



Scan the QR code to
read the manual in
different languages

INSTALLATION MANUAL

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 SAFETY PRECAUTIONS	01
2 GENERAL INTRODUCTION	04
2.1 Documentation	04
2.2 Unpacking	05
2.3 Accessories of the unit	06
2.4 Transportation	07
2.5 Open the unit	08
2.6 Main components	09
2.7 Servicing space requirements	10
2.8 Conditions for installation	10
2.9 Mounting the indoor unit	11
2.10 Refrigerant piping connection	11
3 HYDRAULIC INSTALLATION	12
3.1 Preparations for installation	12
3.2 Water loop connection	12
3.3 Filling water loop with water	13
3.4 Filling domestic hot water tank with water	14
3.5 Water pipe insulation	14
3.6 Freeze protection	14
3.7 Water	15
4 ELECTRICAL INSTALLATION	17
4.1 Opening the electrical box cover	17
4.2 Electrical wiring	18
4.3 Connection of power supply	18
4.4 Connection of other components	18
5 CONFIGURATION	26
5.1 Check before configuration	26
5.2 Configuration	27
5.3 Modbus mapping table	27
6 COMMISSIONING	28
6.1 Test run for the actuator	28
6.2 Air purge	28
6.3 Test run	29
6.4 Check of the minimum flow rate	29
7 HAND-OVER TO THE USER	29

8 MAINTENANCE	30
8.1 Safety precautions for maintenance	30
8.2 Maintenance checklist	30
9 TECHNICAL DATA	31
9.1 General	31
9.2 Piping diagram	32
ANNEX	33
Annex A. Menu structure (wired controller)	33
Annex B. Operation settings	35
Annex C. Terms and abbreviation	38

1 SAFETY PRECAUTIONS

Observe the basic safety regulations before starting work and operation.

Meaning of hazard severity panels

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.

NOTE

Additional information.

Target group

DANGER

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

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

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

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

Safety precaution about the appliances using flammable refrigerant

Refer to Installation Manual of Outdoor Unit.

Intended use

Refer to Installation Manual of Outdoor Unit.

Regulations to be observed

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

Working on the system

Refer to Installation Manual of Outdoor Unit.

Installation

Refer to Installation Manual of Outdoor Unit.

Safety instructions for operating the system

Refer to Installation Manual of Outdoor Unit.

Disposal

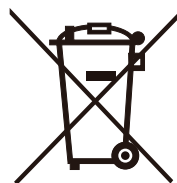
This equipment uses flammable refrigerants. The disposal of the equipment must comply with national regulations.

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

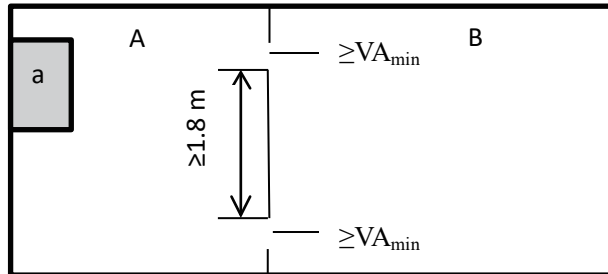
Additional Requirement of the refrigerant amount

If the total refrigerant charge in the system is <1.84 kg, there are no additional minimum floor area requirement.

If the total refrigerant charge in the system is ≥ 1.84 kg, 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 5, "Table 2-Minimum floor area: indoor unit" on page 5 and "Table 3-Minimum venting opening area for natural ventilation: indoor unit" on page 5.

If the piping length is 30 m, then the minimum floor area is ≥ 4.5 m²; if the floor area is less than 4.5 m², it need to trepanning a hole of 200 cm².

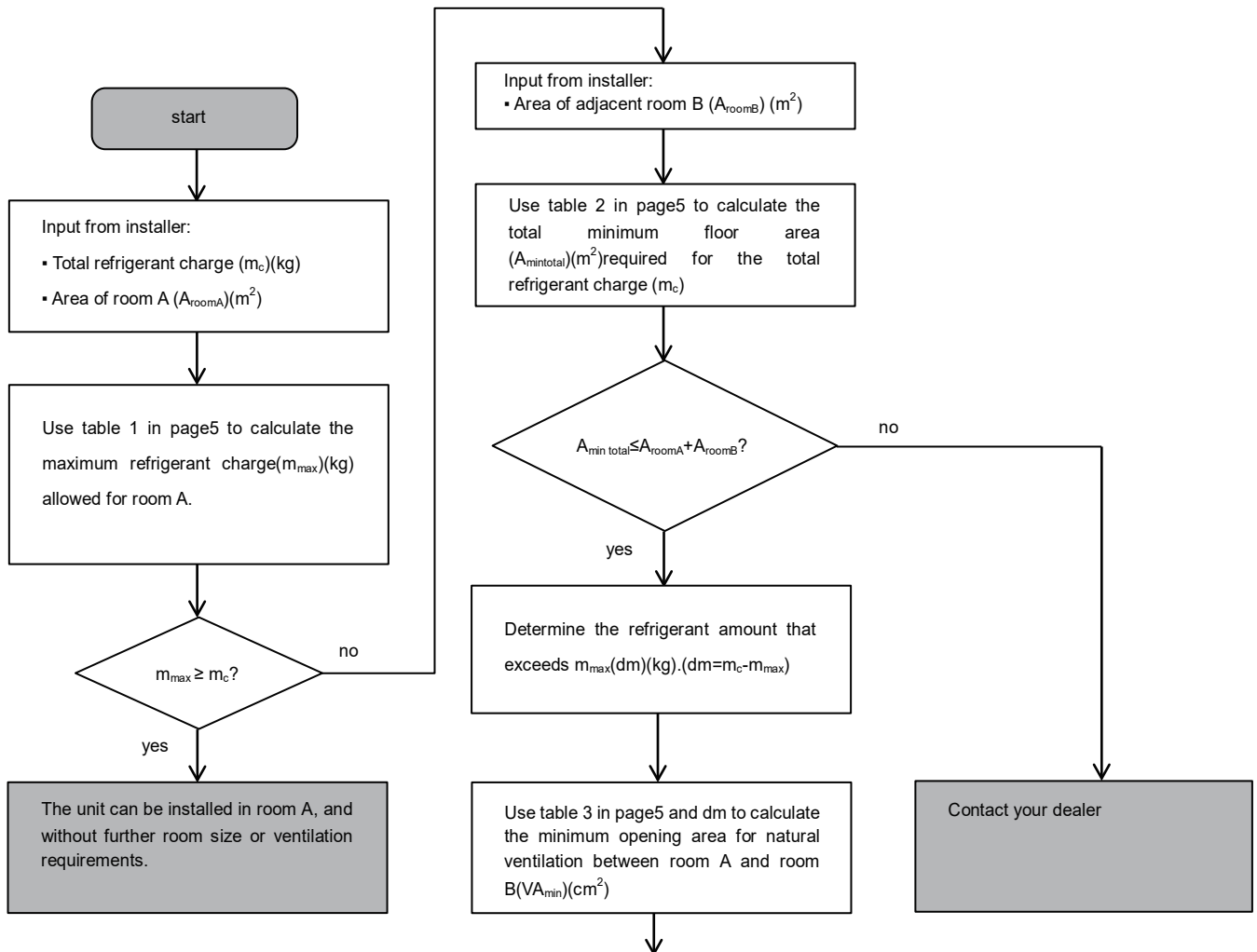


a Indoor unit

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 m².



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=1 800 mm		H=1 800 mm
1	1.02	4	2.05
2	1.45	5	2.29
3	1.77	6	2.51

⚠ CAUTION

- For wall mounted models, the value of "Installation height (H)" is considered 1 800 mm to comply to IEC 60335-2-40:2013 A1 2016 Clause GG2.
- For intermediate A_{room} values(i.e. when A_{room} is between two values from the table), consider the value that corresponds to the lower A_{room} value from the table. If $A_{room}=3m^2$, consider the value that corresponds to " $A_{room}=3m^2$ ".

Table 2-Minimum floor area:indoor unit

$m_c(kg)$	Minimum floor area(m^2)
	H=1 800 mm
1.84	3.32
2.00	3.81
2.25	4.83
2.50	5.96

⚠ CAUTION

- For wall mounted models, the value of "Installation height (H)" is considered 1800 mm to comply to IEC 60335-2-40:2013 A1 2016 Clause GG2.
- For intermediate m_c values(i.e. when m_c is between two values from the table), consider the value that corresponds to the higher m_c value from the table. If $m_c=1.87$ kg, consider the value that corresponds to " $m_c=1.87$ kg".
- Systems with total refrigerant charge lower than 1.84kg are not subjected to any room requirements.

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)
			H=1 800 mm
2.22	0.1	2.12	495.14
2.22	0.3	1.92	448.43
2.22	0.5	1.72	401.72
2.22	0.7	1.52	355.01
2.22	0.9	1.32	308.30
2.22	1.1	1.12	261.59
2.22	1.3	0.92	214.87
2.22	1.5	0.72	168.16
2.22	1.7	0.52	121.45
2.22	1.9	0.32	74.74
2.22	2.1	0.12	28.03

⚠ CAUTION

- For wall mounted models, the value of "Installation height (H)" is considered 1800 mm to comply to IEC 60335-2-40:2013 A1 2016 Clause GG2.
- For intermediate dm values(i.e. when dm is between two values from the table), consider the value that corresponds to the higher dm value from the table. If $dm=1.55$ kg, consider the value that corresponds to " $dm=1.6$ kg".

2 GENERAL INTRODUCTION

2.1 Documentation

- Always observe all the operating and installation instructions included with the system components.
- Hand these instructions and all other applicable documents to the end user.
- Scan the QR code on the right for other languages.

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

Document	Content	Format
Installation Manual - Outdoor Unit	Brief installation instructions of the outdoor unit	Paper (in the box next to the outdoor unit)
Installation Manual(this manual)- Indoor Unit	Brief installation instructions of the indoor unit	Paper (in the box next to the indoor unit)
Installation, Operation and Maintenance Manual	Preparation for the installation, good practices...(more information contained, for installers and advanced users only)	Digital files. Scan the QR code on the right.
Operation Manual (wired controller)	Quick guide for basic usage	Paper (in the box next to the indoor unit)
Technical Data Manual	Performance data and ERP information	Paper (in the box next to the outdoor unit)

Online Tools (APP and websites)

Refer to the OPERATION MANUAL for more information

For the terms and abbreviation, see Annex C.

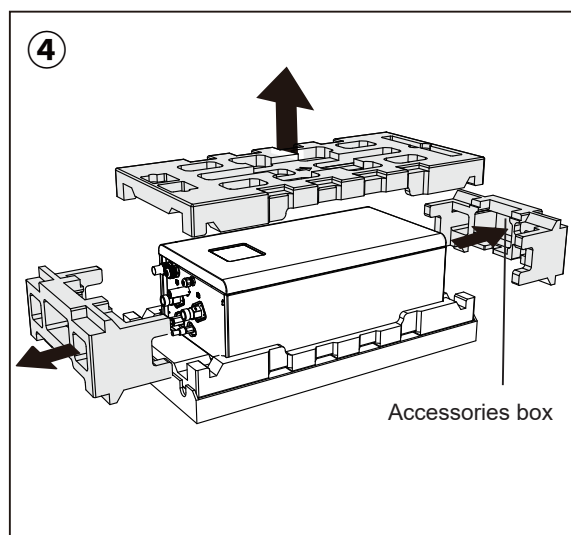
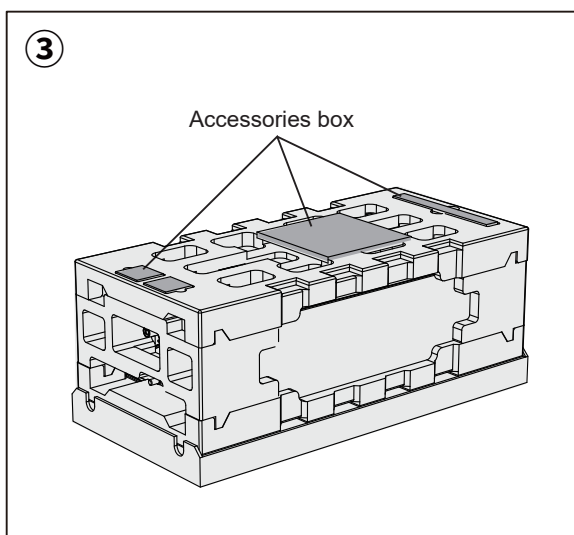
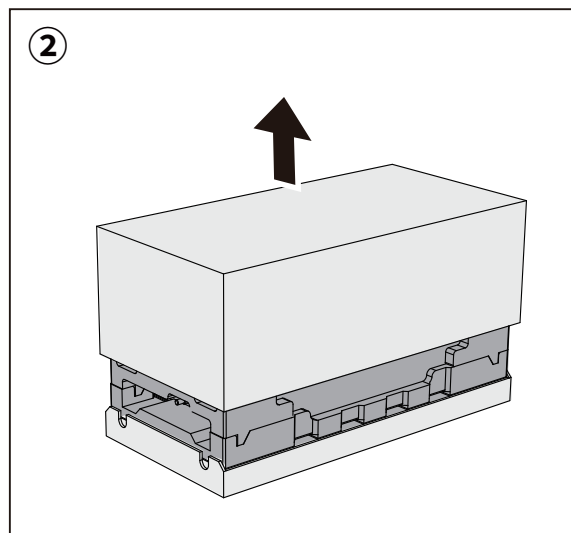
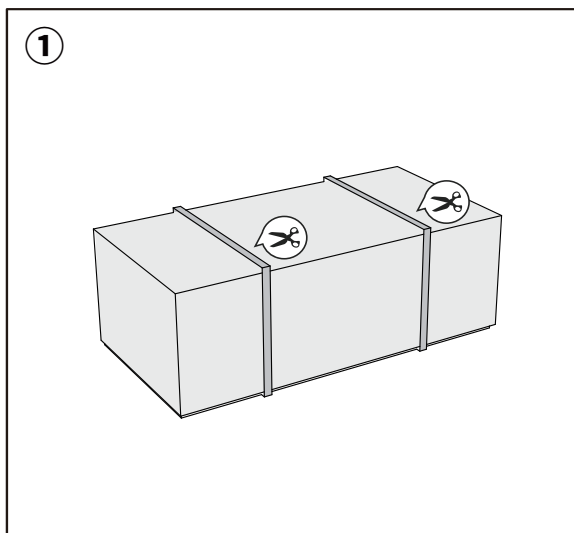


Scan the QR code to read the manual in different languages



Installation, Operation and Maintenance Manual

2.2 Unpacking



For the accessories box, see 2.4 Accessories of the Unit for more details.

