



Hot Water Heat Pump Split System User Manual

Model numbers:

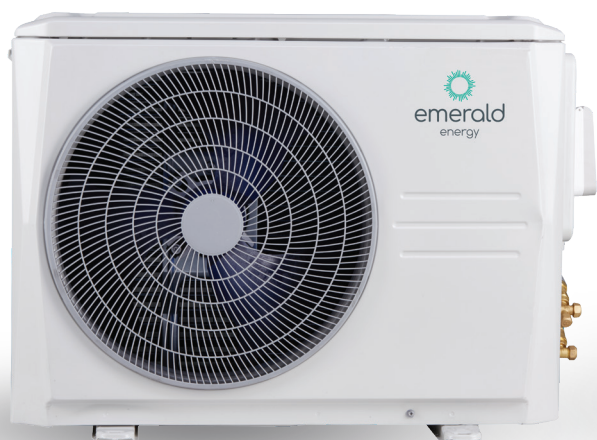
HPR200, HPR200E, HPR300-1, HPR300E-1

Thank you for choosing Emerald.

This leaflet contains important information on the correct installation and operation of your Emerald Hot Water Heat Pump Split System.

Read these instructions carefully before installation.

Keep this manual in a handy for future reference.



IMPORTANT NOTICE

Please read this manual carefully before you attempt to install this product. Failure to do so may result in the product not working according to its design.

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1 SAFETY PRECAUTIONS

Observe the basic safety regulations before starting work and operation.

DANGER

It indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

WARNING

It indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.





CAUTION

It indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

NOTE

Additional information.

Symbols on the unit

| | | |
|---|---------|--|
|  | WARNING | Flammable refrigerant is applied. A fire may occur due to unexpected leakage of refrigerant. |
|  | CAUTION | Read the operation manual carefully before any further action. |
|  | CAUTION | Only a specialist is allowed to take action under the instructions of the installation manual. |
|  | CAUTION | The information is available in the relevant documentation. |

Target group

DANGER

These instructions are exclusively intended for qualified contractors and authorized installers.

- Work on the refrigerant circuit with flammable refrigerant in safety group A3 may only be carried out by authorized heating contractors. These heating contractors must be trained in accordance with EN 378 Part 4 or IEC 60335-2-40, Section HH. The certificate of competence from an industry accredited body is required.

- Brazing/soldering work on the refrigerant circuit may only be carried out by personnel certified in accordance with ISO 13585 and AD 2000, Datasheet HP 100R. And only contractors qualified and certified for the processes can perform brazing/soldering work. The work must fall within the range of applications purchased and be carried out in accordance with the prescribed procedures. Soldering/brazing work on accumulator connections requires certification of personnel and processes by a notified body according to the Pressure Equipment Directive (2014/68/EU).

- Work on electrical equipment may only be carried out by a qualified electrician.

- Before initial commissioning, all safety-related points must be checked by the particular certified heating contractors. The system must be commissioned by the system installer or a qualified person authorized by the installer.

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 product is the outdoor unit of an air-to-water heat pump with monoblock design.

The product uses the outdoor air as a heat source and can be used to heat a ~~residential~~ building and generate domestic hot water.

The air that escapes from the product must be able to flow out freely, and must not be used for any other purposes.

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use, which means that the following places are not appropriate for installation:

- Where there is mist of mineral oil or oil spray or vapors. Plastic parts may deteriorate, and cause joint loose and leakage of water.
- Where corrosive gases (such as sulfurous acid gas) are produced, or corrosion of copper pipes or soldered parts may cause leakage of refrigerant.
- Where there is machinery which emits massive electromagnetic waves. Enormous electromagnetic waves can disturb the control of the system and cause equipment malfunction.
- 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.
- Where voltage fluctuates a lot, such as a location in a factory.
- In vehicles or vessels.
- Where acidic or alkaline vapors are present.

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 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 (top plate).
- Do not climb, sit or stand on top of the unit.

Regulations to be observed

- 1) National installation regulations.
- 2) Statutory regulations for the prevention of accidents.
- 3) Statutory regulations for environmental protection.
- 4) Statutory requirements for pressure equipment: Pressure Equipment Directive 2014/68/EU.
- 5) Codes of practice of the relevant trade associations.
- 6) Relevant country-specific safety regulations.
- 7) Applicable regulations and guidelines for operation, service, maintenance, repair and safety of cooling, air conditioning and heat pump systems containing flammable and explosive refrigerant.

Safety instructions for working on the system

The outdoor unit contains flammable refrigerant R290 (propane C3H8). In case of a leak, the escaping refrigerant may form a flammable or explosive atmosphere in the ambient air. A safety zone is defined in the immediate vicinity of the outdoor unit, in which special rules apply when work is performed on the appliance. See section "Safety zone".

Working in the safety zone

DANGER

Risk of explosion: Refrigerant leak may form a flammable or explosive atmosphere in the ambient air.

Take the following measures to prevent fire and explosion in the safety zone:

- Keep ignition sources away, including naked flames, plug sockets, hot surfaces, light switches, lamps, electrical devices not free of ignition sources, mobile devices with integrated batteries (such as mobile phones and fitness watches).
- Do not use any sprays or other combustible gases in the safety zone.

CAUTION

Permissible tools: All tools for working in the safety zone must be designed and explosion-protected in accordance with the applicable standards and regulations for refrigerant in safety groups A2L and A3, such as brushless machines (cordless disposal containers, installation aids, and screwdrivers), extraction equipment, vacuum pumps, conductive hoses, and mechanical tools of non-sparking material.

CAUTION

The tools must also be suitable for the pressure ranges in use. Tools must be in perfect maintenance conditions.

- The electrical equipment must meet the requirements for areas at risk of explosion, zone 2.
- Do not use flammable materials such as sprays or other flammable gases.
- Before starting work, discharge static electricity by touching earthed objects, such as heating or water pipes.
- Do not remove, block or bridge safety equipment.
- Do not make any changes: Do not modify the outdoor unit, inlet/outlet lines, electrical connections/cables or the surroundings. Do not remove any components or seals.

Working on the system

Switch off the power supply for the unit (including all affiliated parts) at a separate fuse or mains isolator. Check and ensure that the system is no longer live.

CAUTION

In addition to the control circuit there may be several power circuits.

DANGER

Contact with live components can result in severe injuries. Some components on PCBs remain live even after the power supply has been switched off. Prior to removing covers from the appliances, wait at least 4 minutes until the voltage has completely dropped out.

- Safeguard the system against reconnection.
- Wear suitable personal protective equipment when carrying out any work.
- Do not touch any switch or electrical parts with wet fingers. It may cause electrical shock and compromise the system.

DANGER

Hot surfaces and fluids can result in burns or scalding. Cold surfaces may cause frostbite.

- Prior to servicing or maintenance tasks, switch off and allow the equipment to cool down or warm up.
- Do not touch hot or cold surfaces on the appliance, fittings or pipework.

NOTE

Electronic assemblies can be damaged by electrostatic discharge. Before beginning work, touch earthed objects, such as heating or water pipes, to discharge any static.

Safety work area and temporary flammability zones.

CAUTION

When working on systems using flammable refrigerants, the technician should consider certain locations as “temporary flammable zones”. These are normally regions where at least some emission of refrigerant is anticipated to occur during the normal working procedures, such as recovery, charging and evacuation, typically where hoses may be connected or disconnected. The technician should ensure three meters safety working area (radius of the unit) in case of any accidental release of refrigerant that forms a flammable mixture with air.

Working on the refrigerant circuit

R290 refrigerant (propane) is an air displacing, colorless, flammable, odorless gas which forms explosive mixtures with air. Refrigerant drained must be properly disposed of by authorized contractors.

- Perform the following measures before beginning work on the refrigerant circuit:

- Check the refrigerant circuit for leaks.
- Ensure very good ventilation especially in the floor area and maintain this for the duration of the work.
- Secure the area surrounding the work area.
- Inform the following persons of the type of work to be carried out:
 - All maintenance personnel
 - All persons in the vicinity of the system.
- Inspect the area immediately around the heat pump for flammable materials and ignition sources: Remove all flammable materials and ignition sources.
- Before, during and after the work, check the surrounding area for escaping refrigerant using an explosion-proof refrigerant detector suitable for R290. This refrigerant detector must not generate any sparks and must be suitably sealed.
- A CO₂ or powder extinguisher must be available in the following cases:
 - Refrigerant is being drained.
 - Refrigerant is being topped up.
 - Soldering or welding work is in progress.
- Display signs prohibiting smoking.

DANGER

Escaping refrigerant can lead to fires and explosions that result in very serious injuries or death.

- Do not drill or apply heat to a refrigerant circuit filled with refrigerant.
- Do not operate Schrader valves unless a fill valve or extraction equipment is attached.
- Take measures to prevent electrostatic charge.
- Do not smoke. Avoid naked flames and sparks. Never switch lights or electrical appliances on or off in environments with naked flames or sparks.
- Components that contain or contained refrigerant must be labeled, and stored in well ventilated areas in accordance with the applicable regulations and standards.

DANGER

Direct contact with liquid or gaseous refrigerant can cause serious damage to health such as frostbite and/or burns. There is a risk of asphyxiation if liquid or gaseous refrigerant is breathed in.

- Prevent direct contact with liquid or gaseous refrigerant.
- Wear personal protective equipment when handling liquid or gaseous refrigerant.
- Never breathe in any refrigerant vapor.

DANGER

Refrigerant is under pressure: Mechanical loading of lines and components can cause leaks in the refrigerant circuit. Do not apply loads to the lines or components, such as supporting or placing tools.

DANGER

Hot or cold metallic surfaces of the refrigerant circuit may cause burns or frostbite in case of skin contact. Wear personal protective equipment to protect against burns or frostbite.

NOTE

Hydraulic components may freeze during refrigerant removal. Drain heating water from the heat pump beforehand.

DANGER

Damage to the refrigerant circuit can cause refrigerant to enter the hydraulic system. After completion of the work, vent the hydraulic system correctly. When doing so, ensure the area is sufficiently ventilated.

Installation

General

- Be sure to use only specified accessories and parts for installation. Failure to use specified parts may result in water leakage, electric shocks, fires, or the unit falling from its mount.
- Install the unit on a foundation that can withstand its weight. Insufficient physical strength may cause the unit to fall and possible injury.
- Perform specified installation work with full consideration of strong wind, hurricanes, or earthquakes. Improper installation may result in accidents due to equipment falling.
- Earth the unit and install a ground fault circuit interrupter in accordance with local regulations. Operating the unit without a proper ground fault circuit interrupter may cause electric shocks and fires.
- Install the power cable 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.)
- Any damaged power cord must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.

CAUTION

Do not install any air vent valve in the indoor side. Make sure the outlet of the indoor safety valve leads to the outdoor side. No ignition sources exist around the air vent valve and the outlet of safety valve.

Two situations should be considered for outdoor installations to prevent damage to the system, releases, and undesirable consequences:

- Where the equipment is located in an area accessible by members of the public, and.
- Where the equipment is located in a restricted area, with access to authorized persons only.

DANGER



Open flames, fires, open ignition sources and smoking are prohibited.

DANGER



Inflammable matters are prohibited.

Freezing protection

CAUTION

Freezing can cause damage to the heat pump.

- Thermally insulate all the hydraulic lines.
- Antifreeze can be filled in the secondary circuit in accordance with local regulations and standards.

Connecting cables

DANGER

With short electrical cables, should there be leakage in the refrigerant circuit, gaseous refrigerant may reach the inside of the building. Min. length of the electrical connecting cables between the indoor and the outdoor unit: 3 m.

Repair work

CAUTION

Repairing components that fulfil a safety function can compromise the safe operation of the system.

- Replace faulty components only with genuine spare parts from the manufacturer.
- Do not undertake any repairs on the inverter. Replace the inverter if there is a defect.
- Repair work should not be performed in the field. Repair the unit in a specified location.

Auxiliary components, spare and wearing parts

CAUTION

Spare and wearing parts that have not been tested together with the system can compromise the function of the system. Installing non-authorized components and making non-approved modifications or conversions can compromise the safety and may invalidate our warranty. Only use original spare parts supplied or approved by the manufacturer for replacement.

Safety instructions for operating the system

What to do if refrigerant leaks

WARNING

To avoid potential risk from refrigerant leak, always keep 2 meters away from the unit, especially for kids, no matter the unit is in operation or not.

DANGER

Refrigerant leak can lead to fires and explosions that result in very serious injuries or death. Breathing in refrigerant may cause asphyxiation.

- Ensure very good ventilation especially in the floor area of the outdoor unit.
- Do not smoke. Avoid naked flames and sparks. Never switch lights or electrical appliances on or off in environments with naked flames or sparks.
- Evacuate any people from the dangerous zone.
- From a safe position, switch off the power supply for all system components.
- Remove ignition sources from the dangerous zone.
- The system user should know that no ignition source may be brought into the dangerous zone during the repair.
- Repair work must be carried out by an authorized contractor.
- Do not recommission the system until it is repaired.

CAUTION

Direct contact with liquid or gaseous refrigerant can cause serious damage to health, e.g. frostbite and/or burns. Breathing in liquid or gaseous refrigerant may cause asphyxiation.

- Prevent direct contact with liquid or gaseous refrigerant.
- Never breathe in refrigerant vapors.

What to do if water leaks

DANGER

If water leaks from the appliance, an electric shock may occur. Switch off the heating system at the external isolator (e.g. fuse box, domestic distribution board).

DANGER

If water leaks from the appliance, scalding may occur. Never touch hot water.

What to do if the outdoor unit ices up

CAUTION

A build-up of ice in the condensate pan and in the fan area of the outdoor unit can cause damage to the equipment.

- Do not use mechanical items/aids to remove ice.
- Before using electrical heating appliances, check the refrigerant circuit for leaks with a suitable measuring device. The heating appliance should not be a source of ignition, and must meet the requirements of EN 60335-2-30.
- If ice regularly builds up on the outdoor unit (e.g. in areas where frost and heavy fog occur frequently), install a fan ring heater that is suitable for refrigerant R290 and/or an electric ribbon heater in the condensate pan.

Safety instructions for storage of the outdoor unit

The outdoor unit is charged at the factory with refrigerant R290 (propane).

DANGER

Refrigerant leak can lead to fires and explosions that result in very serious injuries or death. Breathing in refrigerant may cause asphyxiation. Store the outdoor unit in the following conditions:

- An explosion prevention plan must be in place for storage.
- Ensure the storage location is well ventilated.
- Keep away from ignition sources (avoid exposure to heat and smoking).
- Temperature range for storage: -25 °C to 70 °C
- Only store the outdoor unit in its exfactory protective packaging.
- Protect the outdoor unit against damage.
- The maximum number of outdoor units that may be stored in one place is determined according to local conditions.

CAUTION

A fire with R290 should only be fought with CO2 or dry powder extinguishers.

About the refrigerant

WARNING

- The following applies to R290 refrigerant systems.
- Prior to work on systems containing flammable refrigerants, safety checks are necessary to minimize the risk of ignition.

For repair of the refrigerating system, the following precautions should be complied with prior to conducting work on the system.

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

All maintenance staff and others working in the local area should be instructed on the nature of work being carried out. Work in confined spaces should be avoided. The area around the workspace should be sectioned off. Ensure that the area is safe through control of flammable materials.

The area should 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. , the equipment should be non-sparking, adequately sealed or intrinsically safe. If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment should be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.

No person carrying out work in relation to a refrigeration system which may expose any pipe that contains or has contained flammable refrigerant should use any sources of ignition in such a manner that it may lead to the risk of fires or explosions.

All possible ignition sources, including lighted cigarettes, should be kept sufficiently far away from the site of installation, repair, removal and disposal, during which flammable refrigerant can possibly be released into the surrounding space.

Prior to work, the area around the equipment should be checked to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs should be displayed.

Ensure that the area is in the open or adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation should continue during the work. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

For any change of the electrical components, they should be fit for the intended purpose and comply with the correct specifications.

Always follow the manufacturer's maintenance and service guidelines. In case of any doubt, consult the manufacturer's technical department for assistance.

The following checks should be applied to installations using flammable refrigerants:

- The charge size should depend on the size of the room within which refrigerant containing components are installed;
- The ventilation machinery and outlets should operate adequately and not be obstructed;
- If an indirect refrigerating circuit is used, the secondary circuit should be checked for any refrigerant;
- Marking to the equipment should remain visible and legible. Illegible markings and signs should be corrected;
- Refrigeration pipes or components should be installed in positions 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 corrosion or are suitably protected against corrosion.

Repair and maintenance of electrical components should include initial safety checks and component inspection procedures.

In the event of a fault that could compromise safety, no power supply should 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 should be used. This should be reported to the owner of the equipment to give advises to all parties involved.

Initial safety checks should include the following:

- Capacitors should be discharged in a safe manner to avoid possibility of sparking;
- No live electrical components and wiring should be exposed while charging, recovering or purging the system;
- The earth bonding should be continuous.

During repairs of sealed components, all power supplies should be disconnected from the equipment where work is in progress prior to any removal of sealed covers or other components. If it is absolutely necessary to keep a power supply connected with the equipment during servicing, a permanent leak detection should be performed at the most critical point to avoid a potential hazard.

Particular attention should be paid to the following to ensure that the casing is not altered in such a way that the level of protection is affected by working on electrical components. This includes damage to cables, an excessive number of connections, terminals not compliance with original specifications, damage to seals, and incorrect fitting of glands.

Ensure that seals or sealing materials have not degraded in such a manner that they no longer serve for the purpose of preventing the ingress of flammable atmospheres. Parts for replacement should be in accordance with the manufacturer's specifications.

Do not apply any permanent inductive or capacitance loads that exceed the permissible voltage or current of the equipment in use to the circuit..

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus should be provided with the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere due to a leak.

Check and ensure that cabling is free from wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check should also take into account the effects of ageing or continual vibration from sources such as compressors or fans.

When breaking into the refrigerant circuit for repair – or for any other purpose – follow the conventional procedures. However, it is important to follow the best practice.

Since flammability is a consideration, the following procedure should be adhered to:

- Remove the refrigerant;
- Purge the circuit with inert gas;
- Evacuate;
- Purge the circuit again with inert gas;
- Open the circuit by cutting or brazing.

The refrigerant should be recovered into correct recovery cylinders. The system should be “flushed” with OFN to guarantee the unit safety. This process may need to be repeated several times. Compressed air or oxygen should not be used for this task.

Flushing should be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved before venting to the atmosphere and pulling down to a vacuum. This process should be repeated until no refrigerant exists in the system. When the final OFN charge is used, the system should be vented down to the atmospheric pressure so that the work can start..

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 adequate ventilation is available.

Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines should be as short as possible to minimize the amount of refrigerant contained in them. Prior to recharging the system, it should be pressure tested with OFN.

DD.12 Decommissioning:

Before this procedure starts, it is necessary for the technician to be completely familiar with the equipment and all its details. It is recommended that all refrigerants be recovered safely. Prior to the task, an oil and refrigerant sample should be taken in case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

- a) Be familiar with the equipment and its operation.
- b) Isolate the system electrically.
- c) Before attempting the procedure, ensure that:
 - Mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - All personal protective equipment is available and being used correctly;

- The recovery process is supervised at all times by a competent person;

- The recovery equipment and cylinders should conform to the appropriate standards.

d) Pump down refrigerant system, if possible.

e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

f) Make sure that the cylinders are situated on the scales before recovery.

g) Start the recovery machine and operate it in accordance with manufacturer's instructions.

h) Do not overfill the cylinders. (No more than 80 % of volume for liquid charge).

i) Do not exceed the maximum working pressure of the cylinders, even temporarily.

j) When the cylinders have been filled correctly, make sure that the cylinders and the equipment are removed from the site promptly and all isolation valves on the equipment are closed off.

k) Recovered refrigerant should not be charged into another refrigeration system unless it has been cleaned and checked.

Equipment should be labeled stating that it has been de-commissioned and emptied of refrigerant. The label should be dated and signed. Ensure that the equipment is provided with a label stating the existence of flammable refrigerant in the equipment.

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended that all refrigerants be removed safely. Always transfer refrigerant into appropriate cylinders. Ensure that a correct number of cylinders are available for supporting the total system charge. All cylinders to be used should be designated for

the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). The cylinders should be complete with pressure relief valves and associated shut-off valves in good working conditions. Empty recovery cylinders should be evacuated and, if possible, cooled down before recovery occurs.

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

The recovered refrigerant should be returned to the refrigerant supplier in correct recovery cylinders, with the relevant Waste Transfer Note arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If any compressor or compressor oils is to be removed, ensure that it has been evacuated to an acceptable level to ensure that flammable refrigerant

does not remain within the lubricant. The evacuation process should be carried out prior to returning the compressor to the supplier. To accelerate this process, you can only heat the compressor body with an electric heater. Draining oil from the system should ensure the safety.

Warning: Disconnect the appliance from its power source during servicing and parts replacement.

These units are partial unit air conditioners, complying with partial unit requirements of this International Standard, and must only be connected to other units that have been confirmed as complying to corresponding partial unit requirements of this International Standard.

Leak detection

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.

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants. Electronic leak detectors should be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment should be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant. Leak detection equipment should be set at a percentage of the LFL of the refrigerant and should be calibrated to be suitable for the refrigerant employed, with the appropriate percentage of gas (25% maximum) confirmed. Leak detection fluids should be suitable for most refrigerants but the use of detergents containing chlorine should be avoided as the chlorine may react with the refrigerant and corrode the copper pipes. If a leak is suspected, all naked flames should be removed or extinguished. If a leakage of refrigerant is found and brazing is required, all of the refrigerant should be recovered from the system, or isolated (by means of shut off valves) in a part of the system that is far from the leak. The system should be purged with oxygen free nitrogen (OFN) both before and during the brazing process.

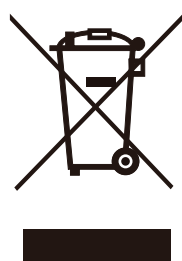
Disposal

This equipment uses flammable refrigerants. The disposal of the equipment must comply with national regulations.

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 unsorted municipal waste, and 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 substances can leak into the groundwater and get into the food chain, damaging your health and well-being.



