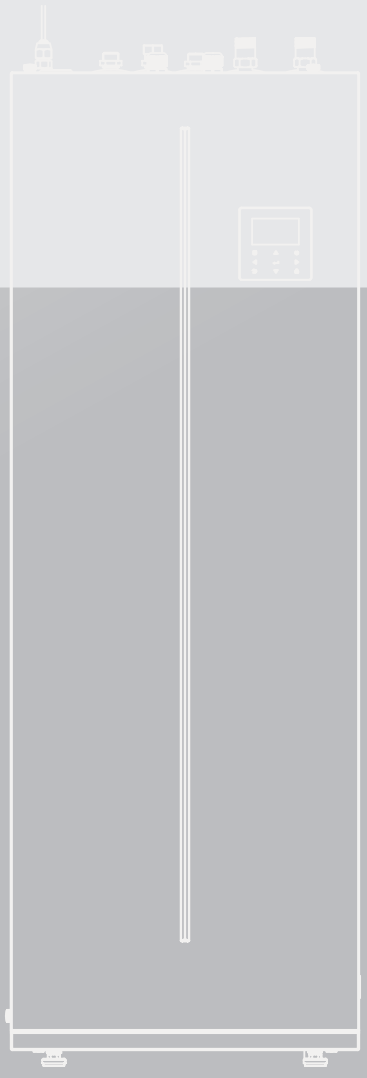
MUNDOCLIMA®
Aerotherm

R32

INSTALLATION AND OWNER'S MANUAL

UI45110-124

M-thermal split
Indoor unit



Original instructions.
Please read this manual carefully and keep it for future reference.
All the pictures in this manual are for illustrations purpose only.

CONTENTS

1 ABOUT THE DOCUMENTATION

1.1 About this document

NOTE

Make sure that the user has the printed documentation and ask him/her to keep it for future reference.

Target audience

Authorised installers + end users.

⚠ WARNING

Please thoroughly read and ensure that you fully understand the safety precautions (including the signs and symbols) in this manual, and follow relevant instructions during use to prevent damage to health or property.

Documentation set

This document is part of a documentation set. The complete set consists of:

- **Installation and owner's manual:**
  -Installation instructions
- **Operation manual:**
  -Operation instructions
- **Technical data manual:**
  -Energy related data
- **Service manual:**
  -After sales instructions, for service personal only
- **Engineering reference manual:**
  -Engineering data, for installer、dealer and professional only

2 SAFETY PRECAUTIONS

2.1 Safely sign

Please thoroughly read and ensure that you fully understand the safety precautions (including the signs and symbols) in this manual, and follow relevant instructions during use to prevent damage to health or property.

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

⊘ PROHIBITION

indicates a certain measure is not allowed to be taken or a certain action should be stopped.

NOTE

indicates a non-hazard risk which, if not avoided, may result in decreased device performance, abnormal functions, or damage to the device or property.

INFORMATION

useful operation and maintenance information.

2.2 Symbols

	WARNING	this symbol shows that this appliance used a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	CAUTION	this symbol shows that the manual should be read carefully.
	CAUTION	this symbol shows that only a competent service personnel should be handling this equipment with reference to the technical manual.
	CAUTION	this symbol shows that information is available such as the operating manual or installation manual.

⚠ WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

Do not pierce or burn.

Be aware that refrigerants might not contain an odour.

⚠ DANGER

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

• Work on the refrigerant circuit with flammable refrigerant in safety group A2L 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 100 R. 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.

⚠ WARNING

- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorises their competence to handle refrigerants safely in accordance with an industry recognised assessment specification.
- Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.

⚠ WARNING

- Do NOT have refrigerant leakage and open flame.

2.3 Transportation, marking and storage for units that employ flammable refrigerants

⚠ WARNING

The unit employs FLAMMABLE REFRIGERANT R32.

2.3.1 General

The following information is provided for units that employ FLAMMABLE REFRIGERANTS.

2.3.2 Transport

Attention is drawn to the fact that additional transportation regulations may exist with respect to equipment containing flammable gas. The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable transport regulations.

2.3.3 Marking of equipment using signs

Signs for similar appliances used in a work area are generally addressed by local regulations and give the minimum requirements for the provision of safety and/or health signs for a work location.

All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs.

The effectiveness of signs should not be diminished by too many signs being placed together.

Any pictograms used should be as simple as possible and contain only essential details.

2.3.4 Disposal of equipment using flammable refrigerants

See national regulations.

2.3.5 Storage of equipment

The storage of the equipment should be in accordance with the applicable regulations or instructions, whichever is more stringent.

2.3.6 Storage of packed (unsold) equipment

Storage package protection should be constructed in such a way 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.

⚠ WARNING

- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater).
- The appliance shall be stored so as to prevent mechanical damage from occurring.

⚠ CAUTION

- Do NOT re-use joints which have been used already.
- Joints made in installation between parts of refrigerant system shall be accessible for maintenance purposes.

⚠ WARNING

Make sure installation, servicing, maintenance and repair comply with instructions and with applicable legislation (for example national gas regulation) and are executed only by authorized persons.

⚠ CAUTION

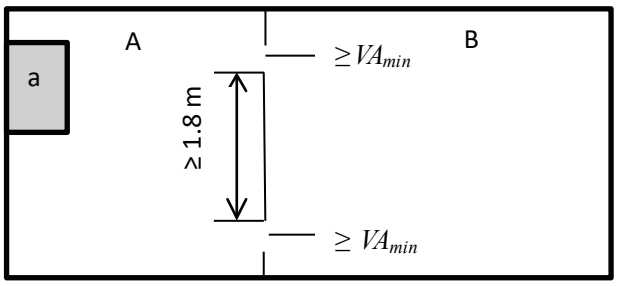
- Pipework should be protected from physical damage.
- Installation of pipework shall be kept to a minimum length.

If the total refrigerant charge in the system is < 1.84 kg (i.e. if the piping length is < 20 m for 8/10 kW), there are no additional minimum floor area requirement.

If the total refrigerant charge in the system is ≥ 1.84 kg (i.e. if the piping length is ≥ 20 m for 8/10 kW), you need to comply with additional minimum floor area requirements as described in the following flow chart. The flow chart uses the following tables:

"Table 1-Maximum refrigerant charge allowed in a room: indoor unit" on page 3, “Table 2-Minimum floor area: indoor unit” on page 4 and "Table 3-Minimum venting opening area for natural ventilation: indoor unit" on page 4.

If the piping length is 30m, then the minimum floor area is ≥4.5 m^2;if the floor area is less than 4.5 m^2, it need to trepanning a hole of 200 cm^2.

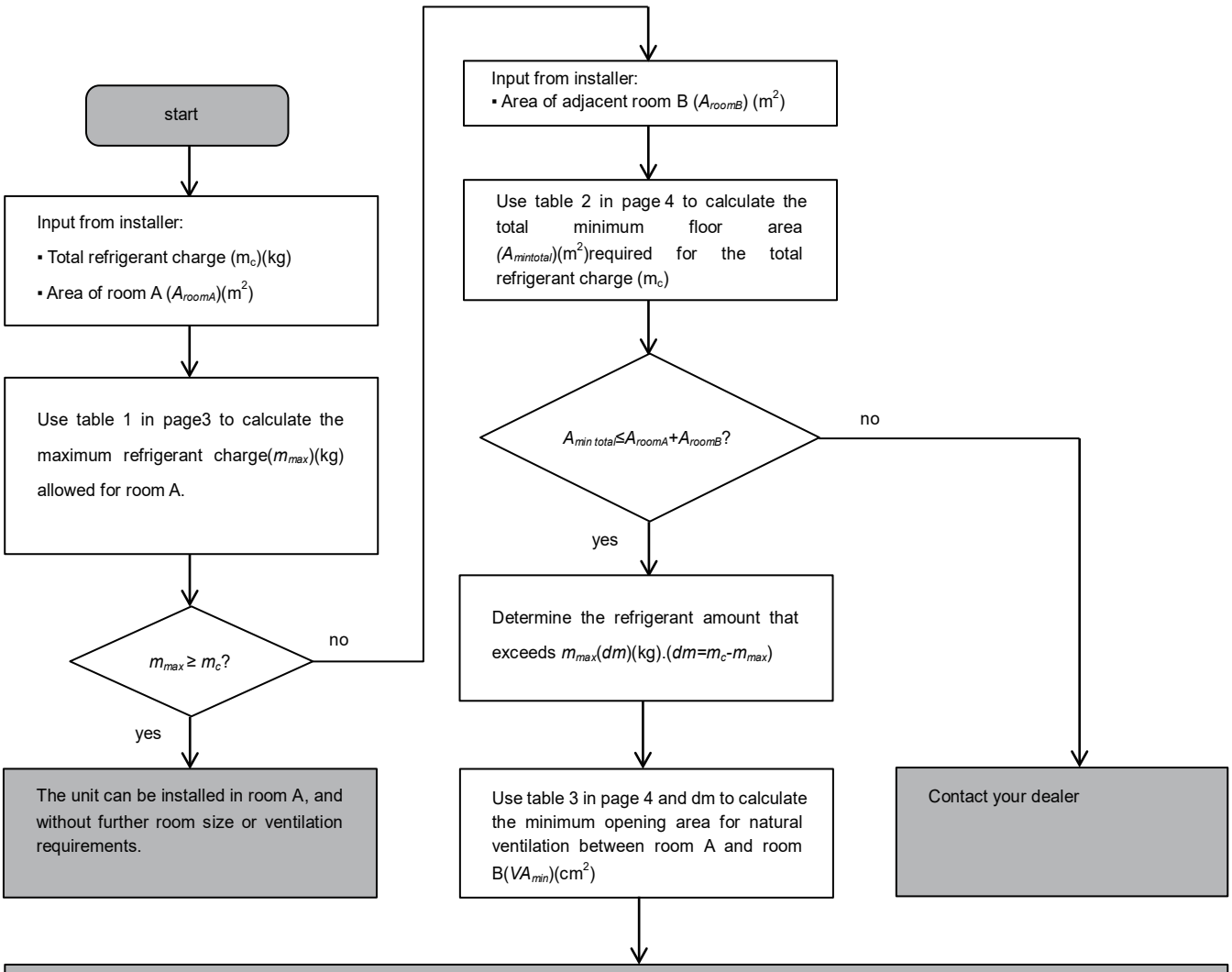


a Indoor unit

A Room where the indoor unit is installed.

B Room adjacent to room A.

The area of A plus B has to be greater than or equal to 4.5 m^2.



Unit can be installed at room A if:

- 2 ventilation openings (permanently open) are provided between room A and B, 1 at the top and 1 at the bottom.
- Bottom opening : The bottom opening must meet the minimum area requirements(VA_{min}).It must be as close as possible to the floor.If the ventilation opening starts from the floor, the height must be ≥ 20 mm. The bottom of the opening must be situated≤ 100 mm from the floor. At least 50 % of the required opening area must be situated < 200 mm from the floor. The entire area of the opening must be situated < 300 mm from the floor.
- Top opening : The area of the top opening must be larger than or equal to the bottom opening. The bottom of the top opening must be situated at least 1.5 m above the top of the bottom opening.
- Ventilation openings to the outside are NOT considered suitable ventilation openings (the user can block them when it is cold).

Table 1-Maximum refrigerant charge allowed in a room:indoor unit

A_{room} (m^2)	Maximum refrigerant charge in a room(m_{max})(kg)	A_{room} (m^2)	Maximum refrigerant charge in a room(m_{max})(kg)
	H =1 230 mm(100/190)		H =1 500 mm(100/240,160/240)
6.9	1.85	4.7	1.85
7.0	1.87	5.0	1.93
8.0	1.98	5.5	2.01
9.0	2.13	6.0	2.10
10.0	2.23	6.5	2.19
11.0	2.34	7.0	2.27
12.0	2.44	7.5	2.34
		8.0	2.44

Table 2-Minimum floor area:indoor unit

m_c(kg)	Minimum floor area(m^2)	m_c(kg)	Minimum floor area(m^2)
	H = 1 230 mm(100/190)		H = 1 500 mm(100/240,160/240)
1.85	6.90	1.85	4.70
1.90	7.31	1.90	4.92
1.95	7.70	1.95	5.18
2.00	8.10	2.00	5.45
2.05	8.51	2.05	5.72
2.10	8.93	2.10	6.01
2.15	9.36	2.15	6.30
2.20	9.80	2.20	6.59
2.25	10.3	2.25	6.89
2.30	10.7	2.30	7.20
2.35	11.2	2.35	7.52
2.40	11.7	2.40	7.84
2.45	12.2	2.45	8.10

Table 3-Minimum venting opening area for natural ventilation: indoor unit

m_c	m_{max}	$dm=m_c-m_{max}$(kg)	Minimum venting opening area(cm^2)	Minimum venting opening area(cm^2)
			H = 1 230 mm(100/190)	H = 1 500 mm(100/240,160/240)
2.41	0.3	2.11	375	290
2.41	0.5	1.91	350	280
2.41	0.7	1.71	330	268
2.41	0.9	1.51	315	258
2.41	1.1	1.31	302	247
2.41	1.3	1.11	278	228
2.41	1.5	0.91	245	200
2.41	1.7	0.71	203	167
2.41	1.9	0.51	154	126
2.41	2.1	0.31	98	80

⚠ DANGER

- Before touching electric terminal parts, turn off power switch.
- When service panels are removed, live parts can be easily touched by accident.
- Never leave the unit unattended during installation or servicing when the service panel is removed.
- Do not touch water pipes during and immediately after operation as the pipes may be hot and could burn your hands. To avoid injury, give the piping time to return to normal temperature or be sure to wear protective gloves.
- Do not touch any switch with wet fingers. Touching a switch with wet fingers can cause electrical shock.
- Before touching electrical parts, turn off all applicable power to the unit.

⚠ WARNING

- Tear apart and throw away plastic packaging bags so that children will not play with them.Children playing with plastic bags face danger of death by suffocation.
- Safely dispose of packing materials such as nails and other metal or wood parts that could cause injuries.
- Ask your dealer or qualified personnel to perform installation work in accordance with this manual. Do not install the unit by yourself. Improper installation could result in water leakage, electric shocks or fire
- Be sure to use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shocks, fire, or the unit falling from its mount.
- Install the unit on a foundation that can withstand its weight. Insufficient physical strength may cause the equipment to fall and possible injury.
- Perform specified installation work with full consideration of strong wind, hurricanes, or earthquakes. Improper installation work may result in accidents due to equipment falling.

- Make certain that all electrical work is carried out by qualified personnel according to the local laws and regulations and this manual using a separate circuit. Insufficient capacity of the power supply circuit or improper electrical construction may lead to electric shocks or fire.
- Be sure to install a earth fault circuit interrupter according to local laws and regulations. Failure to install a earth fault circuit interrupter may cause electric shocks and fire.
- Make sure all wiring is secure. Use the specified wires and ensure that terminal connections or wires are protected from water and other adverse external forces. Incomplete connection or affixing may cause a fire.
- When wiring the power supply, form the wires so that the front panel can be securely fastened. If the front panel is not in place there could be overheating of the terminals, electric shocks or fire.
- After completing the installation work, check to make sure that there is no refrigerant leakage.
- Never directly touch any leaking refrigerant as it could cause severe frostbite. Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor and other refrigerant cycle parts. Burns or frostbite are possible if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear protective gloves.
- Do not touch the internal parts (pump, backup heater, etc.) during and immediately after operation. Touching the internal parts can cause burns. To avoid injury, give the internal parts time to return to normal temperature or, if you must touch them, be sure to wear protective gloves.

⚠ CAUTION

- Earth the unit.
- Earthing resistance should be according to local laws and regulations.
- Do not connect the earth wire to gas or water pipes, lightning conductors or telephone earth wires.
- Incomplete earthing may cause electric shocks.
  - Gas pipes：Fire or an explosion might occur if the gas leaks.
  - Water pipes：Hard vinyl tubes are not effective earths.
  - Lightning conductors or telephone earth wires ： Electrical threshold may rise abnormally if struck by a lightning bolt.

⚠ CAUTION

- Install the power wire at least 3 feet (1 meter) away from televisions or radios to prevent interference or noise. (Depending on the radio waves, a distance of 3 feet (1 meter) may not be sufficient to eliminate the noise.)
- Do not wash the unit. This may cause electric shocks or fire. The appliance must be installed in accordance with national wiring regulations. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- Do not install the unit in the following places:
  - Where there is mist of mineral oil, oil spray or vapors. Plastic parts may deteriorate, and cause them to come loose or water to leak.
  - Where corrosive gases (such as sulphurous acid gas) are produced. Where corrosion of copper pipes or soldered parts may cause refrigerant to leak.
  - Where there is machinery which emits electromagnetic waves. Electromagnetic waves can disturb the control system and cause equipment malfunction.
  - Where flammable gases may leak, where carbon fiber or ignitable dust is suspended in the air or where 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 near the ocean.
  - Where voltage fluctuates a lot, such as in factories.
  - In vehicles or vessels.
  - Where acidic or alkaline vapors are present.
- This appliance can be used by children 8 years old and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they are supervised or given instruction on using the unit in a safe manner and understand the hazards involved. Children should not play with the unit. Cleaning and user maintenance should not be done by children without supervision.
- Children should be supervised to ensure that they do not play with the appliance.
- If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person.
- DISPOSAL: Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary. Do not dispose of electrical appliances as municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substance can leak into the groudwater and get into the food chain, damaging your health and well-being.

- The wiring must be performed by certified person technicians in accordance with national wiring regulation and this circuit diagram. An all-pole disconnection device which has at least 3 mm separation distance in all pole and a residualcurrent device(RCD) with the rating not exceeding 30 mA shall be incorporated in the fixed wiring according to the national rule.
- Confirm the safety of the installation area (walls, floors, etc.) without hidden dangers such as water, electricity, and gas before wiring/pipes.
- Before installation , check whether the user's power supply meets the electrical installation requirements of unit (including reliable earthing , leakage , and wire diameter electrical load, etc.). If the electrical installation requirements of the product are not met, the installation of the product is prohibited until the product is rectified.
- Product installation should be fixed firmly, Take reinforcement measures, when necessary.

⚠ CAUTION

- About Fluorinated Gases

  - This air-conditioning unit contains fluorinated gases. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself. Compliance with national gas regulations shall be observed.

  - Installation, service, maintenance and repair of this unit must be performed by a certified technician.

  - Product uninstallation and recycling must be performed by a certified technician.

  - If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months. When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

3 SAFETY PRECAUTION ABOUT THE APPLIANCES USING FLAMMABLE REFRIGERANT

⚠ WARNING

The following precautions should be complied with when installation, service, maintenance and repair, and decommissioning of appliances using flammable refrigerant.

3.1 General

This appliance employed **A2L** flammable refrigerant R32.
The appliance shall be stored so as to prevent mechanical damage from occurring.

3.2 Installation

3.2.1 Qualification of workers

⚠ WARNING

Refer to **Target group** described in chapter **2 SAFETY PRECAUTION**.

Every working procedure that affects safety means shall only be carried out by competent persons.

Examples for such working procedures are:

– breaking into the refrigerating circuit;

– opening of sealed components;

– opening of ventilated enclosures.

3.2.2 General

⚠ WARNING

Protection devices, piping and fittings shall be protected as far as possible against adverse environmental effects, for example the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris;

Provision shall be made for expansion and contraction of long runs of piping;

Piping in refrigerating systems shall be so designed and installed as to minimize the likelihood of hydraulic shock damaging the system;

Steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation.

3.3 Information on servicing

3.3.1 General

⚠ CAUTION

Servicing shall be performed only as recommended by the manufacturer.

3.3.2 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, Clause 3.3.3 to Clause 3.3.7 shall be completed prior to conducting work on the system.

3.3.3 Work procedure

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

3.3.4 General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

3.3.5 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 toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

3.3.6 Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

3.3.7 No ignition sources

No person carrying out work in relation to a **refrigerating system** which involves exposing any pipe work shall use any sources of ignition in such a manner that it can 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 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.

3.3.8 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.

3.3.9 Checks to the refrigerating 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 **refrigerant charge** is in accordance with the room size within which the refrigerant containing parts are installed;*

– the ventilation machinery and outlets are operating adequately and are not obstructed;

– if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

– marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

– refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which can 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.

3.3.10 Checks to electrical devices

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

Initial safety checks shall include:

– that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;

– that no live electrical components and wiring are exposed while charging, recovering or purging the system;

– that there is continuity of earth bonding.

3.4 Sealed electrical components

⚠ WARNING

Sealed electrical components shall not be repaired.

3.5 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.

3.6 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.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of **flammable refrigerants**, the sensitivity can be inadequate, or can need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the ***LFL*** of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine can react with the refrigerant and corrode the copper pipe-work.

NOTE Examples of leak detection methods are

– bubble method,

– fluorescent agent method.

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

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut-off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to Clause 3.7.

⚠ CAUTION

Oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.

3.7 Refrigerant removal and circuit evacuation

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

– safely remove refrigerant following local and national regulations;
– evacuate;
– purge the circuit with inert gas (optional for A2L);
– evacuate (optional for A2L);
– continuously flush with inert gas when using flame to open circuit;
– open the circuit.

The **refrigerant charge** shall be recovered into the correct recovery cylinders.

⚠ CAUTION

An inert gas, specifically, is dry oxygen free nitrogen(OFN).
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 purging refrigerant systems.

Purging of the refrigerant circuit shall be achieved by breaking the vacuum in the system with inert gas 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. The system shall be vented down to atmospheric pressure to enable work to take place.

⚠ CAUTION

This operation is absolutely vital if brazing operations on the pipework are to take place.

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

3.8 Charging procedures

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

– Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
– Cylinders shall be kept in an appropriate position according to the instructions.
– Ensure that the **refrigerating system** is earthed prior to charging the system with refrigerant.
– Label the system when charging is complete (if not already labelled).
– Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. 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.

3.9 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 recovered refrigerant. It is essential that electrical power is available before the task is commenced.

1) Become familiar with the equipment and its operation.
2) Isolate system electrically.
3) Before attempting the procedure, ensure that:
a) mechanical handling equipment is available, if required, for handling refrigerant cylinders;
b) all personal protective equipment is available and being used correctly;
c) the recovery process is supervised at all times by a competent person;
d) recovery equipment and cylinders conform to the appropriate standards.
4) Pump down refrigerant system, if possible.
5) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6) Make sure that the cylinder is situated on the scales before recovery takes place.
7) Start the recovery machine and operate in accordance with instructions.
8) Do not overfill cylinders (no more than 80 % volume liquid charge).
9) Do not exceed the maximum working pressure of the cylinder, even temporarily.
10) 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.
11) Recovered refrigerant shall not be charged into another **refrigerating system** unless it has been cleaned and checked.

3.10 Labelling

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing **flammable refrigerants**, ensure that there are labels on the equipment stating the equipment contains **flammable refrigerant**.

3.11 Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is required to follow good practice so that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and 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 the **flammable refrigerant**. Consult manufacturer if in doubt. 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.

The recovered refrigerant shall be processed according to local legislation 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 compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. Draining of oil from a system shall be carried out safely.

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

4 BEFORE INSTALLATION

- **Before installation**

  Be sure to confirm the model name and the serial number of the unit.

⚠ CAUTION

Frequency of Refrigerant Leakage Checks

- For unit that contains fluorinated greenhouse gases in quantities of 5 tonnes of CO_2 equivalent or more,but of less than 50 tonnes of CO_2 equivalent,at least every 12 months, or where a leakage detection system is installed, at least every 24 months.
- For unit that contains fluorinated greenhouse gases in quantities of 50 tonnes of CO_2 equivalent or more, but of less than 500 tonnes of CO_2 equivalent,at least every six months, or where a leakage detection system is installed, at least every 12 months.
- For unit that contains fluorinated greenhouse gases in quantities of 500 tonnes of CO_2 equivalent or more,at least every three months, or where a leakage detection system is installed,at least every six months.
- This air-conditioning unit is a hermetically sealed equipment that contains fluorinated greenhouse gases.
- Only certificated person is allowed to do installation, operation and maintenance.

5 INSTALLATION SITE

⚠ WARNING

- There is flammable refrigerant in the unit and it should be installed in a well-ventilated site. If the unit is installed inside, an additional refrigerant detection device and ventilation equipment must be added in accordance with the standard EN378. Be sure to adopt adequate measures to prevent the unit from being used as a shelter by small animals.
- Small animals making contact with electrical parts can cause malfunction, smoke or fire. Please instruct the customer to keep the area around the unit clean.
- The equipment is not intended for use in a potentially explosive atmosphere.

- Select an installation site where the following conditions are satisfied and one that meets with your customer's approval.
  - Places that are well-ventilated.
  - Safe places which can bear the unit's weight and vibration and where the unit can be installed at an even level.
  - Places where there is no possibility of flammable gas or product leak.
  - The equipment is not intended for use in a potentially explosive atmosphere.
  - Places where servicing space can be well ensured.
  - Places where the units' piping and wiring lengths come within the allowable ranges.
  - Places where water leaking from the unit cannot cause damage to the location (e.g. in case of a blocked drain pipe).
  - Do not install the unit in places often used as a work space. In case of construction work (e.g. grinding etc.) where a lot of dust is created, the unit must be covered.
  - Do not place any object or equipment on top of the unit (top plate)
  - Do not climb, sit or stand on top of the unit.
  - Be sure that sufficient precautions are taken in case of refrigerant leakage according to relevant local laws and regulations.

⚠ CAUTION

The indoor unit should be installed in an indoor water proof place, or the safety of the unit and the operator cannot be ensured.

The indoor unit is to be wall mounted in an indoor location that meets the following requirements:

- The installation location is frost-free.
- The space around the unit is adequate for serving, see figure 8-2.
- The space around the unit allows for sufficient air circulation.
- There is a provision for condensate drain and pressure relief valve blow-off.

⚠ CAUTION

When the unit running in the cooling mode, condensate may drop from the water inlet and water outlet pipes. Please make sure the dropping condensate will not result in damage of your furniture and other devices.

- The installation surface is a flat and vertical non-combustible wall, capable of supporting the operation weight of the unit.
- All piping lengths and distance have been taken into consideration.