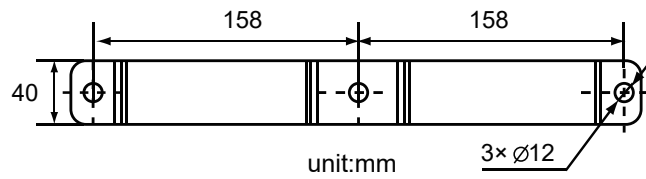
2.3 Accessories of the unit

Installation Fittings		
Name	Shape	Quantity
		160
Installation and owner's manual (this book)		1
M16 Copper Nut Tamper Cap		1
M9 Copper Nut Tamper Cap		1
M8 expansion bolts		5
Thermistor T5(or Tw2 or Tbt or Tsolar)		1
M16 Flare nut		1
M9 Flare nut		1
Y-type Strainer		1
Mounting bracket		1
Operation manual (Wire controller)		1
Tie Wrap		2
Network matching resistor		1

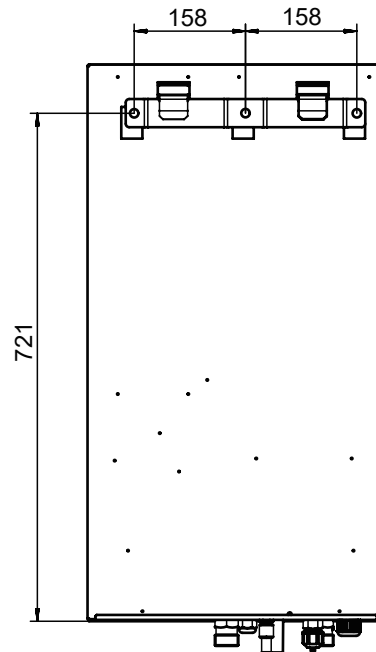
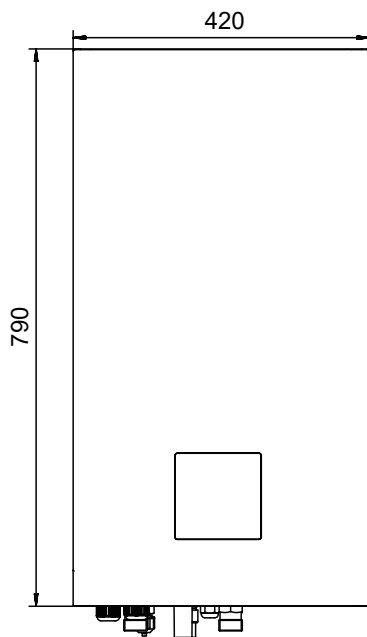
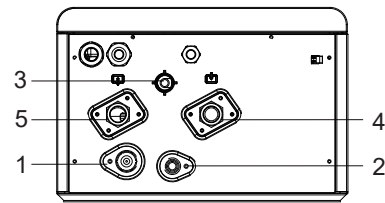
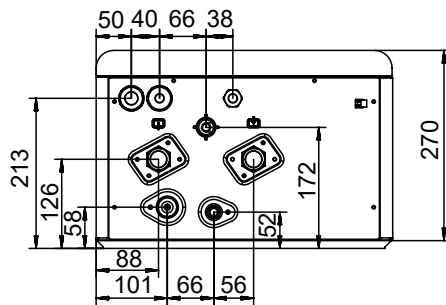
2.4 Transportation

2.4.1 Dimensions

Dimensions of the wall bracket:



Dimensions of the unit:



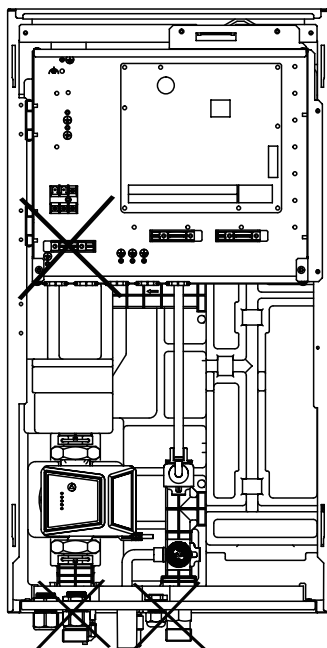
2.4.2 Manual transportation

⚠ WARNING

Risk of injury from lifting a heavy weight.

Lifting weights that are too heavy may cause injury to the spine, for example.

- Note the weight of the product.
- Have two people lift the product.
- Do not hold the control box and pipes during transportation.



2.5 Open the unit

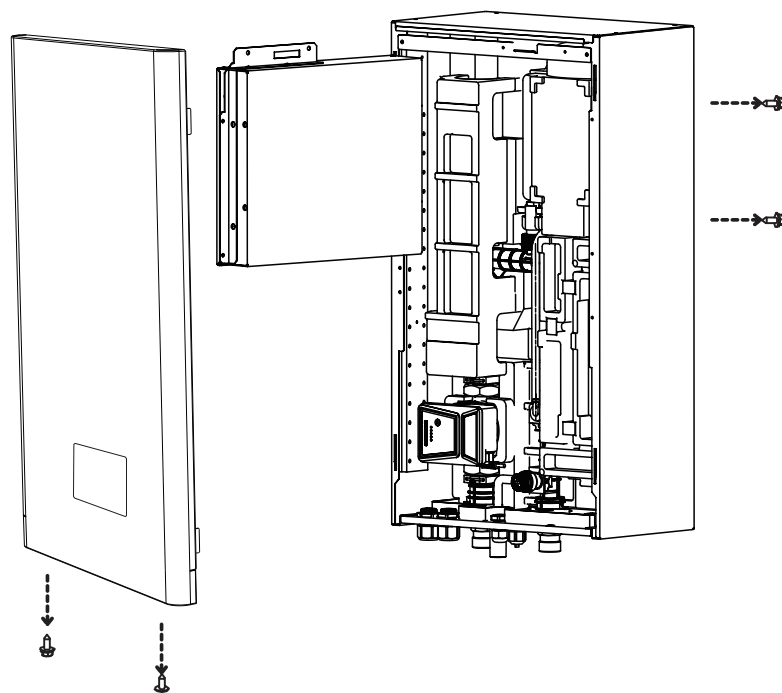
To access the unit for installation and maintenance, follow the instructions below.

⚠ WARNING

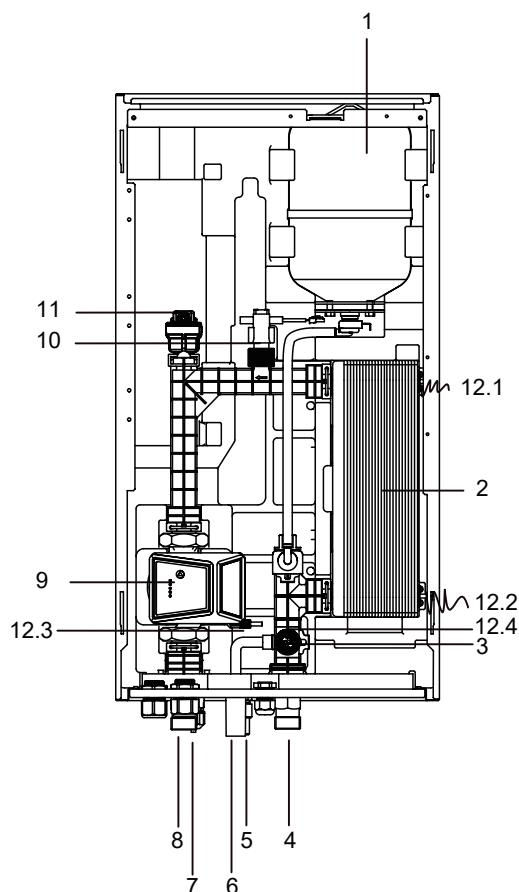
Risk of electrocution.
Risk of burning.

👉 NOTE

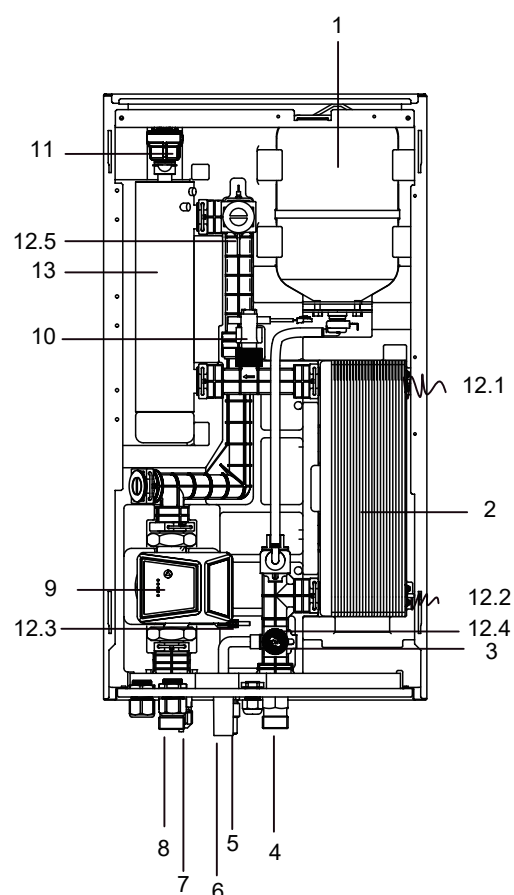
- Keep the screws properly for later use.



2.6 Main components



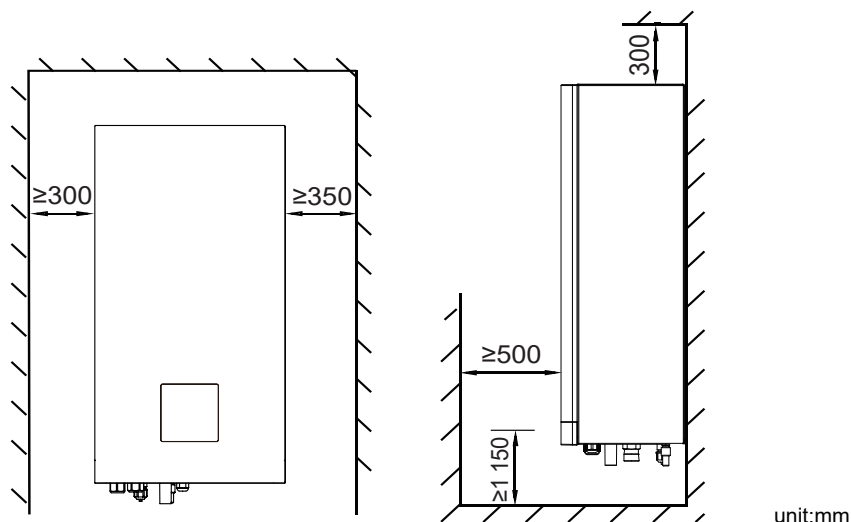
Basic



Customized

Code	Description	Explanation
1	Expansion vessel (8 L)	/
2	Plate heat exchanger	Heat exchanging between water and refrigerant.
3	Pressure relief valve	The pressure relief valve prevents excessive water pressure in the water circuit by opening at 43.5psi(g)/0.3MPa(g) and discharging some water.
4	Flange joint	Water inlet.
5	Refrigerant liquid pipe	/
6	Drainage port	/
7	Refrigerant gas pipe	/
8	Flange joint	Water outlet.
9	Pump_i	The pump circulates the water in the water circuit.
10	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.
11	Automatic air purge valve	Remaining air in the water circuit will be automatically removed via the automatic air purge valve.
12	Temperature sensors	Four temperature sensors determine the water and refrigerant temperature at various points. 12.1-Tw_out ;12.2-Tw_in ;12.3-T2B ;12.4-T2 ;12.5-T1
13	Internal backup heater	The backup heater consists of an electrical heating element that will provide additional heating capacity to the water circuit 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.

2.7 Servicing space requirements



2.8 Conditions for installation

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 servicing.
- 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.

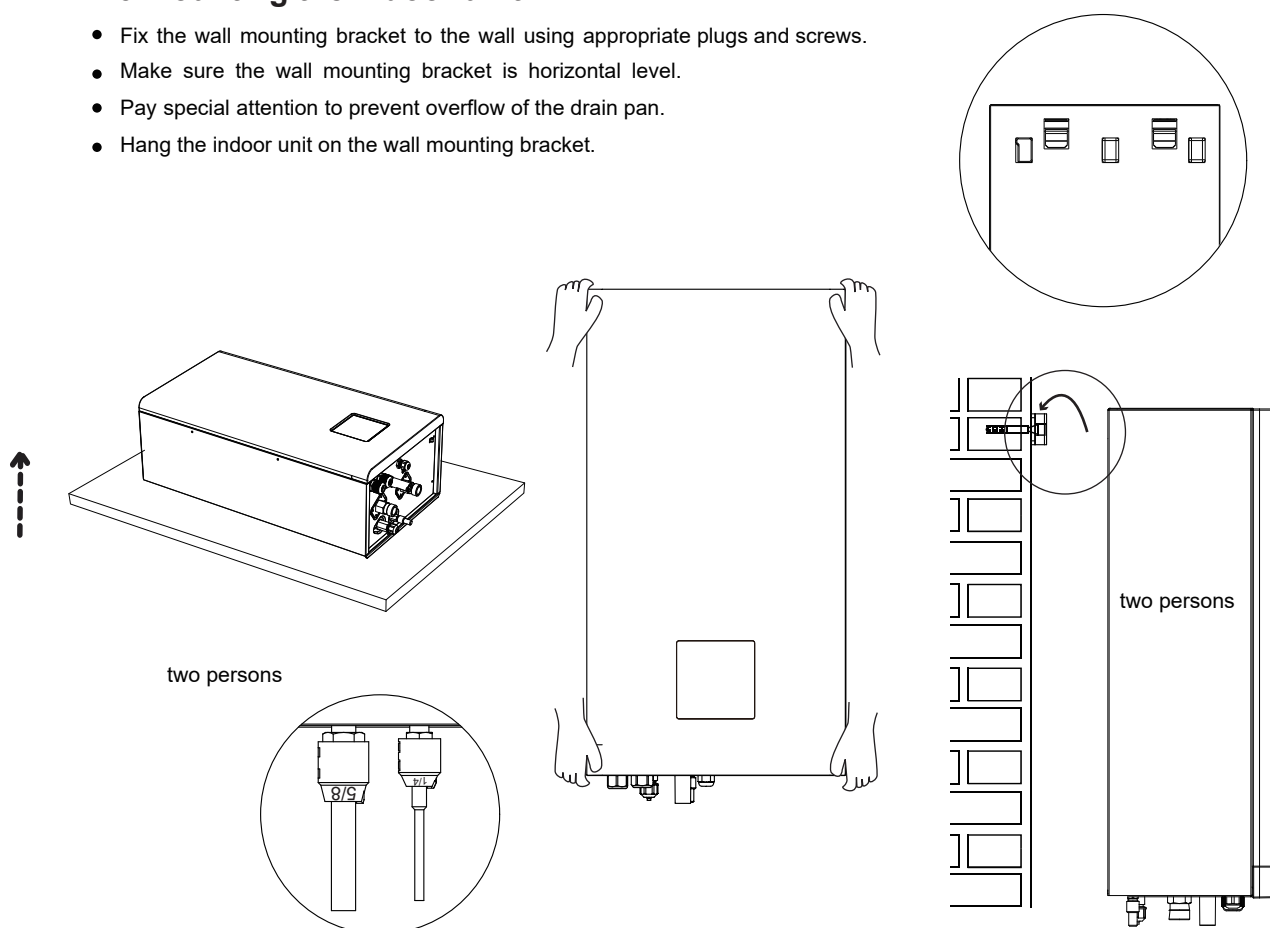
- The installation surface is a flat and vertical non-combustible wall, capable of supporting the operation weight of the unit.
- All piping lengths and distance have been taken into consideration.

