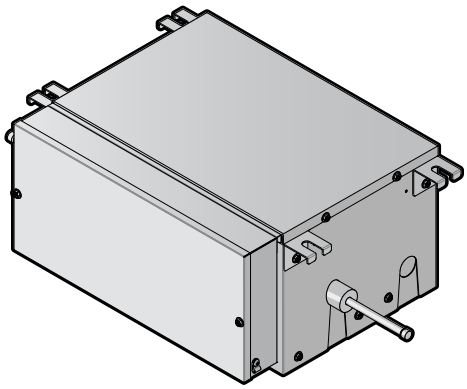
Installer reference guide

CO_2 Conveni-Pack: BEV2 unit



BEV2N112ACV1B

Table of contents

1 About the documentation

1.1 About this document

WARNING

Make sure installation, servicing, maintenance, repair and applied materials follow the instructions from Daikin (including all documents listed in “Documentation set”) and, in addition, comply with applicable legislation and are performed by qualified persons only. In Europe and areas where IEC standards apply, EN/IEC 60335-2-40 is the applicable standard.

Target audience

Authorised installers

INFORMATION

This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.

Documentation set

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

- **General safety precautions:**
  - Safety instructions that you must read before installing
  - Format: Paper (in the box of the **indoor unit**)
- **Installation manual:**
  - Installation instructions
  - Format: Paper (supplied in the kit)
- **Installer reference guide:**
  - Preparation of the installation, good practices, reference data, …
  - Format: Digital files on https://www.daikin.eu. Use the search function to find your model.

The latest revision of the supplied documentation is published on the regional Daikin website and is available via your dealer.

Scan the QR code below to find the full documentation set and more information about your product on Daikin website.

The original instructions are written in English. All other languages are translations of the original instructions.

Technical engineering data

- A **subset** of the latest technical data is available on the regional Daikin website (publicly accessible).
- The **full set** of the latest technical data is available on the Daikin Business Portal (authentication required).

2 General safety precautions

2.1 About the documentation

- The original instructions are written in English. All other languages are translations of the original instructions.
- The precautions described in this document cover very important topics, follow them carefully.
- The installation of the system, and all activities described in the installation manual and in the installer reference guide MUST be performed by an authorised installer.

2.1.1 Meaning of warnings and symbols

DANGER

Indicates a situation that results in death or serious injury.

DANGER: RISK OF ELECTROCUTION

Indicates a situation that could result in electrocution.

DANGER: RISK OF BURNING/SCALDING

Indicates a situation that could result in burning/scalding because of extreme hot or cold temperatures.

DANGER: RISK OF EXPLOSION

Indicates a situation that could result in explosion.

WARNING

Indicates a situation that could result in death or serious injury.

WARNING: FLAMMABLE MATERIAL

CAUTION

Indicates a situation that could result in minor or moderate injury.

NOTICE

Indicates a situation that could result in equipment or property damage.

INFORMATION

Indicates useful tips or additional information.

Symbols used on the unit:

Symbol	Explanation
	Before installation, read the installation and operation manual, and the wiring instruction sheet.
	Before performing maintenance and service tasks, read the service manual.
	For more information, see the installer and user reference guide.
	The unit contains rotating parts. Be careful when servicing or inspecting the unit.

Symbols used in the documentation:

Symbol	Explanation
	Indicates a figure title or a reference to it. **Example:** "1–3 Figure title" means "Figure 3 in chapter 1".
	Indicates a table title or a reference to it. **Example:** "1–3 Table title" means "Table 3 in chapter 1".

2.2 For the installer

2.2.1 General

If you are NOT sure how to install or operate the unit, contact your dealer.

DANGER: RISK OF BURNING/SCALDING

- Do NOT touch the refrigerant piping, water piping or internal parts during and immediately after operation. It could be too hot or too cold. Give it time to return to normal temperature. If you MUST touch it, wear protective gloves.
- Do NOT touch any accidental leaking refrigerant.

WARNING

Improper installation or attachment of equipment or accessories could result in electrical shock, short-circuit, leaks, fire or other damage to the equipment. ONLY use accessories, optional equipment and spare parts made or approved by Daikin unless otherwise specified.

WARNING

Make sure installation, testing and applied materials comply with applicable legislation (on top of the instructions described in the Daikin documentation).

WARNING

Tear apart and throw away plastic packaging bags so that nobody, especially NOT children, can play with them. **Possible consequence:** suffocation.

WARNING

Provide adequate measures to prevent that the unit can be used as a shelter by small animals. Small animals that make contact with electrical parts can cause malfunctions, smoke or fire.

CAUTION

Wear adequate personal protective equipment (protective gloves, safety glasses,...) when installing, maintaining or servicing the system.

CAUTION

Do NOT touch the air inlet or aluminium fins of the unit.

CAUTION

- Do NOT place any objects or equipment on top of the unit.
- Do NOT sit, climb or stand on the unit.

In accordance with the applicable legislation, it might be necessary to provide a logbook with the product containing at least: information on maintenance, repair work, results of tests, stand-by periods,...

Also, at least, following information MUST be provided at an accessible place at the product:

- Instructions for shutting down the system in case of an emergency
- Name and address of fire department, police and hospital
- Name, address and day and night telephone numbers for obtaining service

In Europe, EN378 provides the necessary guidance for this logbook.

2.2.2 Installation site

- Provide sufficient space around the unit for servicing and air circulation.
- Make sure the installation site withstands the weight and vibration of the unit.
- Make sure the area is well ventilated. Do NOT block any ventilation openings.
- Make sure the unit is level.

Do NOT install the unit in the following places:

- In potentially explosive atmospheres.
- In places where there is machinery that emits electromagnetic waves. Electromagnetic waves may disturb the control system, and cause malfunction of the equipment.
- In places where there is a risk of fire due to the leakage of flammable gases (example: thinner or gasoline), carbon fibre, ignitable dust.
- In places where corrosive gas (example: sulphurous acid gas) is produced. Corrosion of copper pipes or soldered parts may cause the refrigerant to leak.

2.2.3 Refrigerant — in case of R744

See the installation manual or installer reference guide of your application for more information.

NOTICE

Make sure refrigerant piping installation complies with applicable legislation. In Europe, EN378 is the applicable standard.

NOTICE

Make sure the field piping and connections are NOT subjected to stress.

WARNING

During tests, NEVER pressurise the product with a pressure higher than the maximum allowable pressure (as indicated on the nameplate of the unit).

WARNING

Take sufficient precautions in case of refrigerant leakage. If refrigerant gas leaks, ventilate the area immediately. Possible risks:

- Carbon dioxide poisoning
- Asphyxiation

NOTICE

After all the piping has been connected, make sure there is no gas leak. Use nitrogen to perform a gas leak detection.

NOTICE

- To avoid compressor breakdown, do NOT charge more than the specified amount of refrigerant.
- When the refrigerant system is to be opened, refrigerant MUST be treated according to the applicable legislation.

WARNING

Make sure there is no oxygen in the system. Refrigerant may ONLY be charged after performing the leak test and the vacuum drying.

