited to alter the power cord or plug. If needed, please contact customer service for assistance. It is recommended to verify the main electrical circuit and ensure its compliance with current regulations. Check that the electrical circuit is suitable for the unit's maximum power consumption (refer to the nameplate data), both in terms of cable cross-section and adherence to applicable standards.



WARNING: The power supply must comply with the specified limits; failure to do so will void the warranty immediately. Before performing any maintenance or operation on the unit, ensure that the power supply is disconnected.



WARNING: Voltage fluctuations must not exceed $\pm 10\%$ of the nominal value. If this tolerance is not met, please contact our technical department for assistance.

The unit must be connected to a grounded power supply. Do not connect if it's not grounded.

Do not use an extension cord to connect the unit to the power supply. If a suitable grounded outlet is not available, have one installed by a qualified electrician.

Do not attempt to move or repair the unit yourself. If the power cord is damaged, it must be replaced by the manufacturer, its authorized service agent, or a qualified professional to prevent hazards. Improper handling or repair of the unit may result in water leakage, electrical shock, injury, or fire.

The power socket should be installed at a height higher than the hydraulic connection point of the unit to prevent any water splashing onto the unit.

To access the electrical box:


1. Remove the front panel of the unit by unscrewing the side screws (using a suitable long screwdriver, you can do this from the front, even in built-in installations or when the unit is placed close to a wall).
2. Remove the metal cover of the electrical box by unscrewing the four screws.
3. The unit comes with a pre-installed power supply cable connected to the electrical box. If you need to disconnect it and install a longer cable, or connect an ON/OFF remote signal, please refer to the wiring diagram.

The size of the fuse

Models	Electricity supply	Max Current	Cable diameter mm ²	Protection Thermal-magneti (D curve)	Fuse type	Fuse Rating
ENDHWDP100	220-240V ~50Hz	9.2 A	H07RN-F 3G 1.5 mm ²	16A	T6.3H 250V	6.3A 250V
ENDHWDP200X		11 A				
ENDHWDP300X		11 A				

Before start-up:

- Ensure the availability of the supplied wiring diagram and the manual for the installed apparatus.
- Ensure the availability of the electrical and hydraulic diagrams for the system where the unit is installed.
- Confirm that all water connections are properly installed and that all unit label instructions are followed.
- Check the inlet water pressure to ensure it is sufficient (above 1.5 bar).
- Verify that the shut-off valves in the hydraulic circuit are open.
- Ensure the hydraulic circuit is properly pressurized and vented.
- Confirm that water flows out of the hot water outlet and that the tank is full before turning on the power.
- Ensure proper provisions have been made for condensate drainage.
- Verify all electrical connections.
- Ensure that electrical connections comply with applicable regulations, including proper grounding.
- Verify that the voltage is within the tolerance range (+10%) of the value indicated on the technical label.
- Check for refrigerant leaks.
- Ensure that all cover panels are properly installed and securely fastened before starting the unit.
- Conduct a final inspection of the unit to ensure everything is in order before powering it on. Confirm the indicator light on the control panel when the unit is operating.
- Use the wire controller to power on the unit.
- Listen carefully to the unit when turning it on. If any abnormal sounds are heard, immediately turn the power off.
- Measure the water temperature to monitor any fluctuations in temperature.
- Once the operational parameters have been set (by qualified personnel only), they should not be altered by the user. If parameter adjustments are required, please contact a qualified service technician.

	WARNING: Never turn off the unit by using the main switch for a temporary stop. The main switch should only be used to disconnect the unit from the power supply during extended shutdowns or for maintenance/repair work.
	WARNING: Do not modify the internal wiring of the unit otherwise the warranty will terminate immediately.

7.8 Installation of the heat pump base

7.8.1. Base

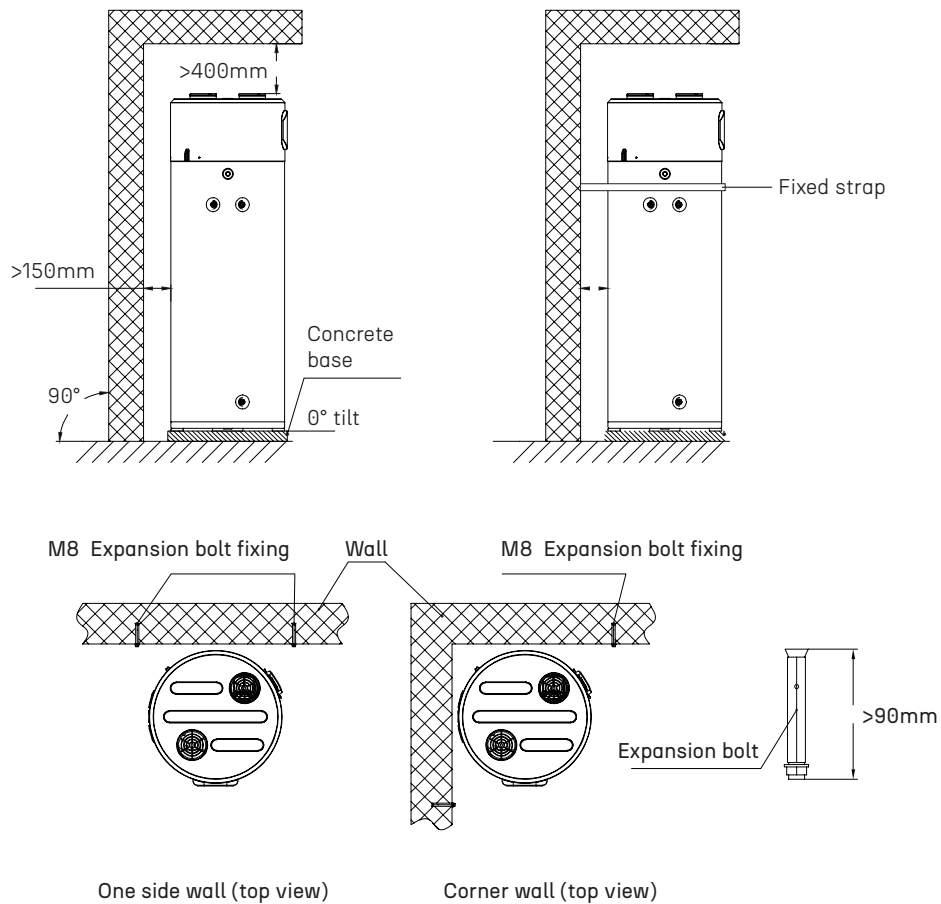
The unit must be installed on a concrete plinth or a stable structure capable of supporting weights exceeding 400kg. It's crucial that the supporting structure remains stable over time and does not shift, especially due to factors like water drainage. You'll need a concrete base that's at least 50mm thick or a well-seasoned hardwood slat with a minimum thickness of 25mm. If you're using concrete base parameters, make sure they have a minimum dimension of 650mm x 650mm.

Make sure all four feet of the unit are supported by the base you are using to avoid any potential warranty issues. Ensure proper drainage is in place to handle any potential overflow.