Table 5-1

Requirement	Value
Maximum allowable piping length between the 3-way valve SV1 and the indoor unit (only for installations with domestic hot water tank)	3 m
Maximum allowable piping length between the domestic hot water tank and the indoor unit (only for installations with domestic hot water tank). The temperature sensor cable supplied with the indoor unit is 10 m in length.	8 m
Maximum allowable piping length between the TW2 and the indoor unit. The temperature sensor a cable of TW2 supplied with the indoor unit is 10 m in length.	8 m

6 ACCESSORIES

6.1 Unpacking

Removing the package

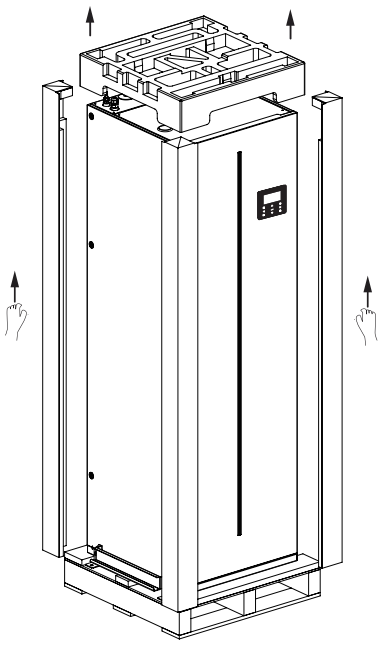


Fig.6-1

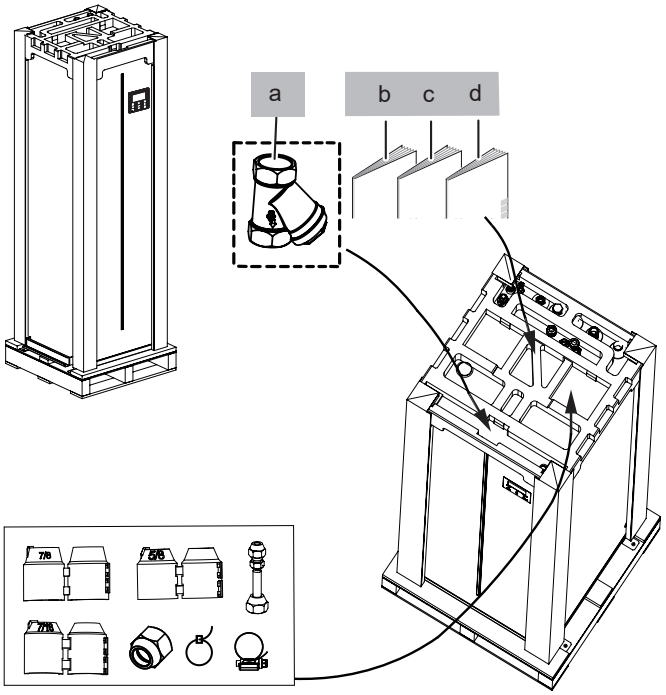


Fig.6-2

Installation Fittings					Installation Fittings				
Name	Shape	Quantity			Name	Shape	Quantity		
		100/190	100/240	160/240			100-190	100-240	160-240
Installation and Owner's Manual(This Book)		1	1	1	M9 Copper Flare Nut		1	1	1
					M16 Copper Flare Nut		1	1	1
Operation Manual		1	1	1	Y-Type Strainer		1	1	1
M16 Copper Flare Nut Insulation Accessories		1	1	1	Operation Manual (Wire Controller)		1	1	1
M9 Copper Flare Nut Insulation Accessories		1	1	1	Adapter 9.52-6.35		1	1	1
M6 Copper Flare Nut Insulation Accessories		1	1	1	Cable Tie L200		2	2	2
					Clamp		1	1	1

Accessories Available from Supplier		
Thermistor for Balance Tank(Tbt1)		1
Extension Wiring Harnesses for Tbt1		1
Thermistor for Zone 2 Flow Temp.(Tw2)		1
Extension Wiring Harnesses for Tw2		1

6.2 Remove the shipping pallet

- Remove the 4 screws of the wooden base(Refer to Fig.6-3).
- Four people hold the sheet metal lifting machine, one of them pull the wooden base(Refer to Fig.6-4).
- Remove the 8 screws of the sheet metal and remove the sheet metal(Refer to Fig.6-5).
- Take carefully when lifting machine and pull the wooden.
- Care should be taken when transporting the heat pump unit that the casing is not damaged by impact. Do not remove the protective packaging unit heat pump unit has reached its final location. This will help protect the structure and control panel. The heat pump unit can be transported ONLY vertically.
- Be careful with the Installation and Operation manual and with the factory-supplied accessories box located at the top of the unit.
- Four people are required when lifting because of the heavy weight of the unit.

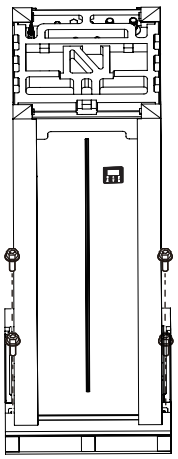


Fig.6-3

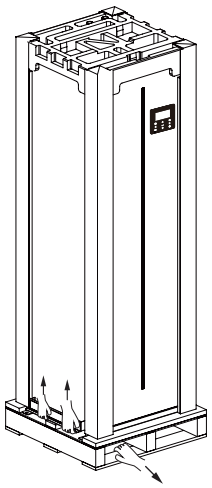


Fig.6-4

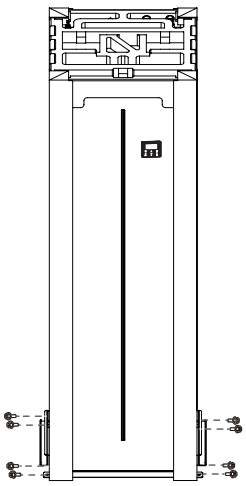


Fig.6-5

INSTALLATION SITE

⚠ WARNING

- Do not install the indoor unit near a bedroom;
- Suggest install it in a garage, utility room, corridor, basement, or laundry room;
- Be sure to adopt adequate measures to prevent the unit from being used as a shelter by small animals.
- Small animals making contact with electrical parts can cause malfunction, smoke or fire. Please instruct the customer to keep the area around the unit clean.
- The equipment is not intended for use in a potentially explosive atmosphere.
- Please connect the top pipe or fill the water tank immediately after removing the wooden frame, so as not to cause the machine to tip over.

- Select an installation site where the following conditions are satisfied and one that meets with your customer's approval.
  - Safe places which can bear the unit's weight and where the unit can be installed at an even level.
  - Places where there is no possibility of flammable gas or product leak.
  - The equipment is not intended for use in a potentially explosive atmosphere.
  - Places where servicing space can be well ensured.
  - Places where the units' piping and wiring lengths come within the allowable ranges.
  - Places where water leaking from the unit cannot cause damage to the location (e.g. in case of a blocked drain pipe).
  - Do not install the unit in place s often used as a work space. Incase of construction work (e.g. grinding etc.) where a lot of dust is created, the unit must be covered.
  - Do not place any object or equipment on top of the unit (top plate)
  - Do not climb, sit or stand on top of the unit.
  - Be sure that sufficient precautions are taken in case of refrigerant leakage according to relevant local laws and regulations.
  - Don't install the unit near the sea or where there is corrosion gas.
- When installing the unit in a place exposed to strong wind, pay special attention to the following. In normal condition, refer to the figures below for installation of the unit:

⚠ CAUTION

The indoor unit should be installed in an indoor water proof place.

The indoor unit is to be floor mounted in an indoor location that meets the following requirements:

- The installation location is frost-free.
- The space around the unit is adequate for serving(Refer to Fig.8-2).
- There is a provision for condensate drain and pressure relief valve blow-off.

⚠ CAUTION

When the unit is running in the cooling mode, condensate may drop from the water inlet and water outlet pipes. Please make sure the dropping condensate will hot result in damage of your furniture and other devices.

7 GENERAL INTRODUCTION

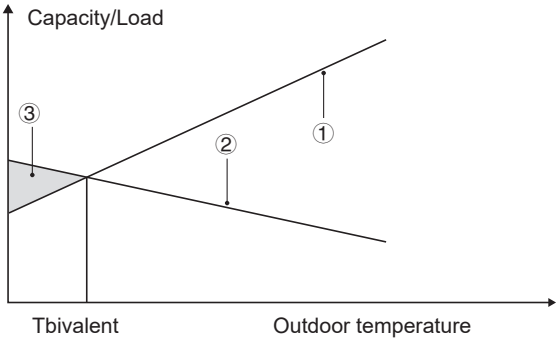
- These units are used for both heating and cooling applications and domestic hot water .They can be combined with fan coil units, floor heating applications, low temperature high efficiency radiators .
- A wired controller is supplied with the unit
- The backup heater can increase the heating capacity during cold outdoor temperatures. The backup heater also serves as a backup in case of malfunctioning and for frozen protection of the outside water piping during winter time.

☞ NOTE

- Maximum length of communication wirings between the indoor unit and the controller is 50 m.

- Power cords and communication wiring must be laid out separately, they can not be placed in the same conduit. Otherwise, it may lead to electromagnetic interference. Power cords and communication wirings should not come in contact with the refrigerant pipe so as to prevent the high temperature pipe from damaging wirings.

- Communication wirings must use shielded lines. Including indoor unit to outdoor unit PQE line, indoor unit to controller ABXYE line.



① Heat pump capacity.

② Required heating capacity (site dependent).

③ Additional heating capacity provided by backup heater.

Room thermostat(field supply)

Room thermostat can be connected to the unit(room thermostat should be kept away from heating source when selecting the installation place).

Operation range

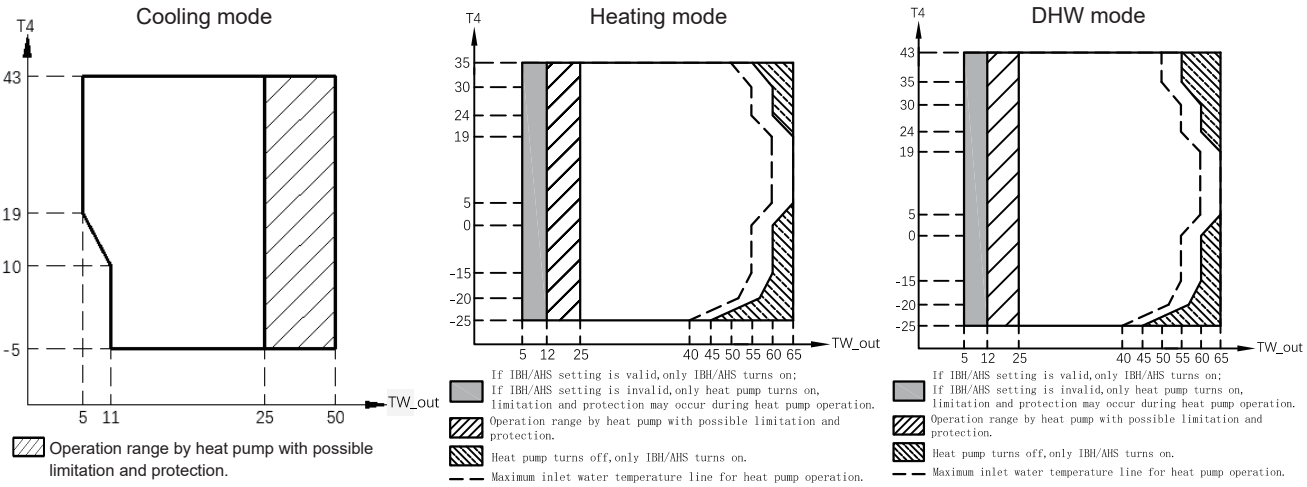
Operation range of indoor unit		
Water pressure		0.1~0.3 MPa
Water flow	100	0.40~2.10 m^3/h
	160	0.70~3.00 m^3/h

The unit have a freeze prevention function that uses the heat pump or backup heater to keep the water system safe from freezing in all conditions. Since a power failure may happen when the unit is unattended, It's suggested to use anti-freezing flow switch in the water system. (Refer to 9.7 "water loop anti-freeze protection").

⚠ CAUTION

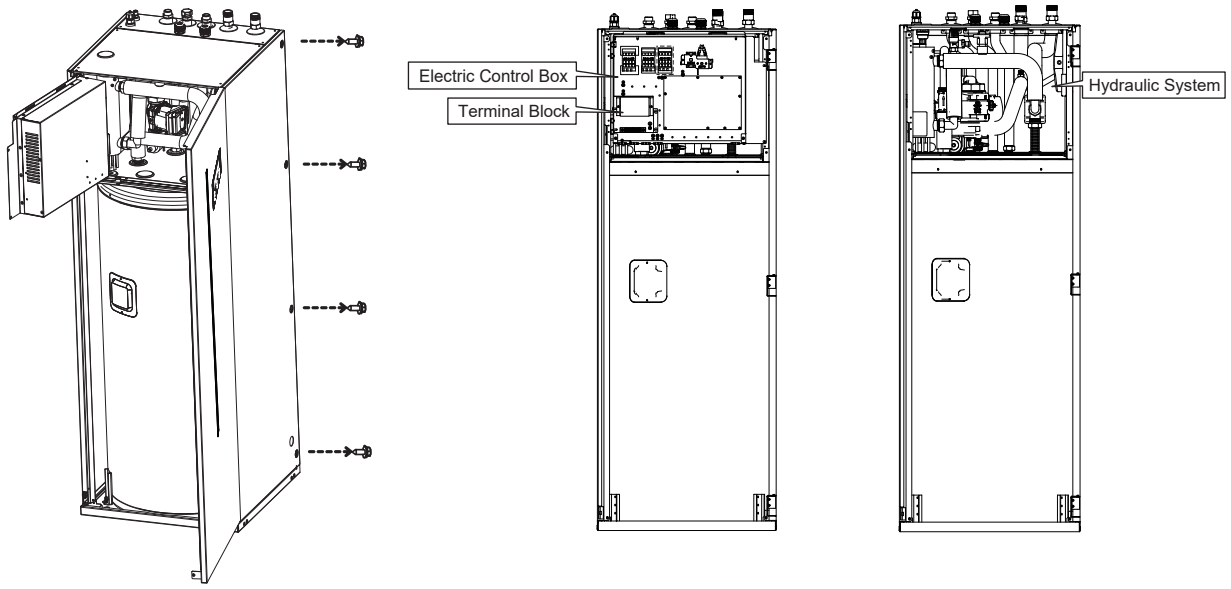
The heat exchanger could be damaged by freezing water due to low water flow rate.

The water flowing temperature (TW_out) range in different outdoor temperature (T4) for different mode is list below:



7.1 Disassembling the unit

The indoor unit cover can be removed by removing the 2 screws and unhitching the cover.



⚠ CAUTION

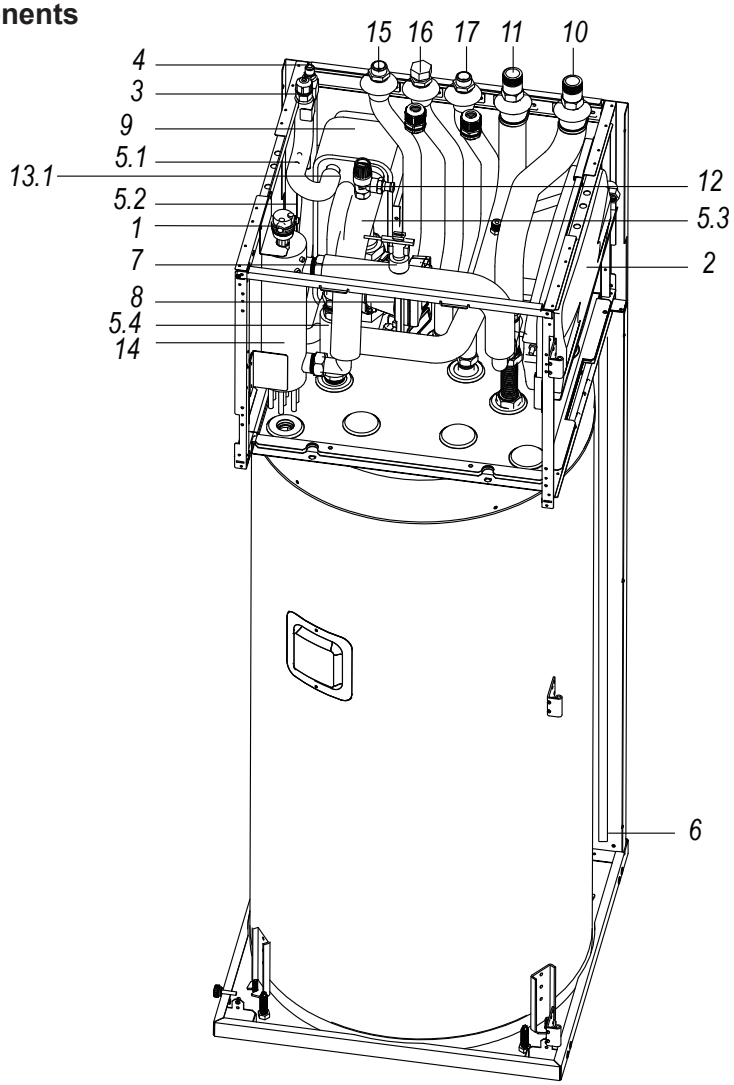
Make sure to fix the cover with the screws and nylon washers when installing the cover (screws are delivered as accessory) .Parts inside the unit can be hot.

- To gain access to the control box components – e.g. to connect the field wiring – the control box service panel can be removed. Thereto, loosen the front screws and unhitch the control box service panel.

⚠ CAUTION

Switch off all power supply – i.e. outdoor unit power supply ,indoor unit power supply, electric heater and additional heater power supply before removing the control box service panel.

7.2 Main components



Code	Assembly unit	Description
1	Automatic air purge valve	Remaining air in the water loop will be automatically removed via the automatic air purge valve.
2	Expansion vessel (8 L)	/
3	Refrigerant gas pipe	/
4	Refrigerant liquid pipe	/
5	Temperature sensors	Four temperature sensors determine the water and refrigerant temperature at various points. 5.1-T2B; 5.2-T2; 5.3-Tw_out; 5.4-Tw_in; 5.5-T1
6	Drain port	/
7	Flow switch	If water flow is below 0.6 m^3/h, the flow switch open, then when the water flow reach 0.66 m^3/h, the flow switch close.
8	Pump_i	The pump circulates the water in the water loop.
9	Plate heat exchanger	Heat exchanging between water and refrigerant.
10	Water outlet pipe	/
11	Water inlet pipe	/
12	Pressure relief valve	The pressure relief valve prevents excessive water pressure in the water loop by opening at 43.5 psi(g) / 0.3 MPa(g) and discharging some water.
13	Electrical heating belt(13.1-13.2)	They are for preventing frozen.(13.2 is optional)
14	Internal backup heater	The backup heater consists of an electrical heating element that will provide additional heating capacity to the water loop if the heating capacity of the unit is insufficient due to low outdoor temperatures, it also protects the external water piping from freezing during cold periods.
15	Domestic hot water outlet	/
16	Domestic hot water recirculation inlet	/
17	Domestic cold water inlet	/

8 INSTALLATION

8.1 Dimensions of the unit:

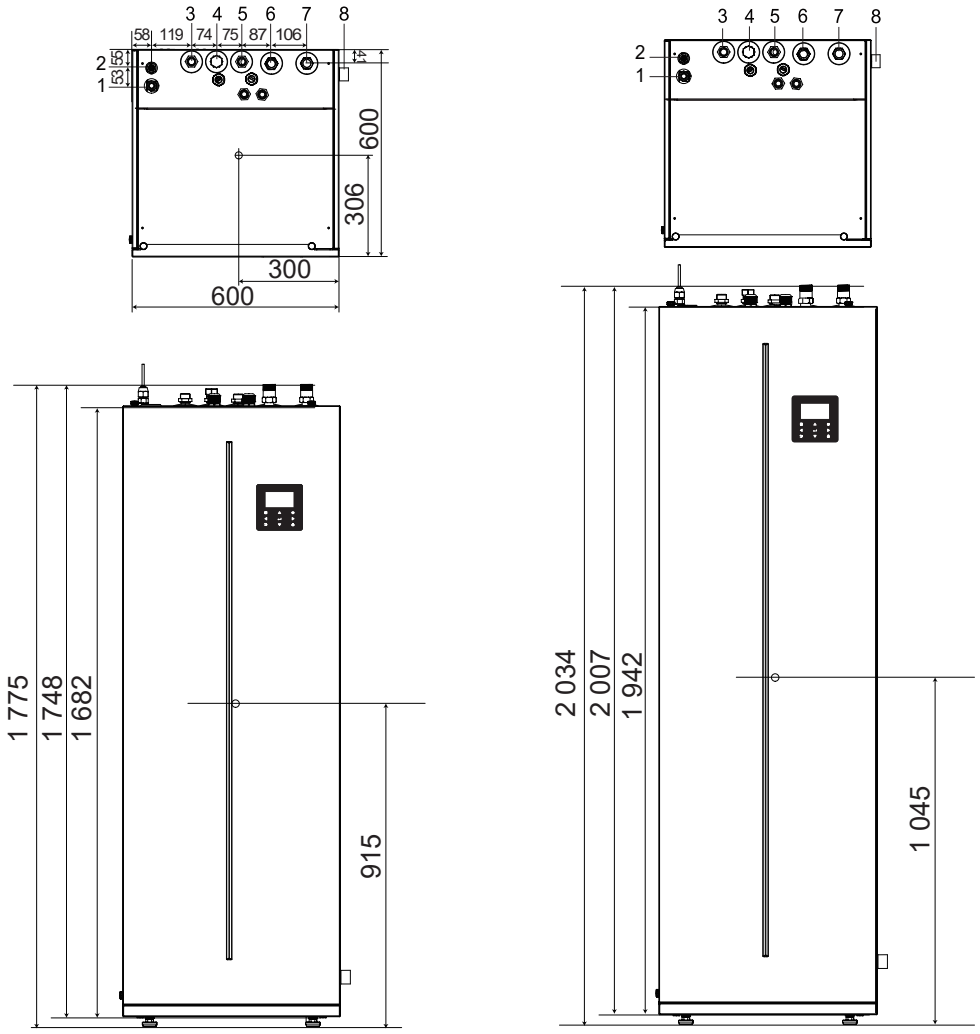


Fig.8-1

Unit: mm

NO.	Name	NO.	Name
1	Refrigerant gas pipe size 5/8", connection size 7/8"-14UNF	5	Domestic cold water inlet
2	Refrigerant liquid pipe size 3/8", connection size 5/8"-18UNF	6	Space heating (cooling) water inlet R1"
3	Domestic hot water outlet R3/4"	7	Space heating (cooling) water outlet R1"
4	Domestic hot water recirculation water inlet (Plugged by the nut).	8	Drain Ø 25

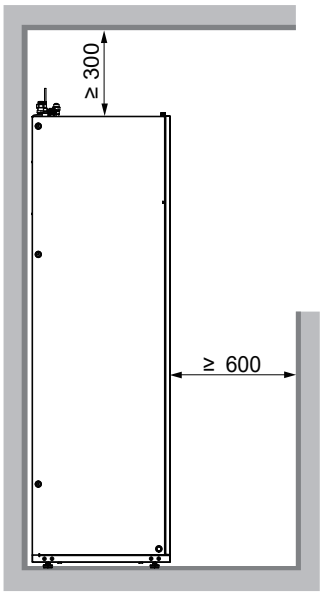
8.2 Installation requirements

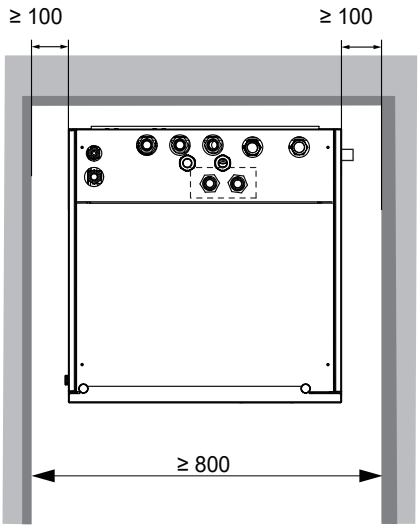
- The indoor unit is packed by the carton cap and corner.
- At delivery, the unit must be checked and any damage must be reported immediately to the carrier claims agent.
- Check if all indoor unit accessories are enclosed.
- Bring the unit as close as possible to the final installation position in its original package in order to prevent damage during transport.
- When the water tank is free of water, the maximum net weight of indoor unit with, water tank shall reach about 158 kg, which needs to be lifted by special equipment.

⚠ WARNING

Do not grasp the control box or pipe to lift the unit!

8.3 Servicing space requirements





Unit : mm

Fig.8-2

8.4 Mounting the indoor unit

⚠ CAUTION

Ensure that apparatus is mounted securely.

Lift the indoor unit from the pallet and place it on the floor.

Slide the indoor unit into position.

Adjust the height of the leveling feet (Refer to Fig.8-3) to compensate for floor irregularities. The maximum allowed deviation is 1° (Refer to Fig. 8-4)

Be specially careful with the mounting foot once the unit is on the floor. Avoid harsh handling of the unit, as it could cause damages to the foot.

Each mounting feet can be adjusted up to 30 mm, but keep all them in the factory supplied position unit has been installed in its final position.

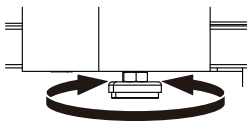


Fig.8-3

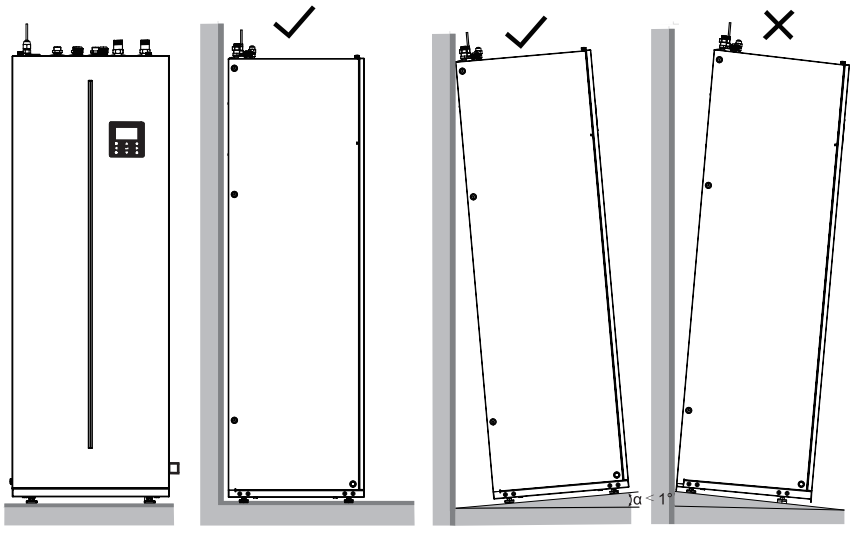


Fig.8-4

8.5 Connecting the refrigerant piping

For all guidelines, instructions and specifications regarding refrigerant pipe between the indoor unit and outdoor unit, please refer to "Installation and owner's manual " (M-thermal split outdoor unit).

Connecting the 16 mm refrigerant pipe to the refrigerant gas connection.

- Sufficiently tighten the flare nut (Refer to Fig.8-7)
- Check the tightening torque (Refer to the right table) .
- Tighten it with a spanner and torque wrench (Refer to Fig.8-8)
- The protective nut is a one-time part, it can not be reused. In case it is removed, it should be replaced vvith a new one.(Refer to Fig.8-9)

Outer diam.	Tightening torque(N·cm)	Additional tightening torque(N·cm)
ϕ 6.35	1 500 (153 kgf·cm)	1 600 (163 kgf·cm)
ϕ 9.52	2 500 (255 kgf·cm)	2 600 (265 kgf·cm)
ϕ 16	4 500 (459 kgf·cm)	4 700 (479 kgf·cm)

⚠ CAUTION

- Mechanical connectors used indoors shall comply with ISO 14903.
- When connecting the refrigerant pipes, always use two wrenches/spanners to tighten or loosen the nuts !(Refer to Fig.8-8) Otherwise, it will cause damage of piping connections and leakage .
- If the indoor unit is matched with outdoor unit (4/6 kW), the transfer 9.52-6.35(Refer to the table in Page 8) should be mounted on the refrigerant liquid connection of indoor unit(Refer to Fig.8-6); The transfer is not used in other types of outdoor unit(8/10/12/14/16 kW).

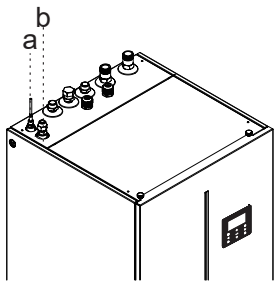


Fig. 8-5

a Refrigerant liquid connection
b Refrigerant gas connection

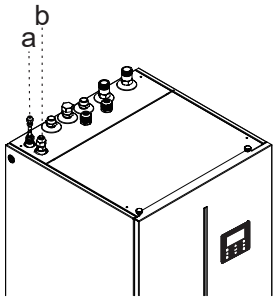


Fig. 8-6

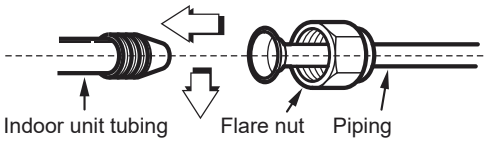
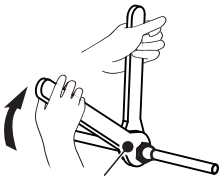


Fig. 8-7



Torque wrench

Fig. 8-8

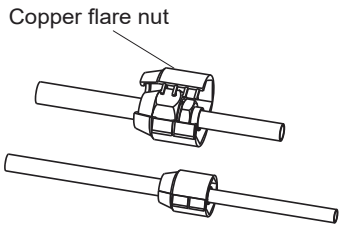


Fig. 8-9

⚠ CAUTION

- Under installation conditions, excessive torque can damage the nut.
- When flared joints are reused , the flare part shall be re-fabricated.
- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.
- Leak detection 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.
- Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.
- Adapter 9.52-6.35 is single-use only.

