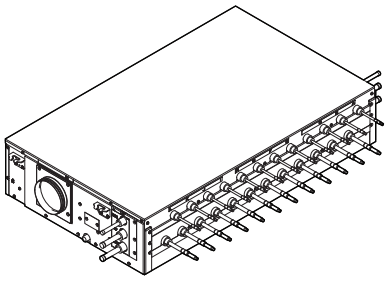
Installer and user reference guide

VRV 5 branch selector unit



BS4A14AJV1B
BS6A14AJV1B
BS8A14AJV1B
BS10A14AJV1B
BS12A14AJV1B

1 About this document

WARNING

Make sure installation, servicing, maintenance, repair and applied materials follow the instructions from Daikin 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 + end users

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 BS unit)
- **BS unit installation and operation manual:**
  - Installation and operation instructions
  - Format: Paper (in the box of the BS unit)
- **Installer and user reference guide:**
  - Preparation of the installation, reference data,…
  - Detailed step-by-step instructions and background information for basic and advanced usage
  - Format: Digital files on https://www.daikin.eu. Use the search function to find your model.

Latest revisions of the supplied documentation may be available on the regional Daikin website or via your dealer.

The original documentation is written in English. All other languages are translations.

Technical engineering data

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

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 General safety precautions

In this chapter

2.1 For the installer

2.1.1 General

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.

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 children, can play with them. Possible risk: 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.

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

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.

2.1.2 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.

2.1.3 Refrigerant — in case of R410A or R32

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

DANGER: RISK OF EXPLOSION

Pump down – Refrigerant leakage. If you want to pump down the system, and there is a leak in the refrigerant circuit:

- Do NOT use the unit's automatic pump down function, with which you can collect all refrigerant from the system into the outdoor unit. **Possible consequence:** Self-combustion and explosion of the compressor because of air going into the operating compressor.
- Use a separate recovery system so that the unit's compressor does NOT have to operate.

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:

- Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency.
- Toxic gas might be produced if refrigerant gas comes into contact with fire.

WARNING

ALWAYS recover the refrigerant. Do NOT release them directly into the environment. Use a vacuum pump to evacuate the installation.

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.

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.

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.

NOTICE

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

- In case recharge is required, see the nameplate of the unit. It states the type of refrigerant and necessary amount.
- The unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant.
- 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.
- Charge the liquid refrigerant as follows:

If	Then
A siphon tube is present (i.e., the cylinder is marked with "Liquid filling siphon attached")	Charge with the cylinder upright. 

If	Then
A siphon tube is NOT present	Charge with the cylinder upside down. 

- Open refrigerant cylinders slowly.
- Charge the refrigerant in liquid form. Adding it in gas form may prevent normal operation.

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.

2.1.4 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 electrical components 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 "14 Unit installation" [▸ 55])

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF ELECTROCUTION

Do NOT leave the unit unattended when the service cover is removed.

WARNING

In case the safety measures require a ventilated enclosure, respect the following:

- Auxiliary devices which may be a potential ignition source shall not be installed in the duct work (example: hot surfaces with a temperature exceeding 700°C and electric switching devices).
- Only auxiliary devices (example: extraction fan) approved by the manufacturer are used in the duct work.

WARNING

Do NOT install operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater) in the duct work.

WARNING

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

WARNING

The fixing method of the unit MUST be in accordance with the instructions from this manual. See "14.4 Mounting the unit" [▸ 61].

WARNING

Follow the service space dimensions in this manual for correct installation of the unit. See "14.1.1 Installation site requirements of the unit" [▸ 55].

CAUTION

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

This unit 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.

CAUTION

If the metal duct passes through a metal lath, wire lath or metal plate of the wooden structure, separate the duct and wall electrically.

Refrigerant piping installation (see "15 Piping installation" [▸ 73])

DANGER: RISK OF BURNING/SCALDING

WARNING

The field piping method MUST be in accordance with the instructions from this manual. See "15 Piping installation" [▸ 73].

WARNING

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

- Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency.
- Toxic gas might be produced if refrigerant gas comes into contact with fire.

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

Bent header or branch pipes can lead to refrigerant leakage. **Possible consequence:** asphyxiation, suffocation and fire.

- NEVER bend the branch and header pipes sticking out of the unit. They have to remain straight.
- ALWAYS support the branch and header pipes at a distance of 1 m from the unit.

WARNING

Overheated insulation can start to burn. **Possible consequence:** fire.

- When performing brazing work header or branch pipes, cool all other header and branch pipes by wrapping them in wet cloths.

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.

NOTICE

- Do NOT use mineral oil on flared part.
- Do NOT reuse piping from previous installations.
- NEVER install a drier to this unit to guarantee its lifetime. The drying material may dissolve and damage the system.

Electrical installation (see "16 Electrical installation" [▸ 80])

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF ELECTROCUTION

Before performing work on the unit, disconnect any power source connected to the unit.

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

The electrical wiring connection method MUST be in accordance with the instructions from this manual. See "16 Electrical installation" [▸ 80].

WARNING

- All wiring MUST be performed by an authorised electrician and MUST comply with the applicable legislation.
- 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.
- Do NOT use taped wires, stranded conductor wires, extension cords, or connections from a star system. They can cause overheating, electrical shocks or fire.

WARNING

ALWAYS use multicore cable for power supply cables.

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

The appliance MUST be installed in accordance with national wiring regulations.

CAUTION

Do NOT push or place redundant cable length into the unit.

CAUTION

Be careful NOT to pinch cables between the service cover and the switch box.

Commissioning (see "18 Commissioning" [▸ 100])

CAUTION

Do NOT perform the test operation while working on the indoor units.

When performing the test operation, NOT ONLY the outdoor unit, but the connected indoor unit will operate as well. Working on an indoor unit while performing a test operation is dangerous.

CAUTION

Do NOT insert fingers, rods or other objects into the air inlet (damper).

Troubleshooting (see "20 Troubleshooting" [▸ 107])

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING/SCALDING

WARNING

Prevent hazards due to inadvertent resetting of the thermal cut-out: power to this appliance MUST NOT be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly turned ON and OFF by the utility.

WARNING

- When carrying out an inspection on the switch box of the unit, ALWAYS make sure that the unit is disconnected from the mains. Turn off the respective circuit breaker.
- When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. NEVER shunt safety devices or change their values to a value other than the factory default setting. If you are unable to find the cause of the problem, call your dealer.

3.1 Instructions for equipment using R32 refrigerant

WARNING: MILDLY FLAMMABLE MATERIAL

The refrigerant inside this unit is mildly flammable.

WARNING

- Do NOT pierce or burn refrigerant cycle parts.
- Do NOT use cleaning materials or means to accelerate the defrosting process other than those recommended by the manufacturer.
- Be aware that the refrigerant inside the system is odourless.

WARNING

The appliance shall be stored as follows:

- in such a way as to prevent mechanical damage.
- in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater).
- in a room with dimensions as specified in "13 Special requirements for R32 units" [▶ 40].

WARNING

Make sure installation, servicing, maintenance and repair comply with instructions from Daikin and with applicable legislation and are executed ONLY by authorised persons.

CAUTION

Do NOT use potential sources of ignition in searching for or detection of refrigerant leaks.

NOTICE

- Take precautions to avoid excessive vibration or pulsation to refrigeration piping.
- Protect the protection devices, piping and fittings as much as possible against adverse environmental effects.
- Provide space for expansion and contraction of long runs of piping.
- Design and install piping in refrigerating systems such as to minimise the likelihood of hydraulic shock damaging the system.
- Mount the indoor equipment and pipes securely and protect them to avoid accidental rupture of equipment or pipes in case of events such as moving furniture or reconstruction activities.

NOTICE

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

See "13.3 To determine the required safety measures" [▶ 41] to check if your system meets the R32 safety requirements.

For the user

4 User safety instructions

Always observe the following safety instructions and regulations.

In this chapter

4.1 General

WARNING

If you are NOT sure how to operate the unit, contact your installer.

WARNING

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 if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children SHALL NOT play with the appliance.

Cleaning and user maintenance SHALL NOT be made by children without supervision.

WARNING

To prevent electrical shocks or fire:

- Do NOT rinse the unit.
- Do NOT operate the unit with wet hands.
- Do NOT place any objects containing water on the unit.

CAUTION

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

- Units are marked with the following symbol:

This means that electrical and electronic products may NOT be mixed with unsorted household waste. Do NOT try to dismantle the system yourself: dismantling the system, treatment of the refrigerant, of oil and of other parts MUST be done by an authorised installer and MUST comply with applicable legislation.

Units MUST be treated at a specialised treatment facility for reuse, recycling and recovery. By ensuring this product is disposed of correctly, you will help to prevent potential negative consequences for the environment and human health. For more information, contact your installer or local authority.

- Batteries are marked with the following symbol:

This means that the batteries may NOT be mixed with unsorted household waste. If a chemical symbol is printed beneath the symbol, this chemical symbol means that the battery contains a heavy metal above a certain concentration.

Possible chemical symbols are: Pb: lead (>0.004%).

Waste batteries MUST be treated at a specialised treatment facility for reuse. By ensuring waste batteries are disposed of correctly, you will help to prevent potential negative consequences for the environment and human health.

4.2 Instructions for safe operation

WARNING

Do NOT install operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater) in the duct work.

WARNING

- Do NOT modify, disassemble, remove, reinstall or repair the unit yourself as incorrect dismantling or installation may cause an electrical shock or fire. Contact your dealer.
- In case of accidental refrigerant leaks, make sure there are no naked flames. The refrigerant itself is entirely safe, non-toxic and mildly flammable, but it will generate toxic gas when it accidentally leaks into a room where combustible air from fan heaters, gas cookers, etc. is present. Always have qualified service personnel confirm that the point of leakage has been repaired or corrected before resuming operation.

