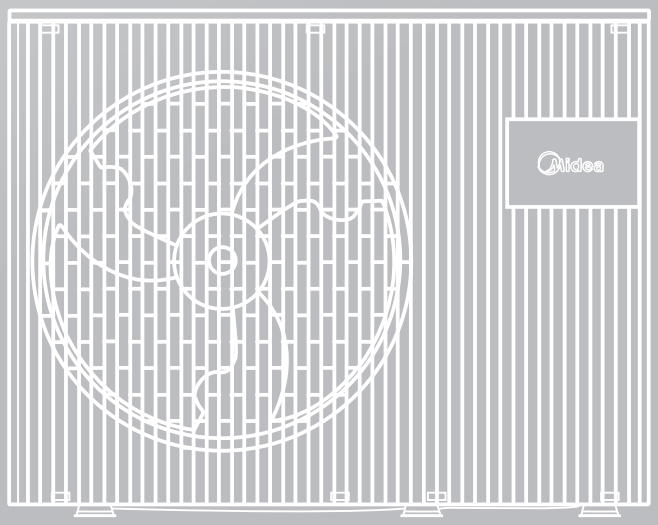
Scan the QR code to read the manual in different languages

INSTALLATION MANUAL

M-thermal split

Outdoor 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

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

⚠ WARNING

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

General

① Information

This appliance employed A2L flammable refrigerant R32.

The appliance shall be stored so as to prevent mechanical damage from occurring.

② Qualification of workers

Refer to Target group described in chapter 1 SAFETY PRECAUTION.

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

Examples for such working procedures are:

– breaking into the refrigerating circuit;

– opening of sealed components;

– opening of ventilated enclosures.

Symbols

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

⚠ WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants might not contain an odour.

Installation

① General Requirement

1)for field-installed refrigerant pipes;

a) that the installation of pipe-work shall be kept to a minimum;

b)that pipe-work shall be securely mounted and guarded from physical damage;

c)that pipe-work shall not be installed in an unventilated space.

2)addition of charge may be required to complete installation, refer to chapter 5 for detail;

3)field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure. No leak shall be detected;

⚠ WARNING

- Precautions shall be taken to avoid excessive vibration or pulsation to refrigerating piping;
- Protection devices, piping and fittings shall be protected as far as possible against adverse environmental effects, for example the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris;
- Provision shall be made for expansion and contraction of long runs of piping;
- Piping in refrigerating systems shall be so designed and installed as to minimize the likelihood of hydraulic shock damaging the system;
- Steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation.

② This appliance should not be installed in unventilated areas

Information on servicing

① General

⚠ CAUTION

Servicing shall be performed only as recommended by the manufacturer.

② Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, DD.4.3 to DD.4.7 shall be completed prior to conducting work on the system.

③ Work procedure

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

④ General work area

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

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

⑤ Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

⑥ Presence of fire extinguisher

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

⑦ No ignition sources

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

⑧ Ventilated area

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

⑨ Checks to the refrigerating equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
The following checks shall be applied to installations using flammable refrigerants:
– the refrigerant charge is in accordance with the room size within which the refrigerant
containing parts are installed;
– the ventilation machinery and outlets are operating adequately and are not obstructed;
– if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

– marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
– refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which can corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

⑩ **Checks to electrical devices**

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

Initial safety checks shall include:

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

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

– that there is continuity of earth bonding.

Sealed electrical components

⚠ WARNING

Sealed electrical components shall not be repaired.

Cabling

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

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

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

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

NOTE Examples of leak detection methods are

– bubble method,

– fluorescent agent method.

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

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut-off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to Clause 8.

⚠ CAUTION

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

Refrigerant removal and circuit evacuation

When breaking into the refrigerant circuit to make repairs – or for any other purpose –

conventional procedures shall be used. However, for flammable refrigerants it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

– safely remove refrigerant following local and national regulations;

– evacuate;

– purge the circuit with inert gas (optional for A2L);

– evacuate (optional for A2L);

– continuously flush with inert gas when using flame to open circuit;

– open the circuit.

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

⚠ CAUTION

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

The system shall be “flushed” with OFN to render the unit safe. This process may need to be repeated several times.

Compressed air or oxygen shall not be used for purging refrigerant systems.

Purging of the refrigerant circuit shall be achieved by breaking the vacuum in the system with inert gas and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. The system shall be vented down to atmospheric pressure to enable work to take place.

⚠ CAUTION

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

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

Charging procedures

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

– Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.

– Cylinders shall be kept in an appropriate position according to the instructions.

– Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.

– Label the system when charging is complete (if not already labelled).

– Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Decommissioning

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

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

1) Become familiar with the equipment and its operation.

2) Isolate system electrically.

3) Before attempting the procedure, ensure that:

a) mechanical handling equipment is available, if required, for handling refrigerant cylinders;

b) all personal protective equipment is available and being used correctly;

c) the recovery process is supervised at all times by a competent person;

d) recovery equipment and cylinders conform to the appropriate standards.

4) Pump down refrigerant system, if possible.

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

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

7) Start the recovery machine and operate in accordance with instructions.

8) Do not overfill cylinders (no more than 80 % volume liquid charge).

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

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

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

Labelling

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

Recovery

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

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. Consult manufacturer if in doubt. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. Draining of oil from a system shall be carried out safely.

Intended use

There is a risk of injury or death to the user or others, or of damage to the product and other property in the event of improper or unintended use.

The product is an air-to-water heat pump with split design, and it consists of outdoor unit and indoor unit.

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

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

The product is only intended for outdoor installation.

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

- Where there is mist of mineral oil or oil spray or vapors. Plastic parts may deteriorate, and cause joint loose and leakage of water.
- Where corrosive gases (such as sulfurous acid gas) are produced, or corrosion of copper pipes or soldered parts may cause leakage of refrigerant.

• Where there is machinery which emits massive electromagnetic waves. Enormous electromagnetic waves can disturb the control of the system and cause equipment malfunction.

• Where flammable gases may leak, carbon fiber or ignitable dust is suspended in the air or volatile flammables such as paint thinner or gasoline are handled. These types of gases might cause a fire.

• Where the air contains high levels of salt such as a location near the ocean.

• Where voltage fluctuates a lot, such as a location in a factory.

• In vehicles or vessels.

• Where acidic or alkaline vapors are present.

Intended use includes the following:

• Observance of the operating instructions included for the product and any other installation components.

• Compliance with all inspection and maintenance conditions listed in the instructions.

• Installing and setting up the product in accordance with the product and system approval.

• Installation, commissioning, inspection, maintenance and troubleshooting by qualified contractors and authorized installers.

Intended use also covers installation in accordance with the IP code.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge provided that they have been given supervision or instruction concerning the use of the appliance in a safe way and understand the hazards involved. Children should not play with the appliance. Cleaning and maintenance should not be made by children without supervision

Any other use that is not specified in these instructions, or use beyond that specified in this document, should be considered as improper use. Any direct commercial or industrial use is also deemed to be improper.

⚠ CAUTION

Improper use of any kind is prohibited.

• Do not rinse the unit.

• Do not place any object or equipment on top of the unit (top plate).

• Do not climb, sit or stand on top of the unit.

Regulations to be observed

1) National installation regulations.

2) Statutory regulations for the prevention of accidents.

3) Statutory regulations for environmental protection.

4) Statutory requirements for pressure equipment: Pressure Equipment Directive 2014/68/EU.

5) Codes of practice of the relevant trade associations.

6) Relevant country-specific safety regulations.

7) Applicable regulations and guidelines for operation, service, maintenance, repair and safety of cooling, air conditioning and heat pump systems containing flammable and explosive refrigerant.

Working on the system

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

⚠ CAUTION

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

⚠ DANGER

Contact with live components can result in severe injuries. Some components on PCBs remain live even after the power supply has been switched off. Prior to removing covers from the appliances, wait at least 5 minutes until the voltage has completely dropped out.

• Safeguard the system against reconnec -tion.

• Wear suitable personal protective equipment when carrying out any work.

• Do not touch any switch or electrical parts with wet fingers. It may cause electrical shock and compromise the system.

⚠ DANGER

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

• Prior to servicing or maintenance tasks, switch off and allow the equipment to cool down or warm up.

• Do not touch hot or cold surfaces on the appliance, fittings or pipework.

NOTE

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

Safety work area and temporary flammability zones.

