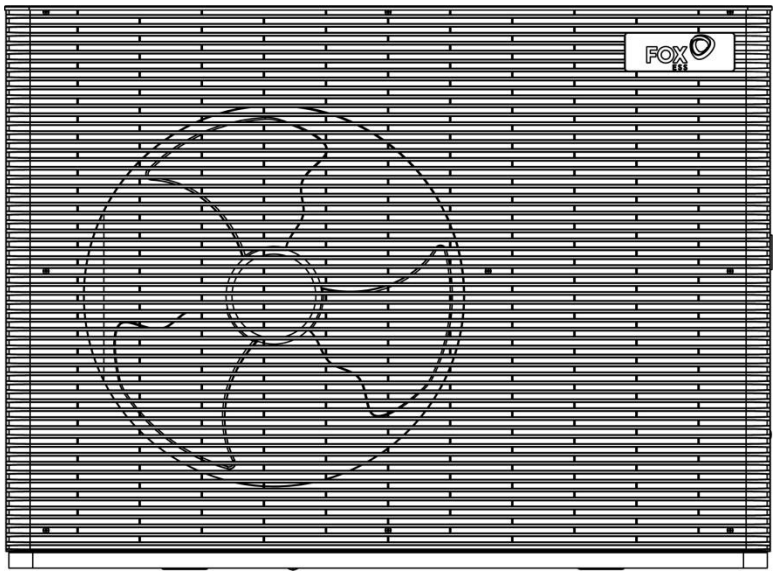
Installation, Operation and Maintenance Manual

HP Series

Air To Water Heat Pump



BEFORE USING YOUR UNIT, PLEASE READ THIS MANUAL CAREFULLY AND KEEP IT FOR FURTHER REFERENCE.

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1 Explanation of Symbols and Safety Precautions

Please read this entire document to ensure the proper use of the unit. Failure to follow this may void the warranty. Please strictly follow the safety instructions in this manual during operation, otherwise it may result in equipment malfunction, electrical shock, series injury or death.

1.1 Symbols Used

This section explains the symbols shown in this manual:

	**Danger!** "Danger" indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	**Warning!** "Warning" indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	**Caution!** "Caution" indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	**Note!** "Note" provides important tips and guidance.

This section explains the symbols shown on the unit:

	**Warning!** Flammable refrigerant is applied. A fire may occur due to unexpected leakage of refrigerant.
	**Note!** The unit complies with the requirements of the applicable CE guidelines.
	**Caution!** Product should not be disposed as household waste.
	**Caution!** Read the manual carefully before any further action.
	**Caution!** The information is available in the relevant documentation.
	**Caution!** Only a specialist is allowed to take action under the instructions of the manual.

1.2 Intended Use

There is a risk of injury or death to the user or others, or of damage to the product and other property in the event of improper or unintended use. The air that escapes from the product must be able to flow out freely, and should not be used for any other purposes.
The following places are not appropriate for installation:

- Areas where there is mist of mineral oil or oil spray or vapors, as plastic parts may deteriorate, and cause joint loose and water leakage.
- Locations where corrosive gases (such as sulfurous acid gas) are produced, or corrosion of copper pipes or soldered parts may cause leakage of refrigerant.
- Areas where there is machinery which emits massive electromagnetic waves. Enormous electromagnetic waves can disturb the control of the system and cause equipment malfunction.
- Areas where flammable gases may leak, carbon fiber or ignitable dust is suspended in the air or volatile flammables such as paint thinner or gasoline are handled. These types of gases might cause a fire.Where the air contains high levels of salt such as a location near the ocean.
- Environments with fluctuating voltage, such as factories, vehicles, or vessels, and places with acidic or alkaline vapors.

Intended use includes the following:

- Observance of the operating instructions included for the product and any other installation components.
- Compliance with all inspection and maintenance conditions listed in the instructions.
- Installing and setting up the product in accordance with the product and system approval.
- Installation, commissioning, inspection, maintenance and troubleshooting by qualified contractors and authorized installers.

Intended use also covers installation in accordance with the ingress protection standard.
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 provided that they have been given supervision or instruction concerning the use of the appliance in a safe way and understand the hazards involved. Children should not play with the appliance. Cleaning and maintenance should not be made by children without supervision.
Any other use that is not specified in these instructions, or use beyond that specified in this document, should be considered as improper use. Any direct commercial or industrial use is also deemed to be improper.

	**Caution!** Improper use of any kind is prohibited. ● Do not rinse the unit. ● Do not place any object or equipment on top of the unit. ● Do not climb, sit or stand on top of the unit.

1.3 Safety Statements

	**Danger!** ● Before touching electric terminal parts, turn off power switch. ● When service panels are removed, live parts can be easily touched by accident. ● Never leave the unit unattended during installation or servicing when the service panel is removed. ● Do not touch water pipes during or immediately after operation as the pipes may be hot and could burn your hands. To avoid injury, wait until the pipes cool down to ordinary temperature or be sure to wear protective gloves. ● Do not touch any switch with wet hands. Touching the switch with wet hands can cause electrical shock. ● Before touching electrical parts, turn off all applicable power to the unit.
	**Warning!** ● Do not use means to accelerate the defrosting process or to clean, 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 odour. ● 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. ● Service personnel who shall be instructed to undertake the following when servicing an appliance that employs a flammable

	refrigerant: wear anti-static equipment; use dedicated recovery equipment to handle refrigerant; verify system integrity with a leak detector after servicing; do not weld pipelines without evacuating refrigerant; and do not use non-standardized replacement parts. ● Tear apart and throw away plastic packaging bags so that children will not play with them. Children playing with plastic bags face danger of death by suffocation. ● Safely dispose of packing materials such as nails, other metal and wood parts that could cause injuries. ● Ask your dealer or qualified personnel to perform installation work in accordance with this manual. Do not install the unit by yourself. ● Improper installation could result in water leakage, electric shocks or fire. ● Be sure to use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shocks, fire, or the unit falling from its mount. ● Install the unit on a foundation that can withstand its weight. Insufficient physical strength may cause the equipment to fall and possible cause injury. ● Perform specified installation work with full consideration of strong wind, hurricanes, or earthquakes. Improper installation work may result in accidents due to equipment falling. ● Make certain that all electrical work is carried out by qualified personnel according to the local laws and regulations and this manual using a separate circuit. Insufficient capacity of the power supply circuit or improper electrical construction may lead to electric shocks or fire. ● Be sure to install a ground fault circuit interrupter according to local laws and regulations. Failure to install a ground fault circuit interrupter may cause electric shocks and fire. ● Make sure all wirings are secure. Use the specified wires and ensure that terminal connections or wires are protected from water and other adverse external forces. Incomplete connection or affixing may cause a fire. ● When wiring the power supply, form the wires so that the side panel can be securely fastened. If the side panel is not in place there could be overheating of the terminals, electric shocks or fire. ● After completing the installation work, check to make sure that there is no refrigerant leakage. ● Never directly touch any leaking refrigerant as it could cause severe frostbite. Do not touch the refrigerant pipes during or immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor and other refrigerant cycle parts.

	Burns or frostbite are possible if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature. If you must touch them, be sure to wear protective gloves. ● Do not touch the internal parts (pump, backup heater, etc.) during or immediately after operation. Touching the internal parts will cause burns. To avoid injury, give the internal parts time to return to normal temperature. If you must touch them, be sure to wear protective gloves.
	**Caution!** ● Ground the unit. ● Grounding resistance should comply with local laws and regulations. ● Do not connect the ground wire to gas or water pipes, lightning conductors or telephone ground wires. ● Incomplete grounding may cause electric shocks. ● Gas pipes：Fire or an explosion may occur if the gas leaks. ● Water pipes：Hard vinyl tubes are not effective grounds. ● Lightning conductors or telephone ground wires: Electrical threshold may rise abnormally if struck by a lightning bolt. ● Install the power wire at least 3 feet (1 meter) away from televisions or radios to prevent interference or noise. (Depending on the radio waves, a distance of 3 feet (1 meter) may not be sufficient to eliminate the noise.) ● Do not wash the unit. This may cause electric shocks or fire. The appliance must be installed in accordance with national wiring regulations. 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. ● If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person. ● DISPOSAL: Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary. Do not dispose of electrical appliances as municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substance can leak into the groundwater and get into the food chain, damaging your health and well-being. ● The wiring must be performed by certified person technicians in accordance with national wiring regulation and this circuit diagram. An all-pole disconnection device which has at least 3mm separation distance in all pole and a residual current device (RCD) with the rating not exceeding 30mA shall be incorporated in the fixed wiring according to the national rule.

	● Confirm the safety of the installation area (walls, floors, etc.) without hidden dangers such as water, electricity, and gas before wiring/pipes. ● Before installation, check whether the user's power supply meets the electrical installation requirements of unit (including reliable grounding, leakage, and wire diameter electrical load, etc.). If the electrical installation requirements of the product are not met, the installation of the product is prohibited until the product is rectified. ● Product installation should be fixed firmly. Take reinforcement measures when necessary.

1.4 Refrigerant Precaution

	**Warning!** ● Transport of equipment containing flammable refrigerants: Compliance with transport regulations. ● Marking of equipment using signs: Compliance with local regulations. ● Disposal of equipment using flammable refrigerants: Compliance with national regulations. ● Storage of equipment/appliances: The storage of equipment should be in accordance with the manufacturer's instructions. ● Storage of packed (unsold) equipment: Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge. The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations. ● Information on servicing: **i.** Checking 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. **ii.** Work Procedure Work shall be undertaken under a controlled procedure so as to minimize the risk of flammable gas or vapor being present while the work is being performed. **iii.** General Work Area All maintenance staff and others working in the local area shall be instructed on the nature of the 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. **iv.** Checking for the 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. **v.** 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 CO_2 fire extinguisher adjacent to the charging area. **vi.** No ignition sources No person carrying out work in relation to a refrigeration system that involves exposing any pipework 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, removal, 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. **vii.** 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. **viii.** Checking 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 of the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected. ➢ Refrigeration pipes 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 that are inherently resistant to being corroded or are suitably protected against being so corroded. **ix.** Checking 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 capacitor is discharged: this shall be done in a safe manner to avoid the possibility of sparking. ➢ That there no live electrical components and wiring are exposed while charging, recovering, or purging the system. ➢ That there is continuity of earth bonding. ● Repairing sealed components ➢ During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation. ➢ Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, an excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc. Ensure that apparatus is mounted securely. Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications. NOTE: The use of silicone sealant may inhibit the effectiveness of

	some types of the leak. ● Repairing 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 currently permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while living in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak. ● Cabling Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans. ● Detection of flammable refrigerants Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. ● Leak detection methods The following leak detection methods are deemed acceptable for systems containing flammable refrigerants. Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25% maximum) is confirmed. Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. ● Removal and evacuation When breaking into the refrigerant circuit to make repairs or for any other purpose, conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to: ➢ Remove refrigerant. ➢ Purge the circuit with inert gas. ➢ Evacuate.

	➢ Purge again with inert gas. ➢ Open the circuit by cutting or brazing. The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be "flushed" with OFN to render the unit safe. This process may need to be repeated several times. Compressed air or oxygen shall not be used for this task. Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to the atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place. Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available. ● Charging procedures In addition to conventional charging procedures, the following requirements shall be followed. ➢ It is strictly prohibited to charge refrigerant without permission. ➢ 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 earthed prior to charging the system with refrigerant. ➢ Label the system when charging is complete (if not already). ➢ Extreme care shall be taken not to overfill the refrigeration system. ➢ Prior to recharging the system, it shall be pressure tested with OFN. The system shall be leak tested on completion of charging prior to commissioning. A follow-up leak test shall be carried out prior to leaving the site. ● 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 the re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced. ➢ Become familiar with the equipment and its operation. ➢ Isolate system electrically.

	➢ 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. ➢ Pump down refrigerant system, if possible. ➢ If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system. ➢ Make sure that cylinder is situated on the scales before recovery takes place. ➢ Start the recovery machine and operate in accordance with manufacturer's instructions. ➢ Do not overfill cylinders (No more than 80% volume liquid charge). ➢ Do not exceed the maximum working pressure of the cylinder, even temporarily. ➢ When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from the site promptly and all isolation valves on the equipment are closed off. ➢ Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked. ● Labeling Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant. ● Recovery ➢ It is strictly prohibited to recover refrigerant without permission. ➢ When removing refrigerants from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e., special cylinders for the recovery of refrigerant). Cylinders shall be complete with a 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 the 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.

2 General Introduction

2.1 Scope of Validity

This manual describes the assembly, installation, commissioning, maintenance and troubleshooting of the following model(s) of products:

HP Series Air To Water Heat Pump:

HP1-8-E HP1-10-E HP1-12-E HP3-8-E HP3-10-E HP3-12-E

HP1-8P-E HP1-10P-E HP1-12P-E HP3-8P-E HP3-10P-E HP3-12P-E

2.2 Unit Introduction

- **Introduction**

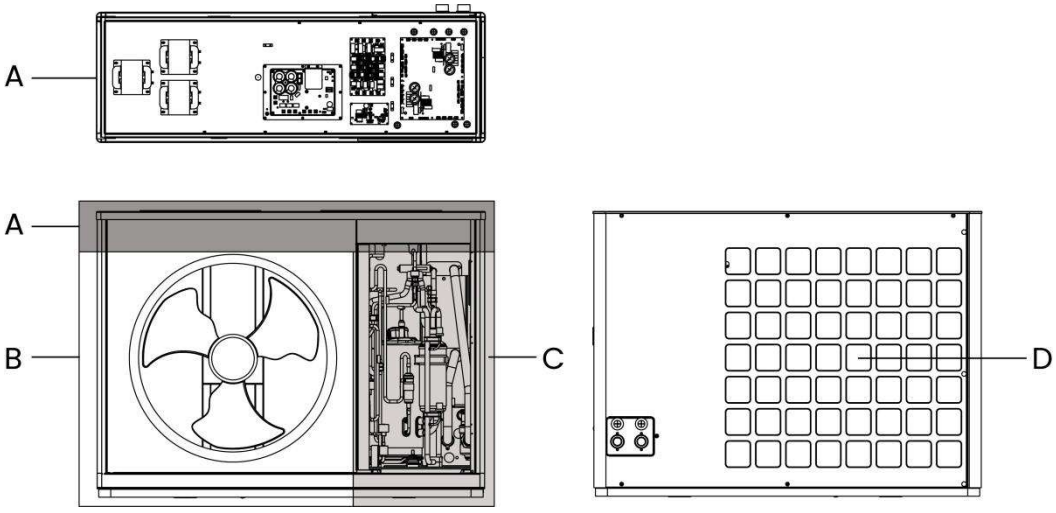
The HP Series Air To Water Heat Pump is a renewable energy technology that extracts heat from the ambient air and transfers it to a water-based heating system. The heat pump absorbs heat from the outdoor air, even in cold weather conditions, utilizing refrigerant to facilitate the heat exchange process. This captured heat is then transferred to a water circuit, such as underfloor heating or radiators, providing efficient space heating and hot water.

- **Function**

The HP Series Air To Water Heat Pump features sterilization, boiler function, solar energy function, smart grid function, modular functionality, energy efficiency analysis during operation, temperature compensation, three-zone temperature control, timer function, LAN and WiFi capability, automatic protection function, and function dip switches.