Possible consequence: Self-combustion and explosion of the compressor because of oxygen going into the operating compressor.

CAUTION

A vacuumed system will be under triple point. To avoid solid ice, ALWAYS start charging with R744 in vapour state. When the triple point is reached (5.2 bar absolute pressure or 4.2 bar gauge pressure), you may continue charging with R744 in liquid state.

- In case recharge is required, see the nameplate or the refrigerant charge label of the unit. It states the type of refrigerant and necessary amount.
- Whether the unit is factory charged with refrigerant or non-charged, in both cases you might need to charge additional refrigerant, depending on the pipe sizes and pipe lengths of the system.
- Only use R744 (CO_2) as refrigerant. Other substances may cause explosions and accidents.
- Do NOT charge liquid refrigerant directly to a gas line. Liquid compression could cause compressor operation failure.
- Only use tools exclusively for the refrigerant type used in the system, this to ensure pressure resistance and prevent foreign materials from entering into the system.
- Open refrigerant cylinders slowly.

CAUTION

When the refrigerant charging procedure is done or when pausing, close the valve of the refrigerant tank immediately. If the valve is NOT closed immediately, remaining pressure might charge additional refrigerant. **Possible consequence:** Incorrect refrigerant amount.

2.2.4 Electrical

DANGER: RISK OF ELECTROCUTION

- Turn OFF all power supply before removing the switch box cover, connecting electrical wiring or touching electrical parts.
- Disconnect the power supply for more than 10 minutes, and measure the voltage at the terminals of main circuit capacitors or electrical components before servicing. The voltage MUST be less than 50 V DC before you can touch electrical components. For the location of the terminals, see the wiring diagram.
- Do NOT touch electrical components with wet hands.
- Do NOT leave the unit unattended when the service cover is removed.

WARNING

If NOT factory installed, a main switch or other means for disconnection, having a contact separation in all poles providing full disconnection under overvoltage category III condition, MUST be installed in the fixed wiring.

WARNING

- ONLY use copper wires.
- Make sure the field wiring complies with the applicable legislation.
- All field wiring MUST be performed in accordance with the wiring diagram supplied with the product.
- NEVER squeeze bundled cables and make sure they do NOT come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections.
- Make sure to install earth wiring. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock.
- Make sure to use a dedicated power circuit. NEVER use a power supply shared by another appliance.
- Make sure to install the required fuses or circuit breakers.
- Make sure to install an earth leakage protector. Failure to do so may cause electrical shock or fire.
- When installing the earth leakage protector, make sure it is compatible with the inverter (resistant to high frequency electric noise) to avoid unnecessary opening of the earth leakage protector.

WARNING

- After finishing the electrical work, confirm that each electrical component and terminal inside the switch box is connected securely.
- Make sure all covers are closed before starting up the unit.

CAUTION

- When connecting the power supply: connect the earth cable first, before making the current-carrying connections.
- When disconnecting the power supply: disconnect the current-carrying cables first, before separating the earth connection.
- The length of the conductors between the power supply stress relief and the terminal block itself MUST be as such that the current-carrying wires are tautened before the earth wire is in case the power supply is pulled loose from the stress relief.

NOTICE

Precautions when laying power wiring:

- Do NOT connect wiring of different thicknesses to the power terminal block (slack in the power wiring may cause abnormal heat).
- When connecting wiring which is the same thickness, do as shown in the figure above.
- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will damage the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them.

Install power cables at least 1 meter away from televisions or radios to prevent interference. Depending on the radio waves, a distance of 1 meter may NOT be sufficient.

NOTICE

ONLY applicable if the power supply is three-phase, and the compressor has an ON/OFF starting method.

If there exists the possibility of reversed phase after a momentary black out and the power goes ON and OFF while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase can break the compressor and other parts.

3 Specific installer safety instructions

Always observe the following safety instructions and regulations.

Unit installation (see "6 Unit installation" [▸ 16])

WARNING

- Installation shall be done by an installer, the choice of materials and installation shall comply with the applicable legislation. In Europe, EN378 is the applicable standard.
- Make sure to install all necessary countermeasures in case of refrigerant leakage according to standard EN378 (see "6.1.2 Additional installation site requirements for CO_2 refrigerant" [▸ 18]).
- Make sure to install a CO_2 leak detector (field supply) in every room with refrigerant piping, air conditioning units, showcases or blower coils, and enable the function for refrigerant leak detection (see the installation manual of the indoor units).

WARNING

Make sure installation, servicing, maintenance, repair and applied materials follow the instructions from Daikin (including all documents listed in “Documentation set”) and, in addition, comply with applicable legislation and are performed by qualified persons only. In Europe and areas where IEC standards apply, EN/IEC 60335-2-40 is the applicable standard.

CAUTION

Appliance NOT accessible to the general public, install it in a secured area, protected from easy access.

This unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment.

CAUTION

This equipment is NOT intended for use in residential locations and will NOT guarantee to provide adequate protection to radio reception in such locations.

Refrigerant piping installation (see "7 Piping installation" [▸ 22])

CAUTION

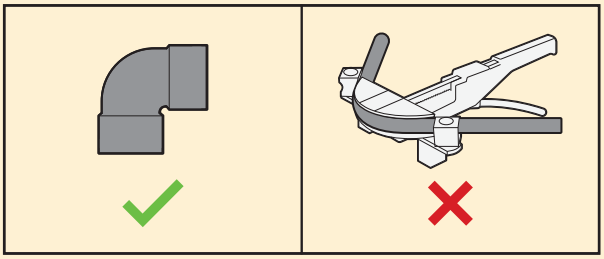
Install the refrigerant piping or components in a position where they are unlikely to be exposed to any substance which may corrode components containing refrigerant, unless the components are constructed of materials that are inherently resistant to corrosion or are suitably protected against corrosion.

WARNING

- Use K65 piping for high-pressure applications with a working gauge pressure of 120 bar or 90 bar, depending on its location in the system.
- Use K65 unions and fittings approved for a working gauge pressure of 120 bar or 90 bar, depending on its location in the system.
- ONLY brazing is allowed for connection of pipes. No other types of connections are allowed.
- Expanding of pipes is NOT allowed.

CAUTION

NEVER bend high pressure piping! Bending can reduce the pipe thickness and thus weaken the piping. ALWAYS use K65 fittings.



Electrical installation (see "8 Electrical installation" [▸ 27])

WARNING

ALWAYS use multicore cable for power supply cables.

WARNING

- All wiring MUST be performed by an authorised electrician and MUST comply with the national wiring regulation.
- Make electrical connections to the fixed wiring.
- All components procured on-site and all electrical construction MUST comply with the applicable legislation.

