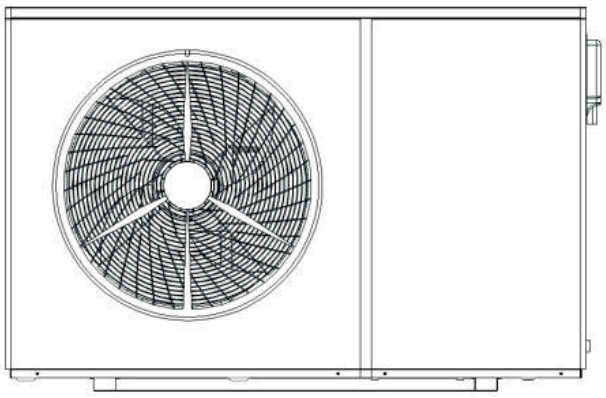
maxcom

MONOBLOCK AIR-TO-WATER HEAT PUMP

INSTALLATION MANUAL



MHP12M3P01NT

12KW monoblock unit

IMPORTANT NOTE:

Thank you for purchasing our product. Before using the device, please read this manual carefully and keep it for future reference.

All information, instructions, specifications, photos, and illustrations are current at the time of printing. Maxcom S.A. reserves the right to change the information contained in this manual due to changes made to the devices. The latest and current version of the manual is available at: www.maxcom.eu.com.

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1. INTRODUCTION

1.1. Read the instructions before starting work

WARNING

Do not use any agents other than those recommended by the manufacturer to speed up the defrosting or cleaning process. The appliance should be stored in a room without sources of ignition (e.g., open flames, gas appliances, or electric heaters).

Do not puncture or set on fire.

Please note that refrigerants are odorless.

Preliminary checks before performing maintenance include:

① Check that the capacitors are discharged: this must be done safely to avoid the possibility of sparking.

② The power supply must be disconnected during filling, recovery, or cleaning of the device.

③ Check the ground connection.

Checking the installation

Before starting work on systems containing flammable refrigerants, special care must be taken to minimize the risk of ignition. When repairing a refrigeration system, the following precautions must be taken before starting work on the system.

Procedure during work

Work must be carried out with extreme caution to minimize the risk of flammable gas or vapors escaping during the work.

Work area

All maintenance personnel and other persons working in the vicinity should be informed about the nature of the work being performed. Avoid working in confined spaces.

Checking for the presence of refrigerant

Before starting work and during work, check the area using an appropriate refrigerant detector so that the service technician is aware of the danger in the event of a flammable refrigerant leak. Ensure that the leak detection equipment used is suitable for use with flammable refrigerants, i.e., non-sparking, properly sealed, or intrinsically safe.

Fire extinguishing agents

If any work is to be carried out on the refrigeration equipment or its parts, suitable fire-fighting equipment must be available. A suitable fire extinguisher must be located nearby.

Precautions – ignition hazard

No person performing work on the refrigeration system that requires contact with flammable refrigerant must not use any sources of ignition that could lead to a fire or explosion hazard. All possible sources of ignition, including smoking, must be kept at a safe distance from the installation, repair, disassembly, and disposal, during which flammable refrigerant may be released into the environment. Before starting work, inspect the area around the device to ensure that there are no combustible hazards or ignition risks. Place "No Smoking" signs.

Ventilation

Before starting any work, ensure that the room is adequately ventilated. If necessary, open windows and doors to force air flow. Ensure adequate ventilation during work. Ventilation should safely disperse the released refrigerant, preferably by discharging it outside into the atmosphere.

Refrigeration equipment inspections

When replacing electrical components, they must be suitable for the purpose and comply with the relevant specifications. Always follow the manufacturer's guidelines for maintenance and service. If in doubt, contact the manufacturer's technical department for assistance.
For installations using flammable refrigerants, the following checks must be carried out:

① The charge quantity is appropriate for the size of the room in which the refrigerant-containing parts are installed containing the refrigerant;

② The ventilation system is functioning properly;

③ If an indirect refrigeration circuit is used, check that the secondary circuit there is a refrigerant;

④ The labeling on the equipment is still visible and legible. Illegible markings and signs should be corrected;

⑤ Refrigerant pipes or components are installed in a location where they are unlikely to be exposed to substances that could cause corrosion of components containing refrigerant, unless these components are made of materials that are inherently corrosion-resistant or are adequately protected against such corrosion.

Repairs to sealed components

DD.5.1 When repairing sealed components, disconnect all power sources from the operating equipment before removing sealed covers, etc. DD.5.1 When repairing sealed components, disconnect the power supply from them and, in most
A continuously operating leak detection device should be installed at the critical point to warn of a potentially dangerous situation.

DD.5.2 Special attention should be paid to the following issues to ensure that when working on electrical components, the enclosure is not modified in a way that affects the level of protection. This applies to damage to cables, excessive number of connections, terminals not made in accordance with the original specifications, damage to seals, incorrect installation of glands, etc. Ensure that the device is securely mounted.
Ensure that seals or sealing materials have not degraded to such an extent that they no longer fulfill their function of preventing the ingress of flammable atmospheres. Replacement parts must comply with the manufacturer's specifications.

Repair of intrinsically safe components
Do not use any fixed inductive or capacitive loads in the circuit without ensuring that this will not exceed the permissible voltage and current for the equipment used. Intrinsically safe components are the only type of components that can operate under voltage in the presence of a flammable atmosphere. Measuring equipment should have appropriate
parameters.
Components should only be replaced with parts approved by the manufacturer. Other parts may cause the refrigerant to ignite as a result of a leak.
CAUTION The use of silicone sealant may inhibit the effectiveness of some types of leak detection equipment.
Intrinsically safe components do not need to be isolated before work begins on them.

Installation
Check that the installation will not be exposed to wear, corrosion, excessive pressure, vibration, sharp edges, or other adverse environmental factors. The check should also take into account the effects of aging or continuous vibration from sources such as compressors or fans.

Detection of flammable refrigerants
When searching for or detecting refrigerant leaks, under no circumstances should potential ignition sources be used. Do not use a gas burner (or any other detector that uses an open flame).

Leak detection methods
The following leak detection methods are considered acceptable for systems containing flammable refrigerants.
Electronic leak detectors should be used to detect flammable refrigerants, but their sensitivity may not be adequate or may require recalibration. (Calibration of detection equipment shall be performed in an area free of refrigerant). Ensure that the detector is not a potential ignition source and is suitable for the refrigerant used. Leak detection equipment should be set to the LFL percentage of the refrigerant and should be calibrated for the refrigerant used and confirmed with the appropriate percentage of gas (maximum 25%).

Leak detection fluids are suitable for use with most refrigerants, but chlorine-containing detergents should be avoided as chlorine can react with the refrigerant and cause corrosion of copper pipes.
If a leak is suspected, remove/extinguish all exposed flames.
If a refrigerant leak is found that requires soldering, remove all refrigerant from the system or isolate it using shut-off valves in the part
of the system away from the leak. The system is then purged with oxygen-free nitrogen (OFN) both before and during the soldering process.

Removal of refrigerant

If it is necessary to interfere with the refrigerant circuit for repair or any other purpose, conventional procedures should be followed. However, it is important to follow best practices as there is a risk of explosion or fire. The following procedure should be followed:

① Remove the refrigerant
② Purge the circuit with inert gas
③ Create a vacuum
④ Purge again with inert gas
⑤ Open the circuit by cutting or desoldering

The refrigerant charge must be recovered into appropriate recovery cylinders. The system must be "flushed" with oxygen-free nitrogen to ensure the safety of the device.
This process may need to be repeated several times. Compressed air or oxygen must not be used for this task.
Flushing should be performed by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is reached, then venting to
atmosphere, and finally create a vacuum. This process should be repeated until there is no refrigerant left in the system. After the last nitrogen filling, the system should be vented to atmospheric pressure to enable operation. This step is necessary if the installation is to be soldered.
Ensure that the vacuum pump outlet is not located near any sources of ignition and that the room is well ventilated.

Filling procedure

In addition to the standard filling procedures, the following requirements must be observed:

① Ensure that different refrigerants are not mixed when using filling equipment. Hoses or pipes should be as short as possible to
minimize the amount of refrigerant contained in them. Cylinders should be stored in an upright position.

② Before filling the refrigeration system with refrigerant, make sure
that the refrigeration system is grounded.

③ Properly label the amount of refrigerant that is filled into the system.

④ Be especially careful not to overfill the refrigeration system. Before
filling the system, it must be pressure tested with nitrogen. After filling, a leak test must be carried out before the system is put into operation.

Before completing the work and putting the device into operation, perform another leak test.

Disassembly of the device

Before performing the disassembly procedure, it is necessary for the service technician to be familiar with the device and all its components. It is recommended good practice to recover all refrigerants in a safe manner. Before performing the task, take a sample of oil and refrigerant in case analysis is required before reusing the recovered refrigerant. Before starting the task, ensure access to a power supply.

① Familiarize yourself with the equipment and its operation.

② Disconnect the power supply.

③ Before proceeding, ensure that:

- Mechanical devices for moving refrigerant cylinders are available if necessary.
- All personal protective equipment is available and used correctly.
- The recovery process is carried out by persons with the appropriate qualifications.
- Recovery equipment and cylinders comply with the relevant standards.

④ If possible, pump out the refrigerant.

⑤ If it is not possible to create a vacuum, use a separator to remove the refrigerant from different parts of the system.

❽ Make sure the cylinder is placed on a scale before recovery.

⑤ Start the recovery machine and operate it according to the manufacturer's instructions.

⑧ Do not overfill the cylinder. (No more than 80% of the liquid volume).

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

ɯ After the cylinder has been filled correctly and the process has been completed, make sure that the cylinders and equipment have been immediately removed from the work site and that all shut-off valves on the equipment are closed.

11 Recovered refrigerant should not be introduced into another refrigeration system unless it has been purified and tested.