WARNING

This unit contains electrical and hot parts.

WARNING

Before operating the unit, be sure the installation has been carried out correctly by an installer.

WARNING

Do NOT obstruct the opening of the air inlet (damper).

WARNING

The unit is equipped with a refrigerant leak detection system for safety.

To be effective, the unit MUST be electrically powered at all times after installation, except for short service periods.

Maintenance and service (see "7 Maintenance and service" [▸ 23])

WARNING

The unit is equipped with a refrigerant leak detection system for safety.

To be effective, the unit MUST be electrically powered at all times after installation, except for maintenance.

WARNING

NEVER replace a fuse with a fuse of a wrong ampere ratings or other wires when a fuse blows out. Use of wire or copper wire may cause the unit to break down or cause a fire.

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

Be careful with ladders when working in high places.

CAUTION

After a long use, check the unit stand and fitting for damage. If damaged, the unit may fall and result in injury.

CAUTION

Do NOT insert fingers, rods or other objects into the air inlet (damper).

CAUTION

Before accessing terminal devices, make sure to interrupt all power supply.

About the refrigerant (see "7.3 About the refrigerant" [▸ 23])

WARNING: MILDLY FLAMMABLE MATERIAL

The refrigerant inside this unit is mildly flammable.

WARNING

- Do NOT pierce or burn refrigerant cycle parts.
- Do NOT use cleaning materials or means to accelerate the defrosting process other than those recommended by the manufacturer.
- Be aware that the refrigerant inside the system is odourless.

WARNING

- The refrigerant inside the unit is mildly flammable, but normally does NOT leak. If the refrigerant leaks in the room and comes in contact with fire from a burner, a heater, or a cooker, this may result in fire, or the formation of a harmful gas.
- Turn OFF any combustible heating devices, ventilate the room, and contact the dealer where you purchased the unit.
- Do NOT use the unit until a service person confirms that the part from which the refrigerant leaked has been repaired.

WARNING

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

WARNING

The R32 refrigerant leakage sensor must be replaced after every detection or at the end of its lifetime. ONLY authorised persons may replace the sensor.

Troubleshooting (see "8 Troubleshooting" [▸ 25])

WARNING

Stop operation and shut OFF the power if anything unusual occurs (burning smells etc.).

Leaving the unit running under such circumstances may cause breakage, electrical shock or fire. Contact your dealer.

WARNING

Make sure installation, servicing, maintenance, repair and applied materials follow the instructions from Daikin 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.

5 About the system

WARNING

- Do NOT modify, disassemble, remove, reinstall or repair the unit yourself as incorrect dismantling or installation may cause an electrical shock or fire. Contact your dealer.
- In case of accidental refrigerant leaks, make sure there are no naked flames. The refrigerant itself is entirely safe, non-toxic and mildly flammable, but it will generate toxic gas when it accidentally leaks into a room where combustible air from fan heaters, gas cookers, etc. is present. Always have qualified service personnel confirm that the point of leakage has been repaired or corrected before resuming operation.

WARNING

The unit is equipped with a refrigerant leak detection system for safety.

To be effective, the unit MUST be electrically powered at all times after installation, except for short service periods.

NOTICE

Do NOT use the system for other purposes. In order to avoid any quality deterioration, do NOT use the unit for cooling precision instruments, food, plants, animals, or works of art.

NOTICE

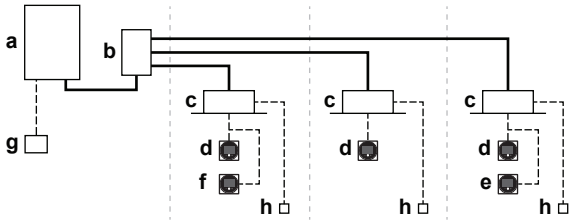
For future modifications or expansions of your system:

A full overview of allowable combinations (for future system extensions) is available in technical engineering data and should be consulted. Contact your installer to receive more information and professional advice.

5.1 System layout

INFORMATION

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



a Heat recovery outdoor unit
b Branch selector (BS)
c VRV direct expansion (DX) indoor unit
d Remote controller in **normal mode**
e Remote controller in **alarm only mode**
f Remote controller in **supervisor mode** (mandatory in some situations)
g iTM (optional)
h Option PCB (optional)
—— Refrigerant piping
----- Transmission and user interface wiring

6 Before operation

CAUTION

See "4 User safety instructions" [▸ 16] to acknowledge all related safety instructions.

NOTICE

NEVER inspect or service the unit by yourself. Ask a qualified service person to perform this work.

NOTICE

Turn ON the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.

This operation manual is for the following systems with standard control. Before initiating operation, contact your dealer for the operation that corresponds to your system type and mark. If your installation has a customised control system, ask your dealer for the operation that corresponds to your system.

7 Maintenance and service

In this chapter

7.1 Precautions for maintenance and service

CAUTION

See "4 User safety instructions" [▶ 16] to acknowledge all related safety instructions.

NOTICE

NEVER inspect or service the unit by yourself. Ask a qualified service person to perform this work.

NOTICE

Maintenance MUST be done by an authorised installer or service agent.

We recommend performing maintenance at least once a year. However, applicable legislation might require shorter maintenance intervals.

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.

7.2 Periodic check of the ventilated enclosure

In case a ventilated enclosure is used as a safety measure for the BS unit, the installer or service agent has to check the airflow rate periodically to confirm that it still meets the legal requirements.

7.3 About the refrigerant

CAUTION

See "4 User safety instructions" [▶ 16] to acknowledge all related safety instructions.

This product contains fluorinated greenhouse gases. Do NOT vent gases into the atmosphere.

Refrigerant type: R32

Global warming potential (GWP) value: 675

Periodical inspections for refrigerant leaks may be required depending on the applicable legislation. Contact your installer for more information.

NOTICE

Applicable legislation on **fluorinated greenhouse gases** requires that the refrigerant charge of the unit is indicated both in weight and CO_2 equivalent.

Formula to calculate the quantity in CO_2 equivalent tonnes: GWP value of the refrigerant × total refrigerant charge [in kg] / 1000

Contact your installer for more information.

7.3.1 About the refrigerant leakage sensor

WARNING

The R32 refrigerant leakage sensor must be replaced after every detection or at the end of its lifetime. ONLY authorised persons may replace the sensor.

NOTICE

The R32 refrigerant leakage sensor is a semiconductor detector which may incorrectly detect substances other than R32 refrigerant. Avoid using chemical substances (e.g. organic solvents, hair spray, paint) in high concentrations, in the close proximity of the BS unit because this may cause misdetection by the R32 refrigerant leakage sensor.

NOTICE

Functionality of the safety measures are periodically automatically checked. In case of malfunction, an error code will be displayed on the user interface.

INFORMATION

The sensor has a lifetime of 10 years. The user interface displays error "**CH-22**" 6 months before the end of the sensor lifetime and error "**CH-23**" after the end of the sensor lifetime. For more information, see the reference guide of the user interface and contact your dealer.

In case of detection

1. The user interface of the indoor units connected to the BS unit displays error "**A0-20**".
2. If applicable, the safety measures of the BS unit are activated. These can be the following:

- the external alarm emits a signal, or
- the extraction fan and damper of the BS unit start operating in case of a ventilated enclosure.

3. Contact your dealer immediately. For more information, see the installation manual of the outdoor unit.

INFORMATION

To stop the alarm of the user interface, see the reference guide of the user interface.

8 Troubleshooting

If one of the following malfunctions occur, take the measures shown below and contact your dealer.

WARNING

In case of a refrigerant leak, the system needs power to contain the problem.

1. Do NOT turn OFF the power supply.
2. Contact your dealer.

Possible consequence: Leaking refrigerant can lead to suffocation, asphyxiation and fire.

In case anything else unusual occurs (burning smells etc.):

1. Stop operation.
2. Shut OFF the power
3. Contact your dealer.

Possible consequence: Leaving the unit running under such circumstances may cause breakage, electrical shock or fire.

The system MUST be repaired by a qualified service person.

Malfunction	Measure
If the system does not operate at all.	▪ Check if there is no power failure. Wait until power is restored. If power failure occurs during operation, the system automatically restarts immediately after power is restored. ▪ Check if no fuse has blown or breaker is activated. If necessary, change the fuse or reset the breaker. ▪ If the problem persists, contact your installer
If a refrigerant leak occurs (error code *RD*/*CH*)	▪ Actions will be taken by the system. Do NOT turn OFF the power supply. ▪ Contact your installer and report the error code.
If a safety device such as a fuse, a breaker or an earth leakage breaker frequently actuates.	▪ Turn off the main power switch. ▪ Contact your installer
If water leaks from the unit.	▪ Stop the operation. ▪ Contact your installer.
Other issues	Contact your installer. State the symptoms, the complete model name of the unit (with manufacturing number if possible) and the installation date (possibly listed on the warranty card).

8.1 Symptoms that are NOT system malfunctions

The following symptoms are NOT system malfunctions:

8.1.1 Symptom: noise

- A "zeen" sound is heard immediately after the power supply is turned on. The electronic expansion valve inside the BS unit starts working and makes the noise. Its volume will reduce in about a minute.
- A continuous low hissing sound is heard when the system is in cooling or defrost operation. This is the sound of refrigerant gas flowing through the BS unit.
- A hissing sound originating from the 4-way valve in the outdoor unit which is heard at the start or immediately after stopping operation or defrost operation, or when switching from cooling to heating operation and vice versa.

9 Relocation

Contact your dealer to remove and reinstall the entire unit. Moving units requires technical expertise.

10 Disposal

This unit uses hydrofluorocarbon. Contact your dealer when discarding this unit. It is required by law to collect, transport and discard the refrigerant in accordance with the "hydrofluorocarbon collection and destruction" regulations.

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.

For the installer

11 About the box

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.