WARNING: Risk of fire

2 GENERAL INTRODUCTION

2.1 Outdoor unit

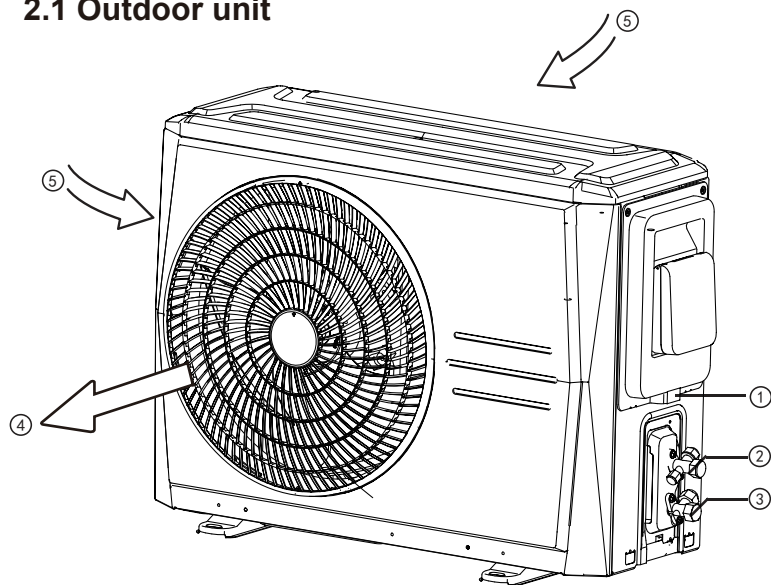


Table 2-1

| No. | Name |
|-----|--------------------------|
| ① | Power cord enter |
| ② | Refrigerant gas valve |
| ③ | Refrigerant liquid valve |
| ④ | Air outlet |
| ⑤ | Air inlet |

Fig. 2-1

2.2 Water tank

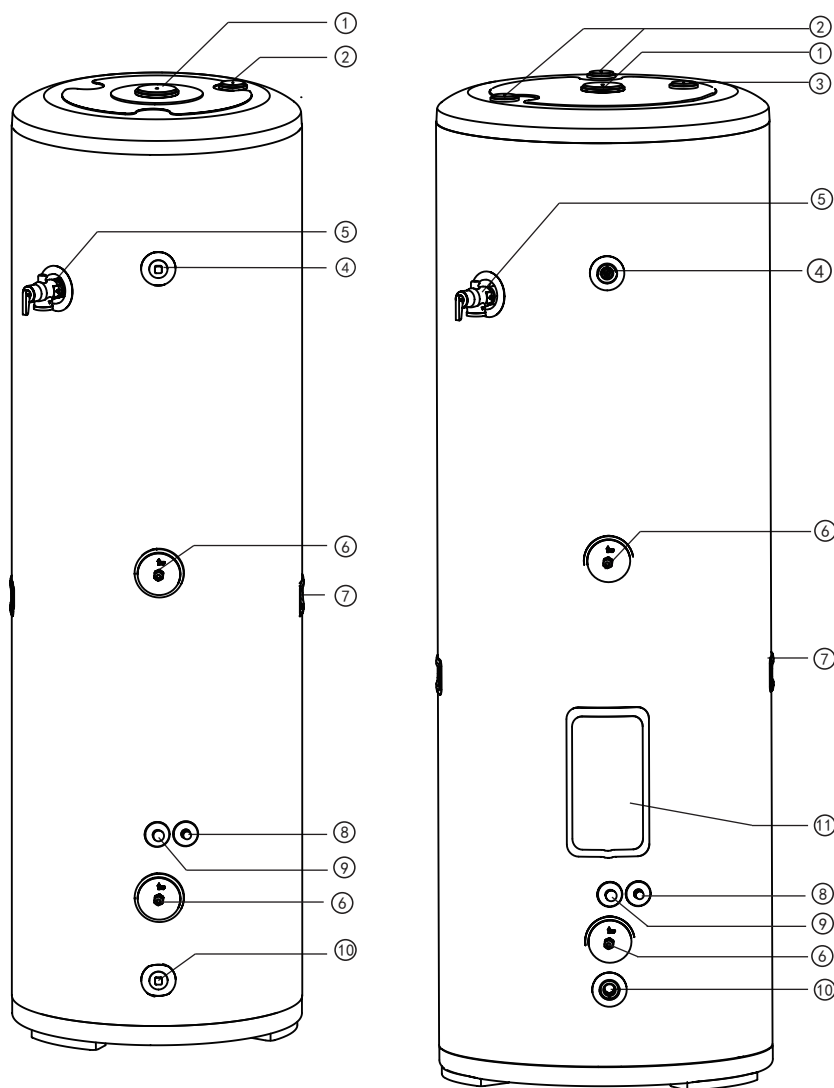


Table 2-2

| No. | Name |
|-----|-----------------------------------|
| ① | Magnesium rod insertion port |
| ② | Foam filling port |
| ③ | Reserved port |
| ④ | Water outlet |
| ⑤ | Pressure temperature relief valve |
| ⑥ | Water tank temperature sensor |
| ⑦ | Handle |
| ⑧ | Refrigerant gas pipe |
| ⑨ | Refrigerant liquid pipe |
| ⑩ | Water inlet/Drain outlet |
| ⑪ | Electric auxiliary heater |

200 L Without Aux.*

300 L With Aux.*

* Electric auxiliary heater is shortened to Aux.

Fig. 2-2

2.3 Specifications

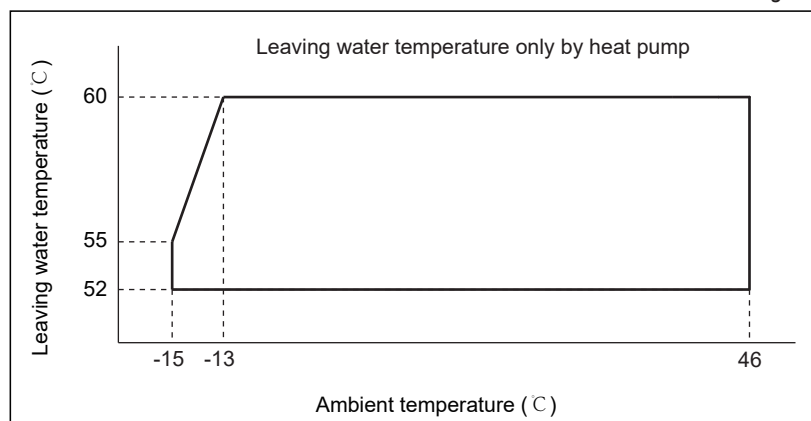
Table 2-3

| | | | | | | | | | | | | |
|--------------|------------------------------|------------------------------|---------|----|--|-------------------|--------------|----------------------|-------------------|-----|--------------|-----|
| General | Outdoor unit model | | HPR200 | | HPR200E | | HPR300 | | HPR300E | | | |
| | Water tank model | | HPR200 | | HPR200E | | HPR300 | | HPR300E | | | |
| | Ambient temperature | | ℃ | | -15~46 | | | | | | | |
| | Leaving water temperature | | ℃ | | 52~60 (default 60 ℃) | | | 52~60 (default 60 ℃) | | | | |
| | Heating | Capacity ¹ | W | | 2 800 | | | | | | | |
| | | Input | W | | 1 150 | | | | | | | |
| | Hot water yield | | m³/h | | 0.04721/ 0.06022 | | | | | | | |
| | Refrigerant piping | Liquid side | mm/inch | | φ 6.35 / φ 1/4' | | | | | | | |
| | | Gas side | mm/inch | | φ 9.52 / φ 3/8' | | | | | | | |
| | | Max. height difference | | m | | 10 | | | | | | |
| | | Max. refrigerant pipe length | | m | | 20 | | | | | | |
| | Design pressure | | MPa | | 3.3 | | | | | | | |
| Outdoor unit | Outdoor unit power supply | | V/N/Hz | | 220-240/1/50 | | | | | | | |
| | Max. current | | A | | 5.2 | | 14.3 | | 5.2 | | 14.3 | |
| | Compressor Type | | Type | | DC inverter rotary | | | | | | | |
| | Fan | | Type | | DC inverter | | | | | | | |
| | Air side heat exchanger | | Type | | Hydraulic aluminum fin + Inner grooved copper tube | | | | | | | |
| | Throttle | | Type | | Electric expansion valve | | | | | | | |
| | Outdoor sound pressure level | | dB(A) | | 54 | | | | | | | |
| | Dimension | Unit dimension(L*W*H) | | mm | | 804 * 327 * 555 | | | | | | |
| | | Packing dimension(L*W*H) | | mm | | 845 * 390 * 630 | | | | | | |
| | | Net weight | | kg | | 27 | | | | | | |
| | Refrigerant | Type | | | | R290 | | | | | | |
| | | Charged weight | | g | | 470 | | | | | | |
| Water tank | Tank volume | | L | | 200 | | 200 | | 300 | | 300 | |
| | Electric heater | Capacity | kW | | / | | 2.1 | | / | | 2.1 | |
| | | Power supply | V/N/Hz | | 220-240/1/50 | | 220-240/1/50 | | 220-240/1/50 | | 220-240/1/50 | |
| | Diemension | Unit dimension(W*D*H) | | mm | | 505 * 505 * 1 665 | | | 580 * 580 * 1 735 | | | |
| | | Packing dimension(W*D*H) | | mm | | 1 775 * 635 * 590 | | | 1 835 * 690 * 670 | | | |
| | | Net weight | | kg | | 74 | | 76 | | 100 | | 102 |

Notes:

1. Ambient temperature 19/15 °C(DB/WB), Initial water temperature 9 °C, Terminative water temp. 60 °C.
2. Ambient temperature 19/15 °C(DB/WB), Initial water temperature 15 °C, Terminative water temp. 55 °C.












Fig. 2-3



3 BEFORE INSTALLATION

3.1 Accessories

Table 3-1

| Accessory Name | | Qty. | Shape | Purpose |
|----------------|-------------------------|------|---|---|
| Outdoor unit | Installation manual | 1 |  | Outdoor unit and water tank instruction |
| | Safety manual | 1 |  | Safety instructions |
| | Drain pipe joint | 1 |  | For condensate water draining |
| | Water drainage pipe | 1 |  | Condensate water drainage of unit bottom plate |
| | Seal ring | 1 |  | Seal between water drainage connection and external machine |
| | Polypropylene strap | 1 |  | Wrap the refrigerant tube between outdoor unit and water tank |
| Water tank | Water tank fixing strip | 1 |  | Fixed water tank |
| | Connector | 2 |  | Connect water tank and safe care |
| | Seal ring | 2 |  | Prevent rust between water tank and joint |
| | Swift Connection | 1 |  | Refrigerant connection pipe (2 m) |
| | PTR valve | 1 |  | Pressure relief |

3.2 Space

NOTE

During installing, it is necessary to reserve enough installation space and maintenance space according to the following figures.

Do not install the outdoor unit and tank in a enclosed space.

3.2.1 Outdoor unit installation and maintenance space, see Fig 3-1 and Fig 3-2 . (Unit: mm)

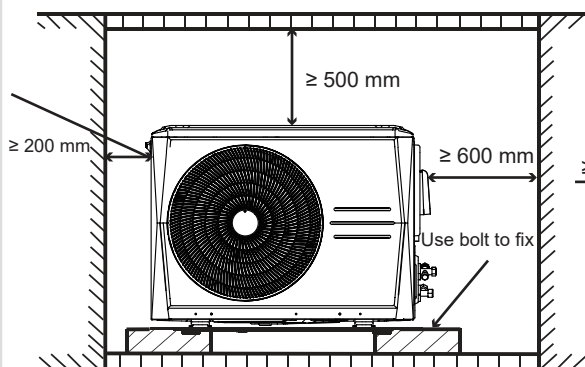


Fig 3-1

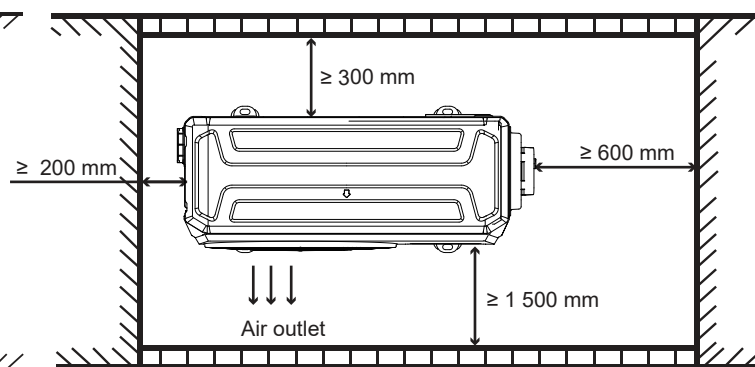
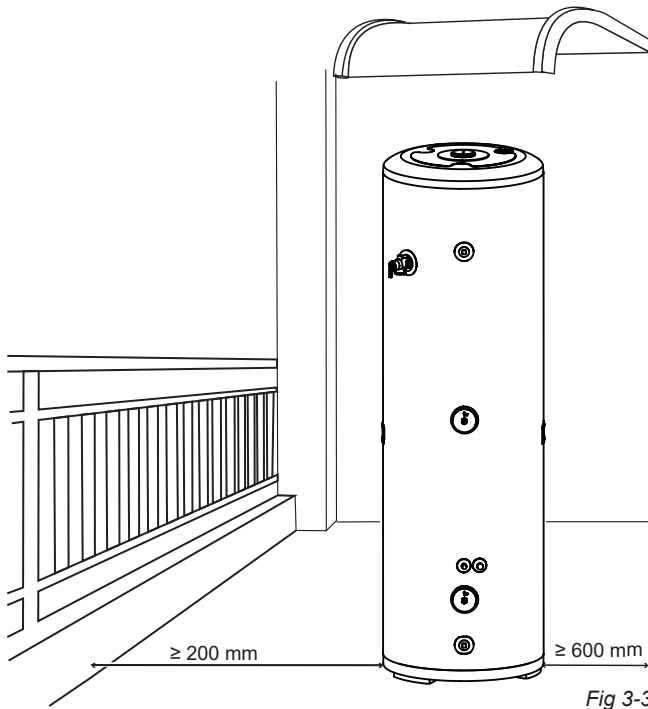


Fig 3-2

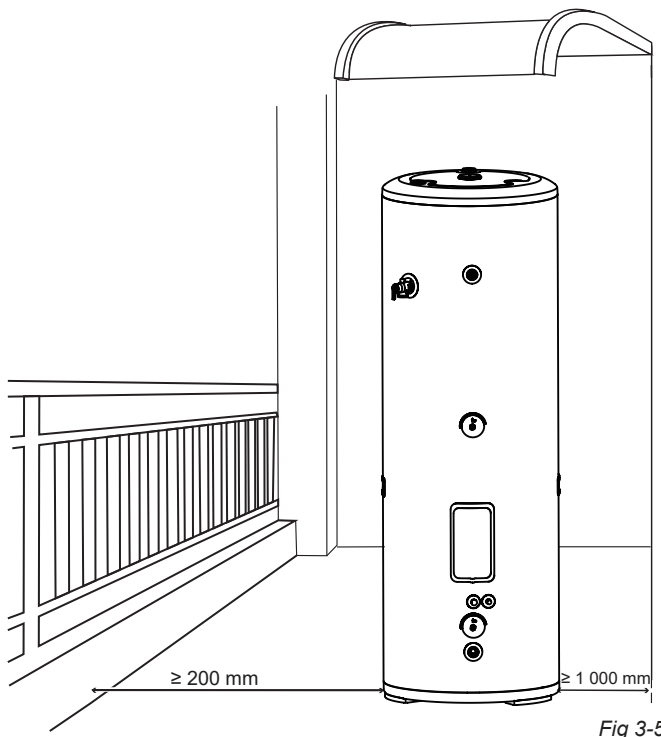
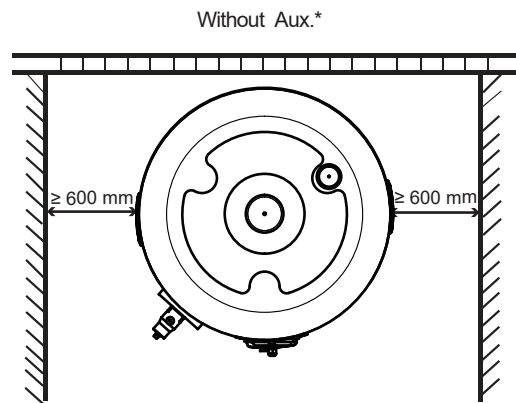
3.2.2 Water tank installation and maintenance space, see Fig 3-3 ~ Fig 3-6 . (Unit: mm)

NOTE

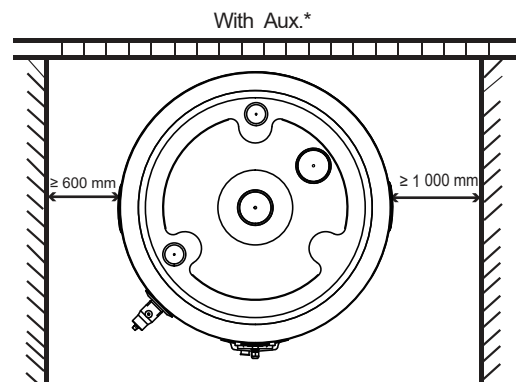
- If the water tank is completely installed outdoors, it is strongly recommended to install a rain shelter.
- When the water tank is installed outdoors, the distance between the water tank and the fence is not less than 200 mm.
- When the water tank is installed indoors, the distance between the water tank and the wall is not less than 600 mm.
- For the water tank with electric auxiliary heater, the electric auxiliary heater shall be at least 1 000 mm away from the wall to ensure that there is enough space for electric auxiliary heat maintenance.



* Electric auxiliary heater is shortened to Aux.



* Electric auxiliary heater is shortened to Aux.

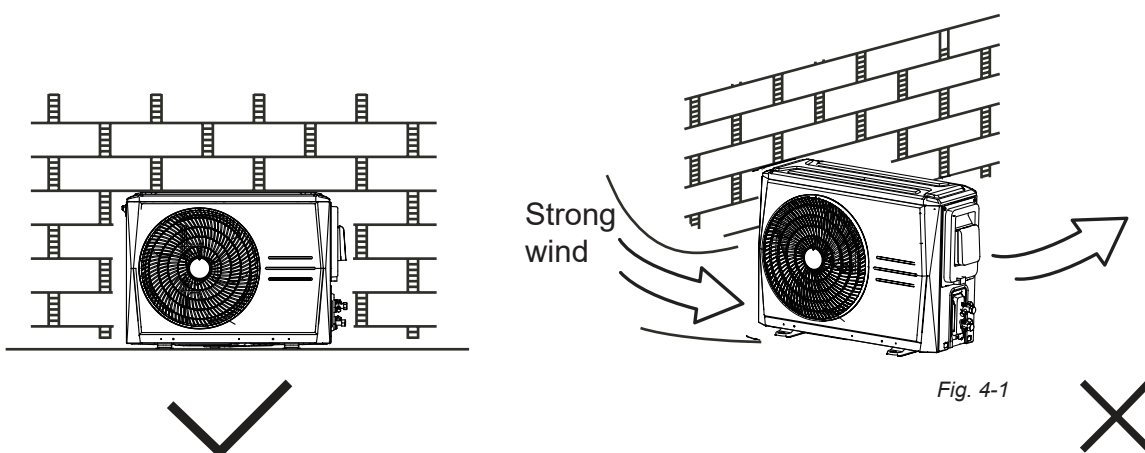


The Aux* is replaceable material, need to make sure there is enough space for e-heater maintenance.

4 INSTALLATION

NOTE

- Ask your dealer or specialized person for moving, repair, and maintenance.
- Install it in the place without direct sunlight and other direct heat radiations. If it can't be avoided, please add a cover to prevent unit from direct sunlight.
- The ceiling is horizontal, and its structure can endure the weight of the indoor unit.
- Please firmly install the unit, otherwise it may cause abnormal noise and vibration.
- Remove obstacles nearby, a narrow circulation space may influence performance of the unit.
- Install in the place that closes to water tank as far as possible, under the condition that the installation requirements could be satisfied.
- When installing in the place that near to the sea and high place where strong wind blows, install the unit against a wall or use a baffle when necessary to ensure the unit could run normally, see *Fig 4-1*. Especially in the place with strong wind, pay attention not to let strong wind blow back to the unit.
- If install the unit in a basement, inside the room or other confined space, please pay attention to air discharge and air supply circulation around the unit and outside. Circulation air volume should not less than 1250 m³/h.



4.1 Dimension and mounting

4.1.1 Outdoor unit, see *Fig. 4-2*, *Fig. 4-3* and *Table 4-1*. (Unit: mm)

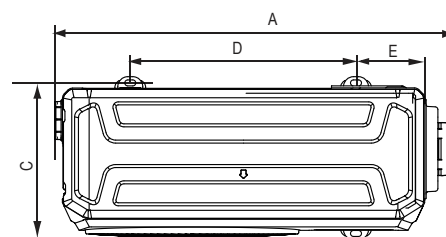
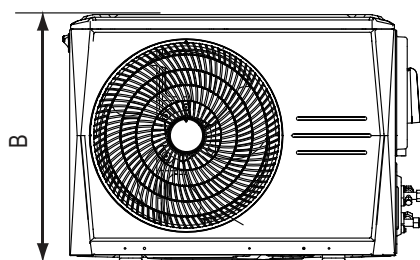


Fig. 4-2

Please fix the four bases of the outdoor unit on the flat ground with bolts.

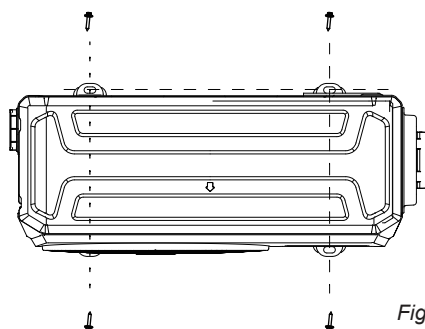


Fig. 4-3

Table 4-1

| Dimension and mounting dimension | | | | |
|----------------------------------|-----|-----|-----|-----|
| A | B | C | D | E |
| 804 | 555 | 302 | 452 | 137 |

4.1.2 Water tank, see Fig. 4-4, Fig. 4-5 and Table 4-2. (Unit: mm)

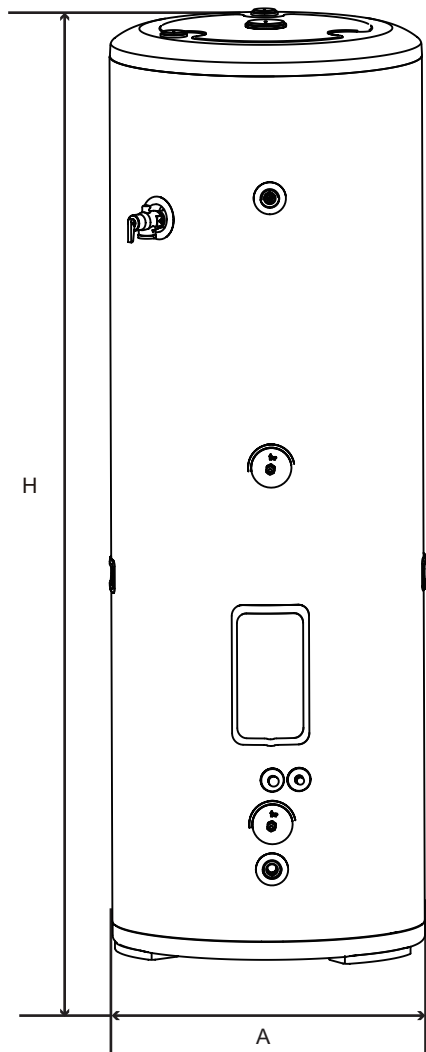
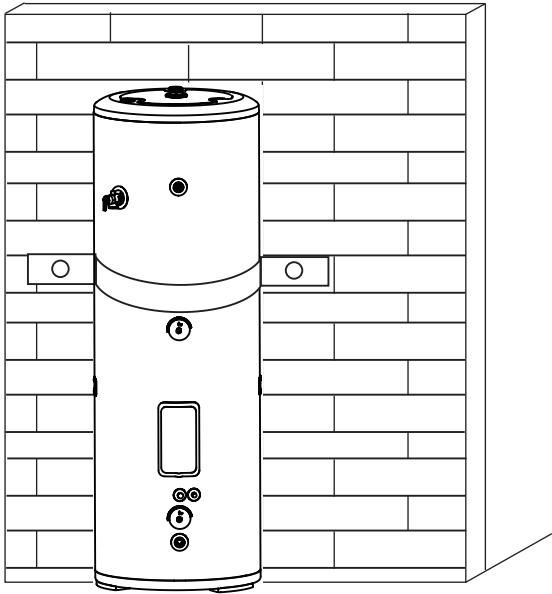


Fig. 4-4

Table 4-2

| Dimension Model | A | H |
|--------------------|-----|-------|
| 200 L | 505 | 1 665 |
| 300 L | 580 | 1 735 |



Please install the water tank fixing strip as shown in the figure to ensure that the water tank is stably fixed.

Fig. 4-5

4.2 Drain hole position

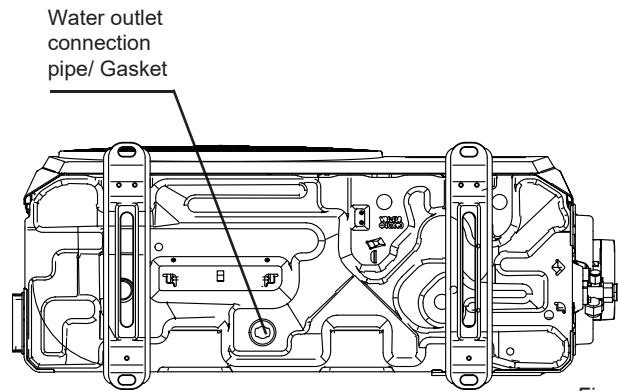


Fig 4-6

Please use the Allen wrench to open the drain valve to drain the water. If no water flows out, it means that the draining is completed.