⚠ CAUTION

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

Installation

General

- Be sure to use only specified accessories and parts for installation. Failure to use specified parts may result in water leakage, electric shocks, fires, or the unit falling from its mount.
- Install the unit on a foundation that can withstand its weight. Insufficient physical strength may cause the unit to fall and possible injury.
- Perform specified installation work with full consideration of strong wind, hurricanes, or earthquakes. Improper installation may result in accidents due to equipment falling.
- Earth the unit and install a ground fault circuit interrupter in accordance with local regulations. Operating the unit without a proper ground fault circuit interrupter may cause electric shocks and fires.
- Install the power cable at least 3 feet (1 meter) away from televisions or radios to prevent interference or noise. (Depending on the radio waves, a distance of 3 feet (1 meter) may not be sufficient to eliminate the noise.)
- Any damaged power cord must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.
- This appliances can not to be used at altitudes

2 000 m and above.

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

⚠ CAUTION

For the primary water circulation loop:

1) Do not install any air vent valve in the indoor side. If the air vent valve has to be installed in the indoor side, no ignition sources exist around the air vent valve.

2) Make sure the outlet of the indoor safety valve leads to the outdoor side and no ignition sources exist around the outlet of safety valve.

For the secondary water circulation loop(e.g. DHW loop):

Follow the general rules for the installation of air vent valve and safety valve.

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

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

⚠ DANGER

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

⚠ DANGER

Inflammable matters are prohibited.

Freezing protection

⚠ CAUTION

Freezing can cause damage to the heat pump.

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

Connecting cables

⚠ DANGER

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

Repair work

⚠ CAUTION

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

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

Auxiliary components, spare and wearing parts

⚠ CAUTION

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

Safety instructions for operating the system

What to do if refrigerant leaks

⚠ WARNING

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

⚠ DANGER

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

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

⚠ CAUTION

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

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

What to do if water leaks

⚠ DANGER

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

⚠ DANGER

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

What to do if the outdoor unit ices up

⚠ CAUTION

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

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

Safety instructions for storage of the outdoor unit

The outdoor unit is charged at the factory with refrigerant R32 .

⚠ DANGER

The storage of the appliance should be in accordance with the local regulations

The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

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

- An explosion prevention plan must be in place for storage.
- Ensure the storage location is well ventilated.
- Keep away from ignition sources (avoid exposure to heat and smoking).
- Temperature range for storage: –25 °C to 70 °C
- Only store the outdoor unit in its original protective packaging from the factory.
- Protect the outdoor unit against damage.

⚠ CAUTION

A fire with R32 should only be fought with CO_2 or dry powder extinguishers.

Transport

The maximum number of pieces of equipment permitted to be transported together will be determined by the local transport regulations.

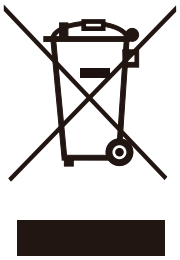
Disposal

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

Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.

- Do not dispose of electrical appliances as unsorted municipal waste, and use separate collection facilities.
- Contact your local government for information regarding the collection systems available.

If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.



WARNING: Risk of fire

2 GENERAL INTRODUCTION

2.1 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 (this manual) - Outdoor Unit	Brief installation instructions of the outdoor unit	Paper (in the box next to the outdoor unit)
Installation 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)

Scan the QR code to read the manual in different languages

Installation, Operation and Maintenance Manual

Online Tools (APP and websites)

Refer to the OPERATION MANUAL for more information

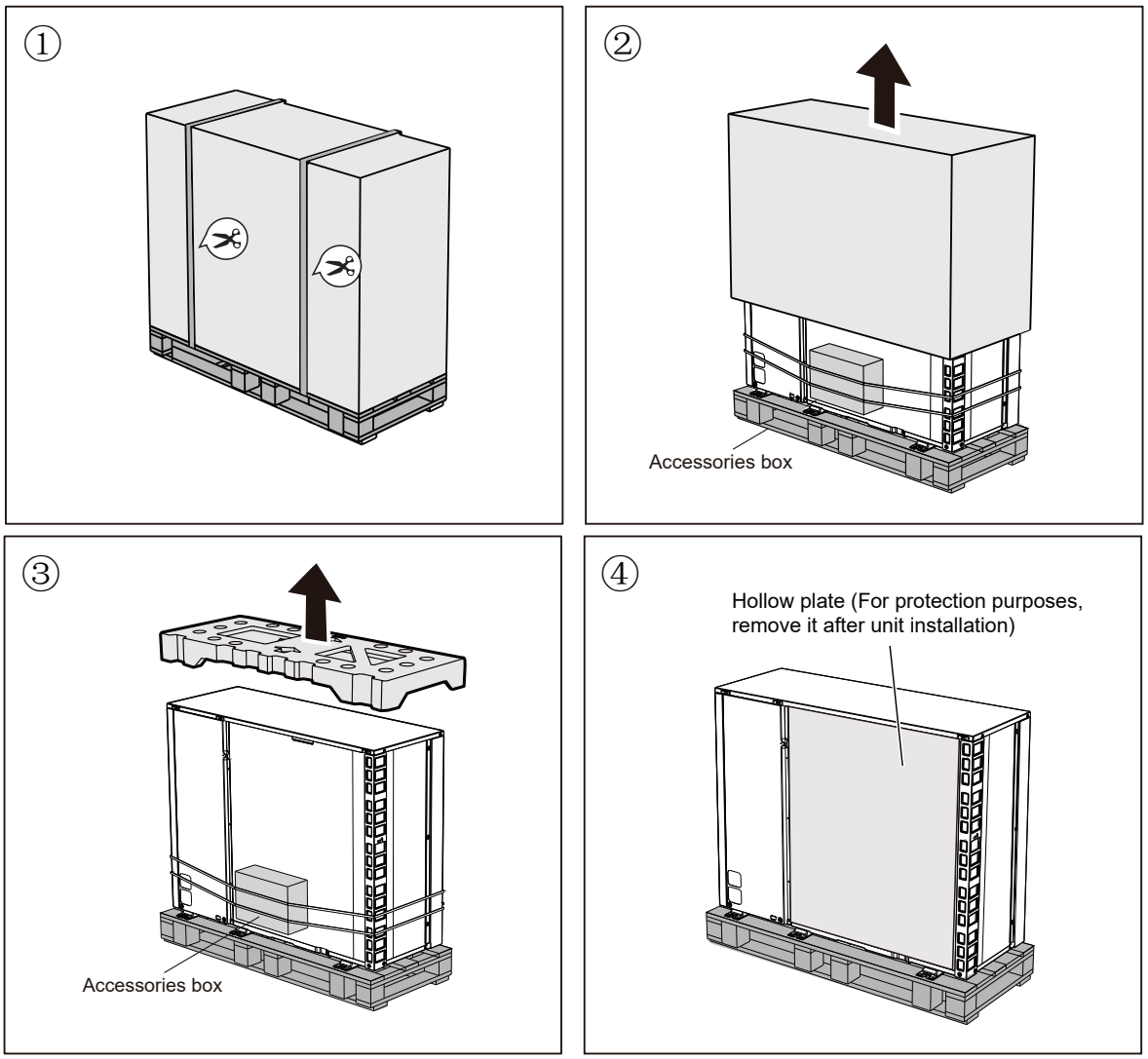
For the terms and abbreviation, see Annex C.

2.2 Validity of the instructions

These instructions apply only to:

Unit	1-phase			3-phase		
	12	14	16	12	14	16
Net weight (kg)	120.5			137.5		
Wiring specification (mm^2) - main power supply	6-10	6-10	6-10	2.5-4	2.5-4	2.5-4

2.3 Unpacking



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

2.4 Accessories of the unit

Accessories of the unit			
Name	Illustration	Quantity	Specification
Installation Manual (this manual)		1	-
Technical Data Manual		1	-
Energy Label		1	-
Rubber Cable Grommet		2	-
Tie Wrap		7	-