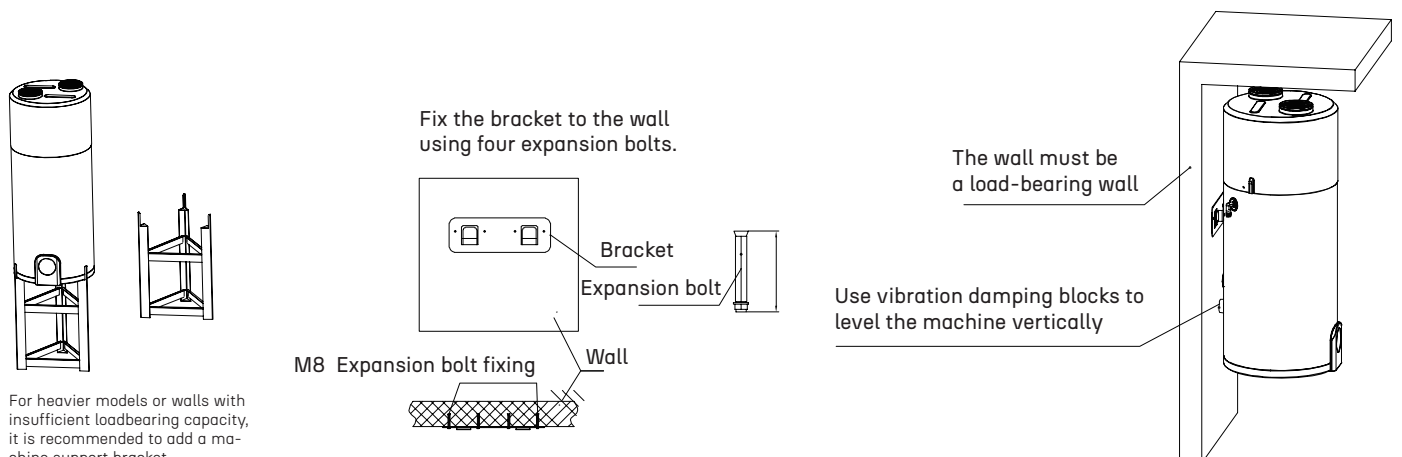
During installation, it's essential to position the unit completely vertically and level to facilitate proper condensate drainage. If the system is installed with a tilt exceeding 3° it could void the warranty.

The fixing strap is recommended as shown as following figures:

7.8.1.1 Floor-standing heat pump



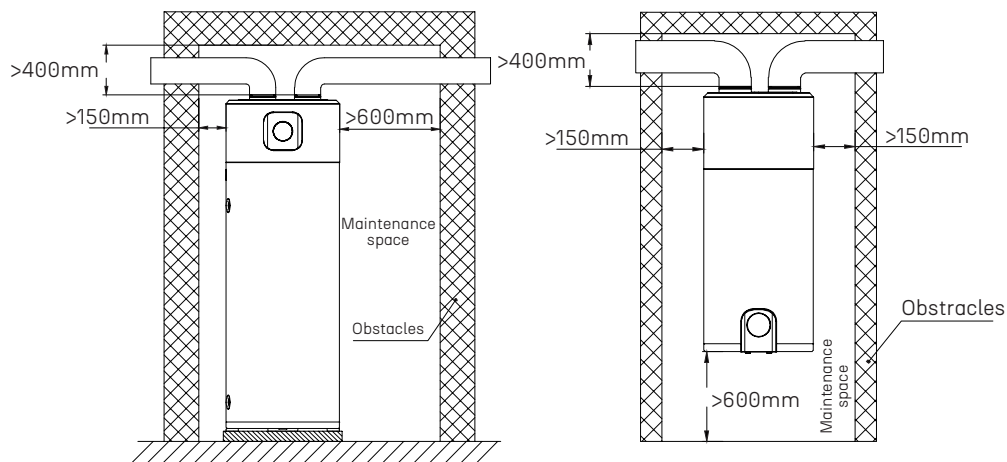
7.8.1.2 Wall-mounted heat pump



For heavier models or walls with insufficient loadbearing capacity, it is recommended to add a machine support bracket.

7.82. Air flow

- Do not install the unit in areas where there is a risk of falling debris, such as leaves, as this could block air vents or cause damage to the unit.
- Avoid placing the system in locations with multiple walls or structures.
- When installing the unit under fixtures or home eaves, follow these clearance requirements:
 - Maintain a minimum clearance of 300mm above the unit-Provide a 600mm clearance to the right side of the system (when facing it).
 - Allow for a 150mm clearance to the left side of the system(when facing it).
 - Position the unit at least 150mm away from your home's wall to ensure full access for servicing and to prevent cold air circulation.
- Install the unit to ensure that the control interface is easily accessible for users. There should be clear access to the electrical panel located at the back of the system. Improper installation could result in voiding the warranty or require additional charges to rectify the system's compliance.



7.9 Maintenance

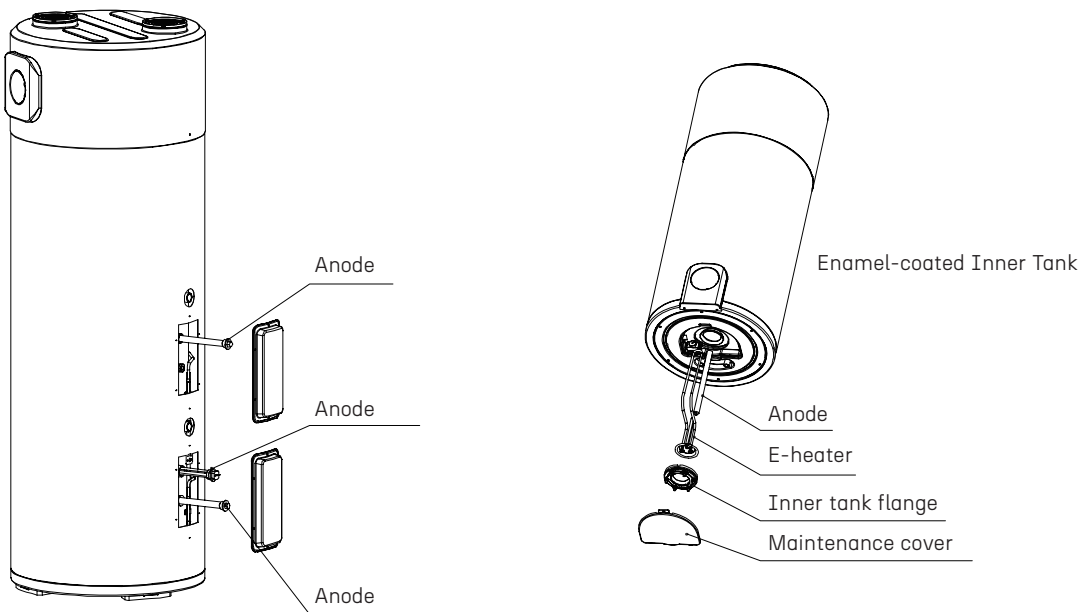
7.9.1. Checking The Anode & Replacing If Required

The anode is a crucial component that safeguards the inner lining of the hot water tank. Over time, it may degrade, reducing its protective capabilities. It is advisable to periodically inspect the anode for degradation and replace it if needed.

1. Turn off the power and shut off the cold water inlet valve.
2. Open a hot water tap to relieve pressure within the tank.
3. Locate the position of the anode.
4. Remove the anode cover by loosening the six screws.
5. Unscrew the anode.
6. Examine it for signs of degradation.
7. If it is still in good condition, re-install it to ensure an effective seal.
8. If the anode is in unsatisfactory condition, replace it with a new one.