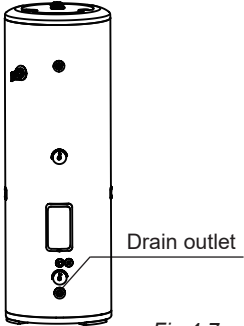


Fig 4-7

4.3 Pipe connection

4.3.1 Unit connection sketch

Unit connection sketch, please refer to Fig.4-8.

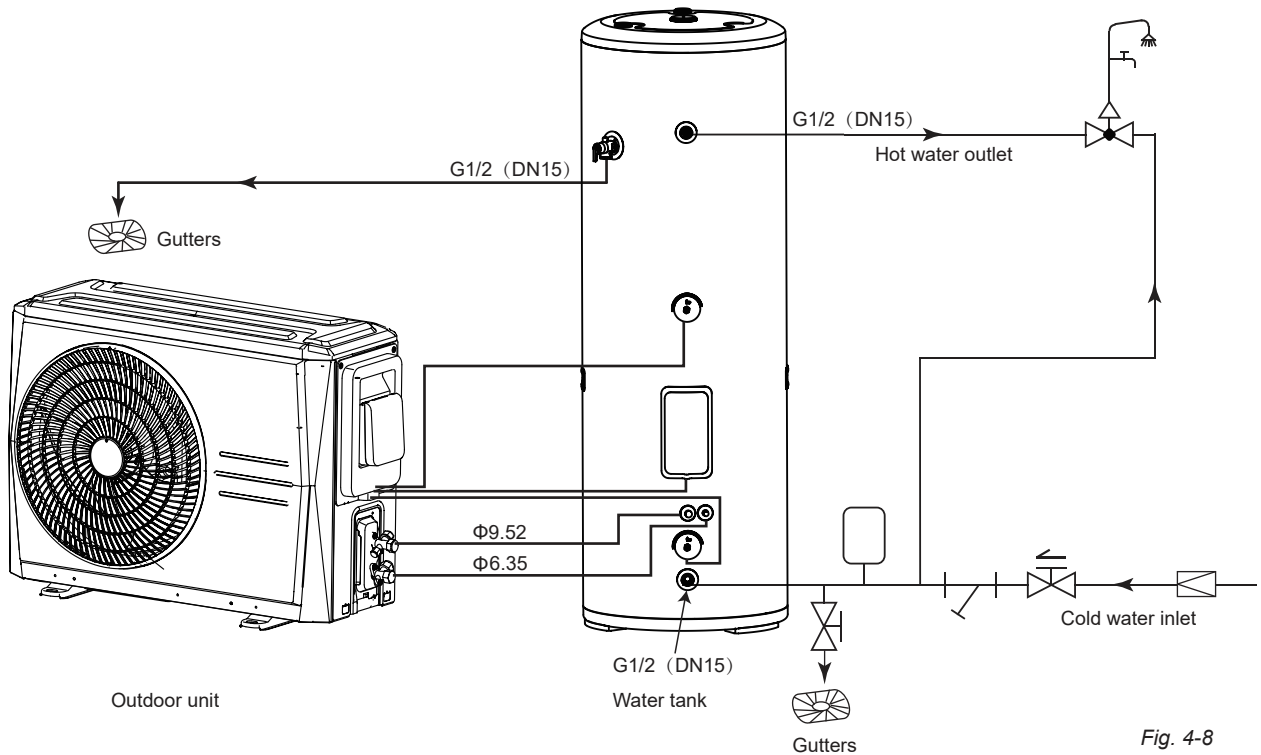


Fig. 4-8

Icons and meanings

Table 4-3

| Name | Water use site | One-way stop valve (field supply) | Water mixing valve (field supply) | Shut valve (field supply) |
|------|----------------|--|--|---|
| Icon | | | | |
| Name | Gutter | Expansion tank (field supply, suggest to install) | Y-type filter (≥40 meshes) (field supply) | Pressure reducing valve (field supply) |
| Icon | | | | |

NOTE

- The water tank temperature can be set from 52 ℃ to 60 ℃.
- The minimum water inlet pressure is not less than 0.15 MPa, and the maximum is not more than 0.5 MPa.
- If the inlet water pressure is less than 0.15 MPa, a pump should be installed at the water inlet.
- To guarantee the safety usage of tank, a pressure reducing valve should be installed in the water inlet pipe, if the water pressure exceeds 0.5 MPa.
- It is strongly recommended to use thread seal tape for sealing when connecting water pipes and valves.
- If the water temperature at the outlet of mixing valve is higher than usage, please install a mixing valve at the end user.

4.3.2 PTR valve

- The valve body unloading pressure is 850 kPa, unloading temperature is 99 °C, and the valve body opening energy value is 46 kW, more details refer to certificate No:WMK26608.
- PTR valve is tightened with a 68 N.m torque wrench. Apply sealant to the first 3 turns of screw thread before installation; After installation, the outlet of the drain pipe shall be installed face down, and the thread turns that are not screwed into the PTR valve shall be less than 3 turns.
- Before filling the water tank, the PTR valve must be installed properly.

⚠ CAUTION

Do not quickly operate the handle of valve, to avoid water hammer impact and damage to the valve.

- The PTR valve should be checked every half year to make sure that there is no restriction of the valve. Please beware of hot water from the valve. The drainage pipe should be well insulated in order to prevent water inside pipe from freezing in cold weather.

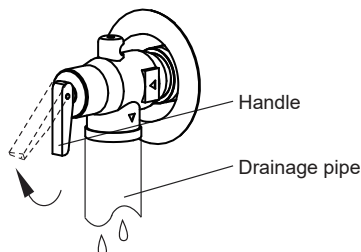


Fig.4-9

4.3.3 Stop valve instruction

- In general, the shape of stop valve and names of each part are shown in Fig.4-10.
- Effect of stop valve:
 - Stop the system when the unit is working.
 - When water tank connects with the outdoor unit, vacuumize and add refrigerant through it.
 - Stop the system and then recycle refrigerant to outdoor unit when maintaining.
- Open and close the stop valve:
 - Open: dismantle the bonnet by wrench and insert an *Allen key to spool, open the stop block anticlockwise and then tighten the bonnet.
 - Close: use a wrench to dismantle the bonnet and insert an Allen key to spool, close the stop block clockwise and then tighten the bonnet.

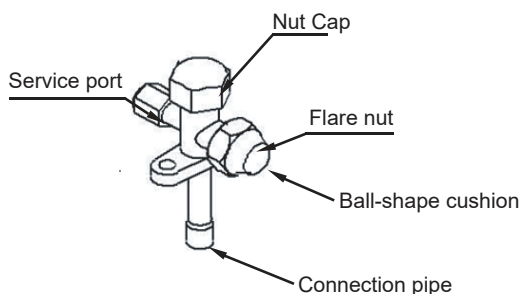
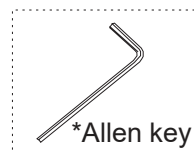


Fig.4-10

⚠ CAUTION

Before water heater runs, please make sure every stop valve has been opened.
When operating the valves, make sure that there are no open flames or sparks to prevent explosion or ignition.

4.3.4 Connection length of outdoor unit and water tank pipe and height difference requirements:

Table 4-4

| Max.length (m) | Max. height difference (m) | Standard length (m) | Standard height difference (m) |
|----------------|----------------------------|---------------------|--------------------------------|
| 20 | 10 | 2 | 0 |

💡 NOTE

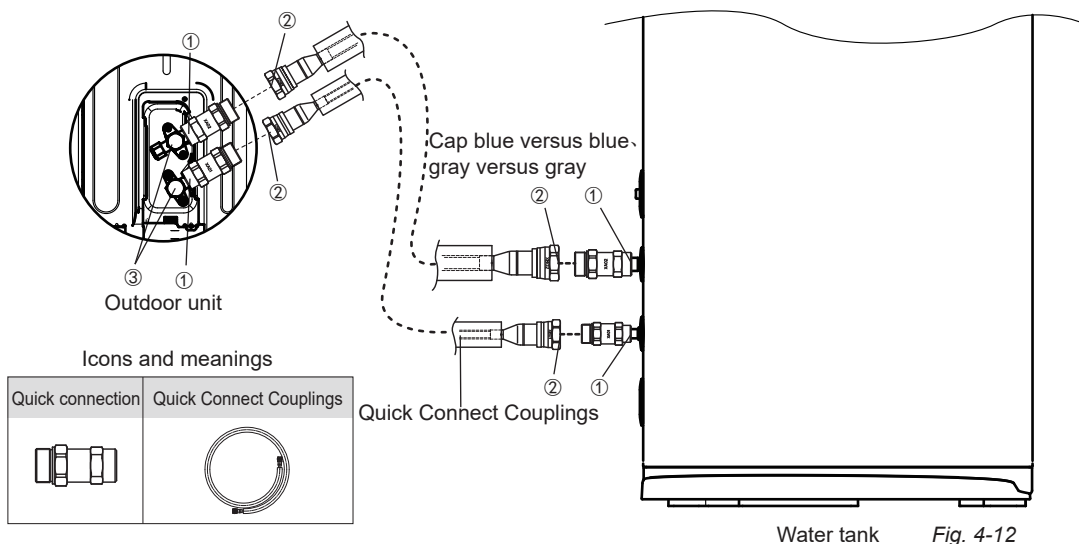
- Do not let air, dust, or other impurities fall in the pipe system during installation.
- The connecting pipe should not be installed until the indoor and outdoor units have been fixed already.
- Keep the connecting pipe dry, and do not let moisture in during installation.
- When connecting copper pipe, please wrap it with thermal insulation material.
- If the required length of piping exceeds the standard length(2-meters), an extended piping of the required actual length (including refrigerant) needs to be ordered from the delivery without the need for additional refrigerant.

4.4 Quick connect couplings

- Quick connection sketch, please refer to Fig.4-12.
 - Retighten the valve using a torque wrench. Tightening torque values: 20 N·m
 - Connect quick connection to stop valve using a torque wrench. Tightening torque values: 20 N·m
 - Open the stop valve, for details, see 4.3.3.
- Leak detection.

The general methods for identifying the source of a leak are as follows:

 - Audio detection: relatively large leaks are audible.
 - Touch detection: place your hand at joints to feel for escaping gas.
 - Soapy water detection: small leaks can be detected by the formation of bubbles when soapy water is applied to a joint.



5 ELECTRICAL CONNECTION

⚠ CAUTION

- The heat pump should use separate power supply with rated voltage. If voltage is not stable, please use stabilized voltage supply.
- The external power supply to the heat pump should have ground wiring, which is linked to the ground wiring of the indoor and outdoor unit.
- The wiring work should be done by qualified persons according to circuit drawing.
- A leakage protector should be installed according to the National Standard concerning electrical appliance.
- An all-pole disconnection device which has at least 3 mm separation distance in contact points should be installed.
- Power supply cords and signal wires should be arranged properly. Separate strong current wire and weak current wire, meanwhile they can't contact with connection pipe and valve.
- Power supply with a leakage protector should be installed in a water-proof place inside the room.
- Don't do cross connection between 2 wires and signal wires must be shielded.
- When power supply cord parallels with controlling wire, please put the wires to corresponding wire pipe and leave proper space between wires.
- When selecting power supply cords, please refer to the National Standard and this manual, power supply used outdoor should not lighter than NO.57 wire in IEC 60245.
- If power supply cord is damaged, to avoid danger, it must be replaced by professional person.
- Do not turn on the power until you have checked carefully after wiring.

5.1 Power supply cords

5.1.1 Specification of power supply

Table 5-1

| Item Model | Power | Min. wire dia.(mm ²) (mental pipe synthetic resin pipe wire) | | Manual switch(A) | | Leakage protector | Max. E-heater Power(W) |
|---------------|------------------|---|-------------|------------------|------|---------------------|---------------------------|
| | | Succesive length ≤ 30 m | Ground wire | Capacity | Fuse | | |
| With AUX. | 220-240 V~ 50 Hz | 2.5 | 2.5 | 20 | 16 | 30 mA below 0.1 sec | 2 100 |
| Without AUX. | | 1.5 | 1.5 | | | | |

⚠ CAUTION

- Specifications of power wires above (outdoor unit power wire and power wire that connets with water tank): H07RN-F.
- Power supply provided individually(not use power supply device).
- Wire diameter shown in the table above and successive length is the situation than voltage drop is in the range of 2 %, when successive length is longer than the value shown in the table, please select wire diameter according to relative standards.

5.2 Water tank temperature sensor installation

Connect the water tank temperature sensor wire connector to the outdoor unit T5U and T5L connector.

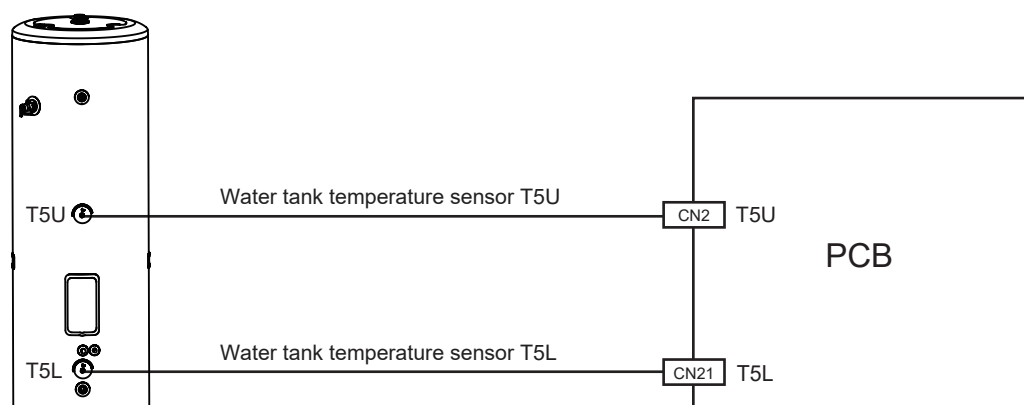


Fig.5-1

5.3 Outdoor unit & AUX. power connection

⚠ CAUTION

If the water tank has the electric auxiliary heater(AUX.)function, please follow the steps below to connect the electric auxiliary heating power cord.

- 1.Remove the protective cover of the electric control box on the right side of the outdoor unit.

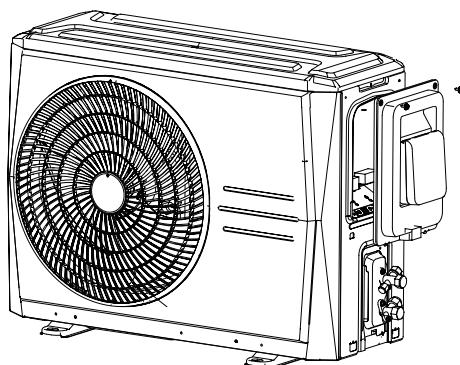
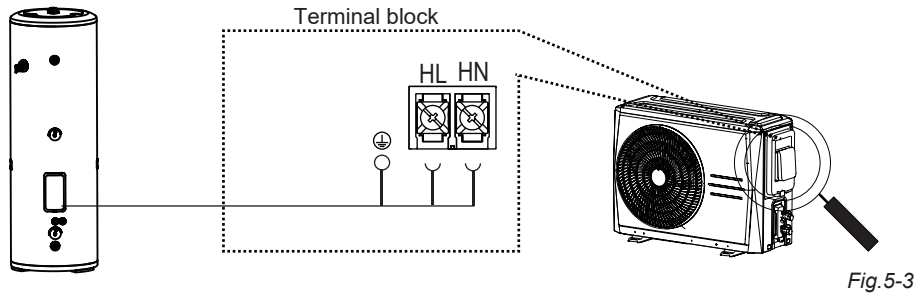
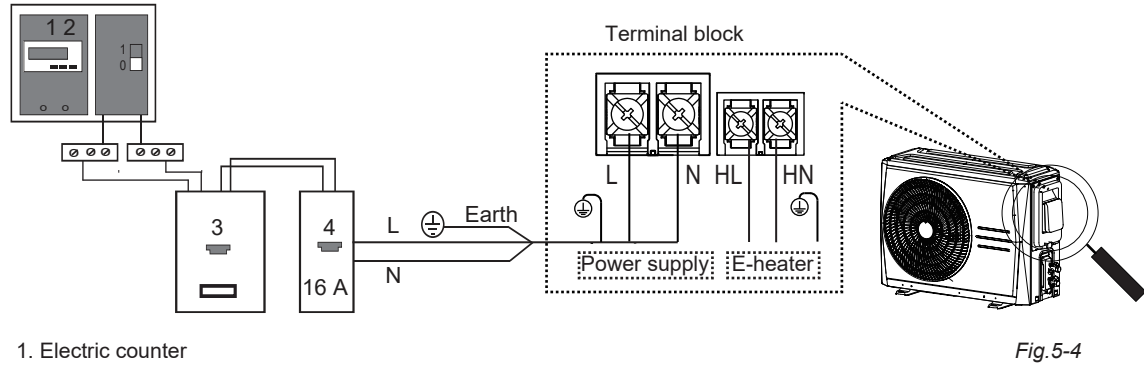


Fig.5-2

2. Connect the electric auxiliary heater power line on the water tank to the corresponding port on the terminal block.



3. Outdoor unit power supply.



1. Electric counter
2. Global overcurrent and leakage circuit breaker
3. Electric leakage circuit breaker
4. Overcurrent circuit breaker

⚠ CAUTION

- A leakage protector must be installed on power supply box outside the unit according to the figure above.
- Power supply with leakage protector must be installed inside or installed in the place that can satisfy water-proof requirements.
- This unit can be started only if it is grounded reliably.

5.4 Dip switch settings

💡 NOTE

The picture shown is for reference only, actual product may vary.

☐ means 0, ☑ means 1.

Table 5-2

| | | | |
|------|--|---|--|
| S1-1 | | 1 | Reserve |
| | | 0 | Default |
| S1-2 | | 1 | Reserve |
| | | 0 | Reserve |
| S1-3 | | 0 | First setting parameters |
| | | 1 | Second setting parameters |
| S2-1 | | 1 | High temperature |
| | | 0 | Default temperature |
| S2-2 | | 1 | User settings are valid in 24 hours by default |
| | | 0 | User settings are always valid by default |
| S2-3 | | 1 | High demand |
| | | 0 | Normal demand |

6 CHECK

NOTE


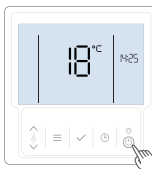





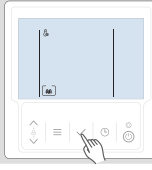






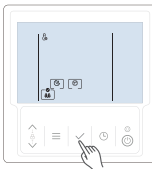


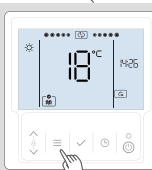


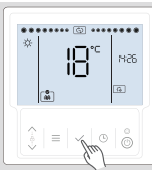



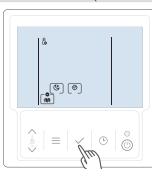

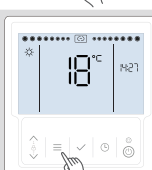
Before switching on the unit, read following recommendations:

- When the installation and parameter setting are completed, cover all the sheet metal of the unit well.
- The unit should be maintained by professionals.

For the water tank with electric auxiliary heater, please check the quality of the electric auxiliary heater according to the method in Chapter 6.1 before the Long-term operation to avoid damage to the unit or personal injury.

6.1 Quality inspection of electric auxiliary heater

Table 6-1

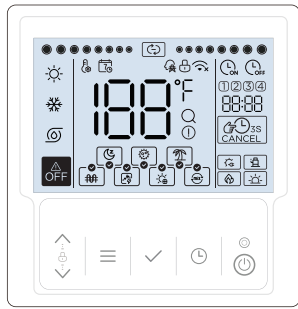
| No. | Description | Image | Notice |
|-----|---|---|---|
| 1 | After the unit is powered on, press the power button  on the controller and the LED light will be lightened. |  | The unit shall be installed according to the requirements of the corresponding specifications. Before the unit is powered on, please ensure that the system operates in the environment where the water tank is full of water to prevent damage to the electric auxiliary heater. |
| 2 | Long press the  button until the manual electric auxiliary heater (E-heater) function icon  appears, then press   buttons to select  icon (flashing slowly). |  | If the controller is locked and displays the icon  , long press  +  buttons to unlock the controller. When the  icon disappears, it indicates that the controller is successfully unlocked. |
| 3 | Press  button again, and the icon  will appear, indicating that the manual electric auxiliary heater function has been turned on. |  | Press the  button to switch the manual electric auxiliary heater function between ON and OFF. |
| 4 | Press  button to return to main interface. If the manual E-heater function icon and E-heater operation status icon are displayed, it means that the manual E-heater function has been turned on, and the E-heater is in operation status. If not, please check whether steps 1 to 4 are correct. |  | |
| 5 | After the manual E-heater function is turned on, wait for 5min to make the E-heater operate stably in the environment with water, check whether the leakage protection switch trips. If there is a trip, immediately cut off the power and notify the professional maintenance personnel. |  | In this case, it is usually need to replace the electric heater. |
| 6 | If no tripping occurs, please turn off the manual E-heater function after unlocking the controller. Then long press the  button to enter the E-heater function interface. |  | |
| 7 | After entering the E-heater function interface, press  button again to cancel the manual E-heater function, and the icon display will change from  to  . |  | |
| 8 | Press the  button to return to the main interface, and you can find that the manual E-heater function icon and the E-heater operation status icon are disappeared, indicating that the manual E-heater function has been closed. |  | |

6.2 System parameters check

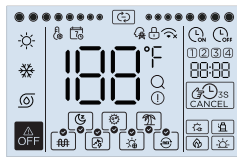
If the unit failed or in protection, the controller will display the corresponding code; when more than one failure or protection occurs, the order of failure protection will display. When checking on the controller, the more parameters can be obtained.