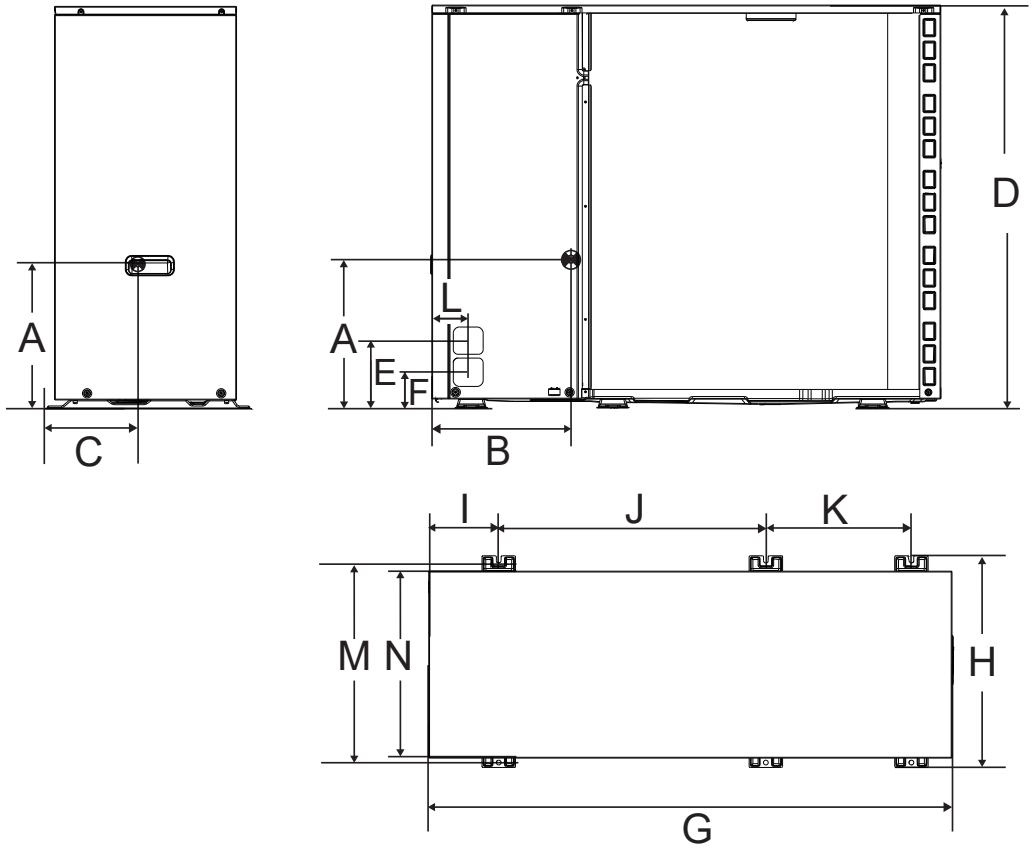
Accessories of the unit			
Name	Illustration	Quantity	Specification
Drain Joint		1	φ 32
Magnet ring (Available on 12/14/16 kW 1-phase)		1	-
Paper Edge Protector		2	-
Sealing Plate		1	-
Screws for Sealing Plate		3	ST 3.9 * 10

For more options supplied by the manufacturer, see the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for further information.

2.5 Transportation

2.5.1 Dimensions and barycenter

A, B, and C indicate the locations of barycenter.



(mm)

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1 phase 12-16 kW	347	535	225	1 051	175	95	1 330	538	178	679	370	132	513	475
3 phase 12-16 kW	347	535	225	1 051	175	95	1 330	538	178	679	370	132	513	475

2.5.2 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 four people lift the product.

1. Take into consideration the weight distribution during transportation. The product is significantly heavier on the compressor side than on the fan motor side. (see content above for the barycenter)
2. After transportation, remove the transport straps.
3. During transportation, do not tilt the product to an angle larger than 45°.

2.5.3 Lifting

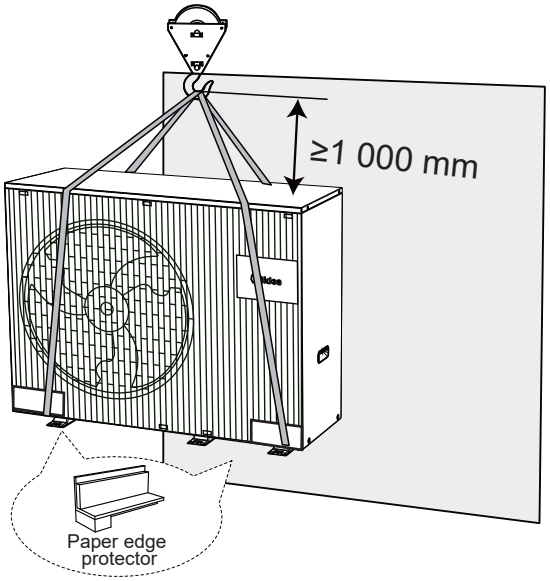
Use lifting tools with transport straps or a suitable hand truck.

Unit on the pallet:

Pass the transport straps through the holes on the left and right sides of the pallet properly.

No pallet under the unit:

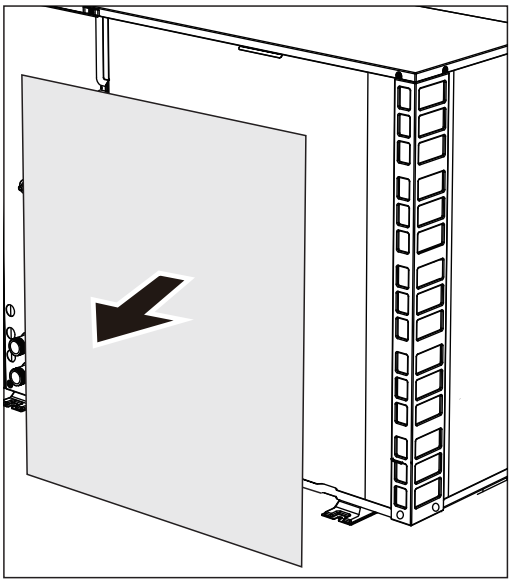
The transport straps can be fitted into the dented position at the base frame that are made specifically for this purpose.

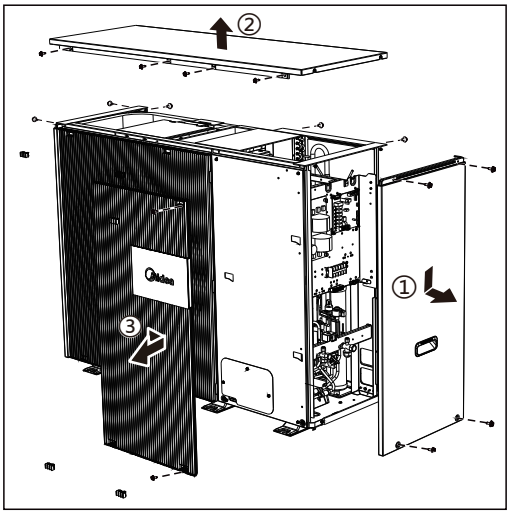


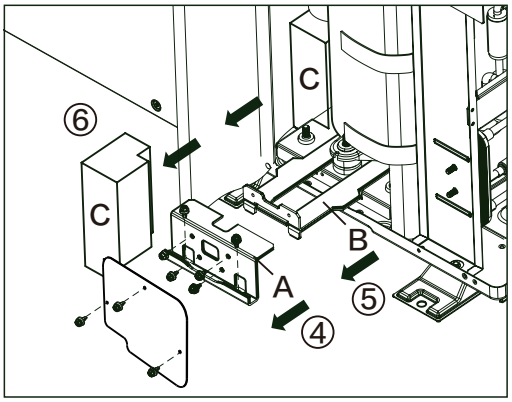
⚠ CAUTION

The barycenter of the product and the hook should be kept in a straight line in the vertical direction to prevent excessive tilting.

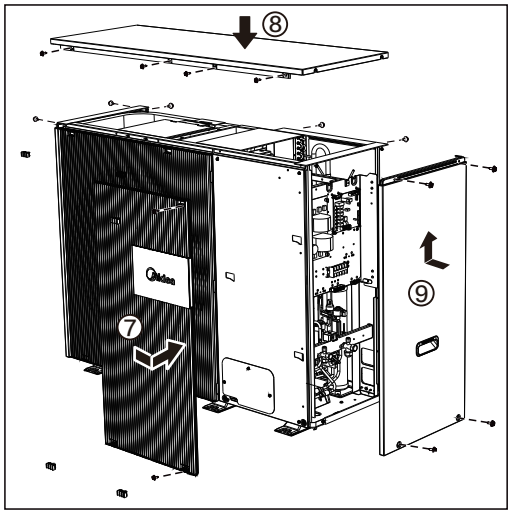
2.6 Parts to be removed







A, B: Compressor support
C: Pearl Wool Packing Cushion

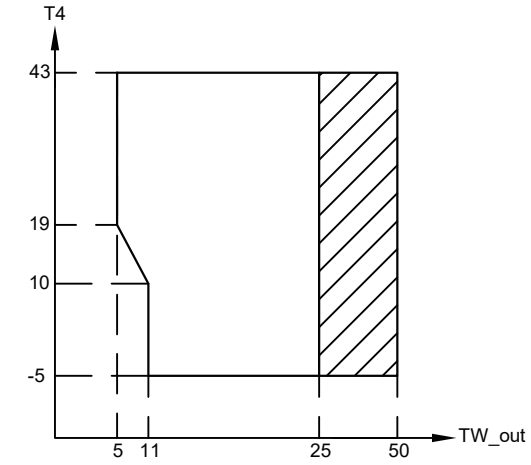


⚠CAUTION

Remove part A, part B, part C after unit installation.