Falling to replace the anode when necessary will void the warranty for the water tank

1. Reopen the cold water inlet valve.
2. Open a hot water tap until hot water flows out, then turn off the tap.
3. Turn on the power to restart the unit.
4. You run it can now be used as usual



7.9.2. Cleaning The Inner Tank And Electric Heating Element

To keep your water heater running efficiently, it's crucial to perform regular maintenance on the inner tank and electric heating element. Follow these steps:

1. Switching off the power to the water heater.
2. Shut off the cold water inlet valve and open a hot water tap to release any built-up pressure.
3. Attach a flexible pipe to the drain outlet and connect it to a suitable sewage drain, Ensure that the drain pipe you use can withstand temperatures of at least 34°C. If the drain pipe doesn't meet this requirement, open the cold water inlet valve and hot water tap until the water temperature is safe for the drain pipe.
4. Open the drain outlet of the water heater and allow all the water inside the inner tank to empty out. If needed, use water to rinse the inner tank multiple times to eliminate any deposits.
5. After cleaning the tank, close the drain outlet.
6. Fill the inner tank with water and turn the power back on.

7.10 Filling the System

Here are the steps to follow for filling and pressuring the system after it has been properly connected:

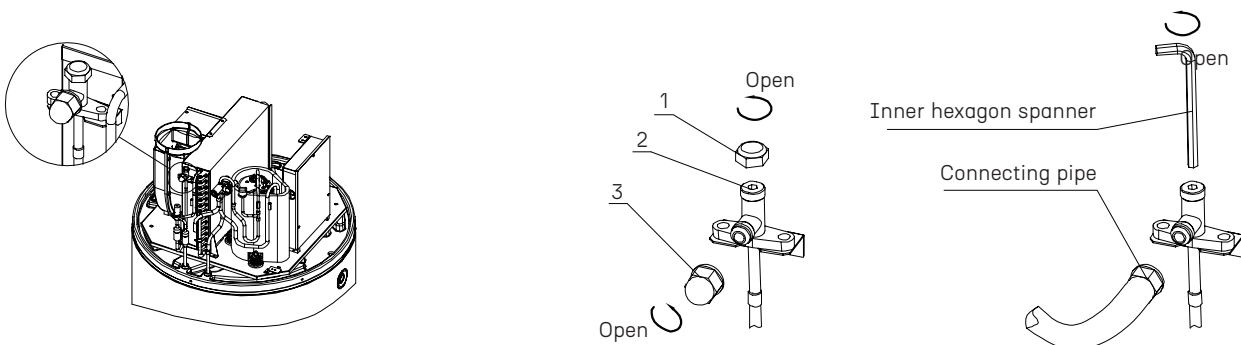
1. Once the system is correctly connected, proceed to fill and pressurize the tank.
2. To start filling the water system, first, open the non-return valve on the cold-water inlet. Simultaneously, make sure at least one hot water tap inside the property is open. As the system fills with water, you'll hear air escaping from the open hot water tap. This process, called "bleeding the system," ensures that any trapped air is removed from the system. When you consistently see water flowing from the hot water tap, it means the system is fully bled, and you can then close the tap.
3. Always ensure that the tank is completely filled with water before connecting and activating the electricity supply.

7.11 Refrigerant filling

Check the refrigerant filling status by reading the liquid level data on the display screen, as well as the air suction and exhaust pressure. If there is a refrigerant leakage or if components in the refrigeration circulation system need to be replaced, conduct an air tightness examination as the first step.

Preparations:

1. Please in a well-ventilated environment while charge refrigerant.
2. Keep away from open flames or potential sources of fire.
3. Disconnect the power supply of the heat pump.
4. Carefully check the nameplate of the heat pump and charge strictly according to the labeled amount.



7.12 Detection of flammable refrigerants

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

The following leak detection methods are deemed acceptable for refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, 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 also 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.

NOTE Examples of leak detection fluids are

- bubble method,
- fluorescent method agents.









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







8. Appliance operation

8.1 User interface













8.2 Operation

Name/Icon	Function description
Power on/off 	<ol style="list-style-type: none"> 1. Press 1s to turn on/off. 2. In the query interface, press this button to return to the main interface. 3. In the setting interface, press this button to return to the main interface. If there is no operation for 60s, it will automatically return to the main interface, turn off the screen, and lock. 4. Press 3s to unlock the controller.
Timer/clock 	<ol style="list-style-type: none"> 1. On the main interface, press to enter the clock setting, and press to switch between "hour" and "minute". 2. On the main interface, press 3s to on/off timer . 3. In the timer interface, press to switch between "hour" and "minute". 4. In the timer interface, press 3s to cancel the current timer. 5. In the clock setting interface, press 3s to enable/disable the weekly timer.
Mode 	<ol style="list-style-type: none"> 1. On the main interface, press 5s to enter the parameter interface. 2. In the power-on interface, switch the working mode(STAN, HYB1, ELE). 3. In the parameter query interface, press to enter/save parameters.
Up 	<ol style="list-style-type: none"> 1. On the main interface and in the power-on state, press to set the temperature. 2. On the main interface, press 3s to enter the query interface. 3. In the query interface, press to choose the parameter no. 4. In the parameter setting interface, press it and  to modify parameters. 5. Modify timer and clock.
Down 	<ol style="list-style-type: none"> 1. On the main interface and in the power-on state, press to set the temperature and curve. 2. On the main interface, press 3s to enter the query and maintenance interface. 3. In the query interface, press to choose the parameter no. 4. In the parameter setting interface, press it and  to modify parameters. 5. Modify timing and clock values;
Power + Up 	Press 5s to enter manual smart network connection.

Name/Icon	Function description
Power + Down 	Press 5s to enter manual AP network connection.
Mode + Up 	In the power-on interface, press 3s to turn on/off "Quick Heat".
Mode + down 	On the main interface in the power-on state, press 5s to turn on/off forced defrost.
Up + down 	<ol style="list-style-type: none"> 1. Press 5s to manually turn on/off the ventilation function. 2. On the main interface and in the power-on state, press 3s to start the "Ventilation" function, the symbol "1 second" flashing (high-speed fan). 3. On the main interface, press 3s again, the symbol "2 second" flashing (low-speed fan). 4. Press 3s again to exit the "Ventilation" function mode.
Switch + Timing + Down 	Press 5s to turn on/off the "Sterilization Function".
Switch + Mode + Up + Down 	Within 5 minutes of power-on, press 5s to restore factory settings.

8.3 LCD icons

Symbol	Interface	Function or meaning	Remark
	Off	Off or not in heating mode	
	On	Heating mode	
	On	ELE mode (Auxiliary heater only)	
	1S Blink	BRB1 mode(Auxiliary heater + Heat pump)	
	2S Blink	Sterilization (Auxiliary heater + Heat pump)	
	Blink	Wi-Fi pairing status	
	On	Wi-Fi connected successfully	
SET	On	Settings	
°C	On	Displays the temperature in Celsius	
MIN	On	Parameter unit (minute)	

Symbol	Interface	Function or meaning	Remark
	On	Displays actual temp. and setting temp	
	On	Freeze protection mode activated	
AUTO	On	Maintenance mode activated: Allows viewing of version and setup tool number	
	On	On and defrosting	
	On	Alarm is active	
	On	Screen is locked	
	On	Compressor running	
	On	Fan running in high speed	
	On	Fan running in low speed	
	Blink	Ventilation mode - High speed	
	Blink	Ventilation mode - Low speed	
	Display	Clock, operating mode, and error code	
	On	Timer activated	
ON	Display	Working under timer period	
	Blink	Set the timer start time	
OFF	Display	Working out timer period	
	Blink	Set the timer finish time	
1 3 2 4	On/Off	When set the timer 1, 2, 3 or entering a time period, the icon stays on. Otherwise, it remains off.	

8.4 Hybrid heating mode (heat pump+e-heater)

Operation: On the power-on interface, press **M** + **▲** for 3s to enter or exit hybrid heating mode.