In this chapter

11.1 To handle the unit

- For easier manual carrying of the BS6~12A, only cut the 2 middle straps to remove the pallet while keeping the unit in its cardboard packaging.
- When handling the unit, take into account the following:

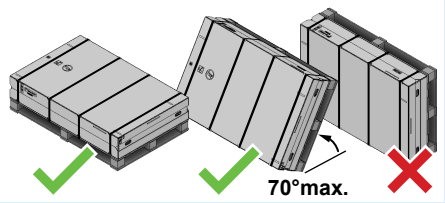
  Fragile, handle the unit with care.

  Keep the unit upright.

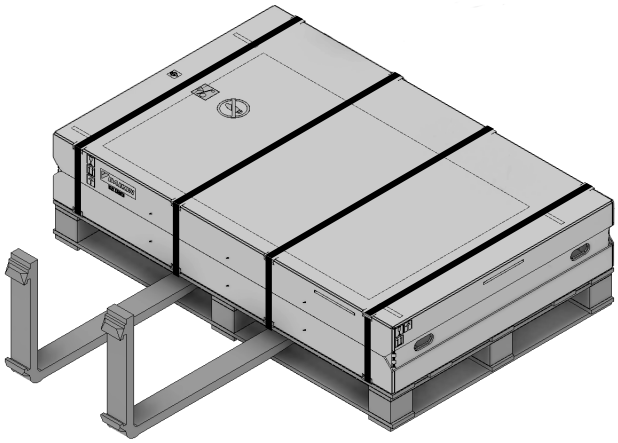
  Do NOT step onto the unit.

NOTICE

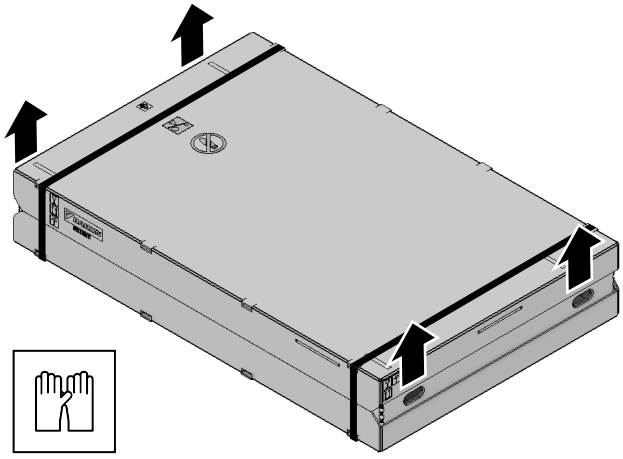
When you carry or manipulate the unit, never tilt it more than 70 degrees in any direction.



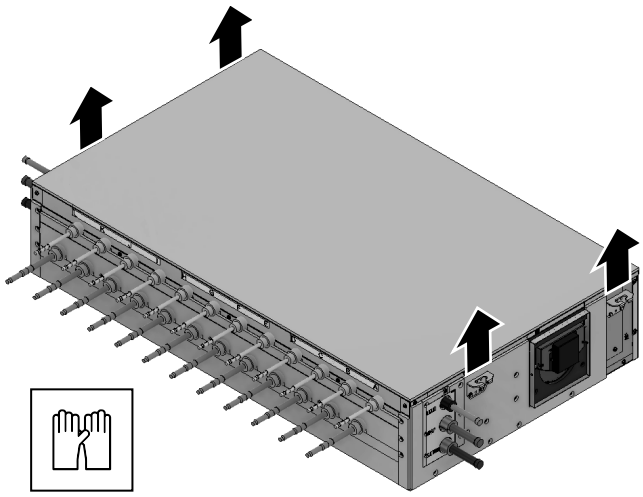
- Optionally: As long as the BS6~12A is attached to a pallet, you can use a forklift. Move slowly when transporting the unit.



- Lift the unit via the cut-outs in the cardboard. For the BS10~12A units, it is advised to lift with more than 2 people.



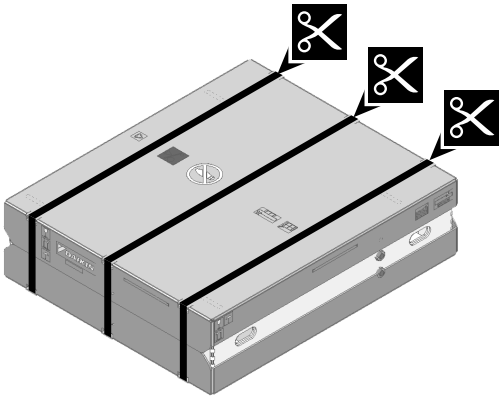
- When moving the unit, carry it slowly.
- After unpacking, lift the unit via the hanger brackets. Do not exert any pressure on other parts, especially not on the refrigerant piping and drain piping. For the BS10~12A units, it is advised to lift with more than 2 people.