Labeling

A label should be placed on the equipment stating that it has been taken out of service and emptied of refrigerant. The label should be dated and signed. Labels should be placed on the equipment stating that it contains flammable refrigerant.

Recovery

When removing refrigerants from the system, both for servicing and decommissioning, it is recommended to follow good practices for the safe removal of all refrigerants. When transferring refrigerant to cylinders, ensure that only suitable refrigerant recovery cylinders are used. Ensure that a sufficient number of cylinders are available to store the entire system charge. All cylinders to be used are designed for refrigerant recovery and marked for that refrigerant (i.e., special refrigerant recovery cylinders).

refrigerant). Cylinders should be equipped with a pressure relief valve and shut-off valves in good working order. Empty cylinders for recovery are emptied and, if possible, cooled before recovery.
Recovery equipment should be in good working order and equipped with a set of instructions for the equipment in question, and should be suitable for the recovery of flammable refrigerants. In addition, a set of calibrated scales in good working order should be available. Hoses should be complete with leak-proof disconnectable couplings in good condition. Before using recovery equipment, check that it is in satisfactory working order, has been properly maintained, and that all associated electrical components are protected to prevent ignition in the event of refrigerant leakage. If in doubt, consult the manufacturer.
The recovered refrigerant should be returned to the refrigerant supplier in a suitable recovery cylinder and a Waste Transfer Note should be completed. Do not mix refrigerants in recovery units, especially in cylinders.
If compressors or compressor oils are to be disposed of, ensure that they have been emptied to the permissible level to ensure that no flammable refrigerant remains inside. The recovery process must be carried out before returning the compressor to the suppliers. To speed up this process, only use electric heating of the compressor body.
When draining oil from the system, do so safely.

1.2. safety tips

The precautions listed here are divided into the following types. They are quite important, so be sure to follow them.

Explanation of symbols on the indoor or outdoor unit:

Symbols	Meaning	Description
	**WARNING** **WARNING**	This symbol indicates that this appliance uses a flammable refrigerant. If the refrigerant leaks and is exposed to an external ignition source, there is a risk of fire. an external ignition source, there is a risk of fire.
	**WARNING** **DANGER**	This symbol indicates that this appliance contains a material with a low burning rate. Keep away from sources of ignition.
	**CAUTION**	This symbol indicates that you should read the instruction manual carefully.
	**CAUTION**	This symbol indicates that service personnel should handle this device in accordance with the rules contained in the installation manual.
Symbols	**Meaning**	**Description**

	**CAUTION**	This symbol indicates that information such as the user manual or installation manual is available.

1.3. Statement

To avoid danger to the user, the following instructions must be observed:

① Improper operation may result in injury or damage.

② Install the device in accordance with local laws, regulations, and standards.

③ Check the power supply voltage and frequency.

④ The device must be properly grounded.

⑤ The device must be connected to a separate circuit breaker.

1.4. afety factors

The following safety factors must be taken into account:

① Please read the following information before installation.

② Be sure to read this manual carefully before performing any maintenance or assembly work.

③ After reading the installation manual, keep it for future reference.

⚠ WARNING

Ensure that the device is installed safely and securely.

● If the device is not secured or installed, it may cause damage and become damaged. The minimum load capacity of the support required for installation of the device is 21g/"².

● If the unit is installed in an enclosed area or confined space, please consider the size of the room and ventilation to prevent suffocation caused by refrigerant leakage.

① Use the specified cable and attach it to the terminal block so that the connection prevents pressure on the parts.

② Improper installation may cause a fire.
Connect the power cord securely and in accordance with the wiring diagram in the manual to avoid damage to the device or fire.

③ Be sure to use the correct material during installation.
Inappropriate parts or materials may cause fire, electric shock, or damage to the device.

④ Install on a stable surface; refer to the installation manual.
Improper installation may result in fire, electric shock, damage to the device, or

water leakage.

⑤ Use professional tools for electrical work.
If the power supply is insufficient or the circuit is not properly protected, it may cause a fire or electric shock.

❽ The device must be grounded.
If the electrical installation does not have a ground connection, do not connect the device.

⑤ The device should only be disassembled and repaired by authorized personnel. Incorrect disassembly or maintenance of the device may result in water leakage, electric shock or fire. Service work may only be performed by authorized personnel.

⑧ Do not disconnect or connect the power supply during operation. This may cause a fire or electric shock.

❽ Do not touch or operate the device with wet hands. This may cause a fire or electric shock.

ɯ Do not place heaters or other electrical appliances near the power cord. Doing so may cause a fire or electric shock.

11 Water must not be poured directly from the device. Do not allow water to penetrate the electrical components.

⚠ WARNING

① Do not install the device in a location where flammable gas may be present.

② If flammable gas is present around the device, it may cause an explosion.
Follow the instructions to perform work related to the condensate drainage system and heating system connection work according to the manual. If the condensate drainage or heating system is not installed correctly, water may leak out and should be cleaned up immediately to prevent flooding and damage to other items in the vicinity.

③ Do not clean the device while the power is on. Before cleaning the device, turn off the power. Otherwise, injury may occur due to the rotating fan or electric shock.

④ Turn off the device in the event of a malfunction or fault.
Turn off the device and disconnect it from the power supply. Failure to do so may result in electric shock or fire.

⑤ Be careful when the device is not packaged or installed.
Be aware of sharp edges and heat exchanger fins.

❽ After installation or repair, check for refrigerant leaks. If there is not enough refrigerant, the device will not operate properly.

⑤ The outdoor unit must be level and placed on a stable surface. Proper installation will ensure that there is no excessive vibration or noise.

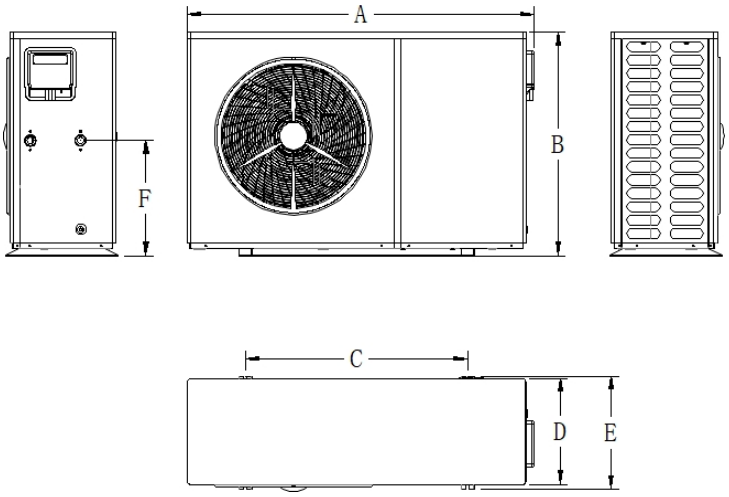
⑧ Do not put your fingers into the fan or evaporator.
A fan operating at high speed can cause serious injury.

❽ The device should be operated by trained personnel with appropriate knowledge of heating/cooling. Children should be supervised to ensure that they do not play

directly near the device. If the power cord is damaged, it must be replaced by a qualified person.

2. OVERVIEW OF THE DEVICE

2.1. vices Dimensions

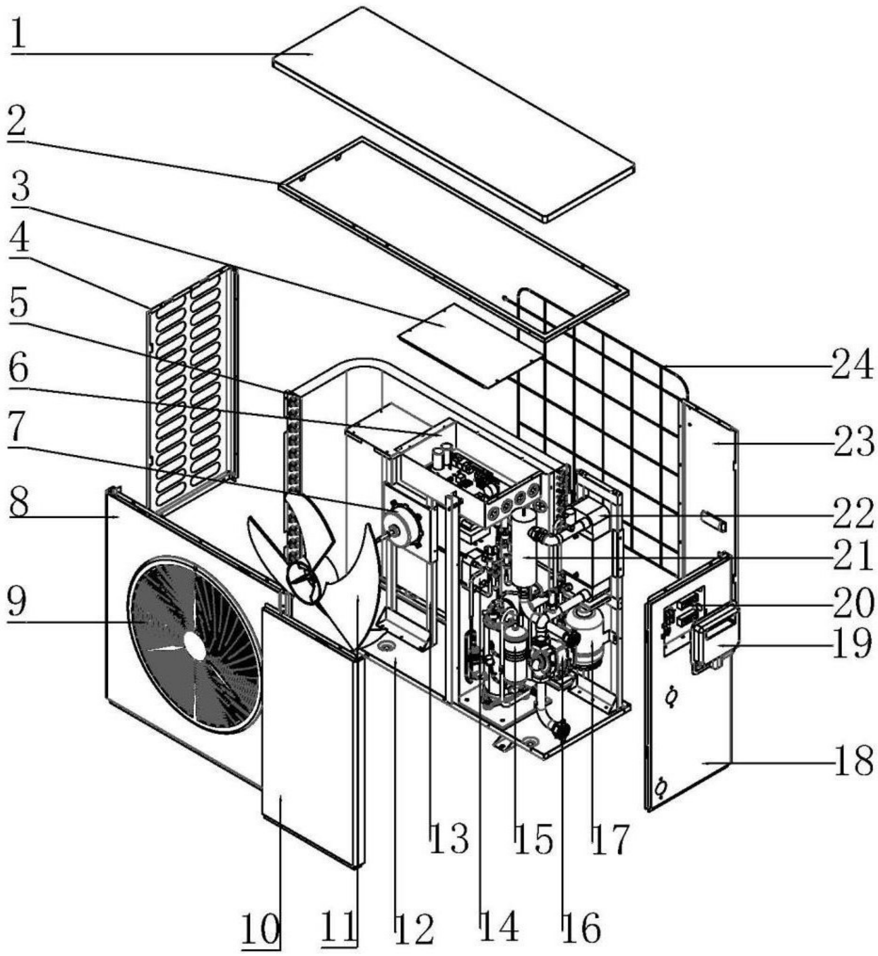


Unit dimensions: (mm)

