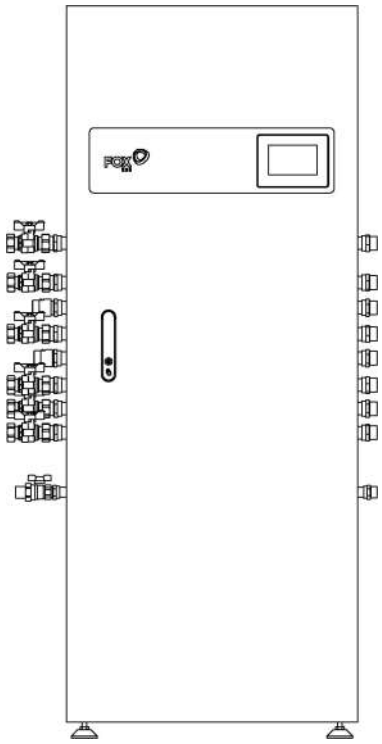
Installation, Operation and Maintenance Manual

HP Box Series

Hydro Box



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

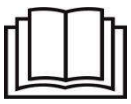
Please read this entire document to ensure the proper use of the unit. Failure to follow this may void the warranty. Please strictly follow the safety instructions in this manual during operation, otherwise it may result in equipment malfunction, electrical shock, series injury or death.

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:

	**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 present, which can corrode copper pipes or soldered parts and lead to refrigerant leakage.
- Places with machinery emitting significant electromagnetic waves, which can disrupt system control and cause equipment malfunctions.
- Areas where flammable gases could leak, or where there are suspended carbon fibers, ignitable dust, or volatile substances like paint thinner or gasoline, as these may pose a fire hazard.
- Environments with fluctuating voltage, such as factories, vehicles, or vessels, and places with acidic or alkaline vapors.

Intended use includes the following:

- Adherence to the operating instructions provided for the product and any accompanying 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 IP code.

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!** • 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 panel can be securely fastened. If the panel is not in place, there could be overheating of the terminals, electric shocks or fire.

	• Do not touch the internal parts 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.

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 Box Series Hydro Box:

HP1 Box-E-WL HP3 Box-E-WL

2.2 Unit Introduction

- **Introduction**

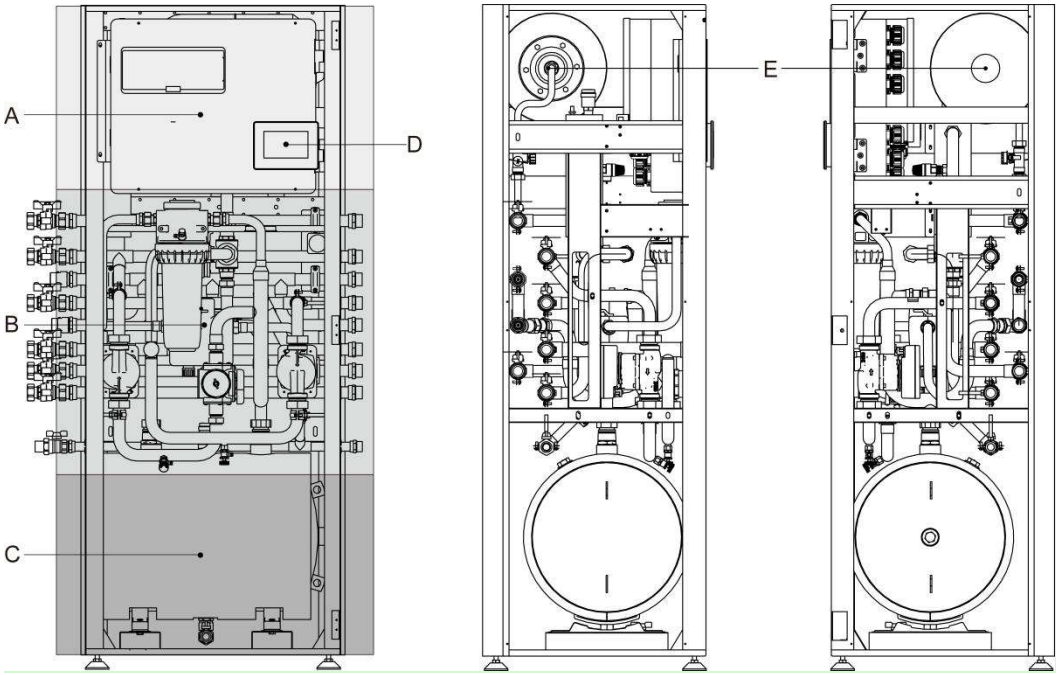
The HP Box Series Hydro Box, when paired with the HP Series Air To Water Heat Pump, is a renewable energy technology that extracts heat from the ambient air and transfers it to a water-based heating system. The heat pump absorbs heat from the outdoor air, even in cold weather conditions, utilizing refrigerant 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 Box Series Hydro Box, when paired with 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**

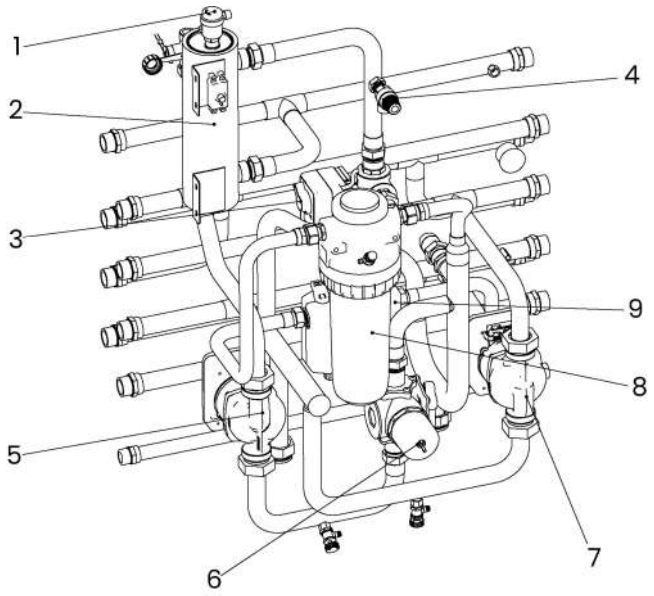
The Indoor Unit:



Code	Name	Code	Name
A	Electronic Control Chamber	D	Control Panel

B	Piping Module	E	Expansion Vessel
C	Buffer Tank		

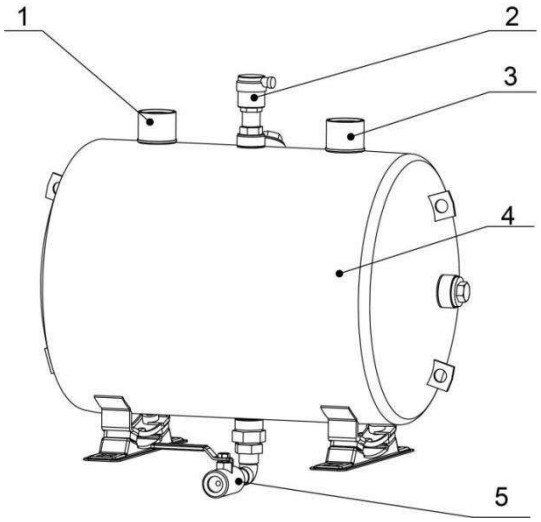
The Piping Module of the Indoor Unit:



No.	Assembly Unit	Explanation
1	Automatic Air Purge Valve	Automatically remove the remaining air from the water loop.
2	Back-up Heater	Provide additional heating capacities when the heating capacity of the heat pump is insufficient due to low outdoor temperature, and protect the external water pipes from freezing.
3	Three-way Valve	Change the direction of water flow to switch between heating and domestic hot water functions.
4	Pressure Relief Valve (3 bar)	Prevent excessive water pressure in space heating/cooling circuit by opening when the pressure reaches 3 bar and discharging water from the water loop.
5	Primary Circulation Water Pump	Circulate water between the heat pump outdoor unit and the indoor unit.
6	Dirt Separator	Remove impurities from the water to prevent pump wear, valve damage, or blockage of heat exchangers.
7	Zone 1 Circulation Water Pump	Circulate water in Zone 1.
8	Filling Section	Desalinate raw water for the first injection or make-up of heating systems.

9	BA Type Check Valve	Isolate the heating circle from the domestic water system to prevent water from the heating circle from flowing back into the domestic water system.

The Buffer Tank of the Indoor Unit:



No.	Assembly Unit	Explanation
1	Water Return	-
2	Air Vent Valve	Automatically remove the air from the tank.
3	Water Flow	-
4	Buffer Tank	Store cooling/heating energy and reduce equipment start-stop frequency.
5	Drain Valve	Drain water from the system.

2.3 Documentation

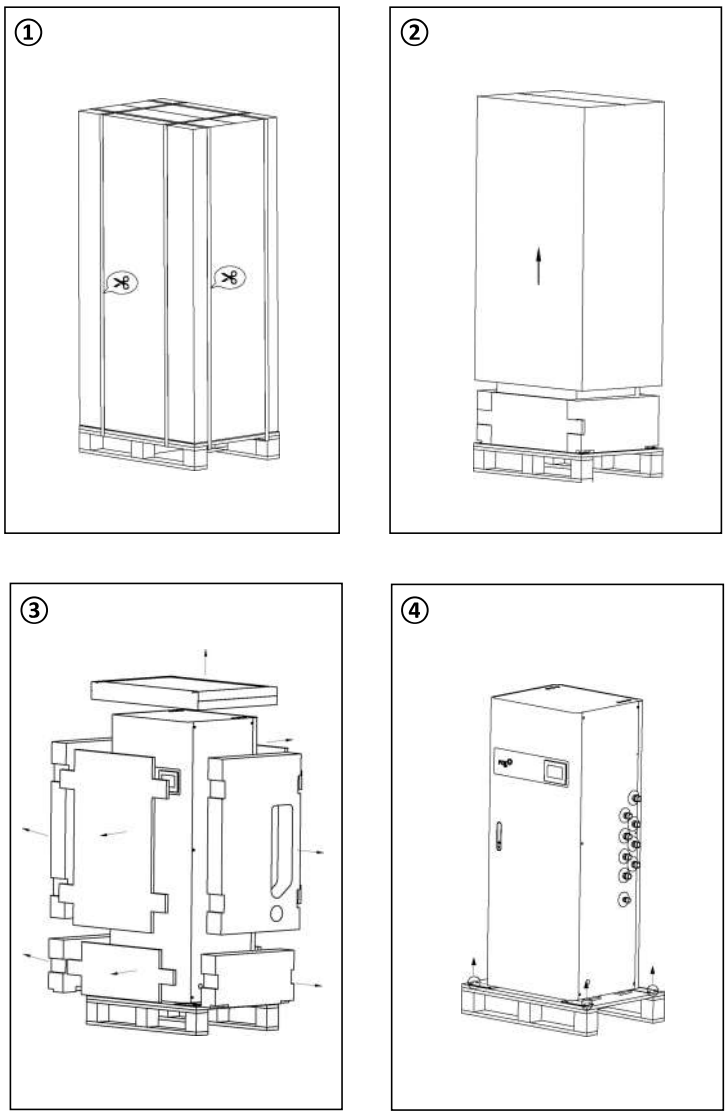
- Installation, Operation and Maintenance Manual

Scan the following QR code to download electronic documents.