2.7 Operating range

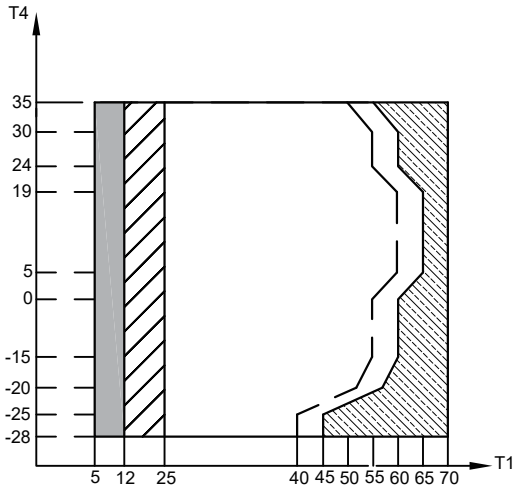
In cooling mode, the product works at an outdoor temperature of -5 °C to 43 °C.



Operation range by heat pump with possible limitation and protection.

TW_out: leaving water temperature
T4: outdoor ambient temperature

In heating mode, the product works at an outdoor temperature of -28 °C to 35 °C



If IBH/AHS setting is valid, only IBH/AHS turns on;
If IBH/AHS setting is invalid, only heat pump turns on, limitation and protection may occur during heat pump operation.

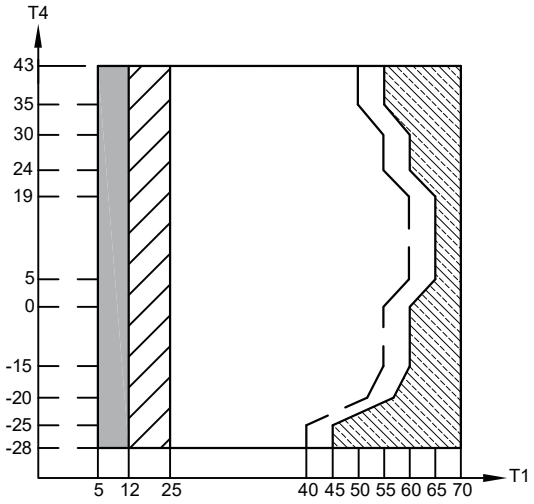
Operation range by heat pump with possible limitation and protection.

Heat pump turns off,only IBH/AHS turns on. (IBH can heat the water temperature up to 65 °C, AHS can heat the water temperature up to 70 °C)

Maximum inlet water temperature line for heat pump operation.

T1: leaving water temperature
T4: outdoor ambient temperature

In DHW mode, the product works at an outdoor temperature of -28 °C to 43 °C



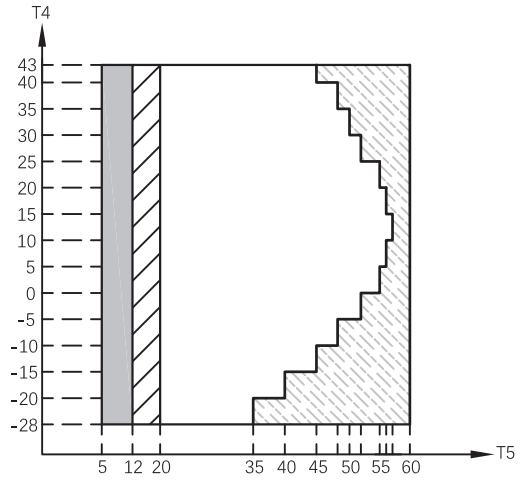
If IBH/AHS setting is valid, only IBH/AHS turns on;
If IBH/AHS setting is invalid, only heat pump turns on, limitation and protection may occur during heat pump operation.

Operation range by heat pump with possible limitation and protection.

Heat pump turns off, only IBH/AHS turns on. (IBH can heat the water temperature up to 65 °C, AHS can heat the water temperature up to 70 °C)

Maximum inlet water temperature line for heat pump operation.

T1: leaving water temperature
T4: outdoor ambient temperature



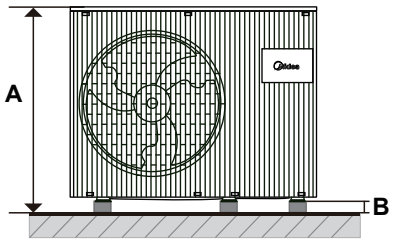
If TBH/IBH/AHS setting is valid, only TBH/IBH/AHS turns on;
If TBH/IBH/AHS setting is invalid, only heat pump turns on, limitation and protection may occur during heat pump operation.

Operation range by heat pump with possible limitation and protection.

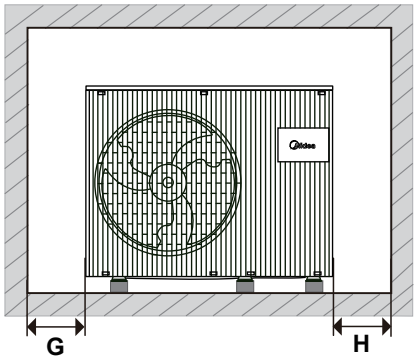
Heat pump turns off, only TBH/IBH/AHS turns on.

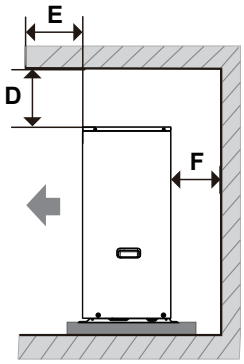
3 UNIT INSTALLATION

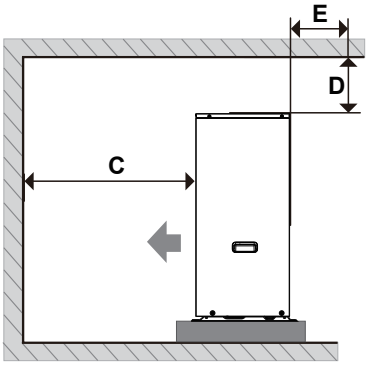
General



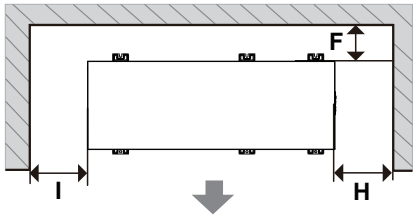
Obstacle over the top

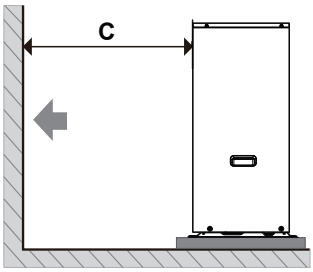






No obstacle over the top





12-16 kW **(mm)**

A	Unit height + B	**D**	≥ 500	**G**	≥ 500
B	≥ 100 *	**E**	≤ 500	**H**	≥ 500
C	≥ 1 500	**F**	≥ 300	**I**	≥ 500

* In case of cold weather, take into account of snow on the ground. For more information, refer to 3.4 In Cold Climates.

For cascade application installation clearance, refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL.

3.1 Conditions for installation

The product can be installed on a ground or flat roof.
Pitched-roof installation is not permitted.
For installation on a flat roof, refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL.

3.2 Foundation and unit installation (installation on a ground)

Installation on a soft ground

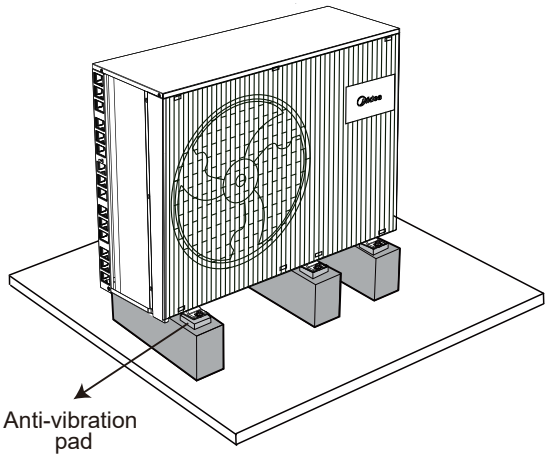
In case of installation on a soft ground (such as on a lawn or earthy ground), refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for the recommended preparations for the foundation.

Installation on a solid ground

In case of installation on a solid ground (such as on a concrete ground), refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for the recommended preparations for the foundation.

Unit mounting

Installation with foundation: Fix the unit with foundation bolts. (Six Φ 10 expansion bolts, nuts and washers are needed, supplied on the site). Screw the foundation bolts to a depth of 20 mm in the foundation.
Installation without foundation: Install proper anti-vibration pads and level the unit.