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 10m in length.	8 m (a)
Maximum allowable piping length between the TW2 and the indoor unit. The temperature sensor a cable of TW2 supplied with the indoor unit is 10m in length.	8 m

(a) The static pressure of the tank differs. In case of the tank with high static pressure, the maximum piping length might be lower than 8 m.

2.9 Mounting the indoor unit

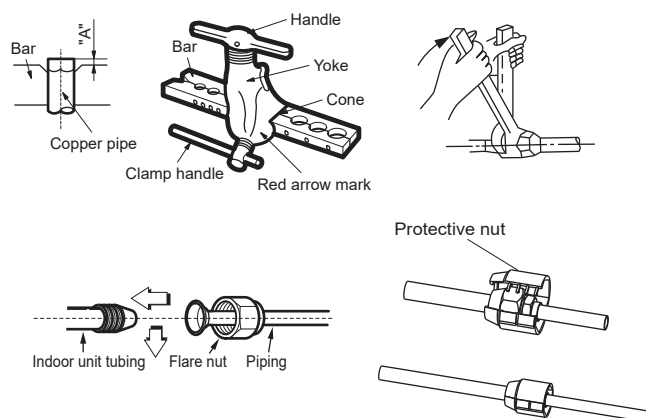
- Fix the wall mounting bracket to the wall using appropriate plugs and screws.
- Make sure the wall mounting bracket is horizontal level.
- Pay special attention to prevent overflow of the drain pan.
- Hang the indoor unit on the wall mounting bracket.



2.10 Refrigerant piping connection

- Align the center of the pipes.
- Sufficiently tighten the flare nut with fingers, and then tighten it with a spanner and torque wrench.
- The protective nut is a one-time part, it can not be reused. In case it is removed, it should be replaced with a new one.

Outer diam.	Tightening torque(N.cm)	Additional tightening torque(N.cm)
φ 6.35	1 500 (153kgf.cm)	1 600 (163kgf.cm)
φ 9.52	2 500 (255kgf.cm)	2 600 (265kgf.cm)
φ 12.7	3 500 (357kgf.cm)	3 600 (367kgf.cm)
φ 16	4 500 (459kgf.cm)	4 700 (479kgf.cm)



- In order to application convenient, first, application the refrigerant liquid pipe and refrigerant gas pipe, and then, application the water pipe.

⚠ CAUTION

- The installation of pipe-work shall be kept to a minimum.
- Excessive torque can break nut on installation conditions.
- When flared joints are reused indoors, the flare part should be re-fabricated.

3 HYDRAULIC INSTALLATION

3.1 Preparations for installation

NOTE

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

System water volume

Check the total water volume in the installation according to the expansion vessel.

For the selection of expansion vessel, refer to INSTALLATION, OPERATION AND MAINTENANCE MANUAL.

Flow rate range

The operation flow rate range of the unit is shown as below. Check and ensure that the flow rate in the installation is guaranteed in all conditions.

Unit	12 kW	14 kW	16 kW
Flow rate range (m ³ /h)	0.7*~3.0	0.7*~3.0	0.7*~3.0

* The minimum output of the Pump_I can be set on wired controller.

CAUTION

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

Refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for more information.

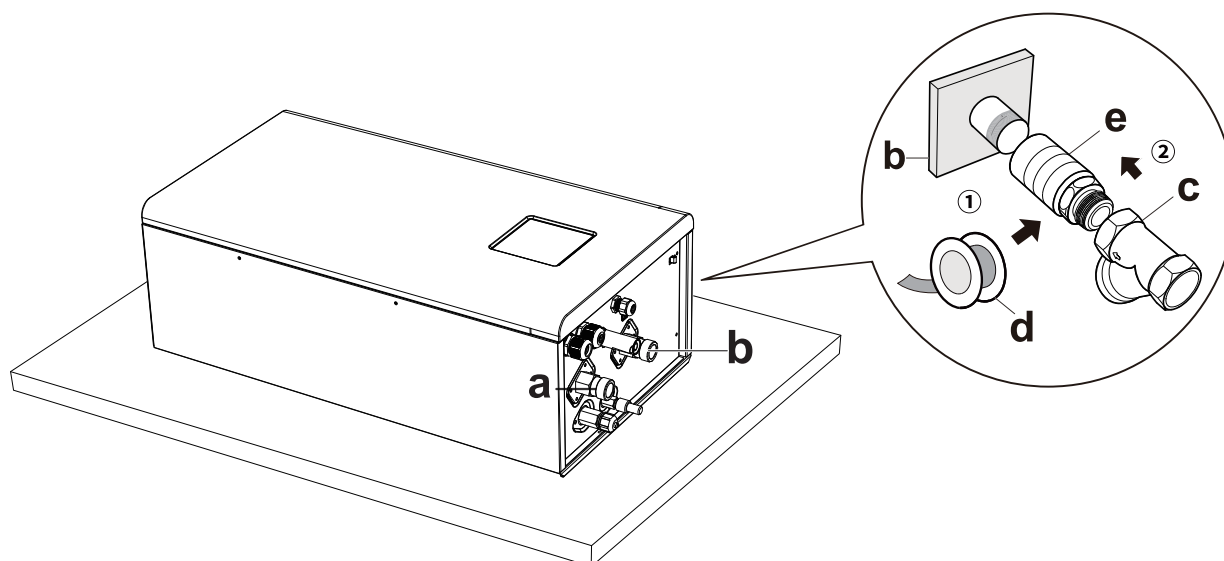
3.2 Water loop connection

CAUTION

- Incorrect direction of the water outlet and inlet can cause unit malfunction.
- Do not apply excessive force when connecting the pipes provided on the site, and make sure the pipes are aligned properly. Water pipe deformation can cause unit malfunction.

1) Connect the Y-type strainer to the water inlet of the unit, and seal the connection with thread sealant. (To provide access to the Y-type strainer for cleaning, an extension pipe can be connected between the strainer and the water inlet depending on the field conditions)

2) Connect the pipe provided on the site to the water outlet of the unit.



a	Water OUTLET (connection with screws, male, 1")
b	Water INLET (connection with screws, male, 1")
c	Y-type strainer (delivered with the unit) (2 screws for connection, female, 1")
d	Thread seal tape
e	Extension pipe (recommended, with the length depending on the field conditions)

CAUTION

- The installation of the Y-type strainer at the water inlet is mandatory
- Pay attention to the correct flow direction of the Y-type strainer.
- Sediment may damage the plate heat exchanger, and there could be refrigerant leakage risk without strainer.
- It is recommended to use strainer with 60 mesh or higher.

NOTE

Problems caused by not installing a filter are not covered by the warranty.

Domestic hot water

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

Others

NOTE

- Air vent valves must be installed at highest points of the system.
- Drain taps must be installed at lowest points of the system.

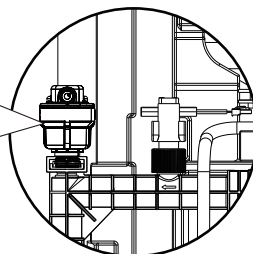
3.3 Filling water loop with water

NOTE

Before filling with water, please check 5.7 Water for the water quality requirements. Pumps and valves may become stuck as a result of poor water quality.

- Connect the water supply to the filling valve and open the valve. Follow applicable regulations.
- Make sure the automatic air vent valve is open.
- Ensure a water pressure of approximately 0.2 MPa(2 bar). Remove the air in the loop as much as possible using the air vent valves. Air in the water loop could lead to malfunction of the backup electric heater.

Do not fasten the black plastic cover on the vent valve at the topside of the unit when the system is running. Open air purge valve, turn anticlockwise at least 2 full turns to release air from the system.



NOTE

The water pressure varies with the water temperature (higher pressure at higher water temperature). Always keep the water pressure above 0.03 MPa(0.3 bar) to prevent air from entering the loop.

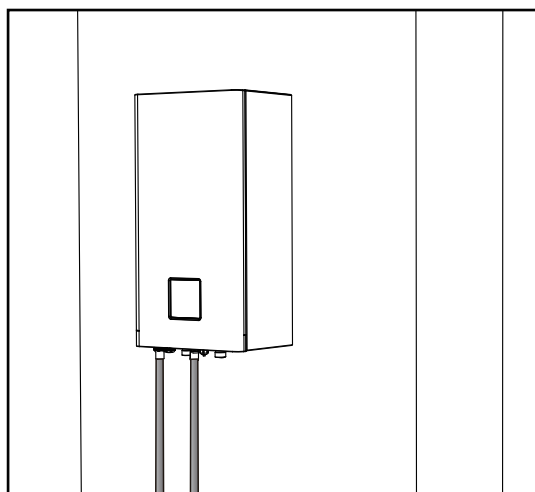
Maximum water pressure	0.3 MPa(3 bar)
------------------------	----------------

3.4 Filling domestic hot water tank with water

See the specific manual of the domestic hot water tank.

3.5 Water pipe insulation

The complete water loop including all pipes, must be insulated to prevent condensation during cooling operation, heating and cooling capacity reduction, and freezing of the outside water pipes in winter.



NOTE

- The insulation material should be provided with a fire resistance rating of B1 or above and comply with all applicable regulations.
- The thermal conductivity of the sealing material should be below 0.039 W/mK.

Recommended thickness of the sealing material is shown as below.

Piping length (m) between the unit and the terminal device	Minimum insulation thickness(mm)
< 20	19
20~30	32
30~40	40
40~50	50

3.6 Freeze protection

3.6.1 Protected by software

The software is equipped with specific functions to protect the entire system from freezing by using the heat pump and the backup heater (if available).

- When the temperature of the water flow in the system drops to a certain value, the unit will heat the water using the heat pump, electric heating tape, or backup heater.
- The anti-freeze function is enabled only when the temperature increases to a certain value.

CAUTION

- In the event of power failure, the above features would fail to protect the unit from freezing. Therefore, always keep the unit powered on.
- If the power supply for the unit is to be switched off for a long time, the water in the system pipe needs to be drained to avoid damage to the unit and pipeline system due to freezing.

3.6.2 Protected by glycol

Glycol lowers the freezing point of water.

CAUTION

Ethylene glycol and propylene glycol are toxic.

CAUTION

Glycol can corrode the system. When uninhibited glycol comes into contact with oxygen, it becomes acidic. This corrosion process is accelerated by copper and high temperature. The acidic uninhibited glycol attacks metal surfaces, forming galvanic corrosion cells that can cause severe damage to the system. Therefore, it is important to follow these steps:

- Let a qualified specialist treat the water correctly;
- Select a glycol with corrosion inhibitors to counteract acids formed by the oxidation of glycols;
- Do not use any automotive glycol because its corrosion inhibitors have a limited lifetime and contain silicates which can contaminate or block the system;
- Do not use galvanized pipes in glycol systems as such pipes may lead to the precipitation of certain components in the glycol's corrosion inhibitor.

NOTE

Glycol absorbs moisture from the environment, so it is important to avoid using glycol exposed to air. If glycol is left uncovered, the water content increases, lowering the glycol concentration and potentially causing hydraulic components to freeze. To prevent this, take precautions and minimize glycol's exposure to air.

Types of glycol

The types of glycol that can be used depend on whether the system contains a domestic hot water tank:

If	Then
The system contains a domestic hot water tank	Only use propylene glycol (a)
The system does NOT contain a domestic hot water tank	Either propylene glycol(a) or ethylene glycol can be used

(a) Propylene glycol, including the necessary inhibitors, falls in Category III according to EN1717.

Required concentration of glycol

The required concentration of glycol depends on the lowest expected outdoor temperature, and on whether you want to protect the system from bursting or from freezing. To prevent the system from freezing, more glycol is required.

Add glycol according to the table below.

Lowest expected outdoor temperature	Prevention [1] from bursting	Prevention [2] from freezing
-5 °C	10 %	15 %
-10 °C	15 %	25 %
-15 °C	20 %	35 %
-20 °C	25 %	N/A
-25 °C	30 %	N/A
-30 °C	35 %	N/A

- [1] : Glycol can prevent the piping from bursting, but cannot prevent the liquid inside the piping from freezing.

- [2] : Glycol can prevent the liquid inside the piping from freezing.

NOTE

- The required concentration might vary depending on the type of glycol used. ALWAYS compare the requirements from the table above with the specifications provided by the glycol manufacturer. If necessary, meet the requirements set by the glycol manufacturer.

- The added concentration of glycol should NEVER exceed 35 %.

- If the liquid in the system is frozen, the pump will NOT be able to start. Please note that solely preventing the system from bursting may not prevent the liquid inside from freezing.

- If water remains stagnant within the system, it is highly likely to freeze and result in system damage.

NOTE

Adding glycol to the water loop reduces the maximum allowed water volume of the system. See the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for more information.

3.7 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 strainer. Various types of strainers are available. A mesh strainer is designed to catch large dirt particles. This strainer is usually placed in the part with the larger flow. A tissue strainer is designed to catch the finer particles.

Water component for corrosion limit on copper

PH	7.5-9.0	
Ryznar Stability Index (RSI)	< 6.0	
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 ₃ O ₄ (black)	Dose < 7.5 mg/L, 50 % of mass, with diameter < 10 µm	
Iron oxide Fe ₂ O ₃ (red)	Dose < 7.5 mg/L, diameter < 1 µm	



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.

4 ELECTRICAL INSTALLATION

DANGER

Risk of electrocution.

WARNING

- The appliance should be installed in accordance with national wiring regulations.
- Follow WIRING DIAGRAM for electrical wiring that is located on the rear side of the electrical box cover.
- This appliance incorporates an earth connection for functional purposes only.
- Be sure to install the required fuses or circuit breakers. An all-pole disconnection switch having a contact separation of at least 3 mm in all poles should be connected in fixed wiring.

Refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for more practical instructions.

4.1 Opening the electrical box cover

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

WARNING

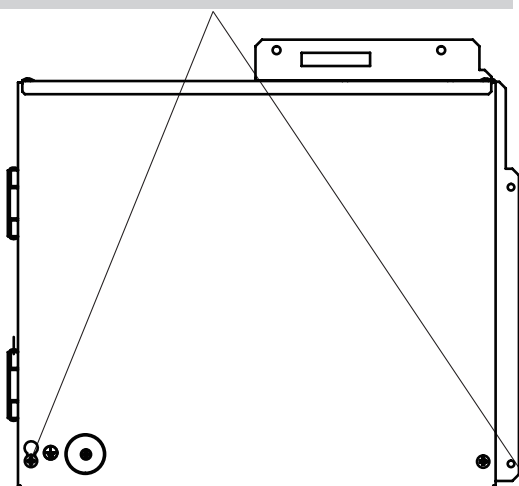
Risk of electrocution.
Risk of burning.