When the electric heater is activated, **🔥** displayed, when the electric heater is not activated, **🔥** blinking at 1Hz.

Deactivation: The hybrid heating mode can be turned off by powering on/off.



8.5 Forced Defrost Function

Operation: When the heat pump is on and not in cooling mode, press **🔥** + **🔻** for 5s to enter forced defrost.




LCD Display: The defrost icon **❄️** will be lighted.



8.6 Operation Parameters Query

To access the query: In the normal interface, press **▲** or **🔻** for 3s to enter the parameter query interface. The temperature display area will show the parameter number, and the timer area will display the parameter value.



Viewing and Exiting: After entering the parameter query interface, press the  or  to each parameter.  Press button or no option for 60s, it will automatically exit the parameter viewing interface.

8.6.1. Parameters table






Description	Display label	Notes
Refrigerant Cycle/water cycle	00	0 = Water Cycle; 1 = Refrigerant Cycle
High Pressure Switch	01	0 = Open; 1 = Closed
Reserved	02	Reserved
Reserved	03	Reserved
Electronic Expansion Valve Measured Value	04	Measured Value
Coil Temperature	05	Measured Value
Ambient Temperature	06	Measured Value
Suction Temperature	07	Measured Value
Exhaust temperature	08	Measured Value
Inlet Water Temperature (Tank Temperature)	09	Displayed Value = Measured Value + Compensation Value
Reserved	10	Reserved
Compressor	11	0 = Stop; 1 = Run
Four-Way Valve	12	0 = Stop; 1 = Run
High-Speed Fan	13	0 = Stop; 1 = Run
Reserved	14	Reserved
Reserved	15	Reserved
Electric Heater	16	0 = Stop; 1 = Run
Pre-Defrost Compressor Running Accumulated Time	17	Measured Value
Interlock Switch	18	0= Open; 1= Closed
Current Model Tool Value	19	Tool 22
Reserved	20	Reserved

Description	Display label	Notes
Reserved	21	Reserved
Reserved	22	Reserved
Reserved	23	Reserved
Reserved	24	Reserved
Reserved	25	Reserved
Reserved	26	Reserved
Reserved	27	Reserved
Reserved	28	Reserved
Reserved	29	Reserved
Reserved	30	Reserved

8.7 Clock setting

When the heat pump is on, press  to set the clock, the clock icon flashing.

8.7.1. Clock setting operation

Once in the clock settings interface, press  to set the hour and minute. The icon flashing.
Press  or  to adjust the value. Press  or  to save and exit, or no option for 5s, it will be automatically saved and exit.










8.7.2. Timer Setting

There are three groups, each group can be set to "timing start", "timing stop".




On the home interface, press  3s to enable or disable timer.

On the timer setting interface, press  3s to cancel timing Settings.







Press , "1" and "ON" icons are displayed, and the hour icon flashing, it means the first timer group is valid.

The hour icon flashing, press  or  to set the value, press  to confirm and switch to the minute setting, the minute icon flashing. Press  or  to set the value; Press  to confirm;

At the same time, enter the "1" and "OFF" icon display, set the value, and the hour icon flashing.





Press  or  to change the time, and then press  to confirm and go to the minute setting.

The minute icon flashing.

Press  or  to change the time, and press  to confirm and enable Timing for Group 1 to enter the setting for Group 2. The operation of Group 2 and 3 is the same as Group 1. On setting timer interface, press  or 60s no operation to give up the timing and exit. The  and " OFF " icons will be displayed during the shutdown period, and the  and the current working Group" 1/2/3 "and" ON" icon will be displayed during the power on period.







8.8 Wifi Function

Press  +  for 5s to enter manual Smart network configuration. The WiFi icon flashing 1/s.
 Press  +  for 5s to enter manual AP Network Configuration. The WiFi icon flashing 2/s.
 For app download and usage, please refer to the WiFi functionality manual.



8.9 Restore factory Settings

Within 5 minutes of power-on, press  +  +  +  for 5s to restore factory Settings. The buzzer beeps. The parameters are successfully restored after two beeps.


8.10 User Parameter Settings

On the main interface, press " + 

, button for Ss to enter the user parameter setting interface.

Code	Description	Default	Range	Note
F01	Heating set temperature	55 °C	STAN: 15-65°C; HYBI: 15-75°C; ELE: 15-75°C	
F03	Water temperature differential	5 °C	1-15°C	STAN: F03; HYBI: F03; ELE: F03+5°C
F10	Ambient temp. to start electric heater	2 °C	-30-35°C	Disabled at -30°C
F13	Automatic Hybrid Heating Function	1	0-1	0: Disabled 1: Enabled
F14	Water Temperature Control Hysteresis for Hybrid Heating	40	2-70°C	
F48	Linkage Switch Setting	0	0-1	0: Disabled 1: Enabled
F65	Intelligent Reservation function	0	0-1	0: Disabled 1: Enabled
F66	Enable Electric Sterilization Function	1	0-1	0: Disabled 1: Enabled
F69	Automatic Sterilization Interval	7	1-20 days	

8.11 Malfunctioning of the unit and error codes

When the unit has a fault, the fault is displayed in the timing area, the fault code is displayed in a cycle, and the  flashes, and the normal display is restored when the fault is eliminated. Failure codes are described in the attached table.

Error code	Protection/Malfunction	Possible reasons
E12	High exhaust temperature protection	The refrigerant system is blocked Lack of refrigerant or sensor T3 damaged
E05	High voltage switch protection	1. Pressure switch is damaged, wiring error CN111(HP) 2. Too much refrigerant 3. Check whether the fan works properly 4. Air intake or blockage in the fluorine system 5. Whether the water tank is masonry serious 6. The water tank temperature sensor is damaged.
E09	The communication between main board and controller failure	Check the communication connection between the wire controller and the main board CN17(COM1)
E16	The coil temperature sensor failure	1. The sensor cable is disconnected or short-circuited 2. The sensor is damaged 3. Main board port is damaged CN1(T1).
E21	The ambient temperature sensor failure	1. The sensor cable is disconnected or short-circuited 2. The sensor is damaged T2 3. Main board port is damaged CN1(T2).
E18	Exhaust sensor failure	1. The sensor cable is disconnected or short-circuited 2. Sensor T3 is damaged 3. Main board port is damaged CN1(T3).
E14	Tank sensor failure	1. The sensor cable is disconnected or short-circuited 2. Sensor T4 is damaged 3. Main board port is damaged CN2(T4).

Error code	Protection/Malfunction	Possible reasons
E29	Suction sensor failure	1. The sensor cable is disconnected or short-circuited 2. The sensor T5 is damaged 3. Main board port is damaged CN1(T5).
E44	Low ambient temperature protection	1. When the ambient temperature $\leq -9^{\circ}\text{C}$, the compressor is not allowed to run. 2. When the ambient temperature $\geq -7^{\circ}\text{C}$, the compressor will disappear and resume operation.

9 Wifi functionality manual

9.1 Download APP and Registration:

Download "Smart Life" app from the app store, as shown in the below:



9.2 Controller Network Configuration::

9.2.1. Smart Network Mode:

Step 1:

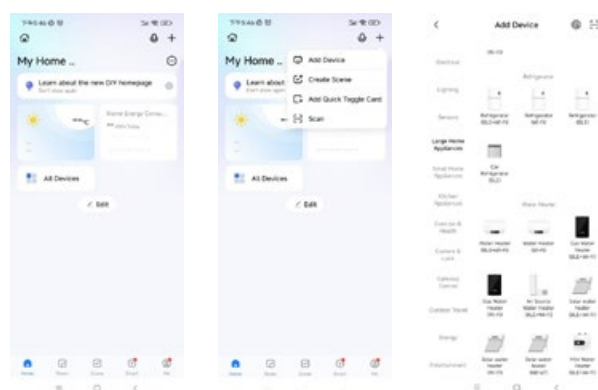
- 1) The device allows connection within 10s of power-on. After 10s, manual intervention is required.
- 2) Press + for 5s start the network configuration.
- 3) The configuration mode will exit after 3mins. To reconnect again, press + or 5s.