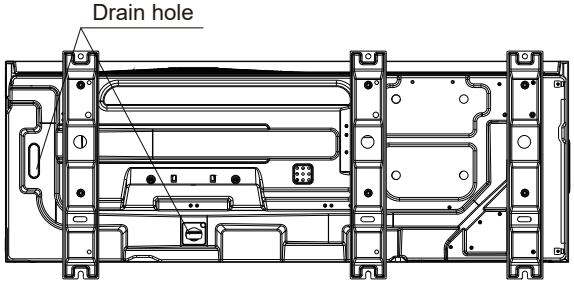
⚠ CAUTION

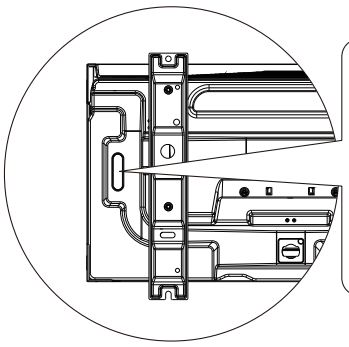
All six feet must be fixed.

Installation with foundation

3.3 Drainage

3.3.1 Drain hole position





This drain hole is covered by a rubber plug. If the small drain hole cannot meet the drainage requirements, the big drain hole can be used instead.

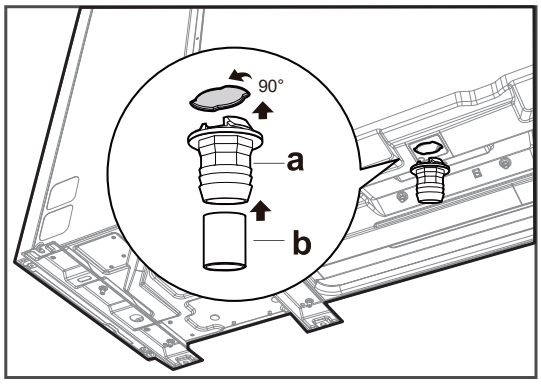
12-16 kW

⚠ CAUTION

- Watch the condensate when removing the rubber plug of the additional drain hole.
- Make sure the condensate is drained properly. Collect and direct the condensate that can drip from the base of the unit to a drain tray. Prevent water dripping onto the floor that may generate a slip hazard, especially in winter.
- For cold climate , it is highly recommended that a belt heater be installed to avoid damage to the unit due to the drain water freezing in case of a low drainage rate.

3.3.2 Drainage layout (installation on a ground)

Drain joint



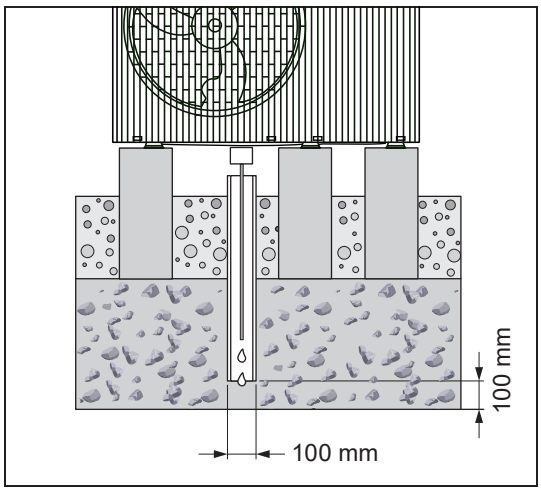
a – Drain joint (plastic, Pagoda connection, 1")

b - Drain hose (field supply)

Installation on a soft ground

Draining condensate into a gravel bed

For installation on a ground, the condensate must be discharged via a downpipe into a gravel bed that is located in a frost-free area.



The downpipe must go into a sufficiently large gravel bed so that the condensate can trickle away freely.
For more methods, refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL.

NOTE

To prevent the condensate from freezing, self-regulating heating cable(field supply) must be threaded into the downpipe so that the condensate can discharge via the downpipe.

Installation on a solid ground

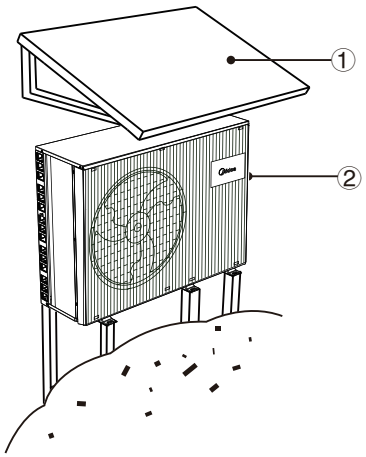
Guide the condensation pipe to a sewer, pump sump or soakaway.

NOTE

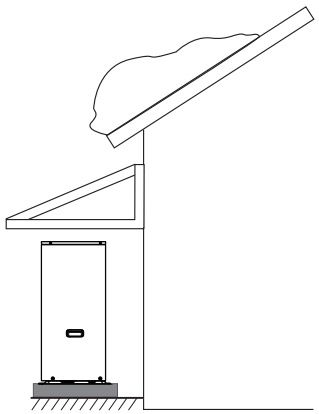
- For all installation types, ensure that any condensate that accumulates is discharged into a frost-free area.
- To prevent the condensate from freezing, self-regulating heating cable(field supply) can be threaded into the downpipe so that the condensate can discharge via the downpipe.

3.4 In cold climates

It is recommended that the unit be placed with the rear side against the wall.
Install a lateral canopy on top of the unit to prevent lateral snowfall in extreme weather conditions.
Install a high pedestal or wall mount the unit to keep a proper clearance (at least 100 mm) between the unit and snow.

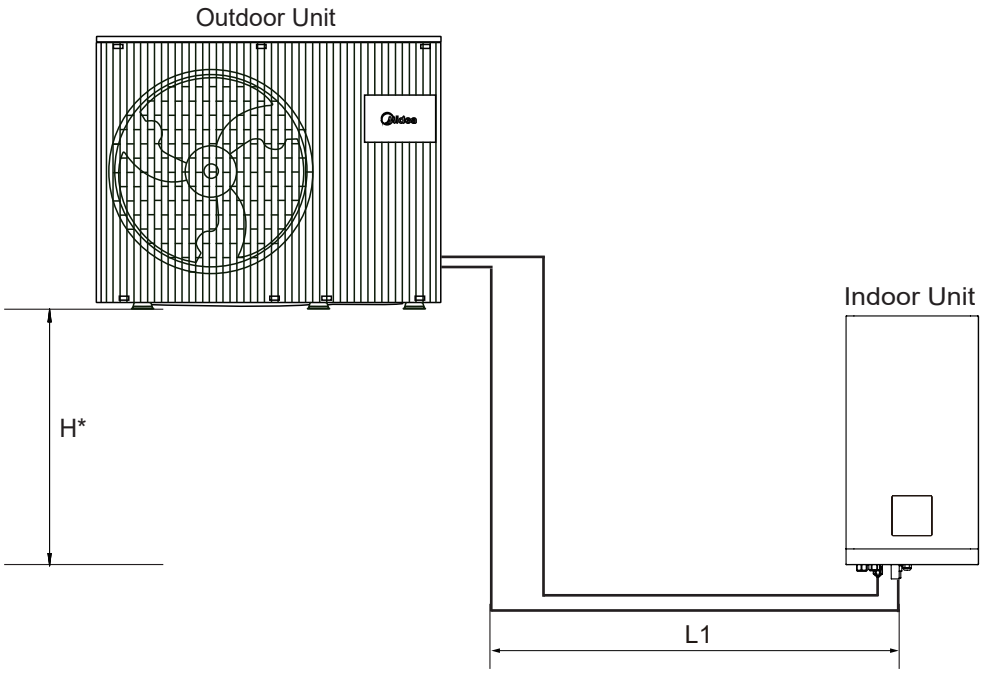


① Canopy or alike
② Pedestal in case of installation on a ground



If there is a risk of snow slip from the roof, a protective roof or cover must be erected to protect the heat pump, pipes and wiring.

4 REFRIGERANT PIPING INSTALLATION



* The relative height between outdoor unit and indoor unit, regardless of which unit is in high position.