7 OPERATION INSTRUCTIONS

7.1 Control panel explanation



7.2 Display explanation



| No. | Icon | Name | Description |
|-----|------|---------------------------|---|
| 1 | | Domestic hot water mode | It will be lightened when the setting operating mode is domestic hot water mode(DHW mode), otherwise it will be extinguished. |
| 2 | | Cooling mode | Not available |
| 3 | | Pump mode | Not available |
| 4 | | Silence function | It will be lightened when the silence function is activated, and extinguished when the silence function is not activated. When it is selected (not activated), the icon [🔇] will slowly flash. If manual disinfection function is activated, the icon [🔇] will quickly flash in main interface. |
| 5 | | Disinfection function | It will be lightened when the disinfection function is activated, and extinguished when the disinfection function is not activated. When it is selected (not activated), the icon [🔍] will slowly flash. If manual disinfection function is activated, icon [🔍] will quickly flash in main interface. |
| 6 | | Holiday away function | It will be lightened when the holiday-away function is activated, and extinguished when the holiday-away function is not activated. When it is selected (not activated), the icon [🏠] will slowly flash. |
| 7 | | Boost function | It will be lightened when the boost function is activated, and extinguished when the boost function is not activated. When it is selected (not activated), the icon [⚡] will slowly flash. If manual boost function is activated, icon [⚡] will quickly flash in main interface. If the disinfection and boost functions are activated together, these two icons will be displayed alternately. |
| 8 | | Manual e-heating function | It will be lightened and quickly flash when the manual e-heating function is activated, and extinguished when the manual e-heating function is not activated. When it is selected (not activated), the icon [🔥] will slowly flash. |
| 9 | | OPT.Backup function | It will be lightened when the OPT.Backup function is activated, and extinguished when the OPT.Backup function is not activated. When it is selected (not activated), the icon [🔋] will slowly flash. |
| 10 | | Solar-energy function | It will be lightened when the solar-energy function is activated, and extinguished when the solar-energy function is not activated. When it is selected (not activated), the icon [☀️] will slowly flash. |
| 11 | | Hybrid function | It will be lightened when the hybrid function is activated, and extinguished when the hybrid function is not activated. When it is selected (not activated), the icon [🔌] will slowly flash. |
| 12 | | OFF icon | It will be lightened when user turns off the controller or selects OFF mode in some timers. |
| 13 | | Operating icon | It will only be dynamically lightened when the unit is operating. |
| 14 | | Setting icon | It will only be lightened when setting or adjusting. |
| 15 | | Weekly-schedule icon | It will be lightened when weekly-schedule is activated in the app, and extinguished when the weekly-schedule is not activated. |

| No. | Icon | Name | Description |
|-----|------|-----------------------|--|
| 16 | | Smart-grid icon | It will be lightened when smart-grid function is activated, and extinguished when the smart-grid function is not activated. |
| 17 | | Lock icon | It will only be lightened when keyboard has been locked. |
| 18 | | WiFi icon | Not available |
| 19 | | Temperature icon | It will display current tank temperature(DHW mode) at main interface, or display setting parameters when setting. |
| 20 | | Temperature-unit icon | It will display °C or °F when [°C/°F] icon display temperature. |
| 21 | | Query icon | It will only be lightened during querying. |
| 22 | | Alarm icon | It will quickly flash when a fault occurs. |
| 23 | | Boiler icon | When this icon is lightened, it is recommended to turn on the boiler. |
| 24 | | Solar icon | It will be lightened when solar energy signal is on. |
| 25 | | E-heater icon | It will be lightened when the e-heater is operating. |
| 26 | | Heat-pump icon | It will be lightened when the compressor is operating. |
| 27 | | Cancel icon | It will be lightened when the timer or buzzer can be cancel. |
| 28 | | Timer-on icon | It will be lightened when setting timer on clock. |
| 29 | | Timer-off icon | It will be lightened when setting timer off clock. |
| 30 | | Clock icon | It will display clock at the main interface normally, and display error code when fault occurs, and display other parameters when querying or setting. |
| 31 | | Timer icon | It will be lightened when corresponding timer is activated. |

7.3 Keyboard explanation

| NO. | button | Name | Explanation |
|-----|--------|--------------------------|---|
| 1 | | Adjustment buttons | For adjusting parameters, moving cursor and so on. |
| 2 | | Menu button | For entering or quit menus, and so on. |
| 3 | | Confirm button | For confirming settings, entering manual functions, and so on. |
| 4 | | Clock/Timer clock button | For setting clock or timer. |
| 5 | | ON/OFF button | For turn on or turn off the unit. If user turn on the unit, the led will be lightened, and the led will be distinguished if user turn off the unit. |

7.4 Operating explanation

7.4.1 Installation settings

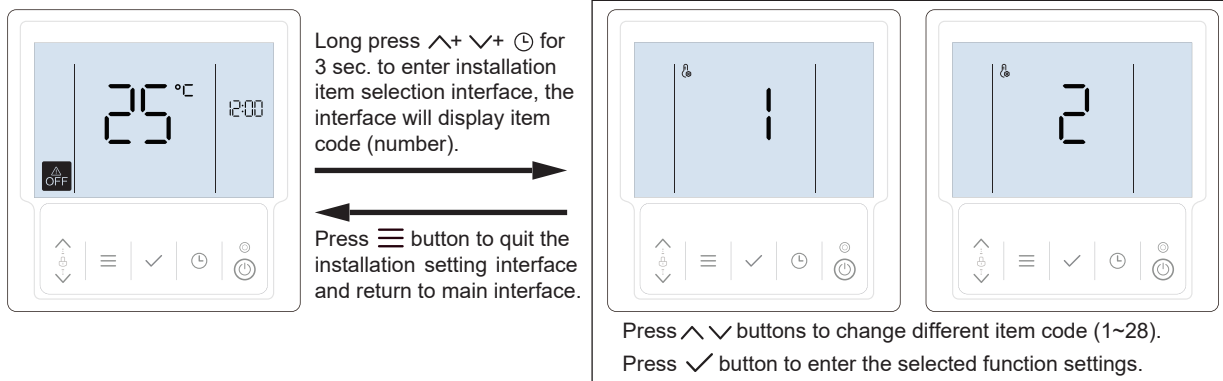
There are up to 20 items can be set up. The items include:

- | | |
|-----------------------|-----------------------------------|
| 1 - Network (reserve) | 11-Smart grid |
| 2 - Timer type | 12- Tank volume |
| 3 - Temperature unit | 15 - Manually defrosting |
| 4 - Silence | 18 - Refrigerant recovery |
| 5 - Disinfection | 19 - Power consumption estimation |
| 6 - Holiday away | 20 - Operating time statistics |
| 7 - OPT.Backup | 24 - Unit address (reserve) |
| 8 - Solar energy | 26 - Clock correction |
| 9 - Hybrid | 27 - Validity period setting |
| 10 - Boost | 28 - E-heater reset |

In these items, only one of 7-OPT.Backup, 8-Solar energy and 11-Smart grid can be set as valid.

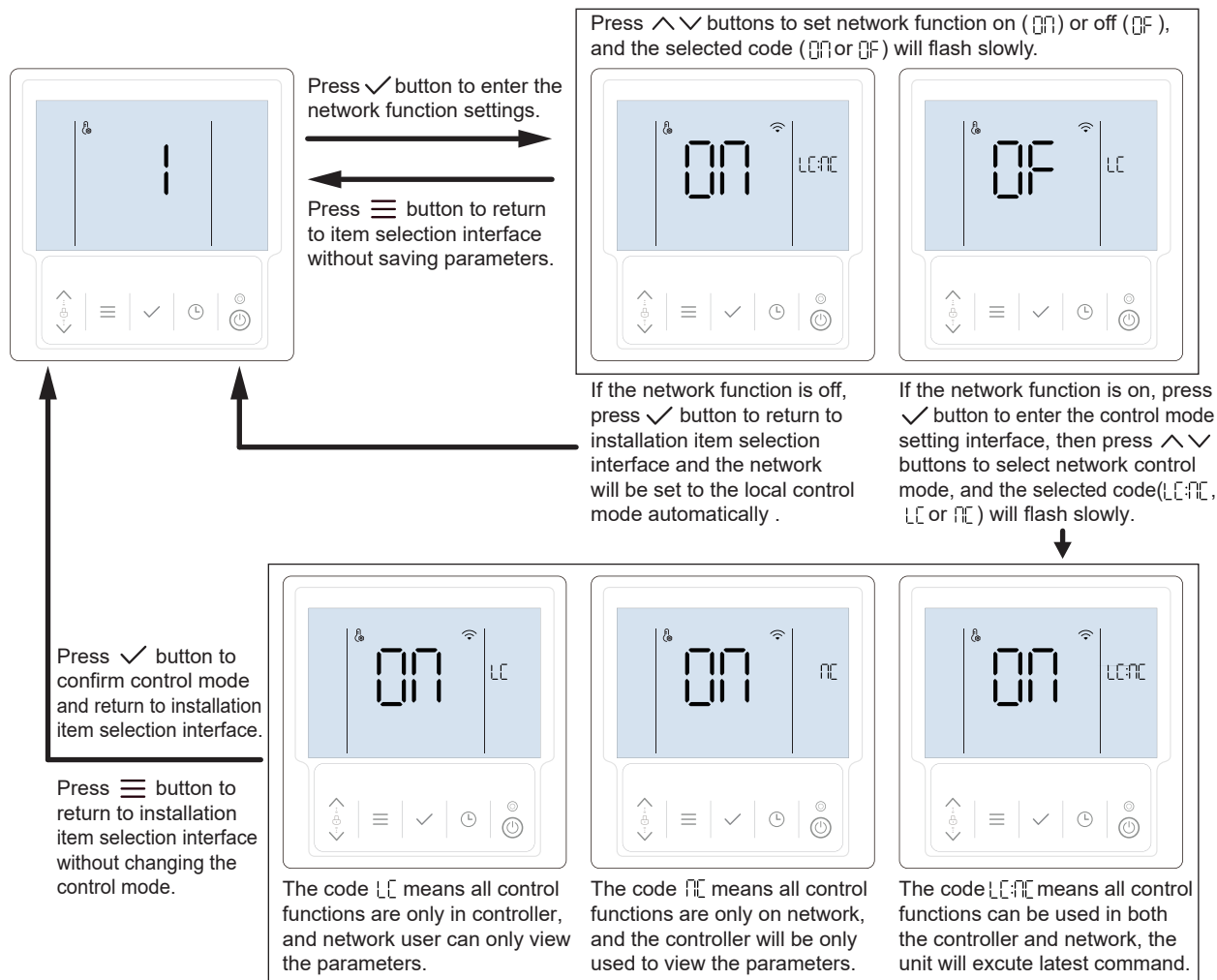
Long press + + for 3 sec. to enter installation settings, then switch and select item number by buttons, then press button to enter the corresponding item setting or press button to quit installation settings(the parameters which does not be confirmed will not be saved).

The setting method is as follows:



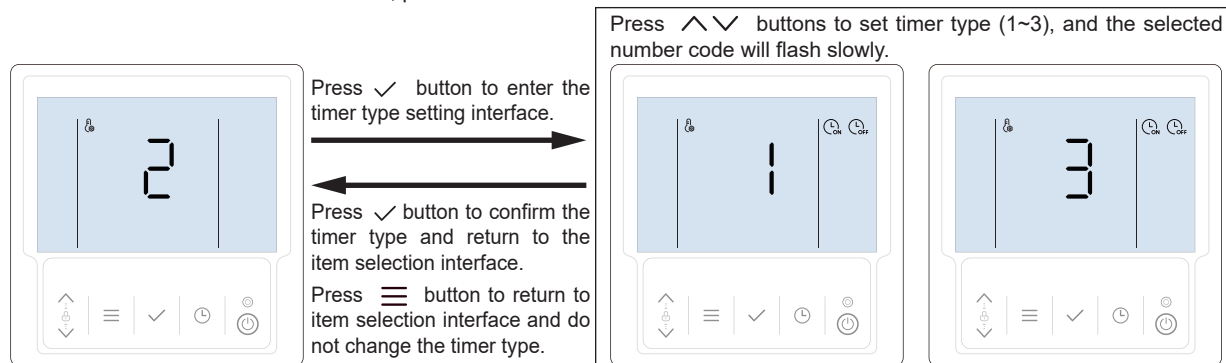
7.4.1.1 Network setting (reserve)

In the installation item selection interface, press $\wedge \vee$ buttons to select the item code 1.



7.4.1.2 Timer type setting

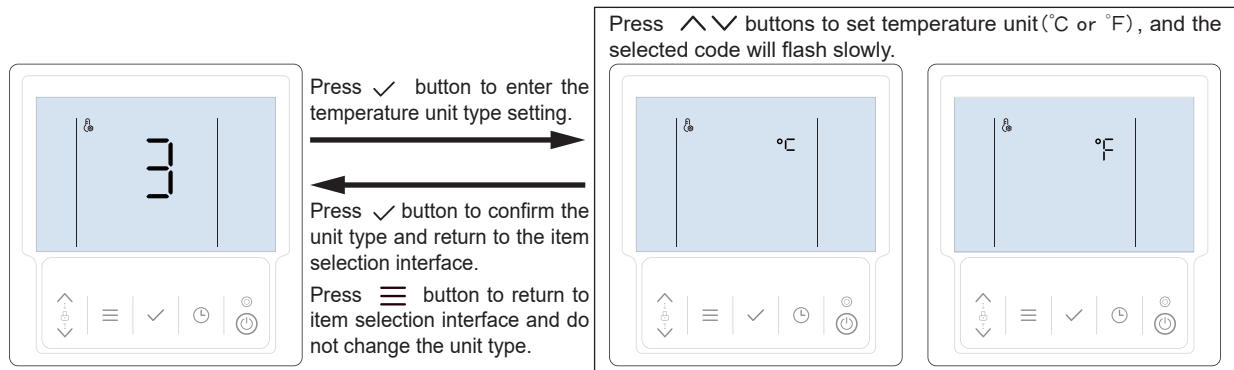
In the installation item selection interface, press $\wedge \vee$ buttons to select the item code 2.



Timer code 1 means point timer (default), and timer code 2 means period timer, and timer code 3 means appointment timer. The specific differences and setting methods of these three timer type will be explained later.

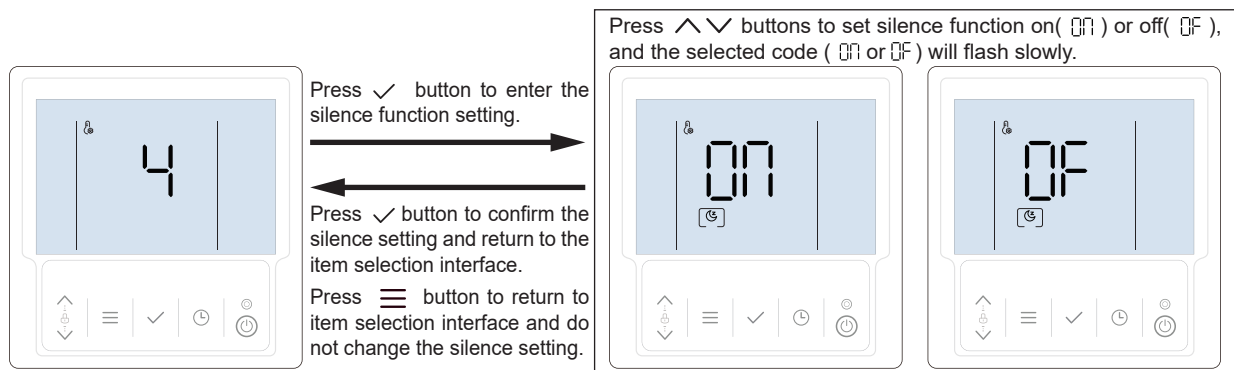
7.4.1.3 Temperature unit setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 3.



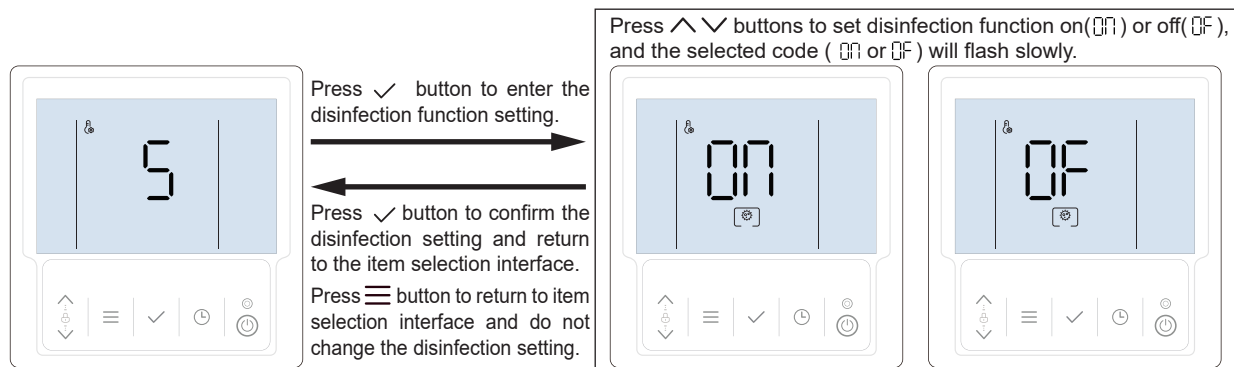
7.4.1.4 Silence setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 4.



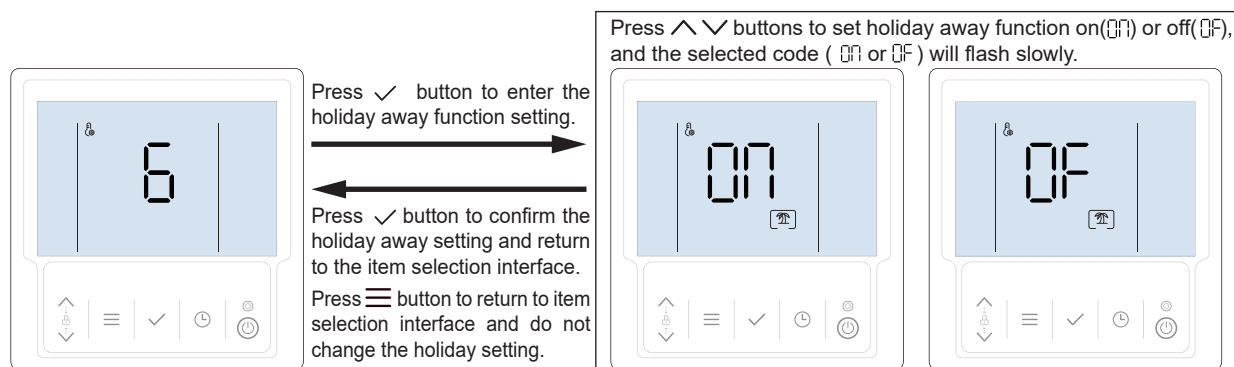
7.4.1.5 Disinfection setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 5.



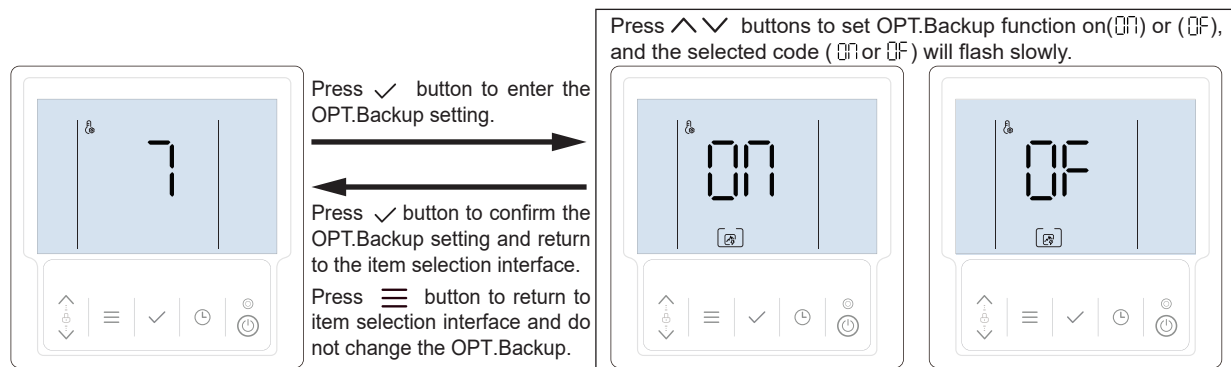
7.4.1.6 Holiday away setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 6.



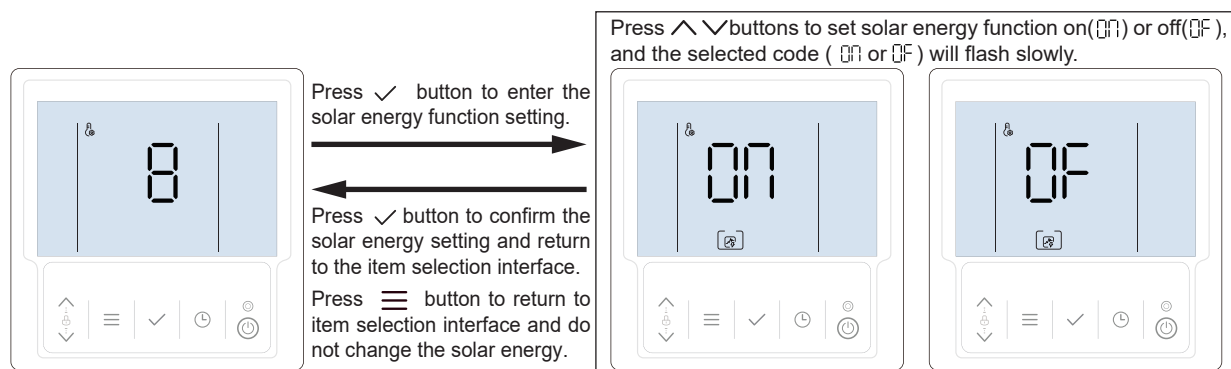
7.4.1.7 OPT.Backup setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 7.



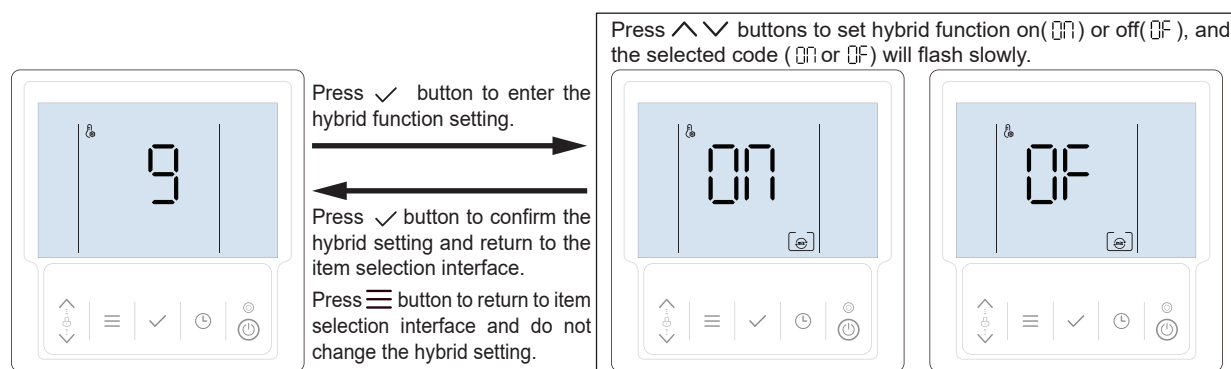
7.4.1.8 Solar energy setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 8.



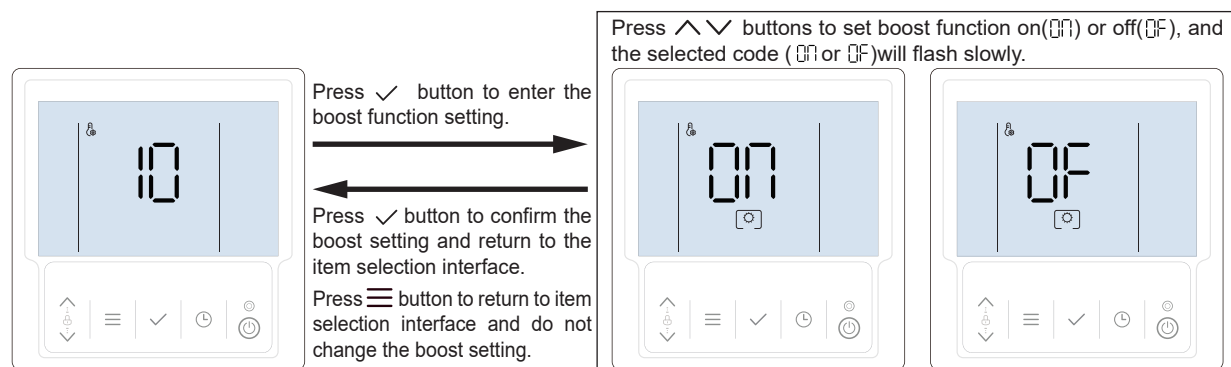
7.4.1.9 Hybrid setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 9.



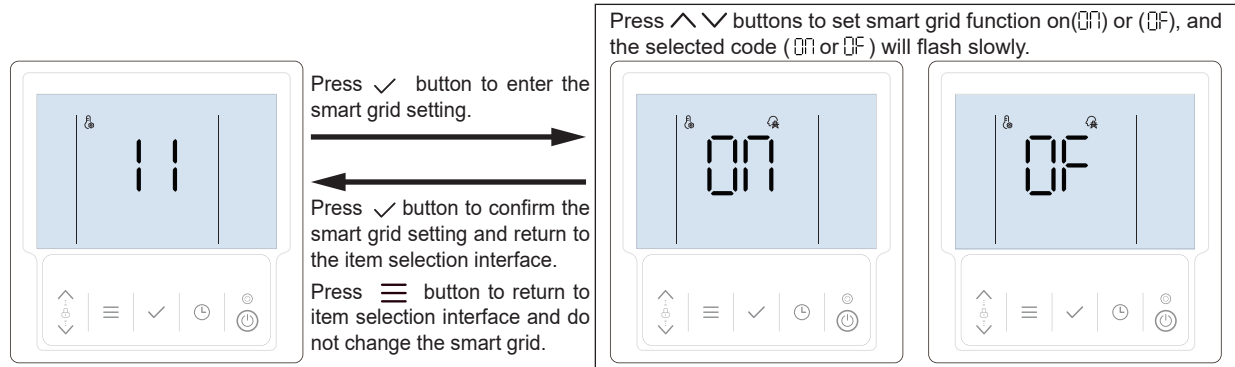
7.4.1.10 Boost setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 10.