NOTE

- Keep the screws properly for later use.

NOTE

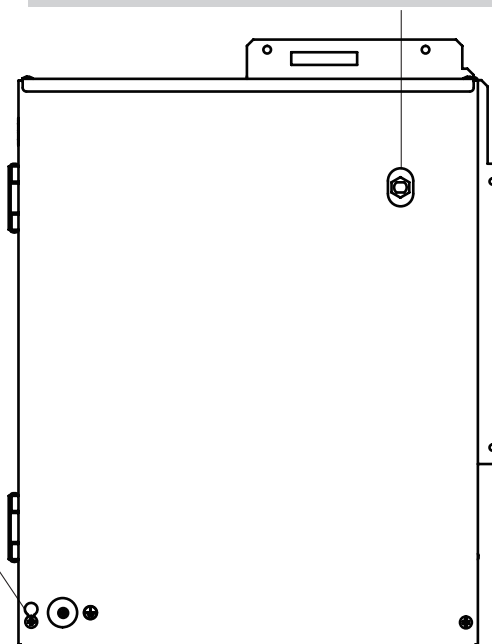
When removing the electric control box cover, loosen the screw on the left side of the electric control box without removing it, so as to prevent the cover from falling suddenly.



Basic

NOTE

Please be careful not to bump the thermostat when removing and installing the electric control box cover.



Customized

4.2 Electrical wiring

Operating current and wire diameter

Refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for more information.

Tightening torques

Item	Tightening torque (N•m)
M4 (power terminal, electric control board terminal)	1.2 to 1.4
M4 (earthed)	1.2 to 1.4

4.3 Connection of power supply

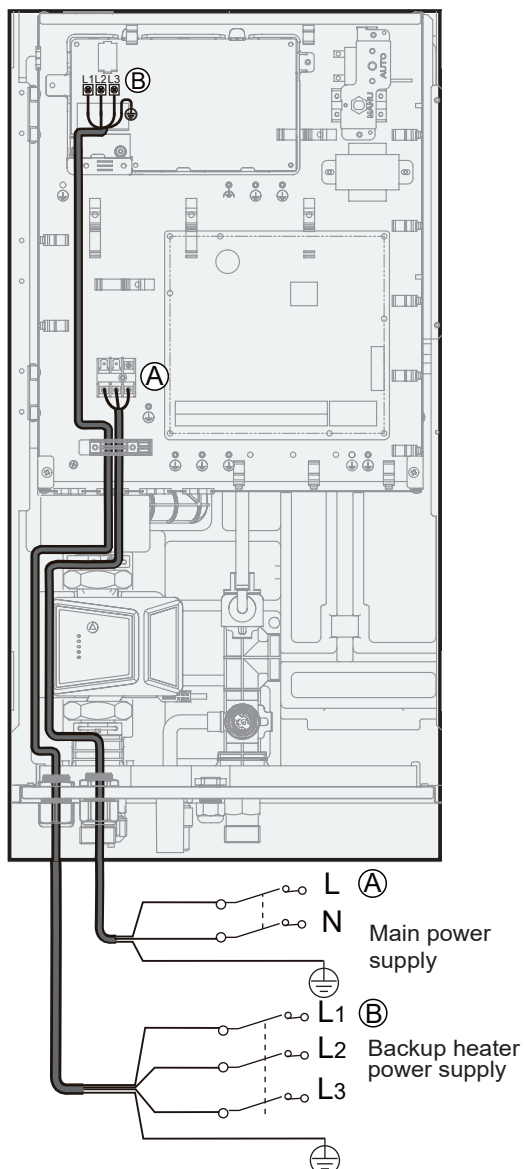
4.3.1 Wiring of main power supply

⚠ CAUTION

- Use a round crimp-style terminal for connection to the power supply terminal board. If it is not available, refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for more information.
- The power cord model is H07RN-F.
- Illustrations below are for units with a backup heater. For more illustrations, refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL.

Unit	Power supply
160	220-240 V~ 50 Hz

3 phase with backup heater.



⚠ CAUTION

Leakage protection switch must be installed.

4.3.2 Wiring of backup heater power supply (optional)

Backup heater type	Power supply	Maximum circuit current (A)
3 kW	220-240 V~ 50 Hz	16
6 kW	380-415 V 3~ 50 Hz	16
9 kW	380-415 V 3~ 50 Hz	16

Refer to the illustration above for the wiring.

⚠ CAUTION

- To ensure the unit is fully earthed, always connect the backup heater power supply and the earth cable.

4.4 Connection of other components

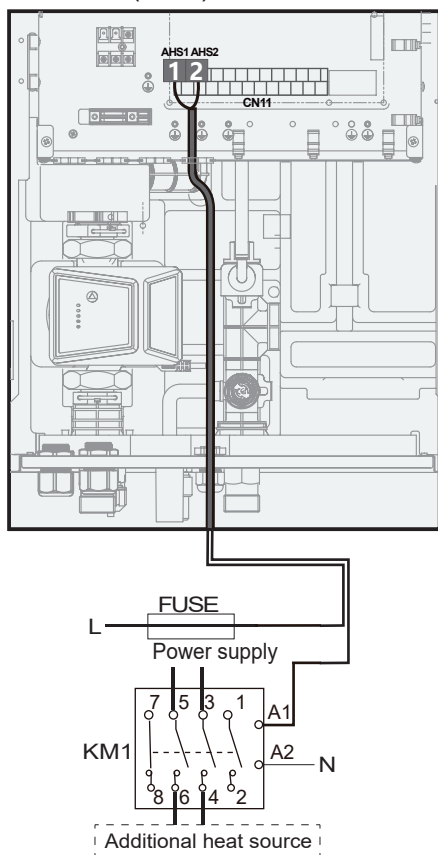
The port provides the control signal to the load. Two kinds of control signal ports:

- Type 1: dry contactor without voltage.
- Type 2: the port provides the signal with 220 -240 V~ 50 Hz voltage.

📌 NOTE

- If the current of load is lower than 0.2 A, the load can be connected to the port directly. If the load current is higher than or equal to 0.2 A, it is necessary to connect the AC contactor to the load.
- Illustrations below are based on units with a backup heater.

4.4.1 Wiring of additional heating source control (AHS)



Voltage	220-240 V AC
Maximum running current(A)	0.2
Minimum wiring size	0.75
Control port signal type	Type 1

NOTE

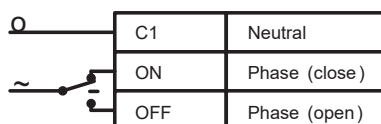
This part only applies to basic units (without a backup heater). For customized units (with a backup heater), the hydraulic module should not be connected to any additional heat source as there is an interval backup heater in the unit.

4.4.2 Wiring of 3-way valves SV1, SV2 and SV3

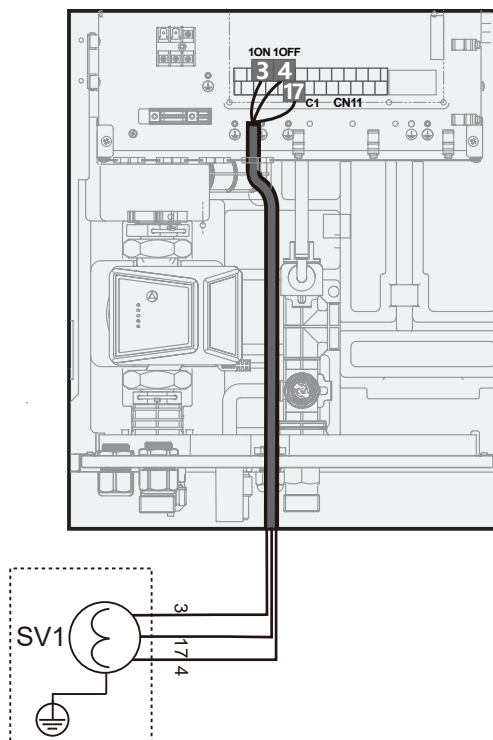
NOTE

Refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for the installation locations of SV1, SV2 and SV3.

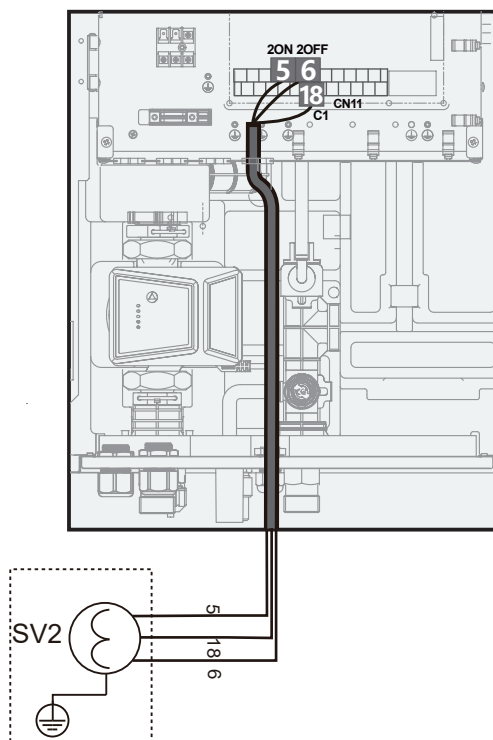
The illustration below is for this type of SV:



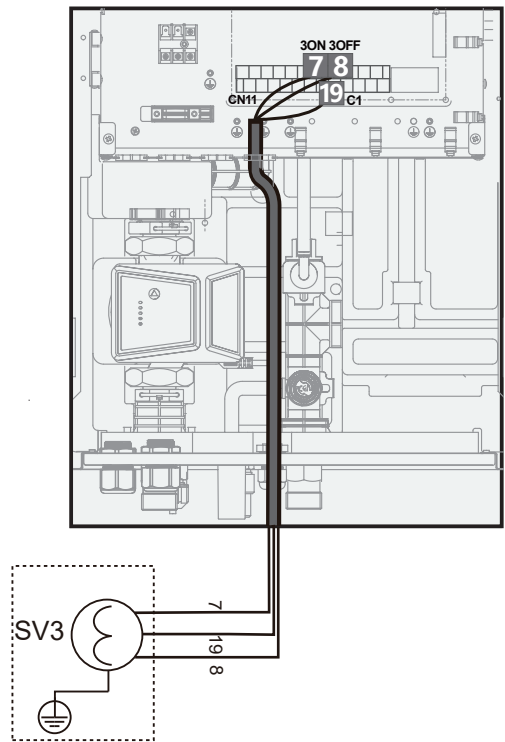
SV1:



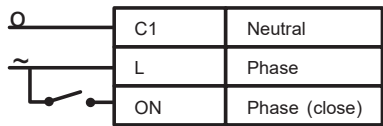
SV2:



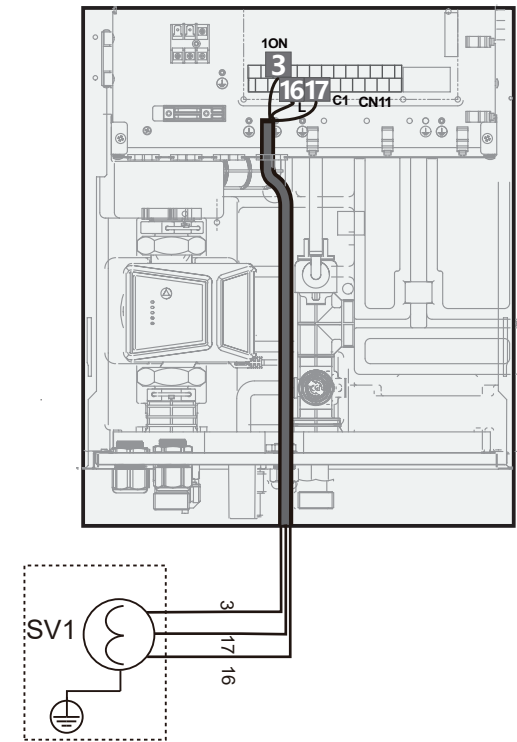
SV3:



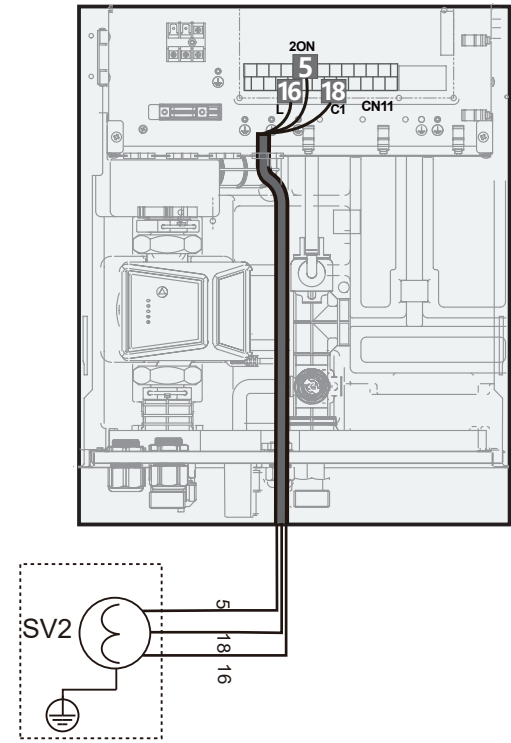
The illustration below is for this type of SV:



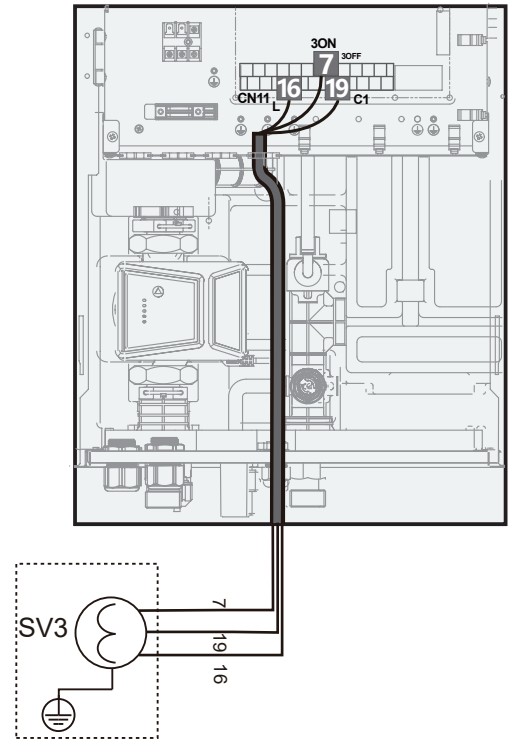
SV1:



SV2:



SV3:

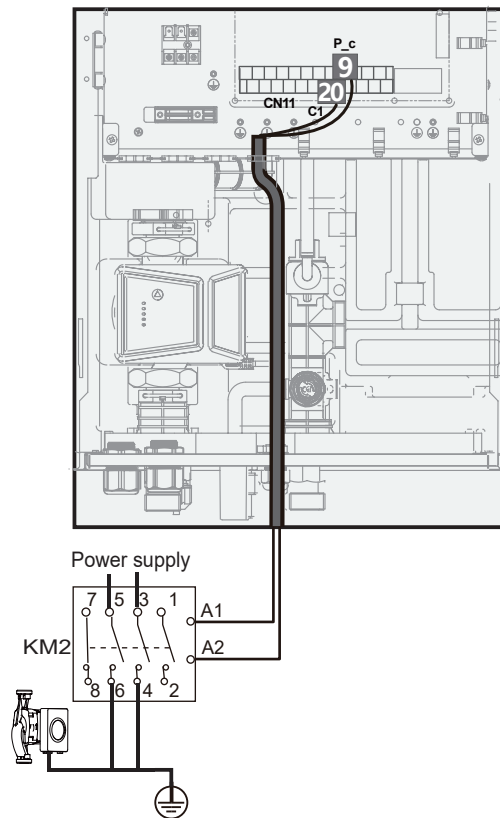


NOTE
C1 is for the neutral conductor .