WARNING

- If the power supply has a missing or wrong N-phase, equipment might break down.
- Establish proper earthing. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earthing may cause electrical shocks.
- Install the required fuses or circuit breakers.
- Secure the electrical wiring with cable ties so that the cables do NOT come into contact with sharp edges or piping, particularly on the high-pressure side.
- Use the included cables (in the box of the indoor unit) and make sure that there is no strain on the terminal connections or wires. Improper connections or improper securing of wires can cause overheating, electrical shocks or fire.
- Do NOT use taped wires, extension cords, or connections from a star system. They can cause overheating, electrical shocks or fire.

WARNING

Use an all-pole disconnection type breaker with at least 3 mm between the contact point gaps that provides full disconnection under overvoltage category III.

WARNING

If the supply cord is damaged, it MUST be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

WARNING

Keep the interconnection wiring away from copper pipes without thermal insulation as such pipes will be very hot.

Following symbols may occur on the indoor unit:

Symbol	Explanation
	Measure the voltage at the terminals of main circuit capacitors or electrical components before servicing.

Commissioning (see "9 Commissioning" [▸ 33])

WARNING

Make sure that the service cover is closed after completing the installation of the indoor unit, BEV2 unit, and outdoor unit.

4 About the box

NOTICE

Before installation, check the packaging and parts for damage. Make sure that the shipment is complete.

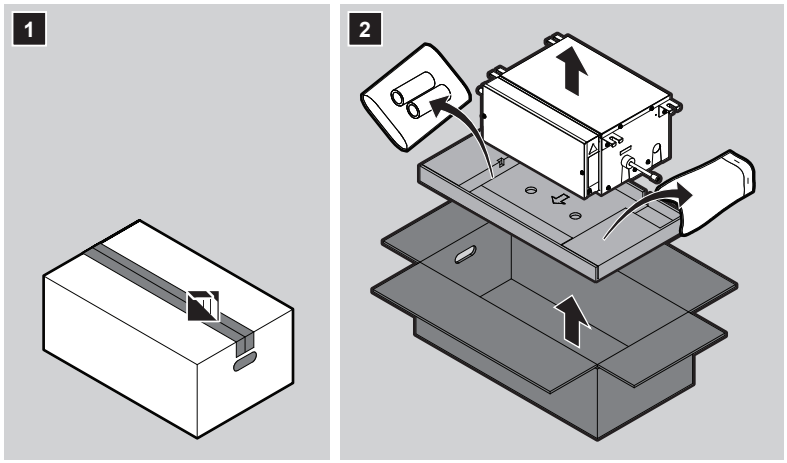
Keep the following in mind:

- At delivery, the unit MUST be checked for damage and completeness. Any damage or missing parts MUST be reported immediately to the claims agent of the carrier.
- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.
- Prepare in advance the path along which you want to bring the unit to its final installation position.

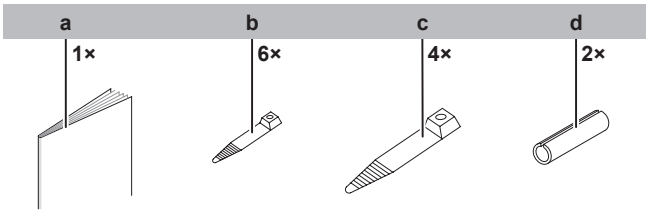
4.1 To unpack and handle the unit

Use a sling of soft material or protective plates together with a rope when lifting the unit in order to avoid damage or scratches to the unit.

1 Lift the unit by holding on to the hanger brackets without exerting any pressure on other parts, especially on refrigerant piping, drain piping and other resin parts.



4.2 To remove the accessories



a BEV unit installation manual
b Tie wrap (short)
c Tie wrap (long)
d Insulation for fitting

5 About the unit

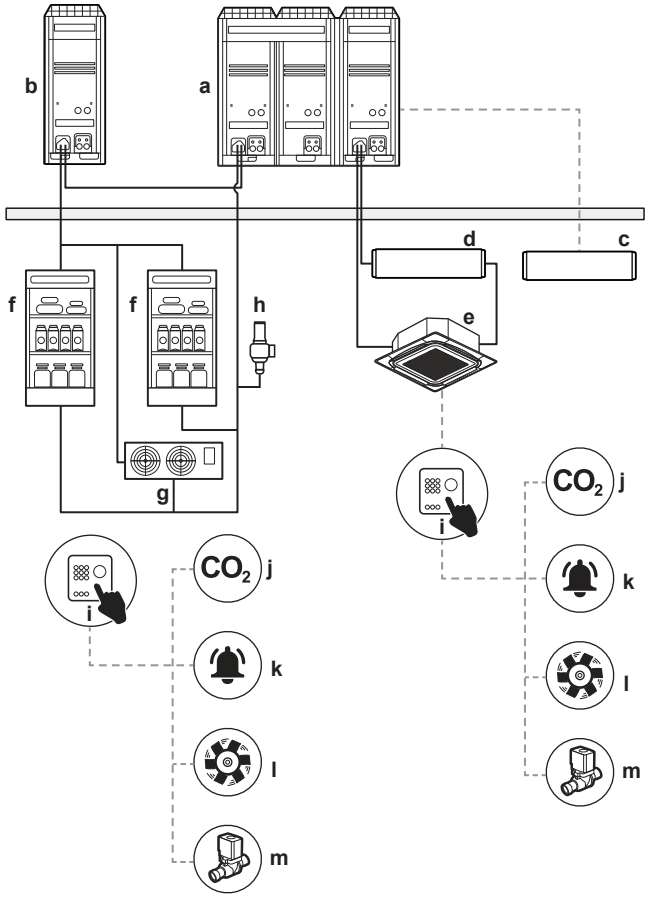
INFORMATION

The BEV2 unit is an extension for the indoor unit containing external expansion valves. It is mandatory for some units using CO2 refrigerant; see the Daikin catalogue for combinations.

5.1 System layout

INFORMATION

The following figure is an example and may NOT completely match your system layout



a Main outdoor unit (LRYEN10*)
b Capacity up unit (LRNUN5*)
c Communication box (BRR9B1V1)
d BEV2 unit
e Indoor unit for air conditioning
f Indoor unit for refrigeration (showcase)
g Indoor unit for refrigeration (blower coil)
h Safety valve
i CO_2 control panel
j CO_2 detector
k CO_2 alarm
l CO_2 ventilator
m Shut-off valve

INFORMATION

- The maximum installation distance between the indoor unit and the BEV2 unit depends on the length of the included transmission and power supply cables.
- Make sure to install the units so the cables reach both units terminals.
- The maximum installation height difference between the indoor unit and the BEV2 unit is ≤0.5 m.

5.2 Compatibility

Combine the EV unit BEV2N112A7V1B with the following indoor units:

- FXFN50A2VEB
- FXFN71A2VEB
- FXFN112A2VEB

For a full list of compatible units, refer to the option list.

6 Unit installation

WARNING

- Installation shall be done by an installer, the choice of materials and installation shall comply with the applicable legislation. In Europe, EN378 is the applicable standard.
- Make sure to install all necessary countermeasures in case of refrigerant leakage according to standard EN378 (see "6.1.2 Additional installation site requirements for CO_2 refrigerant" [▸ 18]).
- Make sure to install a CO_2 leak detector (field supply) in every room with refrigerant piping, air conditioning units, showcases or blower coils, and enable the function for refrigerant leak detection (see the installation manual of the indoor units).