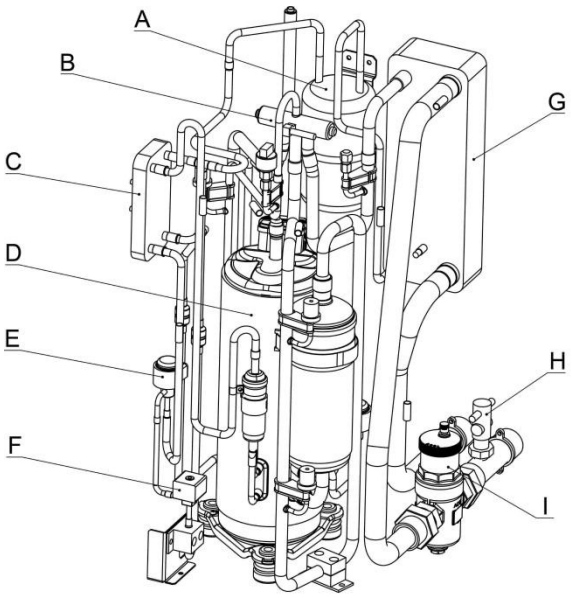
- **Layout**

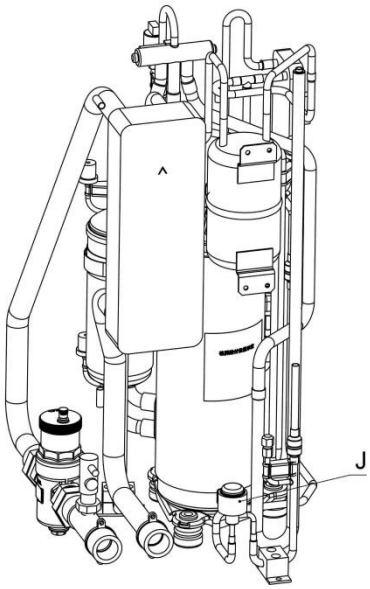
The Outdoor Unit:



Code	Name	Code	Name
A	Electronic Control Chamber	C	Mechanical Chamber
B	Fan Chamber	D	Fin Type Heat Exchanger

Mechanical Chamber of the Outdoor Unit:

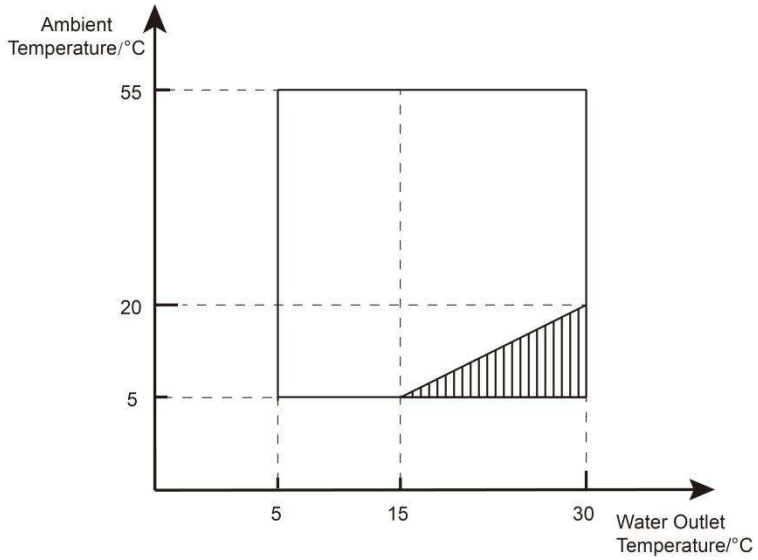




Code	Assembly Unit	Explanation
A	Accumulator	Buffer and store thermal energy during heat exchange and energy transfer processes.
B	Four-way Valve	Change the flow direction of the refrigerant within the heat pump cycle to enable different operational modes.
C	Economizer	The refrigerant itself evaporates and absorbs heat through throttling, allowing another portion of the refrigerant to become subcooled. This increases the efficiency and cooling capacity of the compression refrigeration cycle while reducing the discharge temperature of the compressor.
D	Compressor	Elevate low-pressure gas to high-pressure gas.
E	Auxiliary Electronic Expansion Valve	Implement specific local adjustment and control to optimize system performance and operational efficiency.
F	Magnetic Valve	Control the direction of refrigerant flow or regulate flow within a system.
G	Plate Heat Exchanger	Transfer thermal energy from one fluid to another fluid.
H	Flow Switch	Monitor the magnitude of fluid flow within a fluid system.
I	Microbubble Air Vent Valve	Remove bubbles and air present in pump systems, ensuring proper functionality.
J	Main Electronic Expansion Valve	Control the flow of refrigerant in the refrigeration system, enabling control over parameters such as temperature and humidity.

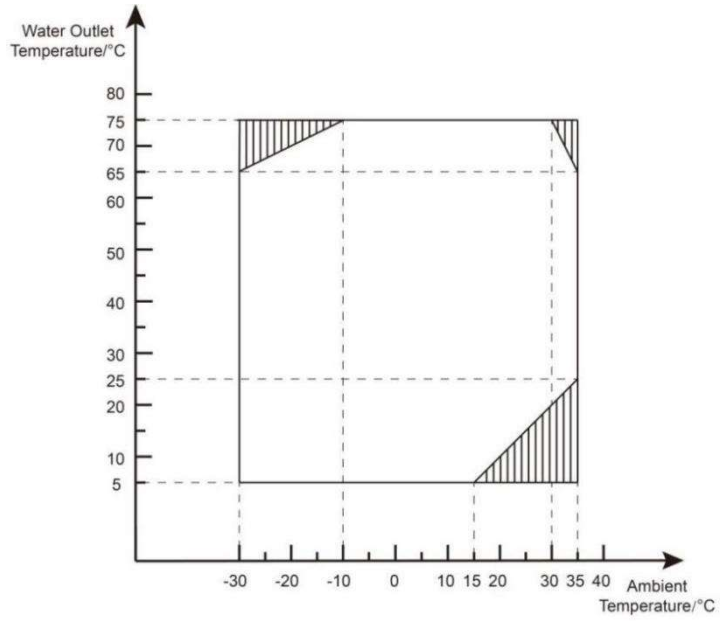
2.3 Operating Range

In the cooling mode, the product works at an outdoor temperature of 5 to 55 °C.



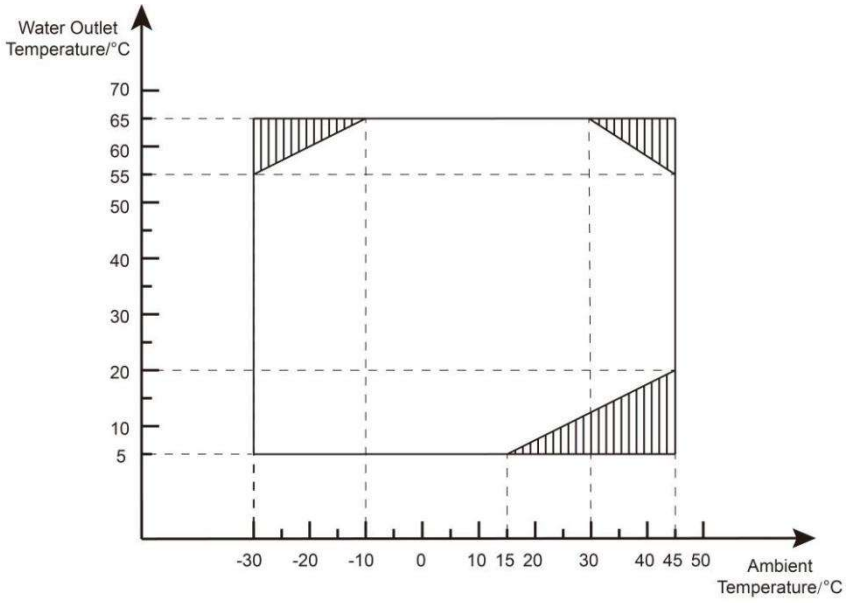
Operation range by heat pump with possible limitation and protection

In the heating mode, the product works at an outdoor temperature of -30 to 35 °C.



Operation range by heat pump with possible limitation and protection

In the DHW mode, the product works at an outdoor temperature of -30 to 45 °C.



Operation range by heat pump with possible limitation and protection

2.4 Documentation

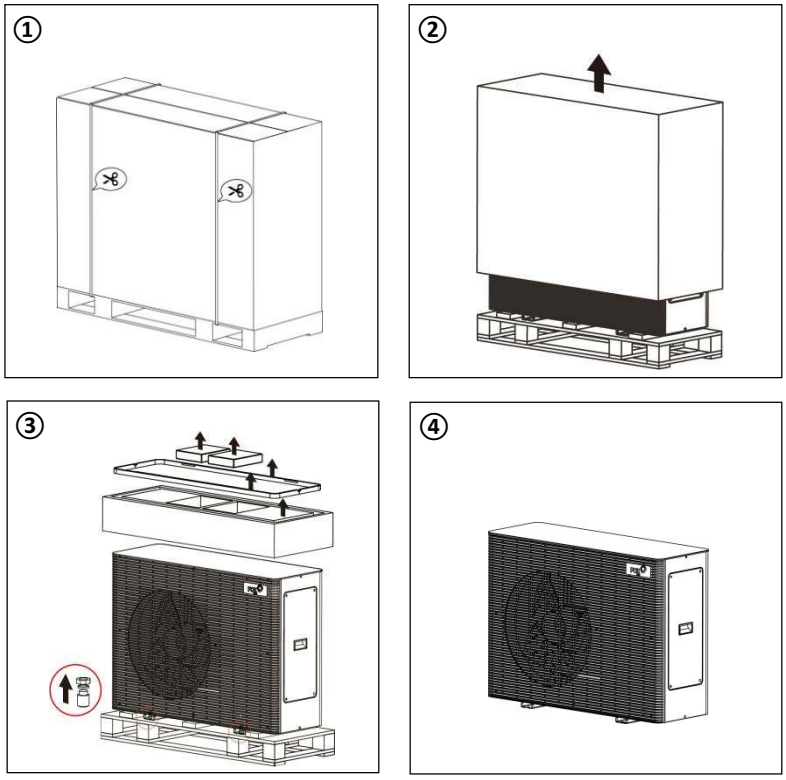
- Installation, Operation and Maintenance Manual

Scan the following QR code to download electronic documents.

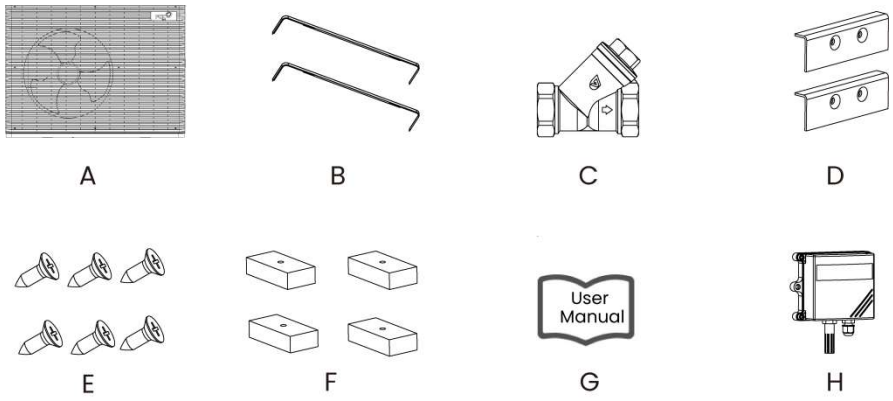
3 Installation

3.1 Before Installation

3.1.1 Unpacking



3.1.2 Packing List



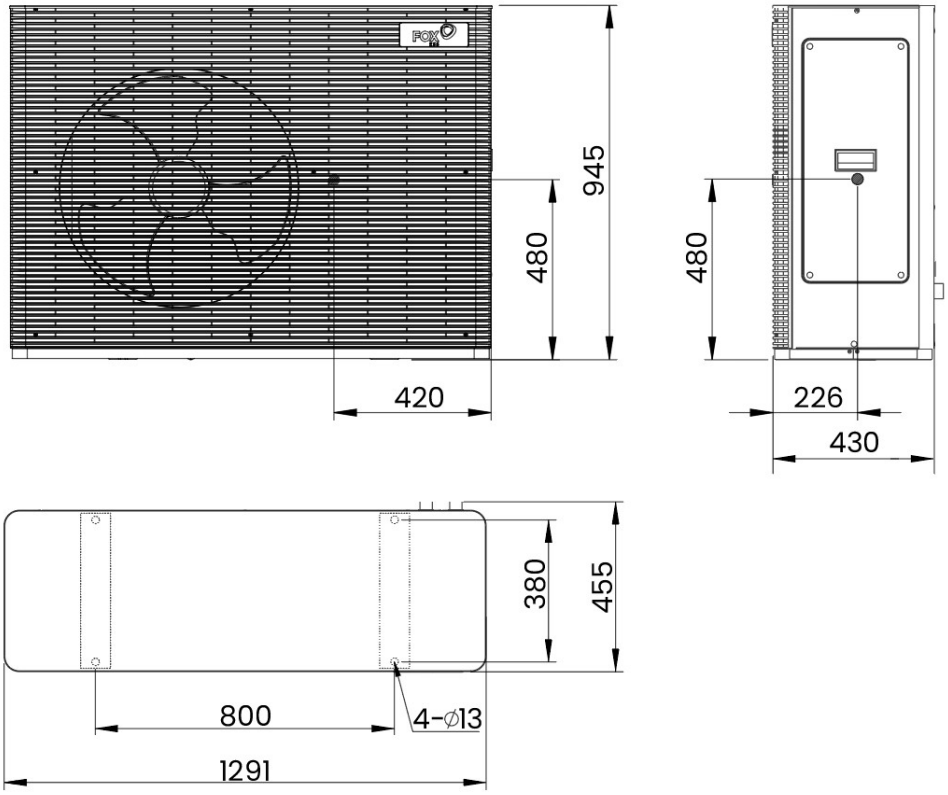
Code	Quantity	Description	Code	Quantity	Description
A	1	Heat Pump	E	6	Countersunk Phillips Screw
B	2	Base Cover	F	4	Rubber Buffer Blocks
C	1	Y-shaped Strainer	G	1	User Manual

D	2	Base Cover Fixing Sheet	H	1	Weather compensation temperature sensor housing (shall be installed on the shaded side of the building to avoid direct solar radiation)

3.1.3 Handling

- **Dimensions and Barycenter**

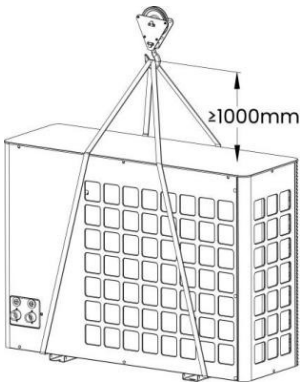
The numerical values indicate the lengths to find the barycenter (Unit: mm).



- **Handling**

⚠	**Caution!** ● To avoid injury, do not touch the air inlet or aluminum fins of the unit. ● The units are heavy. Prevent the units from falling due to improper inclination during handling. ● Protect the casing sections from damage. Use corner protectors under the units during lifting. ● The barycenter of the product and the hook should be kept in a straight line in the vertical direction to prevent excessive tilting. ● After lifting, remove the protectors.

Use lifting tools with transport straps or a suitable transport cart.



3.2 Unit Installation

3.2.1 Installation Site

⚠	**Warning!** ● There is flammable refrigerant in the unit and it should be installed in a well-ventilated site. ● Small animals making contact with electrical parts can cause malfunction, smoke or fire. Please instruct the customer to keep the area around the unit clean. ● The equipment is not intended for use in a potentially explosive atmosphere.

Select an installation site where the following conditions are satisfied and one that meets with your customer's approval.

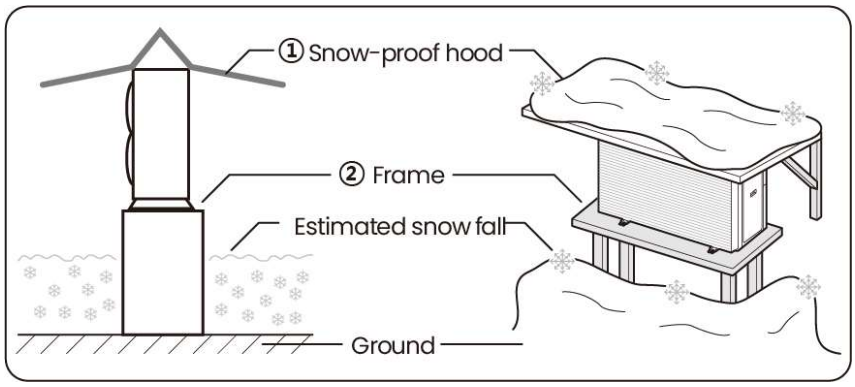
- Places that are well-ventilated.
- Places where the unit does not disturb next-door neighbors.
- Safe places which can bear the unit's weight and vibration and where the unit can be installed at an even level.
- Places where there is no possibility of flammable gas or product leak.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Places where servicing space can be well maintained.
- Places where the units' piping and wiring lengths are within the allowable ranges.
- Places where water leaking from the unit cannot cause damage to the surroundings (e.g. in case of a blocked draining pipe).
- Places where rain exposure can be minimized as much as possible.
- Do not install the unit in places often used as a work space. In case of construction work (e.g. grinding, etc.) that creates a lot of dust, the unit must be covered.
- Do not place any object or equipment on top of the unit (top plate).
- Do not climb, sit or stand on top of the unit.
- Be sure that sufficient precautions are taken in case of refrigerant leakage according to relevant local laws and regulations.
- Do not install the unit near the sea or where there is corrosive gas.