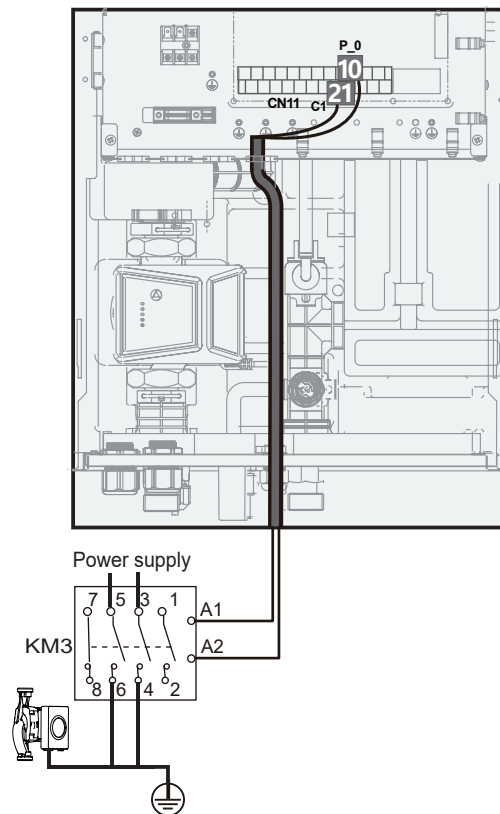
Voltage	220-240 V AC
Maximum running current(A)	0.2
Minimum wiring size	0.75
Control port signal type	Type 2

4.4.3 Wiring of additional pumps

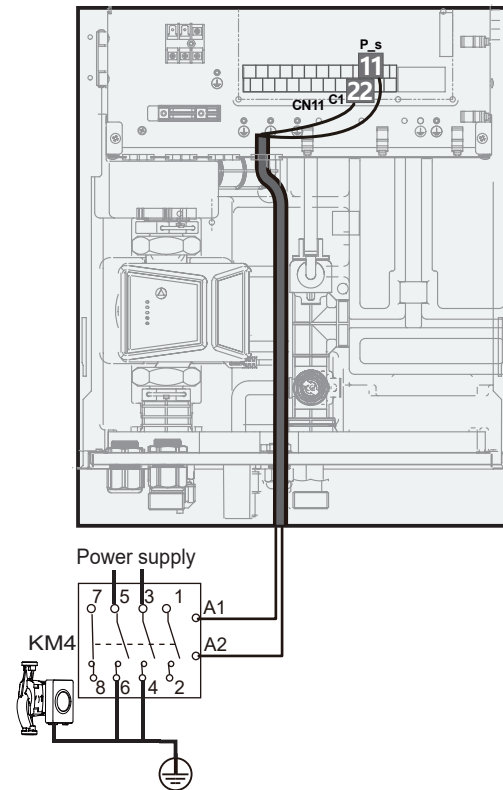
Zone 2 pump P_c:



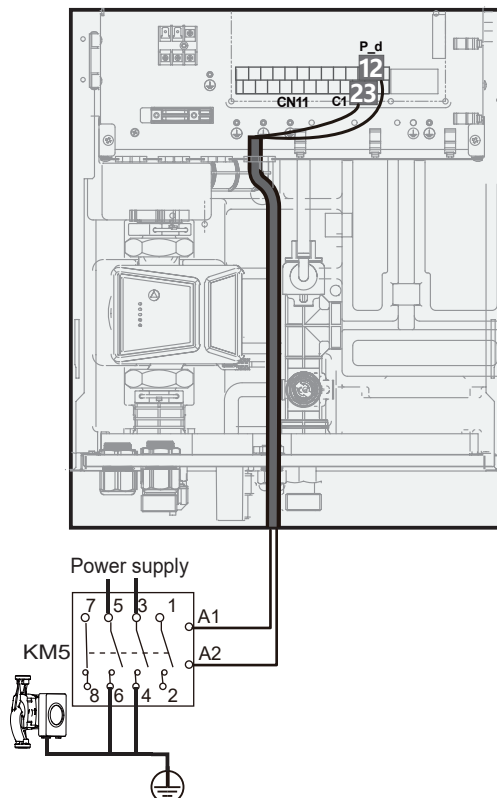
Additional circulation pump P_o:



Solar energy pump P_s:

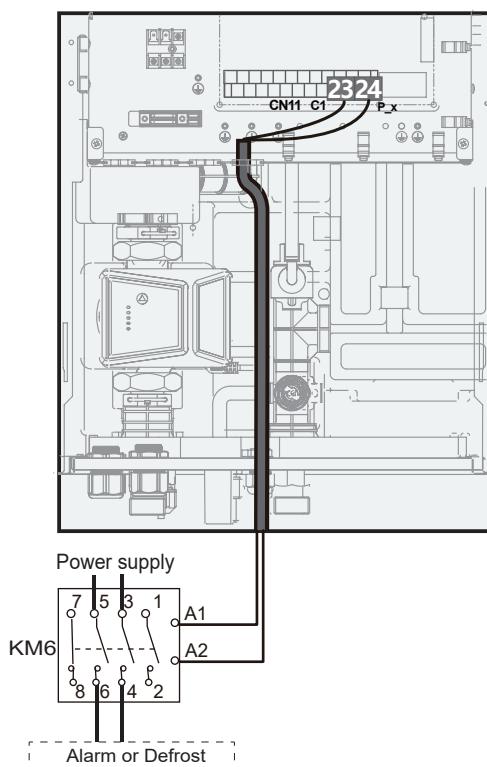


DHW pump P_d:



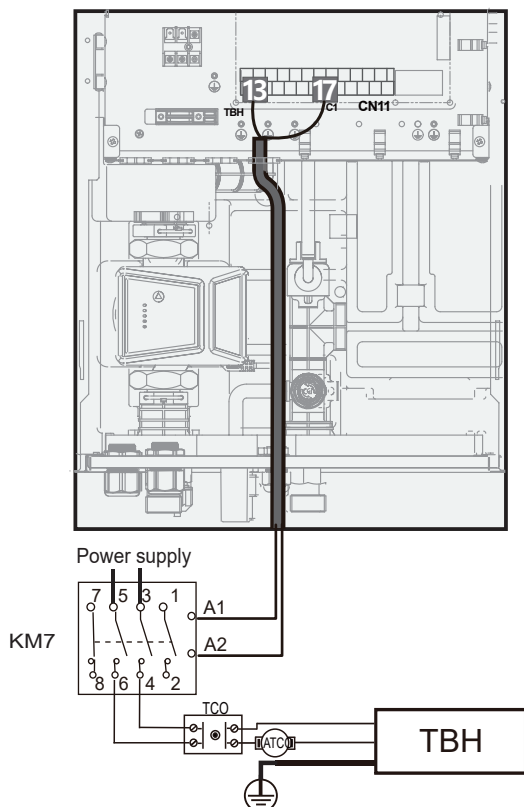
Voltage	220-240 V AC
Maximum running current(A)	0.2
Minimum wiring size	0.75
Control port signal type	Type 2

4.4.4 Wiring of alarm or defrost run (P_x)



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

4.4.5 Wiring of tank booster heater (TBH)

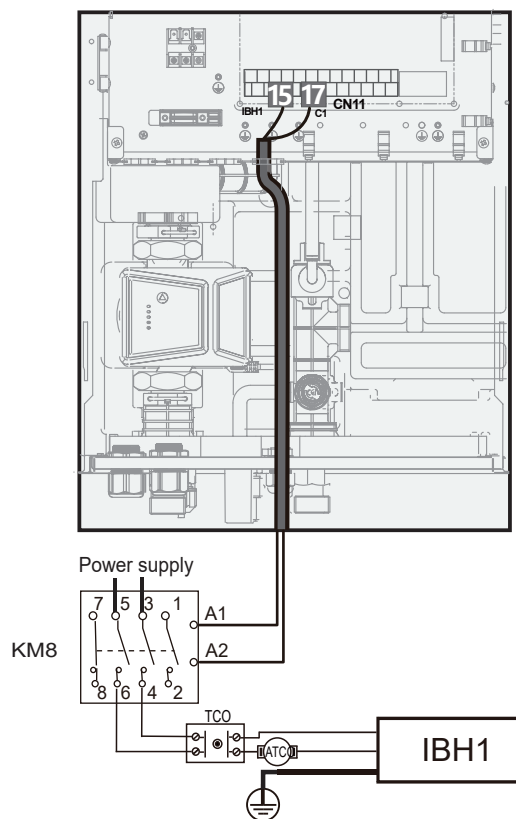


NOTE

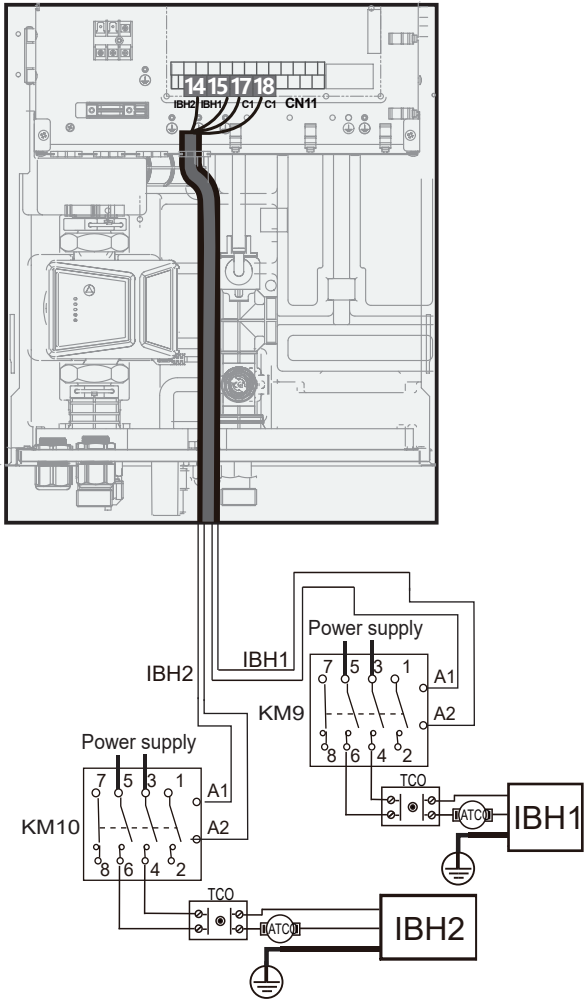
TCO: Manual reset thermal protector
ATCO: Auto reset thermal protector

4.4.6 Wiring of external IBH box

For one-step control IBH:



For two/three - step control IBH:



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

NOTE

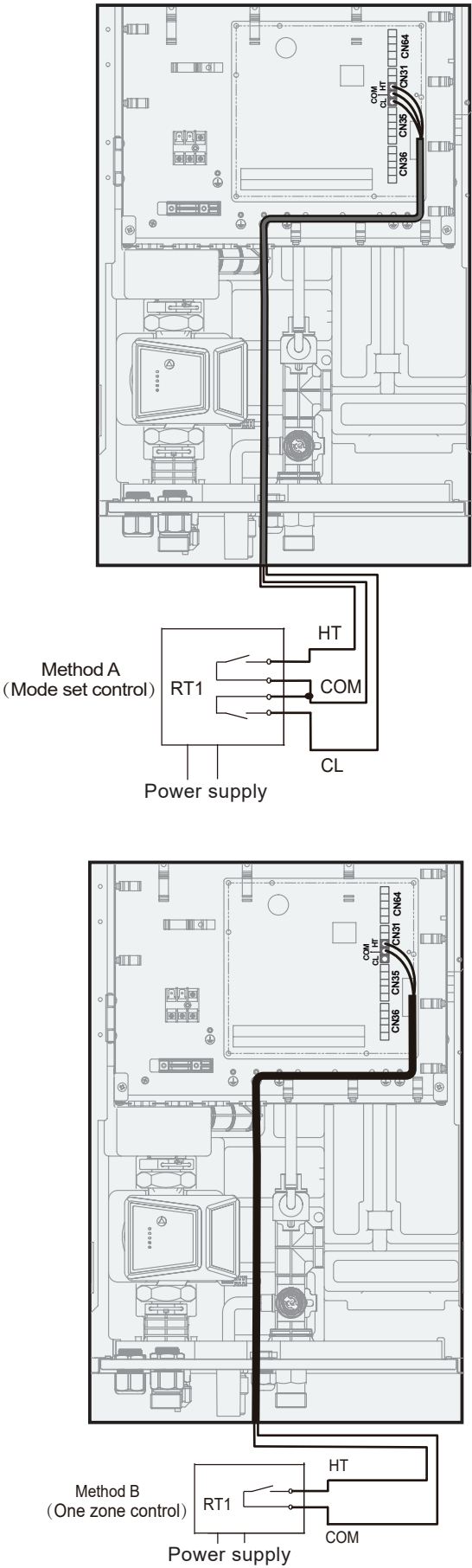
- The unit only sends an ON/OFF signal to the heater.
- IBH2 cannot be wired independently.