In this chapter

6.1 Preparing the installation site

Choose an installation location with sufficient space to transport the unit in and out of the site.

Avoid installation in an environment with a lot of organic solvents such as ink and siloxane.

Do NOT install the unit in places often used as work place. In case of construction works (e.g. grinding works) where a lot of dust is created, the unit MUST be covered.

6.1.1 Installation site requirements of the unit

INFORMATION

Also read the general installation site requirements. See the "2 General safety precautions" [▸ 4] chapter.

INFORMATION

The sound pressure level is less than 70 dBA.

INFORMATION

Equipment meets the requirement for commercial and light-industrial location when professionally installed and maintained.

CAUTION

This equipment is NOT intended for use in residential locations and will NOT guarantee to provide adequate protection to radio reception in such locations.

CAUTION

Appliance NOT accessible to the general public, install it in a secured area, protected from easy access.

This unit, both indoor and outdoor, is suitable for installation in a commercial and light industrial environment.

NOTICE

- The professional installer shall evaluate the EMC situation before installation, if the equipment is installed closer than 30 m to a residential location.
- Special installation measures are NOT required to minimize EMC (electro-magnetic) emissions.

NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

NOTICE

The equipment described in this manual may cause electronic noise generated from radio-frequency energy. The equipment complies to specifications that are designed to provide reasonable protection against such interference. However, there is no guarantee that interference will NOT occur in a particular installation.

It is therefore recommended to install the equipment and electric wires in such a way that they keep a proper distance from stereo equipment, personal computers, etc.

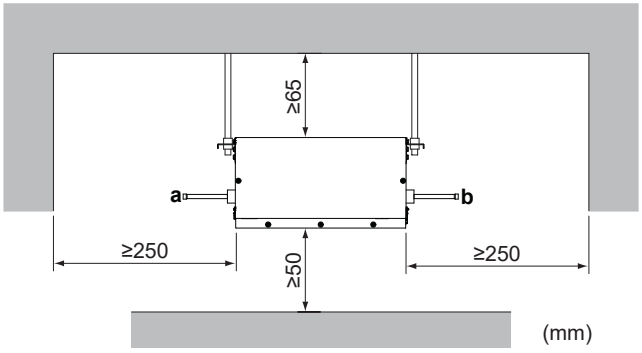
In places with weak reception, keep distances of 1 m or more to avoid electromagnetic interference of other equipment and use conduit tubes for power and transmission lines.

Do NOT install the unit in the following places:

- In places where a mineral oil mist, spray or vapour may be present in the atmosphere. Plastic parts may deteriorate and fall off or cause water leakage.
- Sound sensitive areas (e.g. near a bedroom), so that the operation noise will cause no trouble.

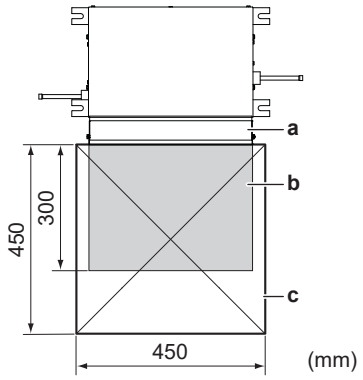
It is NOT recommended to install the unit in the following places because it may shorten the life of the unit:

- Where the voltage fluctuates a lot
- In vehicles or vessels
- Where acidic or alkaline vapour is present
- **Ceiling insulation**. When conditions in the ceiling exceed 30°C and a relative humidity of 80%, or when fresh air is inducted into the ceiling, then additional insulation is required (minimum 10 mm thickness, polyethylene foam).
- **Ceiling strength**. Check whether the ceiling is strong enough to support the weight of the unit. If there is a risk, reinforce the ceiling before installing the unit.
  - For existing ceilings, use anchors.
  - For new ceilings, use sunken inserts, sunken anchors or other field supplied parts.
- **Spacing**. Mind the following requirements:



a Outdoor unit side
b Indoor units side

- **Service space**. Be sure to install the inspection door at the control box side.



a Control box
b Service space
c Inspection door

INFORMATION

- The maximum installation distance between the indoor unit and the BEV2 unit depends on the length of the included transmission and power supply cables.
- Make sure to install the units so the cables reach both units terminals.
- The maximum installation height difference between the indoor unit and the BEV2 unit is ≤0.5 m.

6.1.2 Additional installation site requirements for CO_2 refrigerant

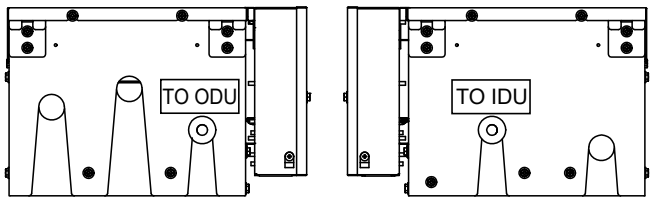
INFORMATION

For units using R744 refrigerant, additional installation site requirements apply. For more information, see the reference guide or installation manual of the indoor unit.

6.2 Mounting the unit

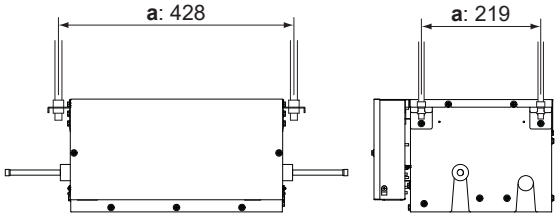
6.2.1 Guidelines when installing the unit

- **Orientation of the unit.** Install the unit according to labels on the sides of the unit "TO ODU" (facing the outdoor unit) and "TO IDU" (facing the indoor unit).



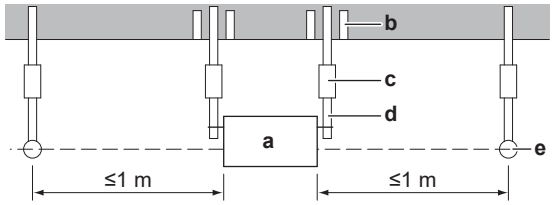
TO ODU Install this side facing to outdoor unit
TO IDU Install this side facing to indoor unit

- **Suspension bolts and unit.** Use M8~M10 suspension bolts for installation. Attach the hanger bracket to the suspension bolt. Fix it securely using a nut and washer on the top and bottom of the hanger bracket.



a Suspension bolt pitch

- **Hanger bracket**. Make sure to support the connection piping around the unit using hanger brackets installed within 1 meter of the side of the unit. Avoid putting excessive weight on the hanger bracket; otherwise the unit may fall and cause injuries.