When installing the unit in a place exposed to **strong wind**, pay special attention to the following points. Strong wind blowing against the unit's air outlet causes a short circuit (suction of discharge air), and this may have the following consequences:

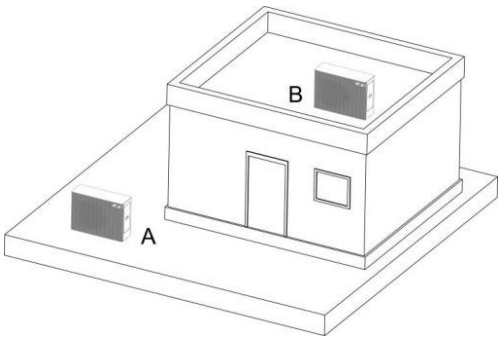
- Deterioration of the operational capacity.
- Frequent frost acceleration in heating operation.
- Disruption of operation due to high pressure rise.
- Motor burnout.
- When a strong wind blows continuously on the front of the unit, the fan can start rotating very fast until it breaks.

When installing the unit in a region of **heavy snow**, allow enough distance between the unit and the ground (or piled up snow).

- In areas with heavy snow fall, piled snow could block the air intake. To avoid this, install a frame that is higher than estimated snow fall. In addition, install a snow-proof hood to avoid snow from piling on the outdoor unit.
- If ice accumulates on the base, it may cause critical damage to the unit. (e.g., a lakeside in a cold area, the seashore, an alpine region, etc.).
- In a heavy snowfall area, do not install the drain plug and drain cap in the outdoor unit. And, it may cause frozen ground. Therefore, take appropriate measures to prevent it.
- Make a space more than 150 mm between the bottom of the unit and the ground for installation.
- Make sure that the unit is located at least 150 mm above the maximum expected level of snow.



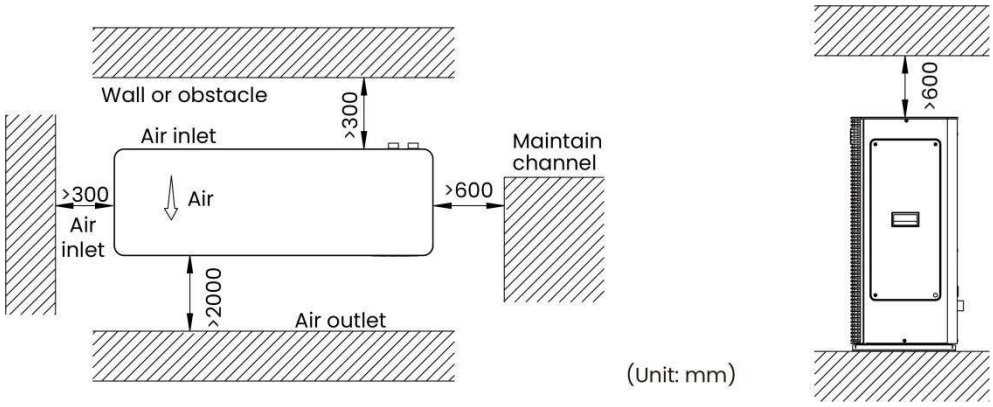
The outdoor unit can be installed on a ground or flat roof. Pitched-roof installation is not permitted.



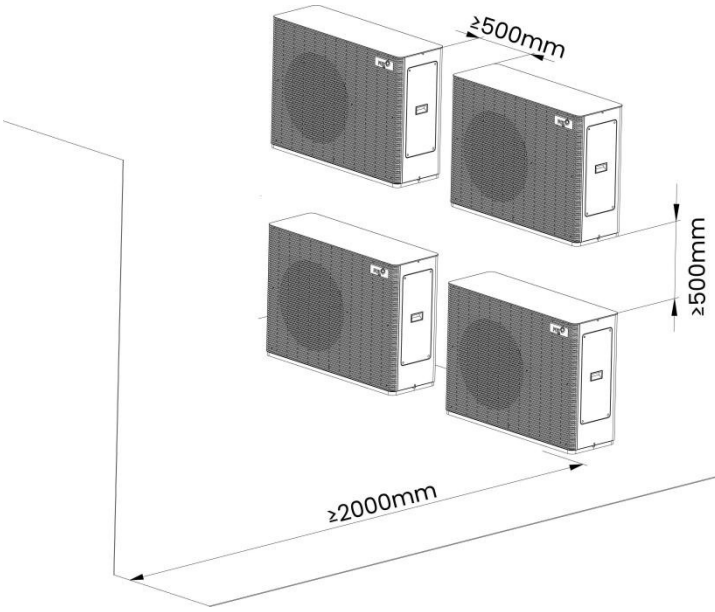
A: Installation on a ground
B: Installation on a flat roof

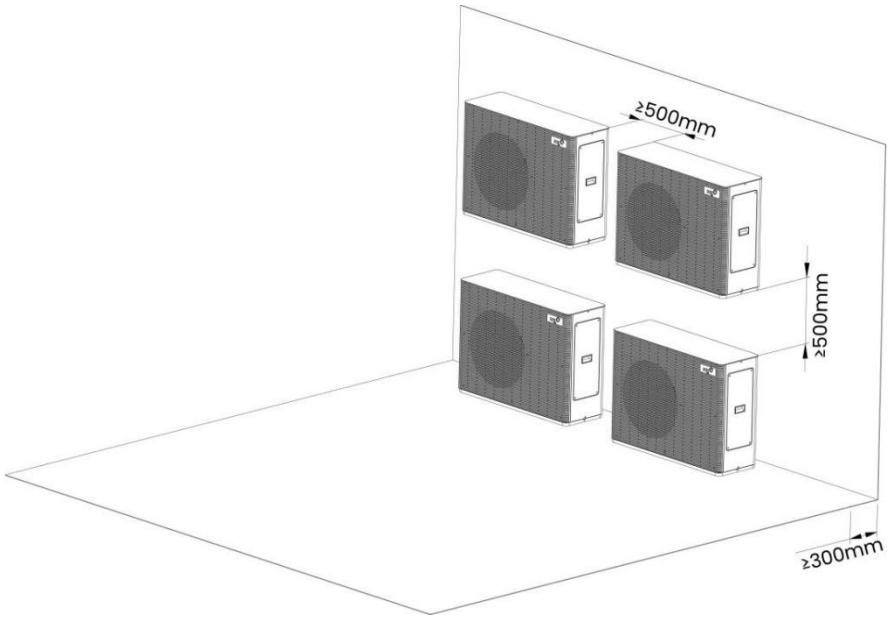
3.2.2 Space Requirement

- Single Unit Installation

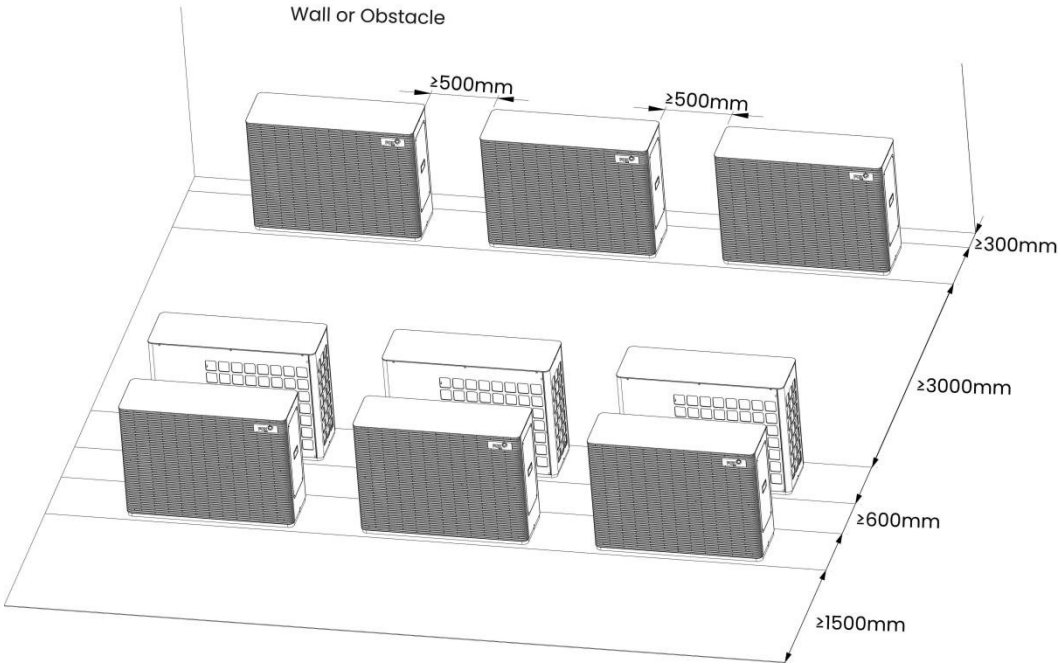


- Stacked Installation





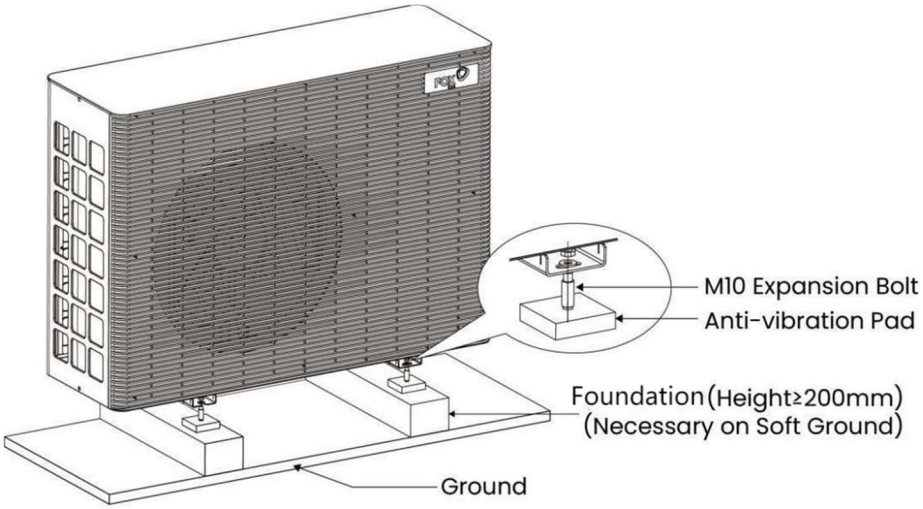
➢ Multiple-row Installation



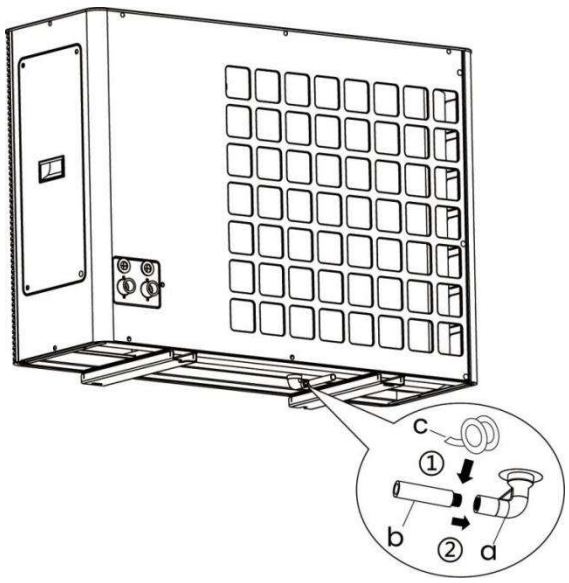
3.2.3 Unit Installation

➢ Fix the unit with expansion bolts (four sets of Φ10 expansion bolts are needed, which are provided by the user).

➢ Screw the expansion bolts to a depth of 20mm into the foundations (foundations are necessary on a soft ground).

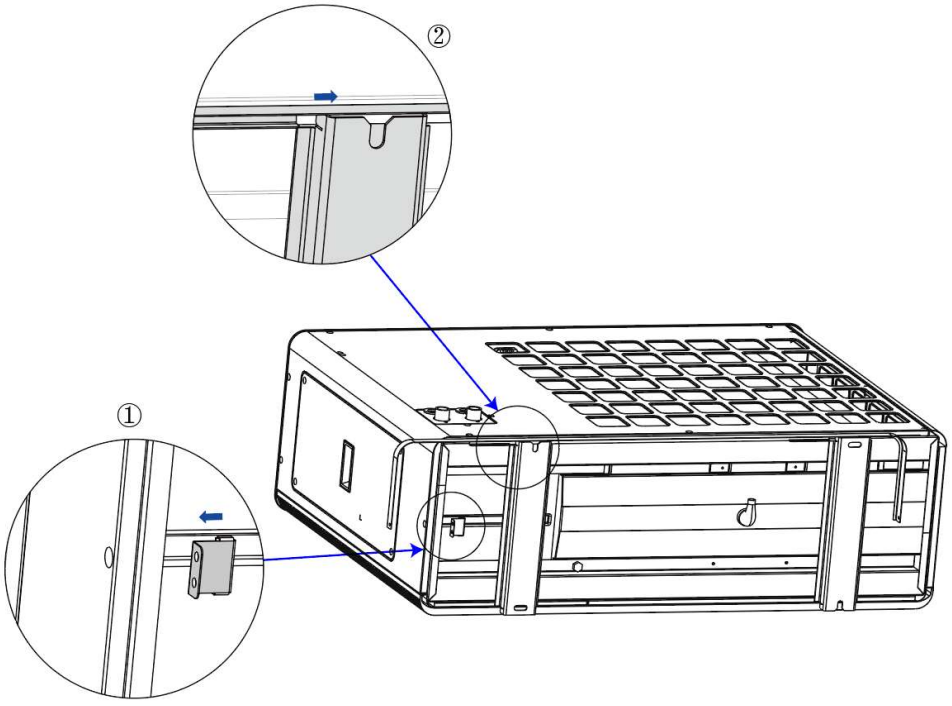


➢ Connect a drain hose to the drain joint at the bottom of the unit. The drain pipe directs condensate to an appropriate location.

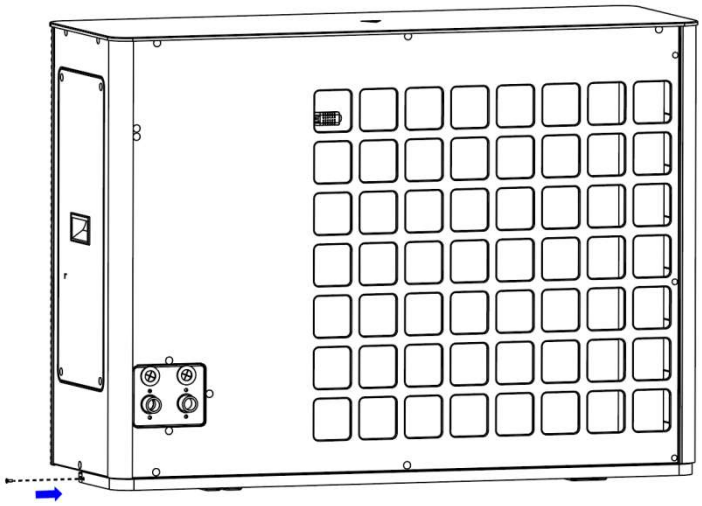


Code	Name
a	Drain Joint (Plastic)
b	Drain Hose (Field Supply)
c	Thread Seal Tape (Field Supply)

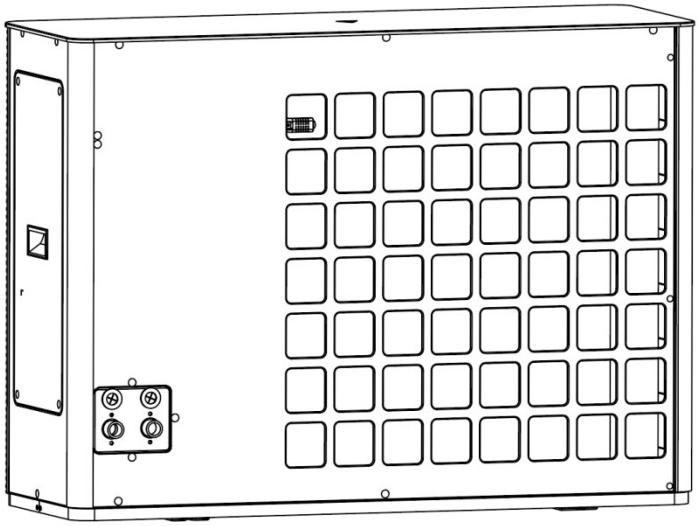
➢ Install a base cover fixing sheet as below, and slide a base cover rightwards along the back slot.