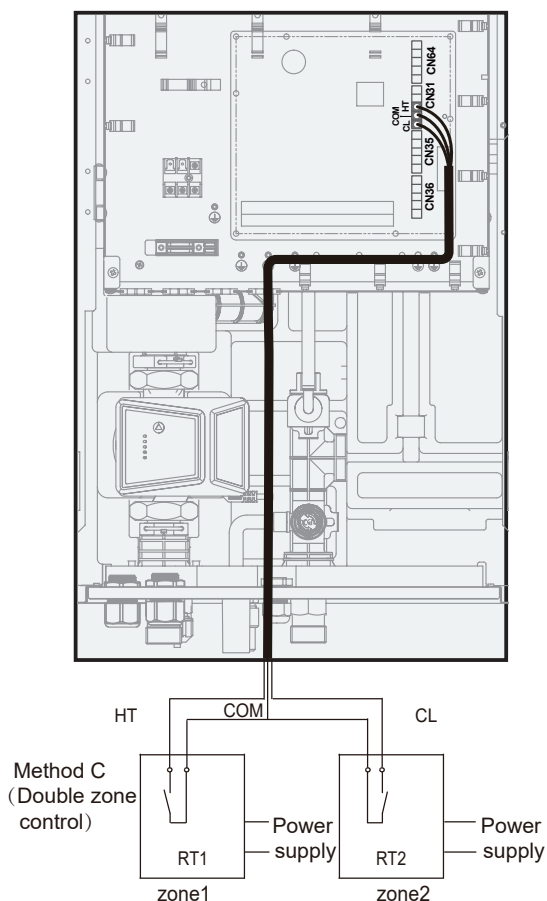
4.4.7 Wiring of room thermostat (RT)

Room thermostat (low voltage): "Power supply" provides the voltage to the RT.

NOTE

The room thermostat must be low-voltage.





The thermostat cable can be connected in three ways (as described in the figures above) and the specific connection method depends on the application.

Method A (Mode set control)

RT can control heating and cooling individually. When the hydraulic module is connected with the external temperature controller, ROOM THERMOSTAT is set to MODE SET on the user interface:

A.1 When "CL" of the thermostat keeps closing for 15 s, the system will run according to the priority mode set on the user interface. The default priority mode is Heating.

A.2 When "CL" of the thermostat keeps opening for 15 s and "HT" close, the system will run according to the non-priority mode set on the user interface.

A.3 When "HT" of the thermostat keeps opening for 15 s and "CL" open, the system will turn off. (Mode set control)

A.4 When "CL" of the thermostat keeps opening for 15 s and "HT" open, the system will turn off.

The port closing voltage is 12 V DC, the port disconnection voltage is 0 V DC.

Method B (single-zone control)

RT provides the switch signal to the unit. ROOM THERMOSTAT is set to ONE ZONE on the user interface:

B.1 When "HT" of the thermostat keeps closing for 15 s, unit turns on.

B.2 When "HT" of the thermostat keeps opening for 15 s, unit turns off.

Method C (double-zone control)

The hydraulic module is connected with two room thermostats, and ROOM THERMOSTAT is set to DOUBLE ZONE on the user interface:

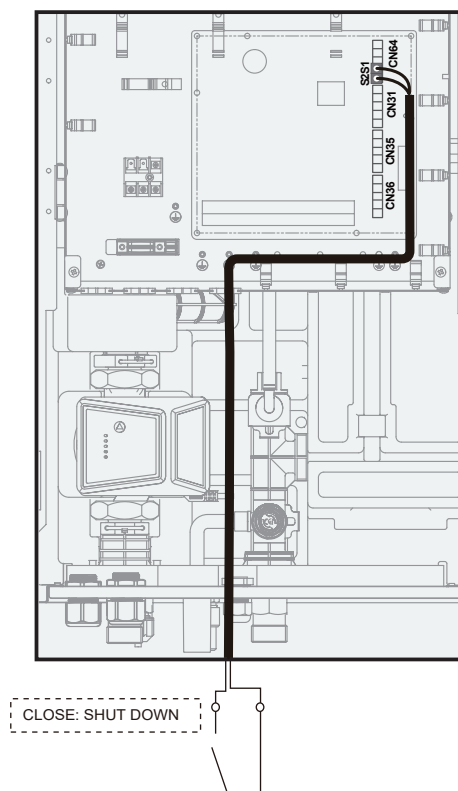
C.1 When "HT" of the thermostat keeps closing for 15 s, zone1 turn on. When "HT" of the thermostat keeps opening for 15 s, zone1 turn off.

C.2 When "CL" of the thermostat keeps closing for 15 s, zone2 turn on. When "CL" of the thermostat keeps opening for 15 s, zone2 turn off.

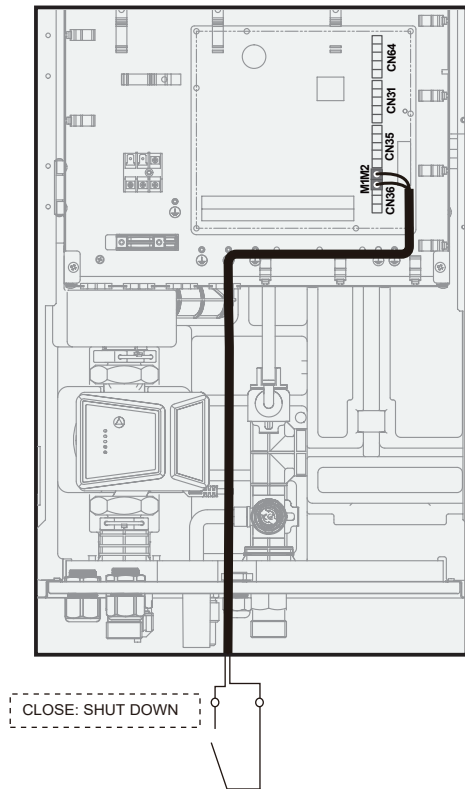
NOTE

- The wiring of the thermostat should correspond to the settings of the user interface.
- 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 zone1 is OFF,"CL" in zone2 closes, system still keeps 'OFF'. While installation, the wiring of thermostats for zone1 and zone2 must be correct.

4.4.8 Wiring of solar energy input signal (low voltage)

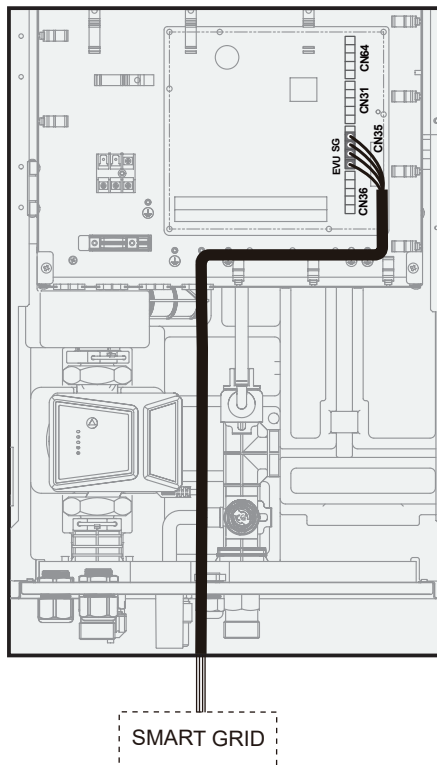


4.4.9 Wiring of remote shutdown



4.4.10 Wiring of smart grid

The unit has a smart grid feature, and there are two ports on the PCB to connect SG signals and EVU signals as below:



NOTE

To utilize smart grid function, the DHW mode must be set available.

1) SG = ON, EVU = ON.

- The heat pump will operate in DHW mode firstly.
- When TBH is set available, if T5 is lower than 69 °C, the TBH will be turned on forcibly (The heat pump and TBH can operate at the same time.); if T5 is higher than or equal to 70 °C, the TBH will be turned off. (DHW: Domestic Hot Water; T5S is the set temperature of the water tank.)

- When TBH is set unavailable and IBH is set available for DHW mode, if T5 is lower than 59 °C, the IBH will be turned on forcibly (The heat pump and IBH can operate at the same time.); if T5 is higher than or equal to 60 °C, the IBH will be turned off.

2) SG = OFF, EVU = ON.

- The heat pump will operate in DHW mode firstly.
- When TBH is set available and DHW mode is set ON, if T5 is lower than T5S-2, the TBH will be turned on (The heat pump and TBH can operate at the same time.); If T5 is higher than or equal to T5S+3, the TBH will be turned off.

- When TBH is set unavailable and IBH is set available for DHW mode, if T5 is lower than T5S-dT5_ON, the IBH will be turned on (The heat pump and IBH can operate at the same time.); If T5 is higher than or equal to Min (T5S + 3, 60), the IBH will be turned off.

3) SG = OFF, EVU = OFF.

The unit will operate properly.

4) SG = ON, EVU = OFF.

The heat pump, IBH, and TBH will be turned off immediately.

5 CONFIGURATION

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

Follow the instructions below for the next step.

5.1 Check before configuration

Before powering on the unit, check the following items:

☐	Field wiring: make sure all wiring connections observe the instructions mentioned in the INSTALLATION, OPERATION AND MAINTENANCE MANUAL.
☐	Fuses, circuit breakers, or protection devices: check the size and type according to the instructions mentioned in the INSTALLATION, OPERATION AND MAINTENANCE MANUAL. Make sure that no fuses or protection devices have been bypassed.
☐	Backup heater's circuit breaker: ensure the backup heater's circuit breaker in the switch box is closed (It varies with the backup heater type). Refer to WIRING DIAGRAM.
☐	Booster heater's circuit breaker: ensure the booster heater's circuit breaker is closed (applicable only to units with an optional domestic hot water tank).
☐	Internal wiring: check the wiring and connections inside the switch box for loose or damaged parts, including earth wiring.
☐	Mounting: check and ensure that the unit and the water loop system are properly mounted to avoid water leakage, abnormal noises and vibrations during the unit startup.
☐	Damaged equipment: check the components and piping inside the unit for any damage or deformation.
☐	Refrigerant leak: check the inside of the unit for any refrigerant leakage. In case of refrigerant leakage, follow the relevant content in the "Safety Precautions".
☐	Power supply voltage: check the voltage of the power supply. The voltage must be consistent with the voltage on the identification label of the unit.
☐	Air vent valve: make sure the air vent valve is open (at least 1 turn).
☐	Shut-off valve: make sure that the shut-off valve is fully open.
☐	Sheet metal: make sure all the sheet metal of the unit is mounted properly.
☐	Water volume: make sure the water volume in the system is within the limitation.
☐	Strainer: make sure the strainer is mounted properly and clean.

After powering on the unit, check the following items:

☐	Upon power-on of the unit, nothing is displayed on the user interface: Check the following abnormalities before diagnosing possible error codes. - Wiring connection issue (power supply or communication signal). - Fuse failure on PCB.
☐	Error code "E8" or "E0" is displayed on the user interface: - Residual air exists in the system. - The water level in the system is insufficient. Before starting test run, make sure that the water system and the tank are filled with water, and air is removed. Otherwise, the pump or backup heater (optional) may be damaged.
☐	Error code "E2" is displayed on the user interface: - Check the wiring between the wired controller and the unit.
☐	Initial start-up at low outdoor ambient temperature: To start the initial start-up in low outdoor ambient temperature, the water has to be heated gradually. Please use the preheating for floor function. (Refer to "SPECIAL FUNCTION" in FOR SERVICEMAN mode)

 **NOTE**

For underfloor heating application, floor could be damaged if the temperature rises sharply in a short time.
Please ask the building construction contractor for further information.

More error codes and failure causes can be found in the INSTALLATION, OPERATION AND MAINTENANCE MANUAL.

5.2 Configuration

To initialize the unit, a group of advanced settings should be provided by the installer. The advanced settings are accessible in FOR SERVICEMAN mode.

The overall parameters list of the advanced settings can be found in Annex B. Operation Settings. For more information, refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL.

How to enter FOR SERVICEMAN mode

Press and hold  and  simultaneously for 3 seconds to enter the authorization page. Enter password 234 and confirm it. Then, the system jumps into the page with a list of advanced settings.

NOTE

"FOR SERVICEMAN" is only for installer or other specialist with sufficient knowledge and skills.
The end user who use "FOR SERVICEMAN" is regarded as improper use.

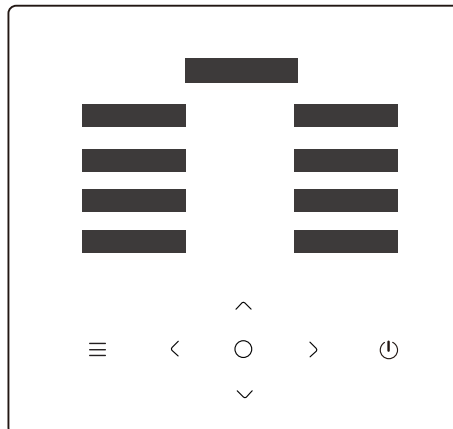
Save the settings and quit FOR SERVICEMAN mode

After all settings are adjusted, press , and the confirmation page pops out. Select Yes and confirm to quit FOR SERVICEMAN mode.

NOTE

The settings are saved automatically after you quit FOR SERVICEMAN mode.
Temperature values displayed on the wired controller (user interface) are measured in °C.

In FOR SERVICEMAN mode, select the target item and enter the setting page. Adjust the enablement settings and values as end user demand. For the list of settings, refer to Annex B. Operation Settings.



5.3 Modbus mapping table

1) MODBUS PORT COMMUNICATION SPECIFICATIONS

Port: RS-485; H1 and H2 are the Modbus communication ports.

Communication address: Only one-to-one connection is available for the host computer and wired controller, and the wired controller is a slave unit. The communication address of the host computer and wired controller is consistent with the address of HMI Address for BMS (In FOR SERVICEMAN mode).

Baud rate: 9600. Number of digits: 8 Verification: none. Stop bit: 1 bit

Communication protocol: Modbus RTU (Modbus ASCII not supported)

2) Mapping of registers in the wired controller

Please download the file via QR code.



6 COMMISSIONING

Test run is used to confirm the functionality of the valves, air purge, circulation pump operation, cooling, heating and domestic water heating.

Checklist during commissioning

☐	Test run for the actuator
☐	Air purge
☐	Test run for operation
☐	Check of the minimum flow rate

6.1 Test run for the actuator

NOTE

During the commissioning of the actuator, the protection function of the unit is disabled. Excessive use may damage components.

Why

Check whether each actuator is in good working conditions.

What - actuator list

No.	Name		Note
1	SV2	Three-way valve 2	
2	SV3	Three-way valve 3	
3	PUMP_I	Integrated circulation pump	
4	PUMP_O	Additional circulation pump(for Zone 1)	
5	PUMP_C	Zone 2 pump	
6	IBH	Internal backup heater	
7	AHS	Additional heat source	
8	SV1	Three-way valve 1	Invisible if DHW is disabled
9	PUMP_D	DHW pump	Invisible if DHW is disabled
10	PUMP_S	Solar heating loop circulation pump	Invisible if DHW is disabled
11	TBH	Tank booster heater	Invisible if DHW is disabled

How

1	Go to "FOR SERVICEMAN" (Refer to 9.2 Configuration).
2	Find "Test run" and enter the process.
3	Find "Point check" and enter the process.
4	Select the actuator, and press  to activate or deactivate the actuator. • The status ON means the actuator is activated, and OFF means the actuator is deactivated.

NOTE

When you return to the upper layer, all actuators turn OFF automatically.