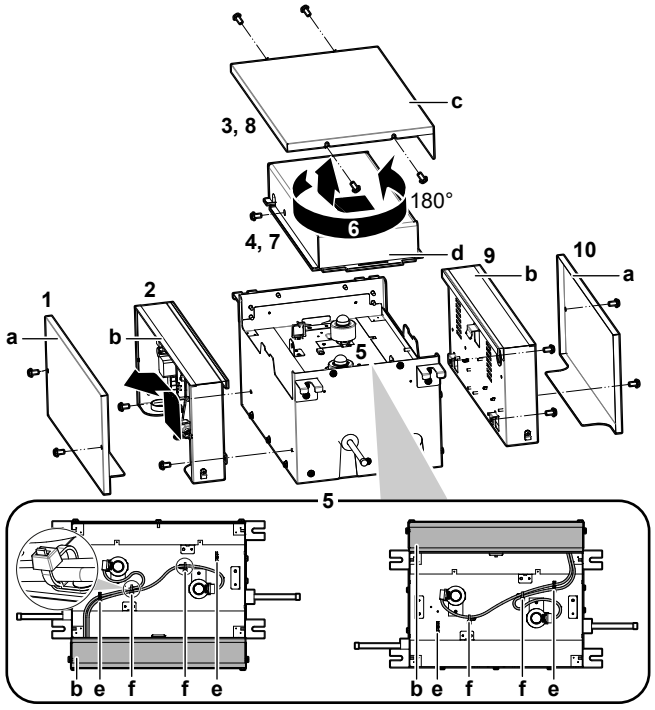


a Unit
b Anchor
c Long nut or turnbuckle
d Suspension bolt
e Hanger bracket

6.2.2 To mount the unit

Changing the installation position of the control box

Prerequisite: The position of the control box can be changed if necessary.



a Control box lid
b Control box
c Top panel
d Coil cover
e Wire clip
f Tie wrap

1 Remove the control box lid (2 screws).

2 Remove the control box (2 screws).

3 Remove the top panel (4 screws).

4 Remove the coil cover (1 screw).

5 Change the pull out direction of the wire (motorised valve coil) between the unit body and the control box.

6 Rotate the coil cover and top panel 180°.

7 Reinstall the coil cover (1 screw).

8 Reinstall the top panel (4 screws)

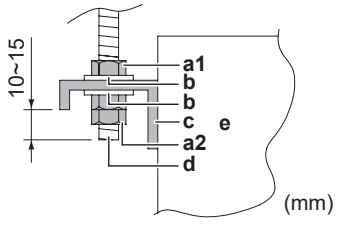
9 Reinstall the control box in the new position (2 screws).

10 Reinstall the control box cover in the new position.

Mount the indoor unit on the suspension bolts

1 Attach the hooks to the suspension bolts. Be sure to use:

- 3 nuts (M8/M10) in 4 locations
- 2 washers (for M8: outside diameter 24~28 mm, for M10: outside diameter 30~34 mm) in 4 locations.



a1 Nut (field supply)
a2 Double nut (field supply)
b Washer (field supply)

c Hanger bracket
d Suspension bolt (field supply)
e Unit

7 Piping installation

In this chapter

7.1 Preparing refrigerant piping

7.1.1 Refrigerant piping requirements

NOTICE

The refrigerant R744 requires strict cautions for keeping the system clean, dry and tight.

- Clean and dry: foreign materials (including mineral oils or moisture) should be prevented from getting mixed into the system.
- Tight: R744 does not contain any chlorine, does not destroy the ozone layer, and does not reduce earth's protection against harmful ultraviolet radiation. R744 can contribute to the greenhouse effect if it is released. Therefore pay special attention to check the tightness of the installation.

NOTICE

The piping and other pressure-containing parts shall be suitable for refrigerant and oil. Use K65 (or equivalent) copper-iron alloy tube system for high-pressure applications with a working pressure of 120 bar gauge at the air conditioner side and 90 bar gauge at the refrigeration side.

NOTICE

NEVER use standard hoses and manometers. Use ONLY equipment that is designed to use with R744.

- Foreign materials inside pipes (including oils for fabrication) must be ≤30 mg/10 m.

NOTICE

If the ability to close the stop valves for field piping is wanted, the installer MUST install a pressure relief valve on the following piping:

- Outdoor unit to refrigeration indoor units: on liquid piping
- Outdoor unit to air conditioning indoor units: on liquid piping AND gas piping

INFORMATION

Also read the precautions and requirements in the "2 General safety precautions" [▸ 4].

Refrigerant piping diameter

Pipe outer diameter (mm)
2× Ø9.5

Refrigerant piping material

- **Piping material:** K65 copper-iron alloy (CuFe2P), maximum operating pressure = 120 bar
- **Piping temper grade and thickness:**

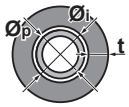
Outer diameter (Ø)	Temper grade	Thickness (t)[(a)]	
9.5 mm (3/8")	R420 (drawn)	≥0.65 mm	

[(a)] Depending on the applicable legislation and the maximum working pressure of the unit (see "PS High" on the unit name plate), larger piping thickness might be required.

7.1.2 Refrigerant piping insulation

- Use polyethylene foam as insulation material:
  - with a heat transfer rate between 0.041 and 0.052 W/mK (0.035 and 0.045 kcal/mh°C)
  - with a heat resistance of at least 120°C
- Insulation thickness:

Pipe outer diameter ($Ø_p$)	Insulation inner diameter ($Ø_i$)	Insulation thickness (t)
9.5 mm (3/8")	10~14 mm	≥10 mm



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

7.2 Connecting the refrigerant piping

7.2.1 About connecting the refrigerant piping

Before connecting the refrigerant piping

Make sure the outdoor and indoor unit are mounted.

Typical workflow

Connecting the refrigerant piping involves:

- Connecting the refrigerant piping to the indoor unit
- Connecting the refrigerant piping to the outdoor unit
- Insulating the refrigerant piping

- Keeping in mind the guidelines for:
  - Pipe bending
  - Brazing
  - Using the stop valves

7.2.2 Precautions when connecting the refrigerant piping

INFORMATION

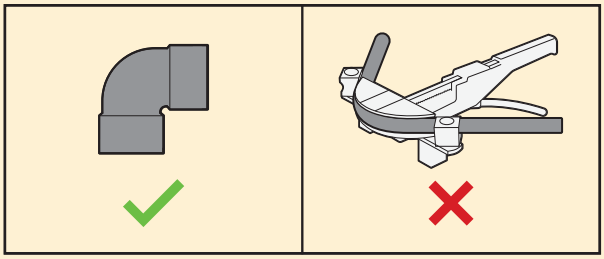
Also read the precautions and requirements in the following chapters:

- "2 General safety precautions" [▶ 4]
- "7.1 Preparing refrigerant piping" [▶ 22]

DANGER: RISK OF BURNING/SCALDING

CAUTION

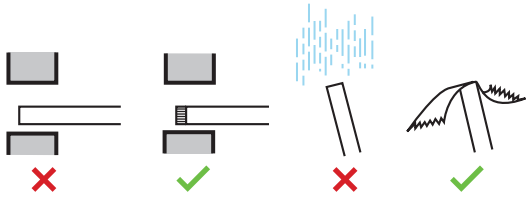
NEVER bend high pressure piping! Bending can reduce the pipe thickness and thus weaken the piping. ALWAYS use K65 fittings.