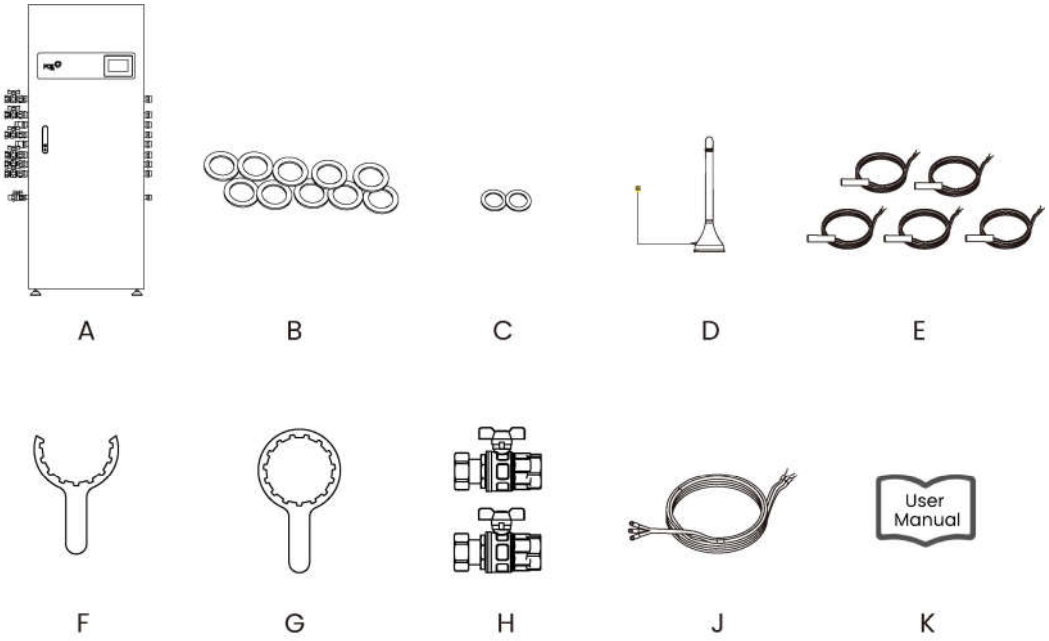
3 Installation

3.1 Before Installation

3.1.1 Unpacking



3.1.2 Packing List

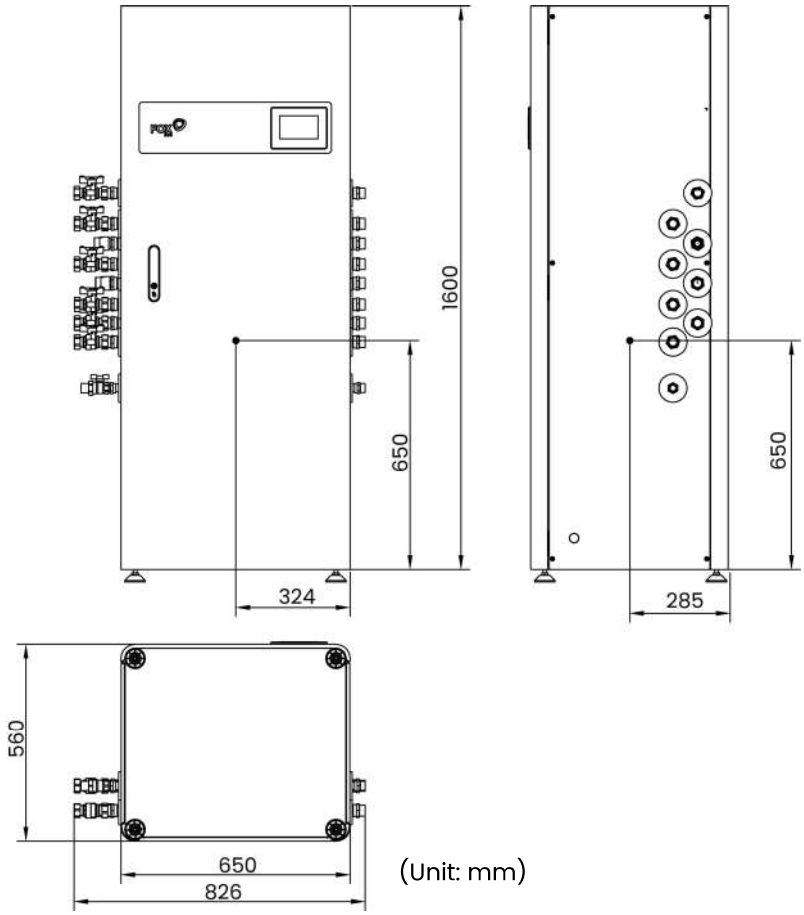


Code	Quantity	Description	Code	Quantity	Description
A	1	Hydro Box	F	1	Magnetic Filter Removal Wrench
B	10	Rubber Gasket-G1"	G	1	Filling Section Removal Wrench
C	2	Rubber Gasket-G3/4"	H	2	Ball Valve
D	1	WiFi Antenna	J	1	IDU-ODU Communication Cable: 15 m
E	5	Flow Temperature Sensor (TZ2, TWT, TW1: 5m; TW2, TW3: 10m)	K	1	User Manual

3.1.3 Handling

- **Dimensions and Barycenter**

The numerical values indicate the lengths to find the barycenter.

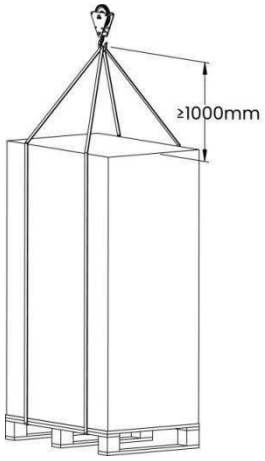


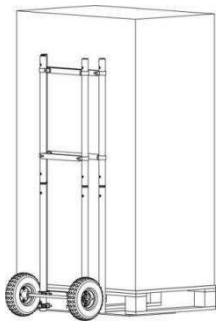
(Unit: mm)

- **Handling**

⚠	**Caution!** • The unit is heavy. Prevent the unit from falling due to improper inclination during handling. • Protect the casing sections from damage. Use corner protectors under the units during lifting.

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





3.2 Unit Installation

3.2.1 Installation Site

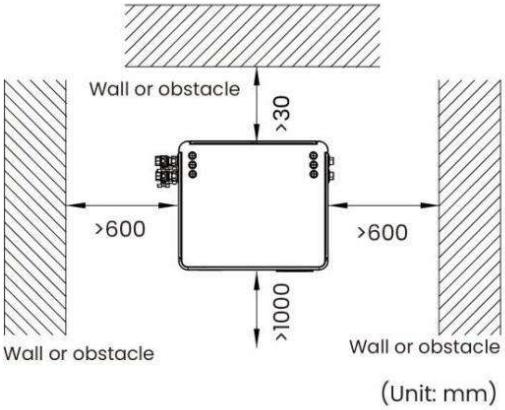
⚠	**Warning!** ● Small animals making contact with electrical parts can cause malfunction, smoke or fire. Please instruct the customer to keep the area around the unit clean. ● The equipment is not intended for use in a potentially explosive atmosphere.

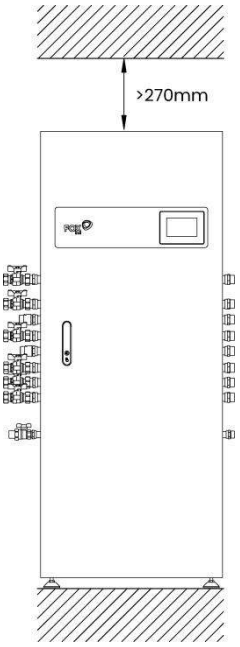
Select an installation site where the following conditions are satisfied and one that meets with your customer's approval.

- 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).
- 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.
- Do not install the unit near the sea or where there is corrosive gas.

The indoor unit can be installed in an indoor waterproof place.

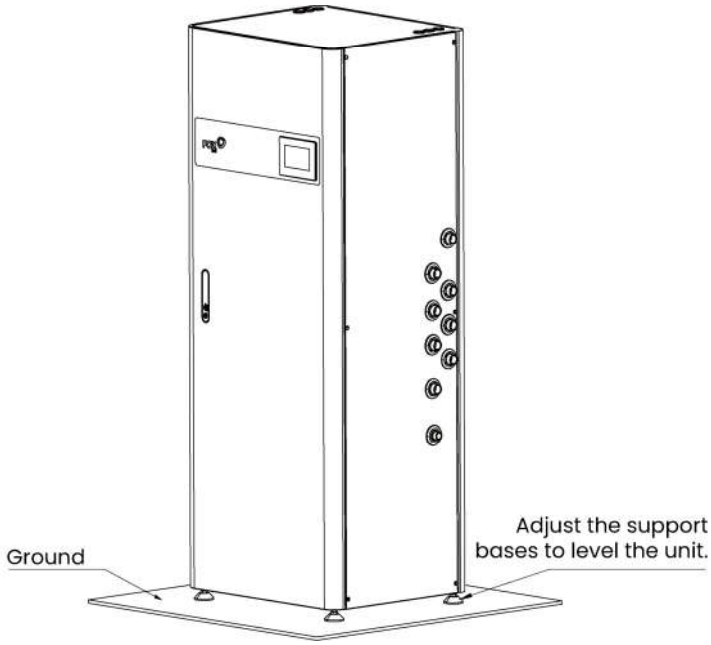
3.2.2 Space Requirement





3.2.3 Unit Installation

➢ Place the indoor unit inside buildings. Adjust the support bases to level the indoor unit.



3.3 Hydraulic Installation

3.3.1 Preparation for Installation

	Note! ● In case of plastic pipes, make sure they are fully oxygen-tight according to DIN 4726. ● The diffusion of oxygen into the piping can lead to excessive corrosion.

➢ **Minimum Water Volume**

Verify that the total water volume in the installation is at least 50L to completely fill the hydraulic module, excluding the internal water volume of the outdoor unit.

	Note! ● Extra water might be required in critical processes or in rooms with a high heating load. ● When circulation in each space heating/cooling loop is controlled by remotely controlled valves, it is necessary to guarantee the minimum water volume, even if all of the valves are closed.

➢ **Flow Rate Range**

Verify that the minimum flow rate in the installation is guaranteed in all conditions. This rate is required during defrosting/backup heater operation.

	Note! ● When one or more heating circuits are controlled by remotely controlled valves, the minimum water flow needs to be guaranteed, even if all valves are closed. If the minimum flow rate cannot be satisfied, flow rate protection (unit shutdown) will be triggered.

➢ **Pre-pressure Adjustment of the Expansion Vessel**

The hydromodule is equipped with an expansion vessel of 24L in space heating/cooling circuit that has a default pre-pressure of 1.5 bar. To assure proper operation of the unit, the pre-pressure of the expansion vessel needs to be adjusted.

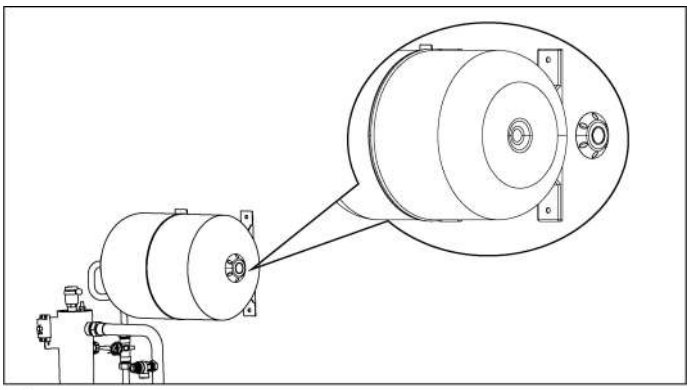
1) Verify that the total water volume in the installation, excluding the internal water volume of the unit, is at least 50L.

2) The calculation of the pre-pressure (Pg) of the expansion vessel in space heating/cooling circuit is shown in the formula below:

$$Pg=0.3+(H/10)\ (bar),$$

wherein H is installation height difference between the hydromodule and the highest point of the water circuit system.

3) Rotate and remove the protective cap, and pressurize (with nitrogen) or vent the expansion vessel through the Schrader valve.



➢ **Requirements for Third-party Tanks**

A Third-party tank should meet the following requirements:

- The heat exchanger coil of the tank is ≥ 1.5m^2.
- The tank thermistor must be located above the heat exchanger coil.
- The booster heater must be located above the heat exchanger coil.

	Note! ● **Performance** Performance data for third-party tanks is unavailable, and the performance CANNOT be guaranteed. ● **Configuration** Configuration of a third-party depends on the size of the heat exchanger coil of the tank.

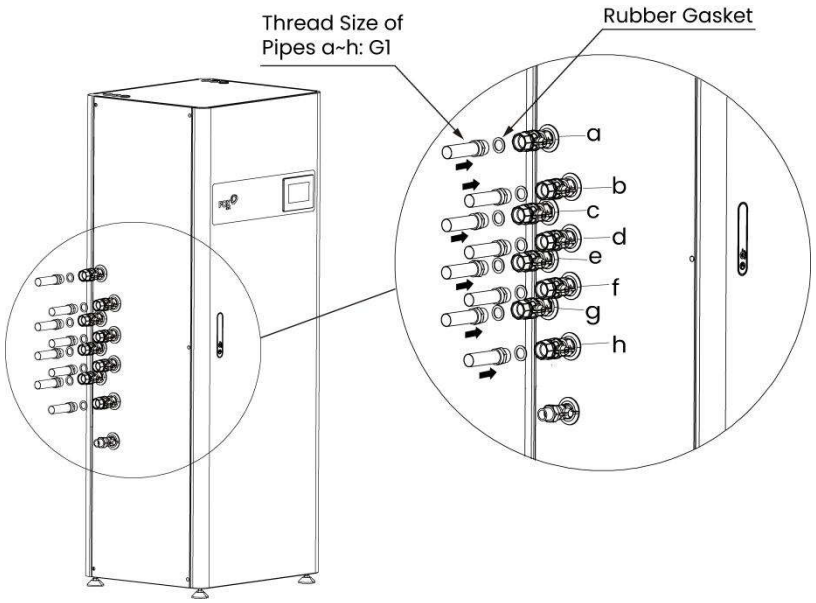
For the installation of the domestic hot water tank (supplied by the user), refer to the specific manual of the domestic hot water tank.