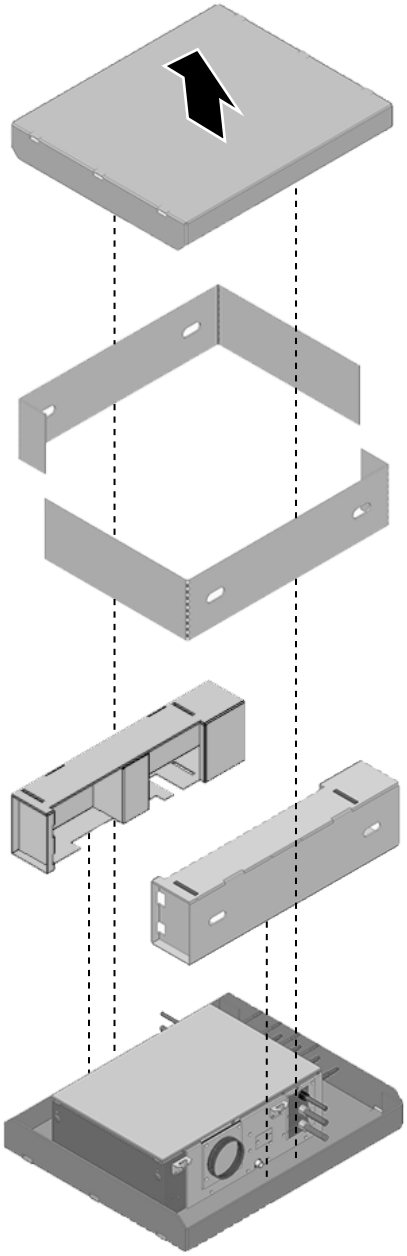
11.2 To unpack the unit

For BS4A

1 Cut and remove the straps.

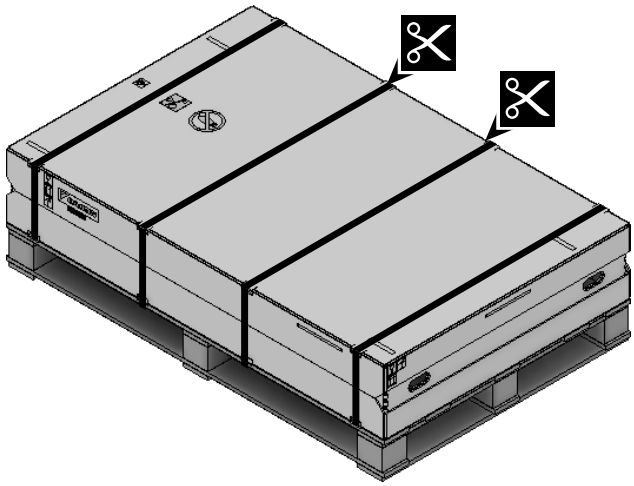


2 Remove the box parts as indicated in the picture.



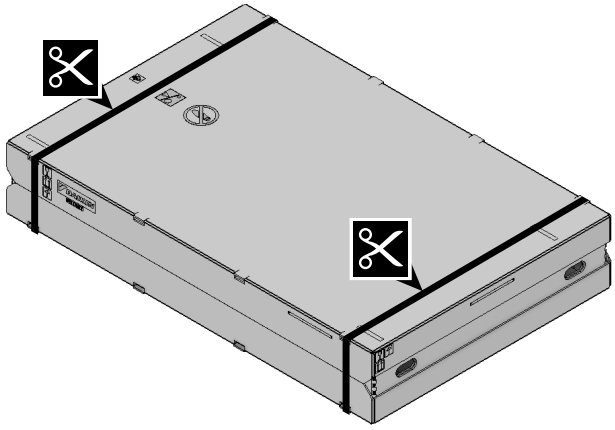
For BS6~12A

3 Cut and remove the inner straps.

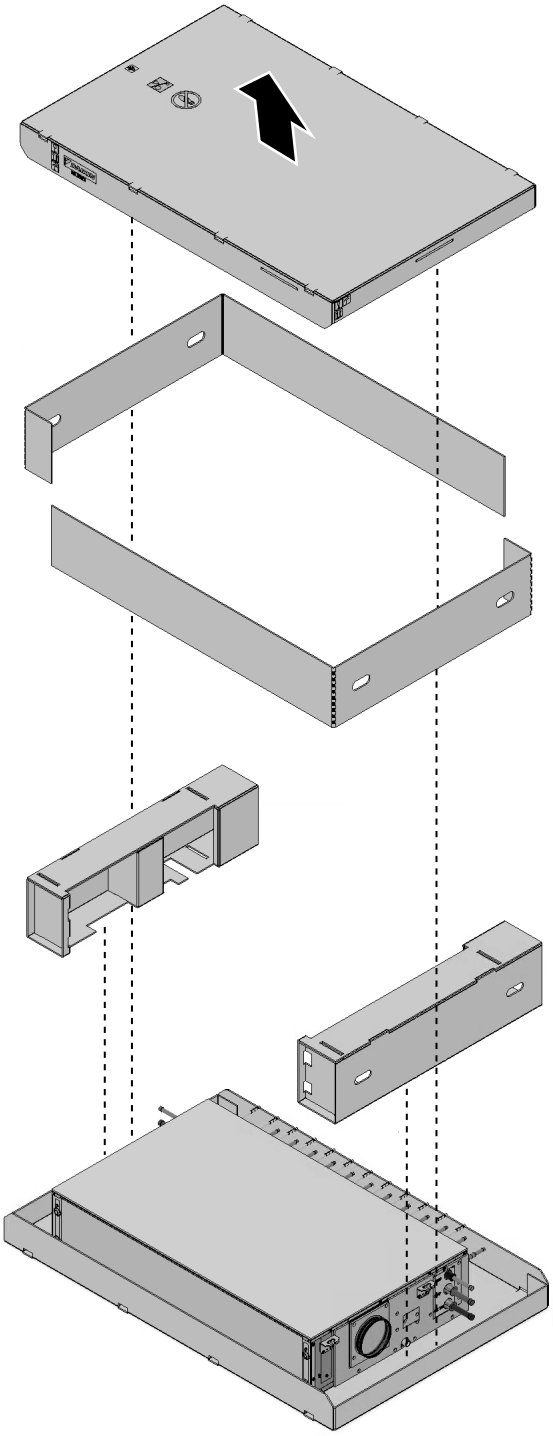


4 Remove the pallet.

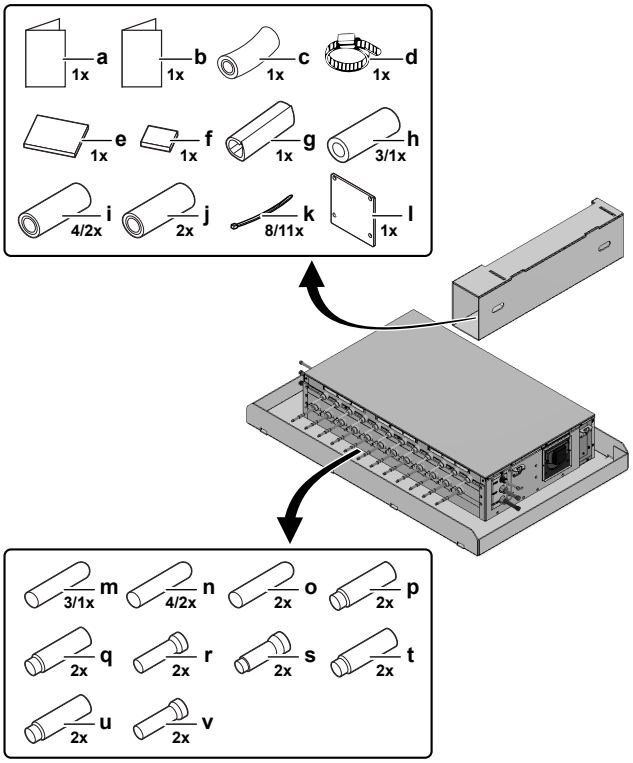
5 Cut and remove the outer straps.



6 Remove the box parts as indicated in the picture.



11.3 To remove the accessories



a Installation and operation manual
b General safety precautions
c Drain hose
d Metal clamp
e Sealing material (large)
f Sealing material (small)
g Sealing material (thin sheet)
h Insulation tube for stopper pipe Ø9.5 mm (3× for BS4A, 1× for BS6~12A)
i Insulation tube for stopper pipe Ø15.9 mm (4× for BS4A, 2× for BS6~12A)
j Insulation tube for stopper pipe Ø22.2 mm
k Tie wraps (8× for BS4A, 11× for BS6~12A)
l Duct closing plate
m Stopper pipe Ø9.5 mm (3× for BS4A, 1× for BS6~12A)
n Stopper pipe Ø15.9 mm (4× for BS4A, 2× for BS6~12A)
o Stopper pipe Ø22.2 mm
p Liquid header reducer pipe (Ø15.9 → 9.5 mm)
q Liquid header reducer pipe (Ø15.9 → 12.7 mm)
r Liquid header expander pipe (Ø15.9 → 19.1 mm)
s Gas header reducer pipe (Ø22.2 → 12.7 mm)
t Gas header reducer pipe (Ø22.2 → 15.9 mm)
u Gas header reducer pipe (Ø22.2 → 19.1 mm)
v Gas header expander pipe (Ø22.2 → 28.6 mm)

12 About the unit and options

In this chapter

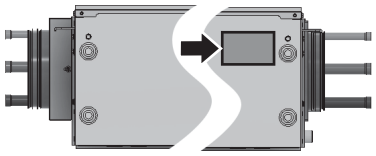
12.1 Identification

NOTICE

When installing or servicing several units at the same time, make sure NOT to switch the service panels between different models.

12.1.1 Identification label: BS unit

Location



12.2 About the operation range

INFORMATION

For the operation limits, see "14.1.1 Installation site requirements of the unit" [▸ 55].

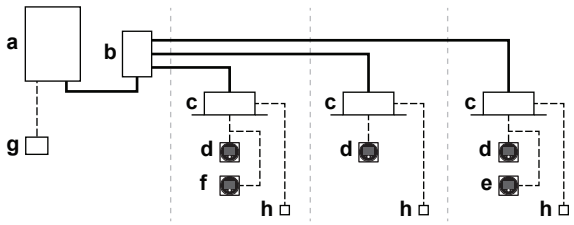
12.3 System layout

WARNING

The installation MUST comply with the requirements that apply to this R32 equipment. For more information, see "13 Special requirements for R32 units" [▸ 40].

INFORMATION

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



a Heat recovery outdoor unit
b Branch selector (BS)
c VRV direct expansion (DX) indoor unit
d Remote controller in **normal mode**
e Remote controller in **alarm only mode**
f Remote controller in **supervisor mode** (mandatory in some situations)
g iTM (optional)
h Option PCB (optional)
—— Refrigerant piping
----- Transmission and user interface wiring

12.4 Combining units and options

INFORMATION

Certain options may NOT be available in your country.

12.4.1 Possible options for the BS unit

INFORMATION

All possible options are mentioned in the option list below. For more information about an option, see the installation and operation manual of the option.

Duct connection kit (EKBSDCK)

This kit is required when you install ducting on the air inlet side. See the examples in "14.2 Possible configurations" [▸ 59] and "14.5.1 To install the ducting" [▸ 65].

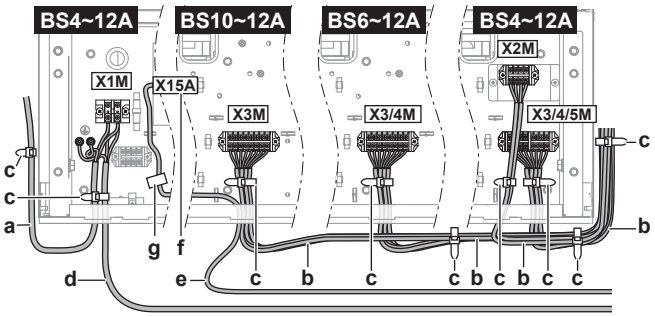
This kit can also be used when measuring the airflow. See "18.3.3 About measuring the airflow rate" [▸ 103].

Joint kit (EKBSJK)

This kit is required when you make a connection with e.g. FXMA200A and FXMA250A. When using the joint kit, change the DIP switch settings. See "16.4 To set the DIP switches" [▸ 87].

Drain up kit (K-KDU303KVE)

- Do NOT route the transmission wiring of the BS unit together with the power supply wire of the drain up kit.
- Route the power supply wire and relay harness of the drain up kit inside the BS unit as shown in the figure below.
- Position the ferrite core on the relay harness of the drain up kit inside the switch box of the BS unit.



a Power supply for the BS unit
b Transmission wiring
c Cable tie
d Power supply of the drain up kit
e Relay harness of the drain up kit
f Relay connector of the drain up kit
g Ferrite core

13 Special requirements for R32 units

In this chapter

13.1 Installation space requirements

NOTICE

- Protect pipework from physical damage.
- Keep the pipework installation to a minimum.

13.2 System layout requirements

The VRV 5 Heat Recovery uses R32 refrigerant, which is rated as A2L and is mildly flammable.

To comply with the requirements of enhanced tightness refrigerating systems of the IEC 60335-2-40, this system is equipped with shut-off valves in the BS unit and an alarm in the remote controller.

The safety measures that are needed for the BS unit are explained in more detail below. If they are followed, no additional safety measures for the BS unit are required. Carefully follow the installation requirements for the BS unit as explained in this manual. Follow the installation requirements described in the outdoor unit and indoor unit installation and operation manuals to ensure that the complete system is compliant with legislation.

Outdoor unit installation

For installation of the outdoor unit, see the installation and operation manual delivered with the outdoor unit.

Indoor unit installation

Room area limitations apply for the indoor units. Details are explained in the installation and operation manual delivered with the outdoor unit. For installation of the indoor unit, see the installation and operation manual delivered with the indoor unit. For compatibility of indoor units, see the latest version of the technical data book of the outdoor unit.

Remote controller requirements

To install the remote controller, see the installation and operation manual delivered with the remote controller. For requirements on where and how to use a remote controller and which type to use, see the installation and operation manual delivered with the outdoor unit.

BS unit installation

Depending on the room size in which the BS unit is installed and the total amount of refrigerant in the system, other safety measures are necessary. See "13.3 To determine the required safety measures" [▸ 41]. For the total amount of refrigerant in the system, see the installation and operation manual delivered with the outdoor unit.

A terminal for external output is available in the BS unit. This SVS output can be used when additional countermeasures are needed, or when the BS unit is installed in a room size where an external alarm is a sufficient safety measure. The SVS output is a potential-free contact on terminal X6M that closes in case a refrigerant leak is detected or if the R32 sensor of the BS unit fails or is disconnected.

For more information about the SVS output, see "16.5 To connect the external outputs" [▸ 88].