Model	A	B	C	D	E	F
MHP12M3P01NT	1263	875	870	414	440	449

2.2. Main parts of the device

MHP12M3P01NT



①	Upper housing	-	Fan cover	-✧-	Diaphragm vessel
②	Fixed frame	%	Front right housing	8	Right casing
③	Electrical box cover	Ι	Fan blade	%	Handle
④	Left grille	ΙΙ	Base	[illegible]	Connection box
⑤	Condenser	Ī	Motor mount	®	Electric heater
⑥	Electrical box	%	Plate heat exchanger EVI	❽	Plate heat exchanger

⑦	Fan motor	⅄	Compressor	❽	Rear housing
⑧	Front housing	⅋	Central heating pump	⑩	Grille – evaporator cover

2.3. Device parameter

Model	MHP12M3P01NT
Power	380V-415V/3N ~/ 50Hz
Refrigerant type	R32
[Room heating]: A7 W35	
Max. heating capacity (kW)	4.32-12.52
Input power (kW)	0.71-2.90
COP	6.08-4.53
[Room heating] A7 W55	
Max. heating power (kW)	3.63-11.91
Input power (kW)	0.87-4.26
COP	4.17-2.80
[Cooling] A35 W7	
Max. cooling capacity (kW)	3.63-11.91
Input power (kW)	0.87-4.26
EER	4.17-2.80
[Hot water] Ambient temperature 20˚C Water temperature from 15˚C to 55˚C.	
Max. heating power (kW)	12.25
Input power (kW)	3.01
COP	4.07
Electric heater Input (kW)	9
Max. input power (kW)	13.4(4.4+9)
Max. operating current (A)	20.4 (6.7+13.7)
Compressor brand	Panasonic
Circulation pump	Built-in
Water-side heat exchanger	Plate Heat Exchanger
Air-side heat exchanger	Finned heat exchanger
Expansion tank (L)	2
Display	4-inch color touch screen
Rated water flow (m^3/h)	2.1
Water pressure drop (kPa)	22
Water pipe connection (inches)	1 1/4
Sound pressure level dB(A) at a distance of 1 m	55
Operating range (˚C)	-25~43
Max. water outlet temperature (˚C)	60
Water resistance rating	IPX4
Resistance to electric shock	I
Net dimensions (L×W×H) (mm)	1263x 440 x 875
Net weight (kg)	107

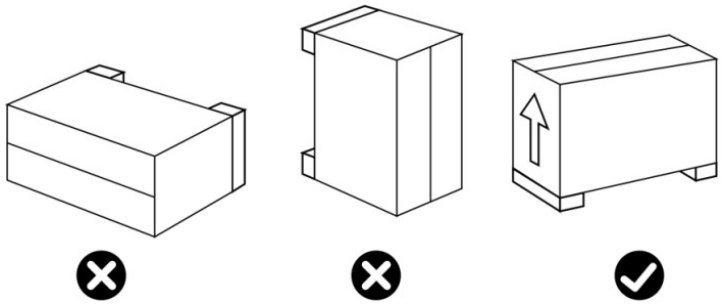
3. INSTALLATION AND CONNECTION

⚠ WARNING

The heat pump must be installed by a professional team. Users are not qualified to install it themselves, otherwise the heat pump may be damaged and may pose a safety hazard to users.
This section is for informational purposes only and should be read and, if necessary, adapted to the actual installation conditions.

3.1. Transport

1. When storing or moving the heat pump, it should be kept in an upright position.



2. When moving the heat pump, do not lift the unit by the water connections, as this may damage the heat exchanger inside the unit.

3.2. allation instructions

3.2.1. preliminary requirements

Components required for heat pump installation:

① Power cable suitable for the power requirements of the device.

② A set of connection materials necessary for installation.

③ Set of screws and wall plugs suitable for fixing the device in place (foundation, bracket, etc.).

④ We recommend connecting the device to the installation using flexible PEX pipes to reduce vibration transmission.

⑤ Use appropriate mounting anchors to secure the device.

3.2.2. Location

Please observe the following rules when selecting the location for the heat pump.

① The future location of the device must be easily accessible for operation and maintenance of the device.

② It must be installed on level ground, mounted on a base or concrete foundation. Make sure that the ground is sufficiently stable and can support the weight of the device.

③ A water drain must be provided near the device to remove condensation from the device's defrosting process
device.

④ If necessary, the device can be raised using appropriate mounting pads designed to support its weight.

⑤ Check that there is sufficient air flow through the device, that the air outlet is not directed towards the windows of neighboring buildings, and that the exhaust air will not be recirculated into the device. In addition, ensure that there is sufficient space around the device for service and maintenance work.

❽ The device must not be installed in a location exposed to oil, flammable gases, corrosive products, sulfur compounds, or near high-frequency devices.

⑤ To prevent splashing, do not install the device near a road.

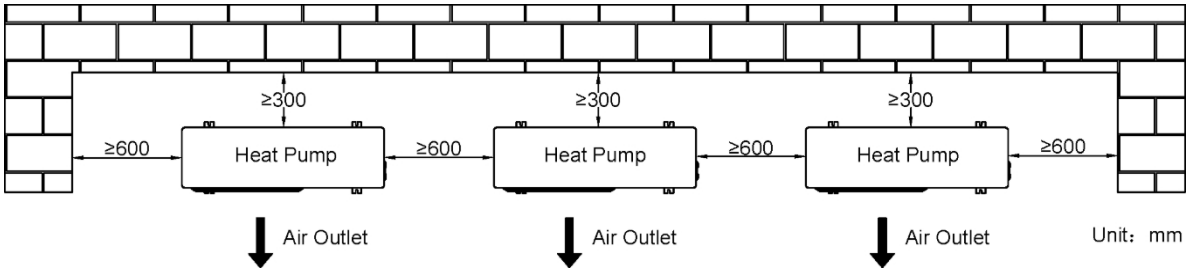
⑧ To avoid causing a nuisance to your neighbors, make sure that the device is installed in such a way that it faces the direction that is least sensitive to noise.

❽ Keep the device out of the reach of children as far as possible.

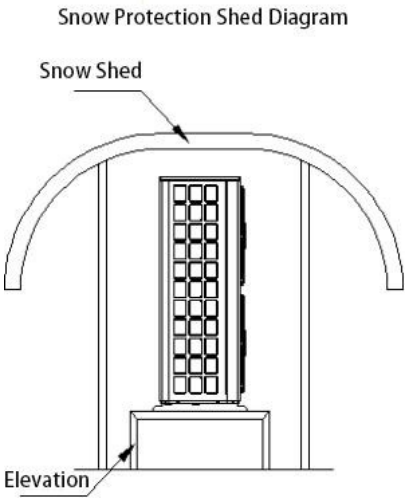
ɯ Installation space:

The device should be installed in a location with sufficient air circulation, without heat radiation or other heat sources, and the minimum acceptable distance between the device and surrounding walls or other obstacles is: the distance between the air inlet surface is greater than 300 mm, the distance between any two devices is greater than 600 mm, as shown in the figure:

Unit:



In areas with heavy snow loads, it is recommended to install the unit under a roof. To minimize the impact of snow, the unit should be mounted on a raised platform.



3.2.3. llocation of the installation

Note:

① A flexible connection between the device and the heating system prevents vibrations from being transmitted from the device to the system.

② Shut-off valves must be installed at the inlet/outlet of the device. After installation, a pressure test must be performed with the shut-off valves closed to prevent damage the device.

③ Open the valves after reducing the pressure to the operating value.

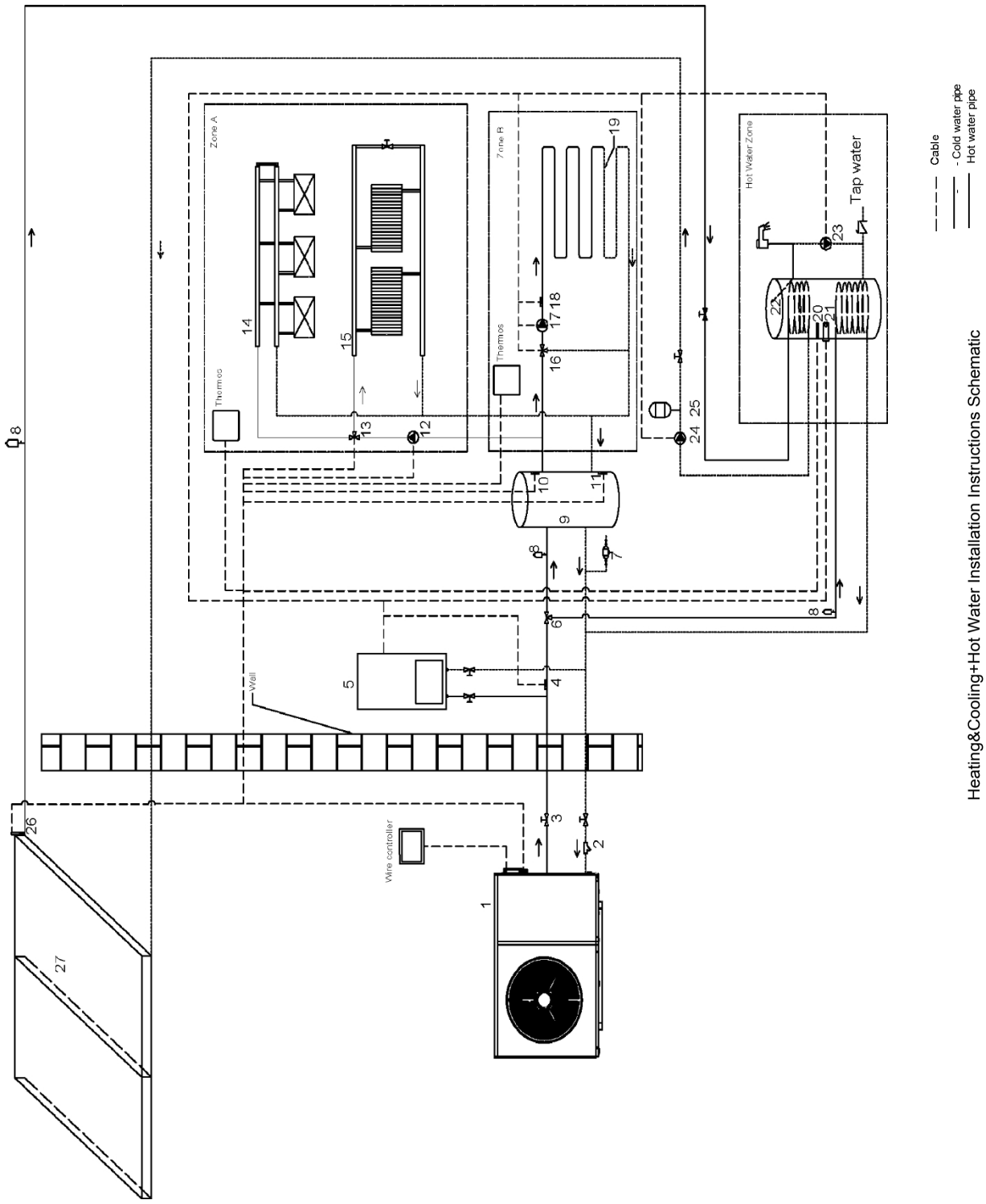
④ A slant filter must be installed on the return pipe to the device to effectively remove contaminants from the water returning to the device.