9 CONNECTING THE WATER PIPING

9.1 Connecting the space heating(cooling)water piping

To facilitate service and maintenance, two shut-off valves(field supply) and one overpressure by pass valve should be installed.

The two shut-off valves should be mounted on the space heating(cooling)water inlet and outlet pipe of indoor unit.

1.Connecting the shut-off valves to the indoor units.

2.Connecting the shut-off valves to the space heating(cooling) water pipes.

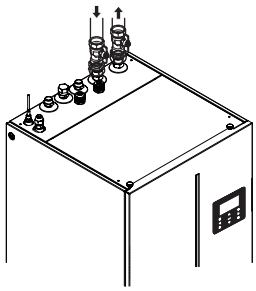


Fig. 9-1

9.2 Connecting the domestic water piping

The shut-off valve should be mounted on the domestic cold water inlet.

1.Connect the shut-off valve to the cold water inlet of indoor unit.

2 Connect the cold water pipe to the shut-off valve.

3 Connect the domestic hot water pipe to the hot water outlet of indoor unit.

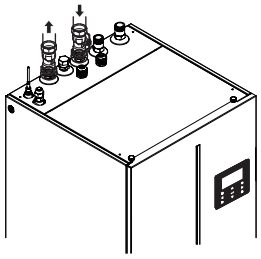


Fig. 9-2

9.3 Connecting the recirculation water piping

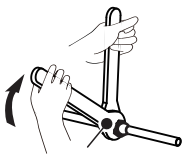
If domestic hot water recirculation function is requested, the recirculation pipe should be connected

1.Removing the nut of the recirculation on the indoor unit.

2.Connecting the recirculation water pipe to the indoor unit.

3.Check the tightening torque (Refer to the right table) .

4.Tighten it with a spanner and torque wrench.



Torque wrench

Outer diam.	Tightening torque(N·cm)	Additional tightening torque(N·cm)
ϕ6.35	1 500 (153 kgf·cm)	1 600 (163 kgf·cm)
ϕ9.52	2 500 (255 kgf·cm)	2 600 (265 kgf·cm)
ϕ 16	4 500 (459 kgf·cm)	4 700 (479 kgf·cm)

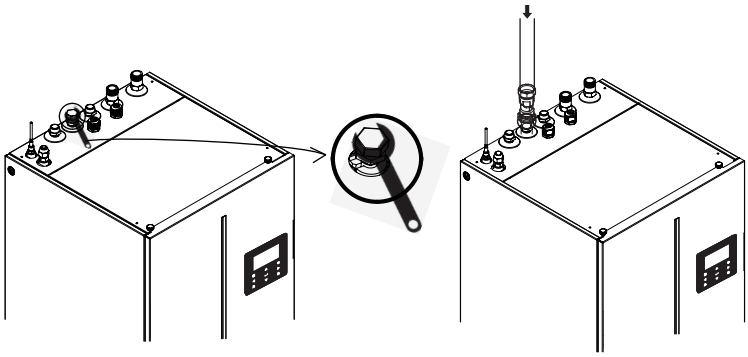


Fig.9-3

Fig.9-4

9.4 Connecting the drain hose to the indoor unit

The water coming from the pressure relief valve and the condensate water is collected in the drain age pan.

The drain hose should be connected to the drain pipe.

Connect the drain pipe with a throat bander and insert the drain pipe into the floor drain.

9.5 Water piping insulation

The insulation materials should be covered on the all piping in the water loop piping system to prevent condenser water during cooling operation, the capacity reduction and freezing of the outside water piping during winter. The insulation material should at least of B1 fire resistance rating and complies with all applicable legislation. The thickness of the sealing materials must be at least 13 mm with thermal conductivity 0.039 W/mK in order to prevent freezing on the outside water piping.

If the outside temperature is higher than 30 °C and the humidity is higher than RH 80 %, Then the thickness of the insulation materials should be at least 20 mm in order to avoid condensation on the surface of the insulation piping.

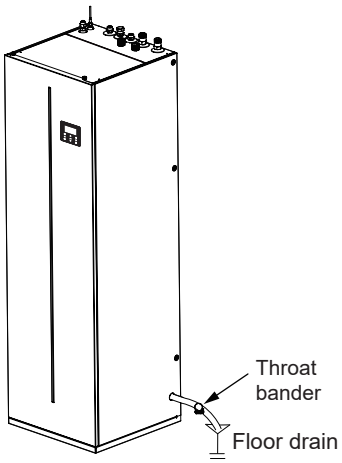


Fig.9-5

9.6 Water volume and sizing expansion vessels

The units are equipped with an expansion vessel of 8 L (effective volume is 5 L, use effective volume for calculation) that has a default pre-pressure of 1.0 bar.

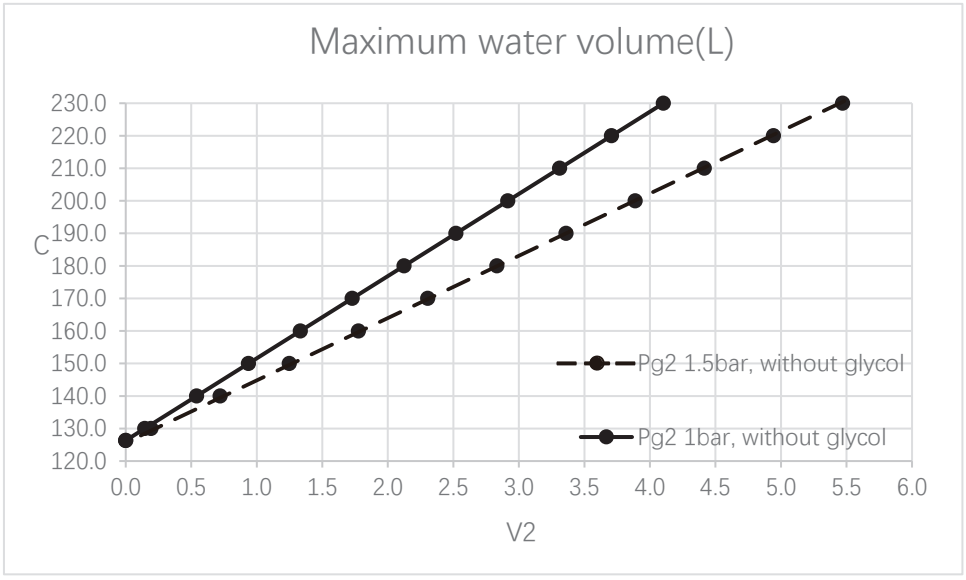
1) Check that the total water volume in the installation, excluding the internal water volume of the unit, is at least 40 L. See 15 "Technical specifications" to find the total internal water volume of the unit.

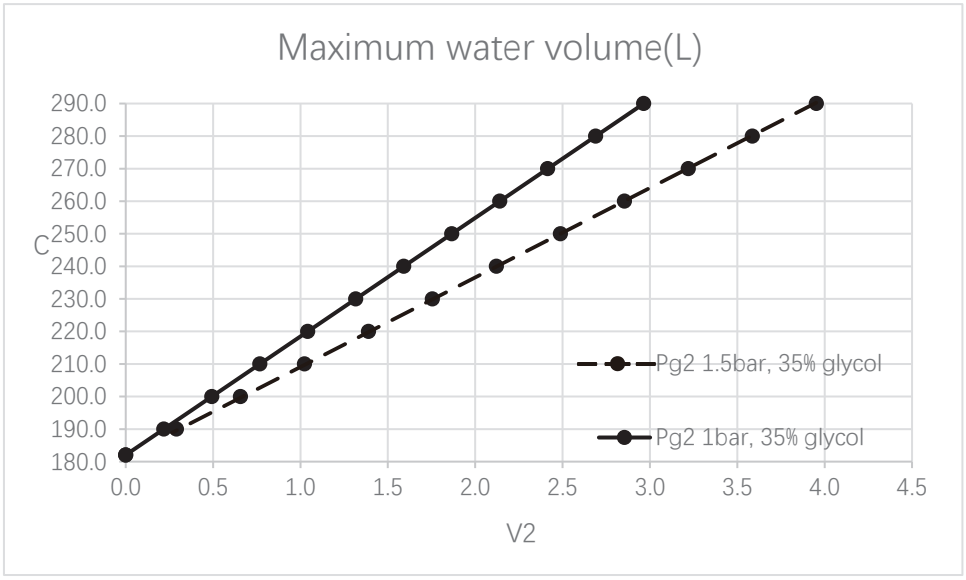
2) When the capacity of the integrated expansion vessel is insufficient for the system due to high water volume, an additional expansion vessel (supplied by the user) is needed.

Refer to the formula below to determine the specification of the additional expansion vessel.

System with only water	System with 35 % glycol
$V_2 = \frac{4C * 0.01979 - V_1 * (3 - Pg_1)}{3 - Pg_2}$	$V_2 = \frac{4C * 0.01373 - V_1 * (3 - Pg_1)}{3 - Pg_2}$

V2：Additional expansion vessel volume, in L;
V1：Integrated expansion vessel volume, in L, 5 L;
C：System water volume, in L;
Pg2：Additional expansion vessel Pre-pressure (relative pressure), in bar.
Pg1：Integrated expansion vessel Pre-pressure (relative pressure), in bar, 1 bar.





9.7 Water loop anti-freeze protection

All hydronic parts inside of the unit are insulated to reduce the heat lose. Insulation materials must be added on the field water piping.

The unit program has special functions which use the heat pump and backup heater (if available) to protect the entire system from freezing. When the temperature of the water flow in the system drops to a certain value, the unit will heat the water by using the heat pump or the electric heating tap or the backup heater. The anti-freeze protection function will turn off only when the temperature increases to a certain value.

When unit lose the power, the above function will not active to protect the unit from freezing.

⚠ CAUTION

When the unit is not running for a long time,make sure the unit is powered on all the time. If the unit should be cut off the power, make sure the water in the piping of the system should be drained completely to avoid the water pump and piping system being damaged by freezing. The power of the unit also needs tc be cut off after water in the system is drained.

Water may enter into the flow switch and cannot be drained out, it may freeze when the temperature is low enough. The flow switch should be removed and dried, then can be reinstalled in the unit.

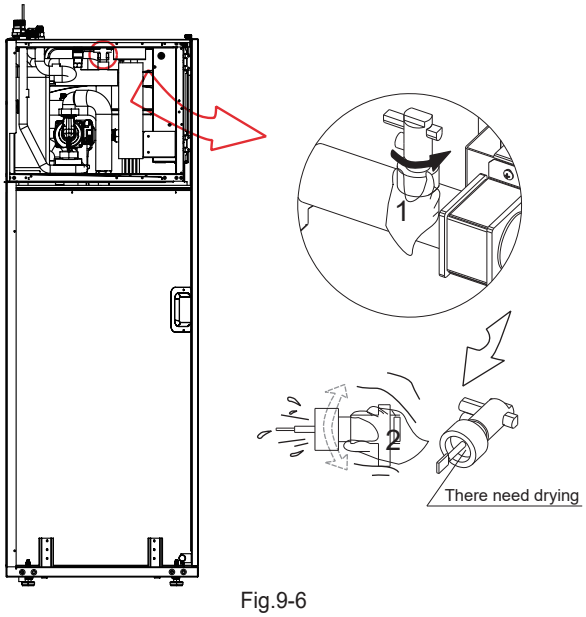


Fig.9-6

NOTE

1.Counterclockwise rotation, remove the flow switch.
2.Dry the flow switch completely.

⚠ CAUTION

Be careful not to deform the unit's piping by using excessive force when connecting the piping.
Deforming the piping may lead to malfunction of heat pump.

If air, moisture or dust gets in the water loop, problems may occur. Therefore, always take into account the following when connecting the water loop:

- Use clean pipes only.
- Hold the pipe end downwards when removing burrs.
- Cover the pipe end when inserting it through a wall to prevent dust and dirt entering.
- Use a good thread sealant for sealing the connections. The sealing must be able to withstand the pressures and temperatures of the system.
- When using non-copper metallic piping, be sure to insulate two kind of materials from each other to prevent galvanic corrosion.
- As copper is a soft material, use appropriate tools for connecting the water loop. Inappropriate tools will cause damage to the pipes.

NOTE

The unit is only to be used in a closed water system. Application in an open water loop can lead to excessive corrosion of the water piping:

- Never use Zn-coated parts in the water loop. Excessive corrosion of these parts may occur as copper piping is used in the unit's internal water loop.
- When using a 3-way valve in the water loop. Preferably choose a ball type 3-way valve to guarantee full separation between the domestic hot water and floor heating water loop.
- When using a 3-way valve or a 2-way valve in the water loop. The recommended maximum changeover time of the valve should be less than 60 seconds.

9.8 Water

NOTE

- Circulators function well exclusively with clean and high-quality tap water.
- Risk of material damage due to poor-quality water.
- The most frequent factors that can affect circulators and the system are oxygen, limescale, sludge, acidity level and other substances (including chlorides and minerals).
- In addition to the quality of water, installation also plays an important role. The heating system must be airtight. Choose materials that are not sensitive to oxygen diffusion (risk of corrosion...).

Characteristics of the water

- Compliant with local regulations.
- Langelier Index (LI) between 0 and + 0.4.
- Within the limits indicated in the chart.

Water quality must be checked by qualified personnel.

Hardness

If the water is hard, install a system suitable to preserve the unit from harmful deposits and limestone formation.

NOTE

If necessary, fit a water softener to reduce water hardness.

Cleanliness

Before connecting the water to the unit, clean the system thoroughly with specific products effective to remove residues or impurities that may affect functioning. Existing systems must be free from sludge and contaminants and protected against buildups.

New systems

In case of new installations, it is essential to wash the entire installation (with the circulator uninstalled) before commissioning the central installation. This removes residues of the installation process (welding, waste, joint products...) and preservatives (including mineral oil). The system must then be filled with clean high-quality tap water.

Existing systems

If a new boiler or heat pump is installed on an existing heating system, the system must be rinsed to avoid the presence of particles, sludge and waste. The system must be drained before installing the new unit. Dirt can be removed only with a suitable water flow. Each section must then be washed separately.

Particular attention must also be paid to “blind spots” where a lot of dirt can accumulate due to the reduced water flow. The system must then be filled with clean high-quality tap water. If, after rinsing, the quality of the water is still unsuitable, a few measures must be taken to avoid problems. An option to remove pollutants is to install a filter. Various types of filters are available. A mesh filter is designed to catch large dirt particles. This filter is usually placed in the part with the larger flow. A tissue filter is designed to catch the finer particles.

Water component for corrosion limit on Copper

PH	7.5 - 9.0	
Electric conductivity	100 - 500	µS/cm
Total Hardness	4.5 – 8.5	dH
Max. quantity glycol	40	%
Sulfate ions (SO_4)	< 50	ppm
Alkalinity (HCO_3)	70 - 300	ppm
Chloride ions (Cl-)	< 50	ppm
Phosphates (PO_4)	< 2.0	ppm
NH_3	< 0.5	ppm
Iron (Fe)	< 0.3	ppm
Manganese (Mn)	< 0.05	ppm
Sulfate ions (S)	None	
Ammonium ions (NH_4)	None	
Silica (SiO_2)	< 30	ppm
CO_2	< 50	ppm
Oxygen content	< 0.1	ppm
Sand	< 10 mg/L, 0.1 to 0.7 mm max diameter	
Ferrite hydroxide Fe_3O_4 (black)	Dose < 7.5 mg/L, 50 % of mass, with diameter < 10 µm	
Iron oxide Fe_2O_3 (red)	Dose < 7.5 mg/L, diameter < 1 µm	

Y-Type Strainer

Y-type strainer shall be installed.

- The function of the Y-type strainer.
- Used to filter impurities and particulate matter in water.
- Protect the heat exchanger from damage.
- Ensure the water flow switch operates correctly.
- Protect equipment such as water pumps, valves, and water meters from damage.

⚠ WARNING

Failure to install a Y-type strainer or installing an incorrect Y-type strainer can lead to damage to the heat exchanger, resulting in refrigerant leakage and serious consequences.

Installation Precautions for Y-type strainers:

Confirm Pressure

- Ensure that the operating pressure is within the specified range to avoid damage to the Y-type strainer due to excessive pressure. Must be cleaned before installation
- Before installing the Y-type strainer, it is essential to clean the interior of the Y-type strainer to ensure its smoothness and filtering effectiveness.

NOTE

Regular Cleaning

- After a period of use, the Y-type strainer will accumulate a certain amount of impurities and particulate matter, affecting the filtering effectiveness. Therefore, it is necessary to regularly clean the Y-type strainer to maintain its flow capacity.

Clean or replace the Y-type strainer

- Close the valves on both sides of the Y-type strainer, relieve the pressure, and then begin cleaning by emptying the impurities and cleaning or replacing the mesh filter.
- When replacing the mesh filter, it is necessary to select a mesh filter that matches the specifications and model of the Y-type strainer to ensure filtering effectiveness and flow capacity.

10 OVERVIEW OF THE UNIT

10.1 Filling water

10.1.1 Filling the water circuit

- Connect the water supply to the filling valve and open the valve.
- Make sure all the automatic air purge valves are open(at least 2 turns).
- Filling with water until the manometer(field supply) indicates a pressure of approximately 2.0 bar. Remove air in the circuit as much as possible using the automatic air purge valves.

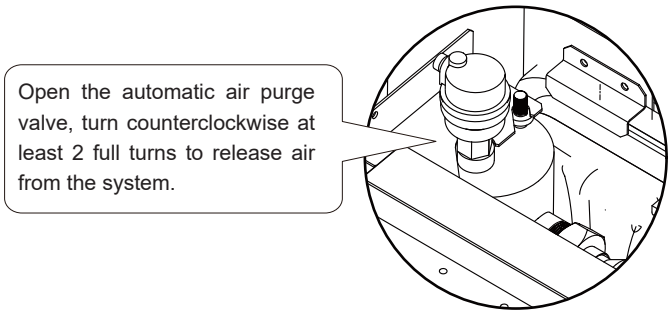


Fig.10-1

☞NOTE

During filling, it might not be possible to remove all air in the system. Remaining air will be removed through the automatic air purge valve during the first operating hours of the system. Topping up the water afterwards might be required.

- The water pressure indicated on the manometer will vary depending on the water temperature (higher pressure at higher water temperature). However, at all times water pressure should remain above 0.5 bar to avoid air entering the circuit.
- The unit might drain-off too much water through the pressure relief valve.
- Water quality should be complied with EN 98/83 EC Directives.
- Detailed water quality condition can be found in EN 98/83 EC Directives.

☞NOTE

- In most applications this minimum water volume will be satisfactory.
- In critical processes or in rooms with a high heat load though, extra water might be required.
- When circulation in each space heating loop is controlled by remotely controlled valves, it is important that this minimum water volume is kept even if all the valves are closed.
- if each space heating (cooling loop is controlled by the valves, the overpressure bypass valve(field supply) should be mounted between the heating(cooling) loops.

10.1.2 Filling the domestic hot water tank

1.Open every hot water tap in turn to purge air from the pipes of the system.
2.Open the cold water supply valve.
3.Close all water taps after all air is purged.
4.Check for water leakage.
5.Manually operate the field-installed pressure relief valve to ensure a free water flow through the discharge pipe.

⚠CAUTION

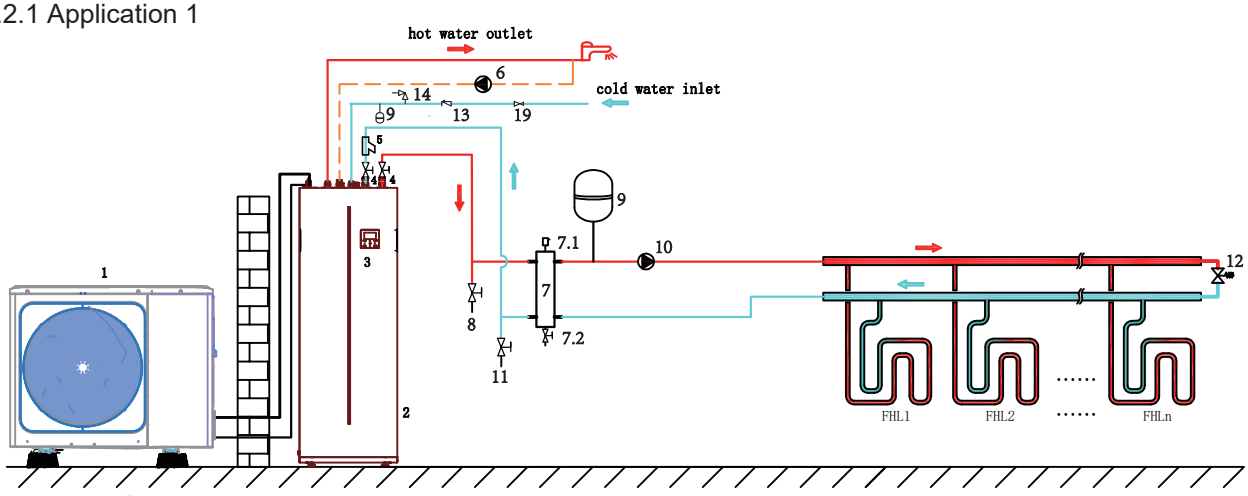
- Cold water inlet pressure should be less than 1.0 MPa. Expansion vessel and safety valve (field supply, protection pressure is 1.0 MPa) must be installed.
- Warning and Water Quality Directive and Groundwater: This product is designed to comply with the European Water Quality Directive 98/83/EC amended by 2015/1787/EU. The lifespan of the product is not guaranteed in the case of the use of groundwater, such as spring water or well water, the use of tap water when salt or other impurities are contained, nor in areas of acidic water quality. Maintenance and warranty costs related to these cases are the customer's responsibility.

10.2 Typical applications

⚠ CAUTION

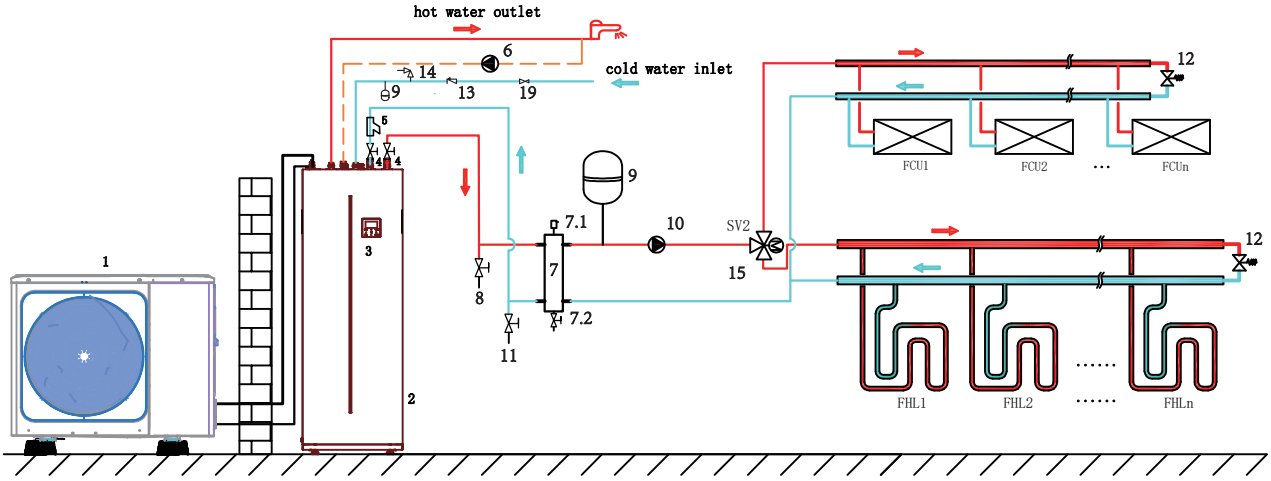
- If a potable water source is used as the equipment's water supply, a backsiphonage prevention device should be installed between the potable water source and the equipment.
- To avoid backsiphonage, it is required to install a non-return valve on the water inlet of the domestic hot water tank or water loop in accordance with the applicable legislation.

10.2.1 Application 1



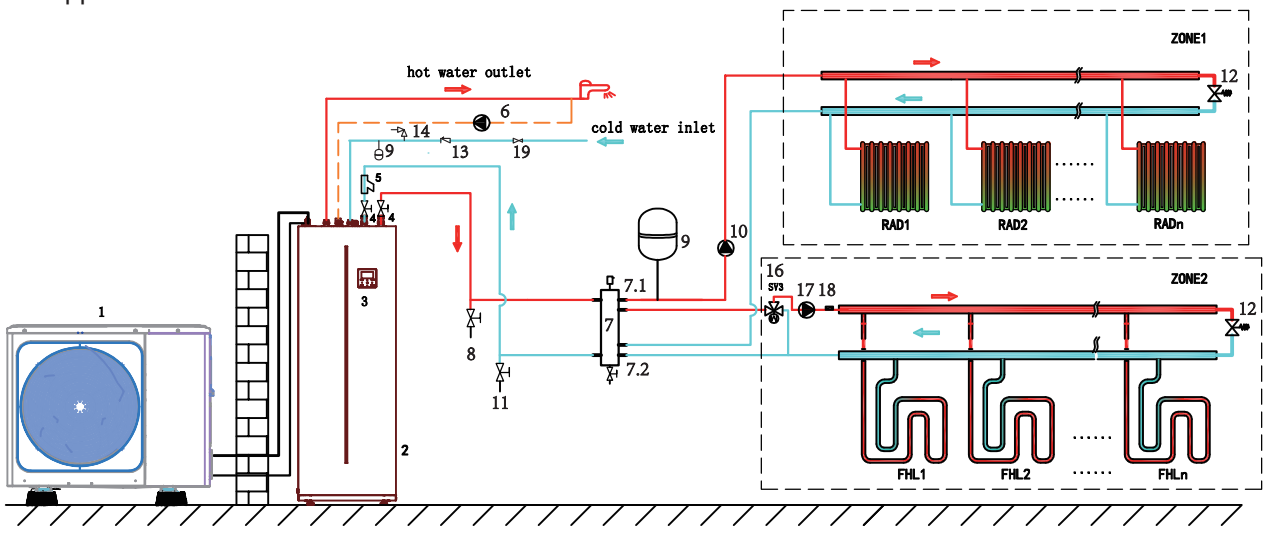
One zone for floor heating loops

10.2.2 Application 2



One zone for floor heating loops and fan coil

10.2.3 Application 3



Double zone for floor heating loops and radiators

Code	Assembly unit	Code	Assembly unit
1	Outdoor unit	10	P_o: Outside circulation pump (Field supply)
2	Indoor unit with tank	11	Filling valve (Field supply)
3	User interface	12	Bypass valve (Field supply)
4	Shut-off valve (Field supply)	13	Non-return valve（Field supply）
5	Y-Type Strainer (Accessory)	14	Pressure relief valve (Field supply)
6	P_d: DHW circulation pump (Field supply)	15	SV2: 3 -way valve (Field supply)
7	Hydraulic separator	16	SV3: 3 -way valve (Field supply)
7.1	Automatic air purge valve	17	P_c: zone2 circulation pump (Field supply)
7.2	Drain valve	18	Tw2： zone 2 temperature sensor（optional）
8	Drain valve (Field supply)	19	Pressure reduction valve （Field supply）
9	Expansion vessel (Field supply)		

Space heating/cooling

One zone application

1)When the unit is ON, P_o keeps running, if unit is OFF, P_o stops running

2) When the unit cooling mode is ON, SV2 keeps OFF

3) When the unit heating mode is ON, SV2 keeps ON,

Double zone application

When zone 1 is ON, P_o keeps running, if zone 1 is OFF, P_o stops running

When zone 2 is ON, P_c keeps running， SV3 switches between ON and OFF according to the Tw2 sensor, if zone 2 is OFF, SV3 keeps OFF, P_c stops running.

The floor heating loops require a lower water temperature in heating mode compared to Radiators or fan coil. To achieve these two set points, a mixing station is used to adapt the water temperature according to requirements of the floor heating loops. The radiators are directly connected to the unit water loop and the floor heating loops are after the mixing station. The mixing station includes SV3,P_c and Tw2， can be controlled by indoor unit.