➢ **Thermistor of Domestic Hot Water Tank**

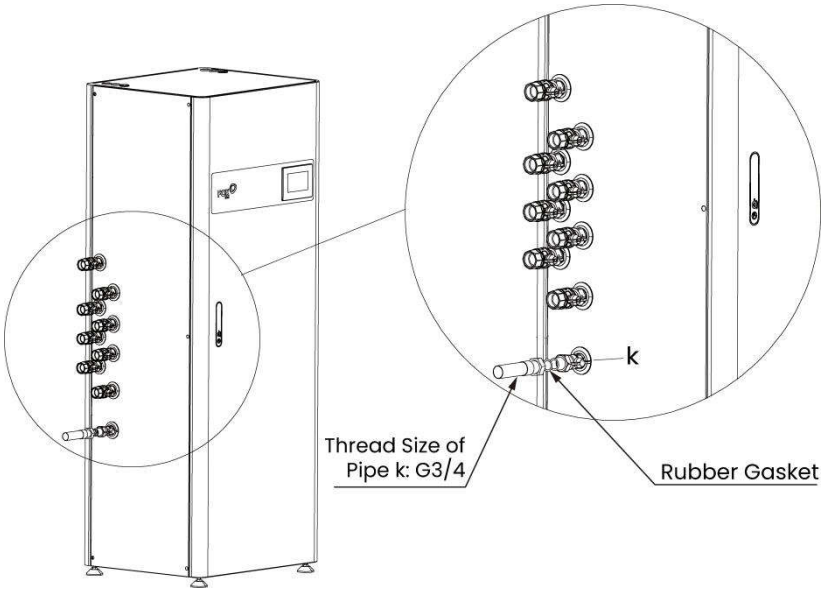
The maximum allowable thermistor cable length is 20m, which is equal to the maximum allowable distance between the domestic hot water tank and the unit (only for installation with a domestic hot water tank).

3.3.2 Water Loop Connection

	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.



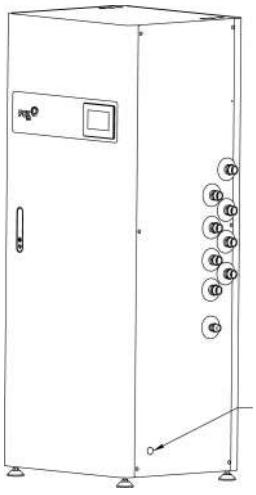
Code	Description
a	Heating Flow from Outdoor Unit
b	Heating Return to Outdoor Unit
c	Return from heating circuit 1
d	Flow to Heating Circuit 1
e	Return from pump group of heating circuit 2
f	Flow to pump group of heating circuit 2
g	Return from DHW tank
h	Flow to DHW tank



Code	Description
k	Tap water

Note!

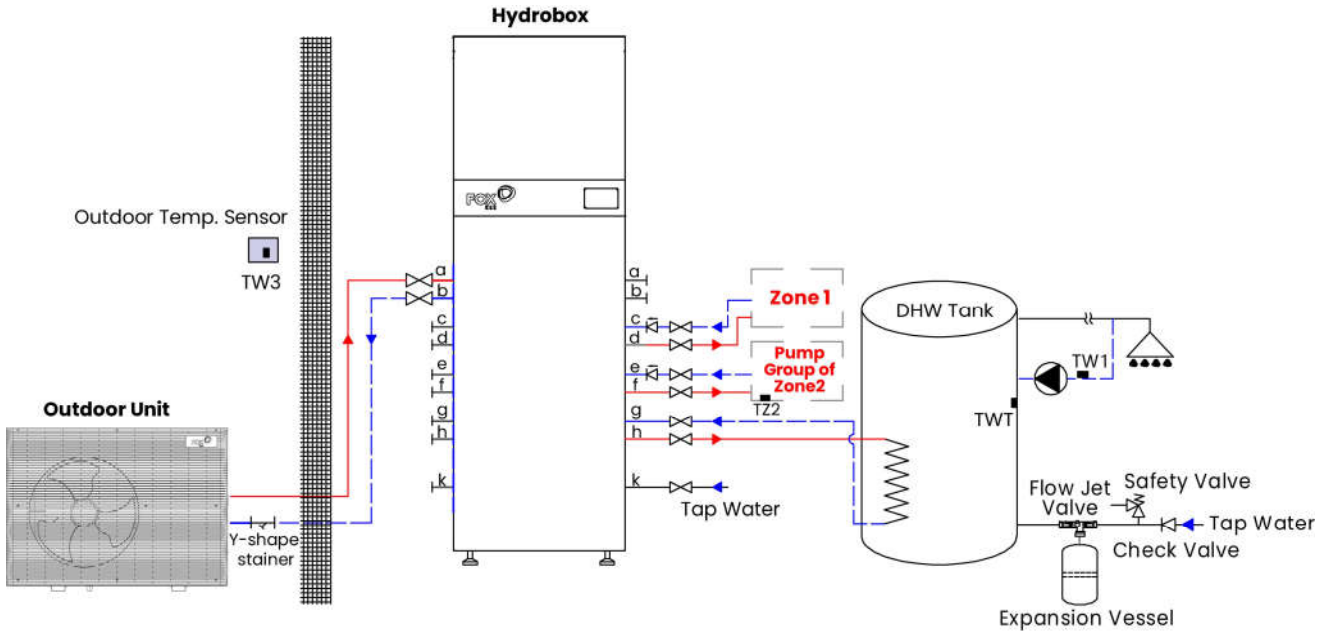
- Air purge valves must be installed at high points of the system.
- Drain taps must be installed at low points of the system.



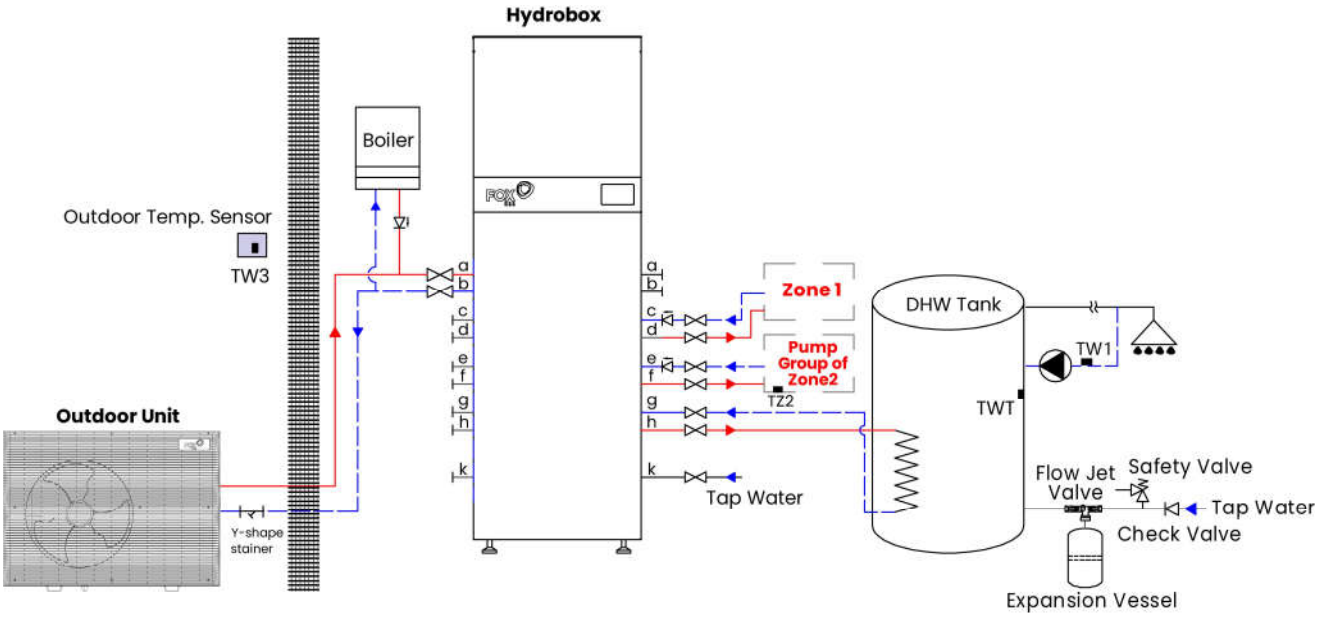
Knock-out holes on both sides are used for routing internal drainage pipes, chosen as needed based on installation location.

3.3.3 System Solutions

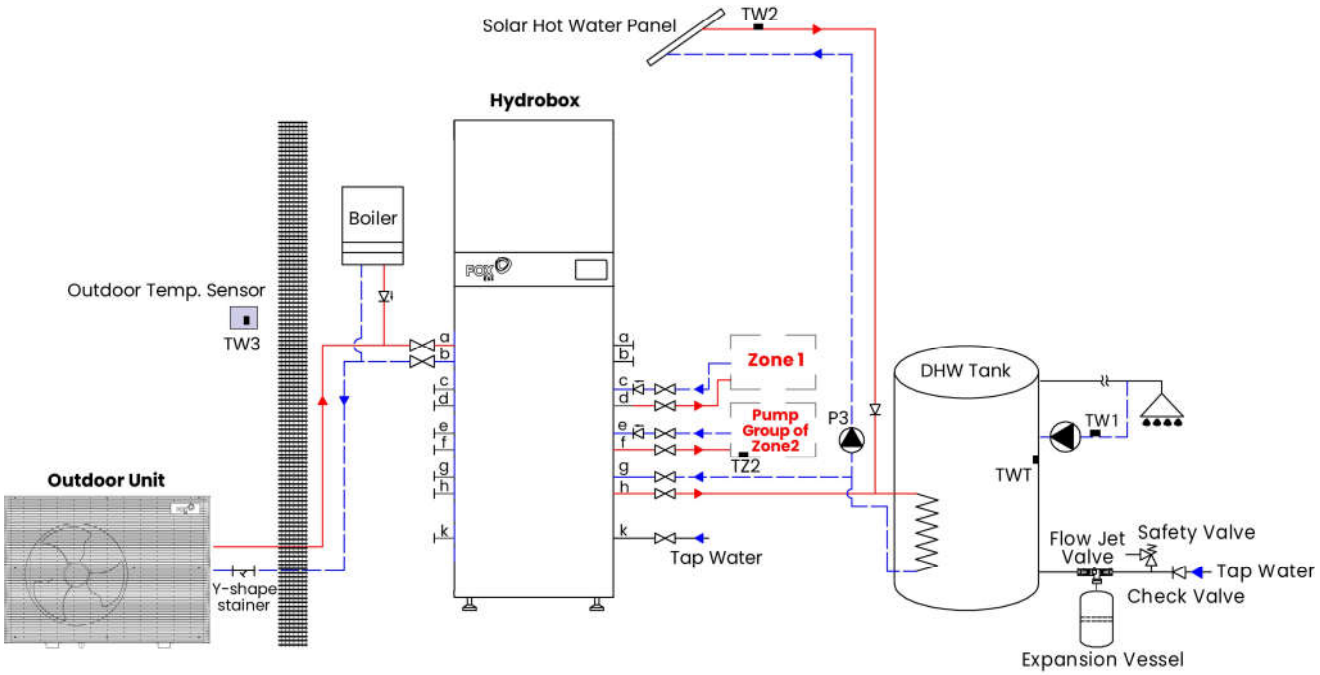
- **System with Single Heat Pump**



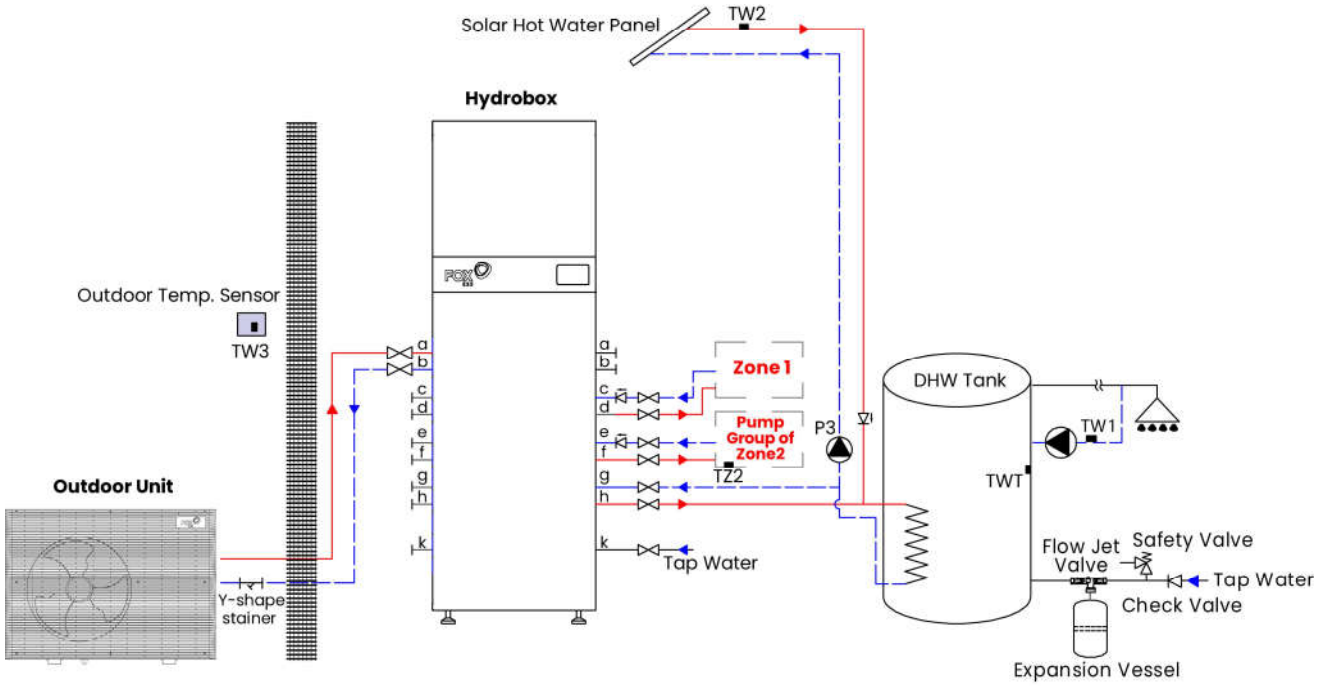
- **System with Heat Pump and Boiler**



- **System with Heat Pump, Boiler, and Solar**



- **System with Heat Pump and Solar**



3.4 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 must 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.