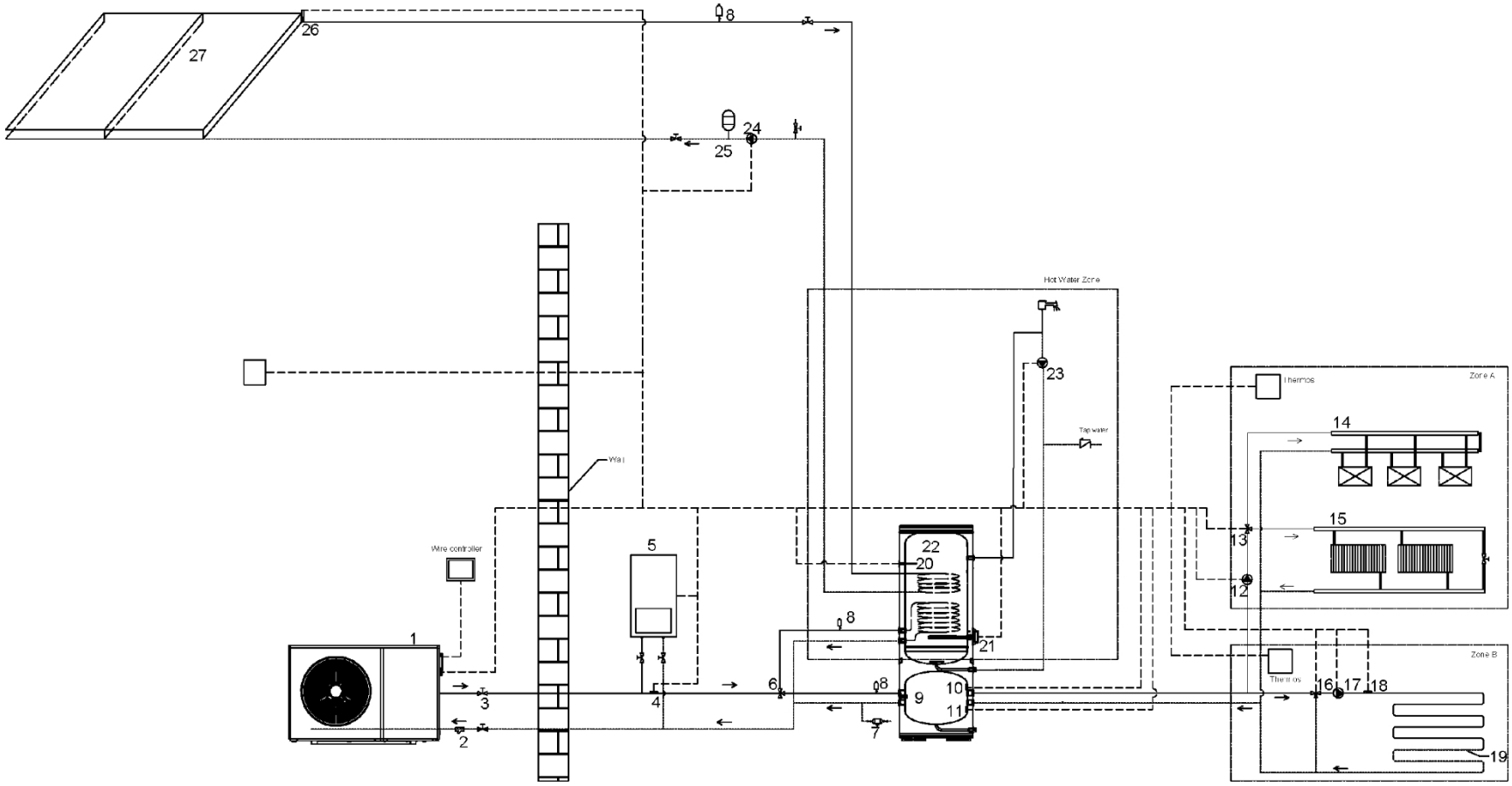
⑤ The water used in the heating system must meet the requirements for drinking water.

❽ The installation of the overflow valve, safety valve, and other parts must comply with with the direction of the arrow marked on the valve body.

⑤ After installation, it is necessary to fill with water to detect any leaks, confirm that there are no leaks, and clean the slant filter.

The installation diagram is shown in the figure below:





Heating & Cooling + Hot water Installation Instructions Schematic

No.	Meaning	No.	Meaning
1	Outdoor unit	15	Radiator installation
2	Skew filter	16	Three-way valve (sold separately)
3	Ball shut-off valve	17	Underfloor heating pump
4	Supply temperature sensor	18	Floor heating supply temperature sensor sensor
5	Auxiliary heat source (to be purchased separately)	19	Floor heating
6	Three-way switching valve (to be purchased separately)	20	Hot water tank temperature sensor.
7	Water refill valve	21	Hot water tank Electric heater (optional)
8	Automatic air vent valve	22	Hot water tank (sold separately)
9	Buffer tank (sold separately)	23	Domestic hot water circulation pump (to purchased separately)
10	Upper buffer tank temperature sensor Upper temperature sensor (optional)	24	Solar system pump (to be purchased separately)
11	Lower buffer tank temperature sensor Lower temperature sensor (optional)	25	Expansion tank (sold separately)
12	External circulation pump (to be purchased separately)	26	Solar collector temperature sensor
13	Three-way valve (to be purchased separately)	27	Solar collector (to be purchased separately)
14	Fan coil units – installation.		

3.2.4. lectrical installation

In order for the device to operate safely and correctly, it must be connected to a power source in accordance with the following guidelines:

① The electrical power supply to the device must be protected by a residual current device 30mA.

② The heat pump must be connected to a suitable D-curve overcurrent circuit breaker in accordance with applicable national standards and regulations.

③ The power cable must be suitable for the rated power of the device and the length of cabling required for the installation. The cable must be suitable for outdoor use.

④ For a three-phase system, it is necessary to connect the phases in the correct order. If the phases are reversed, the heat pump compressor will not operate.

⑤ In public areas, an emergency stop button must be installed near the heat pump.

Model	Power cables		
	Power supply	Cable cross-section	Specification
MHP12M3P01NT	380V-415V/3N ~/ 50Hz	5G 6mm²	AWG 8

3.2.5. Electrical connection

⚠ WARNING

- The electrical power supply installation must comply with the relevant local regulations and regulations. Turn off the power supply before making any connections. Only copper wires may be used copper wires only. Never squeeze wire bundles and make sure they do not touch pipes and sharp edges. Ensure that no external pressure is exerted on the terminal connections. All wiring and components in the installation must be installed by a qualified electrician and must comply with the relevant local codes and regulations.
- The wiring at the installation site must be done in accordance with the wiring diagram supplied with the device and the instructions below.
  Be sure to use a separate power source. Never use a power source shared by other appliances.
- Remember to build a foundation. Do not ground the device to a power pipe, surge protector, or telephone ground. Incorrect grounding can
  result in electric shock.
  Remember to install a ground fault circuit interrupter (30 mA). Failure to do so may result in electric shock.
- Remember to install the required fuse or circuit breaker.

Precautions for installing cables

- Secure the cables so that they do not come into contact with pipes (especially on the high-voltage side).
- Secure the cables with cable ties as shown in the diagram so that they do not touch the pipe, especially on the high-voltage side.
- Ensure that no external pressure is exerted on the terminal connectors.
- When installing a residual current device, make sure that it is compatible with the inverter (against high-frequency electrical noise) to avoid unnecessary tripping of the residual current device
  .

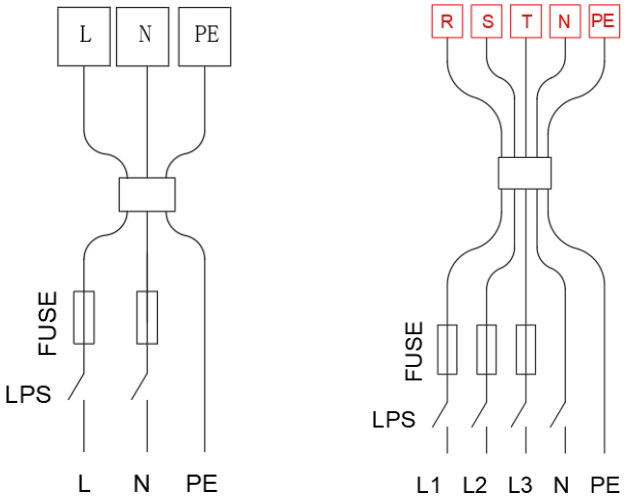
CAUTION

- This device is equipped with an inverter.