Maximum piping length (H+L1)	30 m
Maximum difference in height (H)	20 m

Piping specification and connection type

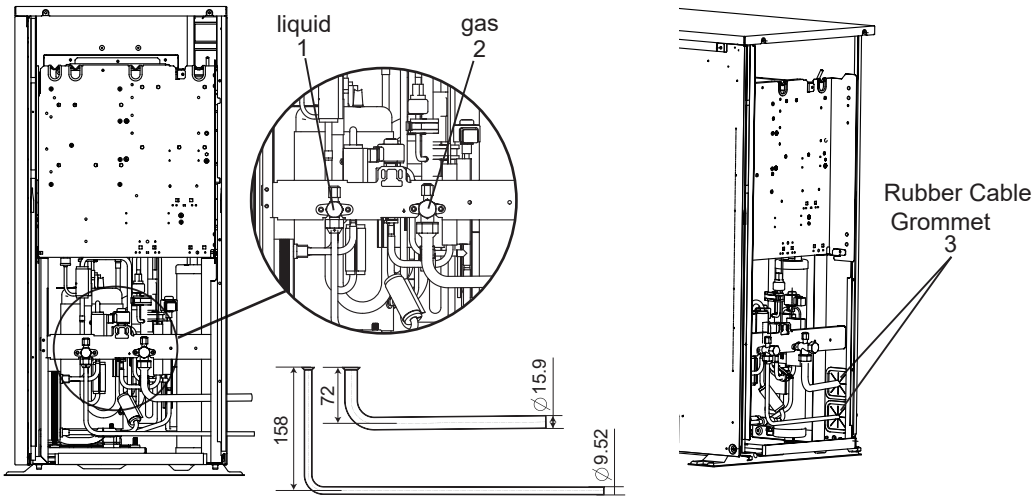
Gas side	Φ 15.9 mm	Flaring connection
Liquid side	Φ 9.52 mm	Flaring connection

4.1 Refrigerant piping connection

⚠ CAUTION

Before Refrigerant piping connection, make sure there is no dirt and water in the pipes, keep the pipes clean. Pipes can be washed with high pressure nitrogen.

12~16 kW



4.2 Installation check

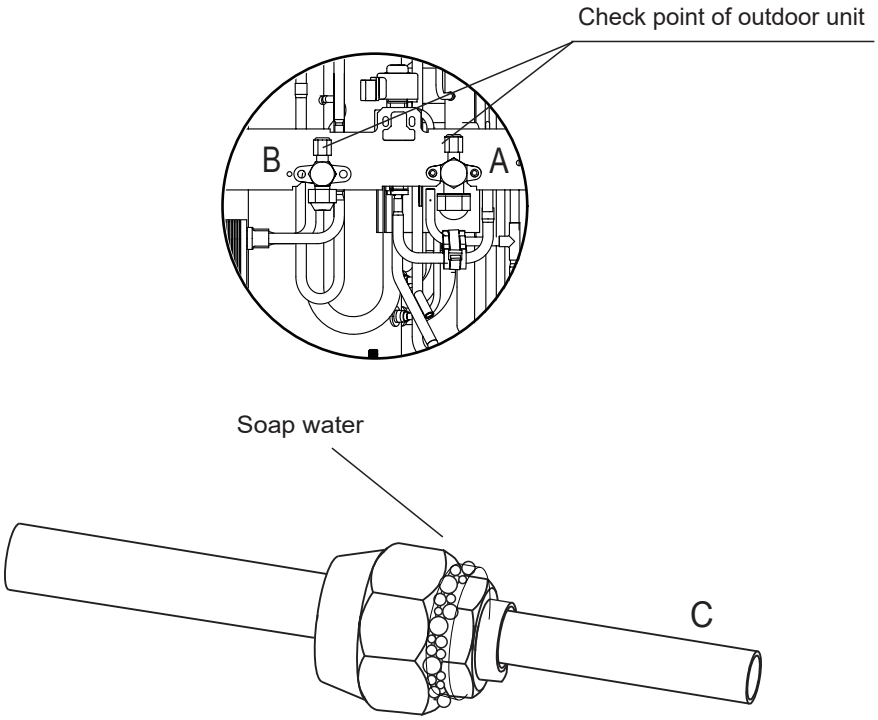
Leakage detection

①Charge pressured nitrogen after connecting indoor/outdoor unit pipes to do airtight testing.

⚠ CAUTION

- Pressured nitrogen [4.3 MPa (44 kg/cm^2) for R32] should be used in the airtight testing. Never use oxygen, flammable gas or poisonous gas.
- Keep stop valves of gas side and liquid side closed before charging the nitrogen.

②Use soap water or leakage detector to check all the joints, especially the joints shown as below .



A is gas refrigerant shut-off valve
B is liquid refrigerant shut-off valve
C is piping connector between indoor unit and outdoor unit

⚠ CAUTION

- No potential sources of ignition should be introduced during leak detection. A halide torch (or any other detector using a naked flame) shall not be used.
- Leak detection fluids are suitable with most of the refrigerants, but detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
- Electronic leak detectors shall be used to detect flammable refrigerants, but the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed and the appropriate percentage of gas (25 % maximum) is confirmed.

Vacuuming

1) Using vacuum pump to do the vacuum, never using refrigerant to expel the air.
2) Vacuuming should be done from liquid side.

4.3 Additional Refrigerant

The refrigerant pre-charged in the outdoor unit could be insufficient depending on the field piping. Refer to the rules below to calculate the additional refrigerant amount.

Refrigerant to be added	Total liquid pipe length L(m)	
	≤ 15 m	＞ 15 m
Total additional refrigerant	0 g	(L-15) × 38 g

⚠ WARNING

Follow the rules below during refrigerant charging:
1) National gas regulations shall be observed.
2) Keep good ventilation.
3) Ensure that the refrigeration system is earthed.
4) Label the system when charging is complete.
5) Do not overfill the refrigeration system in any case.
6) Cylinders shall be kept upright if a siphon tube is used.

4.4 Precautions on refrigerant leakage

When the refrigerant charge in appliance is more than 1.836 kg and the indoor unit is installed in unventilated areas, following requirement should be complied with.

- Requirement for refrigerant charge limits in unventilated areas: The maximum refrigerant charge in appliance shall be in accordance with the following:

$$m_{max} = 2.5 * LFL^{\frac{5}{4}} * 1.8 * A^{1/2}$$

or the required minimum floor area A_{min} to install an appliance with refrigerant charge mc shall be in accordance with following:

$$A_{min} = (m_c/(2.5 * LFL^{\frac{5}{4}} * 1.8))^2$$

where

m_{max} is the allowable maximum refrigerant charge in a room, in kg

A is the room area, in m^2

A_{min} is the required minimum room area, in m^2

m_c is the refrigerant charge in appliance, in kg

LFL is the lower flammable limit in kg/m^3, the value is 0.306 for R32 refrigerant

- Install mechanical ventilator to reduce the refrigerant concentration under critical level.
- Install leakage alarm device related to mechanical ventilator in case that regularly ventilation is failed.

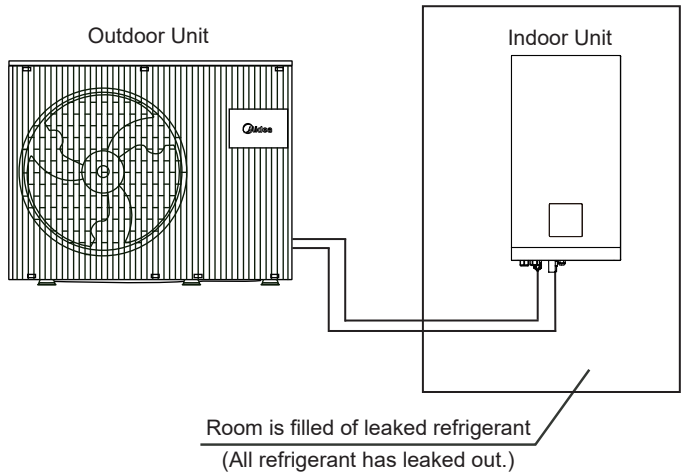
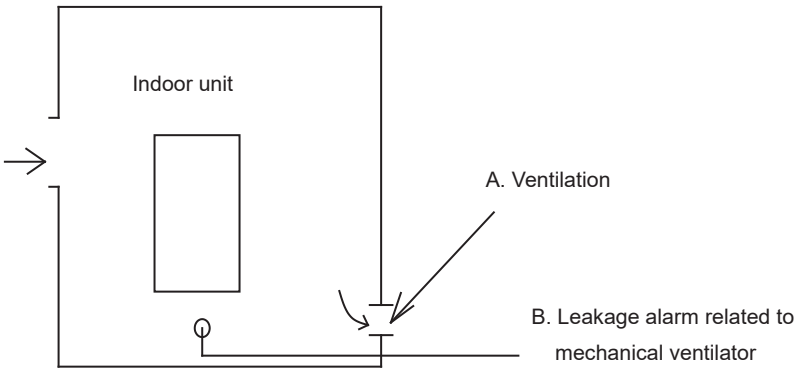


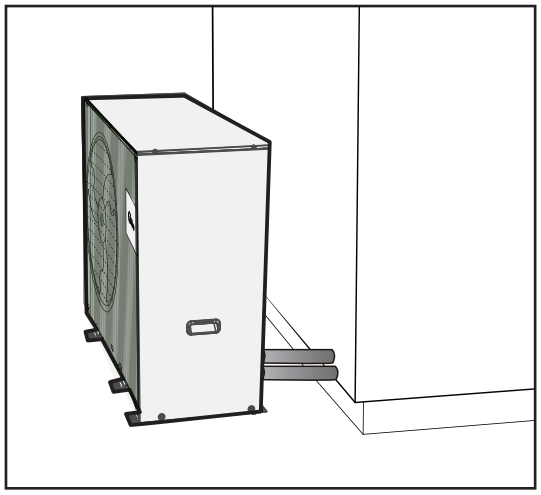
Fig.12-1



4.5 Piping insulation

To save the energy and increase unit energy efficiency, insulate the piping as below,

Insulation	Gas side pipe	Liquid side pipe
Material	B1 grade (heat resistance over 120 ℃)	B1 grade is preferred
Thickness	≥ 20 mm	≥ 15 mm



5 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.