Step 2:

Enable Wi-Fi on your smart-phone and connect Wi-Fi with internet access.

Step 3:

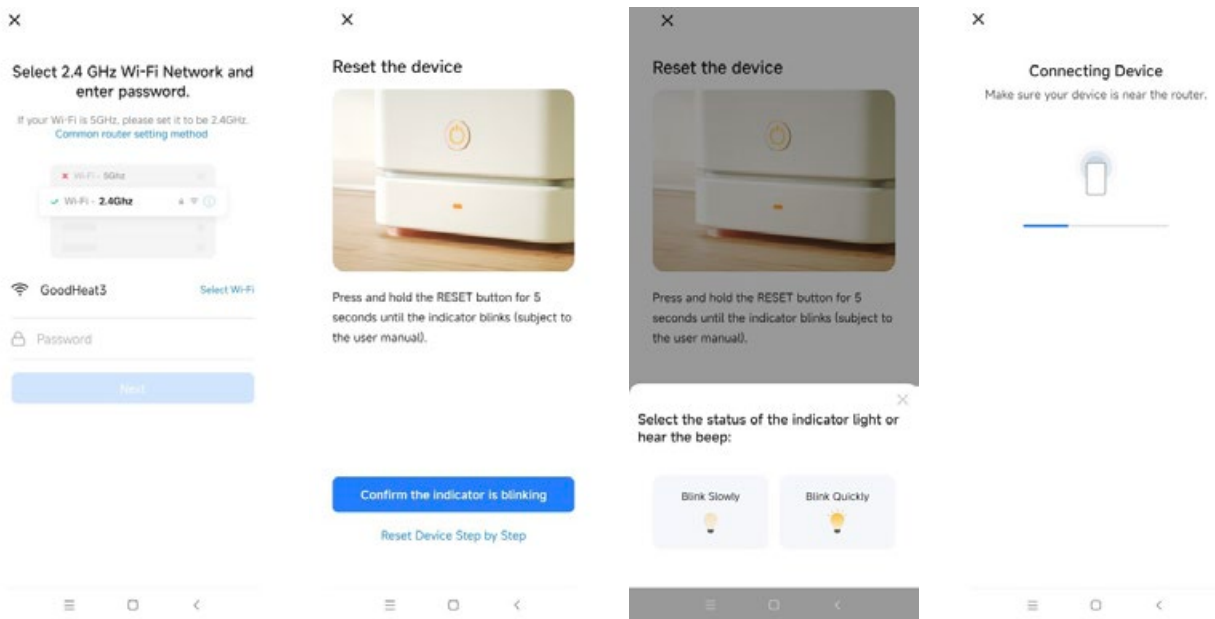
Open the "Smart Life" app, log in and press " + " icon, select "Add Device," and choose "Water Heater" under "Major Appliances" to add the device.



Step 4:

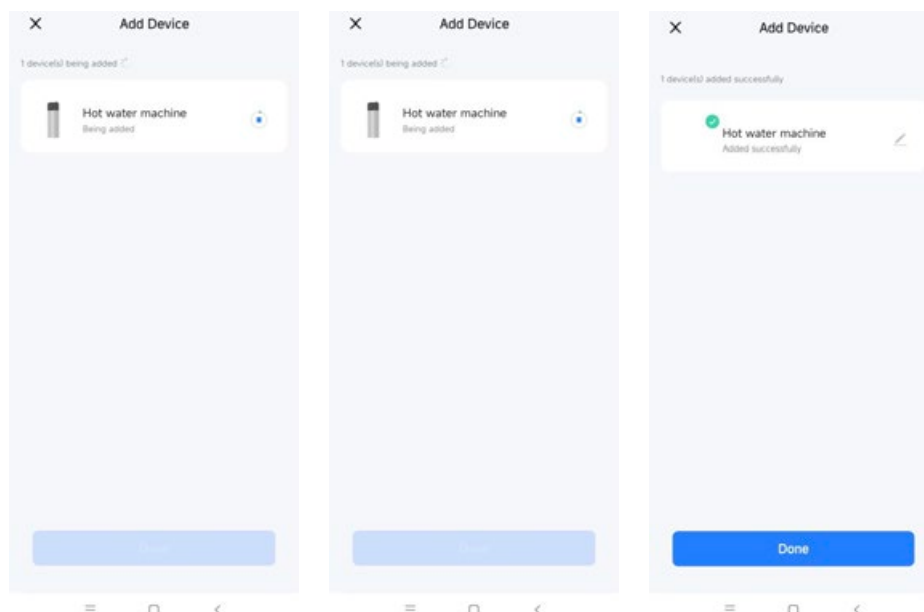
1)After selecting the heat pump, enter the Wi-Fi connection interface, enter the Wi-Fi password (must match your phone's Wi-Fi), and press "Confirm."

2)In the "Add Device" interface, ensure controller is in Smart Network Mode, press "Confirm the indicator is blinking" to start device connection.



Step 5:

When "Device Found," "Device Registered to Smart Cloud," and "Device Initialization" are all completed, the connection is successful. The system will show "Device Added Successfully." You can change the device name, select the installation location (Living Room, Master Bedroom, etc.), and click "Finish" to enter the device operation interface.



9.2.2. AP Network Mode:

Step 1:

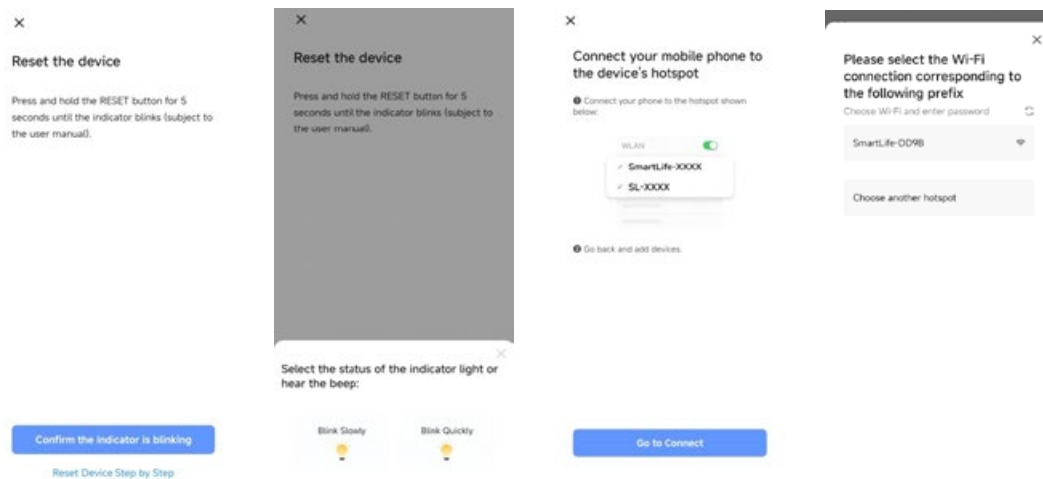
- 1) Press "🔍 + 🔍" for Ss to enter AP network mode. The phone can start the network configuration.
- 2) After 3 mins, the network mode will exit automatically. To enter again, press "🔍 + 🔍" for 5 s.