Domestic water heating

The ON/OFF signal and target tank water temperature (T5S) are set on the user interface.

P_o/P_c stops running as long as the unit is ON for domestic water heating.

NOTE

1. Install air purge valves at all local high points
2. Drain valve must be installed at the lowest position of the piping system.
3. A pressure relief valve with an opening pressure of maximum 10 bar (= 1 MPa) must be installed on the domestic cold water inlet connection in accordance with the applicable legislation.
4. To avoid metal particles damage the unit, It is recommended to install a magnetic filter before the Y-type strainer.

11 FIELD WIRING

⚠ WARNING

- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The appliance shall be installed in accordance with national wiring regulations. .
- A main switch or other means of disconnection, having a contact separation in all poles, must be incorporated in the fixed wiring in accordance with relevant local laws and regulations. Switch off the power supply before making any connections. Use only copper wires. Never squeeze bundled cables and make sure they do not come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections. All field wiring and components must be installed by a licensed electrician and must comply with relevant local laws and regulations.
- The field wiring must be carried out in accordance with the wiring diagram supplied with the unit and the instructions given below.
- Be sure to use a dedicated power supply. Never use a power supply shared by another appliance.
- Be sure to establish a earth. Do not earth the unit to a utility pipe, surge protector, or telephone earth. Incomplete earthing may cause electrical shock.
- Be sure to install a earth fault circuit interrupter (30 mA). Failure to do so may cause electrical shock.
- Be sure to install the required fuses or circuit breakers.

11.1 Precautions on electrical wiring work

- Fix cables so that cables do not make contact with the pipes (especially on the high pressure side).
- Secure the electrical wiring with cable ties as shown in figure so that it does not come in contact with the piping, particularly on the high -pressure side.
- Make sure no external pressure is applied to the terminal connectors.
- When installing the earth fault circuit interrupter make sure that it is compatible with the inverter (resistant to high frequency electrical noise) to avoid unnecessary opening of the earth fault circuit interrupter.

⚠ CAUTION

The earth fault circuit interrupter must be a high- speed type breaker of 30 mA (< 0.1 s).

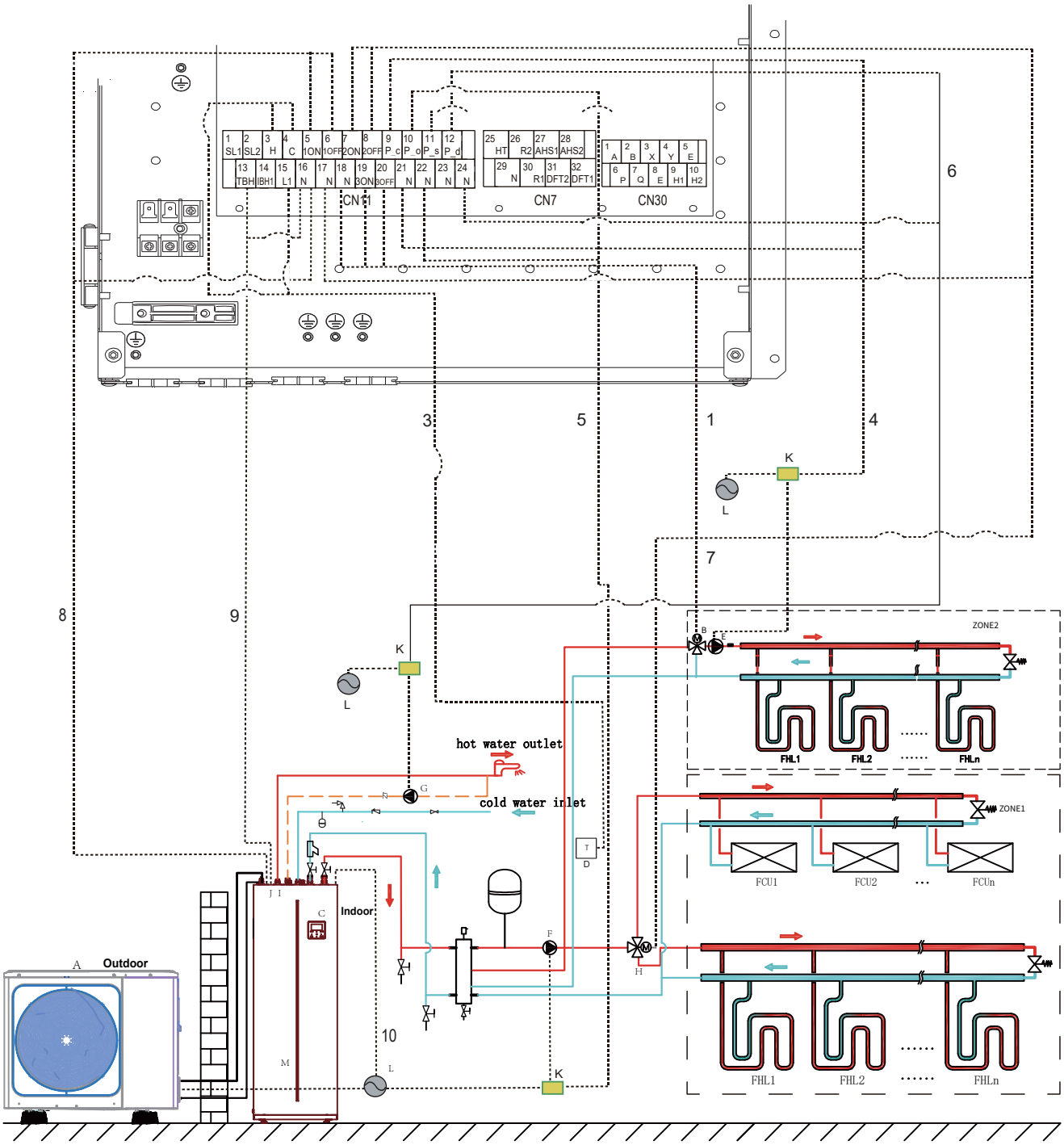
☞ NOTE

- Maximum length of communication wirings is 50 m.
- Power cords and communication wiring must be laid out separately, they can not be placed in the same conduit.
- Otherwise, it may lead to electromagnetic interference. Power cords and communication wirings should not come in contact with the refrigerant pipe so as to prevent the high temperature pipe from damaging the wires.
- Communication wirings must use shielded lines. Including indoor unit to outdoor unit PQE line ,indoor unit to controller ABXYE line.

- This unit is equipped with an inverter. Installing a phase advancing capacitor not only will reduce the power factor improvement effect, but also may cause abnormal heating of the capacitor due to high-frequency waves. Never install a phase advancing capacitor as it could lead to an accident.
- Equipment must be earthed.
- All high-voltage external load, if it is metal or a earthed port, must be earthed.
- All external load current is needed less than 0.2 A, if the single load current is greater than 0.2 A, the load must be controlled through AC contactor.

11.1.1 Wiring overview

The illustration below gives an overview of the required field wiring between several parts of the installation. Refer also to "10.6 Typical application".



One zone for floor heating loops and fan coil

Code	Assembly unit	Code	Assembly unit
A	Outdoor unit	H	SV2: 3-way valve (field supply)
B	SV3: 3-way valve (field supply)	I	SV1: 3-way valve for domestic hot water tank (field supply)
C	User interface	J	Booster heater
D	Room thermostat (field supply)	K	Contactor
E	P_c: Zone 2 pump (field supply)	L	Power supply
F	P_o: Outside circulation pump (field supply)	M	Indoor unit
G	P_d: DHW pump (field supply)		

Item	Description	AC/DC	Required number of conductors		Maximum running current
1	SV3: 3-way valve control cable	AC	3		200 mA(a)
2	User interface cable	AC	5		200 mA
3	Room thermostat cable	AC	2		200 mA(a)
4	Zone 2 pump control cable	AC	2		200 mA(a)
5	Outside circulation pump control cable	AC	2		200 mA(a)
6	DHW pump control cable	AC	2		200 mA(a)
7	SV2: 3-way valve control cable	AC	3		200 mA(a)
8	SV1: 3-way valve control cable	AC	3		200 mA(a)
9	Booster heater control cable	AC	2		200 mA(a)
10	Power supply cable for indoor unit	AC	2 + EARTH	60 100 160 60 (3 kW heater) 100(3 kW heater) 160(3 kW heater)	0.4 A 0.4 A 0.4 A 13.5 A 13.5 A 13.5 A
			4 + EARTH	60 (9 kW heater) 100(9 kW heater) 160(9 kW heater)	13.3 A 13.3 A 13.3 A

(a) Minimum cable section AWG18 (0.75 mm ^{2}).
(b)The thermistor cable are delivered with the unit: if the current of the load is large, an AC contactor is needed.

⚠ CAUTION

Please use H07RN-F for the power cables.

- Equipment must be earthed.
- All high-voltage external load, if it is metal or a grounded port, must be earthed.
- All external load current is needed less than 0.2 A, if the single load current is greater than 0.2 A, the load must be controlled through AC contactor.

  "AHS1" "AHS2", "A1" "A2", "R1" "R2" and "DFT1" "DFT2" wiring terminal ports provide only the switch signal.
- Please refer to image of 11.6 to get the ports position in the unit.
- Plate heat exchanger E-Heating tape and Flow switch E-Heating tape share a control port.

Field wiring guidelines

- Most field wiring on the unit is to be made on the terminal block inside the switch box. To gain access to the terminal block, remove the switch box service panel.

⚠ WARNING

Switch off all power including the unit power supply and backup heater and domestic hot water tank power supply (if applicable) before removing the switch box service panel.

- Fix all cables using cable ties.
- A dedicated power circuit is required for the backup heater.
- Installations equipped with a domestic hot water tank (field supply) require a dedicated power circuit for the booster heater. Please refer to the domestic hot water tank Installation & Owner's Manual.
- Lay out the electrical wiring so that the front cover does not rise up when doing wiring work and attach the front cover securely.
- Follow the electric wiring diagram for electrical wiring works (the electric wiring diagrams are located on the rear side of door 2.
- Install the wires and fix the cover firmly so that the cover may be fit in properly.

11.2 Precautions on wiring of power supply

- Use a round crimp-style terminal for connection to the power supply terminal board. In case it cannot be used due to unavoidable reasons, be sure to observe the following instructions.
  - Do not connect different gauge wires to the same power supply terminal. (Loose connections may cause overheating.)
  - When connecting wires of the same gauge, connect them according to the figure below.

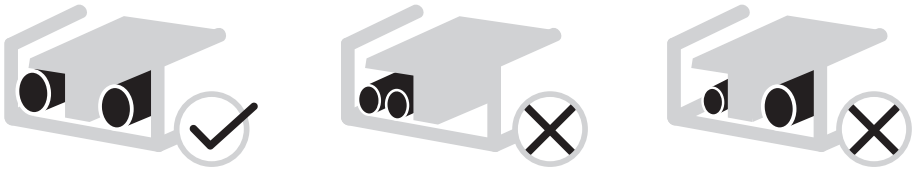


Fig. 11-1

- Use the correct screwdriver to tighten the terminal screws. Small screwdrivers can damage the screw head and prevent appropriate tightening.
- Over-tightening the terminal screws can damage the screws.
- Attach a earth fault circuit interrupter and fuse to the power supply line.
- In wiring, make certain that prescribed wires are used, carry out complete connections, and fix the wires so that outside force cannot affect the terminals.

11.3 Safety device requirements

1. Select the wire diameters(minimum value) individually for each unit based on the table below.

2. Select circuit breaker that having a contact separation in all poles not less than 3 mm providing full disconnection, where MFA is used to select the current circuit breakers and residual current operation breakers:

System			Power Current			IWPM	
		Hz	Voltage (V)	MCA (A)	MFA (A)	kW*	FLA (A)
Standard	100/190(3 kW heater)	50	220-240 V~	16.9	20	0.087	0.66
	100/240(3 kW heater)	50	220-240 V~	16.9	20	0.087	0.66
	160/240(3 kW heater)	50	220-240 V~	16.9	20	0.087	0.66
Optional	100/190(6 kW heater)	50	220-240 V~	33.1	40	0.087	0.66
	100/240(6 kW heater)	50	220-240 V~	33.1	40	0.087	0.66
	160/240(6 kW heater)	50	220-240 V~	33.1	40	0.087	0.66
	100/190(9 kW heater)	50	380-415 V 3N~	16.9	20	0.087	0.66
	100/240(9 kW heater)	50	380-415 V 3N~	16.9	20	0.087	0.66
	160/240(9 kW heater)	50	380-415 V 3N~	16.9	20	0.087	0.66

NOTE

MCA : Min. Circuit Amps. (A)
MFA : Max. Fuse Amps. (A)
IWPM: Indoor Water Pump Motor
FLA : Full Load Amps. (A)
* : Rated Motor Output

11.4 Before connecting the wiring

1.Remove the bolt in the lower left corner of indoor unit.
2.Open the front panel.
3.Remove the cover of the control box.

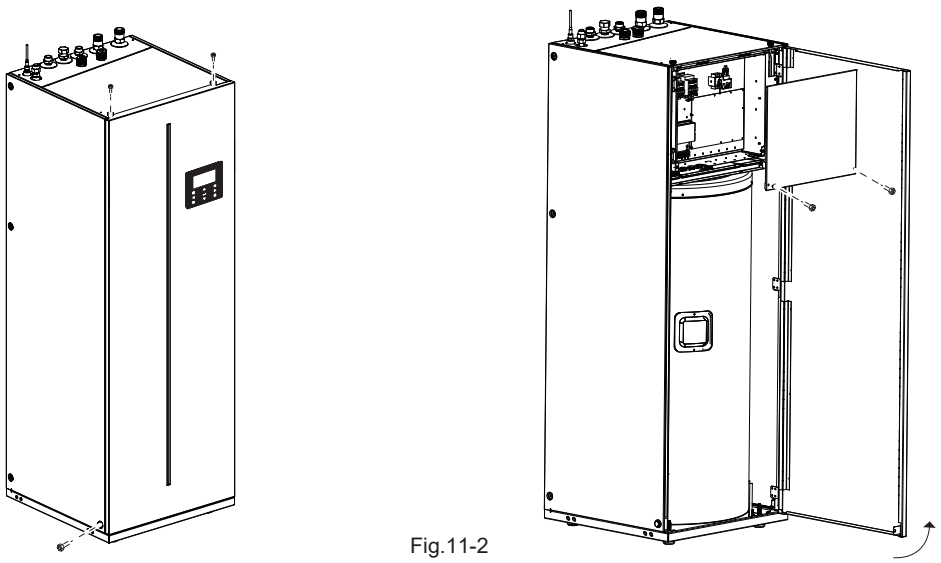


Fig.11-2

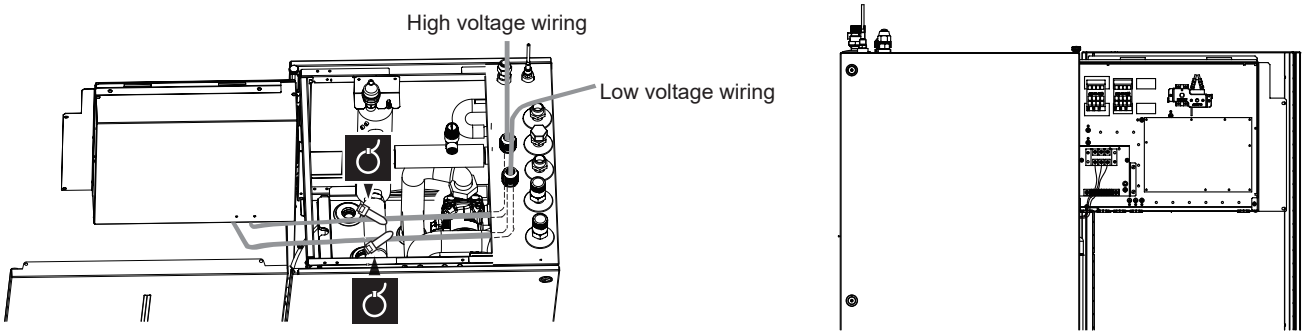
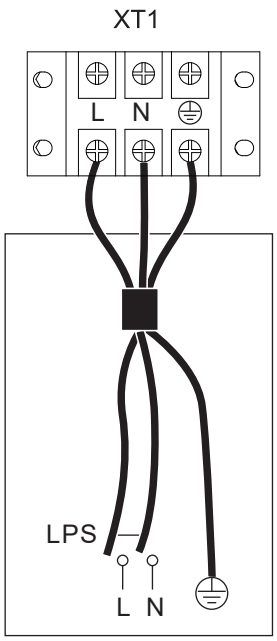


Fig.11-3

11.5 Connecting the main power supply

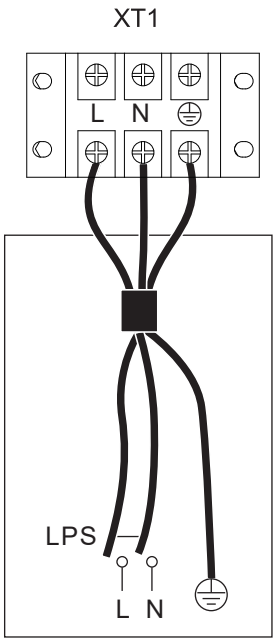
NOTE

Leakage Protection Switch must be installed to the Power Supply of the unit.



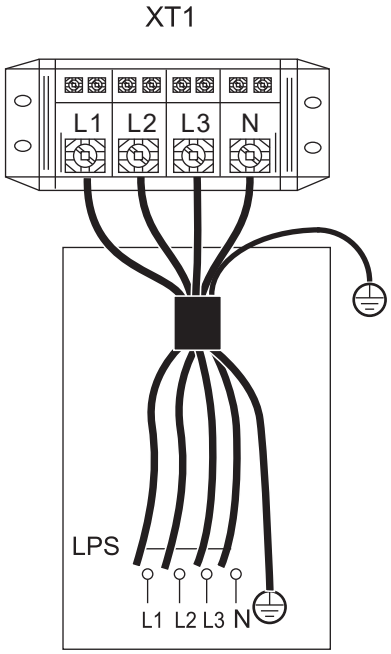
Indoor Unit
Power Supply

1-phase 3 kW backup heater
standard



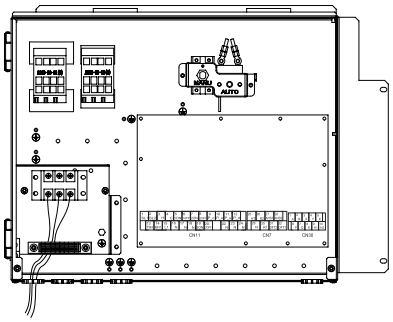
Indoor Unit
Power Supply

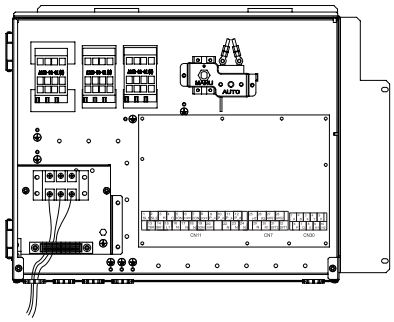
1-phase 6 kW backup heater
optional

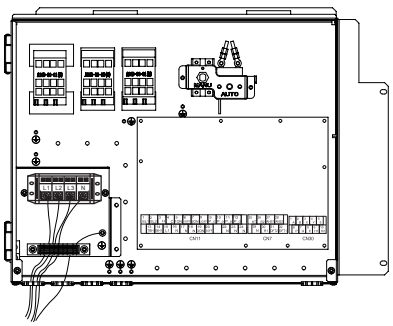


Indoor Unit
Power Supply

3-phase 9 kW backup heater
optional





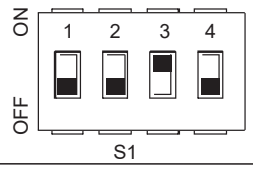
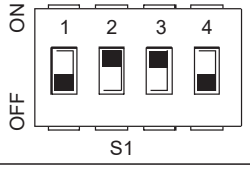
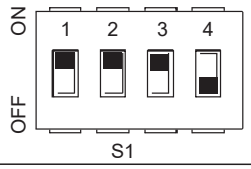


Unit	3 kW-1 Ph	6 kW-1 Ph	9 kW-3 Ph
Wiring size(mm^2)	4.0	8.0	4.0

- Stated values are maximum values (see electrical data for exact values).

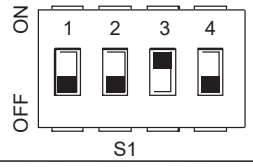
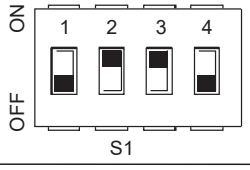
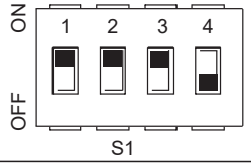
NOTE

The earth fault circuit interrupter must be a high-speed type breaker of 30 mA (< 0.1 s). Flexible cord must meet 60245IEC(H05VV-F) standards.

Mode selection of 3-phase 3/6/9 kW backup heater		
Option 1/3 kW	Option 2/6 kW	Option 3/9 kW
		

NOTE

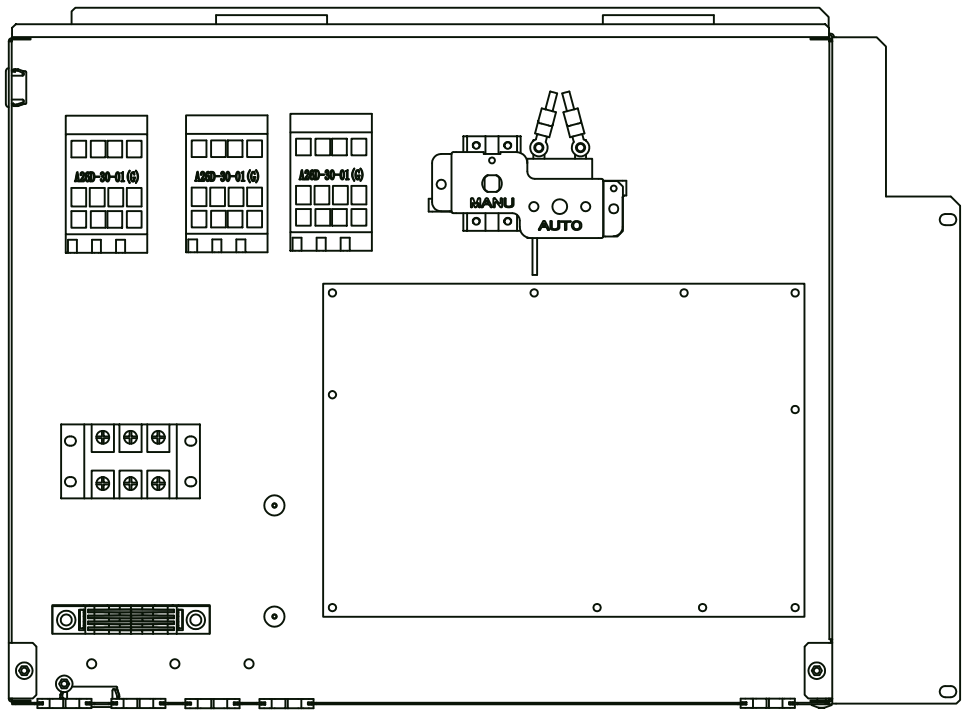
The default of backup heater is as option 3 (for 9 kW backup heater). If 3 kW or 6 kW backup heater is needed, please ask professional installer to change the Dip switch S1 to option 1(for 3 kW backup heater) or option 2(for 6 kW backup heater), refer to 12.1.1 Function Setting.

Mode selection of 1-phase 2/4/6 kW backup heater		
Option 1/2 kW	Option 2/4 kW	Option 3/6 kW
		

NOTE

The default of backup heater is as option 3 (for 6 kW backup heater). If 2 kW or 4 kW backup heater is needed, please ask professional installer to change the Dip switch S1 to option 1(for 2 kW backup heater) or option 2(for 4 kW backup heater), refer to 12.1.1 Function Setting.

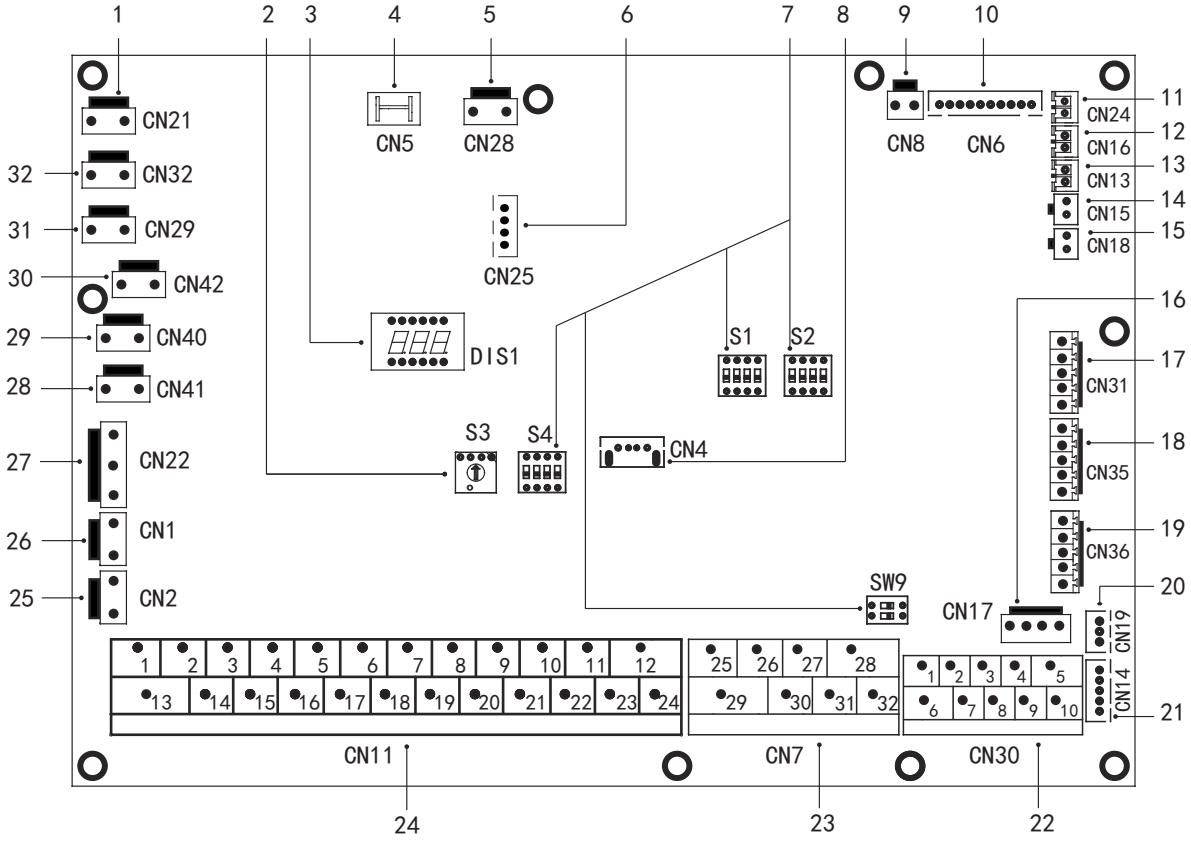
11.6 Electronic control box



NOTE

The picture is only for reference, please refer to the actual product.