Wiring Overview

CAUTION

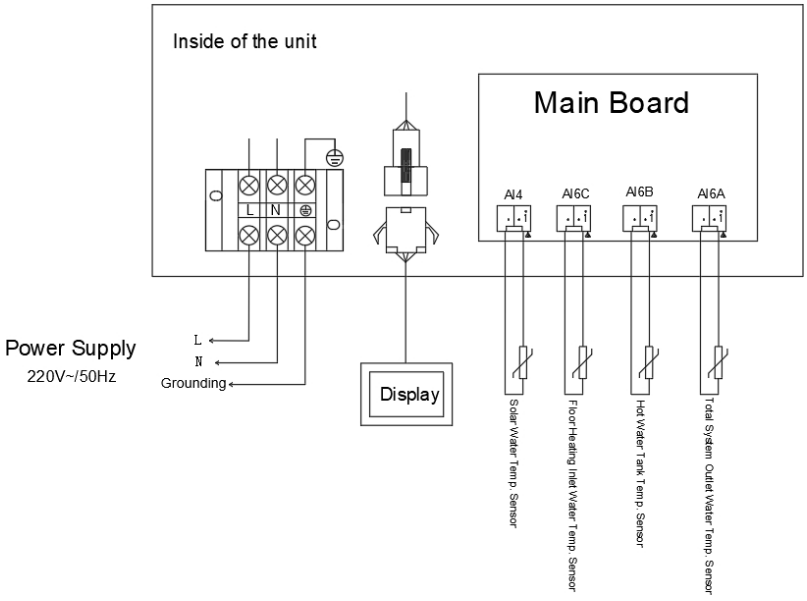
- The power cables for the device should be selected in accordance with the guidelines in this manual. The thermistor and wired controller cables are low-voltage cables; all other cables are connected to high voltage. The device must be grounded.
- All high-voltage external loads, if metallic or having a ground connection, must be grounded.
- All external load currents must be less than 0.2A. If a single load current is greater than 0.2A, the load must be connected via an AC contactor.
  The "AHS1, AHS2," "DFR1, DFR2," and "ERR1, ERR2" terminal ports only provide switching signals.
- The "DI2, G" and "SG, EVU, G" terminal ports receive switching signals.
  See the image below for the location of the port on the device.



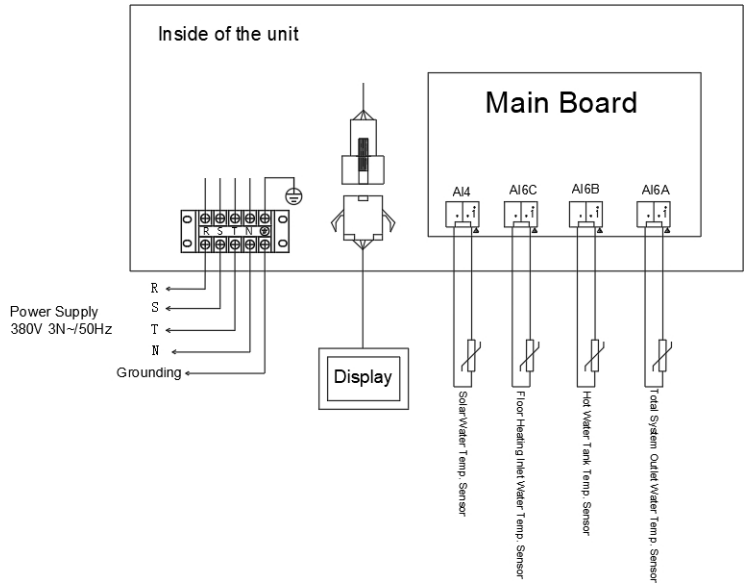
1. Wiring installation

① Open the handle on the right side of the device

② Wiring section



Power supply: 220V~/50Hz



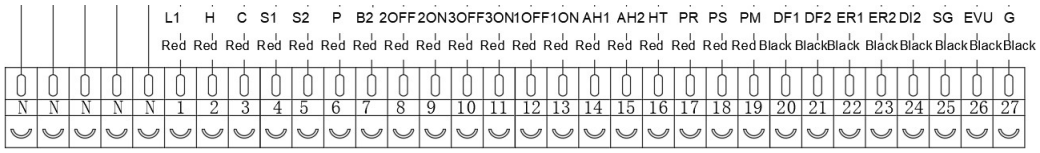
Power supply: 380V 3N~/50Hz

NOTE

- The residual current device must be a 30 mA fast-acting type (<0.1 s). Please use a cable with the appropriate number of cores and specifications.
- The rated current value is based on the maximum allowable operating temperature of the cable (105˚C/70˚C) and the rated ambient temperature (40˚C/25˚C) and assumes that a single cable is freely distributed in the air, and the comparative table of cable diameters is as follows.

Maximum operating current of the device (A)	Wire cross-sectional area (AWG)	Maximum operating current of the device (A)	Wire cross-sectional area (AWG)
≤3.0	≥24	≤15	≥14
≤4.6	≥22	≤21	≥12
≤6.5	≥20	≤28	≥10
≤8.5	≥18	≤40	≥8
≤11	≥16	≤55	≥6

Connection of other components



Printing	Connect to	print	Connect to
N	Neutral wire	14-15	External heat source
1-2	Thermostats Heating signal	16-N	Electric heater/heating cable heating
1-3	Thermostats Cooling signal	17-N	Floor heating pump
4-5	Solar signal	18-N	Solar pump
6-N	External circulation pump	19-N	DHW circulation pump
7-N	Electric heater for water tank	20-21	Defrost indicator
8-N	Heating valve	22-23	Fault indicator
9-N	Cooling valve	24-27	Display switch
10-N	Floor heating External circulation valve external	25-27	Smart grid, photovoltaic installation
11-N	Underfloor heating Internal circulation valve internal	26-27	Smart grid, photovoltaic installation
12-N	Hot water valve		
13-N	Air conditioning valve		

Function manual:

1. Output: control method

Method 1: Voltage-free connector.

Method 2: The port provides a 230V signal. If the load current is <0.2A, the load can be directly connected to the port.

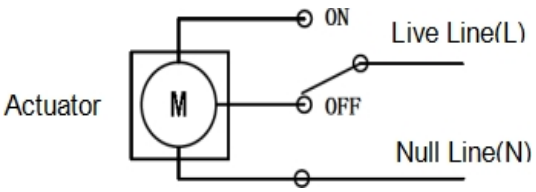
If the load current is >=0.2A, connect an AC contactor to the load.

1) For a three-way valve

When installing a three-way valve, use a three-wire switching valve

three-wire switching valve.

The connection diagram for the three-way valve is shown in the figure below:



The wiring specifications for the three-way valve are shown in the figure below:

Voltage	220-240VAC
Maximum current	0.2A
Specification cable	20AWG/0.75mm²
Control method	Type 2

1# Three-way valve connection The three-way valve is used to switch the flow of the medium between the central heating and the domestic hot water tank.

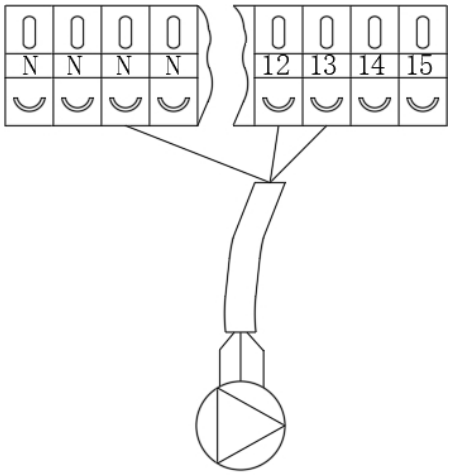
During construction and installation, it is necessary to

connect the valve control cable to the appropriate terminals on the device's connection block

connection block of the device.

When the device is operating in heating and cooling mode, contact 12# has a 230V voltage output, and contact 13# has no voltage output; when the device is operating in domestic hot water preparation mode, contact 13# has a 230V output, and contact 12# has no voltage output. When connecting the valve, pay special attention to connect the wires correctly

so that the valve switches the flow in the desired direction.



1#Electromagnetic 3-way valve

2# Connecting the three-way valve

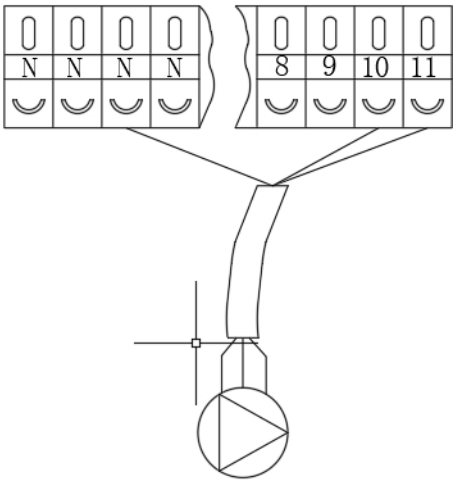
The 2# three-way valve is used to switch the flow of the air conditioner medium. During construction and installation, it is necessary to connect the

controlling the three-way valve to the appropriate terminals on the device's connection block.

When the unit's air conditioner is heated, terminal 8# has a 230V output, and terminal 9# has no output; when the unit is cooled,

terminal 9# has a 230V output, and terminal 8# has no voltage output. When connecting the valve, pay special attention to connect the wires correctly so that the valve

switch the flow in the desired direction.



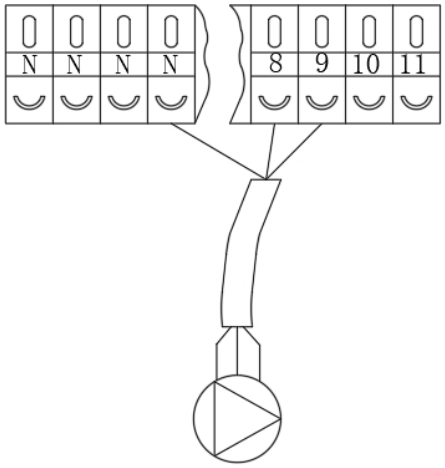
2#Electromagnetic 3-way valve

3# Three-way valve connection The 3# three-way valve is used to control the flow of the heating medium in zone B of the underfloor heating system.