Piping requirements

Piping must be installed according to instructions given in "15 Piping installation" [▸ 73]. Only mechanical joints (e.g. braze connections) that are compliant with the latest version of ISO14903 can be used.

For piping installed in the occupied space, make sure that the piping is protected against accidental damage. Piping should be checked according to procedure as mentioned in the installation and operation manual delivered with the outdoor unit.

13.3 To determine the required safety measures

Step 1 – Determine the total amount of refrigerant in the system. See the installation and operation manual delivered with the outdoor unit.

Step 2 – Determine the area of the room in which the BS unit is installed:

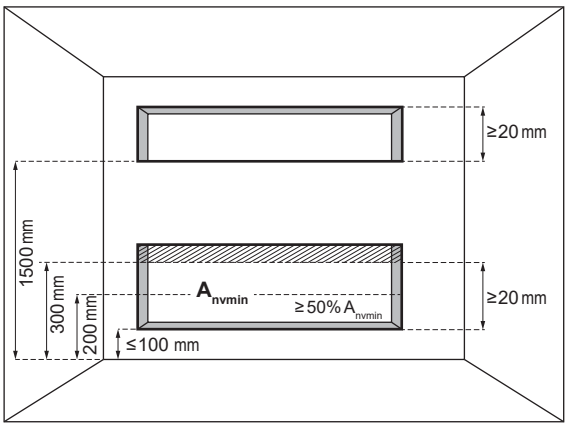
The room area can be determined by projecting the walls, doors and partitions to the floor and calculating the enclosed area.

Spaces connected only through false ceilings, ductwork, or similar connections are not considered a single space.

If the partition between two rooms on the same floor meets the requirements below, then the rooms are considered as one room and the areas of the rooms can be added up. In this way, it is possible to increase the area of the room used when determining the required safety measures.

One of the following two requirements must be met in order to add up room areas.

- Rooms on the same floor that are connected with a permanent opening that extends to the floor and is intended for people to walk through can be considered as one room.
- Rooms on the same floor connected with openings that fulfil following requirements can be considered as a single room. The opening must consist out of two parts to allow for air circulation.



A_{nvmin} Minimal natural ventilation area

For the lower opening:

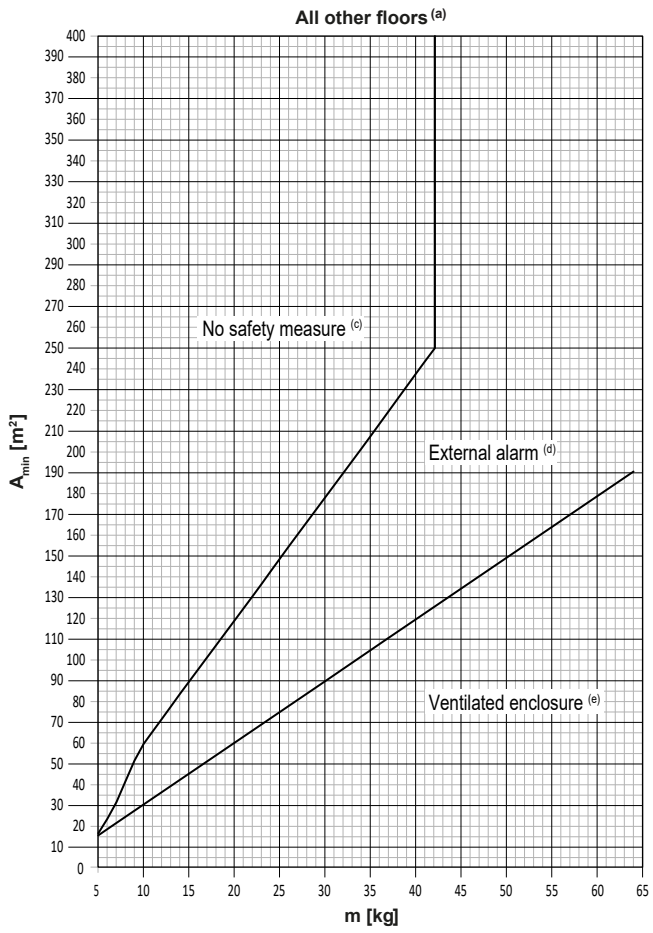
- It is not an opening to the outside
- The opening cannot be closed
- The opening must be ≥0.012 m² (A_{nvmin})
- The area of any openings above 300 mm from the floor does not count when determining A_{nvmin}
- At least 50% of A_{nvmin} is less than 200 mm above the floor
- The bottom of the lower opening is ≤100 mm from the floor
- The height of the opening is ≥20 mm

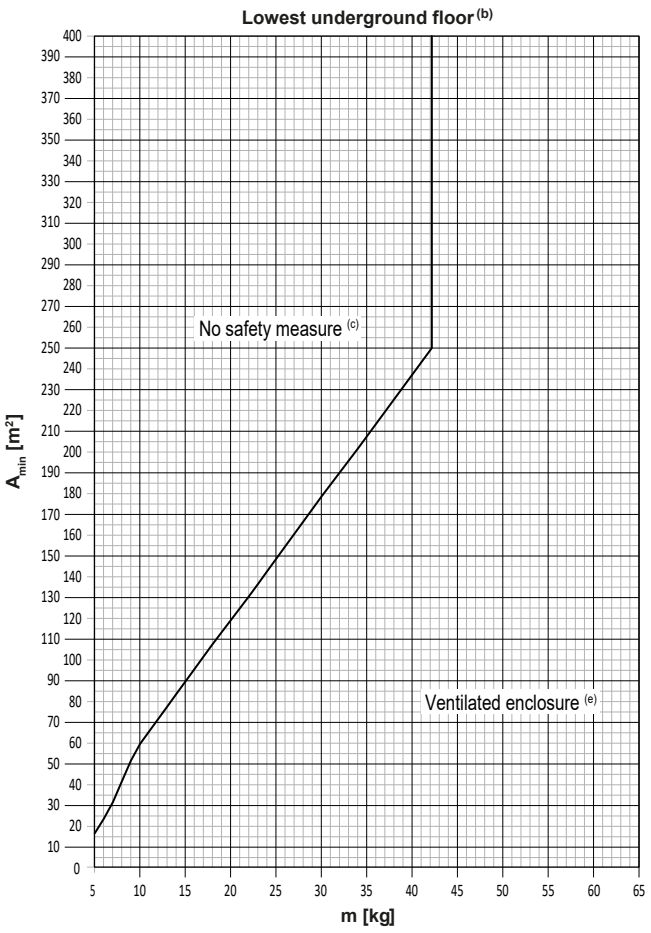
For the upper opening:

- It is not an opening to the outside
- The opening cannot be closed
- The opening must be ≥0.006 m² (50% of A_{nvmin})
- The bottom of the upper opening must be ≥1500 mm above the floor
- The height of the opening is ≥20 mm

Note: The requirement for the upper opening can be met by false ceilings, ventilation ducts or similar arrangements that provide an airflow path between the connected rooms.

Step 3 – Use the graphs or tables below to determine the required safety measures for the BS unit.





m [kg]	A_{min} [m²]		
	All other floors (a)		Lowest underground floor (b)
	No safety measure (c)	External alarm (d)	No safety measure (c)
5	16	15	16
6	23	18	23
7	31	21	31
8	41	24	41
9	51	27	51
10	59	30	59
11	65	33	65
12	71	36	71
13	77	38	77
14	83	41	83
15	89	44	89
16	95	47	95
17	101	50	101
18	107	53	107
19	113	56	113
20	118	59	118
21	124	62	124
22	130	65	130
23	136	68	136
24	142	71	142
25	148	74	148
26	154	77	154
27	160	80	160
28	166	83	166
29	172	86	172
30	178	89	178
31	184	92	184
32	190	95	190
33	195	98	195
34	201	101	201

m [kg]	A_{min} [m²]		
	All other floors (a)		Lowest underground floor (b)
	No safety measure (c)	External alarm (d)	No safety measure (c)
35	207	104	207
36	213	107	213
37	219	110	219
38	225	113	225
39	231	115	231
40	237	118	237
41	243	121	243
42	249	124	249
43	—	127	—
44	—	130	—
45	—	133	—
46	—	136	—
47	—	139	—
48	—	142	—
49	—	145	—
50	—	148	—
51	—	151	—
52	—	154	—
53	—	157	—
54	—	160	—
55	—	163	—
56	—	166	—
57	—	169	—
58	—	172	—
59	—	175	—
60	—	178	—
61	—	181	—
62	—	184	—
63	—	187	—
64	—	190	—

m Total refrigerant charge in the system [kg]
A_{min} Minimum room area [m²]
(a) All other floors (=All other floors)
(b) Lowest underground floor (=Lowest underground floor)

(c) No safety measure (=No safety measure)
(d) External alarm (=External alarm)
(e) Ventilated enclosure (=Ventilated enclosure)

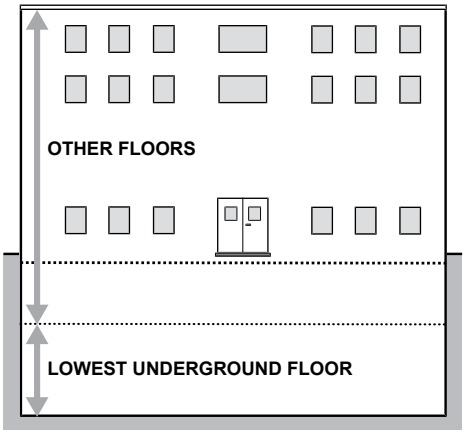
Use the total amount of refrigerant in the system and the area of the room in which the BS unit is installed to check which safety measure is required.

Note: Above a system charge of 42.2 kg, it is not allowed to use "No safety measure" for the BS unit.