11.6.1 Main control board of indoor unit



Order	Port	Code	Assembly unit
1	CN21	POWER	Port for power supply
2	S3	/	Rotary dip switch
3	DIS1	/	Digital display
4	CN5	GND	Port for earth
5	CN28	PUMP	Port for variable speed pump power input
6	CN25	DEBUG	Port for IC programming
7	S1,S2,S4,SW9	/	Dip switch
8	CN4	USB	Port for USB programming
9	CN8	FS	Port for flow switch
10	CN6	T2	Port for temperature sensor of refrigerant liquid side temperature of indoor unit (heating mode)
		T2B	Port for temperature sensor of refrigerant gas side temperature of indoor unit (cooling mode)
		TW_in	Port for temperature sensor of inlet water temperature of plate heat exchanger
		TW_out	Port for temperature sensor of outlet water temperature of plate heat exchanger
		T1	Port for temperature sensor of final outlet water temperature of indoor unit
11	CN24	Tbt1	Port for upper temp. sensor of balance tank
12	CN16	Tbt2	Port for lower temp. sensor of balance tank
13	CN13	T5	Port for domestic hot water tank temp. sensor
14	CN15	Tw2	Port for zone 2 temp.sensor of outlet water
15	CN18	Tsolar	Reserved
16	CN17	PUMP_BP	Port for variable speed pump communication
17	CN31	HT	Control port for room thermostat (heating mode)
		COM	Power port for room thermostat
		CL	Control port for room thermostat (cooling mode)
18	CN35	SG	Port for smart grid (grid signal)
		EVU	Port for smart grid (photovoltaic signal)

Order	Port	Code	Assembly unit
19	CN36	M1 M2	Port for remote switch
		T1 T2	Port for thermostat transfer board
20	CN19	P Q	Communicate port between indoor unit and outdoor unit
21	CN14	A B X Y E	Port for communication with the wired controller
22	CN30	1 2 3 4 5	Port for communication with the wired controller
		6 7	Communicate port between indoor unit and outdoor unit
		9 10	Port for Internal machine Parallel
23	CN7	26 30/31 32	Compressor run/Defrost run
		25 29	Port for antifreeze E-heating tape(external)
		27 28	Port for additional heat source
24	CN11	1 2	Reserved
		3 4 15	Port for room thermostat
		5 6 16	Port for SV1(3-way valve)
		7 8 17	Port for SV2(3-way valve)
		9 21	Port for zone 2 pump
		10 22	Port for outside circulation pump
		11 23	Reserved
		12 24	Port for DHW pipe pump
		13 16	Control port for tank booster heater
		14 17	Control port for internal backup heater 1
		18 19 20	Port for SV3(3-way valve)
25	CN2	TBH_FB	Feedback port for external temperature switch(shorted in default)
26	CN1	IBH1/2_FB	Feedback port for temperature switch (shorted in default)
27	CN22	IBH1	Control port for internal backup heater 1
		IBH2	Reserved
		TBH	Control port for tank booster heater
28	CN41	HEAT8	Port for anti-freeze electric heating tape(internal)
29	CN40	HEAT7	Port for anti-freeze electric heating tape(internal)
30	CN42	HEAT6	Port for anti-freeze electric heating tape(internal)
31	CN29	HEAT5	Port for anti-freeze electric heating tape(internal)
32	CN32	IBH0	Port for backup heater

11.7 Refrigerant pipework

For all guidelines, instructions and specifications regarding refrigerant pipework between the indoor unit and outdoor unit, please refer to Installation and owner's manual (M-thermal split outdoor unit)"

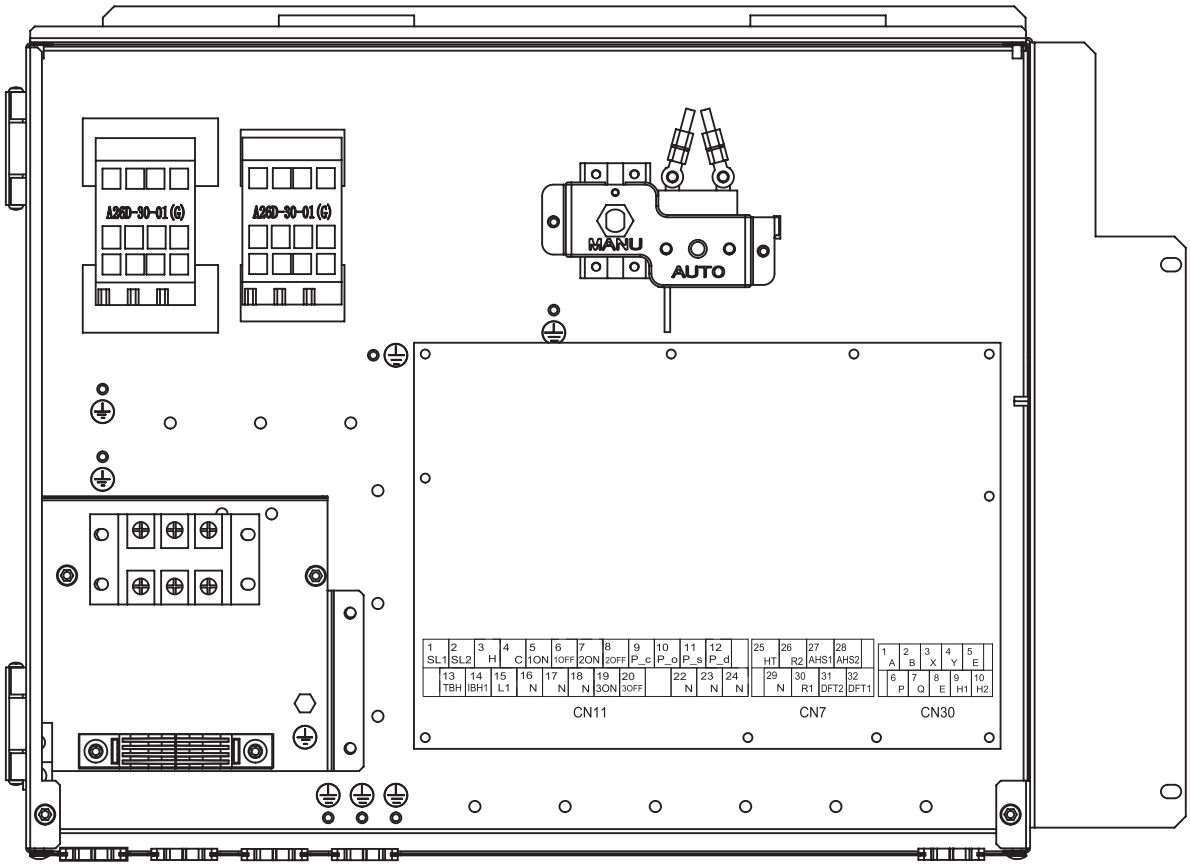
⚠ CAUTION

When connecting the refrigerant pipes, always use two wrenches/spanners for tightening or loosening nuts! Failure to do so can result in damaged piping connections and leaks.

NOTE

- The appliance contains fluorinated greenhouse gases. Chemical name of the gas: R32.
- Fluorinated greenhouse gases are contained in hermetically sealed equipment.
- An electrical switchgear has a tested leakage rate of less than 0.1 % per year as set out in the technical specification of the manufacturer.

11.8 Connecting for other components



	Print		Connect to
CN11	1	SL1	Reserved
	2	SL2	
	3	H	Room thermostat input (high voltage)
	4	C	
	15	L1	
	5	1ON	SV1(3-way valve) (connected in factory)
	6	1OFF	
	16	N	
	7	2ON	SV2(3-way valve)
	8	2OFF	
	17	N	
	9	P_c	Pumpc(zone2 pump)
	21	N	
	10	P_o	Outside circulation pump /zone1 pump
	22	N	
	11	P_s	Reserved
	23	N	
	12	P_d	DHW pipe pump
	24	N	
	13	TBH	Unavailable
	16	N	
	14	IBH1	Internal backup heater 1
	17	N	
	18	N	SV3(3-way valve)
	19	3ON	
	20	3OFF	

	Print		Connect to
CN7	26	R2	Indicator light of unit operating status (field supply)
	30	R1	
	31	DFT2	Indicator light for defrost or alarm status(field supply)
	32	DFT1	
	25	HT	Antifreeze E-heating tape(field supply)
	29	N	
	27	AHS1	Unavailable
	28	AHS2	

	Print		Connect to
CN30	1	A	Wired controller (connected in factory)
	2	B	
	3	X	
	4	Y	
	5	E	
	6	P	Outdoor unit
	7	Q	
	8	E	
	9	H1	Internal cascaded machine
	10	H2	

Port provide the control signal to the load.Two kind of control signal port:

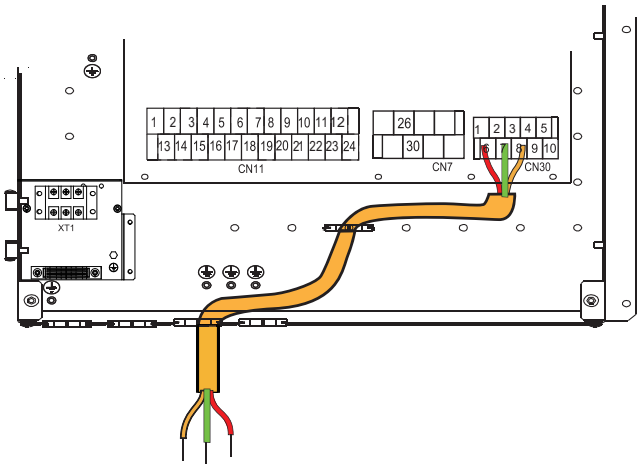
Type 1 : Dry connector without voltage.

Type 2 : Port provide the signal with 220-240 V~.

If the current of load is < 0.2 A, load can connect to the port directly.
If the current of load is > = 0.2 A, the AC contactor is required to connected for the load.

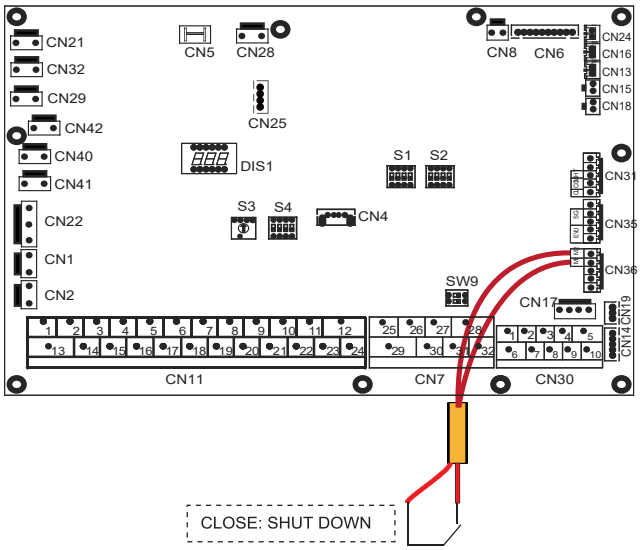
11.8.1 Connecting the communication

wiring to outdoor unit



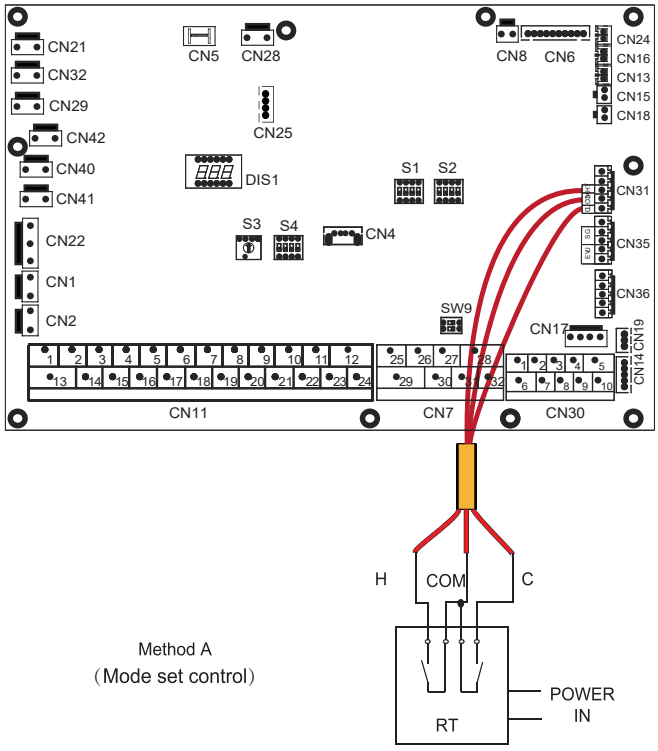
To outdoor unit

11.8.2 For remote shut down:



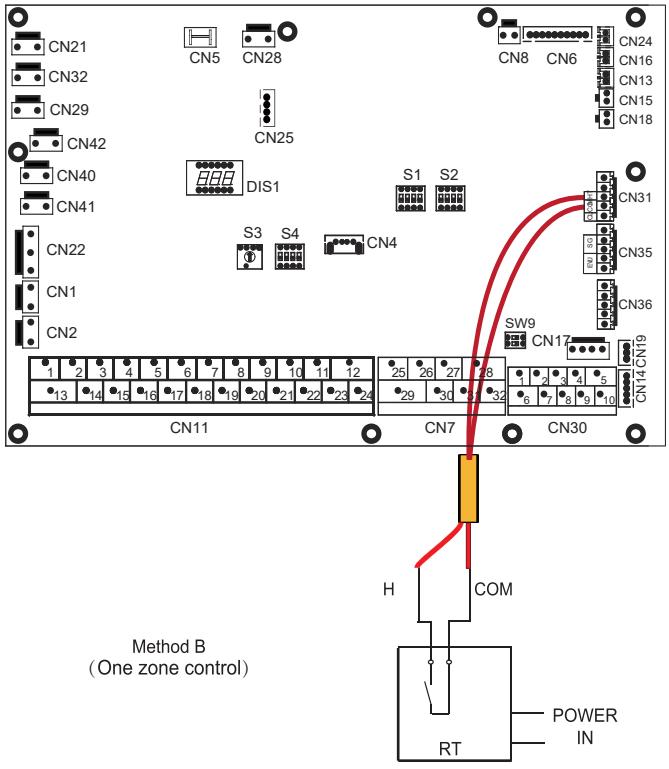
11.8.3 Room thermostat (Low voltage):

There are three methods for connecting the thermostat cable (as described in the pictures) and it depends on the application.

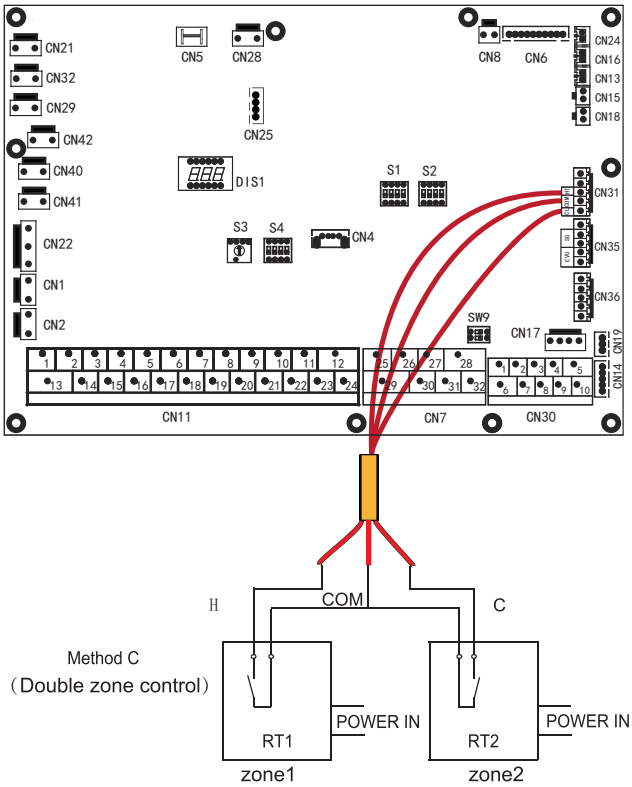


Method A
(Mode set control)

RT=Room Thermostat



Method B
(One zone control)



Method C
(Double zone control)

RT1=1# Room Thermostat

RT2=2# Room Thermostat

NOTE

The unit only sends an ON/OFF signal to the heater.

- **Method A (Mode set control)**

RT can control heating and cooling individually, like the controller for 4-pipe FCU. When the indoor unit is connected with the external temperature controller, user interface FOR SERVICEMAN set ROOM THE RMOSTAT to MODE SET:

A.1 When unit detect voltage is 12 V DC between CL and COM, the unit operates in the cooling mode.

A.2 When unit detect voltage is 12 V DC between HT and COM, the unit operates in the heating mode.

A.3 When unit detect voltage is 0 V DC for both side (CL-COM, HT-COM) the unit stop working for space heating or cooling.

A.4 When unit detect voltage is 12 V DC for both side(CL-COM, HT-COM)the unit working in cooling mode.

- **Method B(One zone control)**

RT provide the switch signal to unit. User interface FOR SERVICE MAN Set ROOM THERMOSTAT to ONE ZONE:

B.1 When unit detect voltage is 12 V DC between HT and COM, unit turns on.

B.2 When unit detect voltage is 0 V DC between HT and COM, unit turns off.

- **Method C (Double zone control)**

Indoor unit is connected with two room thermostat, while user interface FOR SERVICEMAN set ROOM THERMOSTAT to DOUBLE ZONE:

C.1 When unit detect voltage is 12 V DC between HT and COM one1 turn on. When unit detect voltage is 0 V DC between HT and COM, zone1 turn off.

C.2 When unit detect voltage is 12 V DC between CL and COM zone 2 tum on according to climate temp curve. When unit detect voltage is 0 V between CL and COM, zone2 tum off.

C.3 When HT-COM and CL-COM are detected as 0 V DC, unit turn off.

C.4 when HT-COM and CL-COM are detected as12VDC, both zone1 and zone 2 turn on.

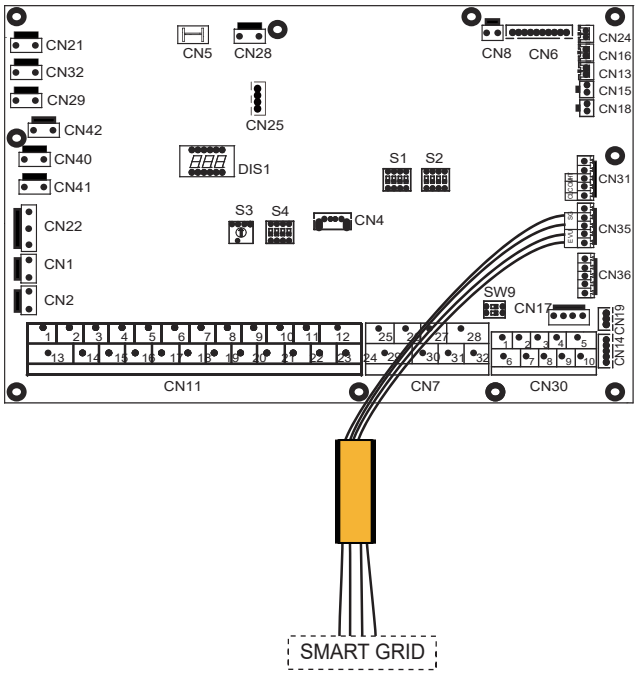
The wiring of the thermostat should correspond to the settings of the user interface. Refer to **ROOM THERMOSTAT.** Power supply of machine and room thermostat must be connected to the same Neutral Line . When ROOM THERMOSTAT is not set to NON. the indoor temperature sensor Ta can't be set to valid Zone 2 can only operate in heating mode, When cooling mode is set on user interface and zone 1 is OFF, "CL" in zone 2 closes, system still keeps 'OFF'. While installation, the wiring of thermostats for zone1 and zone 2 must be correct.

a) Procedure

Connect the cable to the appropriate terminals as shown in the picture.
Fix the cable with cable ties to the cable tie mountings to ensure stress relief.

11.8.4 For smart grid:

The unit has smart grid function, there are two ports on PCB to connect SG signal and EVU signal as following(SG is municipal power, and EVU is free power):



1) SG=ON, EVU=ON.

If DHW mode is set available:

●The heat pump will operate in DHW mode firstly.

●TBH is set available, If T5 < 69 ℃,TBH will be turned on forcibly (The heat pump and TBH can operate at the same time.); if T5≥ 70 ℃, TBH will be turned off.(DHW=Domestic Hot Water, T5S is the set water tank temperature.)

●TBH is set unavailable and IBH is set available for DHW mode, as long as T5 < 59 ℃,IBH will be turned on forcibly(The heat pump and TBH can operate at the same time.); if T5 ≥ 60 ℃, IBH will be turned off.

2) SG=OFF, EVU=ON.

If DHW mode is set available and DHW mode is set ON:

●The heat pump will operate in DHW mode firstly.

●If TBH is set available and DHW mode is set ON, If T5＜T5S-2, the TBH will be turned on (The heat pump and IBH can operate at the same time.); if T5 ≥ T5S+3, the TBH will be turned off.

●If TBH is set unavailable and IBH is set available for DHW mode ,If T5＜T5S-dT5_ON, IBH will be turned on (The heat pump and IBH can operate at the same time.); if T5 ≥ Min(T5S+3,60), the IBH will be turned off.

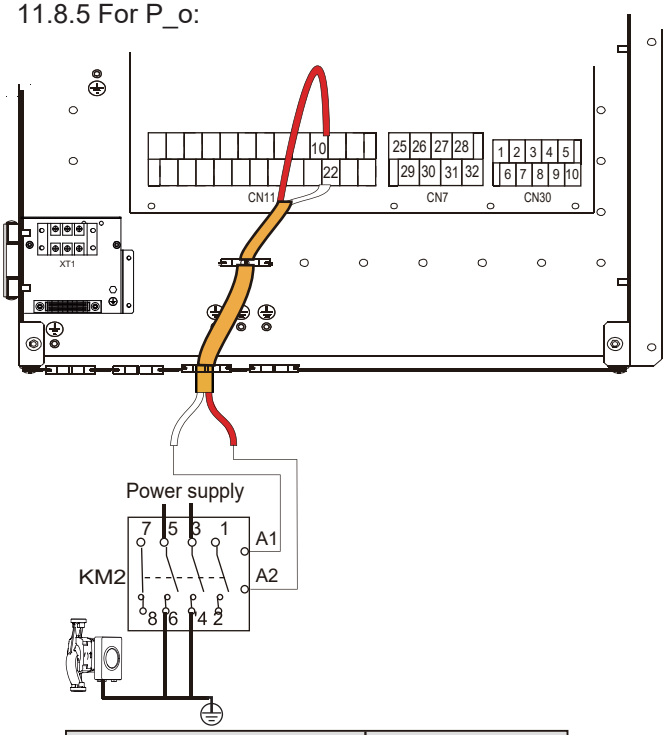
3) SG=OFF, EVU=OFF.

The unit will operate normally

4) SG=ON, EVU=OFF.

Heat pump,IBH, TBH will be turned off immediately.

11.8.5 For P_o:

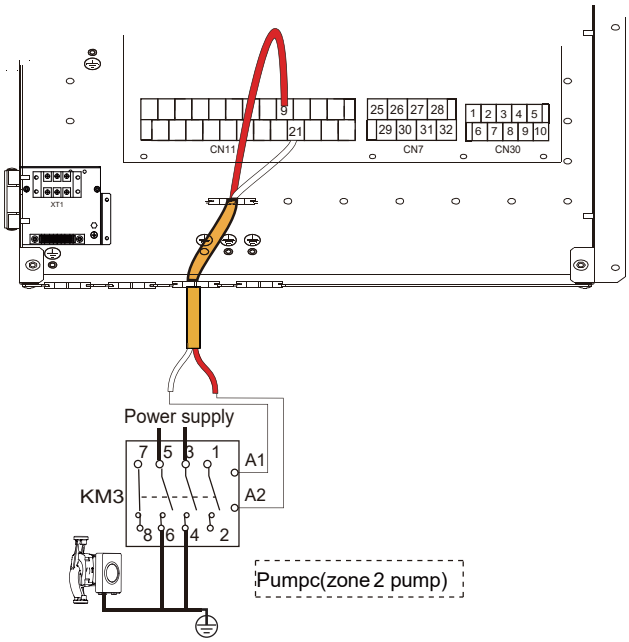


Voltage	220-240 V AC
Maximum running current(A)	0.2
Minimum wiring size(mm^2)	0.75
Control port signal type	Type 2

a) Procedure

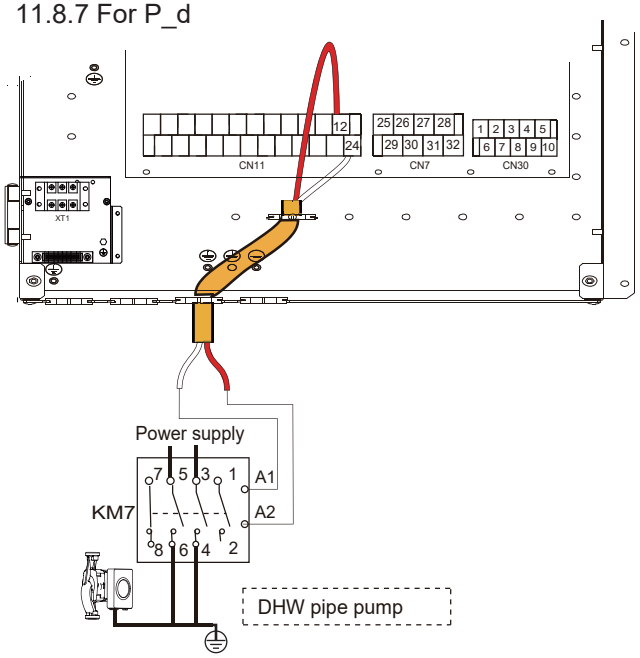
Connect the cable to the appropriate terminals as shown in the picture.
Fix the cable with cable ties to the cable tie mountings to ensure stress relief.