5.1 Opening the electrical box cover

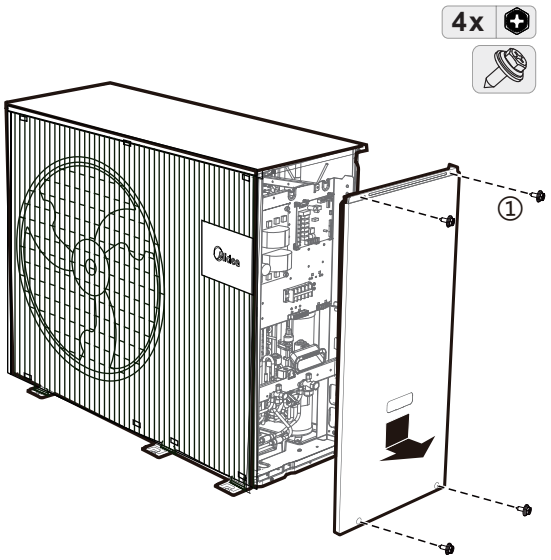
To access the unit for installation and maintenance, follow the instructions below.

⚠ WARNING

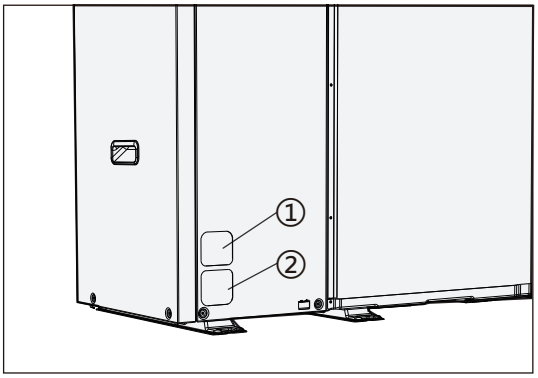
Risk of electrocution.
Risk of burning.

NOTE

- Keep the screws properly for later use.



5.2 Back plate layout for wiring



①	For wiring and gas refrigerant piping.
②	For wiring and liquid refrigerant piping.

5.3 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)	1.2 to 1.4
M4 (earthed)	1.2 to 1.4
M3 (electric control board terminal)	0.3 to 0.5

5.4 Connection of power supply

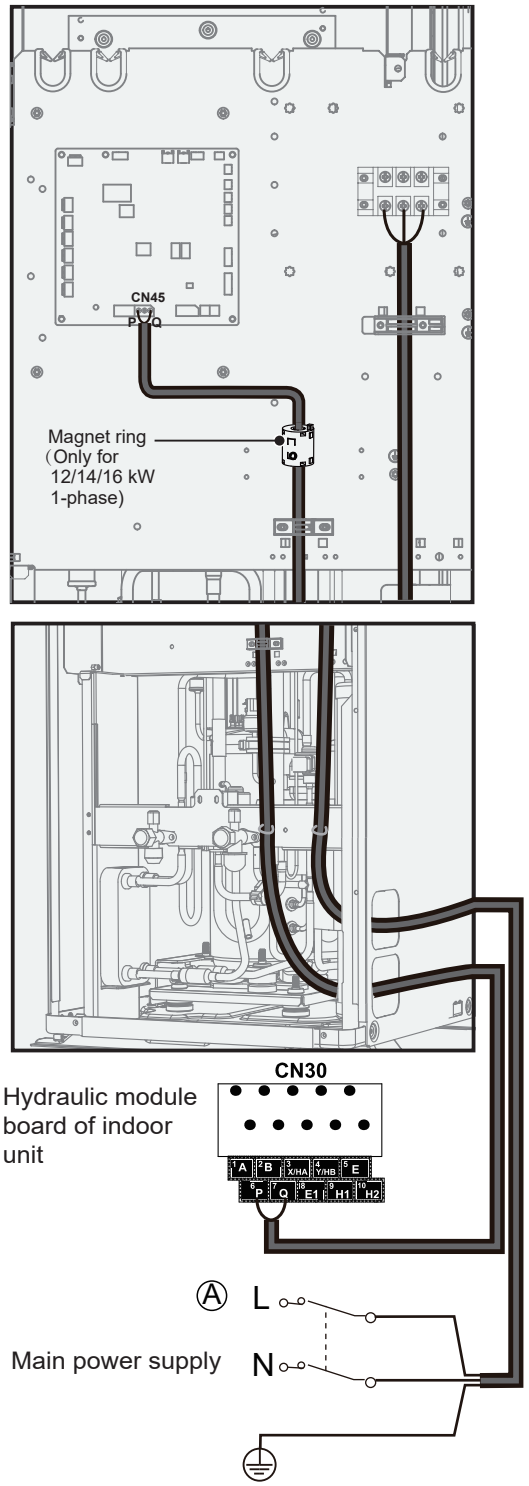
5.4.1 Wiring of main power supply

⚠ CAUTION

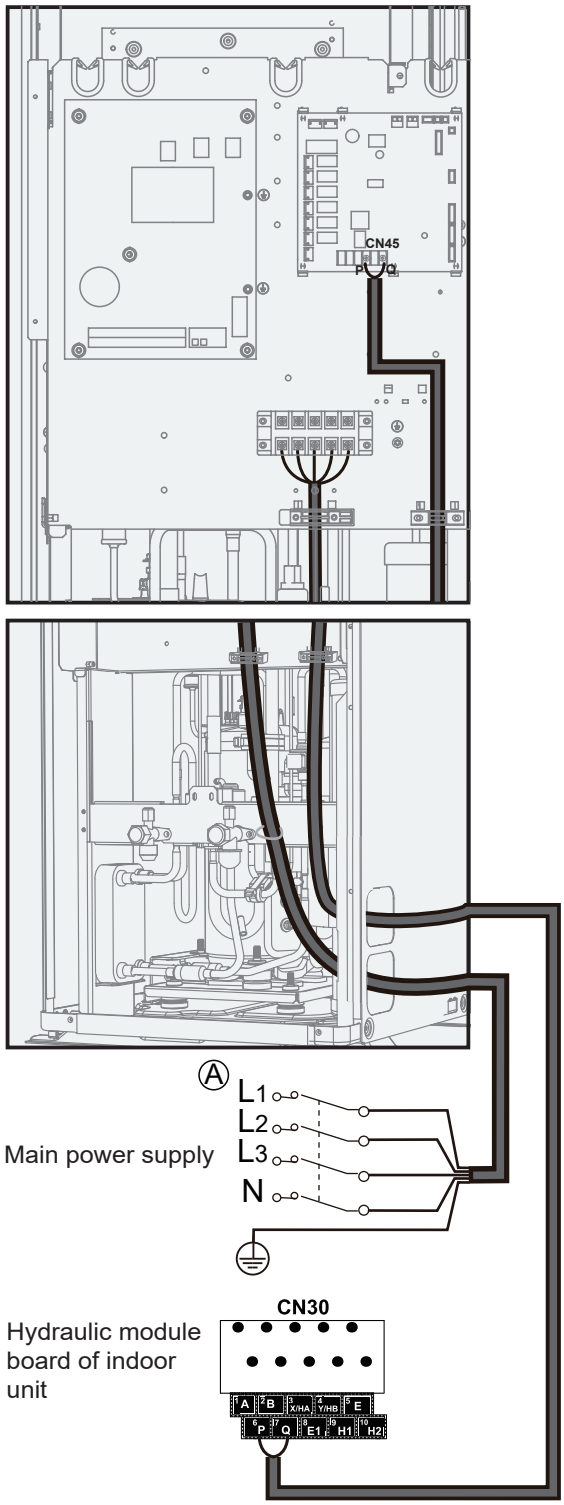
- Use a round crimp-style terminal for connection to the power supply terminal board. If it is not available, refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL for more information.
- The power cord model is H07RN-F.
- Illustrations below are for 3-phase units. The principle is the same for 1-phase units.
- Illustrations below are for units with a backup heater. For more illustrations, refer to the INSTALLATION, OPERATION AND MAINTENANCE MANUAL.