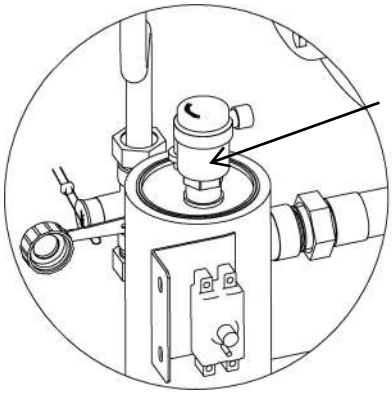
3.5 Filling Water Loop with Water

	**Note!** ● Before filling with water, please check 3.4 Water for the water quality requirements. Units and valves may become stuck as a result of poor water quality.

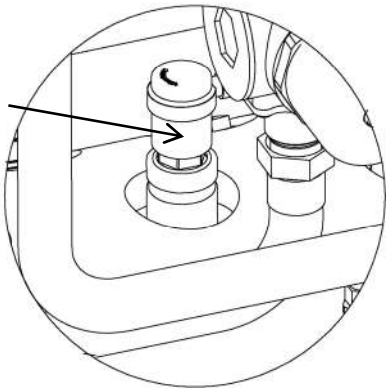
- Connect the water supply to the filling valve (supplied by the user) and open the valve. Follow applicable regulations.

- Make sure the automatic air purge valve is open.
- Ensure a water pressure of approximately 2.0 bar.

Remove the air in the loop as much as possible using the air purge valve. Air in the water loop could lead to malfunction of the backup heater.



When the system is running, open the air purge valve, and turn it anticlockwise at least 2 full turns to release air from the system.



3.6 Electrical Installation

	**Danger!** ● Risk of electrocution.

3.6.1 Total Distribution Power

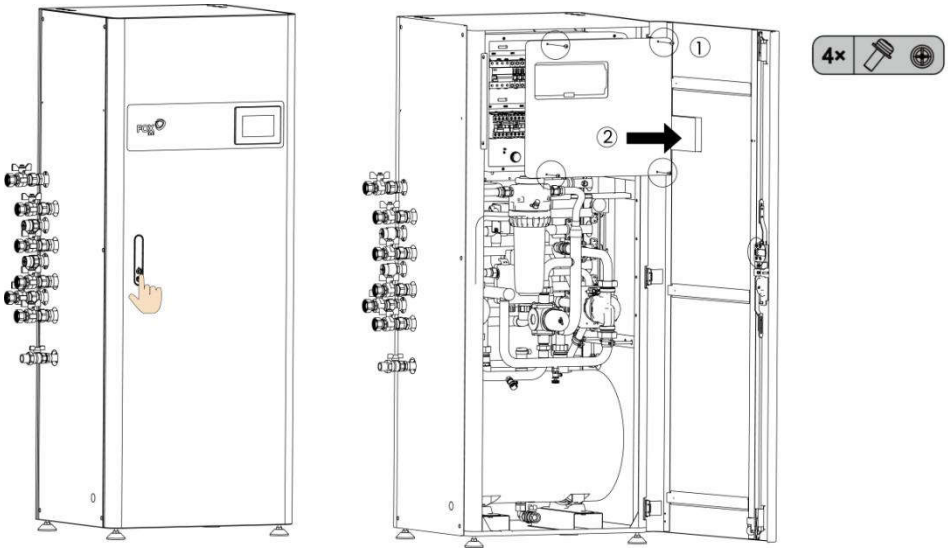
Select the appropriate electrical power based on the power values in the table below.

Indoor unit	Outdoor Unit	Rated Power Input		
		Indoor Unit (kW)	Outdoor Unit (kW)	Total (Indoor unit+Outdoor unit) (kW)
HP1 BOX-E-WL	HP1-5-E/HP1-5P-E	3.51	2.90	6.41
	HP1-8-E/HP1-8P-E	3.51	3.80	7.31
	HP1-10-E/HP1-10P-E	3.51	4.80	8.31
	HP1-12-E/HP1-12P-E	3.51	6.60	10.11
HP3 BOX-E-WL	HP3-8-E/HP3-8P-E	9.51	3.80	13.31
	HP3-10-E/HP3-10P-E	9.51	4.80	14.31
	HP3-12-E/HP3-12P-E	9.51	6.60	16.11

3.6.2 Opening the Electrical Control Box

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.



3.6.3 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

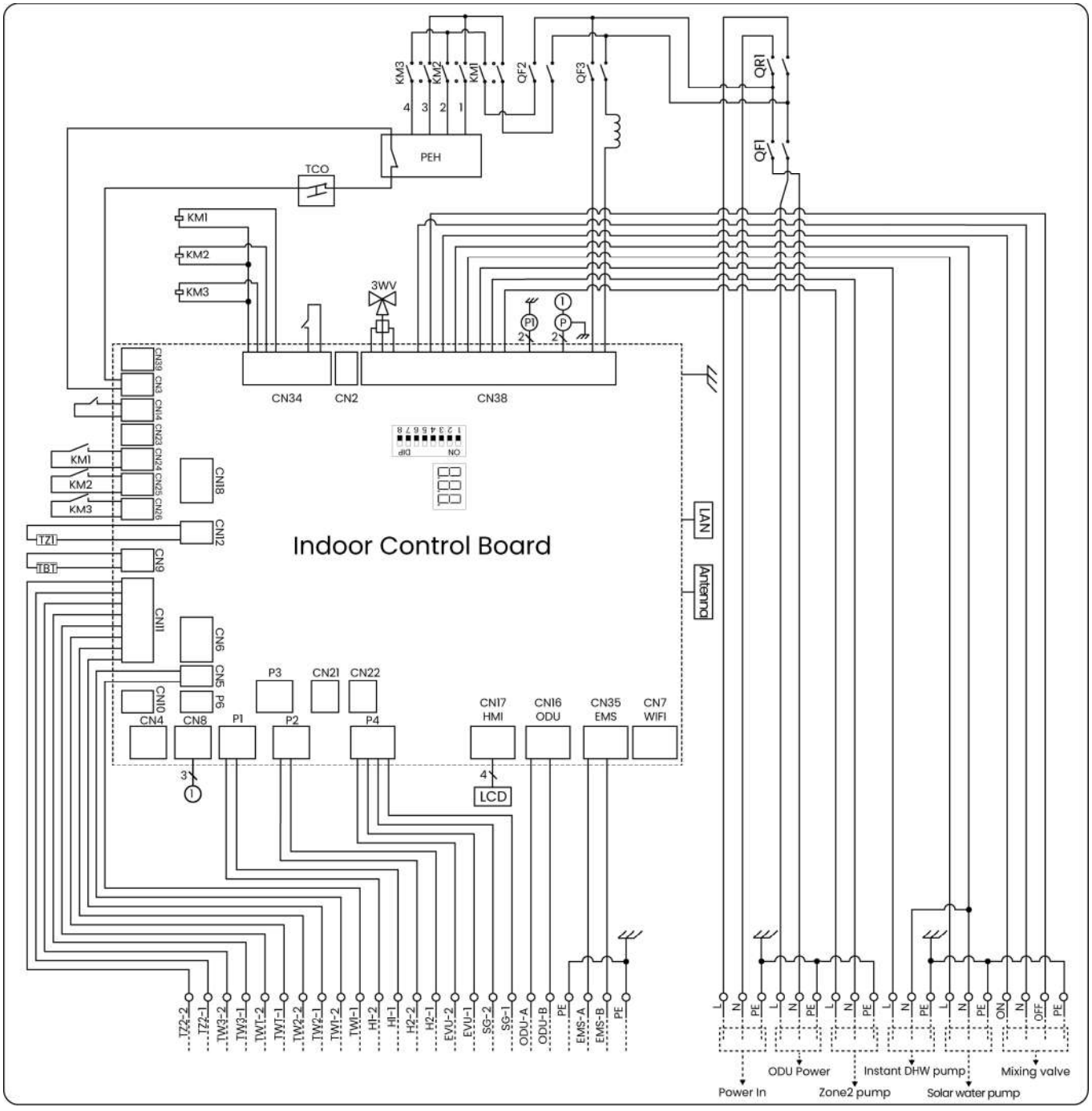
	**Note!** ● Communication wires must be shielded. ● Power cables and communication wires must be laid out separately, and cannot be placed in the same conduit. Otherwise, electromagnetic interference may occur. ● Secure the electrical wires with cable ties so that they will not come in contact with the 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

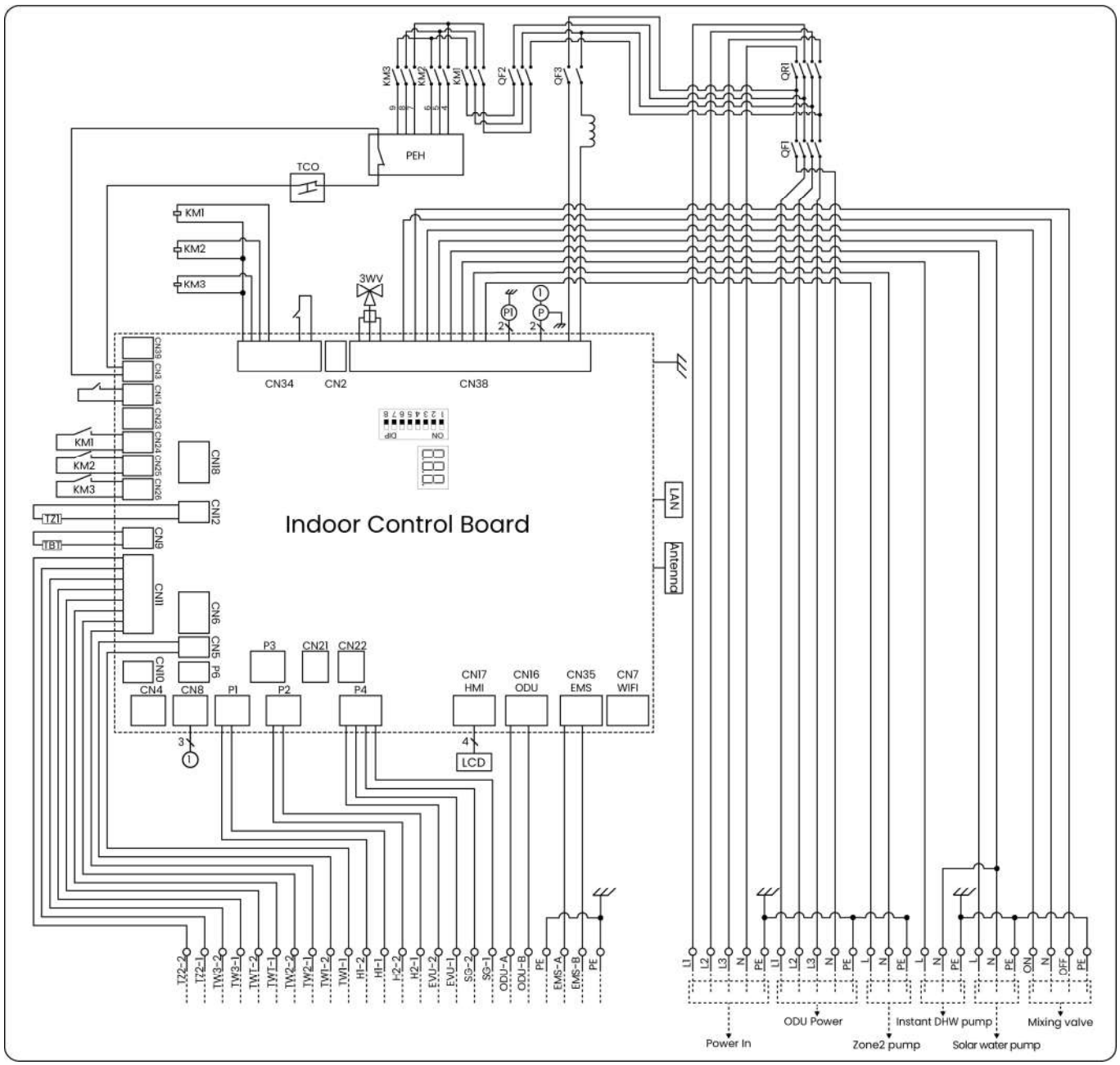
	**Note!** ● The equipment must be earthed. ● Any high-voltage external load, if it is metal or an earthed port, must be earthed. ● Make sure the earth fault circuit interrupter is compatible with the inverter (resistant to high frequency electrical noise) to avoid unnecessary startup of the interrupter.