➢ Install a screw to prevent the base cover from dropping.



➢ Repeat the above steps to install the other base cover, and finally install screws to fasten the base covers.

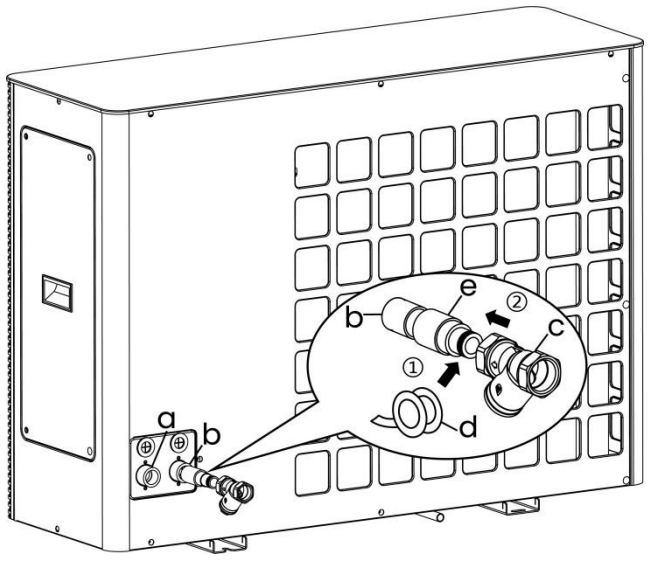


⚠	**Caution!** ● Make sure the condensate is drained properly. Collect the direct the condensate that can drip from the base of the unit to a drain pipe. Prevent water dripping onto the floor that may generate a slip hazard, especially in winter. ● For a cold climate with high humidity, it is highly recommended that a bottom plate heater be installed to avoid damage to the unit due to the drain water freezing in case of a low drainage rate . ● Prevent water dripping onto the floor that may generate a slip hazard, especially in winter.

3.2.4 Water Loop Connection

Requirements

	Note! ● The pipe inside must be clean. ● Hold the pipe end downwards when removing burrs. ● Cover the pipe end when inserting the pipe through a wall to prevent dust and dirt from entering the pipe. ● Use proper thread sealant to seal the connections. The sealing must be able to withstand the pressure and temperature of the system. ● When using non-copper metallic piping, be sure to insulate two kinds of materials from each other to prevent galvanic corrosion. ● Copper is soft. Use appropriate tools to avoid damage. ● Zn-coated parts cannot be used. ● Always use materials that do not react with the water used in the system and with the materials used in the unit. ● Ensure that components installed in the field piping can withstand the water pressure and temperature.
	Caution! ● Incorrect orientation of water outlet and inlet could cause unit malfunction. ● Do not apply excessive force when connecting the field piping and make sure the piping is aligned properly. Water piping deformation could cause unit malfunction.



Code	Name
a	Water Flow (Connection with screws, male)
b	Water Return (Connection with screws, male)
c	Y-shaped Strainer (delivered with the unit)

d	Thread Seal Tape
e	Extension Pipe (recommended, with the length depending on the field conditions)

3.2.5 Water

Check and treat the water/Fill and supplement water.

➢ Before filling or topping up the unit, ensure to check the quality of the water.

	**Note!** ● Risk of material damage due to poor-quality water. ● Ensure that the water is of sufficient quality. ● Water quality should be complied with EN 98/83 EC Directives.

Check the filling and supplementary water.

➢ Before filling the unit, measure the hardness of the filling and supplementary water.

Check the quality of water.

➢ Remove a little water from the heating circuit.

➢ Check the appearance of water. If it is determined that the water contains sedimentary materials, be sure to desludge the unit.

➢ Use a magnetic rod to check whether the water contains magnetite (Ion oxide).

➢ Check the pH value of the removed water at 25 °C.

	**Note!** ● Ensure that oxygen cannot get into the water.

The water quality shall meet the requirements in the following table:

Water Quality	Limit Values for the Heating System
Hardness	<3 °dH
Oxygen Content	<1 mg/l
Carbon Dioxide, CO_2	<1 mg/l
Chloride Ions, Cl^-	<250 mg/l
Sulphate, SO_4	<100 mg/l
Conductivity	<350 μS/cm
pH	7.5-9

Treat the filling and supplementary water.

You need to treat the water in the following cases.

➢ If the entire filling and supplementary water quality during the service life of the system exceeds three times the nominal value of the water loop.

➢ If the guideline values listed in the above table are mot met.

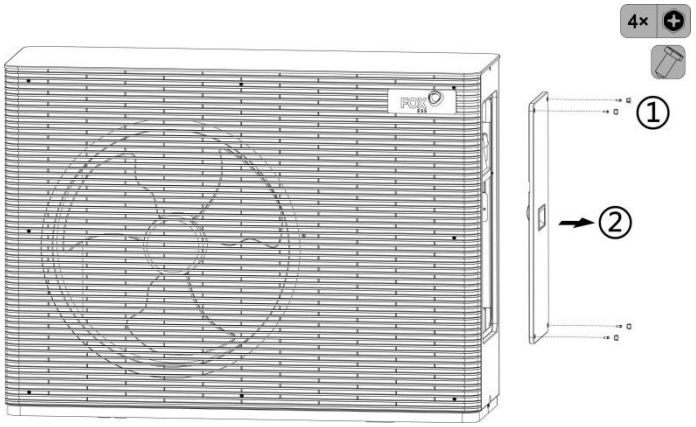
3.3 Electrical Installation

	**Danger!** ● Risk of electrocution.

3.3.1 Opening the Cover

To access the unit for installation and maintenance, follow the instructions below.

	**Warning!** ● Risk of electrocution. ● Risk of burning.
	**Note!** ● Keep the screws properly for later use.



3.3.2 Precautions for Electrical Wiring

	**Warning!** ● The wiring must comply with local laws and regulations. ● Follow the electrical wiring diagrams for electrical wiring.
	**Caution!** ● A main switch or other means of disconnection, such as having a contact separation in all poles, must be incorporated in the fixed wiring in accordance with relevant local laws and regulations. ● Use only copper wires. ● Never squeeze bundled cables and keep them away from piping and sharp edges. ● Make sure no external pressure is applied to the terminal connections. ● The field wiring must be carried out in accordance with the wiring diagram supplied with the unit and the instructions given below. ● Be sure to use a dedicated power source, instead of a power source shared by another appliance. ● Earth the unit properly. Do not connect the unit to a utility pipe, surge protector, or telephone earth. Incomplete earthing may cause electrocution. ● An earth fault circuit interrupter (30 mA) must be installed to avoid electrical shock. Use 3-core shielded wires. ● Be sure to install the required fuses or circuit breakers. ● A leakage protection switch must be installed to the power supply of

	the unit. ● Attach an earth fault circuit interrupter and fuse to the power supply line.

Power Cable and Communication cable

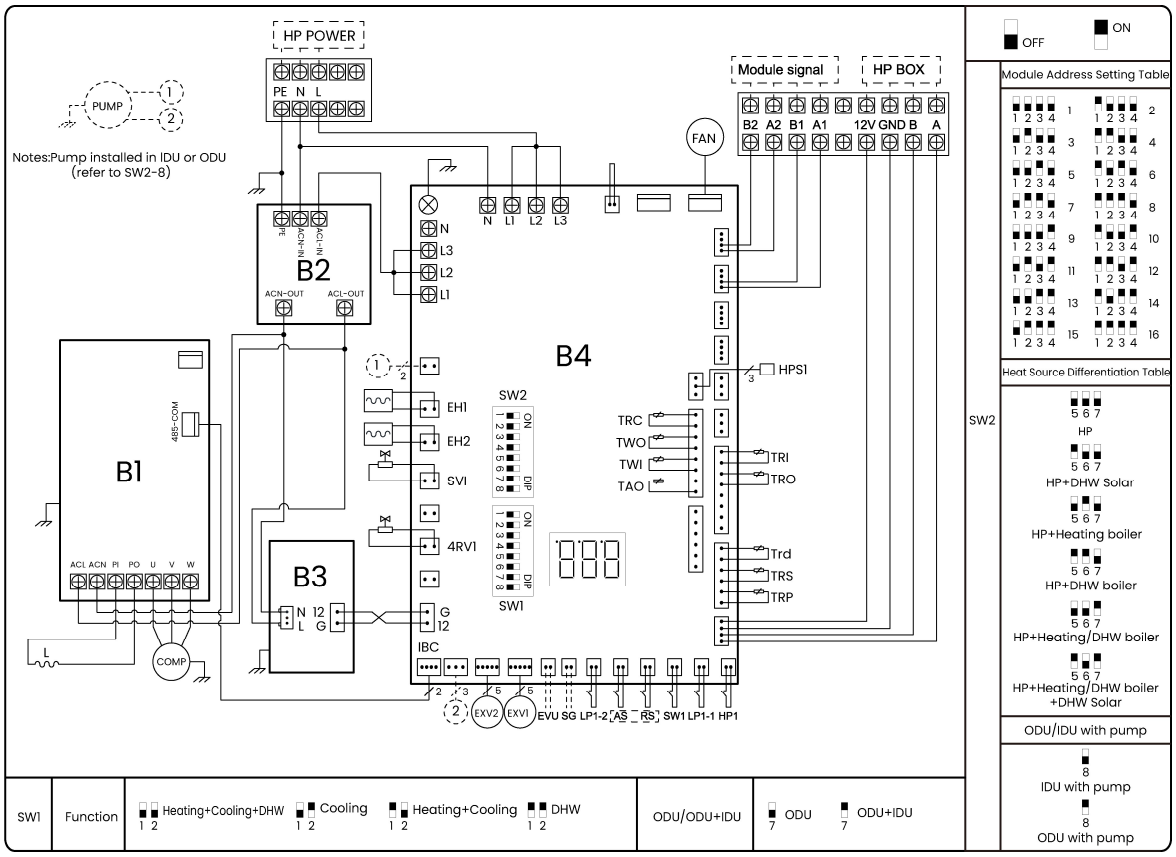
	**Note!** ● Communication wires must be shielded. ● Use H07RN-F as the power cable. Only the thermistor is provided with low voltage. ● Power cables and communication wires must be laid out separately, and cannot be placed in the same conduit. Otherwise, electromagnetic interference may occur. ● Secure the electrical wires with cable ties so that they will not come in contact with the piping, particularly on the high-pressure side. ● The external load current should be lower than 0.2 A. If the single load current is higher than 0.2 A, the load must be controlled through an AC contactor.

Earthing

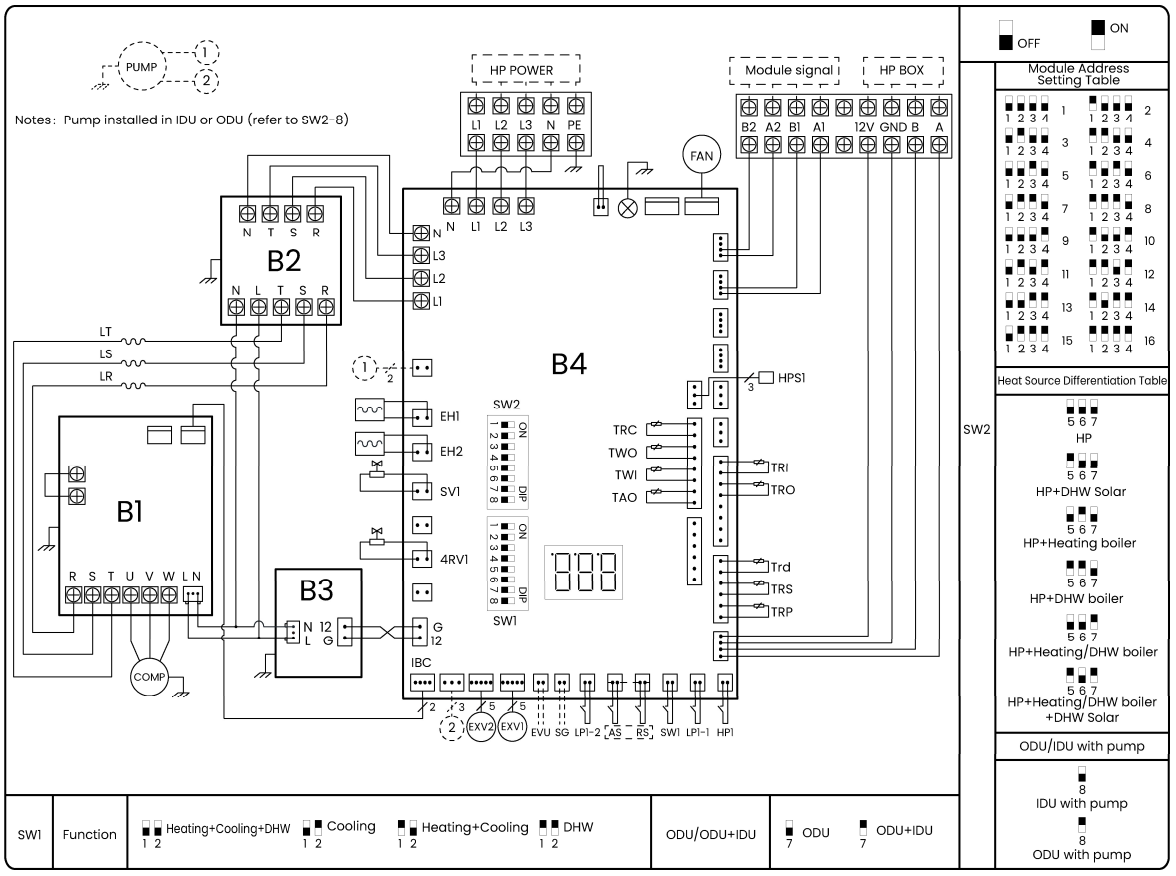
	**Note!** ● The equipment must be earthed. ● Any high-voltage external load, if it is metal or an earthed port, must be earthed. ● Make sure the earth fault circuit interrupter is compatible with the inverter (resistant to high frequency electrical noise) to avoid unnecessary startup of the interrupter.

3.3.3 Overview of Electrical Wiring

The illustration below gives an overview of the required field wiring among different parts.



Single-phase Electrical Wiring Diagram



Three-phase Electrical Wiring Diagram

Code	Assembly Unit	Code	Assembly Unit
B1	Inverter Drive Board	IBC	Inverter Board Communication
B2	Filter Board	EXV1	Main Electronic Expansion Valve
B3	Auxiliary Power Board	EXV2	Auxiliary Electronic Expansion Valve
B4	Main Control Board	LP1-2	Cooling Low-pressure Antifreeze Switch
TRC	Coil Refrigerant Temperature	AS	Linkage Switch
TWO	Outlet Water Temperature	RS	Remote Switch
TWI	Inlet Water Temperature	SW1	Water Flow Switch
TAO	Outdoor Air Temperature	LP1-1	Low Pressure Switch
Trd	Discharge Pipe Refrigerant Temperature	HP1	High Pressure Switch
TRS	Suction Pipe Refrigerant Temperature	HPS1	High Pressure Sensor
TRP	Plate Heat Exchanger Refrigerant Temperature	EH1	Chassis Heater
TRI	Economizer Inlet Refrigerant Temperature	EH2	Oil Heater
TRO	Economizer Outlet Refrigerant Temperature	FAN	DC Fan Motor
SVI	Solenoid Valve	COMP	Compressor
4RV1	4-Reversing Valve		

- **Function Dip Switches**

Differentiation of Unit Functions

Code	Function	SW1-1	SW1-2
1	Cooling+Heating+Hot Water	OFF	OFF
2	Cooling+Heating	ON	OFF
3	Cooling	OFF	ON
4	Hot Water	ON	ON

Differentiation of Heat Sources

Code	Function	SW2-5	SW2-6	SW2-7	Remark
1	Heat Pump	OFF	OFF	OFF	Only heat pump operation, factory default.
2	Heat Pump+Solar	ON	OFF	OFF	Solar energy provides only hot water function, with independent water loop.
3	Heat Pump+Heating Boiler	OFF	ON	OFF	The boiler is only equipped with

					heating functionality, but the system can provide both heating and hot water simultaneously, with independent water loops.
4	Heat Pump+Hot Water Boiler	ON	ON	OFF	The boiler is only equipped with hot water functionality, but the system can provide both heating and hot water simultaneously, with independent water loops.
5	Heat Pump+Heating and Hot Water Boiler	OFF	OFF	ON	Boiler provides heating and hot water functions; heating and hot water supply cannot occur simultaneously, with parallel water loops.
6	Heat Pump+Boiler+Solar	ON	OFF	ON	Solar energy for hot water, boiler for heating; system allows simultaneous heating and hot water supply, with independent water loops.