Unit	Power supply	Maximum circuit current (A)	Recommended wire size(mm^2)
12 kW	220-240 V~ 50 Hz	33	(2 + PE) x (6-10)
14 kW		33	(2 + PE) x (6-10)
16 kW		33	(2 + PE) x (6-10)
12 kW 3 PH	380-415 V 3N~ 50 Hz	15	(4 + PE) x (2.5-4)
14 kW 3 PH		15	(4 + PE) x (2.5-4)
16 kW 3 PH		15	(4 + PE) x (2.5-4)

1 phase 12-16 kW



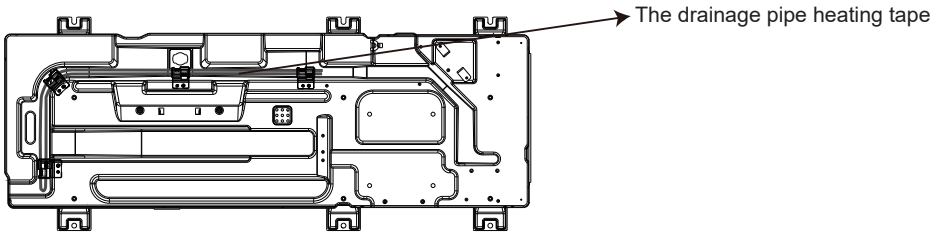
3 phase 12-16 kW



⚠ CAUTION

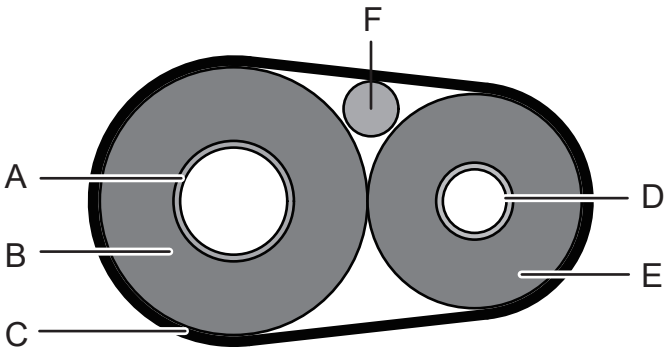
Leakage protection switch must be installed.

The layout of the drainage pipe heating tape(optional) shows as below. For the heating tape selection, you can refer to the output of the connecter in the WIRING DIAGRAM.



5.5 To finish the outdoor unit installation

Insulate and fix the refrigerant piping and interconnection cable as follows:



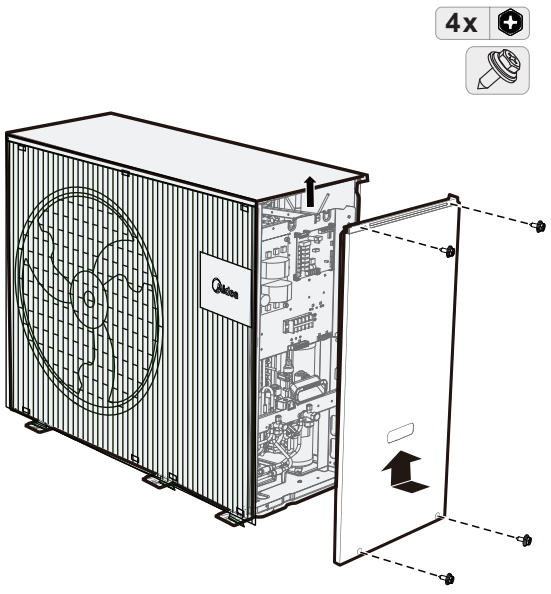
A	Gas pipe
B	Gas pipe insulation
C	Finishing tape
D	Liquid pipe
E	Liquid pipe insulation
F	Interconnection cable

6 COMPLETION OF INSTALLATION

⚠ DANGER

Risk of electrocution.
Risk of burning.

Tightening torque	4.1 N•m



7 CONFIGURATION

Refer to Installation Manual of indoor unit for more information.

8 COMMISSIONING

Refer to Installation Manual of indoor unit for more information.

9 MAINTENANCE

Refer to Installation Manual of indoor unit for more information.

10 TECHNICAL DATA

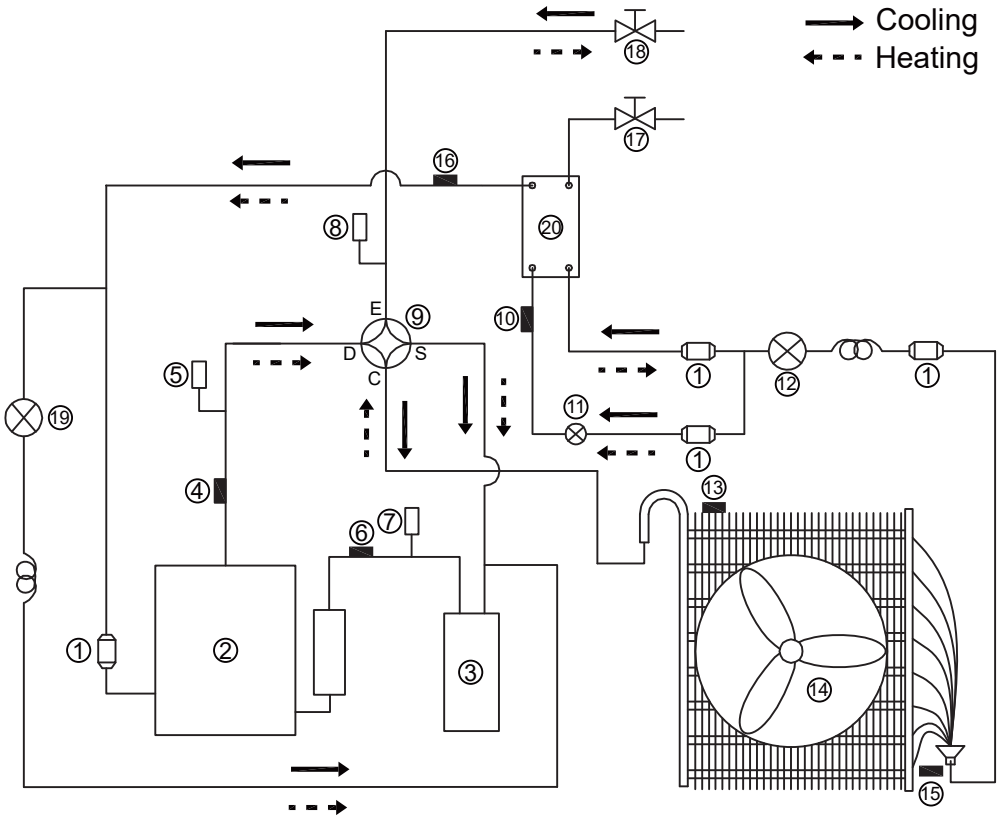
10.1 General

Model	1-phase			3-phase		
	12 kW	14 kW	16 kW	12 kW	14 kW	16 kW
Nominal capacity	Refer to the Technical Data Manual					
Dimensions H × W × D	1 051 x 1 330 x 475 mm					
Packing dimensions H × W × D	1 235 x 1 390 x 570 mm					
Weight						
Net weight	120.5 kg			137.5 kg		
Gross weight	142 kg			156.5 kg		
Fan motor input power	100 W					
Connections						
Liquid side	Φ 9.52					
Gas side	Φ15.9					
Max. piping length	30 m					
Max. difference in height	20 m					
Operation range - water side						
Heating	Maximum 65 °C					
Cooling	Minimum 5 °C					
Operation range - air side						
Heating	-28 °C to 35 °C					
Cooling	-5 °C to 43 °C					
Domestic hot water by heat pump	-28 °C to 43 °C					

Refrigerant		
Refrigerant type	R32	
Refrigerant charge	1.84 kg	1.84 kg

Fuse – on PCB		
PCB name	Inverter module (1Ph)	Filter module (3Ph)
Model name	FUSE-T-30A/250VAC-T-P38	FUSE-T-10A/250VAC-T/S-P25.525.5
Quantity	2	1
Working voltage (V)	250	
Working current (A)	30	10

10.2 Piping diagram



Item	Description	Item	Description
1	Filter	11	Electronic expansion valve 2
2	Compressor	12	Electronic expansion valve 1
3	Gas-liquid separator	13	Temperature sensor (T4:Outdoor ambient)
4	Temperature sensor (Tp:Compressor discharge)	14	Fan
5	High pressure switch	15	Temperature sensor (T3:Heat exchanger)
6	Temperature sensor (Th:Compressor suction)	16	Temperature sensor (T9o)
7	Low pressure switch	17	High pressure shut-off valve
8	Pressure sensor	18	Low pressure shut-off valve
9	4-way valve	19	Bypass valve
10	Temperature sensor (T9i)	20	Plate heat exchanger

NOTE

16125300A18035 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	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）
A-B	梁瀚荣	24-12-5	附件增加三栏	P09