3.6.4 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
PEH	Pipeline Electric Heater	3WV	3-way Valve
TCO	Temperature Controller	P1	Zone 1 Water Pump
LCD	Liquid Crystal Display	P	Main Water Pump
KM1~KM3	Contactor	TZ1	Zone 1 Temperature Sensor
QF1~QF3	Circuit Breaker	TBT	Buffer Tank Temperature Sensor
QR1	Leakage Protector		

3.6.5 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

Wires		Recommended Cross-sectional Area
Power In (*Note 1)	HP1 Box-E-WL	3*10 mm^2 (Minimum)
	HP3 Box-E-WL	5*(4 mm^2 ~6 mm^2)
Zone2 Pump, Solar Water Pump, Mixing Valve, Instant DHW Pump		3*(1 mm^2 ~2 mm^2)
H1, H2, EVU, SG		2*(0.5 mm^2 ~1.5 mm^2)
EMS, ODU		2*(0.5 mm^2 ~1 mm^2) (TP shielded)
ODU Power (*Note 1)	HP1 Box-E-WL	3*6 mm^2
	HP3 Box-E-WL	5*(3 mm^2 ~4 mm^2)

*Note 1: when selecting the model, factors such as the power cable's operating ambient temperature and its actual length shall be taken into consideration.

3.6.6 Specifications for External Water Pump and Thermostatic Mixing Valve

Item	Power Supply	Maximum Running Current	Wiring Instructions
Zone2 Pump Control Cable	220-240V ~50Hz	200mA	-
Instant DHW Pump Control Cable	220-240V ~50Hz	200mA	
Solar Water Pump Control Cable	220-240V ~50Hz	200mA	-
Mixing Valve	220-240V ~50Hz	200mA	ON: Mix OFF: Direct

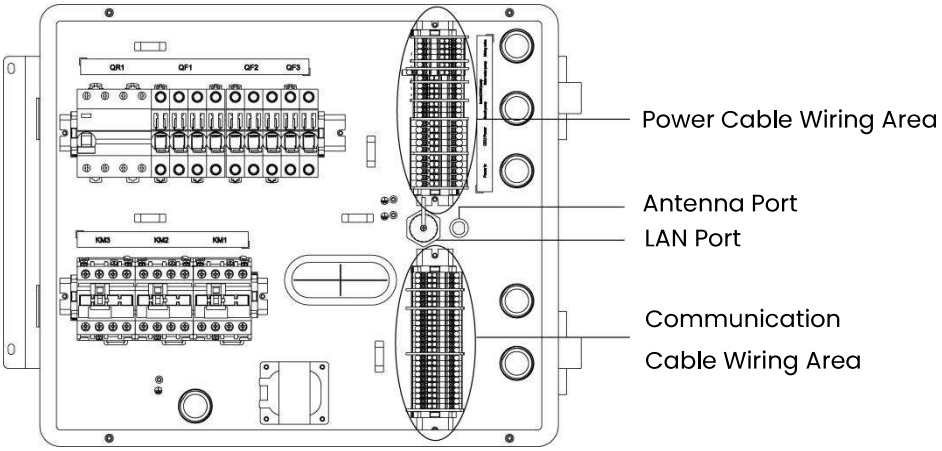
3.6.7 Tightening Torques

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

M4 (Earthed)	1.2 to 1.4

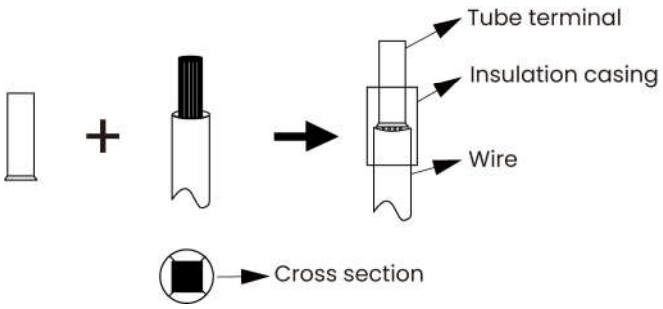
	Note! ● Over-tightening might damage the screws. ● Tighten the screws with a proper screwdriver. Using an improper screwdriver could damage the screws and provide improper tightening torques.

3.6.8 Wiring Box Layout

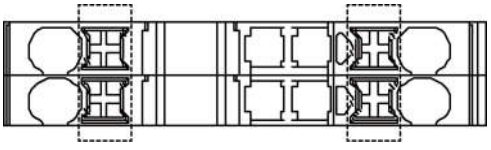


3.6.9 Electrical Connection

1) It is recommended to use the tubular terminal shown in the figure below to crimp the conductor cross-section into a square shape, then apply an appropriate heat-shrink tube. Ensure that the crimping is secure and reliable.
2) Securely connect a power wire or communication wire that meets the specification.

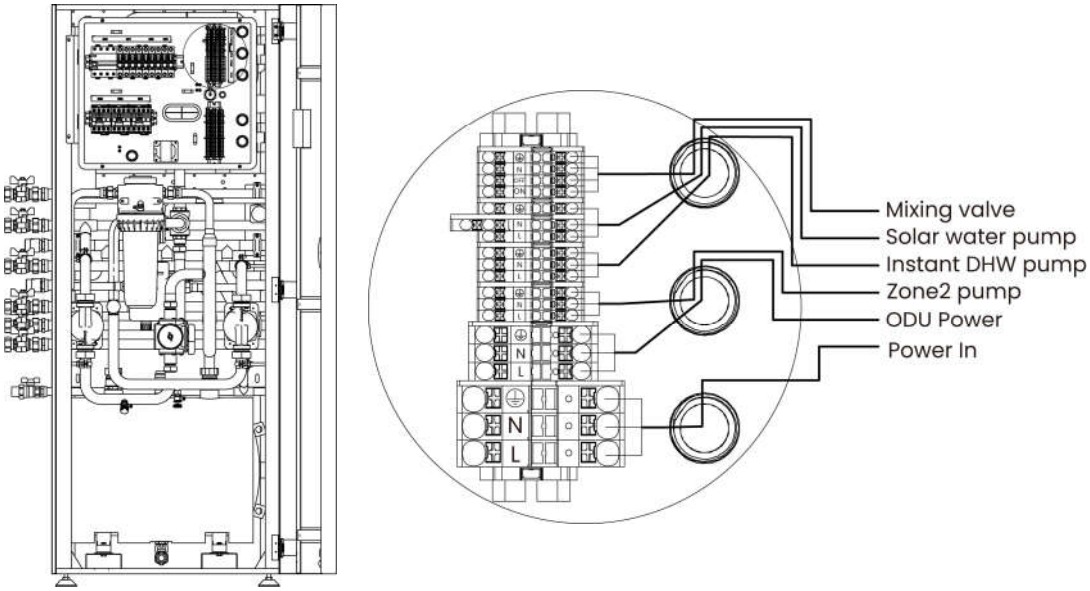


3) When connecting or disconnecting the wires, first use a screwdriver to press down the locking tab at the corresponding terminal position to make the wiring easier and more reliable.



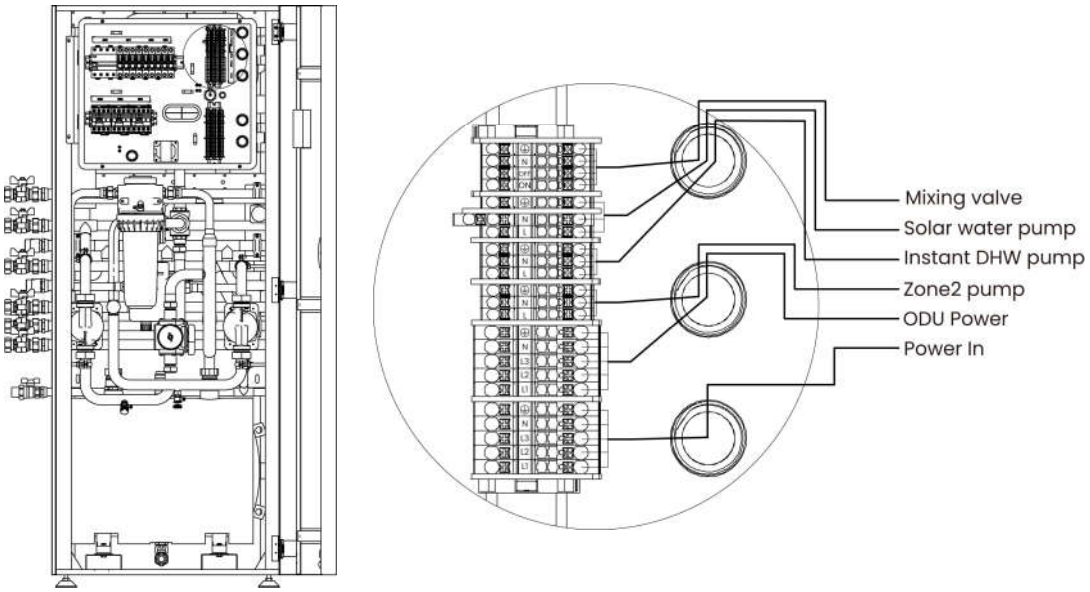
	Danger! ● The wires could overheat due to loose wiring.

➢ Connect power wires (single-phase unit).



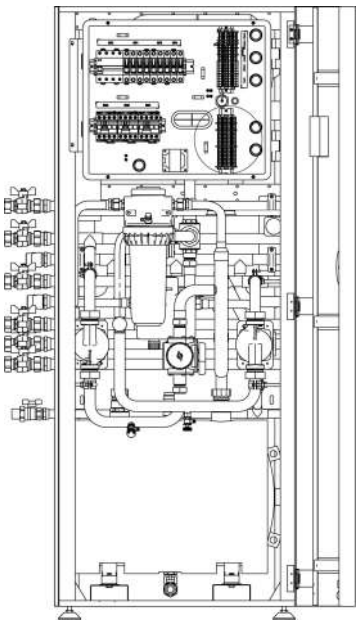
Wires	Stripping Length
Wires to Mixing valve, Solar water pump, Instant DHW pump, Zone2 pump, and ODU power	10mm
Wires to Power in	18mm

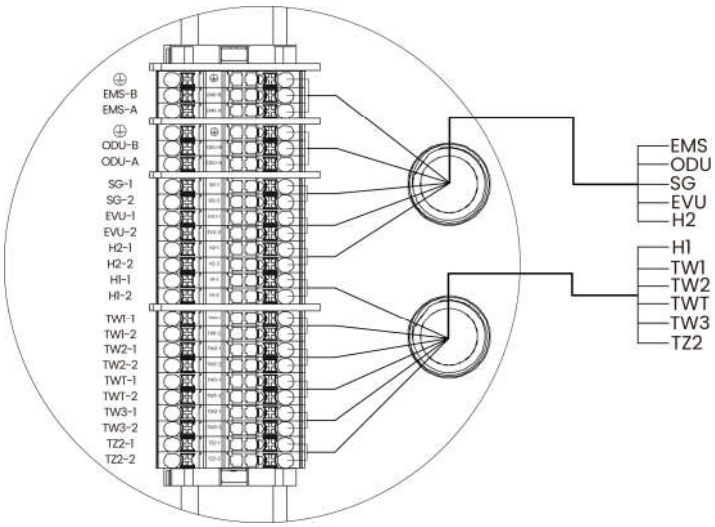
➢ Connect power wires (three-phase unit).



Wires	Stripping Length
Wires to Mixing valve, Solar water pump, Instant DHW pump, and Zone2 pump	10mm
Wires to ODU power and Power in	12mm

➢ Connect communication wires.