Note: When "No safety measure" is required, it is still allowed to install an external alarm or ventilated enclosure if wanted. Follow the respective instructions as described further below.

Note: When an external alarm is required as safety measure, it is also allowed to install a ventilated enclosure. Follow the instructions described further below.

Use the second graph (Lowest underground floor[(b)]) in case the BS unit is installed in the lowest underground floor of a building. For other floors, use the first graph (All other floors[(a)]).



The graphs and table are based on an installation height of the BS unit between 1.8 m and 2.2 m. The installation height is the height of the bottom of the BS unit to the floor. See also "14.1.1 Installation site requirements of the unit" [▸ 55].

If the installation height is more than 2.2 m, different boundaries for the applicable safety measures can apply. To know which safety measure is required in case the installation height is more than 2.2 m, refer to the online tool (VRV Xpress).

NOTICE

BS units cannot be installed lower than 1.8 m from the lowest point of the floor.

Example

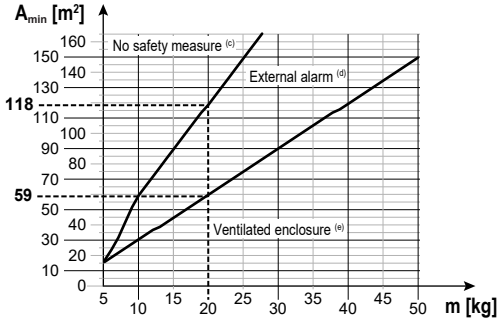
The total amount of refrigerant in the VRV system is 20 kg. All BS units are installed in spaces that do not belong to the lowest underground floor of the building. The space in which the first BS unit is installed has a room area of 125 m², the space in which the second BS unit is installed has a room area of 70 m² and the space in which the third BS unit is installed has a room area of 15 m².

- Based on the graph for "All other floors" (All other floors), the room area limits are as follows:

	A_{min}
"No safety measure" (No safety measures)	118 m²
"External alarm" (External alarm)	59 m²

- This means that the following safety measures are required:

BS unit	Room area	Required safety measure
1	A=125 m²≥118 m²	No safety measures
2	A=70 m²≥59 m²	External alarm
3	A=15 m²<59 m²	Ventilated enclosure



m Total refrigerant charge in the system [kg]
A_{min} Minimum room area [m²]
(a) All other floors (=All other floors)
(b) Lowest underground floor (=Lowest underground floor)
(c) No safety measure (=No safety measure)
(d) External alarm (=External alarm)
(e) Ventilated enclosure (=Ventilated enclosure)

13.4 Safety measures

13.4.1 No safety measure

When the room area is sufficiently large, no safety measures are required. This also includes a BS unit installed in the lowest underground floor.

The duct connection must be replaced with the duct closing plate accessory (see "14.5.2 To install the duct closing plate" [▸ 66]).

BS unit test run

Before BS unit operation, it is required to perform a test run that simulates a refrigerant leak. See "18.3 BS unit test run" [▸ 101] for more details.

Field settings

No safety measure		
Code	**Description**	**Value**
[2-0]	Cluster indication	0 (default): disable
[2-4]	Safety measures	0: disable

Note: Some field settings need to be made on all main PCBs (A1P, A2P and A3P) of the same BS unit. For more information, see "17.1 Making field settings" [▸ 91].

13.4.2 External alarm

Do NOT use the external alarm safety measure in the following cases:

- BS unit is installed in the lowest underground floor of a building.
- BS unit is installed in in an occupied space where people are restricted in their movement.

For the external alarm safety measure, the duct connection must be replaced with the duct closing plate accessory (see "14.5.2 To install the duct closing plate" [▸ 66]).

An external alarm circuit (field supply) must be connected to the SVS output of the BS unit, see "16.5 To connect the external outputs" [▸ 88].

This alarm system must warn audibly AND visibly (e.g. a loud buzzer AND a flashing light). The audible alarm must be 15 dBA above the background sound level at all times.

At least 1 alarm must be installed in the occupied space in which the BS unit is installed.

For the occupancy listed below, the alarm system must **additionally** warn at a supervised location with 24-hour monitoring:

- with sleeping facilities.
- where an uncontrolled number of people are present.
- accessible for persons not familiar with the necessary safety precautions.

To warn at a supervised location, connect a supervisor remote controller to the system. This supervisor remote controller can be connected to any indoor unit of the system, and will warn at the supervised location in case a refrigerant leak is detected in any BS unit of the system. **Note:** An address number for the supervisor remote controller must be assigned to the BS unit. See "17.1 Making field settings" [▸ 91].

When the R32 sensor in the BS unit detects a refrigerant leak, the SVS output will close and activates the alarm. An error message will display on the remote controllers of the connected indoor units. See "20 Troubleshooting" [▸ 107].

BS unit test run

Before BS unit operation, it is required to perform a test run that simulates a refrigerant leak. See "18.3 BS unit test run" [▸ 101] for more details.

Field settings

External alarm		
Code	**Description**	**Value**
[2-0]	Cluster indication	0 (default): disable
[2-4]	Safety measures	1 (default): enable
[2-7]	Ventilated enclosure	0: disable

Note: Some field settings need to be made on all main PCBs (A1P, A2P and A3P) of the same BS unit. For more information, see "17.1 Making field settings" [▸ 91].

13.4.3 Ventilated enclosure

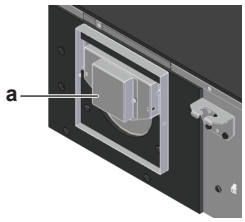
A ventilated enclosure is required as a safety measure in case the other safety measures (see "13.4.1 No safety measure" [▸ 45] and "13.4.2 External alarm" [▸ 45]) are not allowed.

For the ventilated enclosure safety measure, ductwork and an extraction fan have to be installed. See "14.5 Installing the ventilation ducting" [▸ 65] for ductwork (field supply) installation and "16.5 To connect the external outputs" [▸ 88] to connect the extraction fan circuit (field supply) to the BS unit.

Note: As an additional safety measure, an external alarm circuit (field supply) can be installed using the SVS output. See "16.5 To connect the external outputs" [▸ 88].

When the R32 sensor in the BS unit detects a refrigerant leak, it activates the safety measures. This includes opening the damper of the unit to allow air to enter, activate the fan output signal to trigger an extraction fan to operate and evacuate the refrigerant leak, and display an error message on the remote controllers of the connected indoor units.

A damper at the air inlet of the BS unit enables a choice between 3 types of configurations (see below).



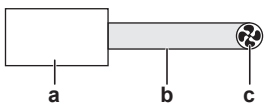
a Damper

Respect the following rules:

Ductwork	The evacuation ductwork MUST vent outside the building. Avoid that dirt, dust and small animals can enter the ductwork and lead to an obstruction. **Example:** Install a non-return valve, grill, filter or other component in the evacuation duct.
Extraction fan	The extraction fan must have a CE marking and cannot act as an ignition source during normal operation. **Example:** Brushed DC motors cause sparks and are not allowed. Fan power must be lower than 2.5 kVA.
Replacement air	Make sure that sufficient replacement air is available for the extraction of a refrigerant leak. The extraction airflow rate must be maintained for at least 6.5 hours. This is achieved by providing a sufficiently large air volume around the BS unit or by providing sufficient replacement air around the BS unit (e.g. natural openings or a dedicated opening in the false ceiling).
Maintenance	A periodic inspection of the unit is required, during which the test run is repeated (see "18.3 BS unit test run" [▸ 101]). Maintain the evacuation channel to avoid dust and dirt from building up and obstructing the flow path (see "7.2 Periodic check of the ventilated enclosure" [▸ 23]).

One BS unit – one extraction fan

In the most simple configuration, each BS unit in the system has its own evacuation channel and its own extraction fan.



a BS unit
b Ductwork
c Extraction fan

An extraction fan must be connected to the BS unit, see "16.5 To connect the external outputs" [▸ 88].

In order to size the fan, calculate the required pressure capacity. The total pressure drop in the evacuation channel consists of multiple parts: the pressure drop generated by the BS unit and the pressure drop generated by the components of the ductwork.

Select an airflow rate for the evacuation that meets the legal requirements. This means that the airflow rate is above the legally required minimum, and generates sufficient pressure difference inside the BS unit when compared with the pressure of the surroundings. The minimum required airflow rate (AFR_{OUT}) is 18.8 m³/h, and the pressure drop generated by the BS unit should lead to a pressure inside the BS unit ($P_{internal}$) that is more than 20 Pa below the pressure of the surroundings.

a BS unit
AFR_{OUT} Airflow
$P_{internal}$ Internal pressure

It is advised to take a safety margin on these minimum values when designing the evacuation channel in order to account for tolerances on parts, dirt and dust building up in the evacuation channel over time, etc.

Note: The internal pressure of the BS unit should not be more than 350 Pa below the pressure of the surroundings.

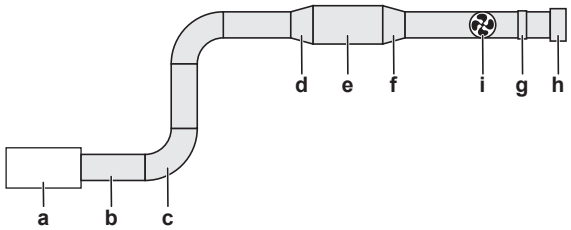
Write down the pressure drop generated by all the components in the evacuation channel for the selected airflow rate. For the BS unit, use the curve that presents the pressure at the outlet (P_{OUT}) in function of the airflow rate (AFR_{OUT}). See the latest version of the technical engineering data for the pressure drop curves of the BS unit.

a BS unit
AFR_{OUT} Airflow
P_{OUT} Outlet pressure

For the pressure drop caused by other components of the evacuation channel (ducts, bends, etc.), use the curves of the manufacturer.

Use the airflow rate and the sum of the pressure drops to select a suitable fan.