6.2 Air purge

Why

To purge out the remaining air in the water loop.

How

1	Go to "FOR SERVICEMAN" (Refer to 9.2 Configuration),
2	Find "Test run and enter the process.
3	Find "Air purge" and enter the process.
4	Select "Air purge" and press  to activate or deactivate the air purge function. •  means the air purge function is activated, and  means the air purge function is deactivated.

Besides

"Air vent pump_i output"	To set pump_i output. The higher the value is, the pump gives a higher output.
"Air vent running time"	To set the duration of air purge. When the set time is due, air purge is deactivated.
"Status check"	Additional operation parameters can be found.

6.3 Test run

Why

Check whether the unit is in good working conditions.

What

Circulated pump operation

Cooling operation

Heating operation

DHW operation

How

1	Go to "FOR SERVICEMAN" (Refer to 9.2 Configuration)
2	Find "Test run" and enter the page.
3	Find "Other" and enter the process.
4	Select "XXXX"* and press  to run the test. During test, press  , select OK and confirm to return to the upper layer. * - Four performance test options are shown in What.

NOTE

In performance test, the target temperature is preset and cannot be changed.

If the outdoor temperature is outside the range of operating temperature, the unit may not operate or may not deliver the required capacity.

In circulated pump operation, If the flow rate is out of recommended flow rate range, please make proper change of the installation, and ensure that the flow rate in the installation is guaranteed in all conditions

6.4 Check of the minimum flow rate

1	Check the hydraulic configuration to find out the space heating loops that can be closed by mechanical, electronic, or other valves.
2	Close all space heating loops that can be closed.
3	Start and operate the circulation pump (See "10.3 Test Run").
4	Read out the flow rate ^(a) and modify the bypass valve settings until the set value reaches the minimum flow rate required + 2 l/min.

(a) During test run for the pump, the unit can operate below the minimum flow rate required.

7 HAND-OVER TO THE USER

- Make sure that the user has the printed documentation and ask the user to keep it for future reference.
- Empty the error history in the HMI before hand-over to the user.
- It is highly recommended to do the WLAN connection of the unit. You can read more information in the APP.
- Explain to the user how to properly operate the system and what to do in case of problems.
- Show the user what to do for the maintenance of the unit. (For the maintenance, refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL)
- Explain to the user about energy saving tips. (Refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL)

8 MAINTENANCE

Regular checks and inspections at certain intervals are required to guarantee the optimal performance of the unit.

8.1 Safety precautions for maintenance

DANGER

Risk of electrocution.

WARNING

- Please note that some parts of the electric component box are hot.
- Do not rinse the unit. Otherwise, electric shock or fire may occur.
- Do not leave the unit unattended when the service panel is removed.

NOTE

- Before performing any maintenance or service work, touch a metal part of the unit to eliminate static electricity and to protect the PCB.
- Without regular maintenance, the performance of the unit may degrade and the risk of parts damage may increase gradually.

8.2 Maintenance checklist

By user

Items	Recommended frequency
Clean the surrounding of the outdoor unit.	Once a month.

By installer

Items	Recommended frequency
General	
Check if all the parts are in the proper position.	Once a year.
Water loop	
Check if the water pressure is sufficient.	Once a year.
Clean the strainer in water system.	Once a year.
Check if the flow switch works in good condition.	Once a year.
Check if the water pressure relief valve (in water system) works in good condition.	Once a year.
Check if the water pressure relief valve (in DHW water loop) works in good condition.	Once a year.
Check if the insulation of backup heater is in good condition.	Once a year.
Check if there is water leakage in the water loop. Take care if anti-refrigerant is applied.	Once a year.
Check if the booster heater of DHW water tank is clean and in good condition.	Once a year.
Check if the water characteristics fulfills the requirements.	Once a year.
Wiring and electrical parts	
Check if the temperature sensor works in good condition.	Once a year.
Check if the wiring and cables of the installation is in good condition.	Once a year.
Check if the contactors and circuit breakers works in good condition.	Once a year.
Refrigerant loop	
Check if there is refrigerant leakage in the refrigerant loop.	Once a year.

NOTE

Ask the supplier and refer to the SERVICE MANUAL for more information.

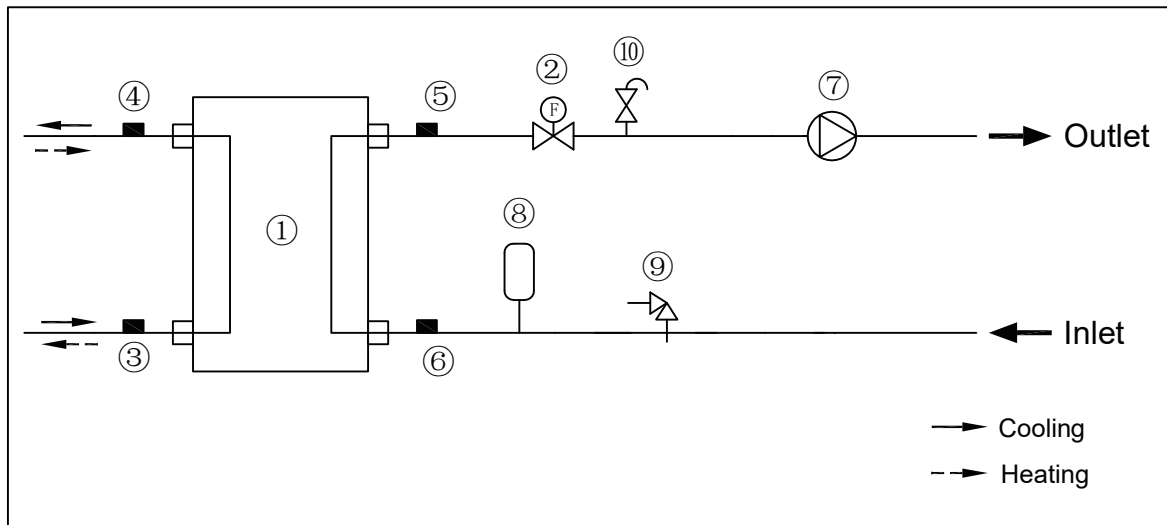
9 TECHNICAL DATA

9.1 General

Indoor unit model	160	160 (3 kW Heater)	160 (6 kW Heater)	160 (9 kW Heater)
Power supply	220-240 V~ 50 Hz		380-415 V 3N~ 50 Hz	
Rated input	100 W	3 350 W	6 100 W	9 100 W
Rated Current	0.4 A	14.6 A	8.8 A	13.2 A
Nominal capacity	Refer to the Technical Data			
Dimensions (W×H×D)[mm]	420 x 790 x 270			
Packing (W×H×D)[mm]	525 x 1 050 x 360			
Heat exchanger	Plate heat exchanger			
Electric heater	/	3 250 W	6 000 W	9 000 W
Rated water pressure	0.3 MPa			
Min.water flow(flow switch)	10 L/min			
Pump				
Type	DC inverter			
Max. head	9 m			
Power input	5 W to 90 W			
Expansion vessel				
Volume	8 L			
Max. working pressure	0.3 MPa(g)			
Pre-charge pressure	0.1 MPa(g)			
Weight				
Net weight	33 kg	38.5 kg	39 kg	39 kg
Gross weight	37 kg	42.5 kg	43 kg	43 kg
Connections				
Refrigerant gas/liquid side	Φ15.9/Φ9.52	Φ15.9/Φ9.52	Φ15.9/Φ9.52	Φ15.9/Φ9.52
Water inlet/outlet	R1"			
Drain connection	DN25			
Operation range				
Outlet water(heating model)	+25 °C to +65 °C			
Outlet water(cooling model)	+5 °C to +25 °C			
Domestic hot water	+20 °C to +60 °C			
Ambient temperature	+5 °C to +35 °C			
Water pressure	0.1 ~ 0.3 MPa			

9.2 Piping diagram

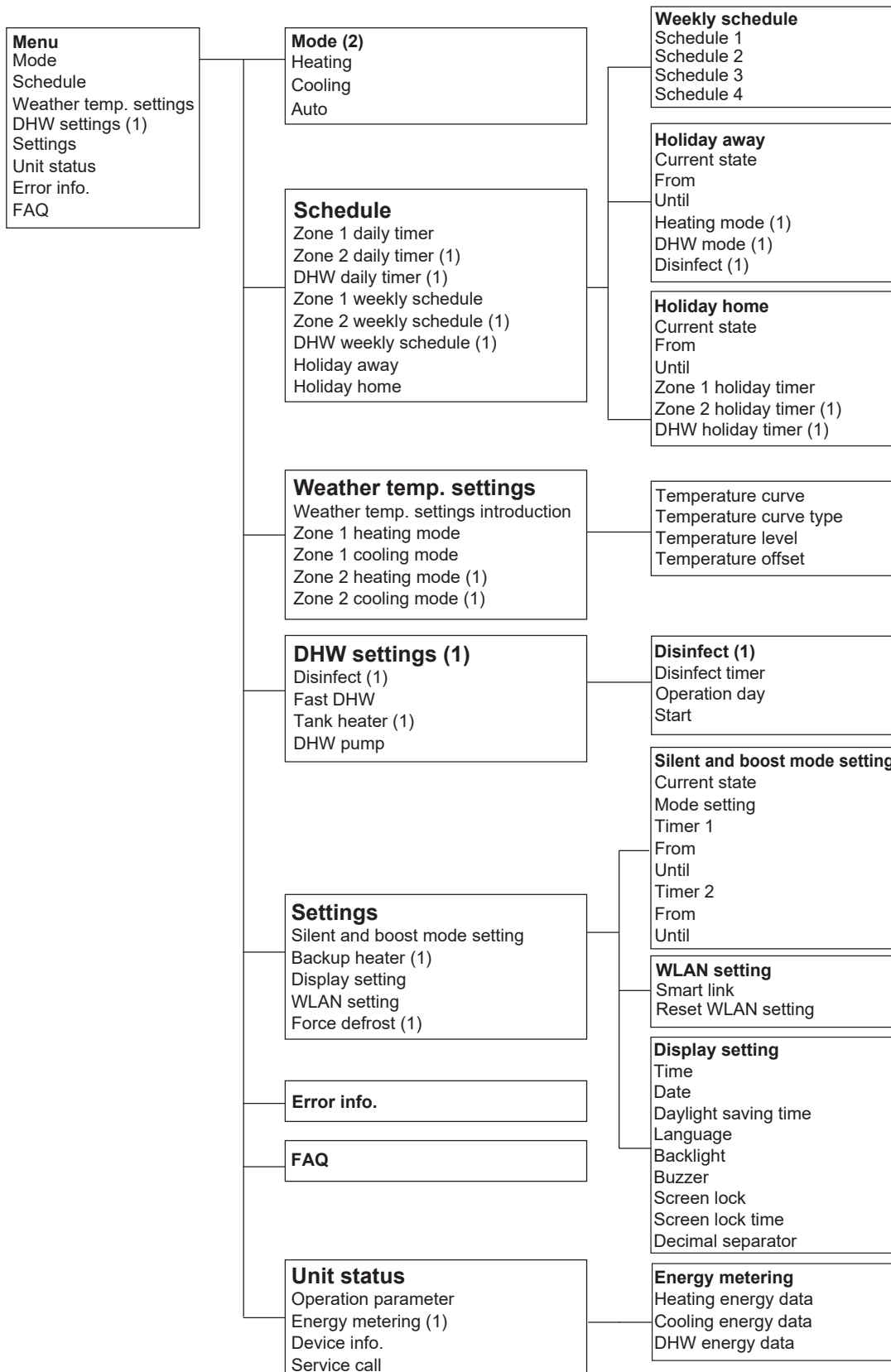
Refrigerant cycle



Item	Description	Item	Description
1	Plate heat exchanger	6	Inlet water temperature sensor
2	Water flow switch	7	Water pump
3	Liquid refrigerant temperature sensor	8	Expansion vessel
4	Gas refrigerant temperature sensor	9	Pressure relief valve
5	Outlet water temperature sensor	10	Automatic air purge valve

ANNEX

Annex A. Menu structure (wired controller)



(1) Invisible if corresponding function is disabled.

(2) The layout could be different if the corresponding function is disabled or enabled.

There are also some other items that are invisible if the function is disabled or unavailable.

For serviceman

For serviceman

- 1 DHW setting
- 2 Cooling setting
- 3 Heating setting
- 4 Auto mode setting
- 5 Temp. type setting
- 6 Room thermostat setting
- 7 Other heating source
- 8 Service call
- 9 Restore factory setting
- 10 Test run
- 11 Special function
- 12 Auto restart
- 13 Power input limitation
- 14 Input define
- 15 Cascade setting
- 16 HMI address setting
- 17 Common setting
- 18 Clear energy data
- 19 Intelligent function settings
- 20 C2 fault restore

1 DHW setting

- 1.1 DHW mode
- 1.2 Disinfect
- 1.3 DHW priority
- 1.4 Pump_D
- 1.5 DHW priority time set
- 1.6 dT5_ON
- 1.7 dT1S5
- 1.8 T4DHWMAX
- 1.9 T4DHWMIN
- 1.10 T5S_Disinfect
- 1.11 t_DI_HIGHTEMP.
- 1.12 t_DI_MAX
- 1.13 t_DHWHP_Restrict
- 1.14 t_DHWHP_MAX
- 1.15 Pump_D timer
- 1.16 Pump_D running time
- 1.17 Pump_D disinfect

2 Cooling setting

- 2.1 Cooling mode
- 2.2 t_T4_Fresh_C
- 2.3 T4CMAX
- 2.4 T4CMIN
- 2.5 dT1SC
- 2.6 dTSC
- 2.7 Zone 1 C-emission
- 2.8 Zone 2 C-emission

3 Heating setting

- 3.1 Heating mode
- 3.2 t_T4_Fresh_H
- 3.3 T4HMAX
- 3.4 T4HMIN
- 3.5 dT1SH
- 3.6 dTSH
- 3.7 Zone 1 H-emission
- 3.8 Zone 2 H-emission
- 3.9 Force defrost

4 Auto mode setting

- 4.1 T4AUTOCMIN
- 4.2 T4AUTOHMAX

5 Temp. type setting

- 5.1 Water flow temp.
- 5.2 Room temp.
- 5.3 Double zone

6 Room thermostat setting

- 6.1 Room thermostat
- 6.2 Mode set priority

16 HMI address setting

- 16.1 HMI address for BMS
- 16.2 Stop BIT

17 Common setting

- 17.1 t_Delay pump
- 17.2 t1_Antilock pump
- 17.3 t2_Antilock pump run
- 17.4 t1_Antilock SV
- 17.5 t2_Antilock SV run
- 17.6 Ta_adj.
- 17.7 Pump_I silent output
- 17.8 Energy metering
- 17.9 Pump_O
- 17.10 Glycol
- 17.11 Glycol concentration

7 Other heating source

- 7.1 IBH function
- 7.2 dT1_IBH_ON
- 7.3 t_IBH_Delay
- 7.4 T4_IBH_ON
- 7.5 P_IBH1
- 7.6 P_IBH2
- 7.7 AHS function
- 7.8 AHS_Pump_I Control
- 7.9 dT1_AHS_ON
- 7.10 t_AHS_Delay
- 7.11 T4_AHS_ON
- 7.12 EnSwitchPDC
- 7.13 GAS_COST
- 7.14 ELE_COST
- 7.15 MAX_SETHEATER
- 7.16 MIN_SETHEATER
- 7.17 MAX_SIGHEATER
- 7.18 MIN_SIGHEATER
- 7.19 TBH function
- 7.20 dT5_TBH_OFF
- 7.21 t_TBH_Delay
- 7.22 T4_TBH_ON
- 7.23 P_TBH
- 7.24 Solar function
- 7.25 Solar control
- 7.26 Deltasol

8 Service call

- Phone number
- Mobile number

9 Restore factory settings

10 Test run

11 Special function

- 11.1 Preheating for floor
- 11.2 Floor drying up

12 Auto restart

- 12.1 Auto restart cooling/heating mode
- 12.2 Auto restart DHW mode

13 Power input limitation

- 13.1 Power input limitation

14 Input define

- 14.1 M1M2
- 14.2 Smart grid
- 14.3 T1T2
- 14.4 Tbt
- 14.5 P_X PORT

15 Cascade setting

- 15.1 PER_START
- 15.2 TIME_ADJUST

18 Clear energy data

19 Intelligent function settings

- 19.1 Energy correction
- 19.2 Sensor backup setting

20 C2 fault restore

There are some items that are invisible if the function is disabled or unavailable.