Step 2 & Step 3:

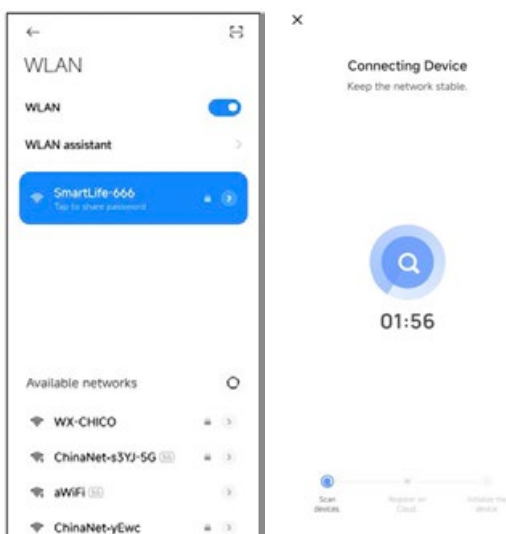
Follow the same steps as in Smart Network Mode.

Step 4:

- 1) After selecting the heat pump, enter the Wi-Fi connection interface, enter the Wi-Fi password (must match your phone's Wi-Fi), and press "Confirm" (same as Smart Network Mode).
- 2) In the "Add Device" interface, ensure the controller is in AP Network Mode, then press "Confirm the indicator is slowly flashing." Follow the prompt to connect your phone to the device's hotspot by pressing "Go to Connect," then proceed to device connection.



- 3) Settings the phone's Wi-Fi interface, find and select the corresponding "Smartlife_XXX" network. Then, return to the "Smart Life" app, which will automatically enter device connection.



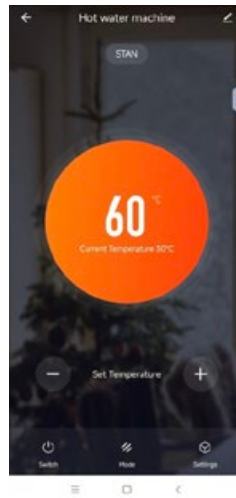
Step 5:

{Same as Smart Network Mode}(l) When "Device Found," "Device Registered to Smart Cloud," and "Device Initialized" are all completed, the connection is successful. The system will display "Device Added Successfully." You can change the device name, select the installation location (e.g., Living Room, Master Bedroom, etc.), and click "Finish" to enter the device operation interface.

Note: If the connection fails, manually enter AP Network Mode and repeat the steps above to reconnect.

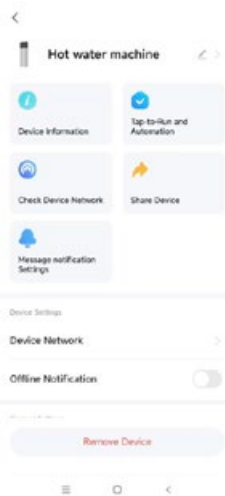
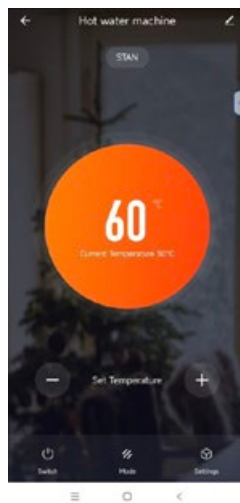
9.3 Software Function

- 1) After successful device binding, enter the "DHW Heat Pump" (default device name, can be changed) operation interface.
- 2) In the "Smart Life" main interface, press "DHW Heat Pump" under "All Devices" to enter the device operation interface.



9.4 Modify Device Name

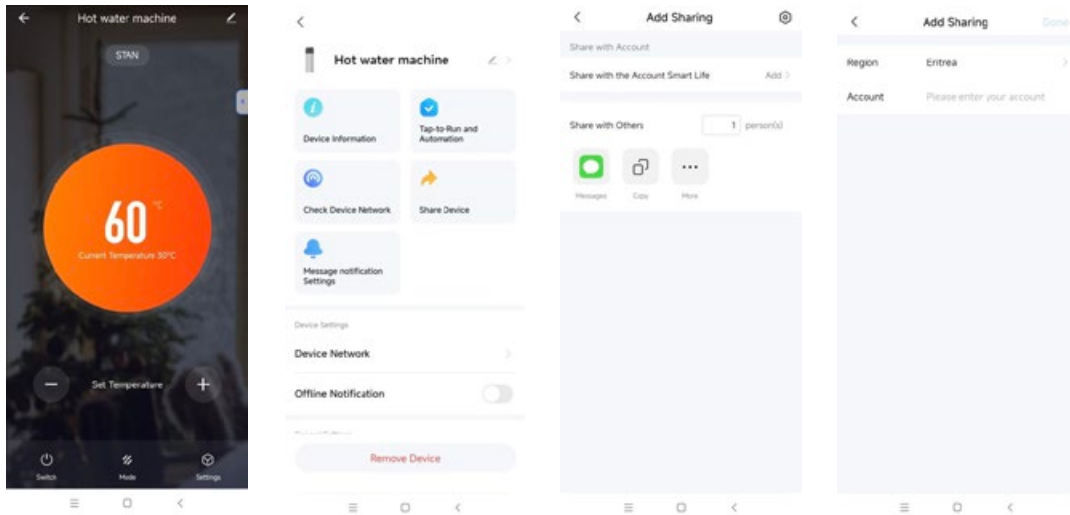
Press the image to enter "Device Details," then press "Device Name" to rename the device.



9.5 Device Sharing

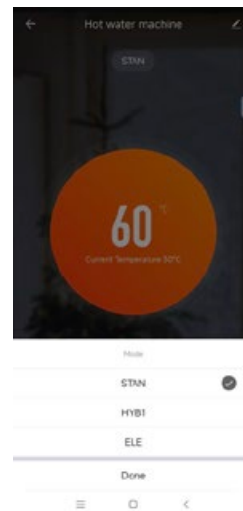
- 1) To share a bound device, the sharer follows the steps below.
- 2) After sharing, the recipient will appear in the list.
- 3) To remove a shared user, long press the selected user, and the delete option will appear. press "Delete" to remove.

Enter the recipient's account, press "Finish," and the shared account will appear in the list.



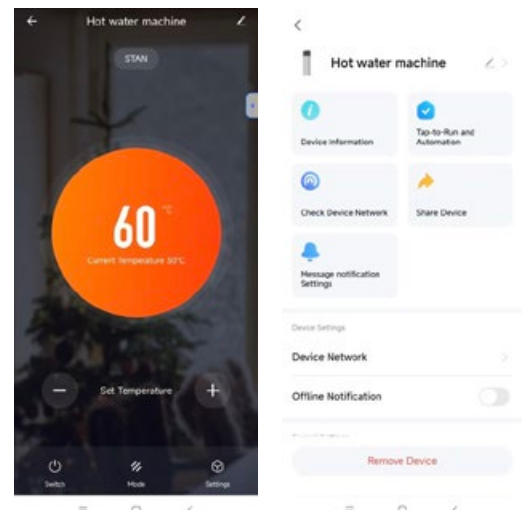
9.6 Mode Settings

In the device operation main interface, press "Mode" icon to open the mode selection interface. Select the desired mode.






9.7 Device Removal

In the device operation main interface, press "Settings" icon to enter the device details interface. At the bottom of the device details interface, press "Remove Device" to enter Smart Network Mode. You can reconnect within 3mins; after 3mins, the network mode will exit. Follow the steps shown in the image.