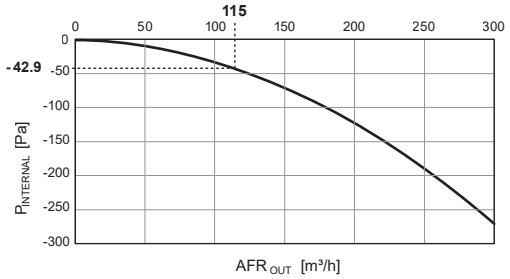
Example



a BS unit
b~h Ductwork (duct, bend, reducer, expander, non-return valve, wall grill, etc.)
i Extraction fan

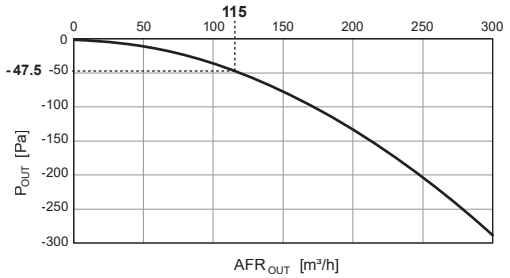
In this example we use a BS12A unit. Use the curve of the internal pressure inside the BS unit ($P_{internal}$) in function of the airflow rate (AFR_{OUT}). When an airflow rate of 115 m³/h is selected, the pressure inside the BS unit is 42.9 Pa below the pressure of the surroundings. So this airflow rate is above the required 18.8 m³/h and the

pressure inside the BS unit is within the range of 20~350 Pa below the pressure of the surroundings. We use this 115 m³/h airflow rate for further calculations.

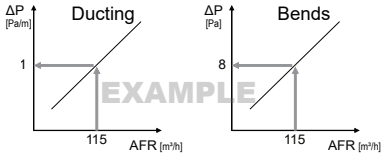


Note: These curves present the internal pressure of the BS unit compared to an ambient pressure of 101325 Pa.

Use the curve of the outlet pressure (P_{OUT}) in function of the airflow rate (AFR_{OUT}) for the BS unit. With an airflow rate of 115 m³/h, the resulting pressure drop generated by the BS unit is 47.5 Pa.



Use the curves, with instructions how to read them, of the manufacturer of the components to find the pressure drop generated by all components in the ductwork. A conversion of units might be required. Beware that for ducting, the pressure drop from the manufacturer might be given per unit length of ducting (units are for example Pa/m). Multiply this value by the duct length to find the total pressure drop.



Write down the pressure drop of each component in an overview table. Sum up the pressure drops.

№	Indication	Type	AFR [m³/h]	Length [m]	ΔP [Pa/m]	ΔP [Pa]
1	a	BS unit	115	-	-	47.5
2	b	Duct	"	5	1	5
3	c	Bend	"	-	-	8
4	b	Duct	"	10	1	10
5	c	Bend	"	-	-	8
6	b	Duct	"	2	1	2
7	d	Expander	"	-	-	4
8	e	Duct	"	6	0.5	3
9	f	Reducer	"	-	-	6
10	b	Duct	"	2	1	2
11	b	Duct	"	1	1	1
12	g	Non-return valve	"	-	-	11
13	b	Duct	"	1	1	1
14	h	Wall grill	"	-	-	15
					Total pressure drop (sum of rows 1 to 14)	**123.5**

Select a fan with the required flow of 115 m³/h and a total pressure rise of 123.5 Pa.

Note: For ease of installation, we recommend to use in-line duct fans.

BS unit test run

Before BS unit operation, it is required to perform a test run that simulates a refrigerant leak. See "18.3 BS unit test run" [▸ 101] for more details.

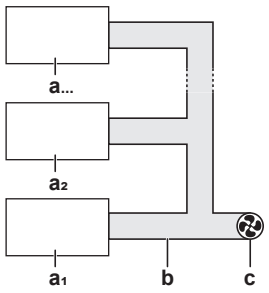
Field settings

1 BS unit – 1 extraction fan		
Code	**Description**	**Value**
[2-0]	Cluster indication	0 (default): disable
[2-4]	Safety measures	1 (default): enable
[2-7]	Ventilated enclosure	1 (default): enable

Note: Some field settings need to be made on all main PCBs (A1P, A2P and A3P) of the same BS unit. For more information, see "17.1 Making field settings" [▸ 91].

Multiple BS units in parallel – 1 extraction fan

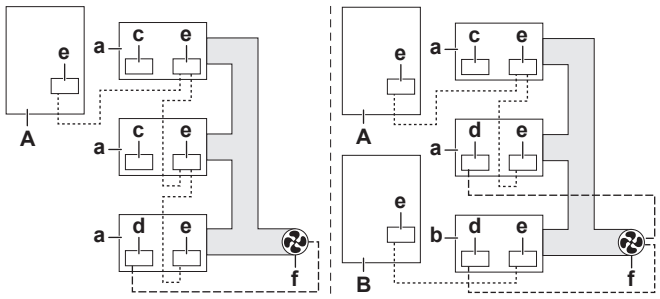
In this configuration, multiple parallel BS units are connected to a single extraction fan. Each BS unit benefits from a direct airflow path to the extraction fan. In case of a refrigerant leak in any BS unit, the damper of that BS unit will open and allow direct air evacuation to the extraction fan. The dampers of the other BS units remain closed.



a# BS unit #
b Ductwork
c Extraction fan

It is sufficient to connect the extraction fan circuit to only 1 BS unit of the cluster (=BS units that belong to the same ductwork and extraction fan) (see "16.5 To connect the external outputs" [▸ 88]). If in a cluster there are BS units that belong to different outdoor unit systems, the fan circuit must be connected to 1 BS unit (in the cluster) of each outdoor unit system.

Example



a BS unit belonging to outdoor unit A
b BS unit belonging to outdoor unit B

c Extraction fan output terminal – NOT connected
d Extraction fan output terminal – connected
e Transmission wiring terminal
f Extraction fan
A Outdoor unit A
B Outdoor unit B
····· Transmission wiring
----- Extraction fan output wiring

An online tool (VRV Xpress) is available to find the required pressure capacity for selecting the correct fan size. Only use this online tool for the calculation.

BS unit test run

Before BS unit operation, it is required to perform a test run that simulates a refrigerant leak. See "18.3 BS unit test run" [▸ 101] for more details.

Field settings

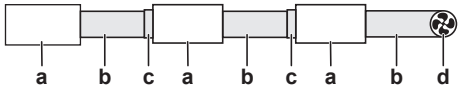
Multiple BS units in parallel – 1 extraction fan		
Code	**Description**	**Value**
[2-0]	Cluster indication	1: enable
[2-1]	Cluster number	#[(a)]
[2-2]	Cluster configuration	0 (default): parallel
[2-4]	Safety measures	1 (default): enable
[2-7]	Ventilated enclosure	1 (default): enable

[(a)] Assign a unique cluster number to each cluster in the system. All BS units in the same cluster MUST have the same cluster number.

Note: Some field settings need to be made on all main PCBs (A1P, A2P and A3P) of the same BS unit. For more information, see "17.1 Making field settings" [▸ 91].

Multiple BS units in series – 1 extraction fan

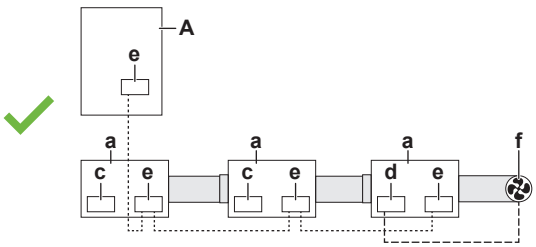
In this configuration, multiple BS units are connected in series to a single extraction fan. The air flows through every BS unit to the extraction fan. In case of a refrigerant leak in any BS unit, the dampers of all BS units will open and allow air evacuation to the extraction fan.

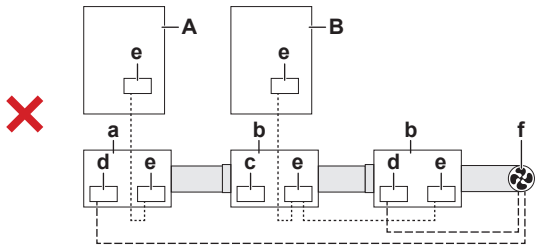


a BS unit
b Ductwork
c EKBSDCK
d Extraction fan

It is sufficient to connect the extraction fan circuit to only 1 BS unit of the cluster (see "16.5 To connect the external outputs" [▸ 88]). It is not allowed to have BS units in the same series cluster that belong to different outdoor unit systems.

Example





a BS unit belonging to outdoor unit A
b BS unit belonging to outdoor unit B
c Extraction fan output terminal – NOT connected
d Extraction fan output terminal – connected
e Transmission wiring terminal
f Extraction fan
A Outdoor unit A
B Outdoor unit B
..... Transmission wiring
----- Extraction fan output wiring
✓ Allowed
✗ NOT allowed

The option kit EKBSDCK is required each time a duct is connected to the air inlet (damper side) of the BS unit.

An online tool (VRV Xpress) is available to find the required pressure capacity for selecting the correct fan size. Only use this online tool for the calculation.

BS unit test run

Before BS unit operation, it is required to perform a test run that simulates a refrigerant leak. See "18.3 BS unit test run" [▸ 101] for more details.