When the water temperature in the underfloor heating is too high, the three-way valve changes the direction of flow so that heat is not supplied to the underfloor heating. Contact 11# maintains a 230V output, and contact 10# has no voltage output; if the temperature in the underfloor heating system falls below the set value, the valve

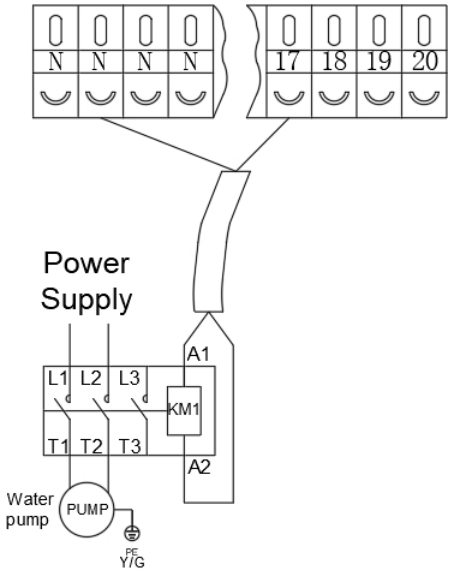
will be switched over to supply the heating medium to the floor heating in zone B. At this time, contact 10# maintains the 230V output, and contact 11# has no voltage output.

When connecting the valve, pay special attention to connecting the wires correctly so that the valve switches the flow in the desired direction.

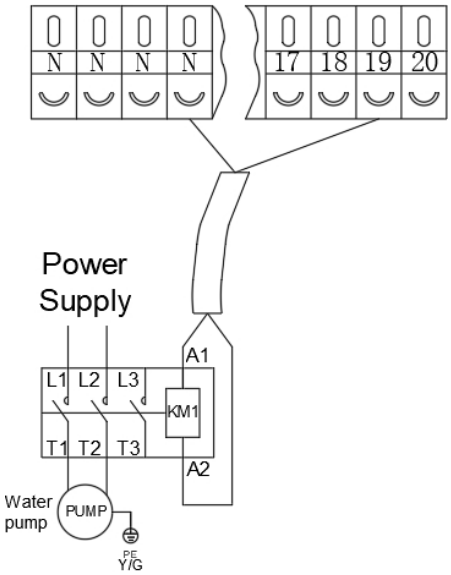


3#Electromagnetic 3-way valve

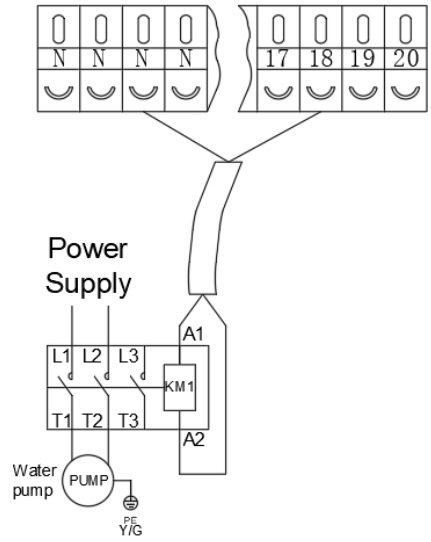
2) For the water pump



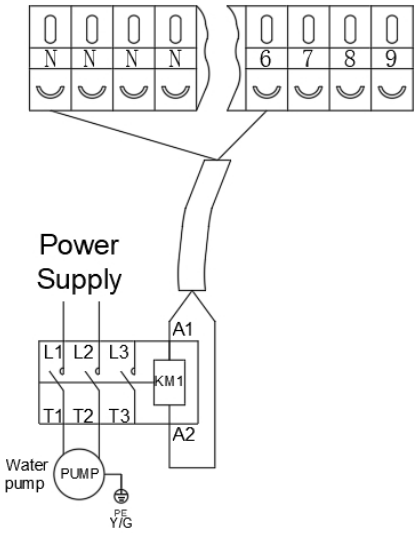
Lower Return Water Pump



Mixing Water Pump



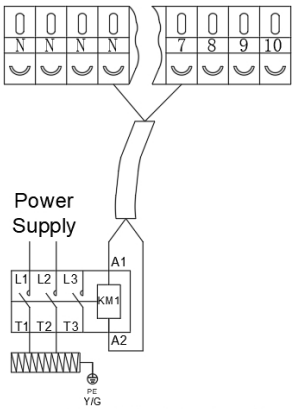
Solar Pump



Outside Circulator Pump

Voltage	220-240VAC
Maximum current	0.2A
Cable specification	20AWG/0.75mm²
Control method	Type 2

3) Electric heater for water tank



Electric Heater for Water Tank

Voltage	220-240VAC
Maximum current	0.2
Cable specification	20AWG/0.75mm²
Control method	Type 2

4) To thermostat

"Power input" supplies voltage to the "thermostat" and does not directly power the motherboard interface.

Port "L1" supplies 230V to the RT connector.

Port "L1" is connected to single-phase power from the main power port L of the device.

There are three methods for connecting the thermostat wire (as shown below), depending on the application.

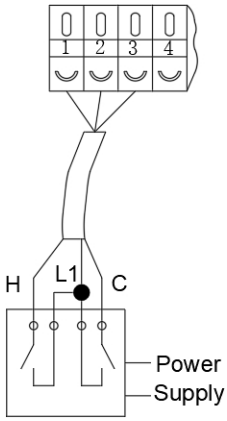
Method 1 When "thermostat control" is set to "single zone mode switch":

When signal C is closed, zone A starts operating in cooling mode;

When signal C is disconnected and signal H is closed

zone A starts heating operation;

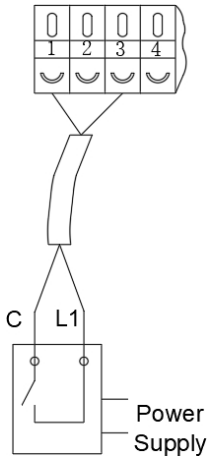
When both signal C and signal H are disconnected, the unit does not heat or cool;



Method 1

(Single zone operation mode switch) **Method 2** When "thermostat control" is set to "single zone switch": When signal C is closed, zone A is cooled;

When signal C is disconnected, zone A is not cooled;



Method 2

(Single switch)

Method 3 When "thermostat control" is set to "dual-zone switch":

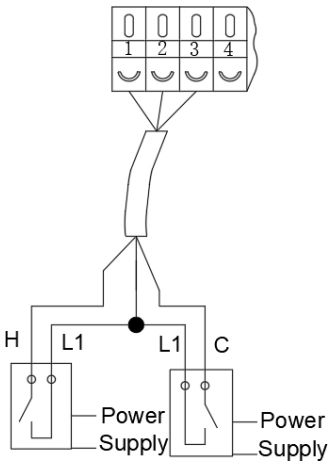
When signal C is closed, zone A is cooled;

when signal C is off, zone A is not cooled;

When signal H is closed, zone B is heated;

when signal H is off, zone B is not heated;

(Note: Zone B is only used for heating mode operation)

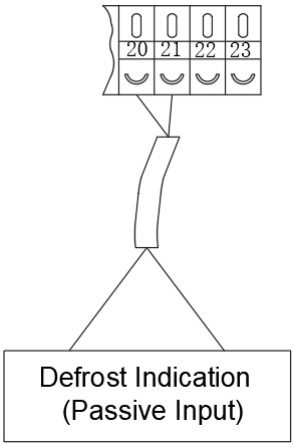


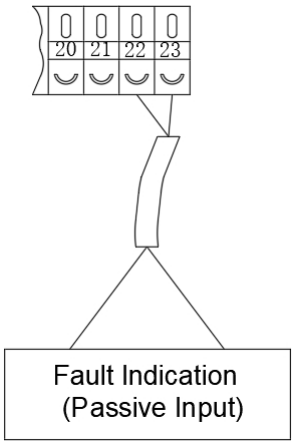
Method 3

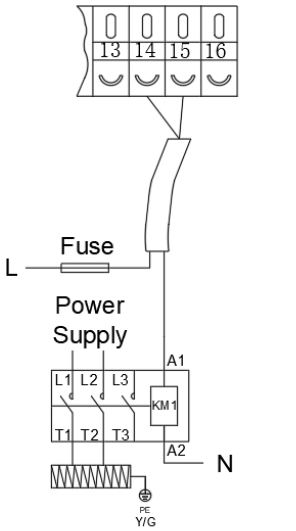
(dual-zone switch)

Voltage	220-240VAC
Maximum current	0.2A
Cable specification	20AWG/0.75mm²

5) For signal output, external heat source



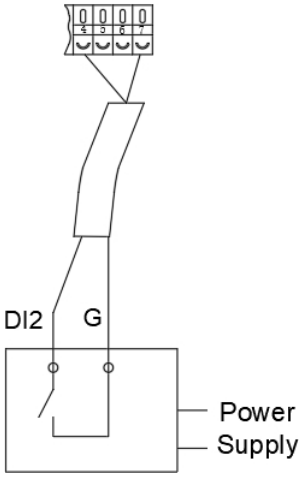




External Heat Source

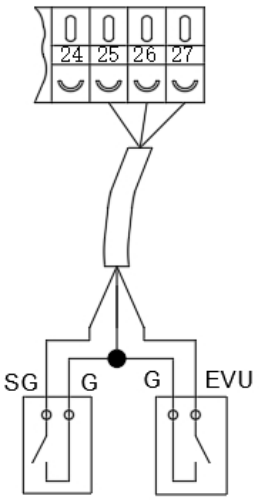
Voltage	220-240VAC
Maximum current	0.2A
Specification cable	20AWG/0.75mm²
Control method	Type 1

6) To control switch with cable



For Smart Grid

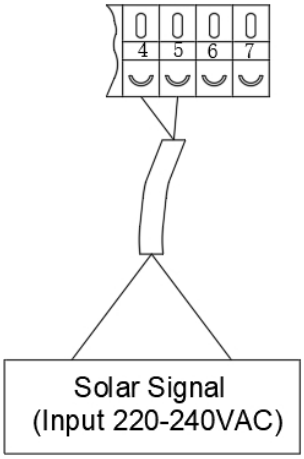
The smart grid cabling is shown in the figure below, SG is the smart grid signal, EVU is the photovoltaic signal.