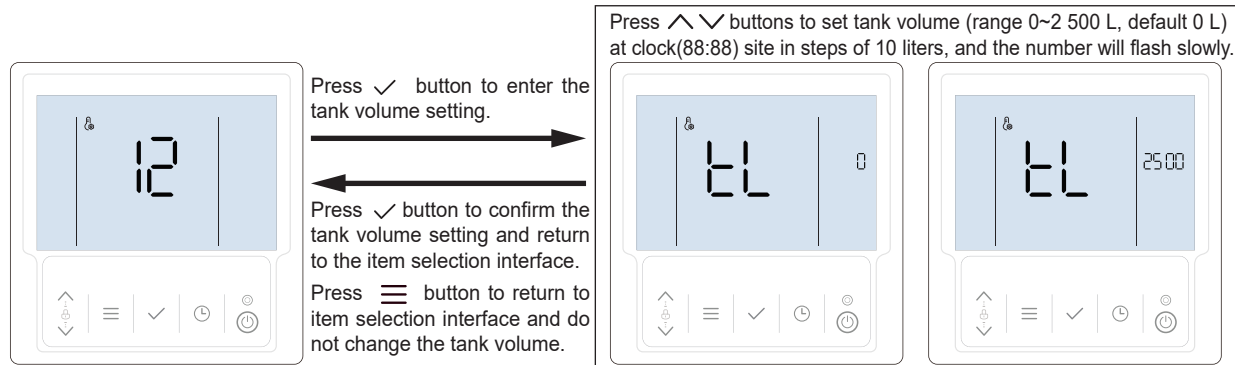
7.4.1.11 Smart grid setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 11.



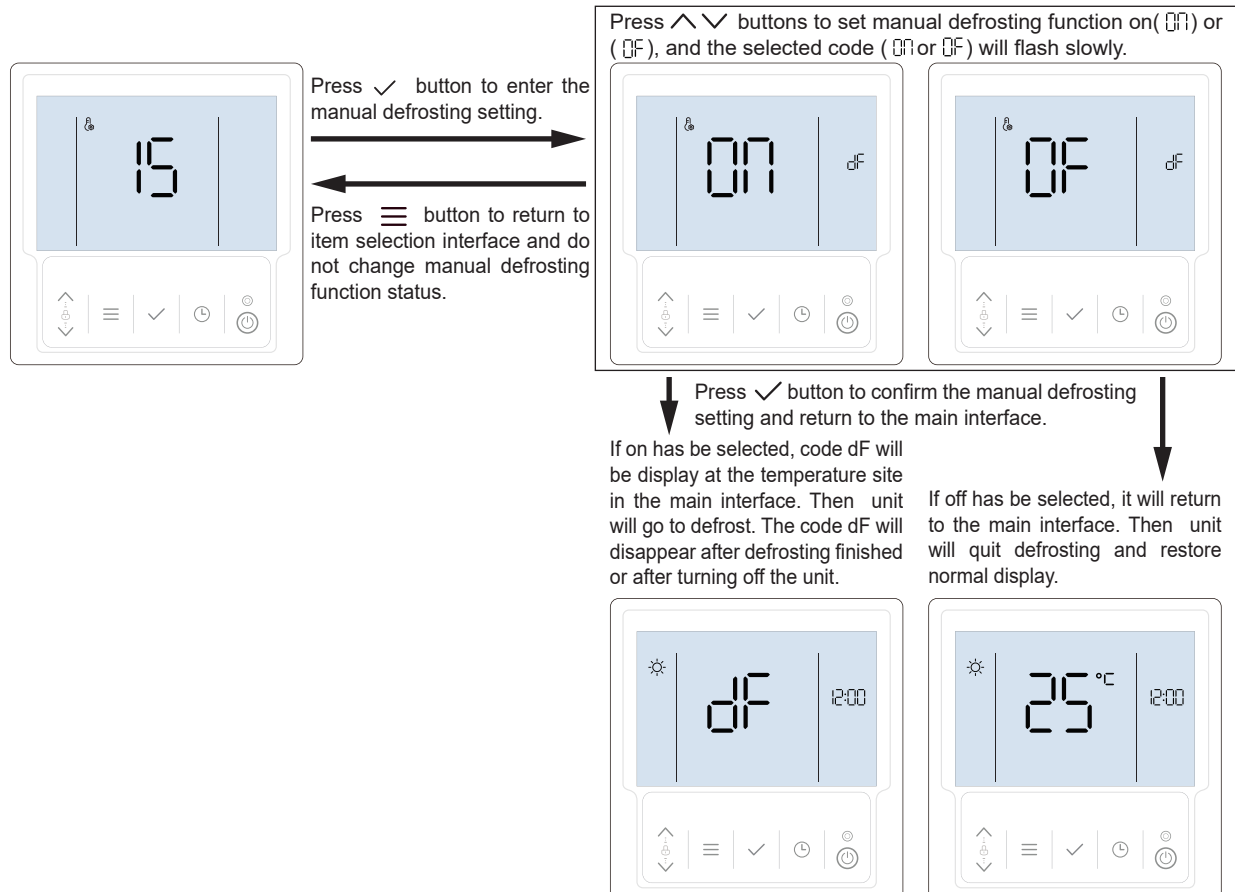
7.4.1.12 Tank volume setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 12.



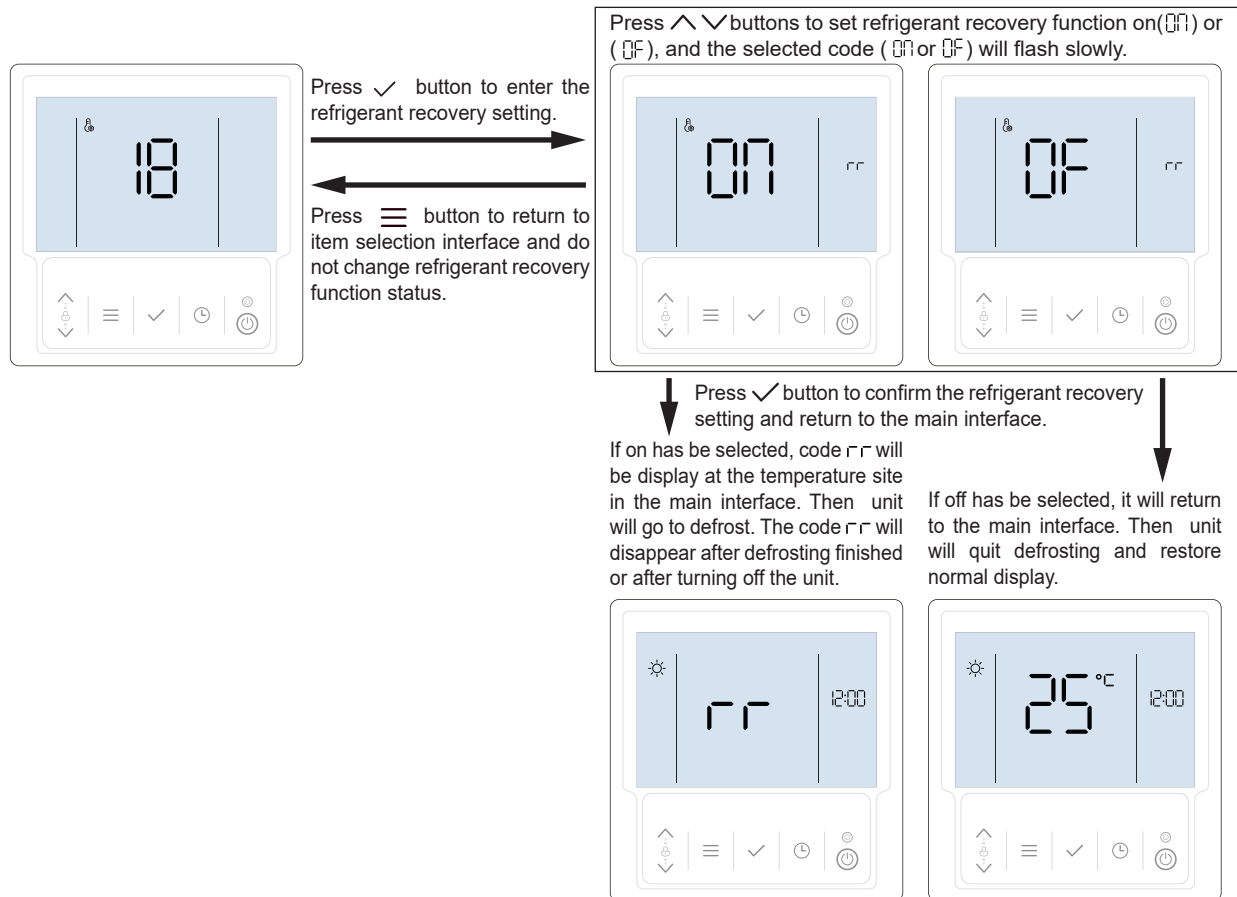
7.4.1.13 Manual defrosting setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 15.



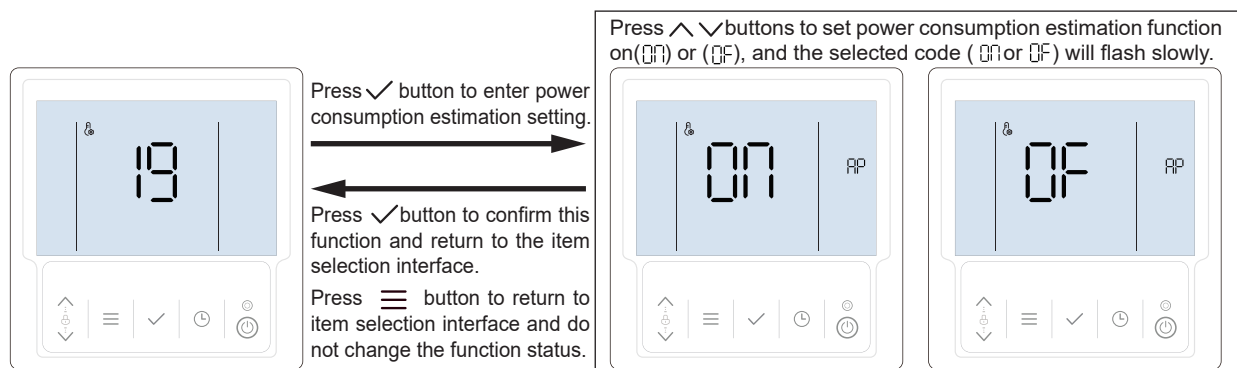
7.4.1.14 Refrigerant recovery setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 18.



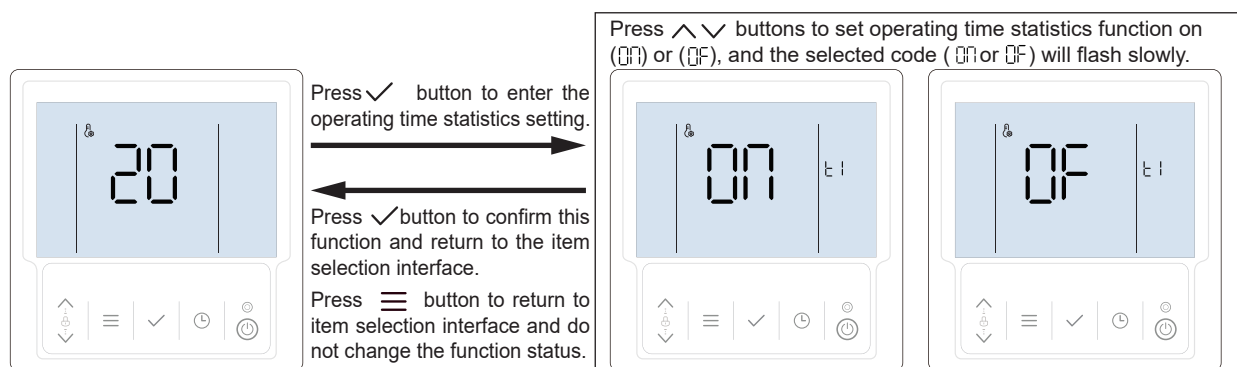
7.4.1.15 Power consumption estimation setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 19.



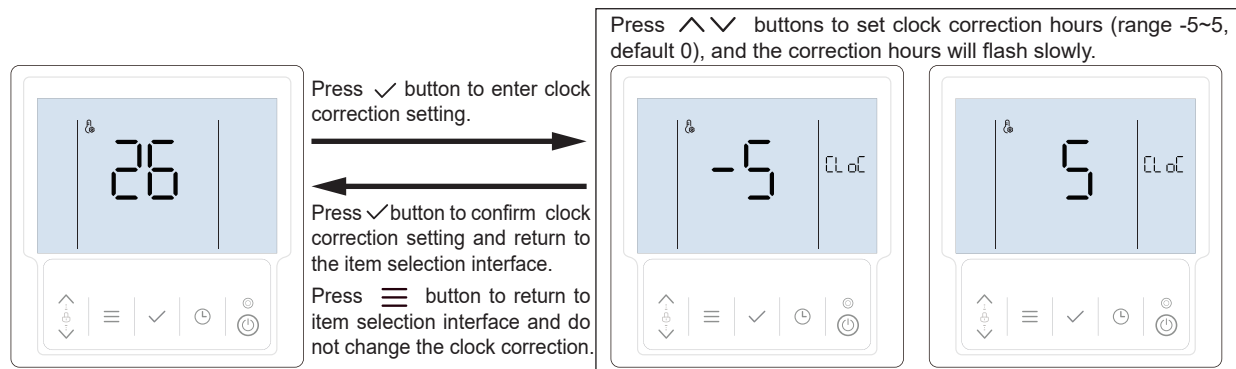
7.4.1.16 Operating time statistics setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 20.



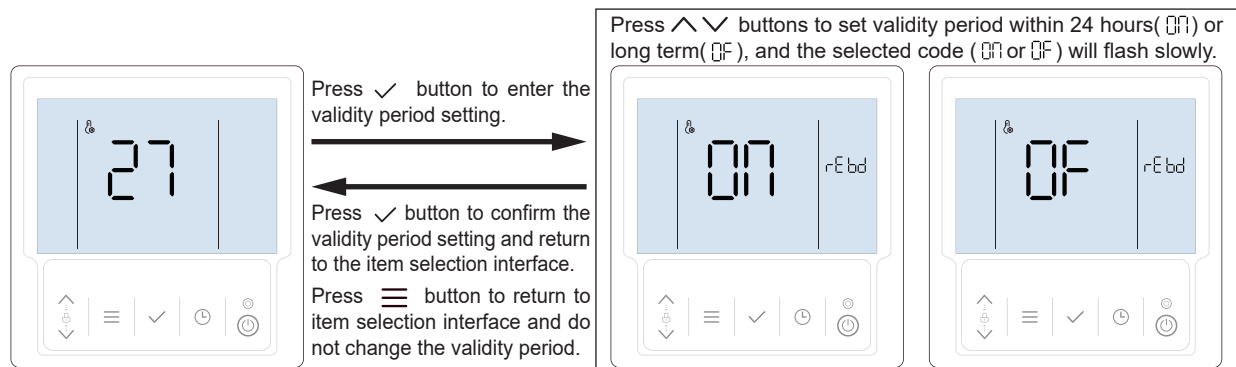
7.4.1.17 Clock correction setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 26 for the correction of Winter and Summer Time.



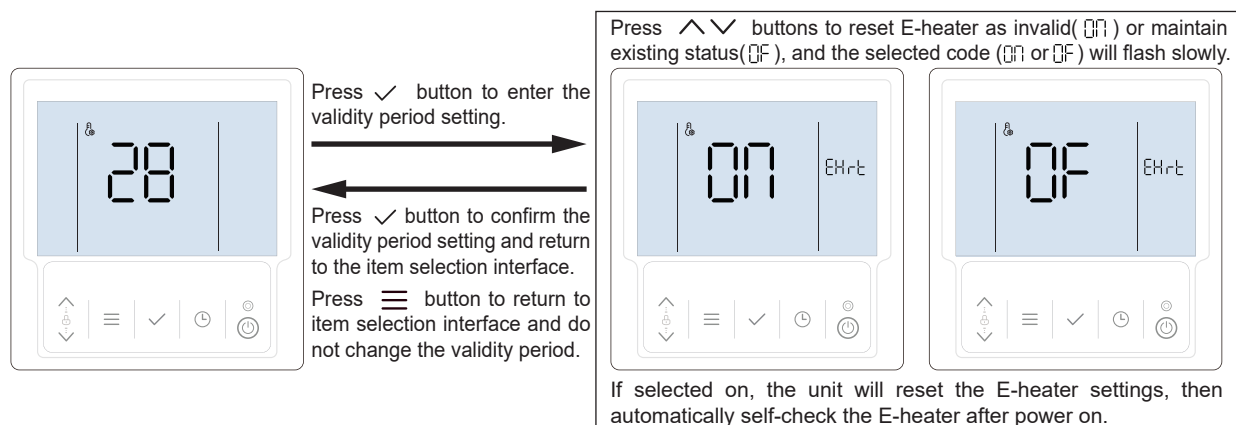
7.4.1.18 Validity period setting

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 27.




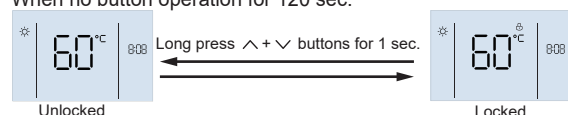
7.4.1.19 E-heater reset

In the installaton item selection interface, press $\wedge \vee$ buttons to select the item code 28 for resetting E-heater as invalid.





7.4.2 Unlock / Lock keyboard

When controller is locked and the  icon is lightened, any button is invalid at this time. Long press the $\wedge + \vee$ buttons for 1 sec. to unlock/lock the keyboard. The keyboard will be locked automatically when no button operation for 120 sec.



7.4.3 Turn on / turn off the unit

Press the  button to turn on or turn off the unit. When the keyboard is unlocked.

If unit is turned on and not operating, the main interface will display setting mode, current temperature, clock and so on. If unit is turned on and operating, the operating icon will flash. If unit is turned off, the  icon will be lightened and operating icon and mode icon will be distinguished.

Some interface examples of operating, standby and OFF state are as follows:



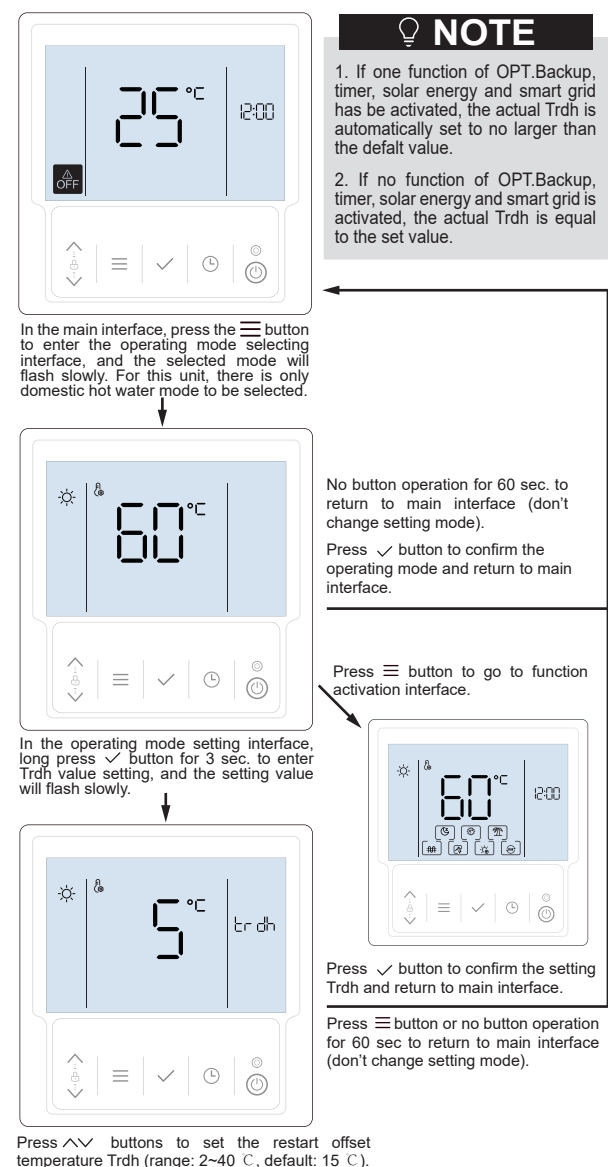
7.4.4 Operating mode and parameter setting

7.4.4.1 Restart offset temperature setting

The code Trdh displayed at $88:88$ means Trdh (restart offset temperature for domestic hot water mode), and the value displays at temperature site 88 .

When the temperature of the water tank drops beyond Trdh , the unit will start heating.

The setting method is as follows:

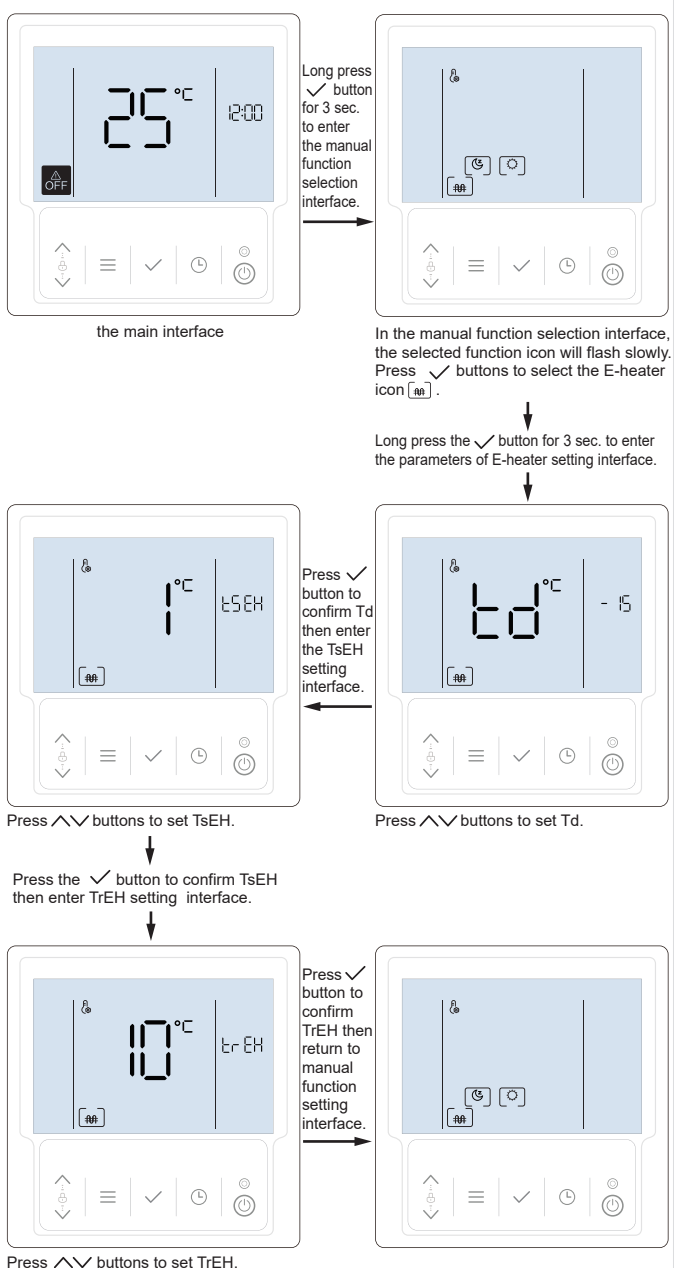


7.4.4.2 Parameters of E-heater setting

If the unit does not equip E-heater, these parameters can not be set. These parameters include Td (the lowest ambient temperature of auto-operating with heat pump and E-heater together, range -15~44 °C, default 0 °C, code Td displays at $88:88$), TrEH (the restart offset temp. of E-heater, range 1~40 °C, default 10 °C, code TrEH displays at $88:88$.) and TsEH (the restart offset temperature of E-heater, range 0~39 °C, default 0 °C, the code TsEH displays at $88:88$).