11.8.6 For P_c



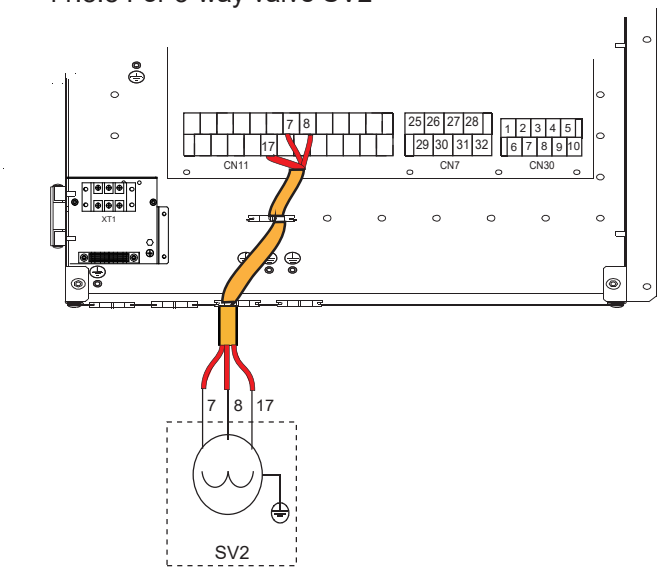
Voltage	220-240 V AC
Maximum running current(A)	0.2
Minimum wiring size(mm^2)	0.75
Control port signal type	Type 2

11.8.7 For P_d

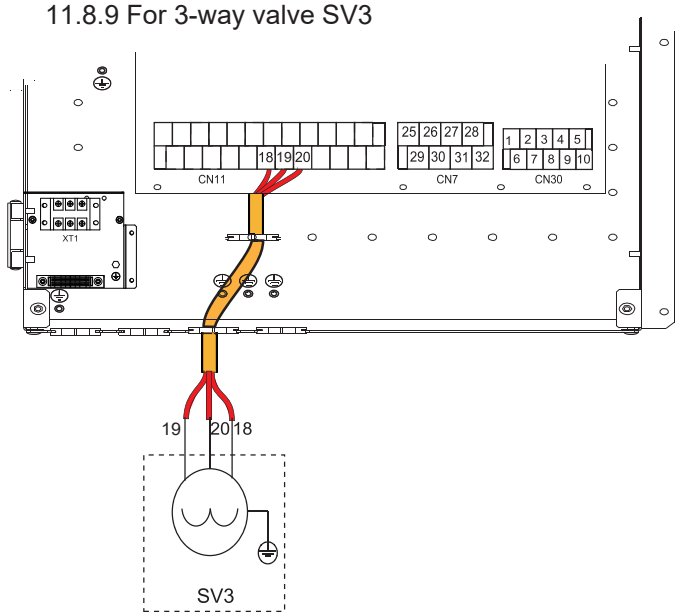


Voltage	220-240 V AC
Maximum running current(A)	0.2
Minimum wiring size(mm^2)	0.75
Control port signal type	Type 2

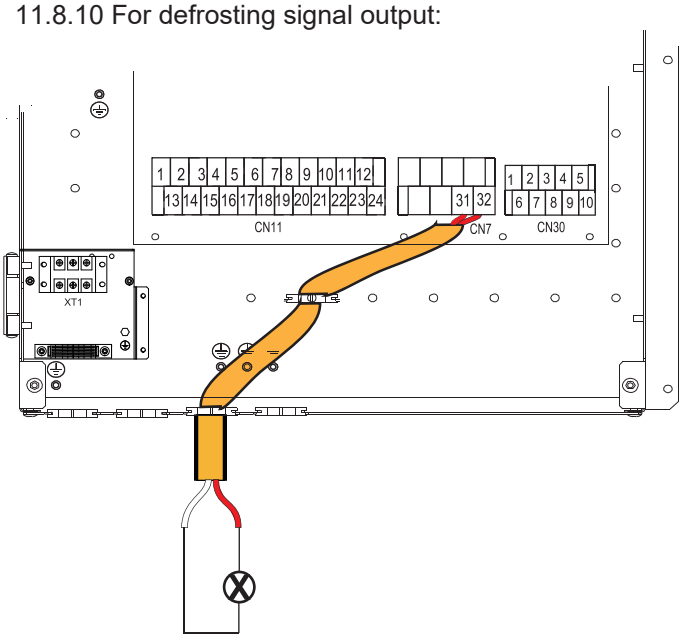
11.8.8 For 3-way valve SV2



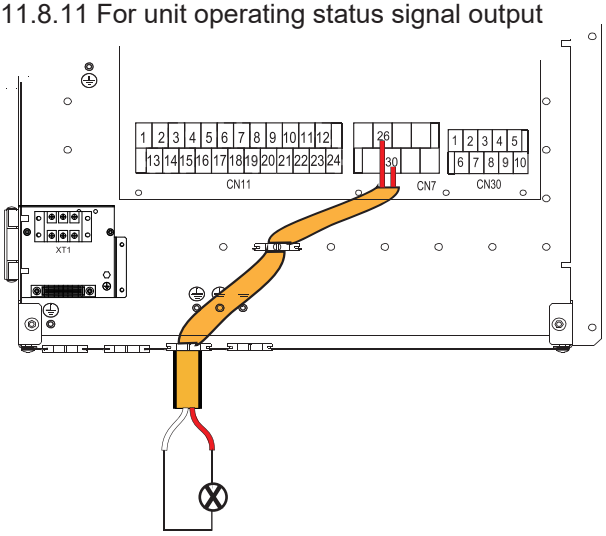
11.8.9 For 3-way valve SV3



11.8.10 For defrosting signal output:



11.8.11 For unit operating status signal output



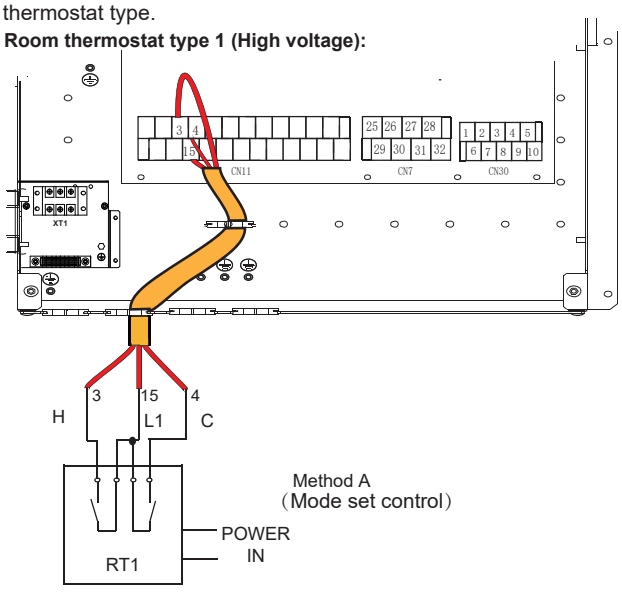
11.8.12 For room thermostat:

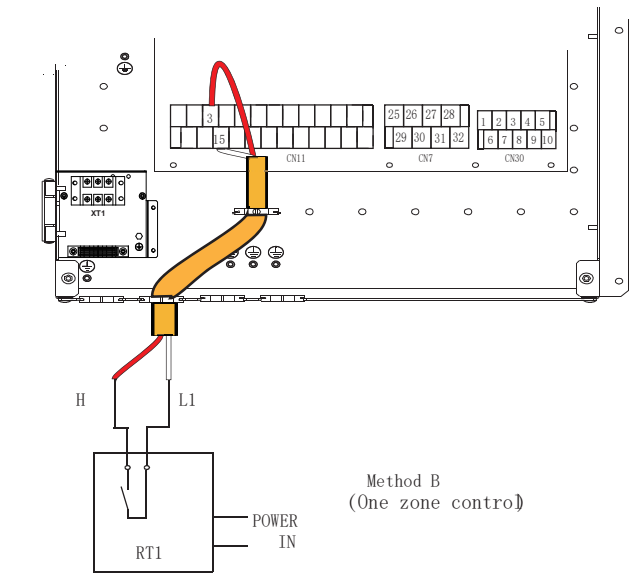
Room thermostat type 1(High voltage): "POWER IN" provide the working voltage to the RT, doesn't provide the voltage to the RT connector directly. Port "15 L1" provide the 220 V voltage to the RT connector. Port "15 L1" connect from the unit main power supply port L of 1- phase power supply.

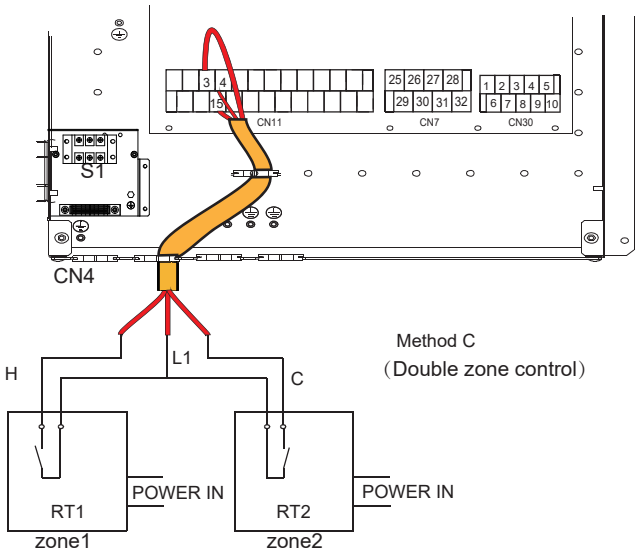
Room thermostat type 2(Low voltage) : "POWER IN" provide the working voltage to the RT

There are two optional connecting methods depending on the room thermostat type.

Room thermostat type 1 (High voltage):







Voltage	220-240 V AC
Maximum running current(A)	0.2
Minimum wiring size(mm^2)	0.75

There are three methods for connecting the thermostat cable(as described in the picture above)and it depends on the application.

·Method A(Mode set control)

RT can control heating and cooling individually, like the controller for 4-pipe FCU. When the indoor unit is connected with the external temperature controller, user interface FOR SERVICEMAN Set ROOM THERMOSTAT to MODE SET:

A.1Whenunit detect voltage is 230 V AC between C and N, the unit operates in the cooling mode.

A.2 When unit detect voltage is 230 V AC between H and N, the unit operates in the heating mode.

A.3 When unit detect voltage is 0 V AC for both side(C-N,H-N) the unit stop working for space heating or cooling.

A.4 When unit detect voltage is 230 V AC for both side(C-N, H-N) the unit working in cooling mode.

·Method B(One zone control)

RT provide the switch signal to unit. User interface FOR SERVICEMAN Set ROOM THERMOSTAT to ONE ZONE:

B.1 When unit detect voltage is 230 V AC between H and N, unit turns on.

B.2When unit detect voltage is 0 V AC between H and N, unit turns off.

·Method C(Double zone control)

Indoor unit is connected with two room thermostat, while user interface FOR SERVICEMAN set ROOM THERMOSTAT to DOUBLE ZONE:

C.1 When unit detect voltage is 230 V AC between H and N, Zone1 turns on. When unit detect voltage is 0V AC between H and N, zone1 turns off.

C.2 When unit detect voltage is 230 V AC between C and N, zone2 turns on according to climate temp curve. When unit detect voltage is 0V between C and N, zone2 turns off.

C.3 When H-N and C-N are detected as 0 V AC, unit turns off.

C.4 when H-N and C-N are detected as 230 V AC, both zone1 and zone2 turn on.

12 START-UP AND CONFIGURATION

The unit should be configured by the installer to match the installation environment (outdoor climate, installed options, and user expertise.

⚠ CAUTION

It is important that all information in this chapter is read sequentially by the installer and that the system is configured applicable.

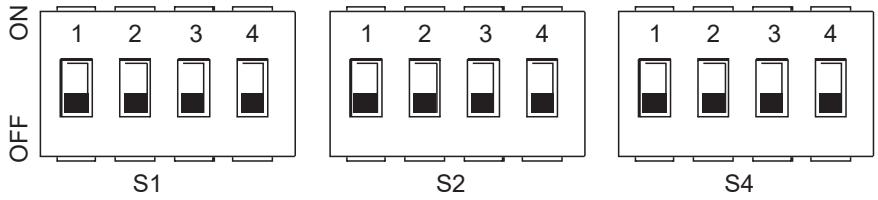
12.1 DIP switch settings overview

12.1.1 Function setting

DIP switch S1、S2 and S4 is located on the indoor unit main control board and allows configuration of additional heating source thermistor installation, the second inner backup heater installation, etc.

⚠ WARNING

Switch off the power supply before opening the switch box service panel and making any changes to the DIP switch settings.



DIP switch		ON=1	OFF=0	Factory defaults
S1	1/2	0/0=IBH(One-step control) 0/1=IBH(Two-step control) 1/1=IBH(Three-step control)		Refer to electrically controlled wiring diagram
	3/4	0/0=Without IBH and AHS 1/0=With IBH 0/1=With AHS for heat mode 1/1=With AHS for heat mode and DHW mode		

DIP switch		ON=1	OFF=0	Factory defaults
S2	1	Start PUMP_O after 24 hours will be invalid	Start PUMP_O after 24 hours will be valid	Refer to electrically controlled wiring diagram
	2	without TBH	with TBH	
	3/4	0/0=pump 1 0/1=pump 2 1/0=pump 3 1/1=pump 4		

DIP switch		ON=1	OFF=0	Factory defaults
S4	1	Reserved	Reserved	Refer to electrically controlled wiring diagram
	2	Valid(IBCH for DHW)	Invalid(IBH for DHW)	
	3/4	Reserved		

12.2 Initial start-up at low outdoor ambient temperature

During initial start-up and when water temperature is low, it is important that the water is heated gradually. Failure to result in concrete floors cracking due to rapid temperature change. Please contact the responsible cast concrete contractor for further details.
To do so, the lowest water flow set temperature can be decreased to a value between 25 °C and 35 °C by adjusting SERVICEMAN.

12.3 Pre-operation checks

Checks before initial start-up

⚠ DANGER

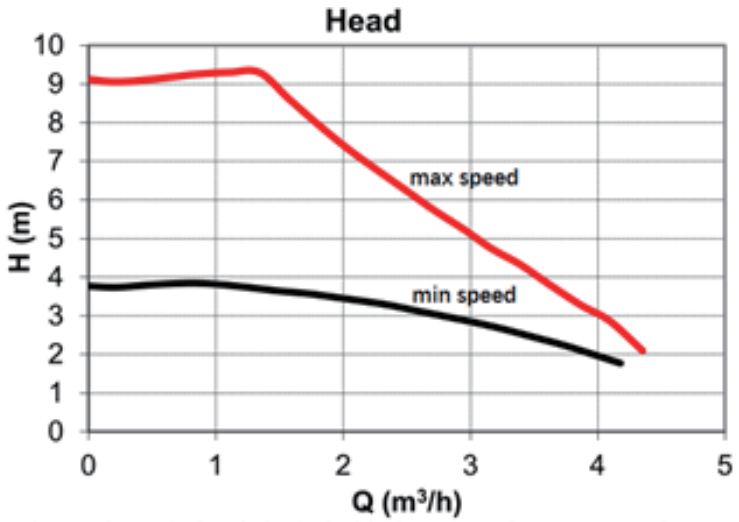
- Switch off the power supply before making any connections.
- After the installation of the unit, check the following before switching on the circuit breaker:
- Field wiring: Make sure that the field wiring between the local supply panel and unit and valves (when applicable), unit and room thermostat (when applicable), unit and domestic hot water tank, and unit and backup heater kit have been connected according to the instructions described in the chapter 11 “FIELD WIRING" , according to the wiring diagrams and to local laws and regulations.
- Fuses, circuit breakers, or protection devices Check that the fuses or the locally installed protection devices are of the size and type specified in 11.3 "Safety device requirements" . Make sure that no fuses or protection devices have been bypassed.
- Backup heater circuit breaker: Do not forget to turn on the backup heater circuit breaker in the switchbox (it depends on the backup heater type). Refer to the wiring diagram.
- Booster heater circuit breaker: Do not forget to turn on the booster heater circuit breaker (applies only to units with optional domestic hot water tank installed).
- Earth wiring : Make sure that the earth wires have been connected properly and that the earth terminals are tightened.
- Internal wiring: Visually check the switch box for loose connections or damaged electrical components.

- Mounting: Check that the unit is properly mounted, to avoid abnormal noises and vibrations when starting up the unit.
- Damaged equipment: Check the inside of the unit for damaged components or squeezed pipes.
- Refrigerant leak: Check the inside of the unit for refrigerant leakage. If there is a refrigerant leak, call your local dealer.
- Power supply voltage: Check the power supply voltage on the local supply panel. The voltage must correspond to the voltage on the identification label of the unit.
- Air purge valve: Make sure the air purge valve is open (at least 2 turns).
- Shut-off valves: Make sure that the shut-off valves are fully open.

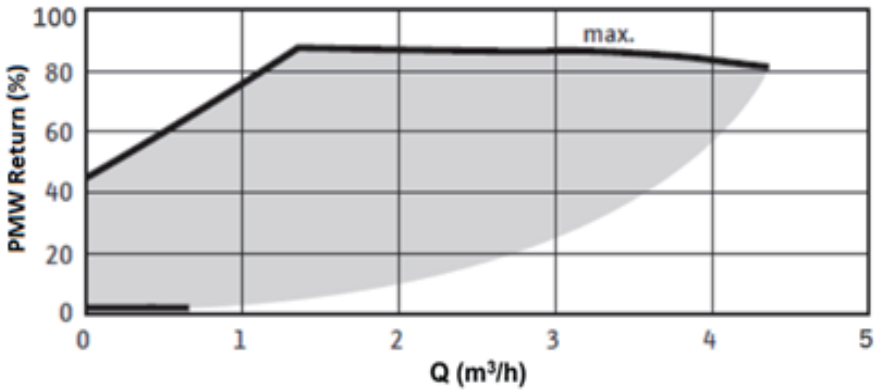
12.4 Setting the pump

The pump is controlled via a digital low-voltage pulse-width modulation signal which means that the speed of rotation depends on the input signal. The speed changes as a function of the input profile.

The relationships between the head and the water flow rated, the PMW Return and the water flow rated are shown in the graph below.

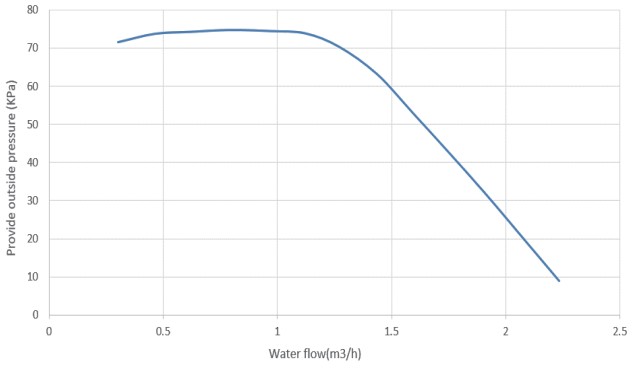


Area of regulation is included in between the max speed curve and the min speed curve.



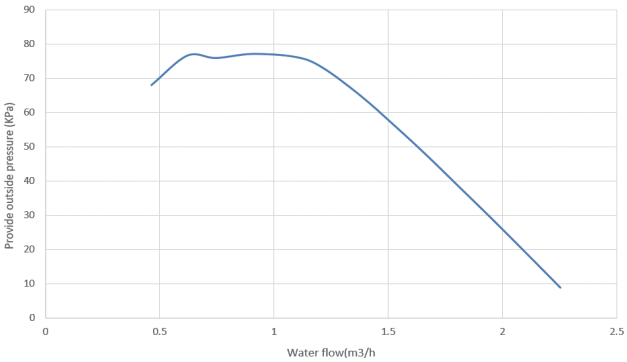
The internal pump maintains maximum output, the indoor unit can provide the head and flow:

Available external static pressure VS Flow rate



Indoor unit 190 L

Available external static pressure VS Flow rate



Indoor unit 240 L

⚠ CAUTION

If the valves are at the incorrect position, the circulation pump will be damaged.

⚠ DANGER

If it's necessary to check the running status of the pump when unit power on, please do not touch the internal electronic control box components to avoid electric shock.

Failure diagnosis at first installation

- If nothing is displayed on the user interface, it is necessary to check for any of the following abnormalities before diagnosing possible error codes.

  -Disconnection or wiring error (between power supply and unit and between unit and user interface).

  -The fuse on the PCB may be broken.

- If the user interface shows "E8" or "E0" as an error code, there is a possibility that there is air in the system, or the water pressure in the system is less than the required minimum.

More error code and failure causes can be found in 17 “ERROR CODES”.

12.5 Field settings

The unit should be configured to match the installation environment (outdoor climate, installed options, etc.) and user demand.

A number of field settings are available. These settings are accessible and programmable through “FOR SERVICEMAN" in user interface.

Powering on the unit

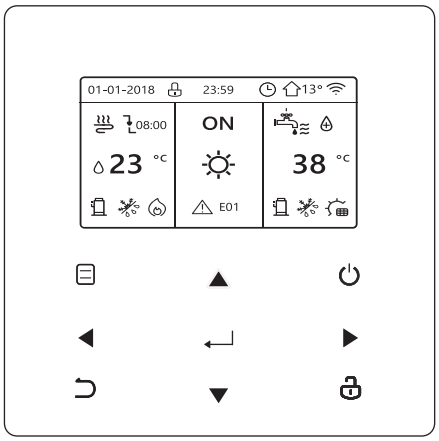
When power on the unit, "1 %~99 %" is displayed on the user interface during initialization. During this process the user interface cannot be operated.

Procedure

To change one or more field settings, proceed as follows.

NOTE

Temperature values displayed on the wired controller (user interface) are in °C.



Keys	Function
	• Go to the menu structure(on the home page)
◄►▼▲	• Navigate the cursor on the display • Navigate in the menu structure • Adjust settings
	• Turn on/off the space heating/cooling operation or DHW mode • Turn on/or off functions in the menu structure
	• Come back to the up level • Long press for unlock /lock the controller
	• Unlock /lock some functions such as "DHW temperature adjusting"
	• Go to the next step when programming a schedule in the menu structure; and confirm a selection to enter in the submenu of the menu structure.

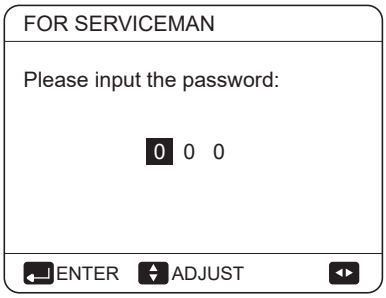
12.6 For serviceman

"FOR SERVICEMAN" is designed for the installer to set the parameters.

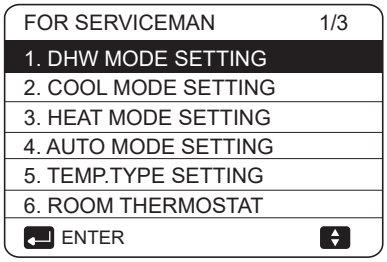
- Setting the composition of equipment.
- Setting the parameters.

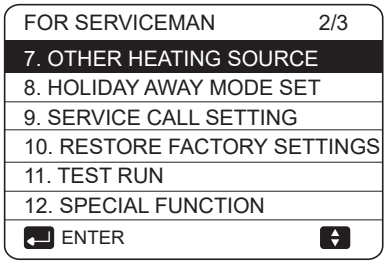
How to go to FOR SERVICEMAN

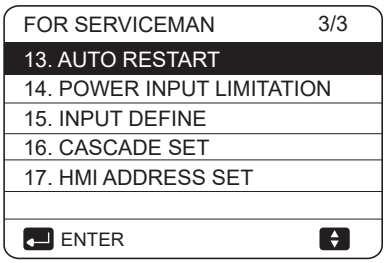
Go to ☰ > FOR SERVICEMAN. Press ↵:



Press ◄ ► to navigate and press ▼ ▲ to adjust the numerical value. Press ↵. The password is 234, the following pages will be displayed after putting the password:





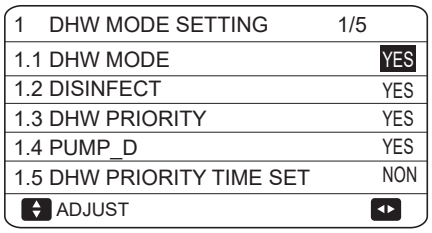


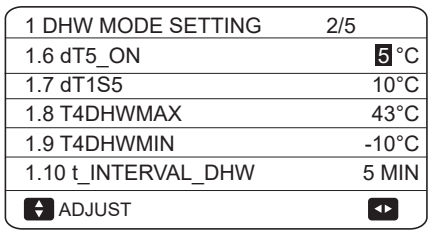
Press ▼ ▲ to scroll and use "↵" to enter submenu.

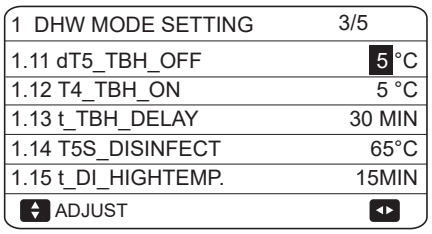
12.6.1 DHW MODE SETTING

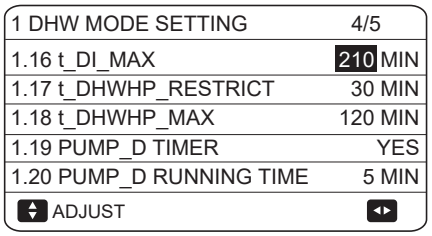
DHW = domestic hot water

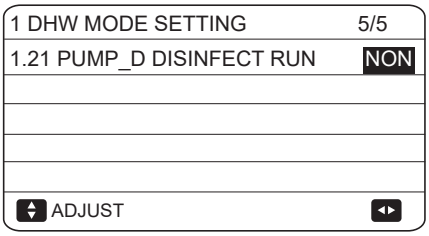
Go to ☰ > FOR SERVICEMAN> 1.DHW MODE SETTING. Press ↵ . The following pages will be displayed:











12.6.2 COOL MODE SETTING

Go to ☰ > FOR SERVICEMAN> 2.COOL MODE SETTING. Press ↵ .

The following pages will be displayed:

2 COOL MODE SETTING	1/3
2.1 COOL MODE	YES
2.2 t_T4_FRESH_C	2.0HRS
2.3 T4CMAX	43°C
2.4 T4CMIN	20°C
2.5 dT1SC	5°C
ADJUST	

2 COOL MODE SETTING	2/3
2.6 dTSC	2°C
2.7 t_INTERVAL_C	5MIN
2.8 T1SetC1	10°C
2.9 T1SetC2	16°C
2.10 T4C1	35°C
ADJUST	

2 COOL MODE SETTING	3/3
2.11 T4C2	25°C
2.12 ZONE1 C-EMISSION	FCU
2.13 ZONE2 C-EMISSION	FLH
ADJUST	

12.6.3 HEATING MODE SETTING

Go to ☰ >FOR SERVICEMAN> 3.HEAT MODE SETTING. Press ↵ . The following pages will be displayed:

3 HEAT MODE SETTING	1/3
3.1 HEAT MODE	YES
3.2 t_T4_FRESH_H	2.0HRS
3.3 T4HMAX	16°C
3.4 T4HMIN	-15°C
3.5 dT1SH	5°C
ADJUST	

3 HEAT MODE SETTING	2/3
3.6 dTSH	2°C
3.7 t_INTERVAL_H	5MIN
3.8 T1SetH1	35°C
3.9 T1SetH2	28°C
3.10 T4H1	-5°C
ADJUST	

3 HEAT MODE SETTING	3/3
3.11 T4H2	7°C
3.12 ZONE1 H-EMISSION	RAD.
3.13 ZONE2 H-EMISSION	FLH
3.14 t_DELAY_PUMP	2MIN
ADJUST	

12.6.4 AUTO MODE SETTING

Go to ☰ > FOR SERVICEMAN> 4.AUTO MODE SETTING. Press ↵, the following page will be displayed.

4 AUTO. MODE SETTING	
4.1 T4AUTOCMIN	25°C
4.2 T4AUTOHMAX	17°C
ADJUST	

12.6.5 TEMP. TYPE SETTING

About TEMP. TYPE SETTING

The TEMP. TYPE SETTING is used for selecting whether the water flow temperature or room temperature is used to control the ON/OFF of the heat pump.

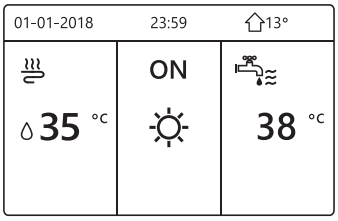
When ROOM TEMP. is enabled, the target water flow temperature will be calculated from climate-related curves.

How to enter the TEMP. TYPE SETTING

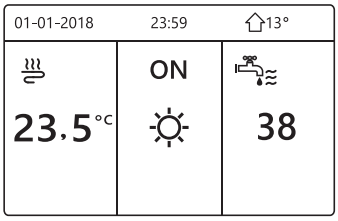
Go to ☰ > FOR SERVICEMAN> 5.TEMP. TYPE SETTING. Press ↵. The following page will be displayed:

5 TEMP. TYPE SETTING	
5.1 WATER FLOW TEMP.	YES
5.2 ROOM TEMP.	NON
5.3 DOUBLE ZONE	NON
5.4 ENERGY METERING	YES
ADJUST	

If you only set WATER FLOW TEMP. to YES, or only set ROOM TEMP. to YES, The following pages will be displayed.

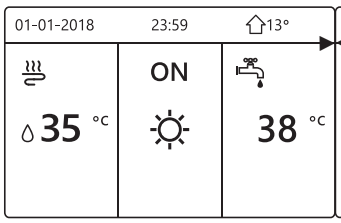


only WATER FLOW TEMP. YES

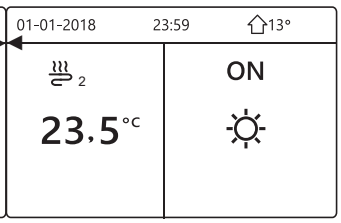


only ROOM TEMP. YES

If you set WATER FLOW TEMP. and ROOM TEMP. to YES, meanwhile set DOUBLE ZONE to NON or YES, the following pages will be displayed.



Homepage (zone 1)

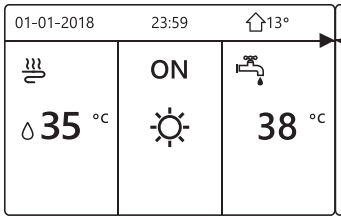


Addition page (zone 2)

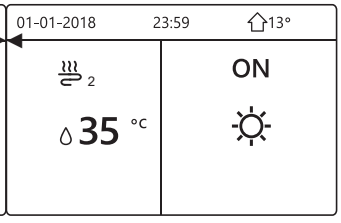
(Double zone is effective)

In this case, the setting value of zone 1 is T1S,the setting value of zone 2 is T1S2(The corresponding TIS2 is calculated according to the climate related curves.)

If you set DOUBLE ZONE to YES and set ROOM TEMP. to NON, meanwhile set WATER FLOW TEMP. to YES or NON, the following pages will be displayed.