Differentiation of Module Addresses

Address	SW2-1	SW2-2	SW2-3	SW2-4
1 (Main Module)	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF
3	OFF	ON	OFF	OFF
4	ON	ON	OFF	OFF
5	OFF	OFF	ON	OFF
6	ON	OFF	ON	OFF
7	OFF	ON	ON	OFF
8	ON	ON	ON	OFF
9	OFF	OFF	OFF	ON

10	ON	OFF	OFF	ON
11	OFF	ON	OFF	ON
12	ON	ON	OFF	ON
13	OFF	OFF	ON	ON
14	ON	OFF	ON	ON
15	OFF	ON	ON	ON
16	ON	ON	ON	ON

- Details of type and rating of fuses

Heat Pump Model	Fuses Type	Rating
Single-phase Heat Pump	HV520.15P	15A 600V
	5ET-032H1A	3.15A 300V
	65TS	30A 250V
	65NM	30A 250V
	50CT	30A 250V
Three-phase Heat Pump	HV520.15P	15A 250V
	6HF	30A 500V
	61CT	30A 500V
	0505030MXEP	30A 500V

3.3.4 Operating Current and Wire Diameter

1) Select the wire diameter (minimum value) individually for each unit based on the following table.
2) The maximum allowable voltage deviation between phases is 2%.
3) Select circuit breakers that have a contact separation of at least 3mm in all poles for full disconnection.

Rated Current (A)	Nominal Cross-sectional Area (mm^2)	
	Flexible Cord	Cable for Fixed Wiring
≤3	0.5 and 0.75	1 and 2.5
>3 and ≤6	0.75 and 1	1 and 2.5
>6 and ≤10	1 and 1.5	1 and 2.5
>10 and ≤16	1.5 and 2.5	1.5 and 4
>16 and ≤25	2.5 and 4	2.5 and 6
>25 and ≤32	4 and 6	4 and 10
>32 and ≤50	6 and 10	6 and 16
>50 and ≤63	10 and 16	10 and 25



Note!

- As to cable selection, factors such as the power cable's operating ambient temperature and actual length shall be taken into account.
- Recommended control wire is 0.3~0.75mm^2 (TP shielded).
- The required power cable material should be at least 60245 IEC 57.

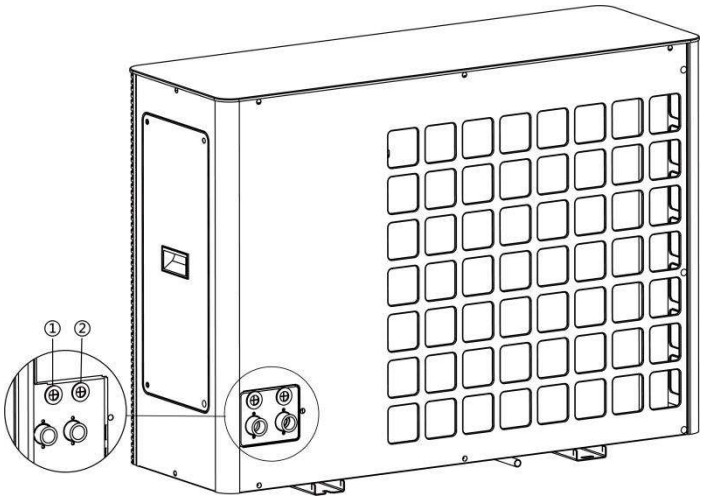
3.3.5 Tightening Torques

Item	Tightening Torque (N*m)
M4 (Power terminal, electric control board terminal)	1.2 to 1.4
M4 (earthed)	1.2 to 1.4

Note!

- Over-tightening might damage the screws.
- Tighten the screws with a proper screwdriver. Using an improper screwdriver could damage the screws and provide improper tightening torques.

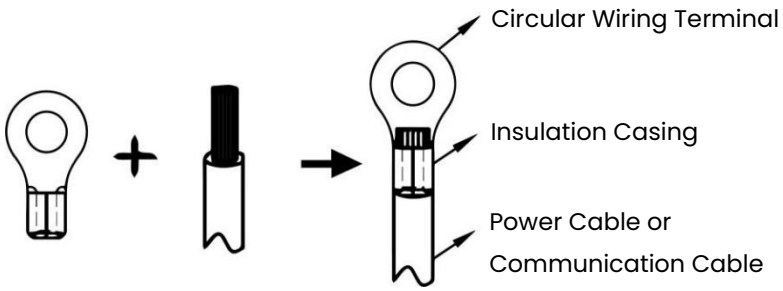
3.3.6 Back Plate Layout for Wiring



① Low-voltage Wiring Hole
② High-voltage Wiring Hole

3.3.7 Electrical Connection

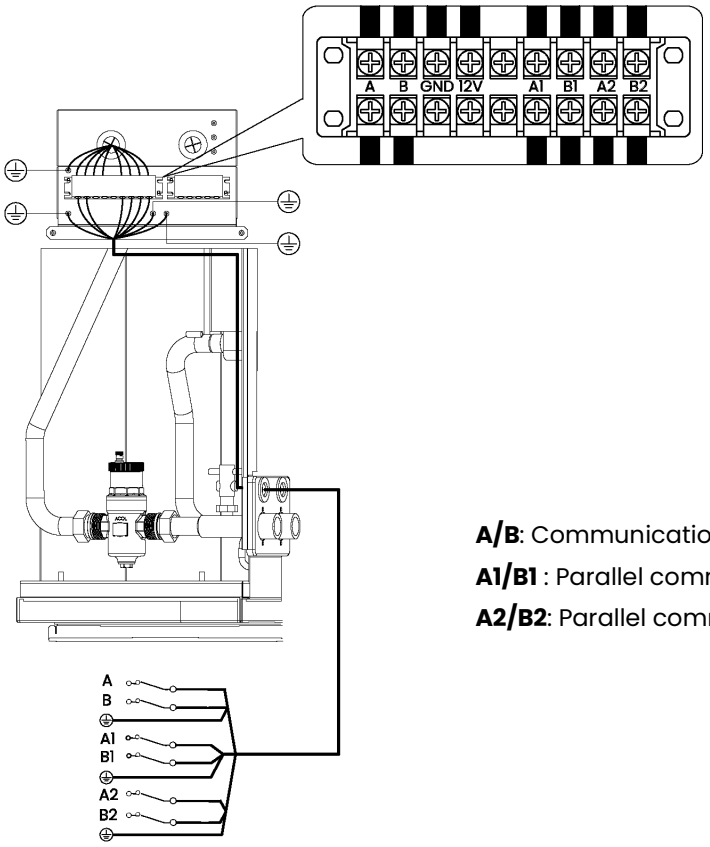
1) Use the circular wiring terminal with the insulating casing.
2) Securely connect a power cable or communication cable that meets the specification.



Danger!

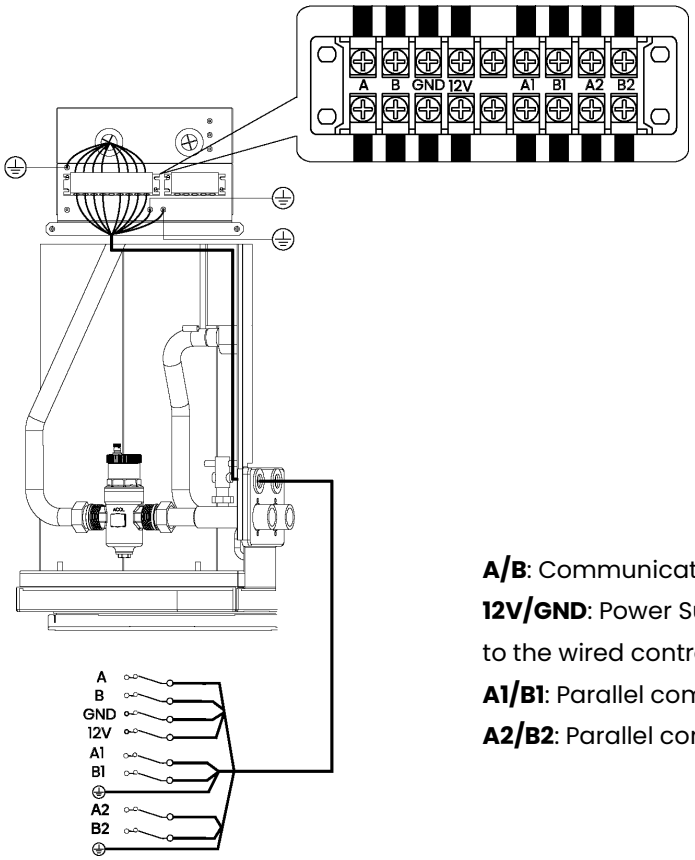
- The wires could overheat due to loose wiring.
- Do not connect two power supply cables with different diameters to the same power supply terminal.

➢ **Connection to the IDU (Communication Cables)**



A/B: Communication Cable ODU-IDU.
A1/B1 : Parallel communication input.
A2/B2: Parallel communication output.

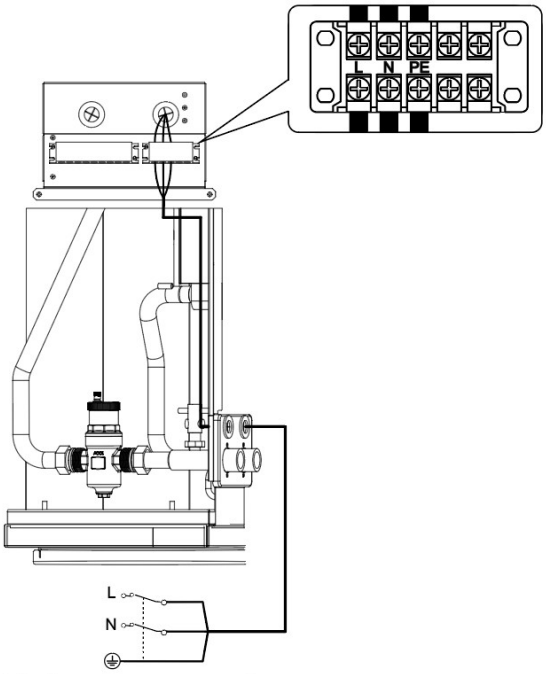
➢ **Connection to the Wired Controller (Communication Cables)**



A/B: Communication Cable ODU-Wired Controller.
12V/GND: Power Supply, used only when connecting to the wired controller.
A1/B1: Parallel communication input.
A2/B2: Parallel communication output.

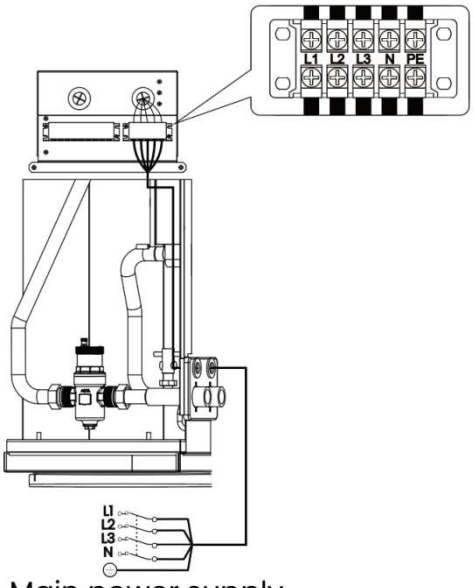
➢ **Connection to Main Power Supply**

Single-phase Heat Pump:



Main power supply

Three-phase Heat Pump:



Main power supply

4 Commissioning

The unit should be configured by an authorized installer to match the installation environment (outdoor climate, installed options, etc.) and meet the user demand.
Follow the instructions below for the next step.

4.1 Check Before Configuration

Before powering on the unit, check the following items:

☐	**Field wiring**: Make sure all wiring connections observe the instructions mentioned in the 3.3 Electrical installation.
☐	**Fuses, circuit breakers, or protective devices**: Check the size and type according to the instructions mentioned in the 3.3.4 Operating Current and Wire Diameter. Make sure that no fuses or protection devices have been bypassed.
☐	**Backup heater's circuit breaker**: Ensure the backup heater's circuit breaker in the switch box is closed (It varies with the backup heater type). Refer to the wiring diagram.
☐	**Booster heater's circuit breaker**: Ensure the booster heater's circuit breaker is closed (applicable only to units with an optional domestic hot water tank).
☐	**Internal wiring**: Check the wiring and connections inside the switch box for loose or damaged parts, including earth wiring.
☐	**Mounting**: Check and ensure that the unit and the water loop system are properly mounted to avoid water leakage, abnormal noises and vibrations during the unit startup.
☐	**Damaged equipment**: Check the components and piping inside the unit for any damage or deformation.
☐	**Refrigerant leak**: Check the inside of the unit for any refrigerant leakage. In case of refrigerant leakage, follow the relevant content in the "Refrigerant Precaution".
☐	**Power supply voltage**: Check the voltage of the power supply. The voltage must be consistent with the voltage on the identification label of the unit.
☐	**Air vent valve**: Make sure the air vent valve is open (at least 2 turns).
☐	**Shut-off valve**: Make sure that the shut-off valve is fully open.
☐	**Sheet metal**: Make sure all the sheet metal of the unit is mounted properly.

After powering on the unit, check the following items:

☐	**Upon power-on of the unit, nothing is displayed on the wired controller:** Check the following abnormalities before diagnosing possible error codes. -Wiring connection issue (power supply or communication signal). -Fuse failure on PCB.
☐	**Error code "6301" is displayed on the control panel:** -Residual air exists in the system. -The water level in the system is insufficient. Before starting test run, make sure that the water system and the tank are filled with water, and air is removed. Otherwise, the pump or backup heater (optional) may be damaged.

☐	**Initial start-up at low outdoor ambient temperature:** To start the initial start-up in low outdoor ambient temperature, the water has to be heated gradually. Please use the preheating for floor function. Note: For underfloor heating application, floor could be damaged if the temperature rises sharply in a short time. Please ask the building construction contractor for further information.

5 Maintenance

To ensure optimal availability of the unit:

- Carry out a series of checks and inspections periodically on both the unit and the electrical connections.

	**Note!** ● These maintenance procedures must be carried out by a qualified serviceman.

	**Warning!** **Electrocution Danger** ● Before performing any maintenance or repair work, switch off the main power panel switch, remove the fuses (or switch off the circuit breakers) or open the unit's protection devices. ● Before starting any maintenance or repair work, make sure that the unit is switched off. ● After disconnecting the power supply, wait 10 minutes before touching live parts to avoid risks due to residual voltages in the DC bus condensers of the compressor inverter. ● Note that some sections of the unit are very hot. The same applies to the components of the high pressure refrigeration circuit. Consider the risk of burns and wear personal protective equipment before carrying out any work in these areas. ● Do not touch the conductive sections. ● Do not rinse the unit. Humidity can cause an electric shock or a fire risk. ● When removing the service panels, there is a risk of accidentally touching live components. ● When installing or servicing, never leave the unit unattended after removing the service panels. ● The electrical box is located on top of the unit. Please pay attention to waterproofing and rain protection, and remember to close the lid when leaving.

The checks described should be carried out at least once a year by a qualified technician.	
Water pressure	● Check that the water pressure is greater than 1 bar. ● If necessary, add water up to 1.5-1.8 bar.
Water filter	● Check and clean the water filter.

Pressure relief valve	To check that the pressure relief valve is working properly: ● Turn the black knob on the valve anticlockwise. If you do not hear a click: ● Contact your local dealer. If water continues to leak out of the unit: ● Close the shut-off valves at the water inlet and outlet. ● Contact your local dealer.
Pressure relief valve pipe	● Check that the pressure relief valve pipe is correctly positioned for draining the water.
Insulating backup heater cover	● Check that the insulating cover of the built-in backup heater is tightly closed around the heater housing.
Domestic hot water storage tank pressure relief valve	Only for installations with domestic hot water storage tank. ● Check that the pressure relief valve on the domestic hot water storage tank is working properly.
Domestic hot water storage tank booster heater	Only for installations with domestic hot water storage tank. It is advisable to remove limescale build-up from the booster heater to prolong its life, especially in hard water areas: ● Empty the domestic hot water storage tank. ● Remove the booster heater from the storage tank. ● Immerse it in a bucket (or other container) with limescale removal product for 24 hours.
Unit control box	● Visually inspect the control box for any obvious defects, e.g. loose connections or faulty electrical connections. ● Check that the contactors are working properly with an ohmmeter. ● All contactor contacts must be in the open position.