Td is a limit value to determine if e-heater and heat pump can operate at the same time or not. If the ambient temperature is higher than or equal to Td , the unit will only start heat pump at first, then start e-heater after heat pump stopped if the water temperature does not reach target temperature (code: T5s) because that heat pump reached its highest water temperature (code: T5stop), or ambient temperature has been over the declared operating range, or some heat pump faults occurred. If the ambient temperature is lower than Td , the unit will only start heat pump at first, then start e-heater if the water temperature is lower than the difference between T5s and TrEH , and the heat pump will operate until water temperature reached T5stop (if T5stop is lower than T5s) or T5s (if T5stop is higher than T5s), and the e-heater will operate until the water temperature reached the difference between T5s and TsEH (if T5stop is higher than the difference between T5s and TsEH) or reached T5s (if T5stop is lower than the difference between T5s and TsEH).

During setting, $88:88$ displays Td value, and 88 displays code Td . The setting method is as follows:



7.4.5 Target temperature setting

In the main interface, press \wedge/\vee buttons to adjust target temperature. During adjusting, press \equiv or \checkmark button to confirm settings then return to main interface, or no press any button for 60 sec then confirm settings automatically and return to main interface. An interface example of setting is as follows:

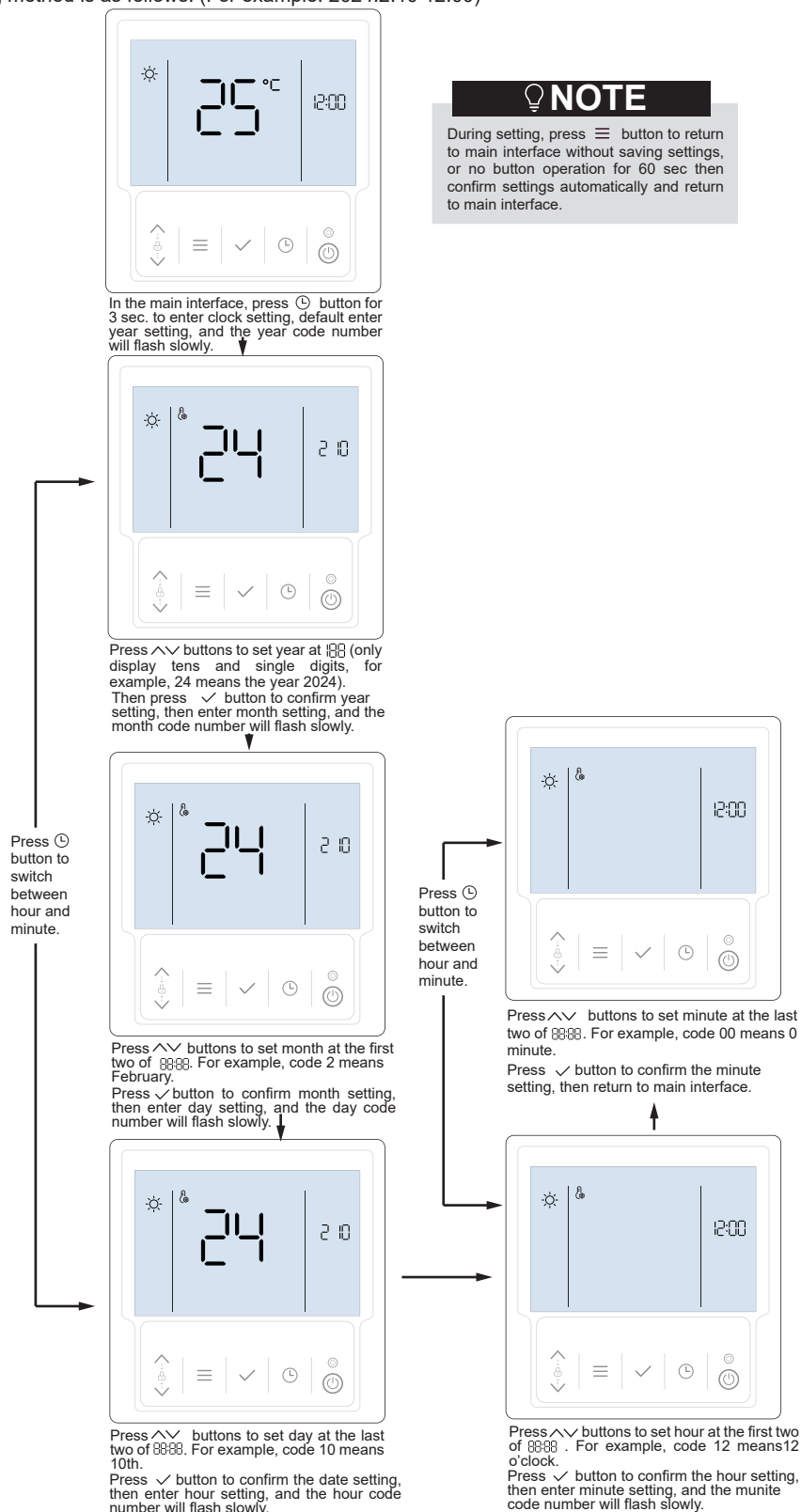


7.4.6 Clock setting

If the controller has successfully connected to network, it will update the clock automatically from network, else user can set clock in the controller. Only $\&$ icon and current setting parameters are lightened during clock setting.

If the controller does not get the correct time from the network after the first power on or a prolonged power outage, the clock will display 12:00 and flash slowly, prompting the user to set the correct time. When the user completes the time setting or the controller gets the time from the network, the clock will no longer flash and remain on.

The setting method is as follows: (For example: 2024.2.10 12:00)



7.4.7 Timer setting

There are 3 mutually exclusive type to set timer, including point timer, period timer, and appointment timer, which one is available depends on the installation settings. Only the activated timer numbers can be displayed in the main interface. The timer step is 10 min. in all timer type.

If the functions of manual on/off, daily timer and weekly schedule conflict, the priority is as follows: manual on/off > holiday away > weekly schedule > daily timer. In case of conflict between different timer numbers, the later set timer prevails and the previous conflicting setting is automatically set to inactive status.

After the timer settings are completed, the activated timer numbers are displayed at the main interface. When the clock reaches the timer point, according to the switching action at that time point, or will be lightened respectively and unit will execute the corresponding commands (on/off, target temperature).

NOTE

1. If user changes the target temperature or manually turns on/off unit when the timer is already in effect, on this day the current timer will be invalidated until the time of next timer then executes the corresponding command according to the timer setting.

For example(point timer), the user sets timer ① (5:00 on, target 55 °C), timer ② (12:00 off), timer ③ (14:00 on, target 60 °C). If user adjusts the target temperature to 60 °C at 7:00, the target temperature will be set to 60 °C directly until 12:00 then unit is turned off; if user manually turns off the unit at 7:00, the unit will be turned off immediately until 14:00 when timer ③ is executed.

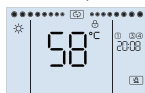
For example(appointment timer), the user sets timer① (12:00~14:00, target 50 °C) and timer ② (20:00~23:00, target 60 °C). If the user has adjusted target temperature at 7:00 (i.e. even if the final temp. is the same as the original target), the timer ① will be invalid on this day, and the unit will keep the current on/off status until 14:00 (the end of timer ①), if needing the unit to operate, please turn it on manually.

2. Under the timer, the is displayed and the LED light is off when the unit is not turned on, and the run icon is displayed and the LED light is on when the unit is turned on.

3. If the time between timer on and off clocks is too short, it will cause that the unit fail to heat up to the set water temperature, so it is recommended that the total time between timer on and off clocks is longer than 8 hours.

4. The timer, solar energy, smart grid, and OPT.Backup functions are mutually exclusive, and the timer can only be used when these functions are not activated.

An interface example (No.1, No.3 and No.4 have been activated, but No.2 is not activated.) is as follows:



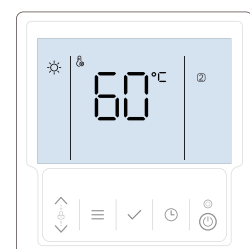
7.4.7.1 Point timer setting

There are 4 point timers in this type. Every timer includes the point clock, operating mode (including OFF mode), target temperature (except OFF mode). Controller will execute the setting action at the point clock.

It is possible to set the on/off timers in any combination (such as 4 on timers and 0 off timer, 3 on timers and 1 off timer, 2 on timers and 2 off timers, 1 on timer and 1 off timer, 2 on timers and 1 off timer, etc.), and it is recommended that the number of off timers be less than or equal to the number of on timers.

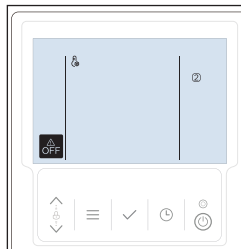
By different combinations of point timers, it is possible to avoid unsuitable operating periods, and to operate during periods with higher ambient temperatures or valley price electricity.

Two examples of point timer settings are as follows:

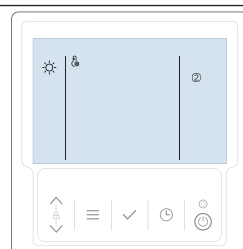


Press buttons to set the target temperature. Then press button to confirm the settings and return to the timer code selecting interface.

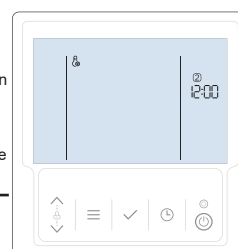
Press button to confirm the operating mode. If set the OFF mode then return to the timer code selecting interface, else enter the target temperature setting interface.



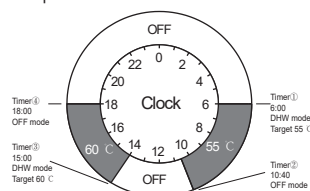
Press buttons to select the operating mode between domestic hot water mode and OFF mode.



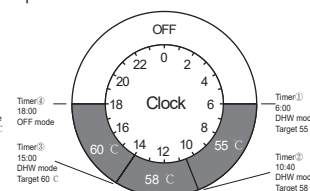
Press button to confirm the timer clock, then enter the operating mode setting.



Example 1:



Example 2:



The setting method is as follows:

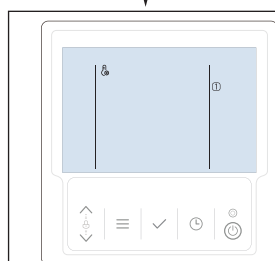
NOTE

1) During setting, in the timer code selecting interface, when the icon is displayed, long press button for 3 sec. to cancel the selected timer, and the number will be distinguished.

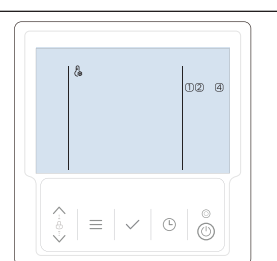
2) During setting, in the timer code selecting interface, press button to return to main interface, or no button operation for 60 sec then return to main interface, and do not change the activation of any unconfirmed point timer.

3) During setting, in the parameters setting interface of timer, press button to return to selecting number interface, or no button operation for 60 sec then return to selecting number interface, and do not change any unconfirmed parameters.

In the main interface, press button to enter timer setting, then display selecting number interface, and the timer code ① (default selected ①) will flash slowly.

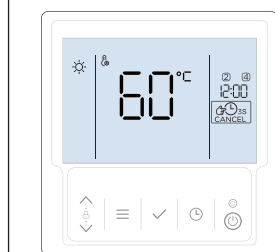


If no timer has been set, only the timer code ① will be displayed and flash slowly.

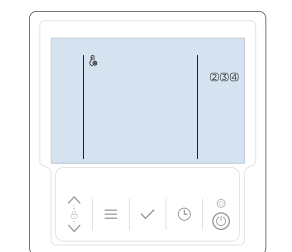


If any timer has been set, the codes of set timers (such as ②/④) will be displayed with the default selected ①, and the selected code will flash slowly.

Press buttons to select different timer codes. If the selected (such as ② or ④) timer has been set, the set parameters will be displayed.



For example, timer ② and ④ have been set, and timer ① and ③ have not been set, so the code ② and ④ are displayed, and code ② is flash slowly, and the parameters of timer ② are displayed in the current interface.



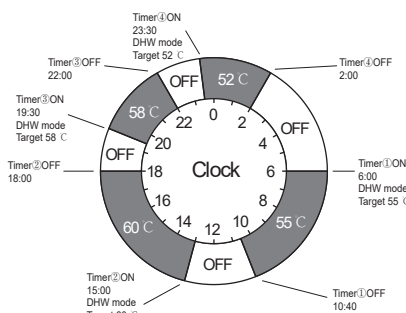
For example, timer ② and ④ have been set, and timer ① and ③ have not been set, so timer ③ has been selected now, so the code ② and ④ are displayed, and code ③ is flash slowly.

Press button to enter the parameter settings of the selected timer, and default to the hour of the timer clock, and the hour will flash slowly.

Then press buttons to adjust hour or minute, press button to switch between hour and minute.

7.4.7.2 Period timer setting

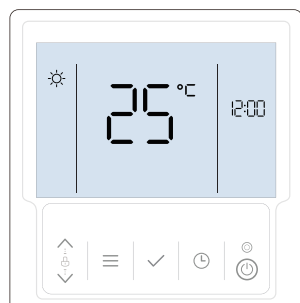
There are 4 period timers in this type. Every timer includes the on clock, off clock, operating mode, target temperature. Controller will execute the setting action at the period clocks. By different combinations of point timers, it is possible to avoid unsuitable operating periods, and to operate during periods with higher ambient temperatures or valley price electricity.



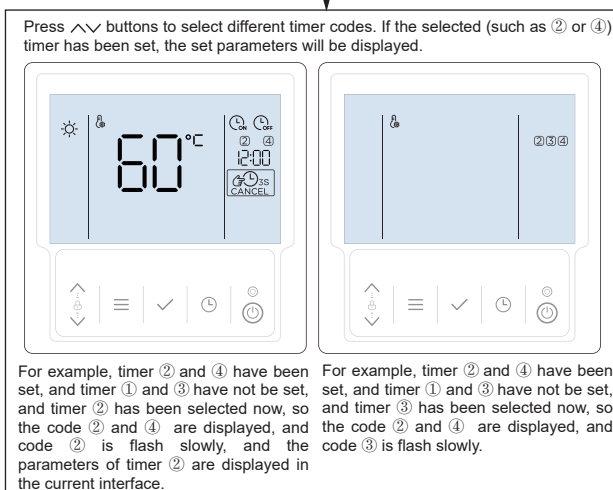
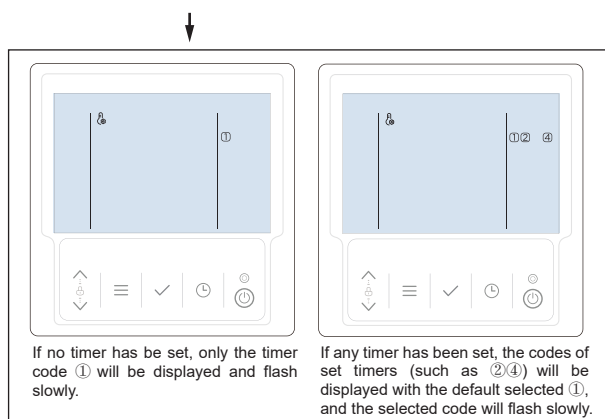
The setting method is as follows:

NOTE

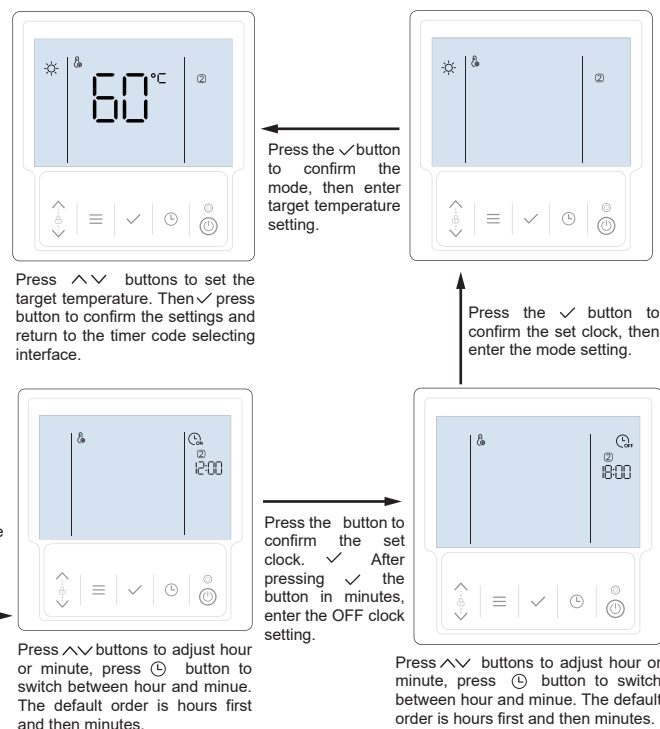
- 1) During setting, in the timer code selecting interface, when the icon is displayed, long press button for 3 sec. to cancel the selected timer, and the number will be distinguished.
- 2) During setting, in the timer code selecting interface, press button to return to main interface, or no button operation for 60 sec then return to main interface, and do not change the activation of any unconfirmed point timer.
- 3) During setting, in the parameters setting interface of timer, press button to return to selecting number interface, or no button operation for 60 sec then return to selecting number interface, and do not change any unconfirmed parameters.



In the main interface, press button to enter timer setting, then display selecting number interface, and the timer code (default selected) will flash slowly.



Press button to enter the on parameter settings of the selected timer, and default to the hour of the timer clock, and the hour will flash slowly, and the icon will be lightened.

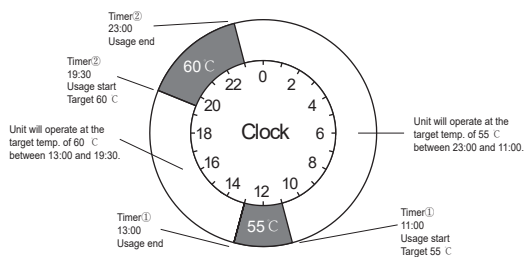


7.4.7.3 Appointment timer setting

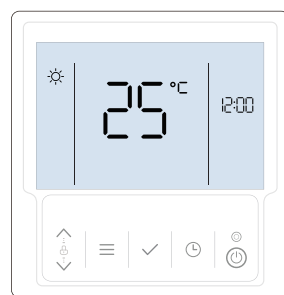
There are 4 period timers in this type. Every timer includes the start and end clocks of water usage, operating mode and target temperature. Controller will send the setting parameters to unit, then unit will automatically calculate the heat up time according to these appointment parameters, ambient temperature and current water temperature, then automatically operate at a suitable time to heat the water up to target temperature before the start clock of water usage of the set timer.

By appointment timers, users do not need to worry about when to turn on or how long to ensure sufficient hot water usage. Users only need to tell the unit when to use water and how much water temperature, and the unit can intelligently determine the timing of turning on.

An example of period timer settings is as follow:



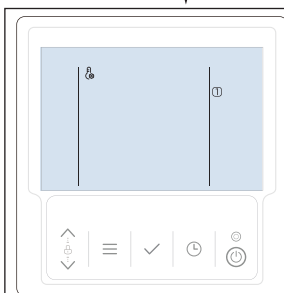
The setting method is as follows:



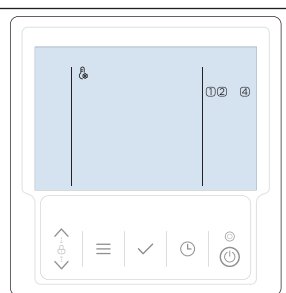
In the main interface, press the clock icon button to enter timer setting, then display selecting number interface, and the timer code ① (default selected ①) will flash slowly.

NOTE

1. During setting, in the timer code selection interface, when the icon is displayed, long press the clock icon button for 3 sec. to cancel the selected timer, and the number will be distinguished.
2. During setting, in the timer code selecting interface, press the left arrow button to return to main interface, or no button operation for 60 sec then return to main interface, and do not change the activation of any unconfirmed point timer.
3. During setting, in the parameters setting interface of timer, press the left arrow button to return to selecting number interface, or no button operation for 60 sec then return to selecting number interface, and do not change any unconfirmed parameters.

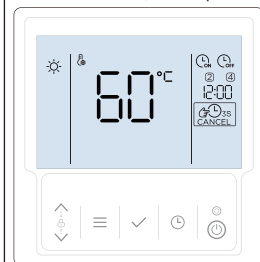


If no timer has been set, only the timer code ① will be displayed and flash slowly.

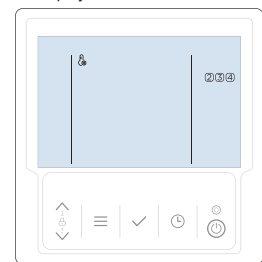


If any timer has been set, the codes of set timers (such as ②, ④) will be displayed with the default selected ①, and the selected code will flash slowly.

Press the left arrow and right arrow buttons to select different timer codes. If the selected (such as ② or ④) timer has been set, the set parameters will be displayed.

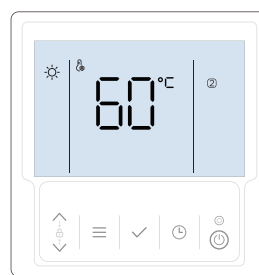


For example, timer ② and ④ have been set, and timer ① and ③ have not been set, and timer ② has been selected now, so the code ② and ④ are displayed, and code ② is flash slowly, and the parameters of timer ② are displayed in the current interface.

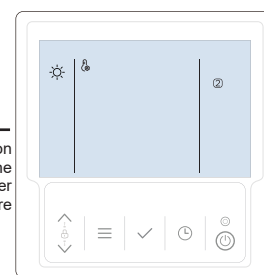


For example, timer ② and ④ have been set, and timer ① and ③ have not been set, and timer ③ has been selected now, so the code ② and ④ are displayed, and code ③ is flash slowly.

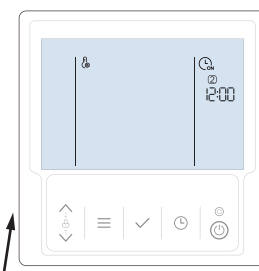
Press the checkmark button to enter the on parameter settings of the selected timer, and default to the hour of the timer clock, and the hour will flash slowly, and the clock icon will be lightened.



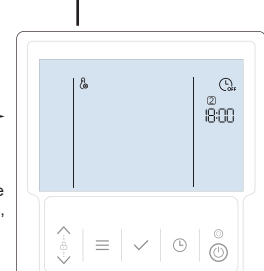
Press the left arrow and right arrow buttons to set the target temperature. Then press the checkmark button to confirm the settings and return to the timer code selecting interface.



Press the checkmark button to confirm the mode, then enter target temperature setting.










Press the left arrow and right arrow buttons to adjust hour or minute, press the clock icon button to switch between hour and minute. The default order is hours first and then minutes.

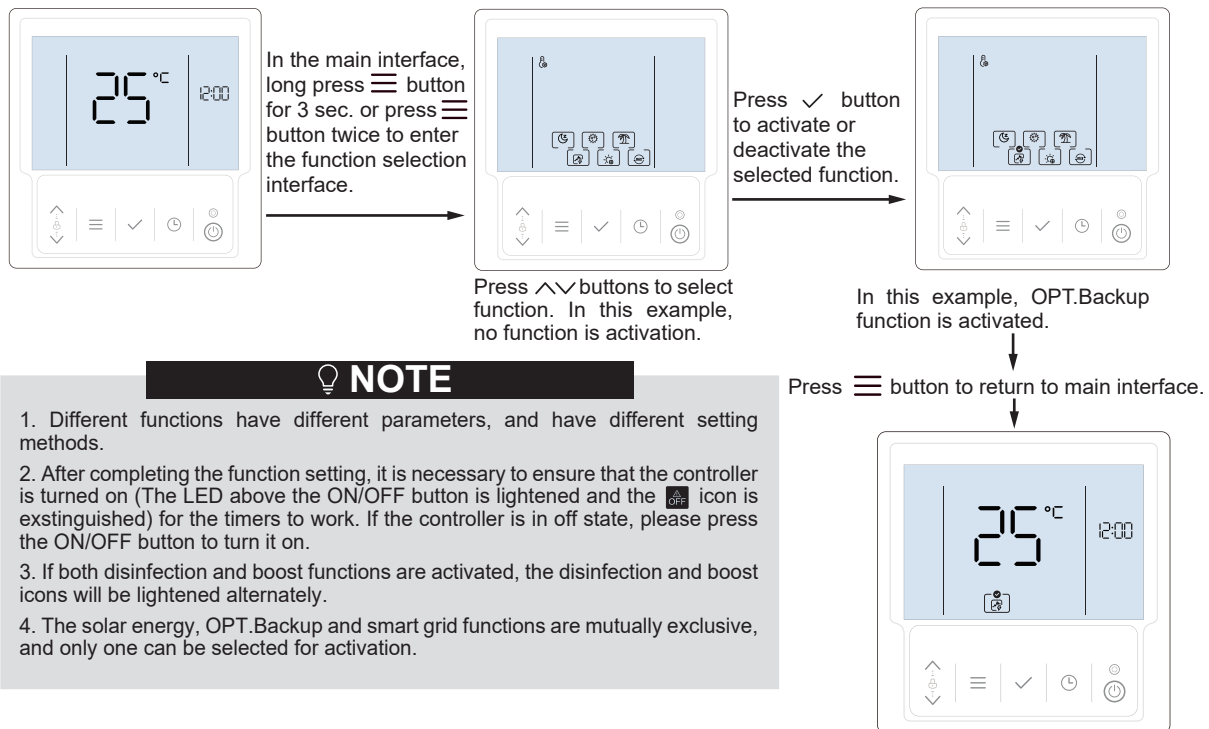


Press the left arrow and right arrow buttons to adjust hour or minute, press the clock icon button to switch between hour and minute. The default order is hours first and then minutes.