10. Maintenance and periodical controls

	WARNING: All operations described in this chapter MUST be performed by qualified personnel only. Before beginning any operation or accessing the internal components of the unit, ensure that the power supply is disconnected. The compressor head and discharge piping typically operate at high temperatures. Exercise extreme caution when working in their vicinity. The aluminum coil fins are very sharp and may cause serious injuries; handle them with care. After completing maintenance procedures, reattach the cover panels and secure them with screws where applicable.
	WARNING: Install the unit with adequate clearance for maintenance and repairs. The warranty does not cover costs for platforms or handling equipment needed for maintenance.
	The refrigerant circuits must only be filled with the gas specified on the nameplate. Using a different refrigerant can cause severe damage to the compressor.
	Only the oils specified in this manual should be used. Using a different oil can cause serious damage to the compressor.
	If the outlet water is adequate, it is recommended to set a lower temperature to reduce heat release, prevent scaling, and save energy.

Periodic checks should be conducted to ensure the proper operation of the unit.

Operation	1 month	2 month	3 month
Frequently check the water supply and air vent to prevent water or air shortages in the water loop. Ensure that the tank is always filled with water.	X		
Verify that safety and control devices are functioning correctly.	X		
Inspect the compressor for any oil leaks.	X		
Check for potential water leaks in the hydraulic circuit.	X		
Confirm the proper operation of the external flow switch (if installed).	X		
Clean the metallic filters in the hydraulic circuit to maintain good water quality. A lack of water or dirty water can damage the unit.	X		
Use compressed air to clean the finned coils of the heat exchanger. It is recommended to keep the unit in a dry, clean area with good ventilation.	X		
Verify the correct operation of the electric heater for the anti-Legionella cycle(*). Ensure diagnostic samples of water are taken from critical points throughout the entire hydraulic circuit.		X	
Ensure that all terminals on the electrical panel and the compressor terminals are securely fixed.		X	
Ensure all electrical components are in good condition. If any part is damaged or if there is an unusual odor, replace it promptly.		X	
Tighten all water connections as needed.		X	
Clean the unit using a soft, damp cloth.		X	
Regularly clean the tank and electric heater to maintain optimal performance		X	
Periodically clean the external air duct grille to ensure efficient operation.		X	
Periodically clean the external air duct grille to ensure efficient operation.			X
Inspect each component of the unit and check the system pressure.			X
Replace any faulty parts and recharge the refrigerant if necessary.			X
Check the operating pressure, superheat, and subcooling temperatures.			X
Assess the efficiency of the circulation pump.			X
If the heat pump is not used for an extended period, drain all water from the unit and seal it to preserve its condition. In winter, drain water from the lowest point of the boiler to prevent freezing. Before restarting the unit, perform a water recharge, disinfection, and a complete inspection.			X
Check and replace the magnesium anode rod if necessary.			every year

(*) Checking the proper operation of the electric heater: To verify the activation of the electric heater, select the "E-heater" mode and monitor the increase in tank water temperature.

11. environmental protection

Because R290 is flammable and explosive, it is directly discharged into the atmosphere, and once it accumulates in the local area to reach the explosion limit, it may cause an explosion accident when it encounters the fire source, so it cannot be released into the atmosphere at will. At the end of its service life, it needs to be reasonably collected and disposed of, and is generally handed over to a qualified recycling enterprise for recycling or proper disposal to ensure safety.



This equipment contains R290 refrigerant, the quantity is in accordance with the specifications. Do not vent R290 into the atmosphere: R290, is flammable and can form an explosive mixture when mixed with air, which is highly likely to cause serious safety accidents such as combustion and explosion if not operated properly. It can only be repaired or disassembled by trained personnel.

12. Troubleshooting

This section provides helpful guidance for diagnosing and resolving common issues that may arise. Before beginning the troubleshooting process, perform a thorough visual inspection of the unit to check for any obvious defects, such as loose connections or faulty wiring.

Please review this chapter carefully before contacting your local dealer, as it may save both time and money.



When performing an Inspection on the electrical box of the unit, ensure that the main power switch is turned to the 'off' position before proceeding.

The guidelines below might help to solve your problem. If you cannot solve the problem, consult your installer/local dealer.

- No image on the controller (blank display): Ensure that the main power supply is properly connected.
- Error code displayed: If an error code appears, please consult your local dealer for assistance.
- Scheduled timer issue (actions executed at incorrect times): If the programmed actions are being executed too early or too late (e.g., 1 hour off), check that the time and day settings are correct. Adjust the clock and day of the week as needed.

13. Disposal requirements



When the unit reaches the end of its life cycle and needs to be decommissioned or replaced, the following steps are recommended:

- The refrigerant should be recovered by trained personnel and sent to an authorized collection center.
- The compressor lubricating oil must be collected and properly disposed of at an authorized facility.
- The casing and other components, if no longer serviceable, should be dismantled and separated according to their material type, particularly copper and aluminum, which are present in significant quantities in the unit.

These procedures facilitate the recovery and recycling of materials, reducing environmental impact.

The user is responsible for ensuring the proper disposal of this product in accordance with national regulations in the destination country.

For more information, please contact the installation company or the relevant local authority.

	Improper decommissioning of the appliance may result in significant environmental damage and pose serious risks to personal safety. Therefore, it is mandatory that the unit be disposed of exclusively by authorized personnel who have completed technical training courses recognized by the relevant competent authorities.
	It is mandatory to adhere to the same safety precautions outlined in the preceding sections.
	Exercise extreme caution during the disposal of refrigerant gas to ensure safety and environmental compliance.
	Illegal disposal of the product by the end user will result in penalties as per the laws of the country where the disposal occurs.
	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.

14. Technical Characteristics

14.1 Enamel Water Tank Material Characteristics

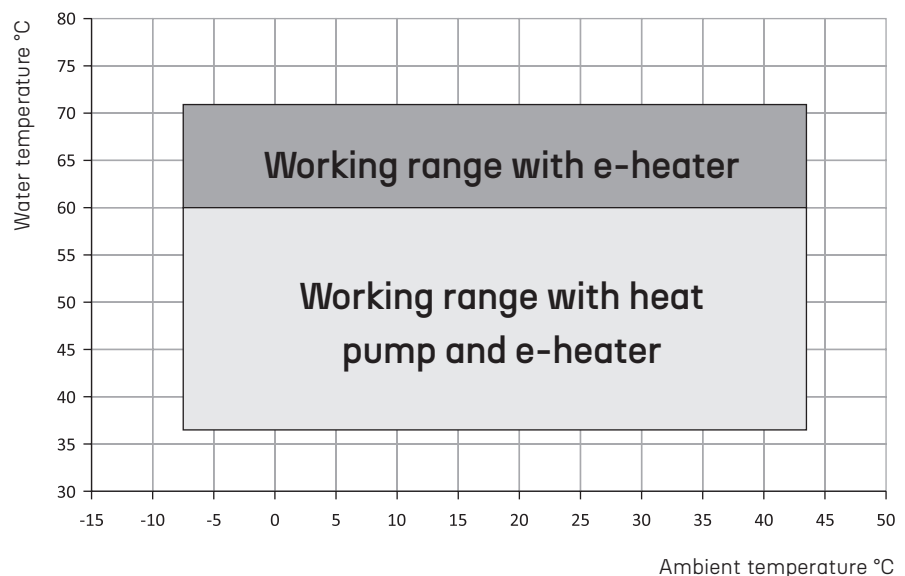
Model		ENDHWDP100	ENDHWDP200X	ENDHWDP300X
Nominal Heating Capacity *	kW	1.1	1.6	
Tapping cycle****	/	M	L	XL
Heating Capacity (7/6°C)**	kW	0.8	1.302	1.18
COP (20/15°C)****	W/W	4.75	4.85	4.85
Energy Class(7/6°C)****	/	A+		
Standby power input(7/6°C)***	W	30		
Sound power level *****	dB(A)	55		
Power supply	V/Ph/Hz	220-240 / 1 / 50		
Rated Power	W	400+ 1600 (e-heeter)	900+ 1600 (e-heater)	
Rated Current	A	2.1 +7.1 (e-heater)	3.9+7.1 (e-heater)	
Max. water temperature (without using backup heater)	°c	65		
Max. water temperature	°c	75		
Temperature setting range	°c	15-75		
Rated water yield*	L/H	23.6	34.4	
Working temperature range	°c	-7-46		
Water inlet temperature range	°c	9-55		
Max. discharge pressure	bar	30		
Max. suction pressure	bar	10		
Refrigerant type	/	R290		
Refrigerant charge	g	150		
Air flow	m ³ /h	500		
Duct diameter	mm	150		
Max allowed pressure of tank	bar	10		