Smart Grid, Photovoltaic Power

7) For Solar Signal (power input 220V, L and N)

When [solar temperature sensor] is set to "off", it is necessary to connect the solar signal in order to control the start and stop of the solar water pump. The connection is shown in the figure below.



3.3. First start-up of the device

WARNING

Before turning on the heat pump, carefully check all cables.

3.3.1. Check before first start-up

Before starting the device for the first time, check the following items:

□	Visual inspection of the correct connection of the device
□	The power supply voltage is the same as the rated voltage of the device
□	Hydraulic and electrical installation correctly performed
□	The air inlet and outlet of the device is unblocked
□	The system is filled and vented, no leaks.
□	The leak protection is working
□	Pipelines are insulated
□	The grounding wire is properly connected

3.3.2. First-time startup

Step 1: The test can be started after all installation work has been completed.

Step 2: All cables and piping should be properly connected and thoroughly checked, then filled before turning on the power;

Step 3: After venting the device and the installation, press the "ON/OFF" button on the control panel to start the device;

Step 4: Items to check during the test:

① During the first start-up, check that the current consumption of the device is normal;

② Check that each function button on the control panel is working properly;

③ Check that the display screen is working correctly;

④ Check for leaks in the entire heating circulation system;

⑤ Is the condensate drain correctly installed?

❽ Are there any abnormal noises or vibrations during operation?

4. MAINTENANCE AND PROTECTION AGAINST FREEZING

4.1. Maintenance

⚠ WARNING

Before performing maintenance on the device, make sure that the power supply is disconnected.

- **Cleaning**

a. The heat pump housing should be cleaned with a damp cloth. The use of detergents or other household products could damage the surface of the casing and impair its properties.

b. The evaporator at the rear of the heat pump should be thoroughly cleaned with a vacuum cleaner and a soft brush attachment.

- **Annual inspection**

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

a. Perform a preliminary visual inspection.

b. Check the condition of the device's electrical installation and power supply.

c. Check the ground connections.

d. Check the pressure in the heating system and the tightness of the cooling system.

4.2. Protection against freezing .

- **"Cut off" the power supply to the device before cleaning or repairing it.**

When the device will not be used during the winter:

a. Disconnect the power supply to prevent mechanical damage.

b. Drain the water from the device and the connection system.

c. Cover the machine body when it is not in use.

- **NOTE: Unscrew the heating medium inlet and outlet connections to remove water from the device.**

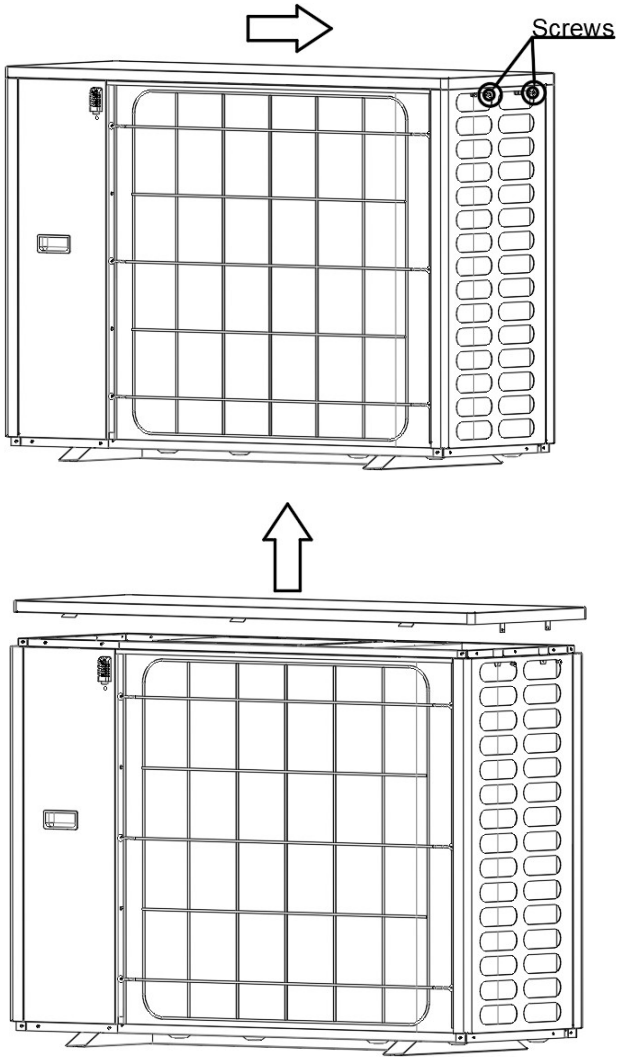
5. EXTERNAL UNIT DISASSEMBLY PROCEDURES

5.1. n outdoor panel removal instructions

For 4kW and 6kW units, the disassembly procedure is the same as for 9kW and 13kW units, but the number of screws to be removed will be different.

will be different.

- **NE-F90HCR4INEM, NE-F90HCR4TINEM, NE-F130HCR4INEM, NE-F130HCR4TINEM**

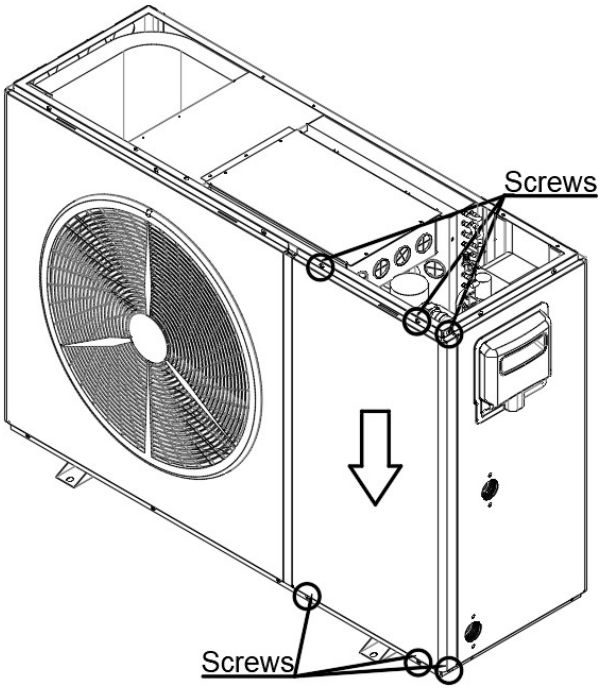
Work procedure	
1. Remove the top cover ① Remove the two screws on the left side of the top cover. ② Slide the top cover to the right. ③ Pull the top cover upward.	

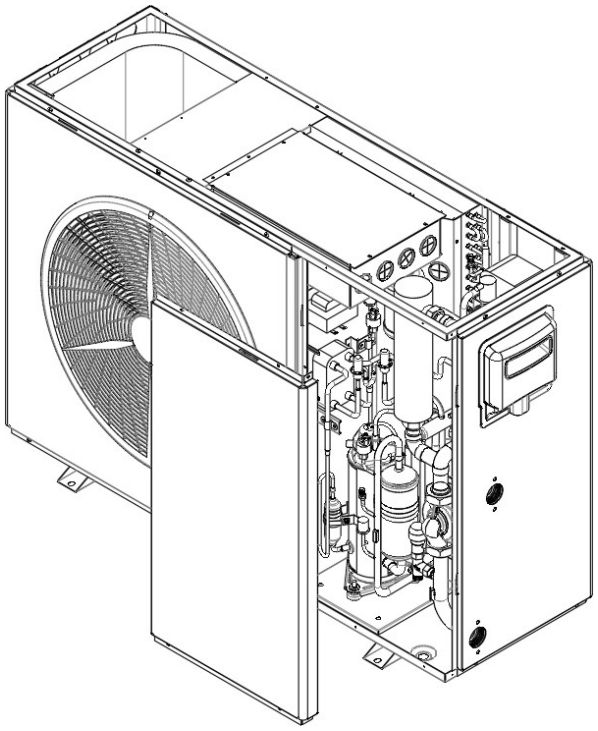
2. Remove the front service cover

① Remove the six screws at the top and bottom of the front service cover
.

A Press and hold the front service cover and slide it down.

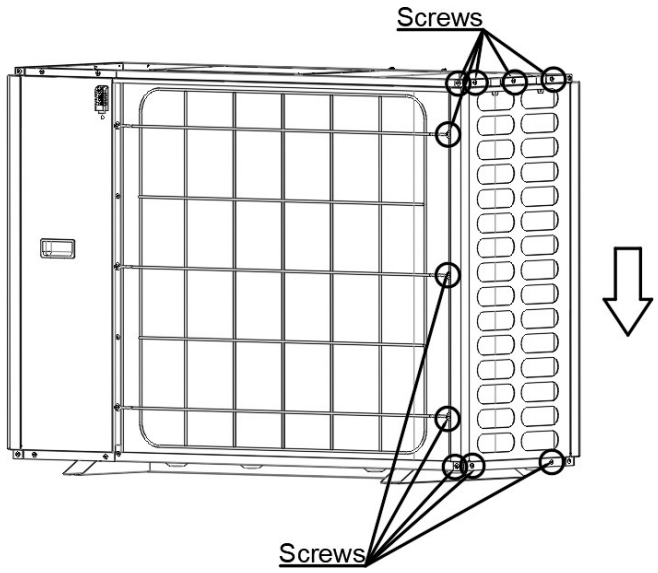
⊙ Then swipe right to remove it.