NOTICE

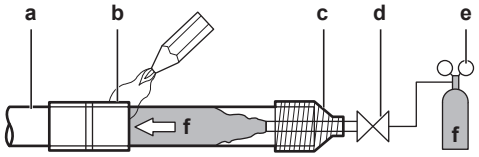
Take the following precautions on refrigerant piping into account:

- Avoid anything but the designated refrigerant to get mixed into the refrigerant cycle (e.g. air).
- Only use R744 (CO_2) when adding refrigerant.
- Only use installation tools (e.g. manifold gauge set) that are exclusively used for R744 (CO_2) installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils and moisture) from entering the system.
- Do NOT leave pipes unattended at the site. If you will finish the work in less than 1 month, tape the pipe ends or pinch the pipe (see figure below). Pipes that are installed outdoors must be pinched, regardless of the duration of the works.
- Use caution when passing copper tubes through walls (see figure below).



7.2.3 Guidelines when connecting the refrigerant piping

- When brazing, blow through with nitrogen to prevent creation of large quantities of oxidized film on the inside of the piping. This film adversely affects valves and compressors in the refrigerating system and prevents proper operation.
- Set the nitrogen pressure to 20 kPa (0.2 bar) (just enough so it can be felt on the skin) with a pressure-reducing valve.



a Refrigerant piping
b Part to be brazed
c Taping
d Manual valve
e Pressure-reducing valve
f Nitrogen

- Do NOT use anti-oxidants when brazing pipe joints.

  Residue can clog pipes and break equipment.
- Do NOT use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (CuP279, CuP281, or CuP284:DIN EN ISO 17672), which does not require flux.

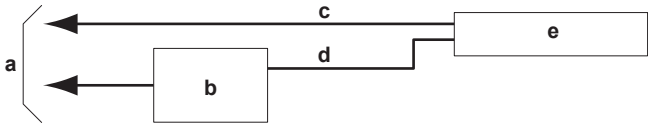
  Flux has an extremely harmful influence on refrigerant piping systems. E.g., if a chlorine-based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will deteriorate the refrigerant oil.
- Always protect the surrounding surfaces (e.g. using insulation foam) against heat when brazing.

7.2.4 To connect the refrigerant piping to the indoor unit

CAUTION

Install the refrigerant piping or components in a position where they are unlikely to be exposed to any substance which may corrode components containing refrigerant, unless the components are constructed of materials that are inherently resistant to corrosion or are suitably protected against corrosion.

- **Pipe length**. Keep refrigerant piping as short as possible
- **Connection example** to the indoor unit:



a Outdoor unit
b BEV2 unit
c Gas piping
d Liquid piping
e Indoor unit

INFORMATION

- Only 1 indoor unit may be connected to each BEV2 unit.
- This chapter describes only the connection procedure to the BEV2 unit. For the connection procedure of the indoor or outdoor unit, refer to the installation manual of the indoor or outdoor unit.

WARNING

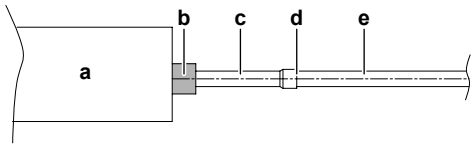
- Use K65 piping for high-pressure applications with a working gauge pressure of 120 bar or 90 bar, depending on its location in the system.
- Use K65 unions and fittings approved for a working gauge pressure of 120 bar or 90 bar, depending on its location in the system.
- ONLY brazing is allowed for connection of pipes. No other types of connections are allowed.
- Expanding of pipes is NOT allowed.

1 Insert the field pipe into the piping on the BEV2 unit side.

2 Connect refrigerant piping to the unit using only **brazed connections**.

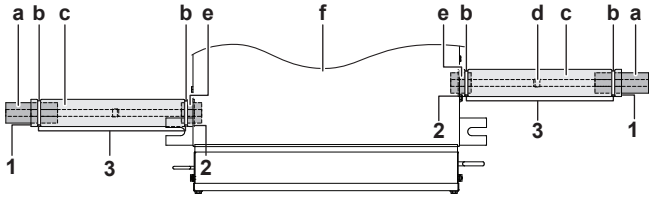
NOTICE

When brazing, place a wet cloth on the insulation attached on the unit (**a**) and make sure the temperature does not exceed 200°C.



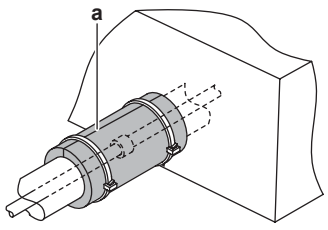
a BEV2 unit
b Piping on the BEV2 unit side
c Insulation attached on the unit
d Brazed connection
e Field piping

3 **Insulate** the refrigerant piping on the BEV2 unit as follows:



a Insulation material (field supply)
b Tie wraps (accessory)
c Insulation pieces (accessory)
d Brazed connection
e Refrigerant pipe connection (attached to the unit)
f Unit

1 Turn up the seams of the insulation pieces.
2 Attach to the base of the unit.
3 Tighten the tie wrap on the insulation pieces.



a Seam of the insulation piece (accessory) facing up

NOTICE

Make sure to insulate all refrigerant piping. Any exposed piping might cause condensation.

8 Electrical installation

NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

In this chapter

8.1 About connecting the electrical wiring

Before connecting the electrical wiring

Make sure the refrigerant piping is connected and checked.

Typical workflow

Connecting the electrical wiring typically consists of the following stages:

1. Making sure the power supply system complies with the electrical specifications of the units.
2. Connecting the electrical wiring to the outdoor unit.
3. Connecting the electrical wiring to the indoor unit.
4. Connection the electrical wiring to the BEV2 unit.
5. Connecting the main power supply.

8.1.1 Precautions when connecting the electrical wiring

DANGER: RISK OF ELECTROCUTION

WARNING

- All wiring MUST be performed by an authorised electrician and MUST comply with the national wiring regulation.
- Make electrical connections to the fixed wiring.
- All components procured on-site and all electrical construction MUST comply with the applicable legislation.

WARNING

ALWAYS use multicore cable for power supply cables.

INFORMATION

Also read the precautions and requirements in the "2 General safety precautions" [▸ 4].

WARNING

- If the power supply has a missing or wrong N-phase, equipment might break down.
- Establish proper earthing. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earthing may cause electrical shocks.
- Install the required fuses or circuit breakers.
- Secure the electrical wiring with cable ties so that the cables do NOT come into contact with sharp edges or piping, particularly on the high-pressure side.
- Use the included cables (in the box of the indoor unit) and make sure that there is no strain on the terminal connections or wires. Improper connections or improper securing of wires can cause overheating, electrical shocks or fire.
- Do NOT use taped wires, extension cords, or connections from a star system. They can cause overheating, electrical shocks or fire.