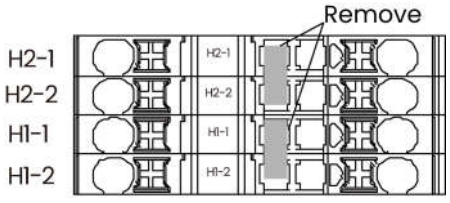


wires	Stripping Length
Communication wires	10mm

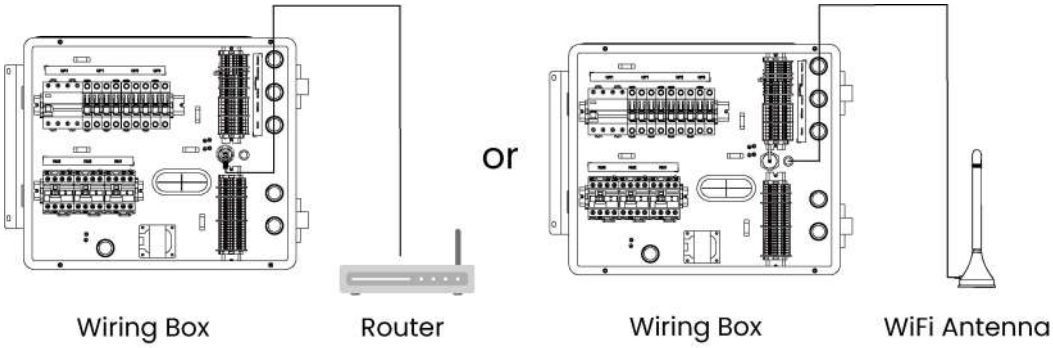
Code	Description	Code	Description
EMS	Communication Port IDU-EMS	TZ2	Zone 2 Temperature Sensor
ODU	Communication Port IDU-ODU	H1	Zone 1 Pump Control Switch
SG	SG-READY	TW2	Solar Temperature Sensor
EVU	SG-READY	TWT	DHW Tank Temperature Sensor
H2	Zone 2 Pump Control Switch	TW3	Weather Compensation Temperature Sensor
TW1	DHW return temperature sensor		

Note!

- Remove jumpers in the communication wire wiring area when an external thermostat switch is connected.



➢ Connect the network cable or perform WiFi connection.



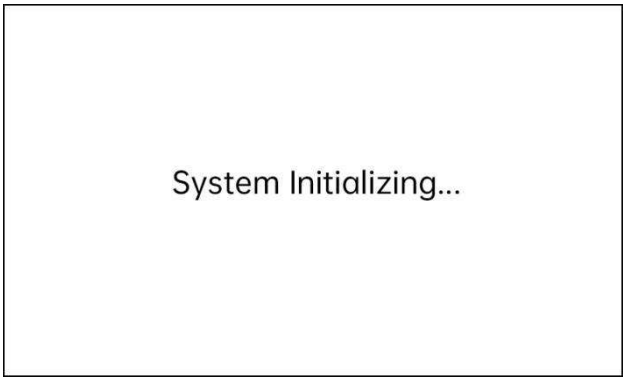
4 Control Panel

4.1 Working Conditions

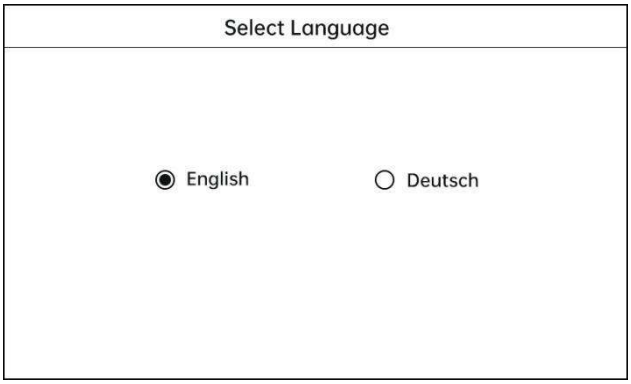
Operation Voltage	DC+12V
Operating Temperature	0~50°C
Ambient Humidity	20~90%RH

4.2 Main Interface

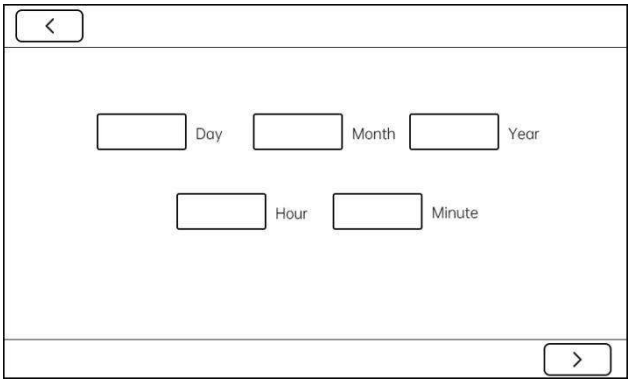
- After powering on the system, the controller screen lights up, entering the initial interface.



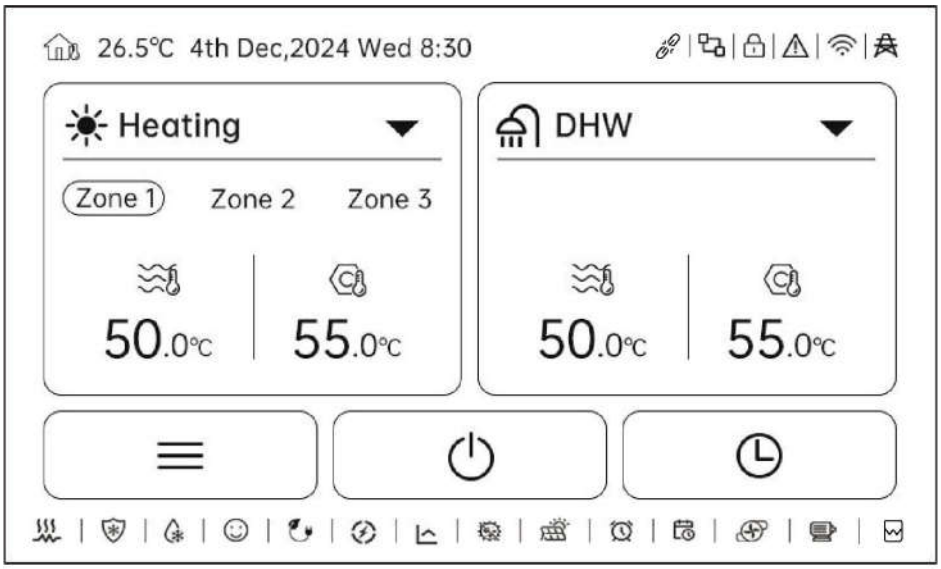
- Wait for 7 seconds, enter the language selection interface.



- After selecting the language, enter the time setting interface as below.



➢ After setting the time, enter the main interface.



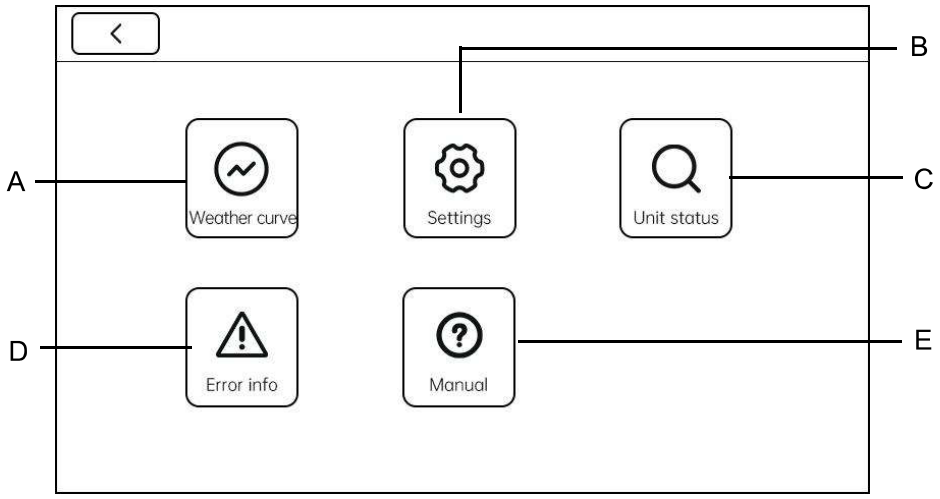
Explanation of Display Icons

Module	Icon	Name	Definition
Upper Module		Current Outdoor Temperature	Display current outdoor temperature.
		Emergency Stop Switch	Disconnect the switch for emergency shutdown.
		Screen Lock	Lock the screen.
		Over the Air (OTA)	Update or download remotely over a wireless network.
		Error	Visible when any error exists.
		WiFi	Visible during WLAN connection and successful WLAN connection.
		Smart Grid	Visible when smart grid function is active.
Middle	Heating	Heating Mode	Visible when the system is in a heating mode.
	Cooling	Cooling Mode	Visible when the system is in a cooling mode.
	Auto	Automatic Mode	Visible when the system is in an automatic mode.
	DHW	Domestic Hot Water (DHW)	Visible when DHW function is active.

Module		Current Water Temperature	Display the current water temperature.
		Target Water Temperature	Set the target water temperature.
		Menu	Tap to enter the menu interface.
		ON/OFF	Turn on/off the unit.
		Timer Setting	The system operates according to the set schedule.
Lower Module		Electric Heating	Visible when electric heating function is active.
		Anti-freezing	Visible when anti-freezing function is active.
		Defrosting	Visible when defrosting function is active.
		Holiday Mode	Visible when holiday mode is active.
		Green Electricity	Visible when smart grid function is active and the input signal is electricity for free.
		Mains Supply	Visible when smart grid function is active and the input signal is mains electricity.
		Peak Electricity	Visible when smart grid function is active and the input signal is electricity at peak.
		Disinfection	Visible when disinfection function is active.
		Solar	Visible when solar heating function is active.
		Daily Timer	Set the daily time.
		Weekly Timer	Set the weekly time.
		Water Pump	Visible when the water Pump is running.
		Compressor	Visible when the compressor is running.
		Oil Heater	Preheat the compressor lubricating oil.

4.3 Main Menu

Users can tap ☰ in the main interface to enter a main menu interface as below.

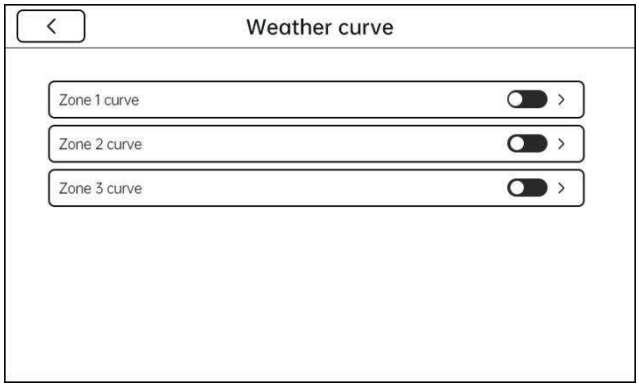


Item	Name	Definition
A	Weather Curve Setting	Allow to regulate the water temperature depending on the outdoor ambient temperature.
B	Settings	General settings.
C	Unit Status	More information of the unit and its operation status.
D	Error Info	Fault history.
E	Manual	Assistance for common questions.

4.3.1 Weather Curve Setting

The set water temperature is regulated automatically depending on the outdoor ambient temperature to achieve energy-saving and comfortable experience. When the outdoor temperature is low, the target water temperature is automatically raised to ensure a warm and comfortable indoor environment. When the outdoor temperature is high, the target water temperature is automatically lowered to further reduce energy consumption while maintaining a comfortable experience.

This function is only for space heating and space cooling. When the function is active, the unit will apply temperature curves if the current operation mode is consistent with the activated function.

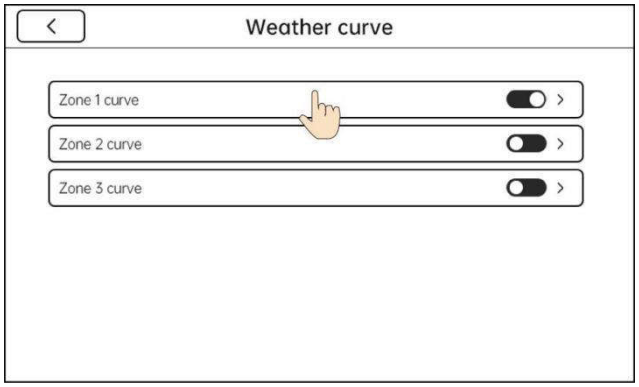


Note!

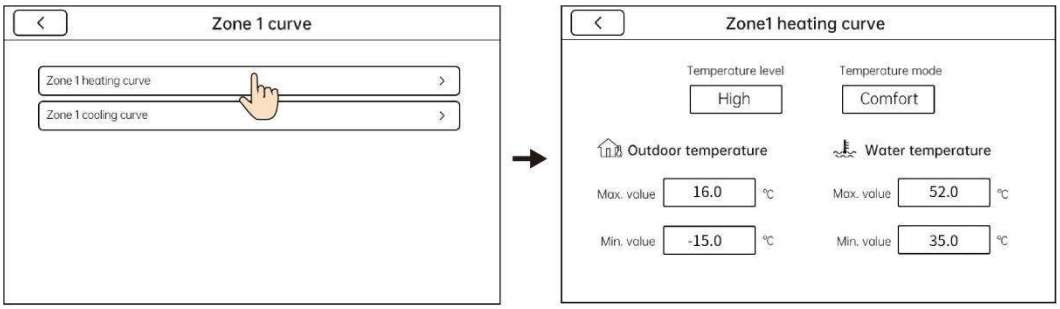
- If the temperature is controlled by water temperature, you cannot adjust the set temperature (in home page) manually once this function is enabled.
- If the temperature is controlled by room temperature, the set temperature (in home page) can be adjusted as usual.
- This function is invalid if the unit is in holiday mode, and the function turns to valid automatically (if this function is set to be active) when the unit quits holiday mode.