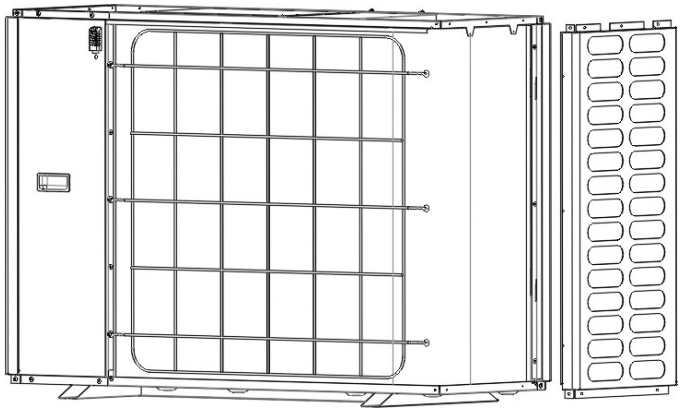


3. Remove the left cover

① Remove the ten screws on the left cover.

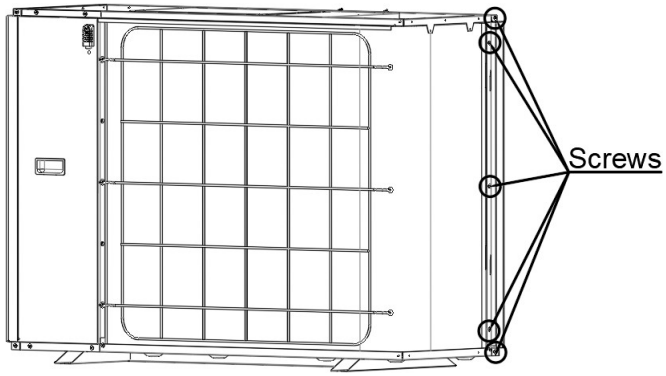


② Remove the left cover by pulling it down.

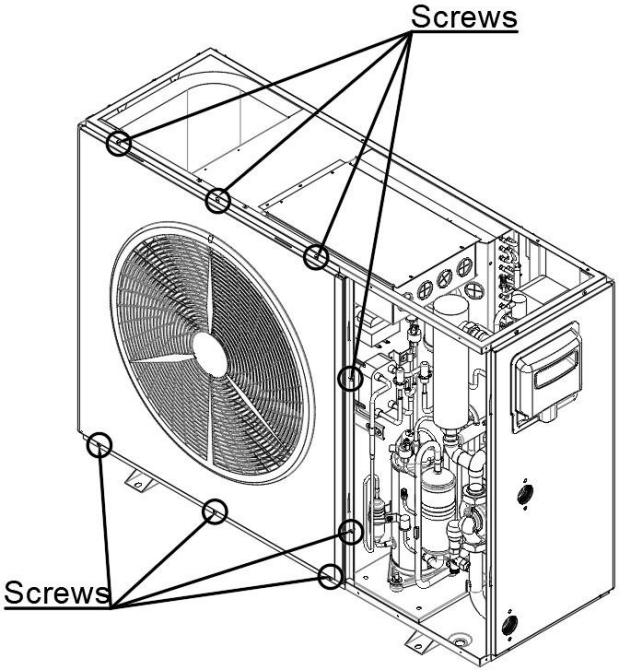


4. Remove the air guide panel

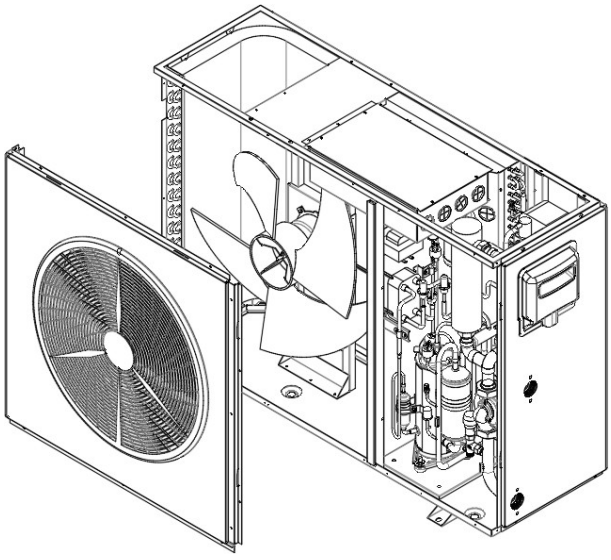
① Remove the five screws on the side of the air guide panel.



A Remove the nine screws on the side of the air guide panel.

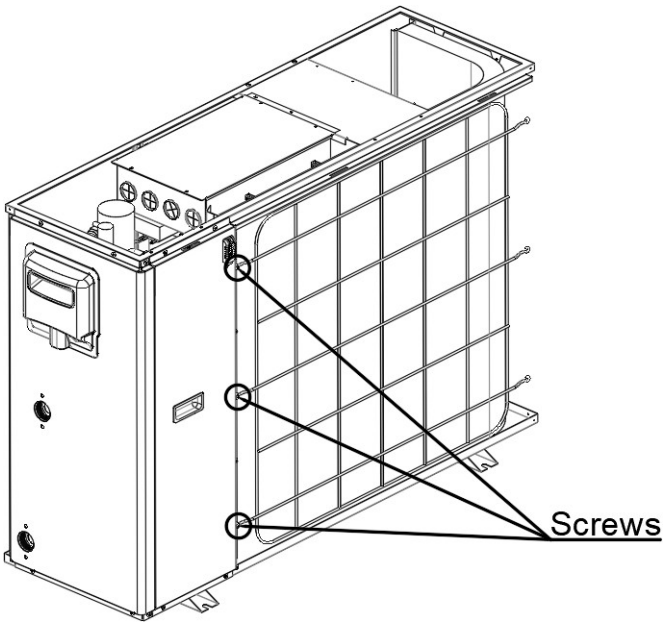


⊙ Pull the left air guide cover
out.

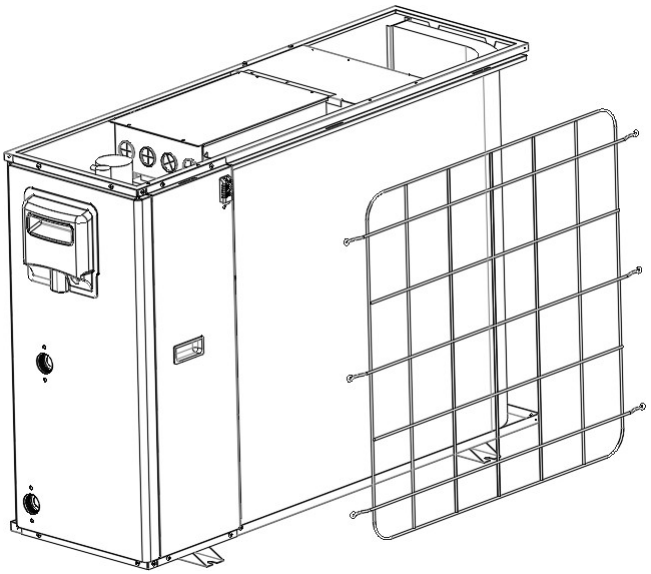


5. Remove the grille

① Remove the three screws securing the grille

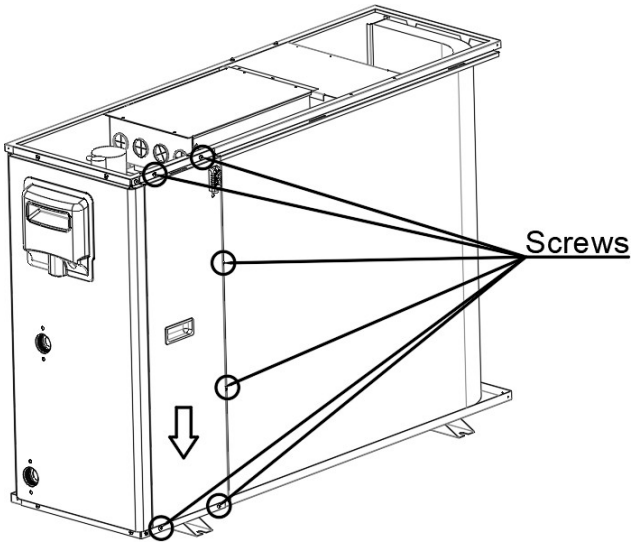


A Remove the grille.

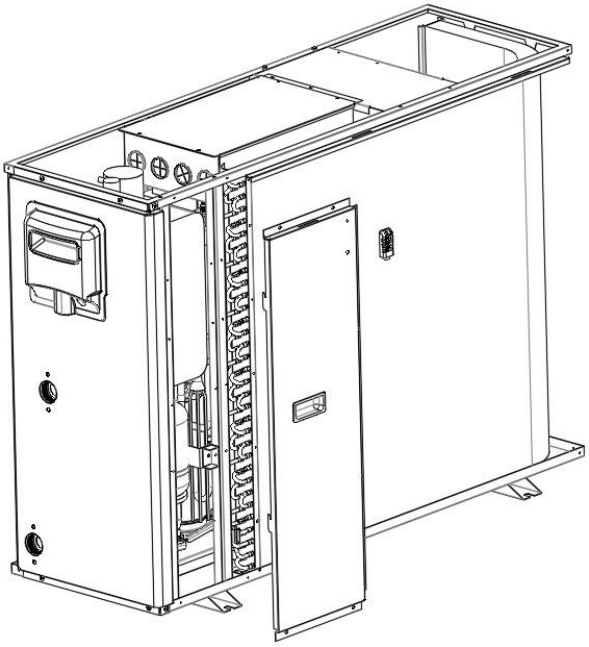


6. Remove the rear service cover

① Remove the six screws from the rear service cover.



② Remove the rear service cover by pulling it down.



Service hotline: 32
506 62 10
serwis@maxcom.eu.co
m

Manufacturer and distributor
MAXCOM S.A. ul.
Towarowa 23a
43-100 Tychy, POLAND
+48 32 327 70 89
office@maxcom.eu.com
www.maxcom.eu.com