The checks described should be carried out at least once a year by a qualified technician.	
Using glycol	● Document the glycol concentration and pH value of the system at least once a year. - A pH value below 8.0 indicates that a significant proportion of the inhibitor has been consumed and should be topped up. - A pH value of less than 7.0 indicates that the glycol has oxidized; in this case it is recommended to drain and flush the system thoroughly to prevent serious damage. ● The glycol solution must be disposed of in accordance with the local laws and regulations in force.
Flow switch	● See Section 3.2.5

6 Troubleshooting

6.1 Typical Abnormalities

Symptom 1: The unit is turned on but the unit fails to operate in cooling or heating mode as expected.

Possible Cause	Troubleshooting
Incorrect temperature setting	Check the parameters.
Too small water flow	● Verify that all shut off valves of the water loop are in the right position. ● Check if the water filter is plugged. ● Make sure there is no air in the water system. ● Check the water pressure. The water pressure must be larger than or equal to 1.5 bar. ● Make sure that the expansion vessel is not broken.
Too small water volume in the installation	Make sure that the water volume in the installation is above the minimum required value.

Symptom 2: The unit is turned on but the compressor fails to start.

Possible Cause	Troubleshooting
The unit may operate out of its operating range (too low water temperature).	In case of low water temperature, the system starts the backup heater to reach the minimum water temperature first (12°C). ● Verify that the power supply for the backup heater is correct. ● Verify that the thermal fuse of the backup heater is closed. ● Verify that the thermal protector of the backup heater is not activated. ● Verify that the contactors of the backup heater are not broken.

Symptom 3: Noise is generated from the pump (cavitation).

Possible Cause	Troubleshooting
Air in the system	Purge the air.
Too small water pressure at the pump inlet.	● Check the water pressure. The water pressure must be larger than or equal to 1.5 bar. ● Verify that the expansion vessel is not broken . ● Verify that the pre-pressure of the expansion vessel is set correctly.

Symptom 4: The water pressure relief valve opens.

Possible Cause	Troubleshooting
Broken expansion	Replace the expansion vessel.

vessel	
Water pressure in the installation higher than 0.3 MPa	Make sure that the water pressure in the installation is within 0.10 to 0.20MPa.

6.2 Error Codes

- **Temperature/Pressure Sensor Errors**

Error Code	Error Name	Possible Reason	Troubleshooting
6101	Ambient temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6102	Inlet water temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6103	Outlet water temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6104	Exhaust temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6105	Coil temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6106	Return gas temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6107	Plate heat exchanger temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Replace the sensor. 2. Tighten the plug. 3. Replace the sensor.
6108	Pressure sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6109	Supplementary air inlet temperature sensor	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6110	Supplementary air outlet temperature sensor	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6111	Solar temperature	1. Broken connection wire 2. Loose plug connection	1. Reconnect the wires. 2. Tighten the plug.

	sensor fault	3. Sensor Failure	3. Replace the sensor.
6112	Hot water temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6113	Return water temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6114	Z1 temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6115	Z2 temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6116	Z3 temperature sensor fault	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6117	Weather Compensation Temperature Sensor Failure	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.
6118	Buffer Tank Temperature Sensor Failure	1. Broken connection wire 2. Loose plug connection 3. Sensor Failure	1. Reconnect the wires. 2. Tighten the plug. 3. Replace the sensor.

- **Temperature Protection Errors**

Error Code	Error Name	Possible Reason	Troubleshooting
6201	Exhaust temperature high protection	1. Environmental impact 2. Small stepping of electronic expansion valve 3. Large error in temperature sensor 4. Poor heat exchange of the heat exchanger 5. Damaged fan or water pump 6. Insufficient refrigerant 7. Air in the system 8. Clogged filter or expansion valve 9. Uneven evaporator flow	1. Ensure ventilation and eliminate other heat source interference. 2. Reset the electronic expansion valve. 3. Correct or replace the temperature sensor. 4. Clean the heat exchanger. 5. Replace the fan or water pump. 6. Recharge the refrigerant. 7. Vacuum and add refrigerant. 8. Clean the refrigeration system and filter.

			9. Adjust the flow distribution.
6202	Cooling water temperature difference protection	1. Inaccurate inlet/outlet temperature detection 2. Insufficient water flow 3. Non-changing four-way valve	1. Replace or properly install the temperature sensor. 2. Clean the water circuit filter or replace the water pump. 3. Replace the four-way valve or check the wiring.
6203	Heating, hot water temperature difference protection	1. Inaccurate inlet/outlet temperature detection 2. Insufficient water flow 3. Non-changing four-way valve	1. Replace or properly install the temperature sensor. 2. Clean the water circuit filter or replace the water pump. 3. Replace the four-way valve or check the wiring.
6204	Cooling anti-freezing protection	1. Water circuit blockage 2. Water pump failure 3. Refrigeration system blockage 4. Expansion control issue 5. Insufficient refrigerant	1. Clear the water circuit blockage. 2. Check the water pump. 3. Clear the blockage. 4. Adjust the expansion control. 5. Recharge the refrigerant.
6205	Cooling outlet water temperature low protection	1. Insufficient water flow 2. Inaccurate outlet temperature sensor 3. Improper temperature setting	1. Check the water pump and water system. 2. Replace the temperature sensor. 3. Adjust the temperature setting.
6206	Suction temperature high protection	1. Leaking gas from four-way valve 2. Leaking gas from compressor 3. Other heat source interference	1. Repair or replace the four-way valve. 2. Repair or replace the compressor. 3. Eliminate the influence of other heat sources.
6207	Evaporation condensation temperature high	1. High environment/water temperature 2. Improper control 3. Sensor failure	1. Ensure the unit operates within the appropriate environment and water temperature range. 2. Adjust the controls.

			3. Replace the sensors.
6208	Condensation temperature low	1. Low environment/water temperature 2. Improper control 3. Sensor failure	1. Ensure the environment or water temperature is within the operating range. 2. Adjust the controls. 3. Replace the sensors.
6209	Condensation temperature high	1. High environment/water temperature 2. Improper control 3. Sensor failure	1. Ensure the environment or water temperature is within the operating range. 2. Adjust the controls. 3. Replace the sensors.
6210	Evaporation temperature high	1. High environment/water temperature 2. Improper control 3. Sensor failure	1. Ensure the environment or water temperature is within the operating range. 2. Adjust the controls. 3. Replace the sensors.
6211	Evaporation temperature low	1. Low environment/water temperature 2. Improper control 3. Sensor failure	1. Ensure the environment or water temperature is within the operating range. 2. Adjust the controls. 3. Replace the sensors.
6212	Exhaust temperature low protection	1. Suction return liquid 2. Supplementary gas return liquid 3. Low environment/water temperature 4. High and low pressure gas leakage	1. Decrease the expansion valve flow. 2. Ensure the environment or water temperature is within the unit's operating range. 3. Repair or replace the four-way valve and compressor.
6213	Temperature sensor out of range	1. Upper limit exceeds range, displaying 200. 2. Lower limit exceeds range, displaying -100.	Ensure that the measured temperature remains within the detection range.
6214	Ambient temperature low protection	1. Low ambient temperature 2. Sensor failure	1. Ensure the environment is within the operating range. 2. Replace the sensors.
6215	Low water flow during	1. Water system shortage 2. Hydraulic filter	1. Verify system integrity and replenish water.

	operation	blockage 3. Water pump failure	2. Clean filtration assembly. 3. Replace water pump if verified.

- **Switch Protection Errors**

Error Code	Error Name	Possible Reason	Troubleshooting
6301	Air conditioning water flow switch protection	1. Disconnected or loose wiring 2. Water flow switch malfunction 3. Air in the water system 4. Insufficient water flow	1. Inspect wiring connections. 2. Repair or replace the water flow switch. 3. Remove air from the system. 4. Check if the pump and water system are clogged.
6302	Compressor high pressure protection	1. Poor wiring connection 2. Too high operating environment temperature 3. High-pressure switch failure 4. Poor heat exchange in the heat exchanger. 5. Fan or pump malfunction 6. Excess refrigerant. 7. Air in the system 8. Too small Electronic expansion valve opening	1. Check wiring connections. 2. Ensure the unit operates within temperature range. 3. Replace the high-pressure switch. 4. Clean the heat exchanger. 5. Repair or replace the fan or pump. 6. Reduce refrigerant levels. 7. Vacuum the system. 8. Adjust the opening of the electronic expansion valve.
6303	Compressor low pressure protection	1. Poor wiring connection 2. Too low operating environment temperature 3. Low-pressure switch failure 4. Poor heat exchange in the heat exchanger 5. Fan or pump malfunction 6. Insufficient refrigerant.	1. Check wiring connections. 2. Ensure the unit operates within the temperature range. 3. Replace the low-pressure switch. 4. Clean the heat exchanger. 5. Repair or replace the fan or pump.

		7. Too small electronic expansion valve opening	6. Add refrigerant. 7. Adjust the opening of the electronic expansion valve.
6304	Cooling anti-freezing low pressure protection	1. Poor wiring connection 2. Too low water temperature 3. Anti-freeze switch failure 4. Poor heat exchange in the heat exchanger 5. Fan or pump malfunction 6. Insufficient refrigerant 7. Too small electronic expansion valve opening	1. Check wiring connections. 2. Ensure the water temperature range. 3. Replace the freeze protection switch. 4. Clean the heat exchanger. 5. Repair or replace the fan or pump. 6. Add refrigerant. 7. Adjust the opening of the electronic expansion valve.
6305	Water flow switch short circuit protection	Intentional short-circuit	Disconnect the short circuit.
6306	Refrigerant leak alarm	Reserve, refrigerant leak	Locate and repair the leak.
6307	Main electric heating contactor/relay sticking fault protection	1. Contactor sticking or PCB relay sticking or wiring short circuit 2. External interference	1. Replace contactor/ relay and inspect wiring. 2. Eliminate interference sources.
6308	3KW heating contactor/relay sticking fault protection	1. Contactor sticking or PCB relay sticking or wiring short circuit 2. External interference	1. Replace contactor/ relay and inspect wiring. 2. Eliminate interference sources.
6309	6KW heating contactor/relay sticking fault protection	1. Contactor sticking or PCB relay sticking or wiring short circuit 2. External interference	1. Replace contactor/ relay and inspect wiring. 2. Eliminate interference sources.
6310	Auxiliary heater contactor coil drive relay power anomaly protection	1. Thermostat overtemperature trip 2. Abnormal circuit condition due to disconnected/loose	1. Check thermostat trip status. 2. Inspect shorting terminal, and verify circuit condition.

		safety shorting terminal	
6311	Internal DHW tank heater power supply fault protection	1. Thermostat overtemperature trip 2. Abnormal circuit condition due to disconnected/loose safety shorting terminal	1. Check thermostat trip status. 2. Inspect shorting terminal, and verify circuit condition.
6312	Internal hydronic buffer tank heater contactor coil power fault protection	1. Thermostat overtemperature trip 2. Abnormal circuit condition due to disconnected/loose safety shorting terminal	1. Check thermostat trip status. 2. Inspect shorting terminal, and verify circuit condition.
6313	DHW heating contactor 1/relay sticking fault protection	1. Contactor sticking or PCB relay sticking or wiring short circuit 2. External interference	1. Replace contactor/ relay and inspect wiring. 2. Eliminate interference sources.
6314	DHW heating contactor 2/relay sticking fault protection	1. Contactor sticking or PCB relay sticking or wiring short circuit 2. External interference	1. Replace contactor/ relay and inspect wiring. 2. Eliminate interference sources.
6315	AC heating contactor 1/relay sticking fault protection	1. Contactor sticking or PCB relay sticking or wiring short circuit 2. External interference	1. Replace contactor/ relay and inspect wiring. 2. Eliminate interference sources.
6316	AC heating contactor 2/relay sticking fault protection	1. Contactor sticking or PCB relay sticking or wiring short circuit 2. External interference	1. Replace contactor/ relay and inspect wiring. 2. Eliminate interference sources.

- **Power and Communication Errors**

Error Code	Error Name	Possible Reason	Troubleshooting
6401	Module communication failure	1. Address setting error 2. Incorrect module quantity setting 3. Disconnected or loose wiring	1. Check the dip switch. 2. Verify the quantity setting. 3. Disconnected or loose wiring.
6402	Wired controller indoor unit	1. Disconnected or loose wiring	1. Check the wiring. 2. Eliminate external

	communication failure	2. External interference	interference.
6403	Outdoor unit indoor unit communication failure	1. Disconnected or loose wiring 2. External interference	1. Check the wiring. 2. Eliminate external interference.
6404	Outdoor unit compressor drive communication failure	1. Disconnected or loose wiring 2. External interference	1. Check the wiring. 2. Eliminate external interference.
6405	Outdoor unit fan drive communication failure	1. Disconnected or loose wiring 2. External interference	1. Check the wiring. 2. Eliminate external interference.
6406	Outdoor unit pump drive communication failure	1. Disconnected or loose wiring 2. External interference. 3. Pump jammed 4. Pump running dry 5. Low voltage 6. Pump malfunction	1. Check the wiring. 2. Eliminate external interference. 3. Check for the cause of the jam. 4. Check for lack of water flow. 5. Confirm power supply voltage. 6. Replace the pump.
6407	Power phase sequence error	1. Incorrect power supply wiring sequence	1. Check the wiring sequence.
6408	Power reverse phase failure	1. Incorrect power supply wiring sequence	1. Check the wiring sequence.
6409	Power phase loss failure	1. Power supply wiring not connected 2. Loose connections	1. Check if any wiring is missed. 2. Check for loose connections.
6410	Power voltage high failure	1. Over-voltage in power supply	1. Check the power supply voltage.
6411	Power voltage low failure	1. Under-voltage in power supply	1. Check the power supply voltage.
6412	Wired controller to IDU Communication Fault	1. Disconnected or loose wiring 2. External interference	1. Check the wiring. 2. Eliminate external interference.

- **Compressor Drive Errors**

Error Code	Error Name	Possible Reason	Troubleshooting
6501	IPM overcurrent	1. Compressor failure 2. Drive module failure	1. Check compressor and its wiring. 2. Check driving module and its wiring.
6502	Compressor drive failure	1. Compressor failure 2. Drive module failure	1. Check compressor and its wiring. 2. Check driving module and its wiring.
6503	Compressor overcurrent	1. Compressor failure 2. Drive module failure	1. Check compressor and its wiring. 2. Check driving module and its wiring.
6504	Input voltage phase loss	1. Input wiring disconnected or loose	1. Check wiring.
6505	IPM current sampling fault	1. Compressor failure 2. Drive module failure	1. Compressor fault. 2. Drive module fault.
6506	Power component overheat shutdown	1. Compressor failure. 2. Drive module failure.	1. Check compressor and its wiring. 2. Check driving module and its wiring.
6507	Pre-charge failure (Not for 5P/6P)	1. Compressor failure 2. Drive module failure	1. Compressor fault. 2. Drive module fault.
6508	DC bus overvoltage	1. Power supply voltage high	1. Check power supply voltage.
6509	DC bus undervoltage	1. Power supply voltage low	1. Check power supply voltage.
6510	AC input undervoltage (Not for 5P/6P)	1. Power supply voltage low 2. Wiring incorrect or loose	1. Check power supply voltage. 2. Check wiring.
6511	AC input overcurrent (Not for 3-phase)	1. Compressor failure 2. Drive module failure	1. Check compressor and its wiring. 2. Check driving module and its wiring.
6512	Input voltage sampling fault (Not for 5P/6P 3-phase)	1. Compressor failure 2. Drive module failure	1. Compressor fault. 2. Drive module fault.
6513	DSP-PFC communication fault (3-phase	1. Drive module failure	1. Drive module failure

	excluded)		
6514	Driver temperature sensor fault	1. Drive module failure	1. Drive module failure
6515	DSP-communication board link failure	1. Drive module failure 2. Communication line of the drive module is disconnected or loose	1. Check the drive module and its wiring. 2. Check wiring.
6516	Mainboard communication anomaly	1. Drive module failure 2. Communication line of the drive module is disconnected or loose	1. Check the drive module and its wiring. 2. Check wiring.
6517	DSP over temperature failure	1. Drive module failure 2. Communication interference	1. Check the drive module and its wiring. 2. Check wiring.
6518	Compressor phase loss fault	1. Drive module failure	1. Check the compressor wiring.
6519	Compressor overload fault	1. Drive module failure	1. Check if the air passage of the fan is blocked. 2. Check if there is abnormally high pressure in the pipeline.
6520	Compressor input current sampling failure	1. Drive module failure	1. Replace the PCB board if the fault reoccurs after a power reset.
6521	Compressor PIM supply voltage failure	1. Drive module failure	1. Check if the 15V power supply to the drive board is normal.
6522	Compressor precharge circuit voltage failure	1. Drive module failure	1. Check if the 15V power supply to the drive board is normal.
6523	Compressor EEPROM failure	1. Drive module failure	1. Replace the PCB board if the fault reoccurs after a power reset.
6524	Compressor AC input overvoltage failure	1. Drive module failure	1. Check the actual input voltage. 2. Replace the PCB board if the input voltage is normal and the fault reoccurs after a power reset.