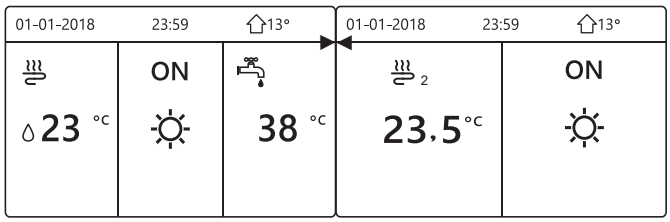
Homepage (zone 1)



Addition page (zone 2)

In this case, the setting value of zone 1 is T1S, the setting value of zone 2 is T1S2.

If you set DOUBLE ZONE and ROOM TEMP. to YES, meanwhile set WATER FLOW TEMP. to YES or NON,the following page will be displayed.



Homepage (zone 1)

Addition page (zone 2)

(Double zone is effective)

In this case, the setting value of zone 1 is T1S,the setting value of zone 2 is T1S2 (The corresponding TIS2 is calculated according to the climate related curves.)

12.6.6 ROOM THERMOSTAT

About ROOM THERMOSTAT

The ROOM THERMOSTAT is used to set whether the room thermostat is available.

How to set the ROOM THERMOSTAT

Go to ☰ >FOR SERVICEMAN> 6.ROOM THERMOSTAT. Press ↵. The following page will be displayed:

6 ROOM THERMOSTAT	
6.1 ROOM THERMOSTAT	NON
ADJUST	

NOTE

ROOM THERMOSTAT = NON, no room thermostat.

ROOM THERMOSTAT = MODE SET, the wiring of room thermostat should follow method A.

ROOM THERMOSTAT=ONE ZONE, the wiring of room thermostat should follow method B.

ROOM THERMOSTAT=DOUBLE ZONE, the wiring of room thermostat should follow method C (refer to 11.8 “ Connecting for other components ”.

12.6.7 OTHER HEATING SOURCE

The OTHER HEATING SOURCE is used to set the parameters of the backup heater, additional heating sources .

Go to ☰ > FOR SERVICEMAN> 7.OTHER HEATING SOURCE, Press ↵. The following page will be displayed:

7 OTHER HEATING SOURCE 1/2	
7.1 dT1_IBH_ON	5°C
7.2 t_IBH_DELAY	30MIN
7.3 T4_IBH_ON	-5°C
7.4 dT1_AHS_ON	5°C
7.5 t_AHS_DELAY	30MIN
ADJUST	

7 OTHER HEATING SOURCE 2/2	
7.6 T4_AHS_ON	-5°C
7.7 IBH LOCATE	PIPE LOOP
7.8 P_IBH1	0.0kW
7.9 P_IBH2	0.0kW
7.10 P_TBH	2.0kW
ADJUST	

12.6.8 HOLIDAYA WAY SETTING

The HOLIDAY AWAY SETTING is used to set the outlet water temperature to prevent freezing when away for holiday.

Go to ☰ > FOR SERVICEMAN> 8.HOLIDAY AWAY SETTING. Press ↵. The following page will be displayed:

8 HOLIDAY AWAY SETTING	
8.1 T1S_H.A._H	20°C
8.2 T5S_H.A._DHW	20°C
ADJUST	

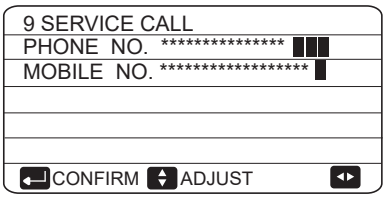
12.6.9 SERVICE CALL SETTING

The installers can set the phone number of the local dealer in SERVICE CALL SETTING. If the unit doesn’t work properly, call this number for help.

Go to ☰ > FOR SERVICEMAN>SERVICE CALL. Press ↵. The following page will be displayed:

9 SERVICE CALL SETTING
PHONE NO. **********
MOBILE NO. **********
CONFIRM ADJUST

Press ▼ ▲ to scroll and set the phone number. The maximum length of the phone number is 13 digits, if the length of phone number is short than 12, please input ■, as shown below:

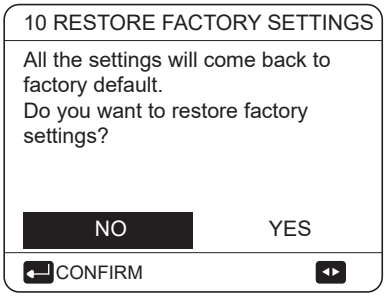


The number displayed on the user interface is the phone number of your local dealer.

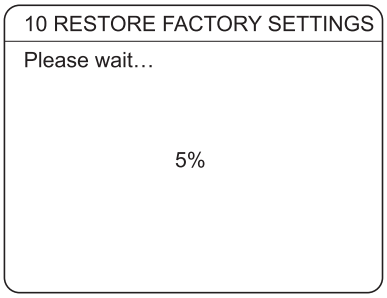
12.6.10 RESTORE FACTORY SETTINGS

The RESTORE FACTORY SETTINGS is used to restore all the parameters set in the user interface to the default setting.

Go to ☰ > FOR SERVICEMAN > 10.RESTORE FACTORY SETTINGS. Press ↵. The following page will be displayed:



Press ◄ ► to scroll the cursor to YES and press ↵. The following page will be displayed:

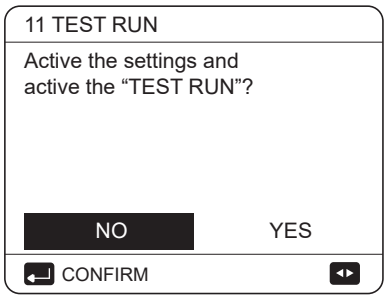


After a few seconds, all the parameters set in the user interface will be restored to factory settings.

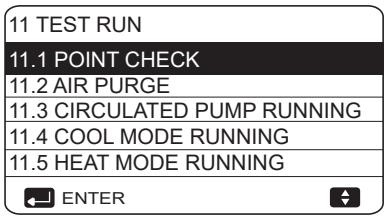
12.6.11 TEST RUN

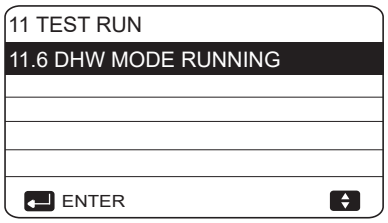
TEST RUN is used to check normal operation of the valves, air purge, circulation pump operation, cooling, heating and domestic water heating.

Go to ☰ > FOR SERVICEMAN> 11.TEST RUN. Press ↵ . The following page will be displayed:

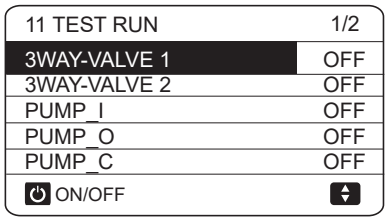


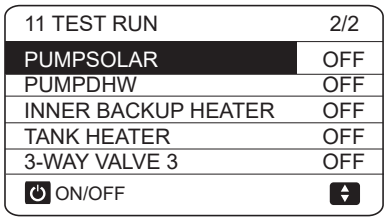
If YES is selected, the following pages will be displayed:





If POINT CHECK is selected, the following pages will be displayed:



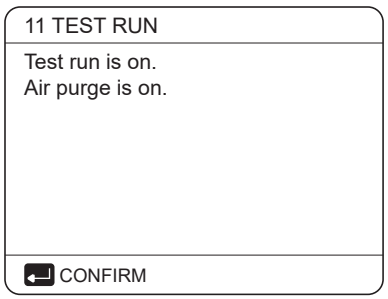


Press ▼ ▲ to scroll to the components you want to check and press ⏻. For example, when 3-way valve is selected and ⏻ is pressed, if the 3-way valve is open/close, then the operation of 3-way valve is normal, and so are other components.

⚠ CAUTION

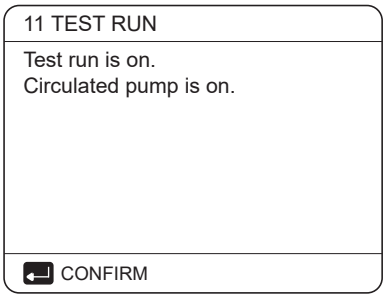
Before the point check, make sure the tank and the water system is filled with water, and air is expelled, otherwise it may cause the pump or backup heater burn out.

If you select AIR PURGE and ↵ is pressed, the following page will be displayed :



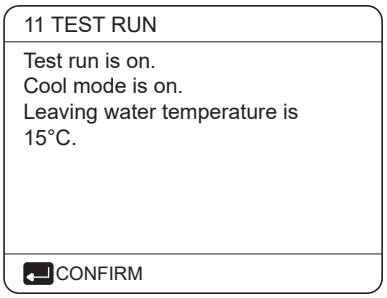
When in air purge mode, SV1 will open, SV2 will close. 60 s later the pump in the unit (PUMPI) will operate for 10 min during which the flow switch will not work. After the pump stops, the SV1 will close and the SV2 will open. 60 s later both the PUMP_I and PUMP_O will operate until the next command is received.

When CIRCULATION PUMP RUNNING is selected, the following page will be displayed:



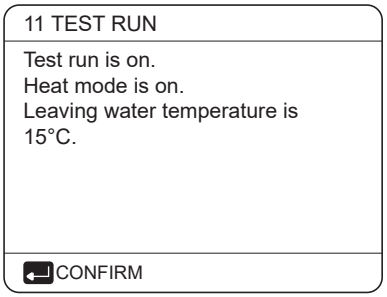
When circulation pump running is turned on, all running components will stop. 60 s later, the SV1 will open, the SV2 will close, 60 s later PUMPI will operate. 30 s later, if the flow switch checked normal flow, PUMPI will operate for 3 min, after the pump stops 60 s, the SV1 will close and the SV2 will open. 60 s later the both PUMPI and PUMPO will operate, 2 mins later, the flow switch will check the water flow. If the flow switch closes for 15 s, PUMPI and PUMPO will operate until the next command is received.

When the COOLING MODE RUNNING is selected, the following page will be displayed:



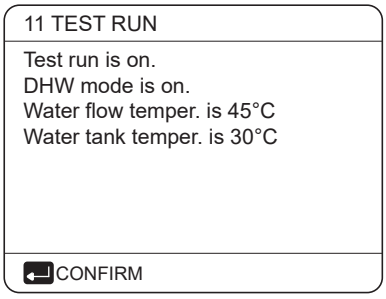
During COOL MODE test running, the default target outlet water temperature is 7 °C. The unit will operate until the water temperature drops to a certain value or the next command is received.

When the HEAT MODE RUNNING is selected, the following page will be displayed:



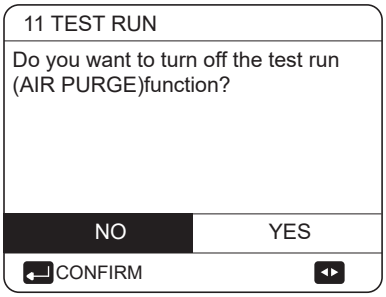
During HEATING MODE test running , the default target outlet water temperature is 35 °C. The IBH (internal backup heater) will turn on after the compressor runs for 10 min. After the IBH runs for 3 mins, the IBH will turn off, the heat pump will operate until the water temperature increase to a certain value or the next command is received.

When the DHW MODE RUNNING is selected, the following page will be displayed:



During DHW MODE test running, the default target temperature of the domestic water is 55 °C. The TBH(tank boost heater) will turn on after the compressor runs for 10 min. The TBH will turn off 3 mins later, the heat pump will operate until the water temperature increase to a certain value or the next command is received.

During test run, all buttons except ↵ are invalid. If you want to turn off the test run, please press ↵ . For example ,when the unit is in air purge mode, after you press ↵, the following page will be displayed:



Press ◄ ► to scroll the cursor to YES and press ↵. The test run will turn off.

12.6.12 SPECIAL FUNCTION

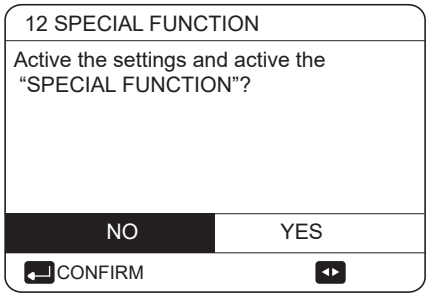
When it is in special function modes, the wired controller can not operate, the page do not return to the homepage, and the screen showed the page that special function runs, the wired controller do not locked.

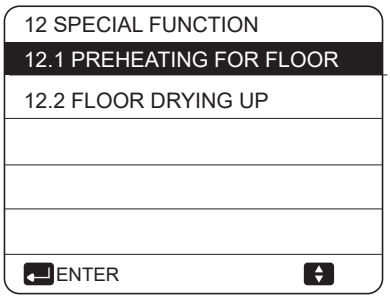
NOTE

During special function operating other functions (WEEKLY SCHDULE/TIMER , HOLIDAY AWAY, HOLIDAY HOME) can't be used.

Go to ☰ > FOR SERVICEMAN> 12.SPECIAL FUNCTION.

Before floor heating, if a large amount of water remains on the floor, the floor may be warped or even rupture during floor heating operation, in order to protect the floor, floor drying is necessary, during which the temperature of the floor should be increased gradually.

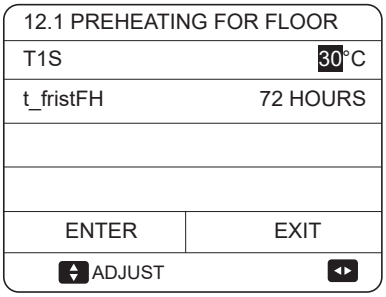




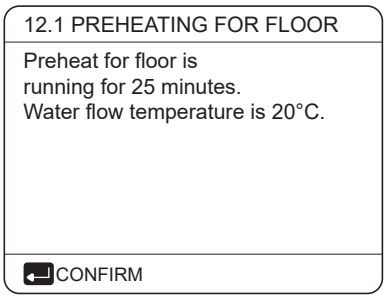
Press ▼ ▲ to scroll and press ↵ to enter.

During first operation of the unit, air may remain in the water system which can cause malfunctions during operation. It is necessary to run the air purge function to release the air (make sure the air purge valve is open).

If PREHEATING FOR FLOOR is selected, after press ↵, the following page will be displayed:

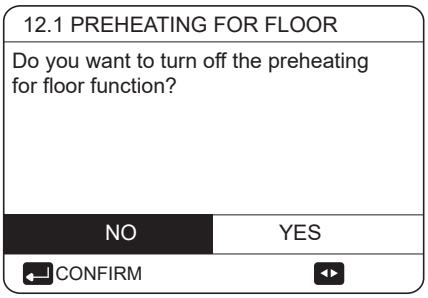


When the cursor is on OPERATE PREHEATING FOR FLOOR, Use ◄ ► to scroll to YES and press ↵. The following page will be displayed:



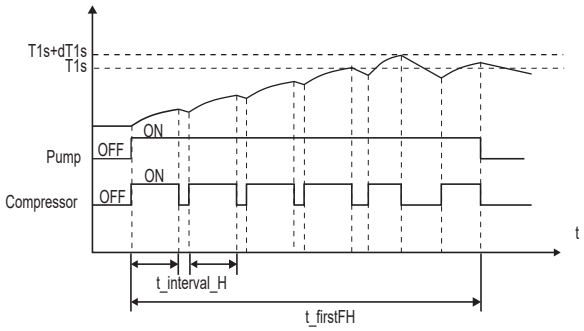
During preheating for floor, all the buttons except ↵ are invalid. If you want to turn off the preheating for floor, please press ↵.

The following page will be displayed:

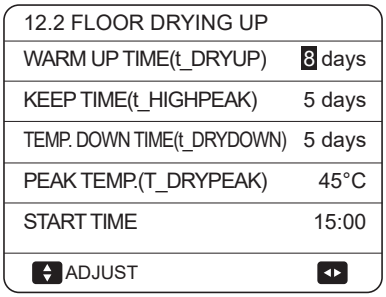


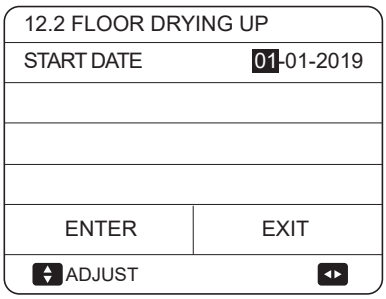
Use ◄ ►to scroll the cursor to YES and press ↵, the preheating for floor will turn off.

The operation of the unit during preheating for floor described in the picture below:



If FLOOR DRYING UP is selected, after pressing ↵, the following pages will be displayed:



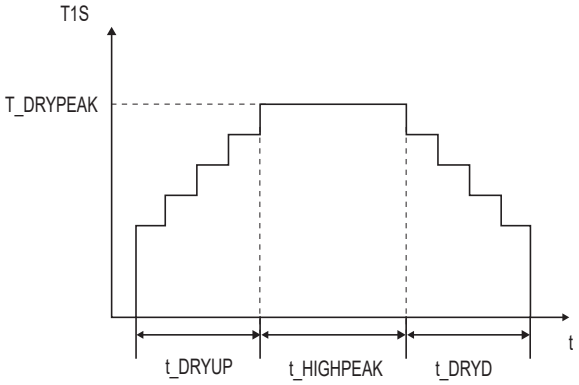


During floor drying, all the buttons except are invalid. When the heat pump malfunctions, the floor drying mode will turn off when the backup heater and additional heating source is unavailable. If you want to turn off floor drying up, please press. The following page will be displayed:

12.3 FLOOR DRYING UP
The unit will operate floor drying up on 09:00 01-08-2018.
CONFIRM

Use ◄ ► to scroll the cursor to YES and press ↵. Floor drying will turn off.

The target outlet water temperature during floor drying up described in the picture below:



12.6.13 AUTO RESTART

The AUTO RESTART function is used to select whether the unit reapplies the user interface settings at the time when power returns after a power supply failure.

Go to ⊟ > FOR SERVICEMAN>13.AUTO RESTART

13 AUTO RESTART	
13.1 COOL/HEAT MODE	YES
13.2 DHW MODE	NON
ADJUST	

The AUTO RESTART function reapplies the user interface settings at the time of the power supply failure. If this function is disabled, when power returns after a power supply failure, the unit won't auto restart.

12.6.14 POWER INPUT LIMITATION

How to set the POWER INPUT LIMITATION

Go to ⊟ > FOR SERVICEMAN>
14.POWER INPUT LIMITATION

14 POWER INPUT LIMITATION	
14.1 POWER LIMITATION	0
ADJUST	

12.6.15 INPUT DEFINE

How to set the INPUT DEFINE

Go to ⊟ > FOR SERVICEMAN> 15.INPUT DEFINE

15 INPUT DEFINE	
15.1 M1M2	REMOTE
15.2 SMART GRID	NON
15.3 Tw2	NON
15.4 Tbt1	NON
15.5 Tbt2	NON
ADJUST	◄►

15 INPUT DEFINE	
15.6 Ta	HMI
15.7 Ta-adj	-2°C
15.8 SOLAR INPUT	NON
15.9 F-PIPE LENGTH	＜10m
15.10 RT/Ta_PCB	NON
ADJUST	◄►

15 INPUT DEFINE	
15.11 PUMP_I SILENT MODE	NO
15.12 DFT1/DFT2	DEFROST
	◄►

NOTE

Please define 15.8 SOLAR INPUT as NON, otherwise Eb error code will appear.

12.6.16 SETTING PARAMETERS

The parameters related to this chapter are shown in the table below.

Order number	Code	State	Default	Minimum	Maximum	Setting interval	Unit
1.1	DHW MODE	Enable or disable the DHW mode:0=NON,1=YES	1	0	1	1	/
1.2	DISINFECT	Enable or disable the disinfect mode:0=NON,1=YES	1	0	1	1	/
1.3	DHW PRIORITY	Enable or disable the DHW priority mode:0=NON,1=YES	1	0	1	1	/
1.4	PUMP_D	Enable or disable the DHW pump mode:0=NON,1=YES	0	0	1	1	/
1.5	DHW PRIORITY TIME SET	Enable or disable the DHW priority time set:0=NON,1=YES	0	0	1	1	/
1.6	dT5_ON	The temperature difference for starting the heat pump	10	1	30	1	℃
1.7	dT1S5	The difference value between Twout and T5 in DHW mode	10	5	40	1	℃
1.8	T4DHWMAX	The maximum ambient temperature that the heat pump can operate at for domestic water heating	43	35	43	1	℃
1.9	T4DHWMIN	The minimum ambient temperature that the heat pump can operate for domestic water heating	-10	-25	30	1	℃
1.10	t_INTERVAL_DHW	the start time interval of the compressor in DHW mode.	5	5	5	1	min
1.11	dT5_TBH_ OFF	the temperature difference between T5 and T5S that turns the booster heater off.	5	0	10	1	℃
1.12	T4_TBH_ON	the highest outdoor temperature the TBH can operate.	5	-5	50	1	℃
1.13	t_TBH_DELAY	the time that the compressor has run before starting the booster heater	30	0	240	5	min
1.14	T5S_DISINFECT	the target temperature of water in the domestic hot water tank in the DISINFECT function.	65	60	70	1	℃
1.15	t_DI_HIGHTEMP.	the time that the highest temperature of water in the domestic hot water tank in the DISINFECT function will last	15	5	60	5	min
1.16	t_DI_MAX	the maximum time that disinfection will last	210	90	300	5	min
1.17	t_DHWHP_RESTRICT	he operation time for the space heating/cooling operation.	30	10	600	5	min
1.18	t_DHWHP_MAX	the maximum continuous working period of the heat pump in DHW PRIORITY mode.	90	10	600	5	min
1.19	PUMP_D TIMER	Enable or disable the DHW pump run as timed and keeps running for PUMP RUNNING TIME:0=NON,1=YES	1	0	1	1	/
1.20	PUMP_D RUNNING TIME	the certain time that the DHW pump will keep running for	5	5	120	1	min
1.21	PUMP_D DISINFECT RUN	Enable or disable the DHW pump operate when the unit is in disinfect mode and T5≥T5S_DI-2:0=NON,1=YES	1	0	1	1	/
2.1	COOL MODE	Enable or disable the cooling mode:0=NON,1=YES	1	0	1	1	/
2.2	t_T4_FRESH_C	The refresh time of climate related curves for cooling mode	0.5	0.5	6	0.5	h
2.3	T4CMAX	The highest ambient operation temperature for cooling mode	52	35	52	1	℃
2.4	T4CMIN	the lowest ambient operating temperature for cooling mode	10	-5	25	1	℃
2.5	dT1SC	the temperature difference for starting the heat pump(T1)	5	2	10	1	℃
2.6	dTSC	the temperature difference for starting the heat pump(Ta)	2	1	10	1	℃
2.7	t_INTERVAL_COOL	the start time interval of the compressor in COOL mode	5	5	5	1	℃
2.8	T1SetC1	The setting temperature 1 of climate related curves for cooling mode.	10	5	25	1	min
2.9	T1SetC2	The setting temperature 2 of climate related curves for cooling mode.	16	5	25	1	℃
2.10	T4C1	The ambient temperature 1 of climate related curves for cooling mode.	35	-5	46	1	℃
2.11	T4C2	The ambient temperature 2 of climate related curves for cooling mode.	25	-5	46	1	℃
2.12	ZONE1 C-EMISSION	The type of zone1 end for cooling mode：0=FCU(fan coil unit),1=RAD.(radiator) ，2=FLH(floor heating)	0	0	2	1	/
2.13	ZONE2 C-EMISSION	The type of zone2 end for cooling mode：0=FCU(fan coil unit)，1=RAD.(radiator)，2=FLH(floor heating)	0	0	2	1	/

3.1	HEAT MODE	Enable or disable the heating mode	1	0	1	1	/
3.2	t_T4_FRESH_H	The refresh time of climate related curves for heating mode	0.5	0.5	6	0.5	h
3.3	T4HMAX	The maximum ambient operating temperature for heating mode	25	20	35	1	℃
3.4	T4HMIN	The minimum ambient operating temperature for heating mode	-15	-25	30	1	℃
3.5	dT1SH	The temperature difference for starting the unit (T1)	5	2	20	1	℃
3.6	dTSH	The temperature difference for starting the unit (Ta)	2	1	10	1	℃
3.7	t_INTERVAL_HEAT	the start time interval of the compressor in HEAT mode	5	5	5	1	min
3.8	T1SetH1	The setting temperature 1 of climate related curves for heating mode	35	25	65	1	℃
3.9	T1SetH2	The setting temperature 2 of climate related curves for heating mode	28	25	65	1	℃
3.10	T4H1	The ambient temperature 1 of climate related curves for heating mode	-5	-25	35	1	℃
3.11	T4H2	The ambient temperature 2 of climate related curves for heating mode	7	-25	35	1	℃
3.12	ZONE1 H-EMISSION	The type of zone1 end for heating mode：0=FCU(fan coil unit)，1=RAD.(radiator)，2=FLH(floor heating)	1	0	2	1	/
3.13	ZONE2 H-EMISSION	The type of zone2 end for heating mode：0=FCU(fan coil unit)，1=RAD.(radiator)，2=FLH(floor heating)	2	0	2	1	/
3.14	t_DELAY_PUMP	The delay time for water pump to stop after the compressor stops	2	0.5	20	0.5	min
4.1	T4AUTOCMIN	The minimum operating ambient temperature for cooling in auto mode	25	20	29	1	℃
4.2	T4AUTOHMAX	The maximum operating ambient temperature for heating in auto mode	17	10	17	1	℃
5.1	WATER FLOW TEMP.	Enable or disable the WATER FLOW TEMP.:0=NON,1=YES	1	0	1	1	/
5.2	ROOM TEMP.	Enable or disable the ROOM TEMP.:0=NON,1=YES	0	0	1	1	/
5.3	DOUBLE ZONE	Enable or disable the ROOM THERMOSTAT DOUBLE ZONE:0=NON,1=YES	0	0	1	1	/
5.4	Energy metering	Energy metering 0=NoN 1=YES	1	0	1	1	/
6.1	ROOM THERMOSTAT	The style of room thermostat：0=NON,1=MODE SET,2=ONE ZONE,3=DOUBLE ZONE	0	0	3	1	/
7.1	dT1_IBH_ON	The temperature difference between T1S and T1 for starting the backup heater.	5	2	10	1	℃
7.2	t_IBH_DELAY	The time that the compressor has run before the first backup heater turns on. Including the interval time between two backup heater operating, If IBH is in two-step control	30	15	120	5	min
7.3	T4_IBH_ON	The ambient temperature for starting the backup heater	-5	-15	30	1	℃
7.4	dT1_AHS_ON	The temperature difference between T1S and T1 for turning the additional heating source on	5	2	20	1	℃
7.5	t_AHS_DELAY	The time that the compressor has run before starting the additional heating source	30	5	120	5	min
7.6	T4_AHS_ON	The ambient temperature for starting the additional heating source	-5	-15	30	1	℃
7.7	IBH_LOCATE	IBH/AHS installation location PIPE LOOP=0; BUFFER TANK=1	0	0	0	0	℃
7.8	P_IBH1	Power input of IBH1	0	0	20	0.5	kW
7.9	P_IBH2	Power input of IBH2	0	0	20	0.5	kW
7.10	P_TBH	Power input of TBH	2	0	20	0.5	kW
8.1	T1S_H.A_H	The target outlet water temperature for space heating when in holiday away mode	25	20	25	1	℃
8.2	T5S_H.A_DHW	The target outlet water temperature for domestic hot water heating when in holiday away mode	25	20	25	1	℃
12.1	PREHEATING FOR FLOOR T1S	The setting temperature of outlet water during first preheating for floor	25	25	35	1	℃
12.3	t_FIRSTFH	The time last for preheating floor	72	48	96	12	h

12.4	t_DRYUP	The day for warming up during floor drying up	8	4	15	1	DAY
12.5	t_HIGHPEAK	The continue days in high temperature during floor drying up	5	3	7	1	DAY
12.6	t_DRYD	The day of dropping temperature during floor drying up	5	4	15	1	DAY
12.7	T_DRYPEAK	The target peak temperature of water flow during floor drying up	45	30	55	1	℃
12.8	START TIME	The start time of floor drying up	Hour: the present time(not on the hour +1, on the hour +2) Minute:00	0:00	23:30	1/30	h/min
12.9	START DATE	The start date of floor drying up	The present date	1/1/2000	31/12/2099	1/1/2001	d/m/y
13.1	AUTO RESTART COOL/HEAT MODE	Enable or disable the auto restart cooling/heating mode. 0=NON,1=YES	1	0	1	1	/
13.2	AUTO RESTART DHW MODE	Enable or disable the auto restart DHW mode. 0=NON,1=YES	1	0	1	1	/
14.1	POWER INPUT LIMITATION	The type of power input limitation, 0=NON, 1~8=TYPE 1~8	0	0	8	1	/
15.1	M1 M2	Define the function of the M1M2 switch; 0= REMOTE ON/OFF,1= TBH ON/OFF,2= AHS ON/OFF	0	0	2	1	/
15.2	SMART GRID	Enable or disable the SMART GRID; 0=NON,1=YES	0	0	1	1	/
15.3	Tw2	Enable or disable the T1b(Tw2) ; 0=NON,1=YES	0	0	1	1	/
15.4	Tbt1	Enable or disable the Tbt1; 0=NON,1=YES	0	0	1	1	/
15.5	Tbt2	Enable or disable the Tbt2; 0=NON,1=YES	0	0	1	1	/
15.6	Ta	Enable or disable the Ta; 0=NON,1=YES	0	0	1	1	/
15.7	Ta-adj	The corrected value of Ta on wired controller	-2	-10	10	1	℃
15.8	SOLAR INPUT	Choose the SOLAR INPUT; 0=NON,1=CN18Tsolar,2=CN11SL1SL2	0	0	2	1	/
15.9	F-PIPE LENGTH	Choose the total length of the liquid pipe(F-PIPE LENGTH); 0=F-PIPE LENGTH <10m,1=F-PIPE LENGTH ≥10m	0	0	1	1	/
15.10	RT/Ta_PCB	Enable or disable the RT/Ta_PCB;0=NON,1=YES	0	0	1	1	/
15.11	PUMP_I SILENT MODE	Enable or disable PUMPI SILENT MODE 0=NON, 1=YES	0	0	1	1	/
15.12	DFT1/DFT2	DFT1/DFT2 port function:0=DEFROST 1=ALARM	0	0	1	1	/
16.1	PER_START	Start-up percentage of multiple units	10	10	100	10	%
16.2	TIME_ADJUST	Adjustment time of adding and subtracting units	5	1	60	1	min
16.3	ADDRESS RESET	Reset the address code of the unit	FF	0	15	1	/
17.1	HMI SET	Choose the HMI; 0=MASTER,1=SLAVE	0	0	1	1	/
17.2	HMI ADDRESS FOR BMS	Set the HMI address code for BMS	1	1	16	1	/
17.3	STOP BIT	HMI stop bit	1	1	2	1	/

NOTE

15.12 DFT1/DFT2 ALARM function can be valid only with indoor unit software version higher than V99.

13 TEST RUN AND FINAL CHECKS

The installer is obliged to verify correct operation of unit after installation.