Following symbols may occur on the indoor unit:

Symbol	Explanation
	Measure the voltage at the terminals of main circuit capacitors or electrical components before servicing.

WARNING

Use an all-pole disconnection type breaker with at least 3 mm between the contact point gaps that provides full disconnection under overvoltage category III.

WARNING

If the supply cord is damaged, it MUST be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

WARNING

Keep the interconnection wiring away from copper pipes without thermal insulation as such pipes will be very hot.

8.1.2 Guidelines when connecting the electrical wiring

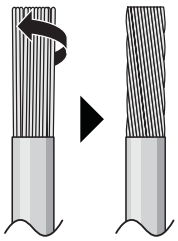
NOTICE

We recommend using solid (single-core) wires. If stranded wires are used, slightly twist the strands to consolidate the end of the conductor for either direct use in the terminal clamp or insertion in a round crimp-style terminal.

To prepare stranded conductor wire for installation

Method 1: Twisting conductor

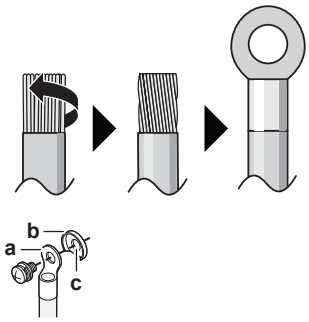
1. Strip insulation (20 mm) from the wires.
2. Slightly twist the end of the conductor to create a "solid-like" connection.



Method 2: Using round crimp-style terminal

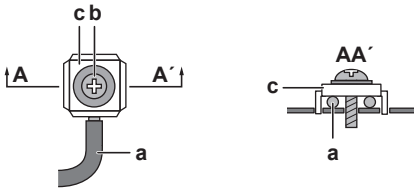
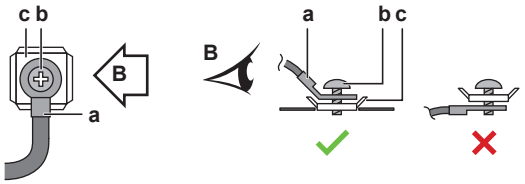
1 Strip insulation from wires and slightly twist the end of each wire.

2 Install a round crimp-style terminal on the end of the wire. Place the round crimp-style terminal on the wire up to the covered part and fasten the terminal with the appropriate tool.



a Round crimp-style terminal
b Cut-out section
c Cup washer

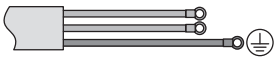
Use the following methods for installing wires:

Wire type	Installation method
Single-core wire Or Stranded conductor wire twisted to "solid-like" connection	 **a** Curled wire (single-core or twisted stranded conductor wire) **b** Screw **c** Flat washer
Stranded conductor wire with round crimp-style terminal	 **a** Terminal **b** Screw **c** Flat washer ✓ Allowed ✕ NOT allowed

Tightening torques

Wiring	Screw size	Tightening torque (N•m)
Power supply cable	M4	1.18~1.44
Earth terminal cable	M4	1.52~1.86

- The earth wire between the wire retainer and the terminal must be longer than the other wires.



8.2 To connect the electrical wiring to the BEV2 unit

NOTICE

- Follow the wiring diagram (delivered with the unit, located at the inside of the service cover).
- For instructions on how to connect the optional equipment, see the installation manual delivered with the optional equipment.
- Make sure the electrical wiring does NOT obstruct proper reattachment of the service cover.

It is important to keep the power supply and the transmission wiring separated from each other. In order to avoid any electrical interference the distance between both wirings should ALWAYS be at least 50 mm.

NOTICE

Be sure to keep the power line and transmission line apart from each other. Transmission wiring and power supply wiring may cross, but may NOT run parallel.

1 Remove the service cover.

2 Connect the **transmission cable**:

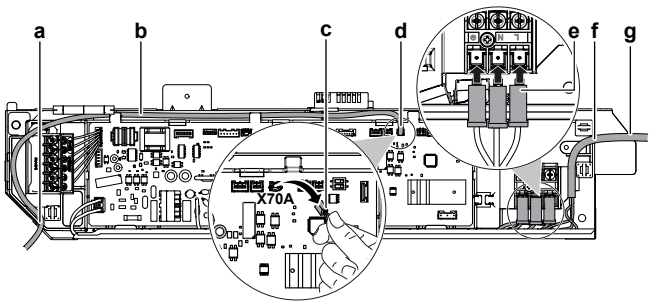
- Take the transmission cable from the accessories of the indoor unit and route the cable through the frames of both units.
- Remove the jumper from connector X70A on the indoor unit PCB and connect the transmission cable to connector X70A.
- Connect the cable to connector X2A on the BEV unit PCB.
- Fix the cable with a small tie wrap (accessory).

3 Connect the **power supply cable**:

- Take the power supply cable from the accessories of the indoor unit and route the cable through the frames of both units.
- Connect the end of the cable with the faston connectors to the indoor unit terminal.
- Connect the other side of the power supply cable to the terminal of the BEV2 unit.
- Fix the cable with a small tie wrap (accessory)

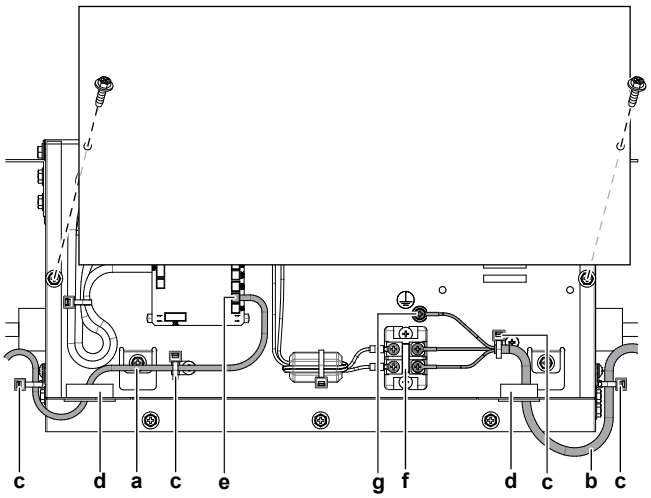
4 Reattach the service cover.

Connection to the indoor unit



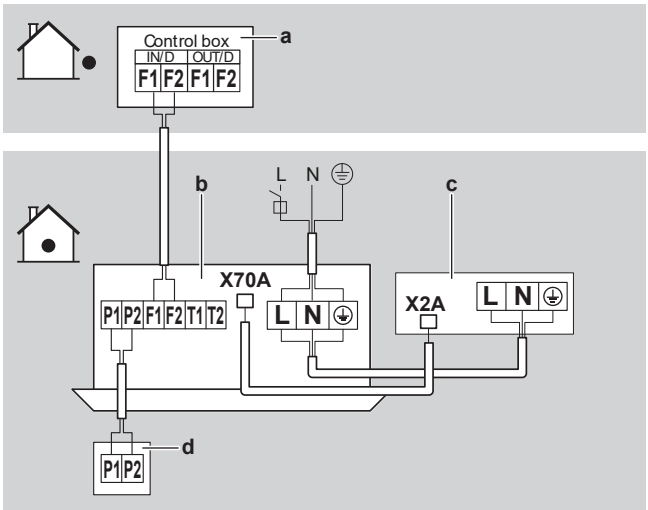
a Transmission cable feed-through hole
b Transmission cable (indoor unit accessory)
c Jumper
d X70A connector
e Faston connector
f Power supply feed-through hole
g Power supply cable

Connection to the BEV2 unit



a Transmission cable
b Power supply cable
c Tie wrap (accessory)
d Wiring feed-through hole
e X2A connector
f Power supply terminal
g Earth

Wiring example



a Outdoor unit control box
b Indoor unit
c BEV2 unit
d User interface

9 Commissioning

WARNING

Make sure that the service cover is closed after completing the installation of the indoor unit, BEV2 unit, and outdoor unit.