Model		ENDHWDP100	ENDHWDP200X	ENDHWDP300X
Water tank Material	/	Enamel		
Hot water outlet	inch	G 1/2 Male thread	G 3/4 Female thread	
Cold water inlet	inch	G 1/2 Male thread	G 3/4 Female thread	
Size of water drain	inch	G 1/2 Male thread	G 3/4 Female thread	
Condensed water outlet	inch	G 1/2 Female thread		
Material of heat pump coil	/	Microchannel		
Unit protection Indoor unit {IP xx}		IPX1		
Water tank Volume	L	100	200	300
Net Dimensions	mm	510*1240	570*1720	650*1926
Packing Dimensions	mm	Ø 570*570*1280	Ø 640*1890	Ø 720*2070
Net Weight	kg	51	93	117
Gross Weight	kg	67	109	137
Included features:	Sanitary water heating			
	auxiliary electrical heater 1.6kw			
	Electronic expansion valve			
(*) Capacities and power inputs based on the following conditions: - Heating: Ambient temperature 20°C / 15°C Water temperature from 15°C to 55°C. (**) Capacities and Heating Time based on ERP (EN 16147) for Stage A; (***) Standby power input based on ERP (EN 16147) for Stage B; (****) COP and Energy Class based on ERP (EN 16147) for Stage C with topping cycle M / L / XL (*****) Noise is tested according to EN 12102 with water 50°C.				

15. Working limits of heat pump

It is recommended to operate the unit within the specified working limits below to prevent the activation of safety and protection devices.

In cases where the water temperature exceeds the operating range, the unit will automatically adjust the water temperature to comply with the limits shown in the diagram below.

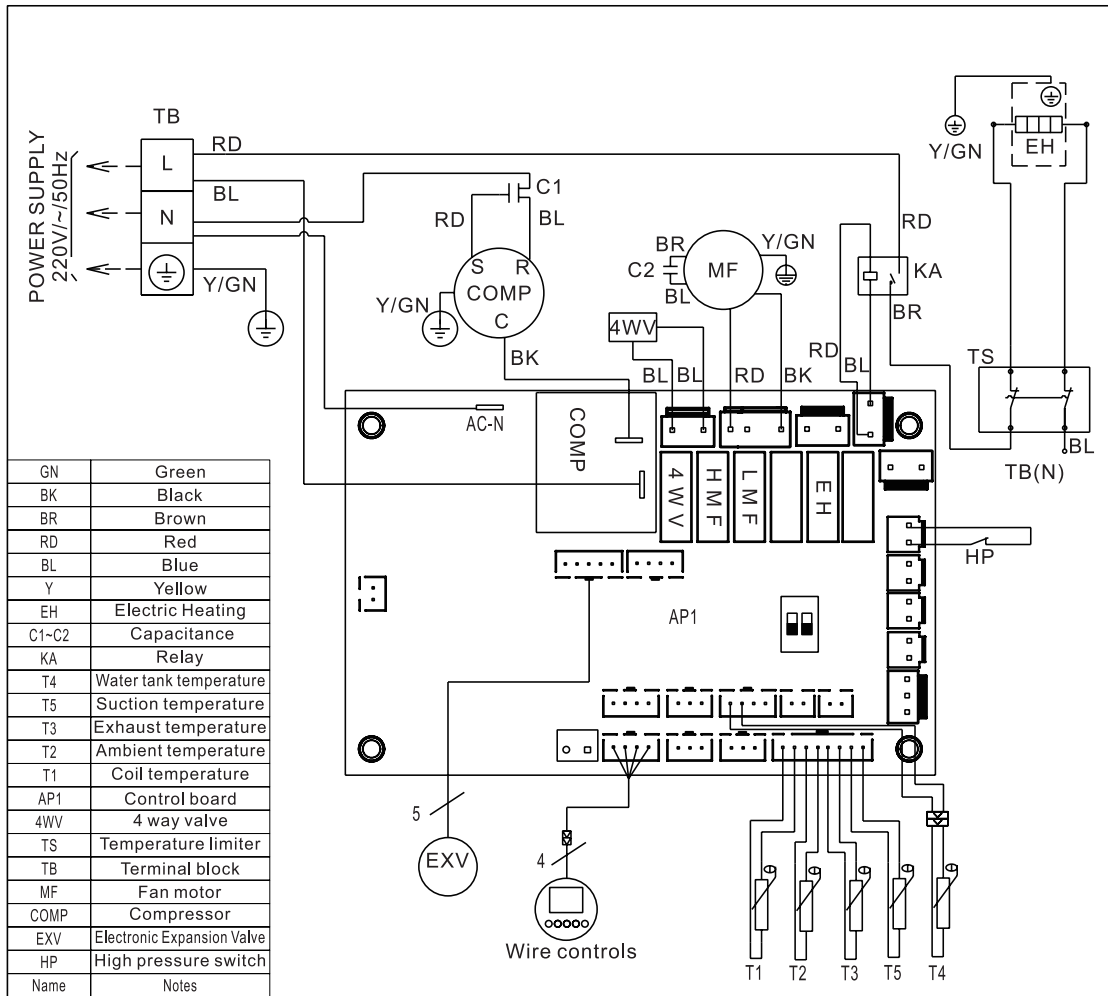


Here below the fixed sets of the pressure switches:

- HP switch: OFF=25 bar, ON=18 bar
- LP switch: OFF=0,2 bar, ON=1 bar

16. Wiring diagram

Please refer to the the wiring diagram stuck on the electric box.



Note: The company reserves the right to make continuous improvements to deliver the latest products to customers. The actual unit wiring diagram shall prevail; this diagram is for reference only.

17. Annex I: Refrigerant handling instructions

DD.4.1 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 minimized. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

DD.4.2 Work procedure

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

DD.4.3 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.

DD.4.4 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.

DD.4.5 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.

DD.4.6 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.

DD.4.7 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.

DD.4.8 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.

DD.4.9 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 no live electrical components and wiring are exposed while charging, recovering or purging the system;
- that there is continuity of earth bonding.

DD.5 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 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.

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 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 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.

DD.6 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.

DD.7 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.

DD.8 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.

DD.9 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.

DD.10 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 flammable 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.

DD. 11 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 minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is grounded 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 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.

DD. 13 Labelling

Equipment shall be labeled 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.

DD.14 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 are available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

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

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

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



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