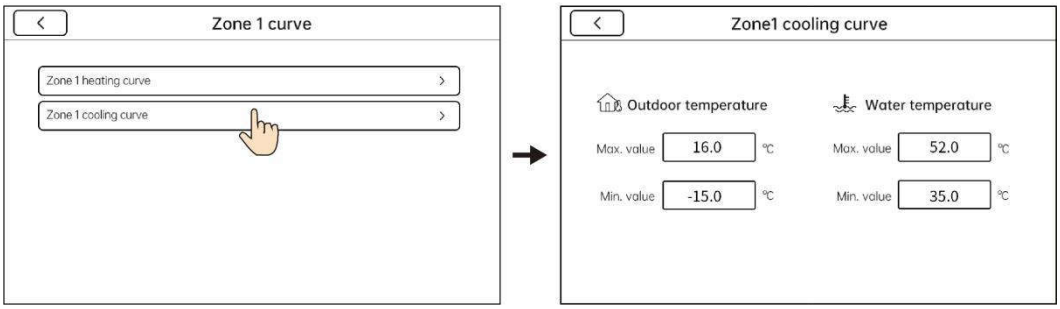
The below is an **Example** for setting Zone 1 curve. The same method applies equally to Zone 2 curve and Zone 3 curve as well.

Step 1: enable Zone 1 curve, and tap this line to enter the next level setting interface.



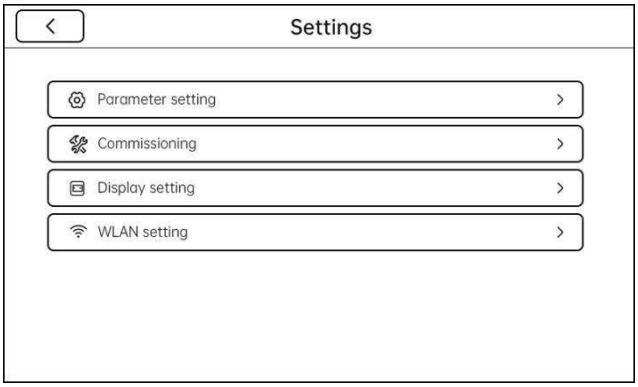
Step 2: tap Zone 1 heating curve or Zone 1 cooling curve to enter the setting interface.





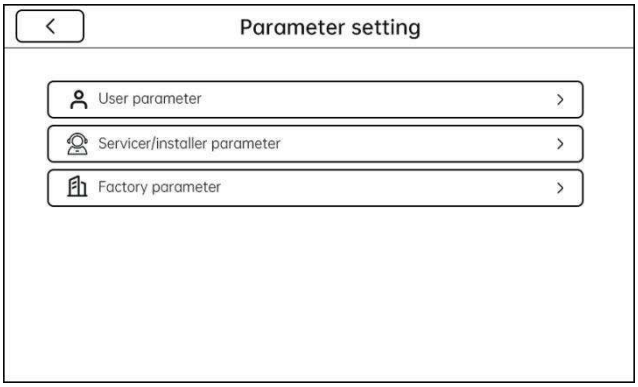
4.3.2 Function Setting

Users can perform general settings on this page, such as parameter setting, commissioning, display setting, and WLAN setting.



➢ **Parameter Setting**

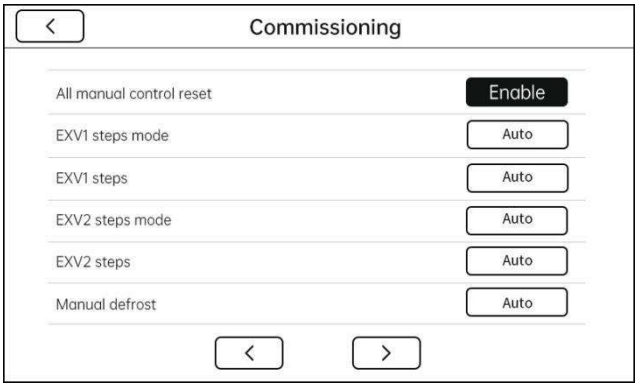
Parameter settings include user parameter, service/installer parameter, and factory parameter. Users need to enter a password to enter pages of service/installer parameter and factory parameter.



Items	Setting Contents
User Parameter	Power-off memory, linkage switch, interlock switch, manual electric control, energy mode, manual sterilization enable, automatic sterilization enable, automatic sterilization:start time, sterilization time, automatic sterilization: cycle, automatic sterilization: Temp., solar heating enable, solar heating value, auto_mode_temp, auto_mode_temp_diff
Service/Installer Parameter	Inlet and outlet of refrigeration temp., inlet and outlet of heating temp., preheating time of compressor oil, aux electric heating control, air conditioning electric heating enable, hot water electric heating enable, electric heating water environmental temp., air conditioning electric heating ambient temp., hot water electric heating ambient temp., electric heating water start temp., electric heating water stop temp., chassis electric heating environment temp., SG ready, maximum defrosting operation time, accumulated defrosting time, defrost tube temp., defrost exit temp., forced defrosting environment temp., defrosting enters outdoor ambient temp., auto mode cooling temp., auto mode heating temp.
Factory Parameter	EXV parameter, fan parameter, compressor protection parameter, system parameter,

➢ **Commissioning**

Users need to enter a password to enter the following commissioning page.

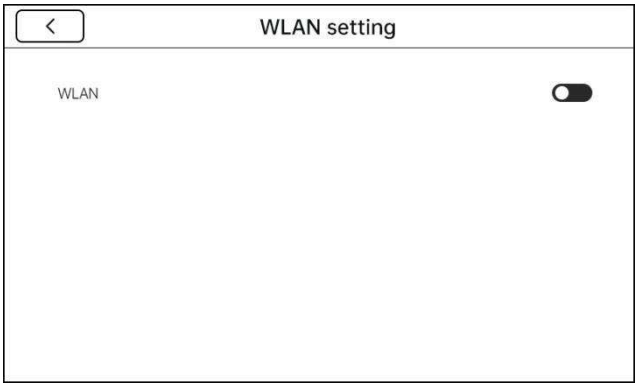


➢ **Display Setting**

Users can set parameters of the control panel, such as time, date, language, sound volume, and backlight.

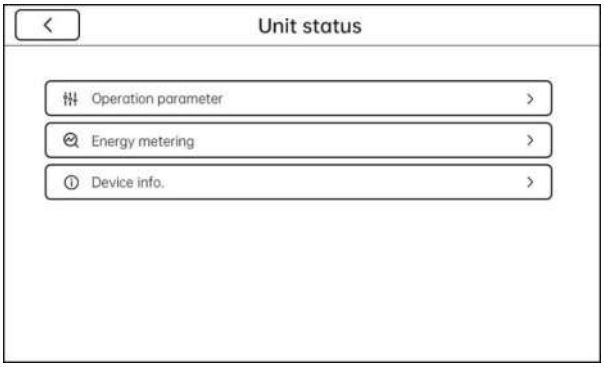


➢ **WLAN Setting**

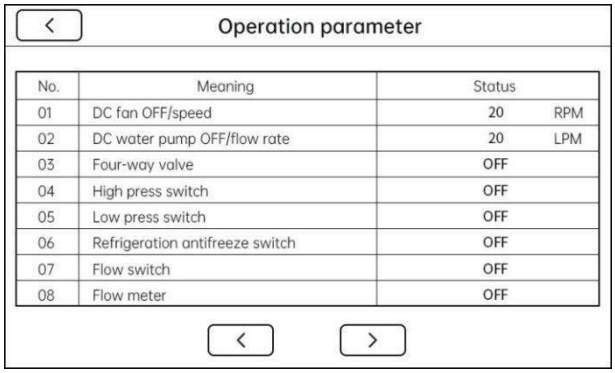


4.3.3 Status Inquiry

A list of parameters related to the units are shown herein. Users can check the current status of each parameter.

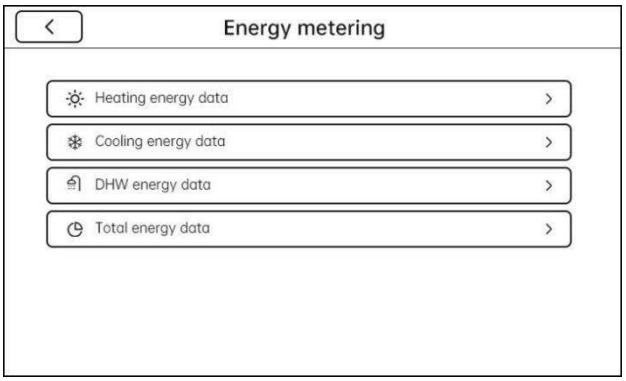


- **Operation Parameter**

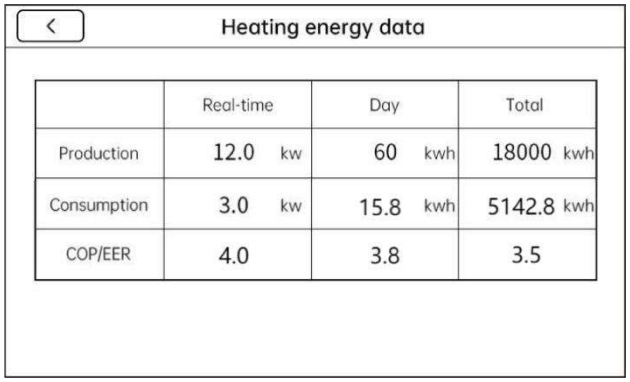


No.	Meaning	Status
01	DC fan OFF/speed	20 RPM
02	DC water pump OFF/flow rate	20 LPM
03	Four-way valve	OFF
04	High press switch	OFF
05	Low press switch	OFF
06	Refrigeration antifreeze switch	OFF
07	Flow switch	OFF
08	Flow meter	OFF

- **Energy Metering**

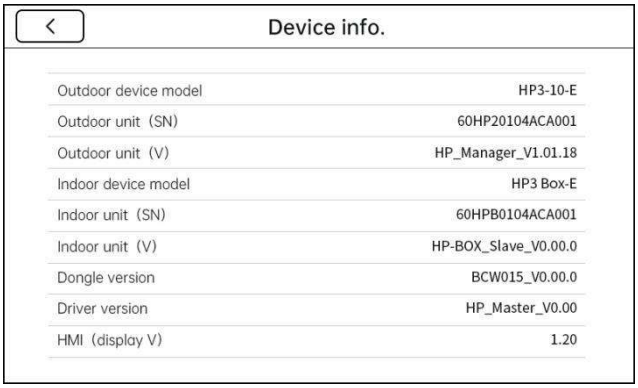


- **Heating Energy Data**



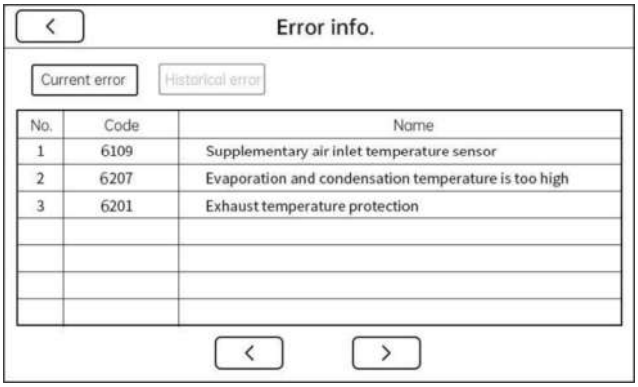
	Real-time	Day	Total
Production	12.0 kw	60 kwh	18000 kwh
Consumption	3.0 kw	15.8 kwh	5142.8 kwh
COP/EER	4.0	3.8	3.5

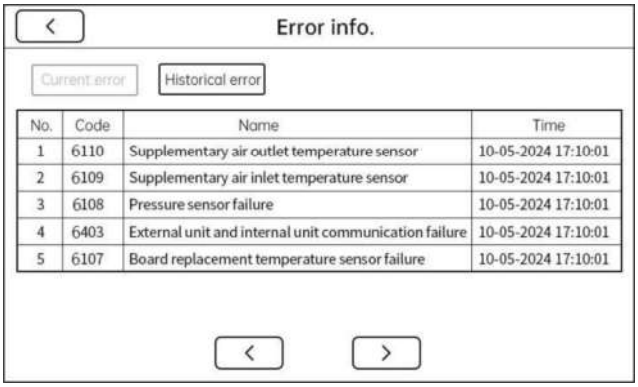
➢ **Device Information**



4.3.4 Fault Inquiry

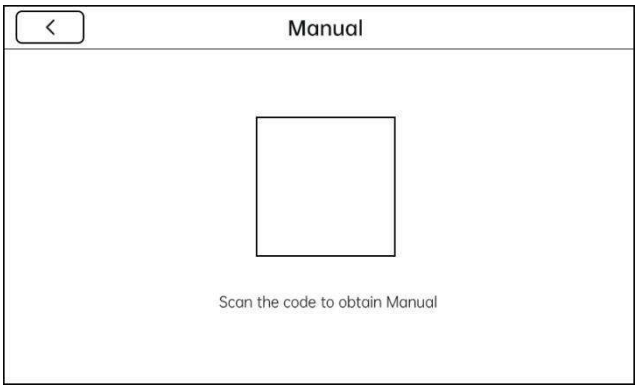
Users can inquire current faults and historical faults on this page.