6525	Compressor microelectronic failure	1. Drive module failure	1. Replace the PCB board if the fault reoccurs after a power reset.
6526	Compressor model code failure	1. Drive module failure	1. Check whether the input model code matches the compressor model code specified in the documentation. 2. Replace the PCB board if the model code is entered correctly and the fault reoccurs after a power reset.
6527	Compressor current sampling signal overcurrent failure	1. Drive module failure	1. Replace the PCB board if the fault reoccurs after a power reset.

- **Other Unit Errors**

Error Code	Error Name	Possible Reason	Troubleshooting
6601	Serial number/DIP switch mismatch	1. Incorrect DIP switch setting	1. Verify DIP switch configuration.
6602	Water pump dry running	1. Water pump operational failure	1. Inspect hydraulic circuit.
6603	Water pump undervoltage condition	1. Water pump operational failure	1. Check water pump and its power supply.
6604	Water pump locked rotor	1. Water pump operational failure 2. Incorrect water pump model selection	1. Check water pump. 2. Change water pump type on wired controller

- **Parallel System Communication Errors**

Error Code	Error Name	Possible Reason	Troubleshooting
6701	Slave to master communication Fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6702	Master to corresponding Slave	1. Parallel system communication fault	1. Inspect parallel system communication cabling.

	communication fault		
6703	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6704	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6706	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6707	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6708	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6709	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6710	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6711	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6712	Master to corresponding	1. Parallel system communication fault	1. Inspect parallel system communication cabling.

	Slave communication fault		
6713	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6714	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6715	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.
6716	Master to corresponding Slave communication fault	1. Parallel system communication fault	1. Inspect parallel system communication cabling.

7 Environmental Protection and Disposal

The quality of our products, their economy and environmental safety are all of equal importance to us and all environmental protection legislation and regulations are strictly observed.

We use the best possible technology and materials for protecting the environment taking account of economic considerations.

Packaging

Where packaging is concerned, we participate in country-specific recycling processes that ensure optimum recycling.

All of our packaging materials are environmentally compatible and can be recycled.

Old electrical and electronic appliances



This symbol means that the product must not be disposed of with other waste, and instead must be taken to the waste collection points for treatment, collection, recycling and disposal.

The symbol is valid in countries where waste electrical and electronic equipment regulations apply, e.g. "(UK) Waste Electrical and Electronic Equipment Regulations 2013 (as amended)". These regulations define the framework for the return and recycling of old electronic appliances that apply in each country.

As electronic devices may contain hazardous substances, it needs to be recycled responsibly in order to minimize any potential harm to the environment and human health. Furthermore, recycling of electronic scrap helps preserve natural resources.

For additional information on the environmentally compatible disposal of old electrical and electronic appliances, please contact the relevant local authorities, your household waste disposal service or the retailer where you purchased the product.

8 Annex

8.1 General Data

Outdoor Unit Model		HP3-8-E	HP3-10-E	HP3-12-E	HP1-8-E	HP1-10-E	HP1-12-E
Power supply		380-415V 3N~50Hz			220-240V ~50Hz		
Rated power input		3.80kW	4.80kW	6.60kW	3.80kW	4.80kW	6.60kW
Rated current		6.1A	7.7A	10.5A	18.2A	23.0A	31.6A
Sound power[1]	Average climate low temperature application	49dB	50dB	52dB	49dB	50dB	52dB
	Average climate medium temperature application	49dB	50dB	52dB	49dB	50dB	52dB
Cooling A35W7	Capacity	8.0kW	9.0kW	10.0kW	8.0kW	9.0kW	10.0kW
	Rated input	2.66kW	3.11kW	3.56kW	2.66kW	3.11kW	3.56kW
	COP	3.01	2.89	2.81	3.01	2.89	2.81
Cooling A35W18	Capacity	8.0kW	9.0kW	10.0kW	8.0kW	9.0kW	10.0kW
	Rated input	1.76kW	2.06kW	2.34kW	1.76kW	2.06kW	2.34kW
	COP	4.54	4.37	4.27	4.54	4.37	4.27
Heating A7W35	Capacity	8.0kW	10.0kW	12.0kW	8.0kW	10.0kW	12.0kW
	Rated input	1.60kW	2.04kW	2.73kW	1.60kW	2.04kW	2.73kW
	COP	5.00	4.90	4.40	5.00	4.90	4.40
Heating A7W55	Capacity	8.0kW	10.0kW	12.0kW	8.0kW	10.0kW	12.0kW
	Rated input	2.56kW	3.31kW	4.26kW	2.56kW	3.31kW	4.26kW
	COP	3.13	3.02	2.82	3.13	3.02	2.82
SCOP[1]	Low temperature application	5.15	4.93	4.56	5.15	4.93	4.56
	Medium temperature application	3.94	3.85	3.58	3.94	3.85	3.58
Energy efficiency class[2]	Low temperature application	A+++	A+++	A+++	A+++	A+++	A+++
	Medium temperature application	A+++	A+++	A++	A+++	A+++	A++
Dimensions (W×H×D) [mm]		1291x945x430					
Packing (W×H×D) [mm]		1350x1165x520					
Fan motor		DC motor/Horizontal					
Compressor		DC inverter dual rotary					
Filter mesh		40					
Min. water flow (flow switch)		10.0L/min					
Refrigerant	Type	R290					
	Quantity	1500g					
Weight	Net weight	180kg			165kg		
	Gross weight	200kg			185kg		
Connections	Water inlet (from indoor unit)	G 1"					
	Water outlet (to indoor unit)	G 1"					
	Drain connection	DN15					
	Outlet water (heating mode)	18~75° C					
	Outlet water (cooling mode)	5~25° C					

Operation range	Domestic hot water	18~75° C
	Ambient temperature (heating mode)	-25~45° C
	Ambient temperature (cooling mode)	5~50° C
	Ambient temperature (domestic hot water mode)	-25~45° C
Notes: 1. Sound power measured according to the EN12102. 2. Seasonal space heating energy efficiency class tests in average climate conditions.		

Outdoor Unit Model		**HP3-8P-E**	**H3-10P-E**	**HP3-12P-E**	**HP1-8P-E**	**HP1-10P-E**	**HP1-12P-E**
Power supply		380-415V 3N~50Hz			220-240V ~50Hz		
Rated power input		3.80kW	4.80kW	6.60kW	3.80kW	4.80kW	6.60kW
Rated current		6.1A	7.7A	10.5A	18.2A	23.0A	31.6A
Sound power[1]	Average climate low temperature application	49dB	50dB	52dB	49dB	50dB	52dB
	Average climate medium temperature application	49dB	50dB	52dB	49dB	50dB	52dB
Cooling A35W7	Capacity	8.0kW	9.0kW	10.0kW	8.0kW	9.0kW	10.0kW
	Rated input	2.65kW	3.11kW	3.55kW	2.65kW	3.11kW	3.55kW
	COP	3.02	2.89	2.82	3.02	2.89	2.82
Cooling A35W18	Capacity	8.0kW	9.0kW	10.0kW	8.0kW	9.0kW	10.0kW
	Rated input	1.76kW	2.05kW	2.34kW	1.76kW	2.05kW	2.34kW
	COP	4.55	4.38	4.28	4.55	4.38	4.28
Heating A7W35	Capacity	8.0kW	10.0kW	12.0kW	8.0kW	10.0kW	12.0kW
	Rated input	1.59kW	2.04kW	2.72kW	1.59kW	2.04kW	2.72kW
	COP	5.02	4.91	4.41	5.02	4.91	4.41
Heating A7W55	Capacity	8.0kW	10.0kW	12.0kW	8.0kW	10.0kW	12.0kW
	Rated input	2.56kW	3.32kW	4.27kW	2.56kW	3.32kW	4.27kW
	COP	3.13	3.01	2.81	3.13	3.01	2.81
SCOP[1]	Low temperature application	5.23	5.04	4.62	5.23	5.04	4.62
	Medium temperature application	3.97	3.90	3.62	3.97	3.90	3.62
Energy efficiency class[2]	Low temperature application	A+++	A+++	A+++	A+++	A+++	A+++
	Medium temperature application	A+++	A+++	A++	A+++	A+++	A++
Dimensions (W×H×D) [mm]		1291x945x430					
Packing (W×H×D) [mm]		1350x1165x520					
Fan motor		DC motor/Horizontal					
Compressor		DC inverter dual rotary					
Filter mesh		40					

Min. water flow (flow switch)		10.0L/min	
Refrigerant	Type	R290	
	Quantity	1500g	
Weight	Net weight	182kg	167kg
	Gross weight	202kg	187kg
Connections	Water inlet (from indoor unit)	G 1"	
	Water outlet (to indoor unit)	G 1"	
	Drain connection	DN15	
Operation range	Outlet water (heating mode)	18~75° C	
	Outlet water (cooling mode)	5~25° C	
	Domestic hot water	18~75° C	
	Ambient temperature (heating mode)	-25~45° C	
	Ambient temperature (cooling mode)	5~50° C	
	Ambient temperature (domestic hot water mode)	-25~45° C	
Notes: 1. Sound power measured according to the EN12102. 2. Seasonal space heating energy efficiency class tests in average climate conditions.			

8.2 Technical Data

The following data are based on the requirements of Regulations (EU) 811/2013 and (EU) 813/2013.

Model	**Average Climate**									
	For medium-temperature application					**For low-temperature application**				
Outdoor unit	**Energy efficiency class**	**Rated heat output**	**Seasonal space heating energy efficiency**	**For space heating, annual energy consum-ption**	**Outdoor unit sound power level**	**Energy efficiency class**	**Rated heat output**	**Seasonal space heating energy efficiency**	**For space heating, annual energy consum-ption**	**Outdoor unit sound power level**
	-	**kW**	**%**	**kWh**	**dB(A)**	**-**	**kW**	**%**	**kWh**	**dB(A)**
HP3-8-E	A+++	8	154	4229	49	A+++	8	203	3214	49
HP3-10-E	A+++	10	151	5369	50	A+++	10	194	4209	50
HP3-12-E	A++	12	140	7016	52	A+++	12	179	5459	52
HP1-8-E	A+++	8	154	4229	49	A+++	8	203	3214	49
HP1-10-E	A+++	10	151	5369	50	A+++	10	194	4209	50
HP1-12-E	A++	12	140	7016	52	A+++	12	179	5459	52
HP3-8P-E	A+++	8	156	4190	49	A+++	8	206	3159	49
HP3-10P-E	A+++	10	153	5304	50	A+++	10	198	4109	50
HP3-12P-E	A++	12	142	6939	52	A+++	12	182	5379	52
HP1-8P-E	A+++	8	156	4190	49	A+++	8	206	3159	49

HP1-10P-E	A+++	10	153	5304	50	A+++	10	198	4109	50
HP1-12P-E	A++	12	142	6939	52	A+++	12	182	5379	52

Heat pump space heater		**Outdoor**	HP3-8-E	HP3-10-E	HP3-12-E	HP1-8-E	HP1-10-E	HP1-12-E
Space heating	**Energy efficiency class 55°C (Medium temp. app.)**	**-**	A+++	A+++	A++	A+++	A+++	A++
Space heating	**Energy efficiency class 35°C (Low temp. app.)**	**-**	A+++	A+++	A+++	A+++	A+++	A+++
Space heating 55°C	**Prated (declared heating capacity) @ –10°C**	**[kW]**	8	10	12	8	10	12
	Seasonal space heating efficiency (ηs)	**[%]**	154	151	140	154	151	140
	Annual energy consumption	**[kWh]**	4,229	5,369	7,016	4,229	5,369	7,016
Space heating 35°C	**Prated (declared heating capacity) @ –10°C**	**[kW]**	8	10	12	8	10	12
	Seasonal space heating efficiency (ηs)	**[%]**	203	194	179	203	194	179
	Annual energy consumption	**[kWh]**	3,214	4,209	5,459	3,214	4,209	5,459
Details and precautions on installation, maintenance and assembly can be found in the installation and or operation manuals.								
Space heating 35°C	**Average climate medium temperature application**	**dB**	49	50	52	49	50	52
	Average climate low temperature application	**dB**	49	50	52	49	50	52
Part load conditions space heating average climate medium temperature application								
(A) condition (-7°C)	**Pdh (declared heating capacity)**	**[kW]**	7.13	8.86	10.77	7.13	8.86	10.77
	COPd (declared COP)	**-**	2.37	2.31	2.06	2.37	2.31	2.06
	Cdh(degradation coefficient)	**-**	0.99	1.00	1.00	0.99	1.00	1.00
(B) condition (2°C)	**Pdh (declared heating capacity)**	**[kW]**	4.57	5.38	6.46	4.57	5.38	6.46
	COPd (declared COP)	**-**	3.87	3.70	3.44	3.87	3.70	3.44
	Cdh(degradation coefficient)	**-**	0.99	0.99	0.99	0.99	0.99	0.99
(C) condition (7°C)	**Pdh (declared heating capacity)**	**[kW]**	3.96	4.95	4.28	3.96	4.95	4.28
	COPd (declared COP)	**-**	5.07	5.16	4.93	5.07	5.16	4.93
	Cdh(degradation coefficient)	**-**	0.98	0.98	0.98	0.98	0.98	0.98