7.4.8 Function activation and parameters setting

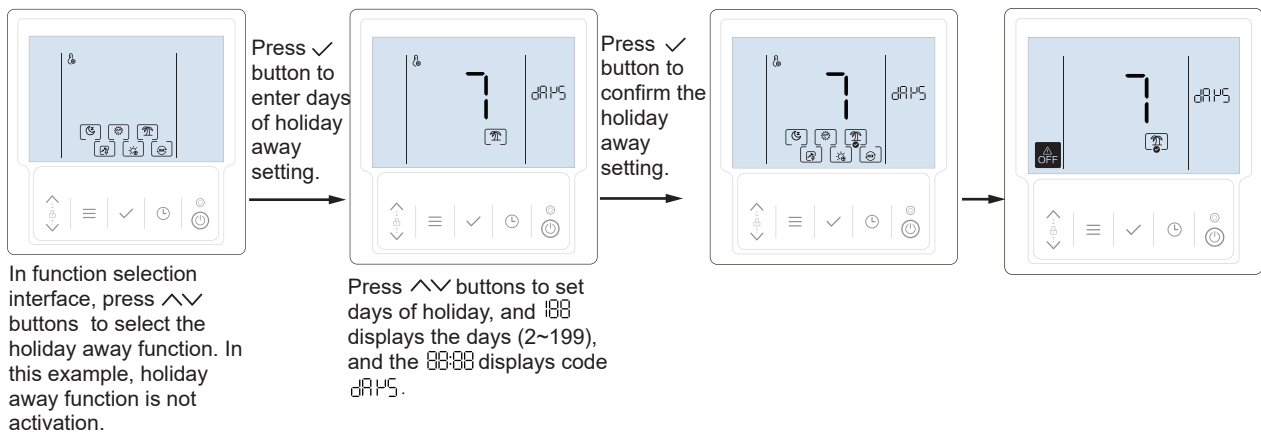
In the main interface, long press  button for 3 sec. or press  button twice to enter the function selection and activation interface. The available functions depend on the unit, including disinfection, holiday away, OPT.Backup, solar energy, silence, boost and hybrid. During setting, the selected function icon will slowly flash. For example, if disinfection function is not activated then  icon will be lightened, and if it is activated then  icon will be lightened, and if it is selected but not activated then the  icon will slowly flash, and if it is selected and activated then the  icon will slowly flash. Press  button to activate or deactivate the selected function.

The setting method is as follows:

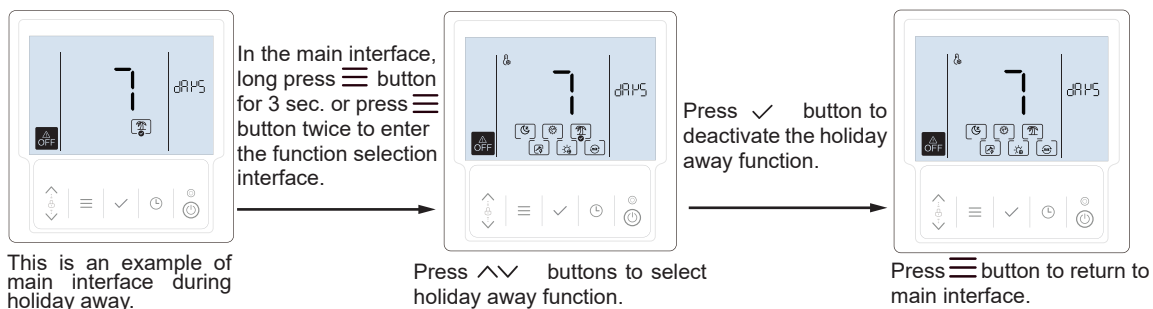


7.4.8.1 Holiday away activation/deactivation

Holiday away function allows user to set a holiday schedule (days of holiday away). During the holiday away period, the unit will be OFF or ON (the setting target temperature will be set to 25 °C automatically.) which depends on the detail parameter settings of holiday away. At the last day of holiday, the unit will do disinfection once and recover the settings before holiday away. The setting method is as follows:



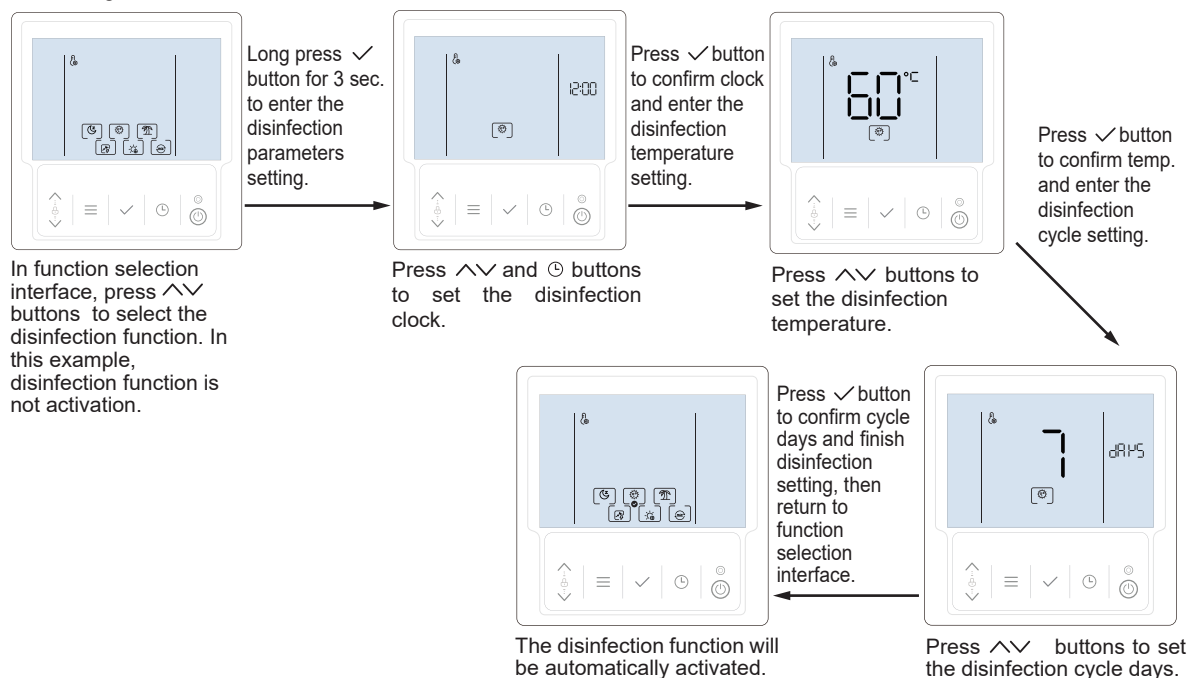
Method for manually canceling vacation function settings is as follows:



7.4.8.2 Disinfection parameters setting

Disinfection parameters setting includes disinfection clock, temperature and cycle time. During setting, 88:88 displays disinfection clock (step 10 min.), 18.8 displays disinfection temperature (55~70 °C, default 60 °C) and cycle days (2~30 days, default 7 days). After disinfection function being activated, unit will do disinfection (heat up the water to the set disinfection temperature) at the set clock every set cycle days.

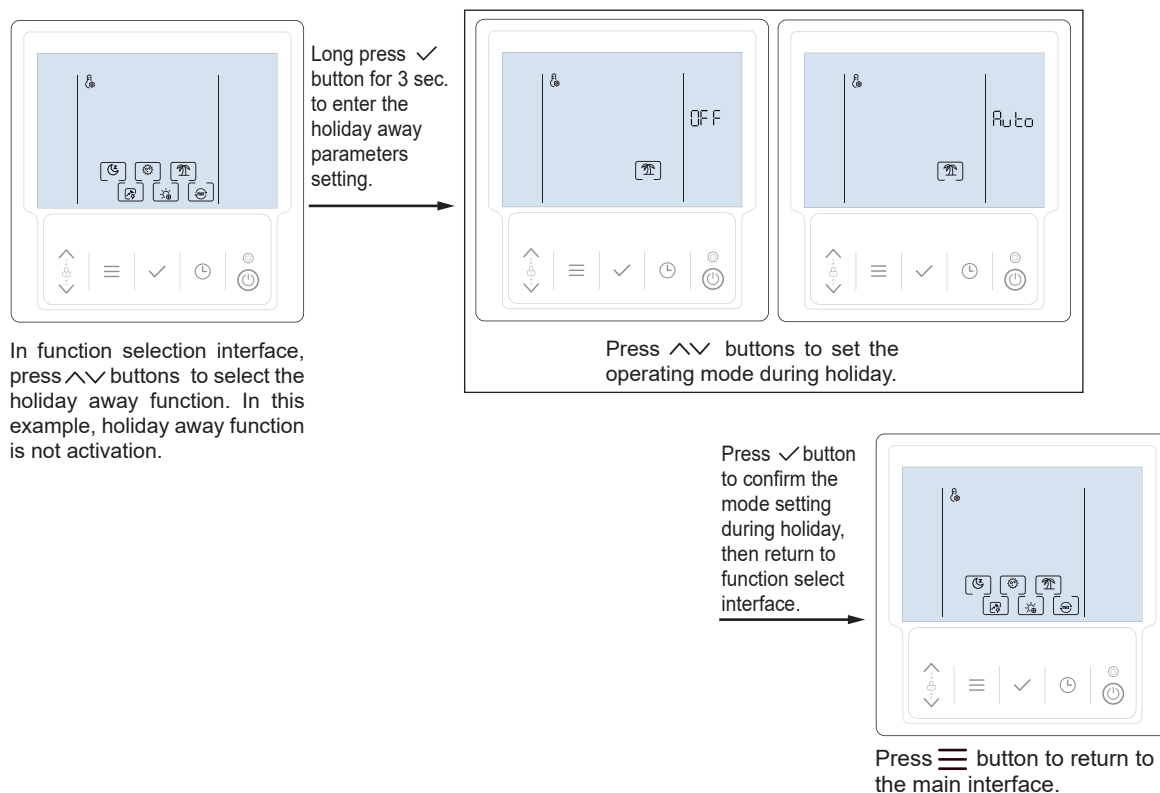
The setting method is as follows:



7.4.8.3 Holiday away parameter setting

Holiday away parameter is the operating mode(include OFF (OFF, default) and Auto(auto) mode, displayed at 88:88) during holiday. If the set mode is OFF, then the unit will be turned off during holiday. If the set mode is Auto, then the unit will be turned off or heat the water up to 25 °C by the controller self-judgment for anti-freezing.

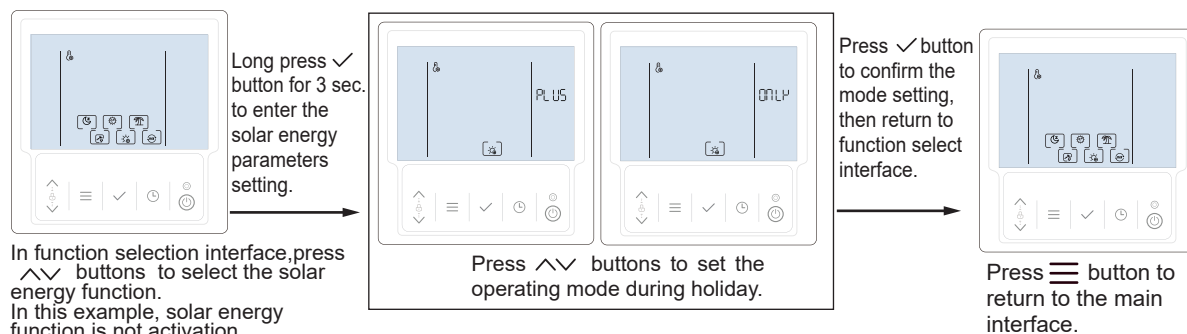
The setting method is as follows:



7.4.8.4 Solar energy parameter setting

Solar energy parameter is the operating mode(include PLUS (PLUS, default) and ONLY (ONLY) mode, displayed at 88:88) when the function is valid. If the set mode is PLUS, then the controller will increase the target temperature by 10 °C automatically when the solar energy signal on. If the set mode is ONLY, then the controller will turn on the unit only when the solar energy signal on.

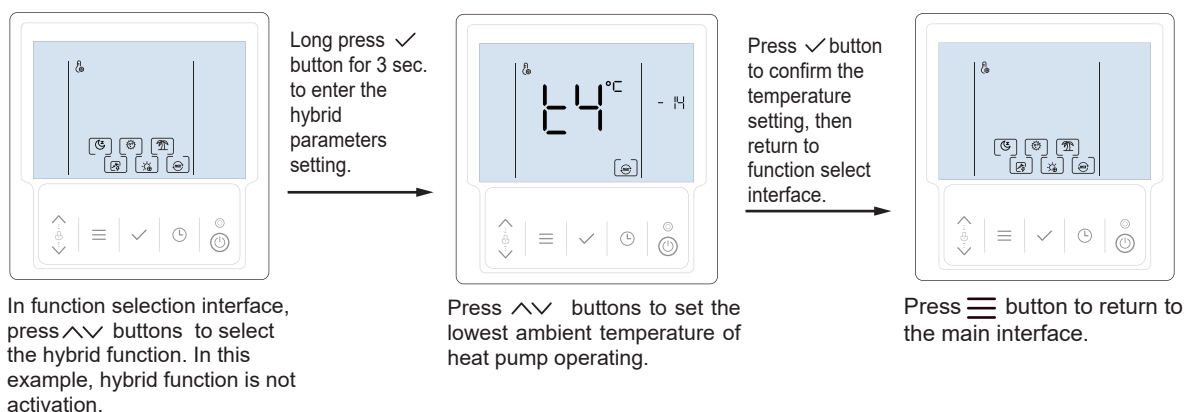
The setting method is as follows:



7.4.8.5 Hybrid parameter setting

Hybrid parameter is an ambient temperature(code: T4ming) of heat pump operating limit. During setting, the 88:88 will display the ambient temperature(-14~20 °C, default 5), and the 88 will display code T4. If the ambient temperature is lower than T4ming, the heat pump will stop operating, and need to operate boiler to continue heating water.

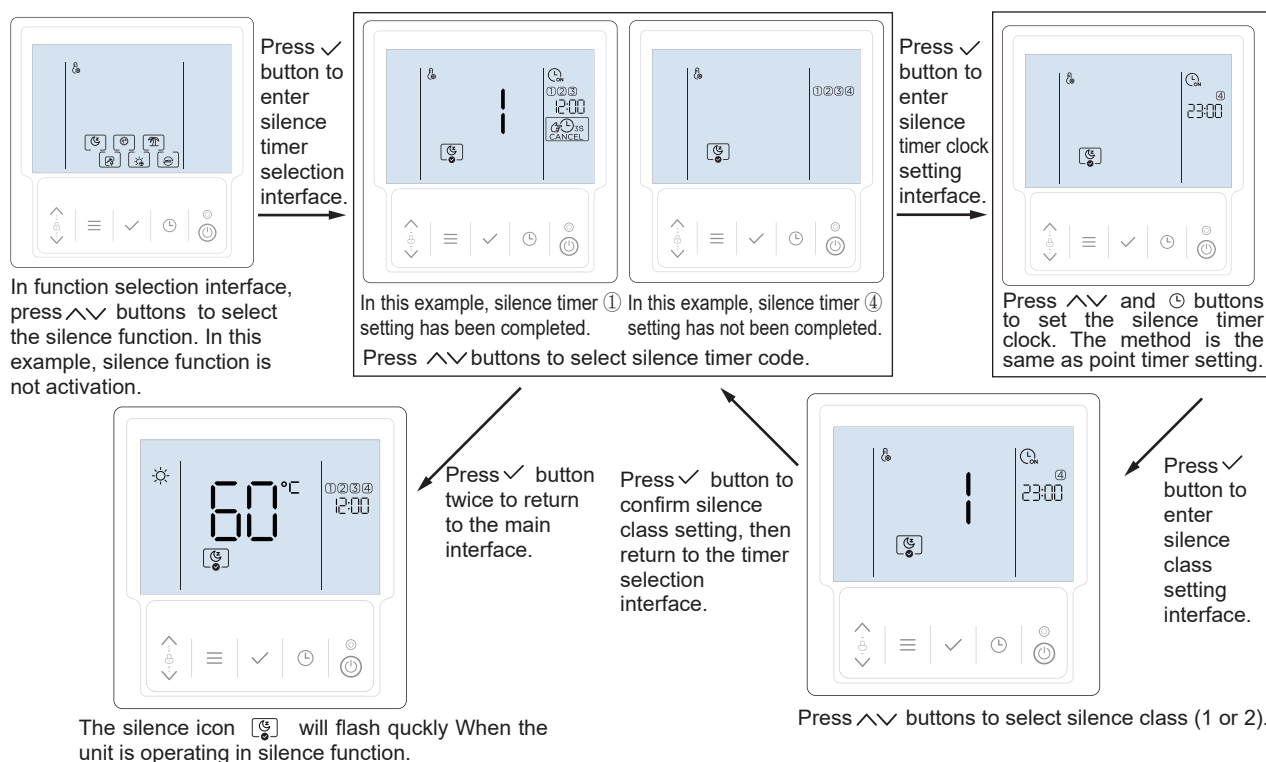
The setting method is as follows:



7.4.8.6 Silence activation/deactivation

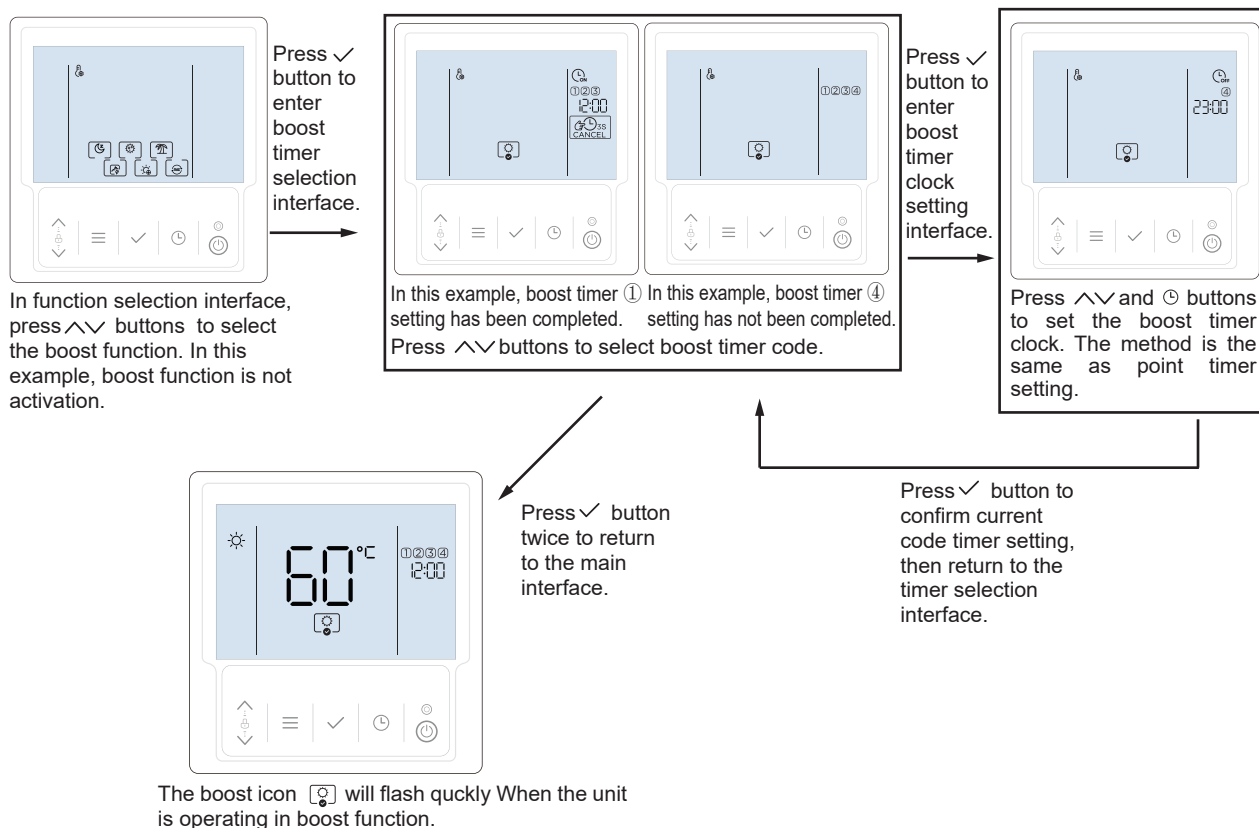
Silence function allows user to set two silence timers. During silence timer, the unit will reduce the operating speeds of compressor and fan motor (depend on silence class) to reduce the operating sound.

The setting method is as follows:



7.4.8.7 Boost activation/deactivation

Boost function allows user to set two boost timers. During boost timer, the unit will increase the operating speeds of compressor and fan motor to increase the unit capacity. If silence timer meets boost timer, the silence timer is prior. The setting method is as follows:

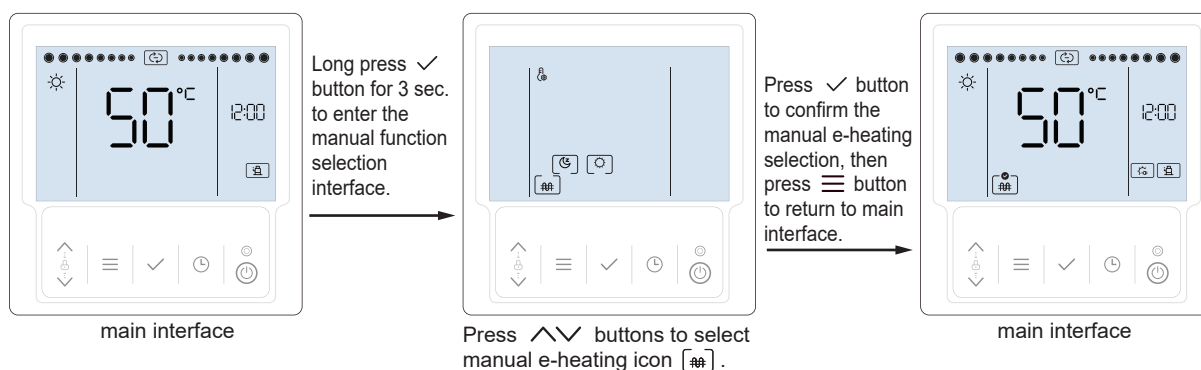


7.4.9 Manual function

In main interface, long press ✓ button for 3 sec. to enter manual function selection interface, setting icon () and manual function icons (such as e-heating , disinfection , silence , boost , depend on the installation settings) will be lightened, then press ^/ buttons to select function. If the function is selected, the function icon will slowly flash. Press ✓ button to activate or deactivate the selected manual function. If the function is activated, the function icon (such as disinfection) and the icon will be lightened together (such as).