INFORMATION

Refer to the installation manuals provided with the indoor and outdoor units for the commissioning of the system.

9.1 Checklist before commissioning

1. After the installation of the unit, check the items listed below.
2. Close the unit.
3. Power up the unit.

☐	You read the complete installation instructions, as described in the **installer reference guide**.
☐	**Installation** Check that the unit is properly installed, to avoid abnormal noises and vibrations when starting up the unit.
☐	The **indoor unit** is properly mounted.
☐	The **outdoor unit** is properly mounted.
☐	The **refrigerant pipes** (gas and liquid) are installed correctly and thermally insulated.
☐	There are NO **refrigerant leaks**.
☐	There are NO **missing phases** or **reversed phases**.
☐	The system is properly **earthed** and the earth terminals are tightened.
☐	The **fuses** or locally installed protection devices are installed according to this document, and have NOT been bypassed.
☐	The **power supply voltage** matches the voltage on the identification label of the unit.
☐	There are NO **loose connections** or damaged electrical components in the switch box.
☐	There are NO **damaged components** or **squeezed pipes** on the inside of the indoor and outdoor units.
☐	The **stop valves** (gas and liquid) on the outdoor unit are fully open.

10 Disposal

NOTICE

Do NOT try to dismantle the system yourself: dismantling of the system, treatment of the refrigerant, oil and other parts MUST comply with applicable legislation. Units MUST be treated at a specialised treatment facility for reuse, recycling and recovery.

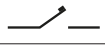
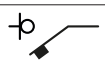
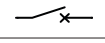
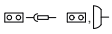
11 Technical data

- A **subset** of the latest technical data is available on the regional Daikin website (publicly accessible).
- The **full set** of the latest technical data is available on the Daikin Business Portal (authentication required).

11.1 Wiring diagram

11.1.1 Unified wiring diagram legend

For applied parts and numbering, refer to the wiring diagram on the unit. Part numbering is by Arabic numbers in ascending order for each part and is represented in the overview below by "*" in the part code.

Symbol	Meaning	Symbol	Meaning
  	Circuit breaker		Protective earth
	Connection		Protective earth (screw)
	Connector		Rectifier
	Earth		Relay connector
	Field wiring		Short-circuit connector
	Fuse		Terminal
	Indoor unit		Terminal strip
	Outdoor unit		Wire clamp
	Residual current device		Heater

Symbol	Colour	Symbol	Colour
BLK	Black	ORG	Orange
BLU	Blue	PNK	Pink
BRN	Brown	PRP, PPL	Purple
GRN	Green	RED	Red
GRY	Grey	WHT	White
SKY BLU	Sky blue	YLW	Yellow

Symbol	Meaning
A*P	Printed circuit board
BS*	Pushbutton ON/OFF, operation switch
BZ, H*O	Buzzer
C*	Capacitor

Symbol	Meaning
AC*, CN*, E*, HA*, HE*, HL*, HN*, HR*, MR*_A, MR*_B, S*, U, V, W, X*A, K*R_*, NE	Connection, connector
D*, V*D	Diode
DB*	Diode bridge
DS*	DIP switch
E*H	Heater
FU*, F*U, (for characteristics, refer to PCB inside your unit)	Fuse
FG*	Connector (frame ground)
H*	Harness
H*P, LED*, V*L	Pilot lamp, light emitting diode
HAP	Light emitting diode (service monitor green)
HIGH VOLTAGE	High voltage
IES	Intelligent eye sensor
IPM*	Intelligent power module
K*R, KCR, KFR, KHuR, K*M	Magnetic relay
L	Live
L*	Coil
L*R	Reactor
M*	Stepper motor
M*C	Compressor motor
M*F	Fan motor
M*P	Drain pump motor
M*S	Swing motor
MR*, MRCW*, MRM*, MRN*	Magnetic relay
N	Neutral
n=*, N=*	Number of passes through ferrite core
PAM	Pulse-amplitude modulation
PCB*	Printed circuit board
PM*	Power module
PS	Switching power supply
PTC*	PTC thermistor
Q*	Insulated gate bipolar transistor (IGBT)
Q*C	Circuit breaker
Q*DI, KLM	Earth leak circuit breaker
Q*L	Overload protector

Symbol	Meaning
Q*M	Thermo switch
Q*R	Residual current device
R*	Resistor
R*T	Thermistor
RC	Receiver
S*C	Limit switch
S*L	Float switch
S*NG	Refrigerant leak detector
S*NPH	Pressure sensor (high)
S*NPL	Pressure sensor (low)
S*PH, HPS*	Pressure switch (high)
S*PL	Pressure switch (low)
S*T	Thermostat
S*RH	Humidity sensor
S*W, SW*	Operation switch
SA*, F1S	Surge arrester
SR*, WLU	Signal receiver
SS*	Selector switch
SHEET METAL	Terminal strip fixed plate
T*R	Transformer
TC, TRC	Transmitter
V*, R*V	Varistor
V*R	Diode bridge, Insulated-gate bipolar transistor (IGBT) power module
WRC	Wireless remote controller
X*	Terminal
X*M	Terminal strip (block)
Y*E	Electronic expansion valve coil
Y*R, Y*S	Reversing solenoid valve coil
Z*C	Ferrite core
ZF, Z*F	Noise filter

12 Glossary

Dealer
Sales distributor for the product.

Authorised installer
Technical skilled person who is qualified to install the product.

User
Person who is owner of the product and/or operates the product.

Applicable legislation
All international, European, national and local directives, laws, regulations and/or codes that are relevant and applicable for a certain product or domain.

Service company
Qualified company which can perform or coordinate the required service to the product.

Installation manual
Instruction manual specified for a certain product or application, explaining how to install, configure and maintain it.

Operation manual
Instruction manual specified for a certain product or application, explaining how to operate it.

Accessories
Labels, manuals, information sheets and equipment that are delivered with the product and that need to be installed according to the instructions in the accompanying documentation.

Optional equipment
Equipment made or approved by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

Field supply
Equipment NOT made by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

DAIKIN EUROPE N.V.

Zandvoordestraat 300, B-8400 Oostende, Belgium

4P677928-1B 2023.11