13.1 Final checks

Before switching on the unit, read following recommendations:

- When the complete installation and all necessary settings have been carried out, close all front panels of the unit and refit the unit cover.
- The service panel of the switch box may only be opened by a licensed electrician for maintenance purposes.

13.2 Test run operation (manually)

If required, the installer can perform a manual test run operation at anytime to check correct operation of air purge, heating, cooling and domestic water heating, refer to 12.6.11 TEST RUN .

14 MAINTENANCE AND SERVICE

In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals.

This maintenance needs to be carried out by your local technician.

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This maintenance has to be carried out by your local technician.

⚠ DANGER

ELECTRIC SHOCK

- Before carrying out any maintenance or repairing activity, must switch off the power supply on the supply panel.
- Do not touch any live part for 10 min after he power supply is turned off.
- The crank heater of compressor may operate even in standby.
- Please note that some sections of the electric component box are hot.
- Forbid touch any conductive parts.
- Forbid rinse the unit. It may cause electric shock or fire.
- Forbid leave the unit unattended when service panel is removed.

The following checks must be performed at least once a year by qualified person.

- Water pressure

Check the water pressure, if it is below 1bar, fill water to the system.

- Water strainer

Clean the water strainer.

- Water pressure relief valve

Check for correct operation of the pressure relief valve by turning the black knob on the valve counter-clockwise:

If you do not hear a clacking sound, contact your local dealer.

In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.

- Pressure relief valve hose

Check that the pressure relief valve hose is positioned appropriately to drain the water.

- Backup heater vessel insulation cover

Check that the backup heater insulation cover is fastened tightly around the backup heater vessel.

- Domestic hot water tank pressure relief valve (field supply).

Check for correct operation of the pressure relief valve on the domestic hot water tank.

- Unit switch box

Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose

connections or defective wiring.

Check for correct operation of contactors with an ohm meter. All contacts of these contactors must be in open position.

15 TECHNICAL SPECIFICATIONS

Indoor unit model	100/190 3 kW heater	100/240 3 kW heater	160/240 3 kW heater
Power supply	220-240 V~ 50 Hz		
Rated input	3 095 W		
Rated Current	13.5 A		
Norminal capacity	Refer to the technical data		
Dimensions (W×H×D)[mm]	600 x 1 683 x 600	600 x 1 943 x 600	
Packing (W×H×D)[mm]	730 x 1 920 x 730	730 x 2 180 x 730	
Heat exchanger	Plate heat exchanger		
Electric heater	3 000 W		
Internal water volume	13.5 L		
Rated water pressure	0.3 MPa		
Filter mesh	60		
Min. water flow (flow switch)	6 L/min		10 L/min
Pump			
Type	DC inverter		
Max. head	9 m		
Power input	5 ~ 90 W		
Expanssion vessel			
Volume	8 L		
Max. operating pressure	0.3 MPa		
Pre-charge pressure	0.10 MPa		
Weight			
Net weight	143 kg	157 kg	159 kg
Connections			
Refrigerant pipe(gas/liquid)	Φ15.9 / Φ9.52		
Water inlet/outlet	R1"		
Drain connection	Φ25		
Operation range			
Outlet water(heating model)	+12 ℃ to +65 ℃		
Outlet water(cooling model)	+5 ℃ to +30 ℃		
Domestic hot water	+12 ℃ to +60 ℃		
Space heating/cooling water inlet water pressure	0.1 ~ 0.25 MPa		
Domestic cold water pressure	0.15 ~ 0.3 MPa		
Ambient temperature(Indoor side)	+5 ℃ to +35 ℃		

Indoor unit model	100/190 6 kW heater	100/240 6 kW heater	160/240 6 kW heater	100/190 9 kW heater	100/240 9 kW heater	160/240 9 kW heater
Power supply	220-240 V~ 50 Hz			380-415 V 3N~ 50 Hz		
Rated input	6 095 W			9 095 W		
Rated Current	26.5 A			13.5 A		
Norminal capacity	Refer to the technical data					
Dimensions (W×H×D)[mm]	600 x 1 683 x 600	600 x 1 943 x 600		600 x 1 683 x 600	600 x 1 943 x 600	
Packing (W×H×D)[mm]	730 x 1 920 x 730	730 x 2 180 x 730		730 x 1 920 x 730	730 x 2 180 x 730	
Heat exchanger	Plate heat exchanger					
Electric heater	6 000 W			9 000 W		
Internal water volume	13.5 L					
Rated water pressure	0.3 MPa					
Filter mesh	60					
Min. water flow (flow switch)	6 L/min		10 L/min	6 L/min		10 L/min
Pump						
Type	DC inverter					
Max. head	9 m					
Power input	5 ~ 90 W					
Expanssion vessel						
Volume	8 L					
Max. operating pressure	0.3 MPa					
Pre-charge pressure	0.10 MPa					
Weight						
Net weight	143 kg	157 kg	159 kg	143 kg	157 kg	159 kg
Connections						
Refrigerant pipe (gas/liquid)	Φ15.9 / Φ9.52					
Water inlet/outlet	R1"					
Drain connection	Φ25					
Operation range						
Outlet water(heating model)	+12 ℃ to +65 ℃					
Outlet water(cooling model)	+5 ℃ to +30 ℃					
Domestic hot water	+12 ℃ to +60 ℃					
Space heating/cooling water inlet water pressure	0.1 ~ 0.25 MPa					
Domestic cold water pressure	0.15 ~ 0.3 MPa					
Ambient temperature (Indoor side)	+5 ℃ to +35 ℃					

16 TROUBLE SHOOTING

This section provides useful information for diagnosing and correcting certain troubles which may occur in the unit.
This troubleshooting and related corrective actions may only be carried out by your local technician.

16.1 General guidelines

Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

⚠ WARNING

When carrying out an inspection on the switch box of the unit, always make sure that the main switch of the unit is switched off.

When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. Under no circumstances can safety devices be bridged or changed to a value other than the factory setting. If the cause of the problem cannot be found, call your local dealer.

If the pressure relief valve is not working correctly and is to be replaced, always reconnect the flexible hose attached to the pressure relief valve to avoid water dripping out of the unit!

16.2 General symptoms

Symptom 1: The unit is turned on but the unit is not heating or cooling as expected

POSSIBLE CAUSES	CORRECTIVE ACTION
The temperature setting is not correct.	Check the parameters.T4HMAX,T4HMIN in heat mode. T4CMAX,T4CMIN in cool mode.T4DHWMAX,T4DHWMIN in DHW mode.
The water flow is too low.	• Check that all shut off valves of the water loop are in the right position. • Check if the water strainer is plugged. • Make sure there is no air in the water system. • Check on the manometer that there is sufficient water pressure. The water pressure must be>1 bar (water is cold). • Make sure that the expansion vessel is not broken. • Check that the resistance in the water loop is not too high for the pump.
The water volume in the installation is too low.	Make sure that the water volume in the installation is above the minimum required value (refer to "9.6 Water volume and sizing expansion vessels").

Symptom 2: The unit is turned on but the compressor is not starting (space heating or domestic water heating)

POSSIBLE CAUSES	CORRECTIVE ACTION
The unit maybe operate out of its operation range (the water temperature is too low).	In case of low water temperature, the system utilizes the backup heater to reach the minimum water temperature first (12 °C). • Check that the backup heater power supply is correct. • Check that the backup heater thermal fuse is closed. • Check that the backup heater thermal protector is not activated. • Check that the backup heater contactors are not broken.

Symptom 3: Pump is making noise (cavitation)

POSSIBLE CAUSES	CORRECTIVE ACTION
There is air in the system.	Purge air.
Water pressure at pump inlet is too low.	• Check on the manometer that there is sufficient water pressure. The water pressure must be > 1 bar (water is cold). • Check that the manometer is not broken. • Check that the expansion vessel is not broken. • Check that the setting of the pre- pressure of the expansion vessel is correct (refer to 9.6 Water volume and sizing expansion vessels").

Symptom 4: The water pressure relief valve opens

POSSIBLE CAUSES	CORRECTIVE ACTION
The expansion vessel is broken.	Replace the expansion vessel.
The filling water pressure in the installation is higher than 0.3 MPa.	Make sure that the filling water pressure in the installation is about 0.10~0.20 MPa (refer to "9.6 Water volume and sizing expansion vessels").

Symptom 5: The water pressure relief valve leaks

POSSIBLE CAUSES	CORRECTIVE ACTION
Dirt is blocking the water pressure relief valve outlet.	Check for correct operation of the pressure relief valve by turning the red knob on the valve counter clockwise: • If you do not hear a clacking sound, contact your local dealer. • In case the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your local dealer.

Symptom 6: Space heating capacity shortage at low outdoor temperatures

POSSIBLE CAUSES	CORRECTIVE ACTION
Backup heater operation is not activated.	Check that the "OTHER HEATING SOURCE/ BACKUP HEATER" is enabled, see "12.5 Field settings" Check whether or not the thermal protector of the backup heater has been activated (refer to "Controls parts for backup heater(IBH)"). Check if booster heater is running, the backup heater and booster heater can't operate simultaneously.
Too much heat pump capacity is used for heating domestic hot water (applies only to installations with a domestic hot water tank).	Check that the "t_DHWHP_MAX" and "t_DHWHP_RESTRICT" are configured appropriately: • Make sure that the "DHW PRIORITY" in the user interface is disabled. • Enable the "T4_TBH_ON" in the user interface/FOR SERVICEMAN to activate the booster heater for domestic water heating.

Symptom 7: Heat mode can't change to DHW mode immediately

POSSIBLE CAUSES	CORRECTIVE ACTION
Volume of tank is too small and the location of water temperature probe not high enough	• Set "dT1S5" to maximum value, and set "t_DHWHP_RESTRICT" to minimum value. • Set dT1SH to 2 °C. • Enable TBH, and TBH should be controlled by the outdoor unit. • If AHS is available, turn on first, if requirement for turn heat pump on is full filled, the heat pump will turn on. • If both TBH and AHS are not available, try to change the position of T5 probe.

16.3 Operation parameter

This menu is for installer or service engineer reviewing the operation parameters.

- At home page, go to " ⊟ ">"OPERATION PARAMETER".
- Press " ↵ ". There are nine pages for the operating parameter as following. Press "▼ "、 "▲" to scroll.

OPERATION PARAMETER	#00
ONLINE UNITS NUMBER	1
OPERATE MODE	COOL
SV1 STATE	ON
SV2 STATE	OFF
SV3 STATE	OFF
PUMP_I	ON
ADDRESS	1/9

OPERATION PARAMETER	#00
PUMP-O	OFF
PUMP-C	OFF
PUMP-S	OFF
PUMP-D	OFF
PIPE BACKUP HEATER	OFF
TANK BACKUP HEATER	ON
ADDRESS	2/9

OPERATION PARAMETER	#00
GAS BOILER	OFF
T1 LEAVING WATER TEMP.	35°C
WATER FLOW	1.72m3/h
HEAT PUMP CAPACTIY	11.52kW
POWER CONSUM.	1000kWh
Ta ROOM TEMP	25°C
ADDRESS	3/9

OPERATION PARAMETER	#00
T5 WATER TANK TEMP.	53°C
Tw2 CIRCUIT2 WATER TEMP.	35°C
TIS' C1 CLI. CURVE TEMP.	35°C
TIS2' C2 CLI. CURVE TEMP.	35°C
TW_O PLATE W-OUTLET TEMP.	35°C
TW_I PLATE W-INLET TEMP.	30°C
ADDRESS	4/9

OPERATION PARAMETER	#00
Tbt1 BUFFERTANK_UP TEMP.	35°C
Tbt2 BUFFERTANK_LOW TEMP.	35°C
Tsolar	25°C
IDU SOFTWARE	01-09-2019V01
ADDRESS	5/9

OPERATION PARAMETER	#00
ODU MODEL	6kW
COMP.CURRENT	12A
COMP.FREQENCY	24Hz
COMP.RUN TIME	54 MIN
COMP.TOTAL RUN TIME	1000Hrs
EXPANSION VALVE	200P
ADDRESS	6/9

OPERATION PARAMETER	#00
FAN SPEED	600R/MIN
IDU TARGET FREQUENCY	46Hz
FREQUENCY LIMITED TYPE	5
SUPPLY VOLTAGE	230V
DC GENERATRIX VOLTAGE	420V
DC GENERATRIX CURRENT	18A
ADDRESS	7/9

OPERATION PARAMETER	#00
TW_O PLATE W-OUTLET TEMP.	35°C
TW_I PLATE W-INLET TEMP.	30°C
T2 PLATE F-OUT TEMP.	35°C
T2B PLATE F-IN TEMP.	35°C
Th COMP. SUCTION TEMP.	5°C
Tp COMP. DISCHARGE TEMP.	75°C
ADDRESS	8/9

OPERATION PARAMETER	#00
T3 OUTDOOR EXCHARGE TEMP.	5°C
T4 OUTDOOR AIR TEMP.	5°C
TF MODULE TEMP.	55°C
P1 COMP. PRESSURE	2300kPa
ODU SOFTWARE	01-09-2018V01
HMI SOFTWARE	01-09-2018V01
ADDRESS	9/9

NOTE

The power consumption parameter is preparatory. some parameter is not be activated in the system, the parameter will show "--" The heat pump capacity is for reference only, not used to judge the ability of the unit. The accuracy of sensor is ±1 ℃. The flow rates parameters are calculated according to the pump running parameters, the deviation is different at different flow rates, the maximum of deviation is 25 %.

17 ERROR CODES

When a safety device is activated, an error code will be displayed on the user interface.
A list of all errors and corrective actions can be found in the table below.
Reset the safety by turning the unit OFF and back ON.
In case this procedure for resetting the safety is not successful, contact your local dealer.

Error Code	Malfunction or protection	Failure cause And corrective action
E0	Water flow fault(after 3 times E8)	1.The wire circuit is short connected or open. Reconnect the wire correctly. 2.Water flow rate is too low. 3. Water flow switch is failed, switch is open or close continuously, change the water flow switch.
E2	Communication fault between controller and indoor unit	1.Wire doesn't connect between wired controller and unit. connect the wire. 2.Communication wire sequence is not right. Reconnect the wire in the right sequence. 3.Whether there is a high magnetic field or high power interfere, such as lifts, large power transformers, etc.. To add a barrier to protect the unit or to move the unit to the other place.
E3	Final outlet water temp.sensor(T1) fault	1.Check the resistance of the sensor 2.The T1 sensor connector is loosen. Reconnect it. 3.The T1 sensor connector is wet or there is water in. remove the water, make the connector dry. Add waterproof adhesive. 4.The T1 sensor failure, change a new sensor.
E4	water tank temp.sensor (T5) fault	1.Check the resistance of the sensor 2.The T5 sensor connector is loosen. Reconnect it. 3.The T5 sensor connector is wet or there is water in. remove the water, make the connector dry. Add waterproof adhesive 4.The T5 sensor failure, change a new sensor. 5.If you want to close the domestic water heating when T5 sensor do not connected to the system, then T5 sensor can not be detected, refer to "12.6.1 DHW MODE SETTING"
E8	Water flow failure	Check that all shut off valves of the water loop are completely open. 1. Check if the water strainer needs cleaning. 2. Refer to "10.1 Filling water". 3. Make sure there is no air in the system(purge air). 4. Check on the manometer that there is sufficient water pressure. The water pressure must be >1 bar. 5. Check that the pump speed setting is on the highest speed. 6. Make sure that the expansion vessel is not broken. 7. Check that the resistance in the water loop is not too high for the pump. 8. If this error occurs at defrost operation (during space heating or domestic water heating), make sure that the backup heater power supply is wired correctly and that fuses are not blown. 9. Check that the pump fuse and PCB fuse are not blown.
Ed	Inlet water temp.sensor (Tw_in) malfunction	1.Check the resistance of the sensor 2. The Tw_in sensor connector is loosen. Re connect it. 3.The Tw_in sensor connector is wet or there is water in. remove the water, make the connector dry. Add waterproof adhesive 4. The Tw_in sensor failure, change a new sensor.

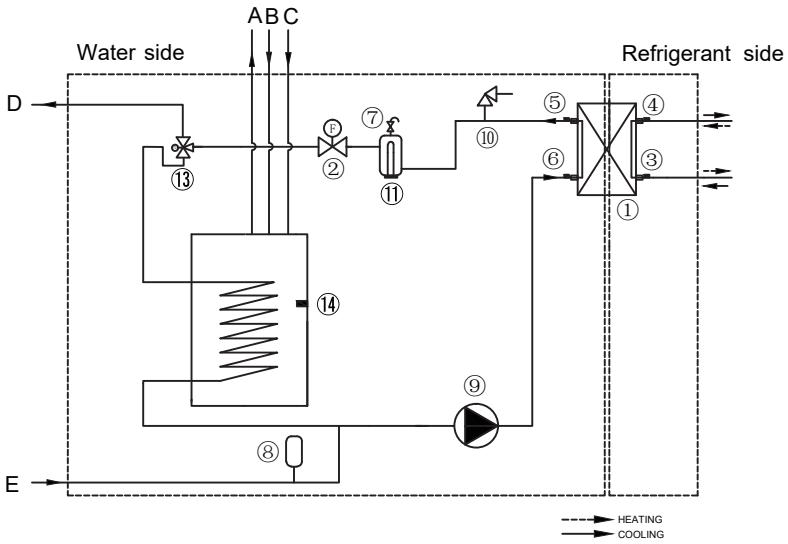
Error Code	Malfunction or protection	Failure cause And corrective action
EE	Indoor unit EEPROM failure	1. The EEPROM parameter is error, rewrite the EEPROM data. 2. EEPROM chip part is broken, change a new EEPROM chip part. 3. main control board of indoor unit is broken, change a new PCB.
H0	Communication fault between indoor unit and outdoor unit	1.wire doesn't connect between outdoor unit and main control board of indoor unit. connect the wire. 2.Communication wire sequence is not right. Reconnect the wire in the right sequence. 3. Whether there is a high magnetic field or high power interfere, such as lifts, large power transformers, etc.. To add a barrier to protect the unit or to move the unit to the other place.
H2	Refrigerant liquid temp.sensor(T2) fault	1.Check the resistance of the sensor 2.The T2 sensor connector is loosen. Re connect it. 3.The T2 sensor connector is wet or there is water in. remove the water, make the connector dry. Add waterproof adhesive 4. The T2 sensor failure, change a new sensor.
H3	Refrigerant gas temp.sensor(T2B) fault	1.Check the resistance of the sensor 2. The T2B sensor connector is loosen. Reconnect it. 3.The T2B sensor connector is wet or there is water in. remove the water, make the connector dry. Add waterproof adhesive 4. The T2B sensor failure, change a new sensor.
H5	Room temp.sensor(Ta) fault	1.Check the resistance of the sensor 2. The Ta senor is in the interface; 3. The Ta sensor failure， change a new sensor or change a new interface, or reset the Ta, connect a new Ta from the indoor unit PCB
H9	Outlet water for zone 2 temp.sensor (Tw2) fault	1.Check the resistance of the sensor 2. The T1B sensor connector is loosen. Reconnect it. 3.The T1B sensor connector is wet or there is water in. Remove the water, make the connector dry. add waterproof adhesive 4. The T1B sensor failure, change a new sensor.
HA	Outlet water temp.sensor(Tw_out) fault	1. The TW_out sensor connector is loosen. Reconnect it. 2.The TW_out sensor connector is wet or there is water in. remove the water, make the connector dry. add waterproof adhesive 3. The TW_out sensor failure, change a new sensor.
P5	|Tw_out - Tw_in| value too big protection	1. Check that all shut off valves of the water loop are completely open. 2. Check if the water strainer needs cleaning. 3. Refer to "10.1 Filling water". 4. Make sure there is no air in the system (purge air). 5. Check on the manometer that there is sufficient water pressure. The water pressure must be >1 bar(water is cold). 6. Check that the pump speed setting is on the highest speed. 7. Make sure that the expansion vessel is not broken. 8. Check that the resistance in the water loop is not too high for the pump.
Pb	Anti-freeze mode	Unit will return to the normal operation automatically.
PP	Tw_out - Tw_in unusual protection	1.Check the resistance of the two sensor 2.Check the two sensors locations 3.The water inlet/outlet sensor wire connector is loosen. Reconnect it. 4.The water inlet/outlet （TW_in /TW_out） sensor is broken, Change a new sensor. 5. Four-way valve is blocked. Restart the unit again to let the valve change the direction. 6.Four-way valve is broken, change a new valve.

Error Code	Malfunction or protection	Failure cause And corrective action
Hb	Three times “PP” protection and Tw_out＜7 ℃	The same to "PP".
E7	Hydraulic separator up temp.sensor(Tbt1) fault	1.Check the resistance of the sensor. 2.The Tbt1 sensor connector is loosen, reconnect it. 3.The Tbt1 sensor connector is wet or there is water in, remove the water, make the connector dry. Add waterproof adhesive. 4.The Tbt1 sensor failure, change a new sensor.
Eb	Reserved	Reserved Make sure Wired controller>>For serviceman>>15 INPUT DEFINE>>15.8 SOLAR INPUT = NON, otherwise Eb error code will appear.
Ec	Hydraulic separator low temp.sensor(Tbt2) fault	1.Check the resistance of the sensor. 2.The Tbt2 sensor connector is loosen, reconnect it. 3.The Tbt2 sensor connector is wet or there is water in, remove the water, make the connector dry. Add waterproof adhesive. 4.The Tbt2 sensor failure, change a new sensor."
HE	Communication error between main board and thermostat transfer board	RT/Ta PCB is set to be valid on user interface but the thermostat transfer board is not connected or the communication between thermostat transfer board and main board is not effectively connected. If the thermostat transfer board is not needed, set the RT/Ta PCB to invalid. If the thermostat transfer board is needed, please connect it to the main board and make sure the communication wire is connected well and there is no strong electricity or strong magnetic interference.

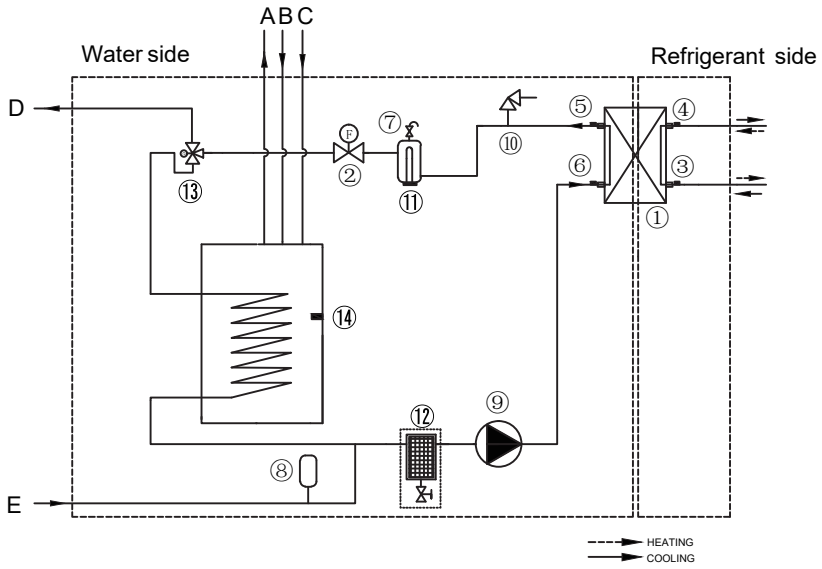
⚠ CAUTION

- In winter, if the unit has E0 and Hb failure and the unit is not repaired in time, the water pump and pipeline system may be damaged by freezing, so E0 and Hb failure must be repaired in time.

ANNEX A:REFRIGERANT CYCLE



Standard Unit



Optional Unit

Item	Description	Item	Description
1	Water side heat exchanger (Plate heat exchange)	11	Backup heater
2	Flow switch	12	Magnetic separator(Optional)
3	Refrigerant liquid piping temperature sensor	13	3-Way valve
4	Refrigerant gas piping temperature sensor	14	Domestic water tank temperature sensor
5	Water outlet temperature sensor	A	Domestic hot water outlet
6	Water inlet temperature sensor	B	Domestic hot water recirculation inlet
7	Automatic air purge valve	C	Domestic cold water inlet
8	Expansion vessel	D	Space heating/cooling water outlet
9	Circulated pump	E	Space heating/cooling water inlet
10	Pressure relief valve		

ANNEX B: SYSTEM CLEANING AND PROTECTION MEASURES

The use of inappropriate additives may cause damage to components, noise, and other related issues.

Do not use unsuitable anti-corrosion agents, antifreeze, biocides, or sealants.

Mundoclima recommends the use of the following additives:

Cleaning products (requires subsequent rinsing):

- Fernox F3 (MA11903)

- Sentinel X 400 (MA11804)

Anti-corrosion additives:

- Fernox F1 (MA11901)

- Sentinel X 100 (MA11801)

Anti-algae biocidal additives:

- Fernox F7 (MA11907)

- Sentinel X 700 (MA11807)

When using them, carefully follow the instructions provided by the additive manufacturer.

MUNDOCLIMA®

ROSSELLÓ 430-432
08025 BARCELONA
SPAIN
(+34) 93 446 27 80

www.mundoclima.com