Annex B. Operation settings

Title	Code	State	Default	Minimum	Maximum	Set interval	Unit
DHW heating setting	DHW mode	Enable or disable DHW mode: 0=NO, 1=YES	1	0	1	1	/
	Disinfect	Enable or disable the disinfect mode: 0=NO, 1=YES	1	0	1	1	/
	DHW priority	Enable or disable DHW priority mode: 0=NO, 1=YES	1	0	1	1	/
	Pump_D	Enable or disable DHW pump mode: 0=NO, 1=YES	0	0	1	1	/
	DHW priority time set	Enable or disable DHW priority time setting: 0=NO, 1=YES	0	0	1	1	/
	dT5_ON	The temperature difference for starting DHW mode	10	1	30	1	°C
	dT1S5	The difference value between Twout and T5 in DHW mode	10	5	40	1	°C
	T4DHWMAX	The maximum ambient temperature at which the heat pump can operate for domestic water heating	46	35	46	1	°C
	T4DHWMIN	The minimum ambient temperature at which the heat pump can operate for domestic water heating	-10	-28	30	1	°C
	T5S_Disinfect	The target temperature of water in the domestic hot water tank in DISINFECT mode	65	60	70	1	°C
	t_DI_HIGHTEMP.	The time for which the highest temperature of water in the domestic hot water tank in DISINFECT mode lasts	15	5	60	5	Minutes
	t_DI_MAX	The maximum time for which disinfection lasts	210	90	300	5	Minutes
	t_DHWHP_Restrict	The operating time for heating/cooling	30	10	600	5	Minutes
	t_DHWHP_MAX	The maximum continuous operating time of the heat pump in DHW PRIORITY mode	90	10	600	5	Minutes
	Pump_D timer	Enable or disable the DHW pump to run as scheduled and to keep running for PUMP RUNNING TIME: 0=NO, 1=YES	1	0	1	1	/
Cooling setting	Pump_D running time	The certain time for which the DHW pump keeps running	5	5	120	1	Minutes
	Pump_D disinfect	Enable or disable the DHW pump to operate when the unit is in DISINFECT mode and T5 is larger than or equal to T5S_DI-2: 0=NO, 1=YES	1	0	1	1	/
	Cooling mode	Enable or disable the cooling mode:0=NO,1=YES	1	0	1	1	/
	t_T4_Fresh_C	The refresh time of climate-related curves in cooling mode	0.5	0.5	6	0.5	Hours
	T4CMAX	The highest ambient operating temperature in cooling mode	52	35	52	1	°C
	T4CMIN	The lowest ambient operating temperature in cooling mode	10	-5	25	1	°C
	dT1SC	The temperature difference for starting the heat pump (T1)	5	2	10	1	°C
	dTSC	The temperature difference for starting the heat pump (Ta)	2	1	10	1	°C
	Zone 1 C-emission	The type of Zone 1 terminal for cooling mode:0=FLH (floor heating), 1=FCU(fan coil unit), 2=RAD(radiator)	1	0	2	1	/
	Zone 2 C-emission	The type of Zone 2 terminal for cooling mode: 0=FLH (floor heating), 1=FCU(fan coil unit), 2=RAD(radiator)	1	0	2	1	/
	Heating mode	Enable or disable the heating mode: 0=NO, 1=YES	1	0	1	1	/

Heating setting	t_T4_Fresh_H	The refresh time of climate-related curves in heating mode	0.5	0.5	6	0.5	Hours
	T4HMAX	The maximum ambient operating temperature in heating mode	25	20	35	1	°C
	T4HMIN	The minimum ambient operating temperature in heating mode	-15	-28	30	1	°C
	dT1SH	The temperature difference for starting the unit (T1)	5	2	20	1	°C
	dTSH	The temperature difference for starting the unit (Ta)	2	1	10	1	°C
	Zone 1 H-emission	The type of Zone 1 terminal for heating mode: 0=FLH (floor heating) 1=FCU(fan coil unit), 2=RAD(radiator)	2	0	2	1	/
	Zone 2 H-emission	The type of Zone 2 terminal for heating mode: 0=FLH (floor heating) 1=FCU(fan coil unit), 2=RAD(radiator)	0	0	2	1	/
	Force defrost	Enable or disable the force defrost: 0=NO, 1=YES.	0	0	1	1	/
AUTO mode setting	T4AUTOCMIN	The minimum operating ambient temperature for cooling in auto mode	25	20	29	1	°C
	T4AUTOHMAX	The maximum operating ambient temperature for heating in auto mode	17	10	17	1	°C
Temp. type setting	Water flow temp.	Enable or disable the Water flow temp.: 0=NO, 1=YES	1	0	1	1	/
	Room temp.	Enable or disable the Room temp.: 0=NO, 1=YES	0	0	1	1	/
	Double zone	Enable or disable the Double zone: 0=NO, 1=YES	0	0	1	1	/
Room thermostat setting	Room thermostat	The style of room thermostat: 0=NO, 1=Mode set, 2=One zone, 3=Double zone	0	0	3	1	/
	Mode set priority	Select the priority mode in Room thermostat: 0=Heating, 1=Cooling	0	0	1	1	/
Other heat source	IBH function	Select the mode of IBH (Internal backup heater) : 0=Heating and DHW, 1=Heating 0 (DHW=valid) 1 (DHW=invalid)	0	0	1	1	/
	dT1_IBH_ON	The temperature difference between T1S and T1 for starting the backup heater	5	2	10	1	°C
	t_IBH_Delay	The time for which the compressor has run before startup of the first step backup heater	30	15	120	5	Minutes
	T4_IBH_ON	The ambient temperature for starting the backup heater	-5	-15	30	1	°C
	P_IBH1	Power input of IBH1	0.0	0.0	20.0	0.5	kW
	P_IBH2	Power input of IBH2	0.0	0.0	20.0	0.5	kW
	AHS function	Enable or disable the AHS (Auxiliary heating source) function: 0=NO, 1=Heating, 2=Heating and DHW	0	0	2	1	/
	AHS_Pump_I Control	Select the pump operating status when only AHS runs: 0=Run, 1=Not run	0	0	1	1	/
	dT1_AHS_ON	The temperature difference between T1S and T1 for starting the auxiliary heating source	5	2	20	1	°C
	t_AHS_Delay	The time for which the compressor has run before startup of the additional heating source	30	5	120	5	Minutes
	T4_AHS_ON	The ambient temperature for starting the additional heating source	-5	-15	30	1	°C
	EnSwitchPDC	Enable or disable automatic switch of heat pump and auxiliary heating source based on running cost: 0=NO, 1=YES	0	0	1	1	/
	GAS-COST	Price of gas	0.85	0.00	5.00	0.01	price/m ³
	ELE-COST	Price of electricity	0.20	0.00	5.00	0.01	price/kWh

Other heat source	MAX-SETHEATER	Maximum set temperature of additional heating source	80	1	80	1	°C
	MIN-SETHEATER	Minimum set temperature of additional heating source	30	0	79	1	°C
	MAX-SIGHEATER	The voltage corresponding to the maximum set temperature of additional heating source	10	1	10	1	V
	MIN-SIGHEATER	The voltage corresponding to the minimum set temperature of additional heating source	3	0	9	1	V
	TBH function	Enable or disable the TBH (Tank booster heater) function: 0=NO, 1=YES	1	0	1	1	/
	dT5_TBH_OFF	The temperature difference between T5 and T5S (the set water tank temperature) for turning the booster heater off	5	0	10	1	°C
	t_TBH_DELAY	The time for which the compressor has run before startup of the booster heater	30	0	240	5	Minutes
	T4_TBH_ON	The ambient temperature for starting the tank booster heater	5	-5	50	1	°C
	P_TBH	Power input of TBH	2.0	0.0	20.0	0.5	kW
	Solar function	Enable or disable the Solar function: 0=NO, 1=Only solar, 2=Solar and HP (Heat Pump)	0	0	2	1	/
	Solar control	Solar pump (pump_s) control: 0=SL1SL2, 1=Tsolar	0	0	1	1	/
	Deltatsol	The temperature deviation for solar function running	10	5	20	1	°C
Special function	Preheating for floor	Enable or disable floor preheating: 0=NO, 1=YES	0	0	1	1	/
	T1S	The set outlet water temperature during first floor preheating	25	25	35	1	°C
	t_ARSTH	Running time for first floor preheating	72	48	96	12	Hours
	Floor drying up	Enable or disable floor drying: 0=NO, 1=YES	0	0	1	1	/
	t_Dryup	Temp-up days for floor drying	8	4	15	1	Days
	t_Highpeak	Days for floor drying	5	3	7	1	Days
	t_Drydown	Temp-down days for floor drying	5	4	15	1	Days
	t_Drypeak	Outlet water temperature for floor drying	45	30	55	1	°C
	Start time	The start time of floor drying	00:00	0:00	23:30	1/30	h/min
	Start date	The start date of floor drying	Current date+1	Current date+1	31/12/2099	1/1/1	dd/mm/yyyy
Auto restart	Auto restart cooling/heating mode	Enable or disable the auto restart of cooling/heating mode: 0=NO, 1=YES	1	0	1	1	/
	Auto restart DHW mode	Enable or disable the auto restart of DHW mode: 0=NO, 1=YES	1	0	1	1	/
Power input limitation	Power input limitation	The type of power input limitation	1	1	8	1	/
Input definition	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	/
	Smart grid	Enable or disable the smart grid: 0=NO, 1=YES	0	0	1	1	/
	T1T2	Control options of Port T1T2: 0=NO, 1=RT/Ta_PCB	0	0	1	1	/
	Tbt	Enable or disable the TBT: 0=NO, 1=YES	0	0	1	1	/
	P_X port	Select the function of P_X port: 0=Defrost, 1=Alarm	0	0	1	1	/
Cascade setting	PER_START	Percentage of operating units among all units	10	10	100	10	%
	TIME_ADJUST	Time interval for determining the necessity of unit loading/unloading	5	1	60	1	Minutes

HMI address setting	HMI address for BMS	Set the HMI address code for BMS	1	1	255	1	/
	Stop BIT	Upper computer stop bit: 1=STOP BIT1, 2=STOP BIT2	1	1	2	1	/
Common setting	t_Delay pump	The time for which the compressor has run before startup of the pump	2.0	0.5	20.0	0.5	Minutes
	t1_Antilock pump	The pump anti-lock interval	24	5	48	1	Hours
	t2_Antilock pump run	The pump anti-lock running time	60	0	300	30	Seconds
	t1_Antilock SV	The valve anti-lock interval	24	5	48	1	Hours
	t2_Antilock SV run	The valve anti-lock running time	30	0	120	10	Seconds
	Ta-adj.	The corrected value of Ta inside the wired controller	0	-10	10	1	°C
	Pump_I silent output	The Pump_I max output limitation	100	50	100	5	%
	Energy metering	Enable or disable the energy analysis: 0=NO, 1=YES	1	0	1	1	/
	Pump_O	Additional circulation pump operation: 0=ON (keep running) 1=Auto (controlled by the unit)	0	0	1	1	/
	Glycol	Glycol application: 0=Without glycol, 1=With glycol	0	0	1	1	/
	Glycol concentration	Glycol added concentration	10	10	30	5	%
Intelligent function settings	Pump_I minimum output	Circulation pump Pump_I operating lowest limit	30	30	80	5	%
	Energy correction	Correction for Energy metering	0	-50	50	5	%
	Sensor backup mode	Sensor backup operation function, 0 =NO, 1=YES	1	0	1	1	/

NOTE

Please set P_IBH1, P_IBH2, P_TBH according to the field installation. If the values are different with the actual values, the energy metering calculation could deviate from actual situation.

Annex C. Terms and abbreviation

Tp	Compressor discharge temperature
Th	Compressor Suction temperature
T4	Outdoor air temperature
T3	Heat exchanger temperature
T2	Plate heat exchanger inlet refrigerant(cooling) temperature
T2B	Plate heat exchanger outlet refrigerant(cooling) temperature
Tw_in	Inlet water temperature
Tw_out	Outlet water temperature
T5	DHW tank temperature
Tw2	Zone 2 water temperature
Tbt	Balance tank temperature
T1	IBH/AHS outlet water temperature
Ta	Indoor ambient temperature
SV	3-way valves
Pump_I	Integrated circulation pump
P_c (Pump_C)	Zone 2 pump
P_o (Pump_O)	Additional circulation pump(for Zone 1)
P_s (Pump_S)	Solar heating loop circulation pump
P_d (Pump_D)	DHW pump
AHS	Additional heat source
IBH	Internal backup heater
TBH	Tank booster heater
SG	SG-ready signal 1
EVU	SG-ready signal 2
HMI	Human-machine interface (wired controller)

16125300A17997 V1.1

GD Midea Heating &Ventilating
Equipment Co.,Ltd.
Penglai Industry Road,Beijiao, Shunde, Foshan,
Guangdong,528311,P.R.China

此页不做菲林，仅核对使用

印刷技术要求

材质	封底封面内页双胶纸80g
规格	210*297(双面)
颜色	黑白
其他	

设计更改记录表（仅做说明用，不做菲林）

版本升级	更改人	更改日期	更改主要内容	涉及更改页面 （印刷页码）
V1.0-V1.1		24.12.20	!! ů Y í €	!! ů Y í €