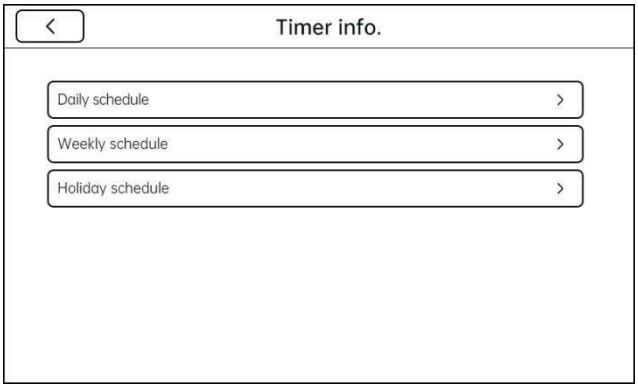
4.3.5 FAQ

Users can scan the code to obtain FAQ files.



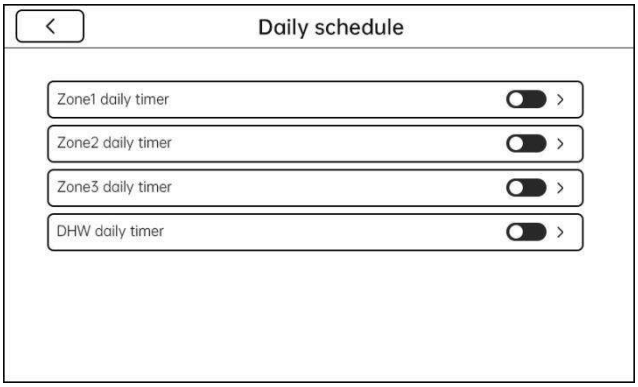
4.4 Timer Setting

Users can tap in the main interface to make schedules for the unit operation.



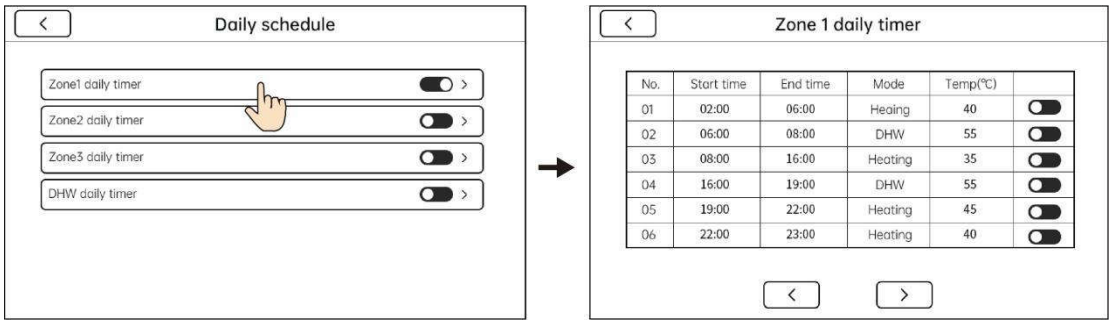
4.4.1 Daily Schedule

Users can set daily schedules for Zone 1, Zone 2, Zone 3, and DHW. Four parameters can be set for each zone. Up to 6 commands can be set. The commands repeat every day.



The below is an **Example** for setting Zone 1 daily timer. The same method applies equally to Zone 2, Zone 3, and DHW as well.

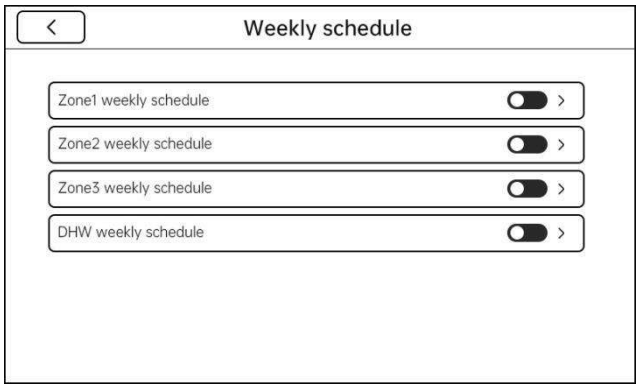
Step 1: enable Zone 1 daily timer, and tap this line to enter the next level setting interface.



Step 2: set start time, end time, mode, and temperature. Up to 6 commands can be set.

4.4.2 Weekly Schedule

Users can set weekly schedules for Zone 1, Zone 2, Zone 3, and DHW. Up to 4 schedules can be set. The commands repeat every week.

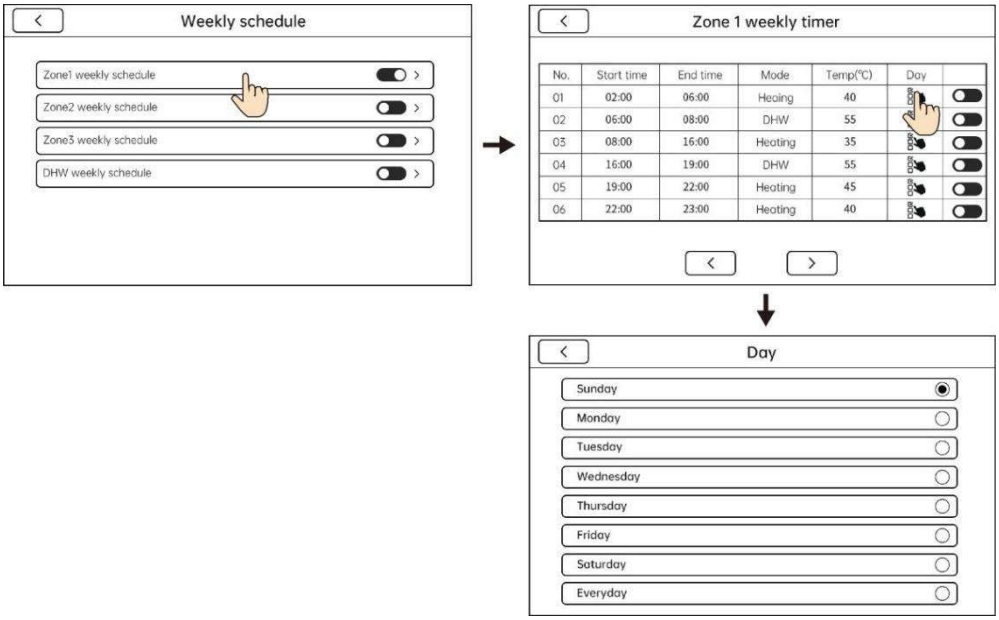


The below is an **Example** for setting Zone 1 weekly timer. The same method applies equally to Zone 2, Zone 3, and DHW as well.

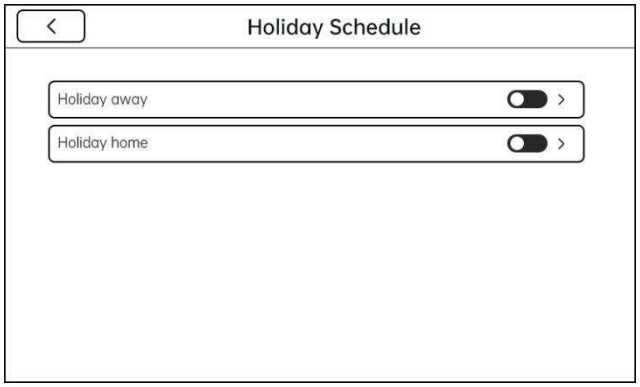
Step 1: enable Zone 1 daily timer, and tap this line to enter the next level setting interface.

Step 2: tap schedule 1 to set weekly schedule, day, and command. Up to 6 schedules can be set.

Step 3: tap  to select days on which the schedule is implemented.

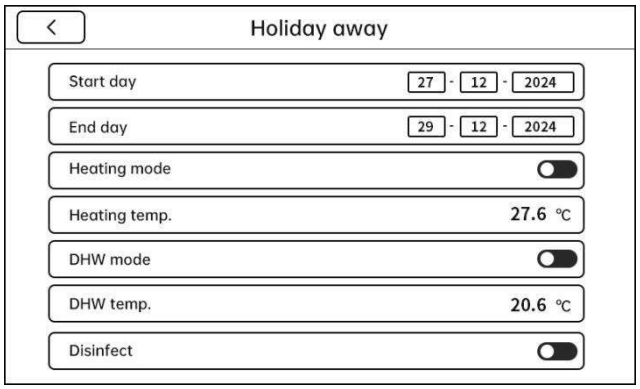


4.4.3 Holiday Schedule



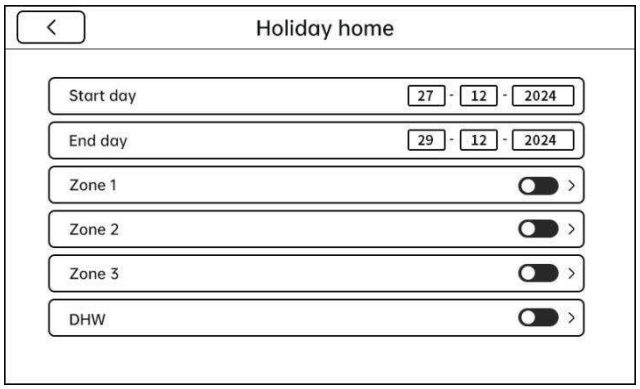
➢ **Holiday Away**

Holiday away mode is a schedule for a holiday, providing a mild temperature for the residence to prevent freezing. Users can set start day, end day, heating mode, heating temp., DHW mode, DHW temp., and disinfect.



➢ **Holiday Home**

Holiday home mode is a schedule that users can make in case of stay at home for holiday. Users can set start day, end day, Zone 1, Zone 2, Zone 3 and DHW.



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 3.5

6 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.

7 Technical Data

Indoor Unit Model		HP3 Box-E-WL	HP1 Box-E-WL
Power supply		380-415V 3N~50Hz	220-240V ~50Hz
Rated power input	Cooling	0.51kW	0.51kW
	Heating	9.51kW	3.51kW
Rated current	Cooling	0.8A	2.3A
	Heating	14.5A	16.1A
Rated power input of backup heater		9kW	3kW
Dimensions (W×H×D) [mm]		650x1600x560	650x1600x560
Packing (W×H×D) [mm]		920x1800x630	920x1800x630
Internal water volume		50L	50L
Monitoring module		WiFi, LAN	WiFi, LAN
Communication port		RS485	RS485
Display		Wired controller, App, Website	Wired controller, App, Website
Max. water pressure	Heating/cooling circuit	0.3MPa(g)	0.3MPa(g)
Pump for outdoor unit	Type	DC inverter	DC inverter
	Max. head	9m	9m
	Power input	2~90W	2~90W
Pump for Zone1	Type	AC	AC
	Head	9m	9m
	Power input	90W	90W
Expansion vessel for heating/ cooling circuit	Volume	20L	20L
	Max. operating pressure	0.3MPa(g)	0.3MPa(g)
	Pre-charge pressure	0.15MPa(g)	0.15MPa(g)
Buffer tank	Volume	50L	50L
	Max. operating pressure	0.3MPa(g)	0.3MPa(g)
	Drain connection	G 3/4"	G 3/4"
Weight	Net weight	145kg	145kg
	Gross weight	171kg	171kg
Connections	Heating flow from outdoor unit	G 1"	G 1"
	Heating return to outdoor unit	G 1"	G 1"
	Return from heating circuit 1	G 1"	G 1"
	Flow to heating circuit 1	G 1"	G 1"
	Flow to pump group of heating circuit 2	G 1"	G 1"

	Return from pump group of heating circuit 2	G 1"	G 1"
	Return from DHW tank	G 1"	G 1"
	Flow to DHW tank	G 1"	G 1"
	Tap water	G 3/4"	G 3/4"
Operation range	Ambient temperature	5~45°C	5~45°C
	Inlet water	5~75°C	5~75°C
	Outlet water (heating mode)	18~75°C	18~75°C
	Outlet water (cooling mode)	5~25°C	5~25°C
	Domestic hot water	18~75°C	18~75°C
	Heating/cooling circuit pressure	0.1 ~ 0.3MPa(g)	0.1 ~ 0.3MPa(g)

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