(D) condition (12°C)	**Pdh (declared heating capacity)**	**[kW]**	5.31	5.73	6.13	5.31	5.73	6.13
	COPd (declared COP)	**-**	7.74	7.58	7.32	7.74	7.58	7.32
	Cdh(degradation coefficient)	**-**	0.98	0.98	0.98	0.98	0.98	0.98
(E) Tol (temperature operating limit)	**Tol (temperature operating limit)**	**[°C]**	-10	-10	-10	-10	-10	-10
	Pdh (declared heating capacity)	**[kW]**	7.93	9.97	10.82	7.93	9.97	10.82
	COPd (declared COP)	**-**	1.96	2.07	1.83	1.96	2.07	1.83
	WTOL (Heating water Operation Limit)	**[°C]**	75	75	75	75	75	75
(F) Tbivalent temperature	**Tbiv**	**[°C]**	-7	-7	-7	-7	-7	-7
	Pdh (declared heating capacity)	**[kW]**	7.13	8.86	10.77	7.13	8.86	10.77
	COPd (declared COP)	**-**	2.37	2.31	2.06	2.37	2.31	2.06
Supplementary capacity at P_design	**Psup (@Tdesignh: –10°C)**	**[kW]**	0.070	0.043	1.354	0.070	0.043	1.354
Part load conditions space heating average climate low temperature application								
(A) condition (-7°C)	**Pdh (declared heating capacity)**	**[kW]**	7.09	8.88	10.66	7.09	8.88	10.66
	COPd (declared COP)	**-**	3.18	2.81	2.72	3.18	2.81	2.72
	Cdh (degradation coefficient)	**-**	0.99	0.99	1.00	0.99	0.99	1.00
(B) condition (2°C)	**Pdh (declared heating capacity)**	**[kW]**	4.64	5.52	6.80	4.64	5.52	6.80
	COPd (declared COP)	**-**	5.12	4.87	4.49	5.12	4.87	4.49
	Cdh (degradation coefficient)	**-**	0.98	0.99	0.99	0.98	0.99	0.99
(C) condition (7°C)	**Pdh (declared heating capacity)**	**[kW]**	5.05	5.12	5.42	5.05	5.12	5.42
	COPd (declared COP)	**-**	6.69	6.70	5.99	6.69	6.70	5.99
	Cdh (degradation coefficient)	**-**	0.98	0.98	0.98	0.98	0.98	0.98
(D) condition (12°C)	**Pdh (declared heating capacity)**	**[kW]**	4.94	6.01	5.79	4.94	6.01	5.79
	COPd (declared COP)	**-**	8.55	8.40	8.28	8.55	8.40	8.28
	Cdh (degradation coefficient)	**-**	0.97	0.98	0.98	0.97	0.98	0.98
(E) Tol (temperature operating limit)	**Tol (temperature operating limit)**	**[°C]**	-10	-10	-10	-10	-10	-10
	Pdh (declared heating	**[kW]**	7.95	9.94	10.75	7.95	9.94	10.75

	capacity)							
	COPd (declared COP)	**-**	2.76	2.77	2.40	2.76	2.77	2.40
	WTOL (Heating water Operation Limit)	**[°C]**	75	75	75	75	75	75
(F) Tbivalent temperature	**Tbiv**	**[°C]**	-7	-7	-7	-7	-7	-7
	Pdh (declared heating capacity)	**[kW]**	7.09	9.94	10.66	7.09	9.94	10.66
	COPd (declared COP)	**-**	3.18	2.77	2.72	3.18	2.77	2.72
Supplementary capacity at P_design	**Psup (@Tdesignh: –10°C)**	**[kW]**	0.063	0.092	1.304	0.063	0.092	1.304
Product description	**Air-to-water heat pump**	**Y/N**	Yes	Yes	Yes	Yes	Yes	Yes
	Water-to-water heat pump	**Y/N**	No	No	No	No	No	No
	Brine-to-water heat pump	**Y/N**	No	No	No	No	No	No
	Low-temperature heat pump	**Y/N**	No	No	No	No	No	No
	Equipped with a supplementary heater	**Y/N**	No	No	No	No	No	No
	Heat pump combination heater	**Y/N**	No	No	No	No	No	No
Air to water unit	**Rated airflow (outdoor)**	**[m³/h]**	4030	4030	4450	4030	4030	4450
Brine/water to water unit	**Rated water/brine flow (outdoor H/E)**	**[m³/h]**	/	/	/	/	/	/
Other	**Capacity control**	**-**	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter
	Poff (Power consumption Off mode)	**[kW]**	0.016	0.016	0.016	0.016	0.016	0.016
	Pto (Power consumption Thermostat off mode)	**[kW]**	0.016	0.016	0.016	0.016	0.016	0.016
	Psb (Power consumption Standby mode)	**[kW]**	0.016	0.016	0.016	0.016	0.016	0.016
	PCK (Power crankcase heater model)	**[kW]**	0.052	0.052	0.052	0.052	0.052	0.052
	Qelec (Daily electricity consumption)	**[kWh]**	/	/	/	/	/	/
	Qfuel (Daily fuel consumption)	**[kWh]**	/	/	/	/	/	/

Note:

(*) Sound power measured according to the EN12102.

Heat pump space heater	**Outdoor**	HP3-8P-E	HP3-10P-E	HP3-12P-E	HP1-8P-E	HP1-10P-E	HP1-12P-E

Space heating	**Energy efficiency class 55°C (Medium temp. app.)**	**-**	A+++	A+++	A++	A+++	A+++	A++
Space heating	**Energy efficiency class 35°C (Low temp. app.)**	**-**	A+++	A+++	A+++	A+++	A+++	A+++
Space heating 55°C	**Prated (declared heating capacity) @ –10°C**	**[kW]**	8	10	12	8	10	12
	Seasonal space heating efficiency (ηs)	**[%]**	156	153	142	156	153	142
	Annual energy consumption	**[kWh]**	4,190	5,304	6,939	4,190	5,304	6,939
Space heating 35°C	**Prated (declared heating capacity) @ –10°C**	**[kW]**	8	10	12	8	10	12
	Seasonal space heating efficiency (ηs)	**[%]**	206	198	182	206	198	182
	Annual energy consumption	**[kWh]**	3,159	4,109	5,379	3,159	4,109	5,379
Details and precautions on installation, maintenance and assembly can be found in the installation and or operation manuals.								
Space heating 35°C	**Average climate medium temperature application**	**dB**	49	50	52	49	50	52
	Average climate low temperature application	**dB**	49	50	52	49	50	52
Part load conditions space heating average climate medium temperature application								
(A) condition (-7°C)	**Pdh (declared heating capacity)**	**[kW]**	7.12	8.86	10.75	7.12	8.86	10.75
	COPd (declared COP)	**-**	2.37	2.22	2.06	2.37	2.22	2.06
	Cdh(degradation coefficient)	**-**	0.99	1.00	1.00	0.99	1.00	1.00
(B) condition (2°C)	**Pdh (declared heating capacity)**	**[kW]**	4.57	5.48	6.46	4.57	5.48	6.46
	COPd (declared COP)	**-**	3.90	3.82	3.47	3.90	3.82	3.47
	Cdh(degradation coefficient)	**-**	0.99	0.99	0.99	0.99	0.99	0.99
(C) condition (7°C)	**Pdh (declared heating capacity)**	**[kW]**	3.97	4.88	4.29	3.97	4.88	4.29
	COPd (declared COP)	**-**	5.14	5.22	5.03	5.14	5.22	5.03
	Cdh(degradation coefficient)	**-**	0.98	0.98	0.98	0.98	0.98	0.98
(D) condition (12°C)	**Pdh (declared heating capacity)**	**[kW]**	5.31	5.71	6.12	5.31	5.71	6.12
	COPd (declared COP)	**-**	7.88	7.77	7.50	7.88	7.77	7.50
	Cdh(degradation	**-**	0.98	0.98	0.98	0.98	0.98	0.98

	coefficient)							
(E) Tol (temperature operating limit)	**Tol (temperature operating limit)**	**[°C]**	-10	-10	-10	-10	-10	-10
	Pdh (declared heating capacity)	**[kW]**	7.93	9.96	10.81	7.93	9.96	10.81
	COPd (declared COP)	**-**	1.95	1.93	1.81	1.95	1.93	1.81
	WTOL (Heating water Operation Limit)	**[°C]**	75	75	75	75	75	75
(F) Tbivalent temperature	**Tbiv**	**[°C]**	-7	-7	-7	-7	-7	-7
	Pdh (declared heating capacity)	**[kW]**	7.12	8.86	10.75	7.12	8.86	10.75
	COPd (declared COP)	**-**	2.37	2.22	2.06	2.37	2.22	2.06
Supplementary capacity at P_design	**Psup (@Tdesignh: –10°C)**	**[kW]**	0.125	0.050	1.344	0.125	0.050	1.344
Part load conditions space heating average climate low temperature application								
(A) condition (-7°C)	**Pdh (declared heating capacity)**	**[kW]**	7.07	8.86	10.64	7.07	8.86	10.64
	COPd (declared COP)	**-**	3.19	2.92	2.72	3.19	2.92	2.72
	Cdh (degradation coefficient)	**-**	0.99	0.99	1.00	0.99	0.99	1.00
(B) condition (2°C)	**Pdh (declared heating capacity)**	**[kW]**	4.63	5.40	6.79	4.63	5.40	6.79
	COPd (declared COP)	**-**	5.20	4.96	4.54	5.20	4.96	4.54
	Cdh (degradation coefficient)	**-**	0.98	0.99	0.99	0.98	0.99	0.99
(C) condition (7°C)	**Pdh (declared heating capacity)**	**[kW]**	5.05	5.01	5.42	5.05	5.01	5.42
	COPd (declared COP)	**-**	6.85	6.93	6.13	6.85	6.93	6.13
	Cdh (degradation coefficient)	**-**	0.98	0.98	0.98	0.98	0.98	0.98
(D) condition (12°C)	**Pdh (declared heating capacity)**	**[kW]**	4.93	5.87	5.78	4.93	5.87	5.78
	COPd (declared COP)	**-**	8.89	8.56	8.64	8.89	8.56	8.64
	Cdh (degradation coefficient)	**-**	0.97	0.98	0.98	0.97	0.98	0.98
(E) Tol (temperature operating limit)	**Tol (temperature operating limit)**	**[°C]**	-10	-10	-10	-10	-10	-10
	Pdh (declared heating capacity)	**[kW]**	7.94	9.87	10.73	7.94	9.87	10.73
	COPd (declared COP)	**-**	2.75	2.45	2.34	2.75	2.45	2.34
	WTOL (Heating water Operation Limit)	**[°C]**	75	75	75	75	75	75

(F) Tbivalent temperature	**Tbiv**	**[°C]**	-7	-7	-7	-7	-7	-7
	Pdh (declared heating capacity)	**[kW]**	7.07	8.86	10.64	7.07	8.86	10.64
	COPd (declared COP)	**-**	3.19	2.92	2.72	3.19	2.92	2.72
Supplementary capacity at P_design	**Psup (@Tdesignh: -10°C)**	**[kW]**	0.063	0.154	1.289	0.063	0.154	1.289
Product description	**Air-to-water heat pump**	**Y/N**	Yes	Yes	Yes	Yes	Yes	Yes
	Water-to-water heat pump	**Y/N**	No	No	No	No	No	No
	Brine-to-water heat pump	**Y/N**	No	No	No	No	No	No
	Low-temperature heat pump	**Y/N**	No	No	No	No	No	No
	Equipped with a supplementary heater	**Y/N**	No	No	No	No	No	No
	Heat pump combination heater	**Y/N**	No	No	No	No	No	No
Air to water unit	**Rated airflow (outdoor)**	**[m³/h]**	4030	4030	4450	4030	4030	4450
Brine/water to water unit	**Rated water/brine flow (outdoor H/E)**	**[m³/h]**	/	/	/	/	/	/
Other	**Capacity control**	**-**	Inverter	Inverter	Inverter	Inverter	Inverter	Inverter
	Poff (Power consumption Off mode)	**[kW]**	0.016	0.016	0.016	0.016	0.016	0.016
	Pto (Power consumption Thermostat off mode)	**[kW]**	0.016	0.016	0.016	0.016	0.016	0.016
	Psb (Power consumption Standby mode)	**[kW]**	0.016	0.016	0.016	0.016	0.016	0.016
	PCK (Power crankcase heater model)	**[kW]**	0.052	0.052	0.052	0.052	0.052	0.052
	Qelec (Daily electricity consumption)	**[kWh]**	/	/	/	/	/	/
	Qfuel (Daily fuel consumption)	**[kWh]**	/	/	/	/	/	/

Note:

(*) Sound power measured according to the EN12102.

Condition (°C)	**Model**	**Capacity (kW)**	**Power input (kW)**	**EER/COP (/)**
Ambient Temperature: 35/24	HP3-8-E	8.0	2.66	3.01

Water temperature: 12/7	HP3-10-E	9.0	3.11	2.89
	HP3-12-E	10.0	3.56	2.81
	HP1-8-E	8.0	2.66	3.01
	HP1-10-E	9.0	3.11	2.89
	HP1-12-E	10.0	3.56	2.81
	HP3-8P-E	8.0	2.65	3.02
	HP3-10P-E	9.0	3.11	2.89
	HP3-12P-E	10.0	3.55	2.82
	HP1-8P-E	8.0	2.65	3.02
	HP1-10P-E	9.0	3.11	2.89
	HP1-12P-E	10.0	3.55	2.82
	HP3-8-E	8.0	1.76	4.54
	HP3-10-E	9.0	2.06	4.37
	HP3-12-E	10.0	2.34	4.27
	HP1-8-E	8.0	1.76	4.54
	HP1-10-E	9.0	2.06	4.37
Ambient Temperature: 35/24	HP1-12-E	10.0	2.34	4.27
Water temperature: 23/18	HP3-8P-E	8.0	1.76	4.55
	HP3-10P-E	9.0	2.05	4.38
	HP3-12P-E	10.0	2.34	4.28
	HP1-8P-E	8.0	1.76	4.55
	HP1-10P-E	9.0	2.05	4.38
	HP1-12P-E	10.0	2.34	4.28
	HP3-8-E	8.0	1.60	5.00
	HP3-10-E	10.0	2.04	4.90
	HP3-12-E	12.0	2.73	4.40
	HP1-8-E	8.0	1.60	5.00
	HP1-10-E	10.0	2.04	4.90
Ambient Temperature: 7/6	HP1-12-E	12.0	2.73	4.40
Water temperature: 30/35	HP3-8P-E	8.0	1.59	5.02
	HP3-10P-E	10.0	2.04	4.91
	HP3-12P-E	12.0	2.72	4.41
	HP1-8P-E	8.0	1.59	5.02
	HP1-10P-E	10.0	2.04	4.91
	HP1-12P-E	12.0	2.72	4.41
	HP3-8-E	8.0	1.91	4.19
	HP3-10-E	10.0	2.43	4.12
	HP3-12-E	12.0	3.25	3.69
Ambient Temperature: 2/1	HP1-8-E	8.0	1.91	4.19
Water temperature: 30/35	HP1-10-E	10.0	2.43	4.12
	HP1-12-E	12.0	3.25	3.69
	HP3-8P-E	8.0	1.89	4.23
	HP3-10P-E	10.0	2.41	4.15

	HP3-12P-E	12.0	3.22	3.73
	HP1-8P-E	8.0	1.89	4.23
	HP1-10P-E	10.0	2.41	4.15
	HP1-12P-E	12.0	3.22	3.73
Ambient Temperature: -7/-8 **Water temperature: 30/35**	HP3-8-E	8.0	2.51	3.19
	HP3-10-E	10.0	3.19	3.13
	HP3-12-E	12.0	4.29	2.80
	HP1-8-E	8.0	2.51	3.19
	HP1-10-E	10.0	3.19	3.13
	HP1-12-E	12.0	4.29	2.80
	HP3-8P-E	8.0	2.49	3.21
	HP3-10P-E	10.0	3.15	3.17
	HP3-12P-E	12.0	4.24	2.83
	HP1-8P-E	8.0	2.49	3.21
	HP1-10P-E	10.0	3.15	3.17
	HP1-12P-E	12.0	4.24	2.83
Ambient Temperature: 7/6 **Water temperature: 47/55**	HP3-8-E	8.0	2.56	3.13
	HP3-10-E	10.0	3.31	3.02
	HP3-12-E	12.0	4.26	2.82
	HP1-8-E	8.0	2.56	3.13
	HP1-10-E	10.0	3.31	3.02
	HP1-12-E	12.0	4.26	2.82
	HP3-8P-E	8.0	2.56	3.13
	HP3-10P-E	10.0	3.32	3.01
	HP3-12P-E	12.0	4.27	2.81
	HP1-8P-E	8.0	2.56	3.13
	HP1-10P-E	10.0	3.32	3.01
	HP1-12P-E	12.0	4.27	2.81
Ambient Temperature: 2/1 **Water temperature: 47/55**	HP3-8-E	8.0	2.85	2.81
	HP3-10-E	10.0	3.62	2.76
	HP3-12-E	12.0	4.84	2.48
	HP1-8-E	8.0	2.85	2.81
	HP1-10-E	10.0	3.62	2.76
	HP1-12-E	12.0	4.84	2.48
	HP3-8P-E	8.0	2.82	2.84
	HP3-10P-E	10.0	3.59	2.79
	HP3-12P-E	12.0	4.80	2.50
	HP1-8P-E	8.0	2.82	2.84
	HP1-10P-E	10.0	3.59	2.79
	HP1-12P-E	12.0	4.80	2.50
Ambient Temperature: -7/-8 **Water temperature: 47/55**	HP3-8-E	8.0	3.50	2.29
	HP3-10-E	10.0	4.33	2.31
	HP3-12-E	12.0	5.94	2.02

	HP1-8-E	8.0	3.50	2.29
	HP1-10-E	10.0	4.33	2.31
	HP1-12-E	12.0	5.94	2.02
	HP3-8P-E	8.0	3.46	2.31
	HP3-10P-E	10.0	4.30	2.33
	HP3-12P-E	12.0	5.89	2.04
	HP1-8P-E	8.0	3.46	2.31
	HP1-10P-E	10.0	4.30	2.33
	HP1-12P-E	12.0	5.89	2.04
EER and COP calculation is based in accordance to EN14511.				

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