In manual silence function, the silence class is fixed to class 1.

The setting method is as follows (such as manual e-heating):



The activated manual function will slowly flash in main interface.

After the manual e-heating function is activated, if the e-heater is off, the manual e-heating function will automatically be deactivated.

After the manual disinfection function is activated, if the water temperature reach the target disinfection temperature, the manual disinfection function will automatically be deactivated.

After the manual boost function is activated, when the compressor of unit stop, then the manual boost function will automatically be deactivated.

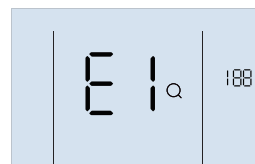
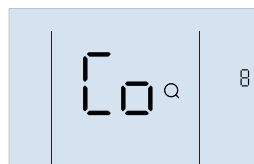
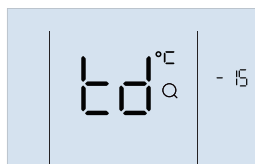
7.4.10 Query

Press \wedge + \odot buttons for 1 sec. to query unit operating parameter. During querying, press \wedge / \vee buttons to switch different parameters. The \odot icon will be lightened during querying. If some parameters are invalid for some unit, the parameter will be displayed as "--" or "----".

Query explanation

| No. | Displayed at 88:88 | Explanation | Displayed at 188 |
|-----|---|--|---|
| 1 | Fan speed value (rpm) | Fan speed | F $\dot{\text{R}}$ (FA) |
| 2 | Pulse value | Pulse value of EXV1 | E 1 (E1) |
| 3 | Compressor speed (Hz) | Compressor speed | F $\dot{\text{r}}$ (Fr) |
| 4 | Current value (A) | Unit current | C $\dot{\text{o}}$ (Co) |
| 5 | Current value (A) | E-heater current | C $\dot{\text{E}}$ (CE) |
| 6 | Power value (W) | Power input | P $\dot{\text{R}}$ (PA) |
| 7 | Voltage value (V) | AC voltage supply | U $\dot{\text{o}}$ (uo) |
| 8 | Voltage value (V) | DC bus voltage | d $\dot{\text{C}}$ (dC) |
| 9 | Temperature value (°C) | Discharge temp. of compressor (Tp) | T $\dot{\text{P}}$ (Tp) |
| 10 | Temperature value (°C) | Suction temp. of compressor (Th) | T $\dot{\text{h}}$ (Th) |
| 11 | Temperature value (°C) | Heat exchanger temp. of outdoor unit (T3) | T $\dot{\text{3}}$ (T3) |
| 12 | Temperature value (°C) | Ambient temp. of outdoor unit (T4) | T $\dot{\text{4}}$ (T4) |
| 13 | Temperature value (°C) | Upper temp. of water tank (T5U) | T $\dot{\text{5U}}$ (T5U) |
| 14 | Temperature value (°C) | Lower temp. of water tank (T5L) | T $\dot{\text{5L}}$ (T5L) |
| 15 | Temperature value (°C) | Ambient temp. limit of E-heater (Td) | T $\dot{\text{d}}$ (Td) |
| 16 | T $\dot{\text{r}}\dot{\text{d}}\dot{\text{h}}$ (Trdh) | Restart offset temp. of unit(Trdh) | Temp. value (°C) |
| 17 | S $\dot{\text{G}}\dot{\text{S}}\dot{\text{L}}$ (SGSL) | Smart grid class | Class value (0 means no signal) |
| 18 | Power value in kWh, don't display ":" | Cumulative estimated power consumption | P $\dot{\text{P}}$ (AP) |
| 19 | Power value in kWh. The top two display integer, and the last two display decimal, and ":" means the decimal point. | Estimated power consumption of E-heater in 24 hours | E $\dot{\text{P}}$ (EP) |
| 20 | Power value in kWh. The top two display integer, and the last two display decimal, and ":" means the decimal point. | Estimated power consumption of heat pump in 24 hours | H $\dot{\text{P}}$ (HP) |
| 21 | Integer time value in hours, don't display ":" | Cumulative operating time of unit | t $\dot{\text{1}}$ (t1) |
| 22 | Integer time value in hours, don't display ":" | Cumulative operating time of compressor | t $\dot{\text{2}}$ (t2) |
| 23 | Integer time value in hours, don't display ":" | Cumulative operating time of E-heater | t $\dot{\text{3}}$ (t3) |
| 24 | C $\dot{\text{F}}$ (EF) | Clock chip state | Display code "EF" if chip error, else display "--". |
| 25 | E $\dot{\text{r}}$ 1 (Er1) | Historical fault code | Fault code |
| 26 | E $\dot{\text{r}}$ 2 (Er2) | Historical fault code | Fault code |
| 27 | E $\dot{\text{r}}$ 3 (Er3) | Historical fault code | Fault code |
| 28 | C $\dot{\text{t}}\dot{\text{r}}$ (Ctrl) | Software version of controller | Version number |
| 29 | O $\dot{\text{D}}\dot{\text{U}}$ (ODU) | Software version of outdoor unit | Version number |
| 30 | Address (range 1~63) | Unit address | A $\dot{\text{d}}$ (Ad) |

Some interface examples are as follows:



8 ERROR AND OTHER CODES EXPLANATION

When the unit occurred any fault, the error code will be displayed at 88:88, and alarm icon ① will quickly flash, and cancel icon ② will slowly flash, and buzzer will sound 3 times every 180 sec. Long press ③ for 3 sec. to cancel buzzer, but alarm icon and error code will quickly flash until the fault is removed.

Error and Other Code Explanation

| Code | Explanation |
|------|---|
| E0 | There is not enough water in the water tank |
| E2 | Communication malfunction between controller and main control board |
| E4 | Water tank temperature sensor error (T5L) |
| E5 | ODU heat exchanger temperature sensor error (T3) |
| E6 | ODU ambient temperature sensor error (T4) |
| E9 | Suction temperature sensor error (Th) |
| E8 | E0 protection continuously occurs three times |
| EA | Discharge temperature sensor error (Tp) |
| EE | EEPROM chip error |
| EF | Clock chip error |
| EP | Leakage error of e-heater |
| P0 | System low pressure protection (low pressure switch) |
| P1 | System high pressure protection (high pressure switch) |
| P3 | Over load protection of inverter compressor |
| P4 | High discharge temperature (Tp) protection |
| PA | Low water temperature protection |
| bA | The ambient temperature exceeds the declared range (not an error) |
| bb | Low heat pump capacity |
| C7 | High temperature protection of inverter module |
| CH | Over load protection of E-heater (> 16 A) |
| H1 | Communication malfunction between main control board and inverter board |
| H4 | Three times L0 protects |
| H6 | The DC fan motor malfunction |
| H7 | Voltage protection |
| HC | E-heater error (Current is less than 2 A when e-heater operating) |
| HF | Inverter module board EEPROM malfunction |
| HP | Smart Grid signal error |
| HH | 10 times H6 in 2 hours |
| F1 | DC bus low voltage protection |
| F2 | Low super-heat of discharge protection |
| F6 | Electric expansion valve joint fault |
| L0 | Inverter over load protection |
| L1 | Inverter high temperature protection |
| L2 | DC bus high voltage protection |
| L3 | Inverter module sampling abnormality |
| L4 | Operating speed abnormality of compressor |
| L5 | Phase loss protection of inverter |
| LA | Program of inverter module verification abnormality |
| Lb | PFC protection |
| d0 | Oil returning (not an error) |
| d8 | Remote shutdown (not an error) |
| db | Anti-freezing operating (not an error) for some unit |
| dF | Defrosting (not an error) |

9 OPERATIONS

1) Characteristics of water heating——3 minute protection

Restart or open manual switch after the unit has been shut down within a short time. Unit will not start immediately until 3 minutes later, because of the self-protect function of the compressor.

2) During operation, if outdoor temperature is higher than normal, the fan motor will runs at low air volume or stop running.

3) About defrosting function perform at heating operation

- In case of frosting during heating operation, to prevent the heating efficiency from decreasing, defrosting operation will turn on -automatically (Approx. 2~7 minutes) .

- In the process of defrosting operation, the unit fan motor will stop running.

4) About protection device

- When protection device operate, though the unit stops, the operating indicator of wire control still will be blinking.

- When protection device operates, nixie indicator will display malfunction code (unit).

- Protection device will act when the following circumstances occur:

- a) Air inlet or outlet are blocked.

- b) Voltage is a little higher or lower compare to the voltage range (Exceeding the range of -10 %~10 % of 230 V)

5) Start the unit after a long period out of service

Start-up the unit after out of service for a long period (includes drive up a unit at the first time), you would see rust mix up water in red, flow out from tap. Such that is a normal phenomenon, please be calmly and keep draining, after for a while rust will disappear.

6) About power failure

- In case power failure during the unit working, please stop all operating actions.

- At the next startup after power failure, the RUN indicator of wire controller will blink slowly for several seconds for noting user.

- Misoperation occur during unit working.

7) About RCCB

Outdoor unit must use RCCB,pleases install an RCCB between in user power supply and the outdoor unit. In case the unit cannot act but not attribute to power failure, please check these RCCB switches at first. Before operate the RCCB, please ensure that the user installing switch is break off.

8) About start/stop control

The user can set the target water temperature and dead band temperature on the wired controller. When the upper temperature sensor of the water tank detects that the water temperature is lower than the difference value between the target water temperature and the dead band, the controller will start the heat pump heating until the upper water temperature of the water tank reaches the target water temperature and then stop.

9) About energy consumption

If the user sets the water temperature to be lower than the default value (60 ℃), or sets the dead band to be larger than the default value (15 ℃), that will cause a decrease in energy consumption of the unit but decrease in hot water supply. If the user sets the dead band to be smaller than the default value (15 ℃), that will cause an increase in energy consumption of the unit but increase in hot water supply.

10) About legionella control method

The unit will perform disinfection operation weekly (default between 1:00 am and 6:00 am). During disinfection, the temperature sensor at the bottom of the water tank will be used to control the heat pump operation to heat more than 90 % of the water to above 60 ℃ and maintaining it for at least 32 minutes. At this time, the maximum outlet temperature of the water tank will exceed 60 ℃.

11) About boost e-heater

The e-heater is installed in the lower part of the water tank and shares the water temperature sensor control with the heat pump. It is used to replace the heat pump to heat the water tank when exceeding the operating range of the heat pump (ambient temperature range: -15~46 ℃), or to activate it when water temperture is lower than the value of the difference between target and dead band, or to activate it manually when boost heating is occasionally needed, or to use it in emergency when the heat pump system malfunctions.

10 SERVICE AND MAINTENANCE

1) Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

2) Work procedure

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

3) General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided. The area around the work space shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

4) Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. no sparking, adequately sealed or intrinsically safe.

5) Presence of fire extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry power or CO₂ fire extinguisher adjacent to the charging area.

6) No ignition sources

No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which flammable refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. NO SMOKING signs shall be displayed.

7) Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

8) Checks to the refrigeration equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using flammable refrigerants.

- The charge size is in accordance with the room size within which the refrigerant containing parts are installed.
- The ventilation machinery and outlets are operating adequately and are not obstructed.
- If an indirect refrigerating circuit is being used, the secondary circuits shall be checked for the presence of refrigerant; marking to the equipment continues to be visible and legible.
- Marking and signs that are illegible shall be corrected.
- Refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

9) Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
- That there are no live electrical components and wiring are exposed while charging, recovering or purging the system.
- That there is continuity of earth bonding.

10) Repairs to sealed components

a) 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.

b) Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Ensure that apparatus is mounted securely.

Ensure that seals or sealing materials have not degraded such that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

11) Repair to intrinsically safe components

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

12) 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.

13) 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.

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

15) Removal and evacuation

When breaking into the refrigerant circuit to make repairs or for any other purpose conventional procedures shall be used. However, it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- Remove refrigerant;
- Purge the circuit with inert gas;
- Evacuate;
- Purge again with inert gas;
- Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. The system shall be flushed with OFN to render the unit safe. This process may need to be repeated several times.

Compressed air or oxygen shall not be used for this task.

Flushing shall be achieved by breaking the vacuum in the system with OFN and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system.

When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.

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

16) Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete(if not already).
- Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system it shall be pressure tested with OFN. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

17) Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken.

In case analysis is required prior to re-use of reclaimed refrigerant. It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically

c) Before attempting the procedure ensure that:

- Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
- All personal protective equipment is available and being used correctly.
- The recovery process is supervised at all times by a competent person.
- Recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system, if possible.

e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

f) Make sure that cylinder is situated on the scales before recovery takes place.

g) Start the recovery machine and operate in accordance with manufacturer's instructions.

h) Do not overfill cylinders. (No more than 80 % volume liquid charge).

i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

k) Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

18) Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

19) Recovery

When removing refrigerant from a system, either for service 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 numbers of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant(i.e special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure relief valve and associated shut-off valves in good working order.

Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order.

Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

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

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

20) Transportation, marking and storage for units

Transport of equipment containing flammable refrigerants Compliance with the 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.

10.1 Confirmation before running

- 1) Make sure whether ground wire is broken or fall off.
- 2) Power on the machine after all connections are qualified.

10.2 Troubleshooting when abnormal situation happens

Before asking for serving or repairing, check the following points:

- Non-mechanical malfunction

- 1) Water oozes from safety valve pressure relief opening

- When water heating, cold water will expand when heated, water oozing is normal. Do not block it for safety consideration.
- If a large amount of water flows, it means safety valve is invalid. Stop using and replace safety valve.

- 2) Long period for heating a tank of water

- In winter, water heating efficiency will decrease because of low ambient temperature (about 0 °C). It will take a longer time for water heating.
- If customer needs to use hot water, please start the unit in advance.

- Need to check

- 1) Automatically start or stop

- Whether we set timer wrongly.

- 2) When not working

- Check whether powering on.
- Whether manual switch is on.
- Whether fuse blows.
- Whether start the protection device (indicator lights).
- Whether it is not the time of timer on. (Operation lamp lights.)

- 3) If heating effect is not good

- Whether air outlet and inlet has been blocked.

CAUTION

- If the following situation happens, please stop running and cut off power supply manually and contact with the dealer or service center.
 - ON/OFF operation is ineffective.
 - Fuse or RCCB trips frequently
- Before leave unused for a long time, please complete the following items:
 - Drain water from tank and pipes, close all valve bodies.
- After leave unused for a long time, please check the following items:
 - Check air inlet and outlet of the unit to see whether they are blocked. Clean immediately when they are blocked.
 - Check whether water pipes, valves have been damaged or blocked. Whether there's water leakage in joints, replace them when water leaks.
 - It is suggested to inspect anode protection material every half year. If it has been exhausted, please replace it with a new one.

10.3 After-sale service

In case of malfunctions, please cut off the power switch and contact after-sale service centre or technical service department, for detailed information please refer to User Service Guide.

10.4 Important information for the used refrigerant

This product has flammable gas, it is forbidden to install in an enclosed space.

Refrigerant type: R290; Value of GWP: 3;

GWP=Global Warming Potential

Table 10-1

| Factory charge | |
|----------------|-----------------------------------|
| Refrigerant/kg | tonnes CO ₂ equivalent |
| 0.47 | 0.00141 |

⚠ WARNING

Frequency of Refrigerant Leak Checks:

1. For equipment that contains fluorinated greenhouse gases in quantities of 5 tonnes of CO₂ equivalent or more, but of less than 50 tonnes of CO₂ equipment, at least every 12 months, or where a leakage detection system is installed, at least every 24 months.
2. For equipment that contains fluorinated greenhouse gases in quantities of 50 tonnes of CO₂ equivalent or more, but of less than 500 tonnes of CO₂ equipment, at least every six months, or where a leakage detection system is installed, at least every 12 months.
3. For equipment that contains fluorinated greenhouse gases in quantities of 500 tonnes of CO₂ equivalent or more, at least every three months, or where a leakage detection system is installed, at least every six months.
4. Non-hermetically sealed equipment charged with fluorinated greenhouse gases shall only be sold to the end user where evidence is provided that the installation is to be carried out by an undertaking certified person.
5. Only certified person is allowed to do installation, operation and maintenance.

10.5 Water quality limitations

💡 NOTE

If the water quality does not meet the requirements in the table below, please contact the supplier for advice.

Table 10-2

| PH Value | Total Hardness | Electrical Conductivity |
|--------------|----------------|-------------------------|
| 6.5-8.0 | 50 ppm | < 200 µS/cm(25 °C) |
| Sulphate Ion | Silicon | Iron Content |
| < 50 ppm | < 30 ppm | < 0.3 ppm |
| Sulfide Ion | Chloride Ion | Ammonia Ion |
| None | < 50 ppm | None |
| Sodium Ion | Calcium Ion | _____ |
| None | < 50 ppm | _____ |

10.6 About maintenance

10.6.1 About refrigerant recovery

If the water tank needs to be replaced, the refrigerant needs to be recycled to the unit. The operation method for refrigerant recovery is as follows:

At first, when the controller of the unit is turned on, activate the refrigerant recovery function according to the operating instructions of the controller.

After blowing out hot air from the unit, then shut the liquid side refrigerant stop valve (the smaller one) of the unit.

After the temperature of the air blown out is close to ambient temperature, shut the gas side refrigerant stop valve (the bigger one), then cut off the power, and the refrigerant recovery is completed..

10.6.2 About vacuuming

10.6.2.1 Purpose

Vacuum drying should be performed in order to remove moisture and non-condensable gases from the system. Removing moisture prevents ice formation and oxidization of copper piping or other internal components. The presence of ice particles in the system would cause abnormal operation, whilst particles of oxidized copper can cause compressor damage. The presence of non-condensable gases in the system would lead to pressure fluctuations and poor heat exchange performance.

10.6.2.2 Procedure

⚠ CAUTION

- When installing for the first time, there is no need to vacuum because the water tank and connecting pipes (included in the accompanying accessories) are already pre filled with refrigerant.
- Vacuuming is needed after having finished field maintenance of refrigerant system without disconnecting outdoor unit, water tank and connection pipes.
- When vacuuming after maintenance, make sure that there are no open flames or sparks to prevent explosion or ignition.

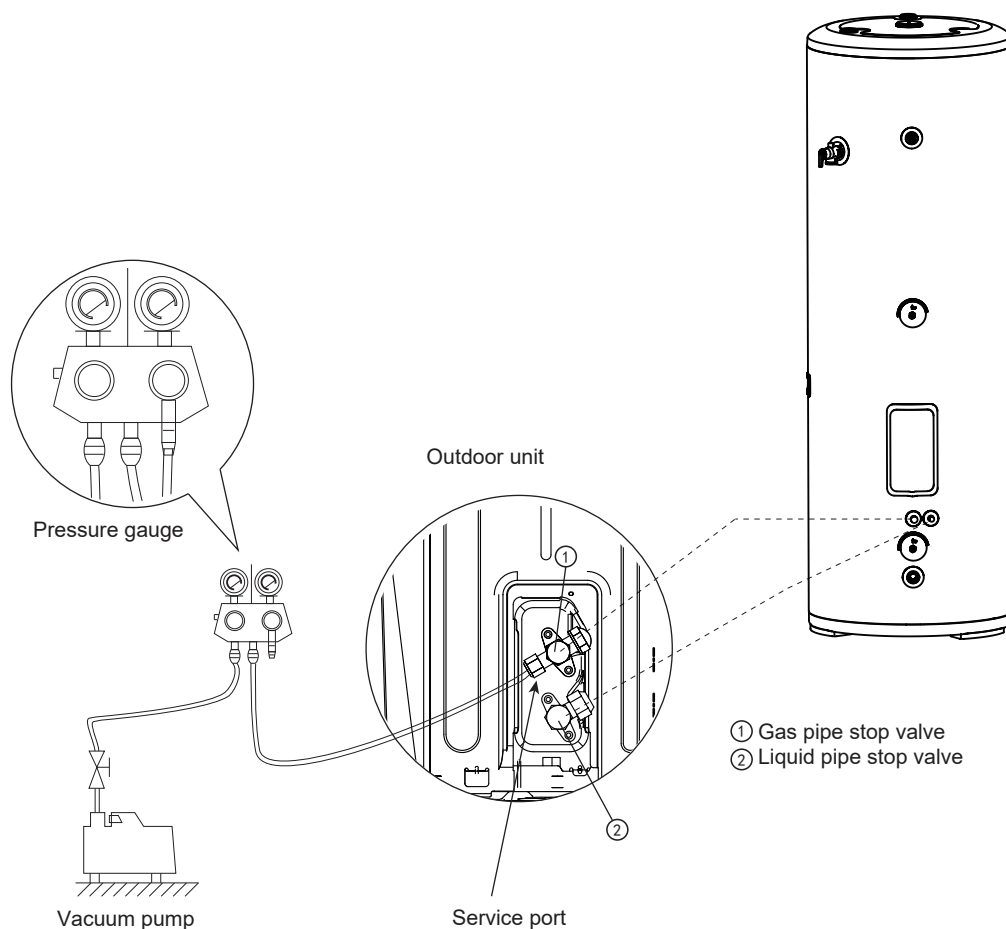
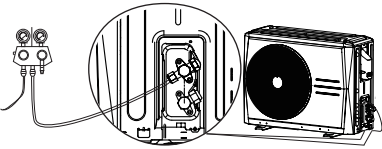
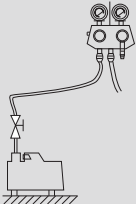
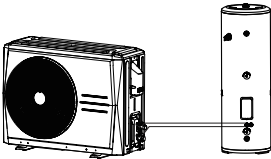


Table 10-3

| Item | Description | Image | Notice |
|------|---|--|--|
| 1 | Connect the (low pressure side) hose of a pressure gauge to the outdoor unit gas pipe stop valve. |  | Before performing vacuum drying, make sure that all the outdoor unit stop valves are firmly closed. |
| 2 | Connect the hose to the vacuum pump. |  | <p>1. Mixing of pump lubricant with compressor oil could cause compressor malfunction and a one-way valve should therefore be used to prevent vacuum pump lubricant seeping into the piping system.</p> <p>2. Using a vacuum pump with a discharge in excess of 4 L/s and a precision level of 0.02 mmHg is recommended.</p> |
| 3 | Connect the outdoor unit stop valve to water tank connection |  | |
| 4 | Start the vacuum pump and then open the pressure gauge valves to start vacuum the system. | | |
| 5 | After 15-20 minutes, close the pressure gauge valves. | | |
| 6 | After a further 5 to 10 minutes check the pressure gauge. If the gauge is no change, then vacuum drying is OK. If the gauge has returned to zero, check for leakages in the refrigerant piping, then fix them. | | |
| 7 | After leakages are fixed, re-open the pressure gauge valves and continue vacuum drying for at least 20 minutes and until a pressure difference of 756 mmHg or more has been achieved. Once the pressure difference of at least 756 mmHg has been achieved, continue vacuum drying for 20 minutes. | | |
| 8 | Close the pressure gauge valves and then stop the vacuum pump. | | |
| 9 | After 1 hour, check the pressure gauge. If the pressure in the piping has not increased, the procedure is finished. If the pressure has increased, check for leakages. | | After vacuum drying, keep the hoses connected to the pressure gauge and to the outdoor unit stop valves, in preparation for refrigerant charging. |

10.6.3 Refrigerant charge

- If there is no refrigerant in the system after maintenance, it is necessary to recharge the refrigerant after completing the vacuum pumping operation.
- The weight of refrigerant recharge should be calculated according to the following rules:
 If the pipe length is less than 2 meters, the recharge weight of refrigerant 470 g.
 If the pipe length is more than 2 meters, adding additional refrigerant charge is necessary, and the rule is 10 g/m for the additional pipe length.

After sales service

Warranty information

Emerald Energy Pty Ltd warrants this heat pump to the original purchaser.

Emerald Energy Pty Ltd warrants each new heat pump is free from defects in material and workmanship under normal use and service from the date of purchase. 2 years service, 5 years parts, 7 years tank. *Subject to terms and conditions.

This warranty does not cover damage resulting from accident, misuse or abuse or lack of reasonable care of the product.

In no case shall Emerald Energy Pty Ltd be liable for any incidental or consequential damages for breach of this or any other warranty express or implied whatsoever.

For full warranty details visit our website emerald.com.au

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