Field settings

Multiple BS units in series – 1 extraction fan		
Code	**Description**	**Value**
[2-0]	Cluster indication	1: enable
[2-1]	Cluster number	#[(a)]
[2-2]	Cluster configuration	1: series
[2-4]	Safety measures	1 (default): enable
[2-7]	Ventilated enclosure	1 (default): enable

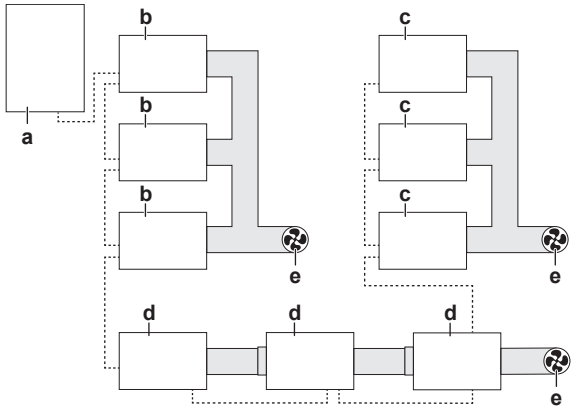
[(a)] Assign a unique cluster number to each cluster in the system. All BS units in the same cluster MUST have the same cluster number.

Note: Some field settings need to be made on all main PCBs (A1P, A2P and A3P) of the same BS unit. For more information, see "17.1 Making field settings" [▸ 91].

13.5 Combinations of ventilated enclosure configurations

It is possible to combine different ventilated enclosure configurations (clusters) in the same system. To do this, assign a unique cluster value to each cluster. All the BS units in the same cluster need to be assigned the same cluster number.

Example



a Outdoor unit
b BS unit belonging to cluster 1
c BS unit belonging to cluster 2
d BS unit belonging to cluster 3
e Extraction fan
..... Transmission wiring

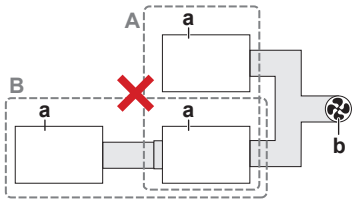
Field settings

Code	Description	Value		
		Cluster		
		1	2	3
[2-0]	Cluster indication	1: enable		
[2-1]	Cluster number	1	2	3
[2-2]	Cluster configuration	0 (default): parallel		1: series
[2-4]	Safety measures	1 (default): enable		
[2-7]	Ventilated enclosure	1 (default): enable		

Note: Some field settings need to be made on all main PCBs (A1P, A2P and A3P) of the same BS unit. For more information, see "17.1 Making field settings" [▸ 91].

Example

It is not allowed to combine parallel and series configurations within the same cluster.

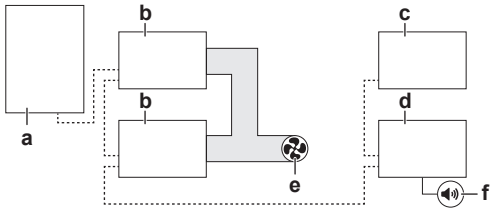


a BS unit
b Extraction fan
A Parallel configuration
B Series configuration
✕ NOT allowed

13.6 Combinations of safety measures

It is possible to combine BS units with different safety measures (no safety measures, external alarm and ventilated enclosure) in the same system.

Example



a Outdoor unit
b BS unit with ventilated enclosure safety measure
c BS unit without safety measures
d BS unit with external alarm safety measure
e Extraction fan
f External alarm
..... Transmission wiring

Field settings

BS units (b) with ventilated enclosure safety measure		
Code	**Description**	**Value**
[2-0]	Cluster indication	1: enable
[2-1]	Cluster number	1
[2-2]	Cluster configuration	0 (default): parallel
[2-4]	Safety measures	1 (default): enable
[2-7]	Ventilated enclosure	1 (default): enable

BS units (c) without safety measures		
Code	**Description**	**Value**
[2-0]	Cluster indication	0 (default): disable
[2-4]	Safety measures	0: disable

BS units (d) with external alarm safety measure		
Code	**Description**	**Value**
[2-0]	Cluster indication	0 (default): disable
[2-4]	Safety measures	1 (default): enable
[2-7]	Ventilated enclosure	0: disable

Note: Some field settings need to be made on all main PCBs (A1P, A2P and A3P) of the same BS unit. For more information, see "17.1 Making field settings" [▸ 91].

14 Unit installation

WARNING

The installation MUST comply with the requirements that apply to this R32 equipment. For more information, see "13 Special requirements for R32 units" [▶ 40].

In this chapter

14.1 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.

WARNING

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

14.1.1 Installation site requirements of the unit

CAUTION

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

This unit 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.

NOTICE

If the equipment is installed closer than 30 m to a residential location, the professional installer MUST evaluate the EMC situation before installation.

NOTICE

The installation and any maintenance requires a professional with relevant EMC experience to install any specific EMC mitigation measures defined in the user instructions.

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 3 m or more to avoid electromagnetic interference of other equipment and use conduit tubes for power and transmission lines.

INFORMATION

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

INFORMATION

The sound pressure level is less than 70 dBA.

INFORMATION

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

INFORMATION

Also read the following requirements:

- Service space requirements. See below in this topic.
- Refrigerant piping requirements. See "15 Piping installation" [▸ 73].

Safety measures differ depending on the total amount of refrigerant in the system and on the floor area. See "13.3 To determine the required safety measures" [▸ 41].

The BS unit is designed for indoor installation only. Always respect the following conditions.

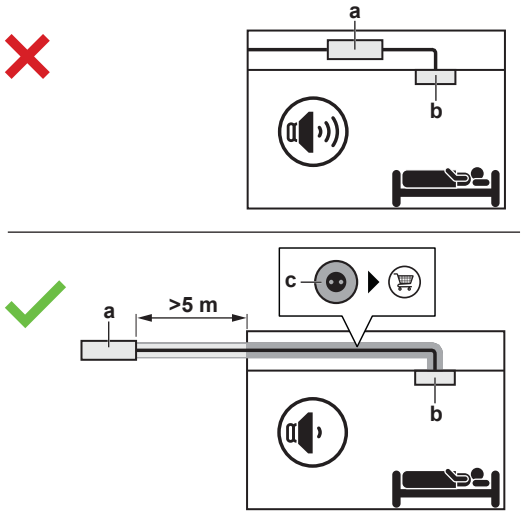
Ambient condition	Value
Indoor temperature	15~32°C DB
Indoor humidity	≤80%

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.
- Where acidic or alkaline vapour is present.
- In vehicles or vessels.

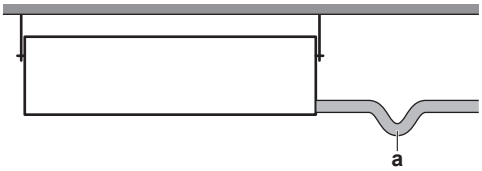
It is NOT recommended to install the unit in the following places because it may shorten the life of the unit:

- In places where voltage fluctuates a lot.
- **Water leakage.** Take care that in the event of a water leak, water CANNOT cause any damage to the installation space and its surroundings.
- **Noise.** Choose a location where the operation noise of the unit does not disturb the room occupants. To avoid that the refrigerant noise disturbs the people in the room, keep at least 5 m of piping between the occupied room and the BS unit. If there is no false ceiling in the room, it is advised to add sound insulation around the piping between the BS unit and the indoor unit, or to keep more length between the BS unit and the indoor unit.



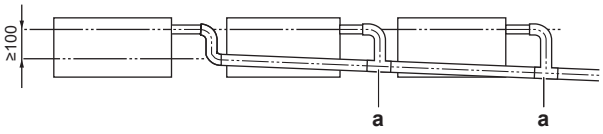
a BS unit
b Indoor unit
c Sound insulation (field supply)

- **Drainage.** Make sure condensation water can be evacuated properly.
- **Drain pipe length.** Keep drain piping as short as possible.
- **Drain pipe size.** Keep the pipe size equal to or greater than that of the connecting pipe (vinyl pipe of 20 mm nominal diameter and 26 mm outer diameter).
- **Bad odours.** To prevent bad odours and air going into the unit through the drain piping, install a trap.



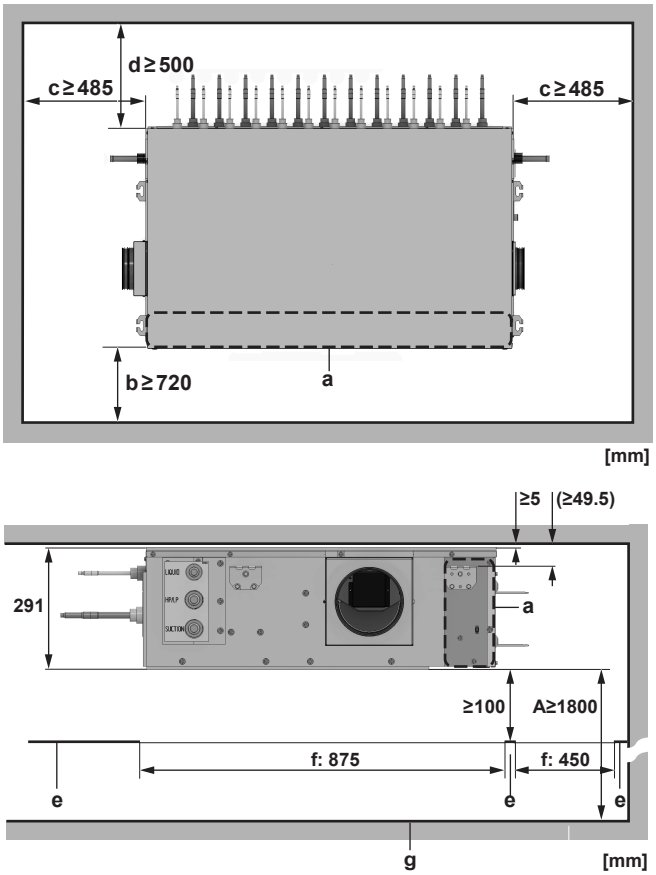
a Trap

- **Ammonia.** Do not connect the drain piping directly to sewage pipes that smell of ammonia. The ammonia in the sewage pipe might enter the unit through the drain piping and cause corrosion.
- **Combining drain pipes.** It is possible to combine drain pipes. Use drain pipes and T-joints with the correct gauge for the operating capacity of the units.



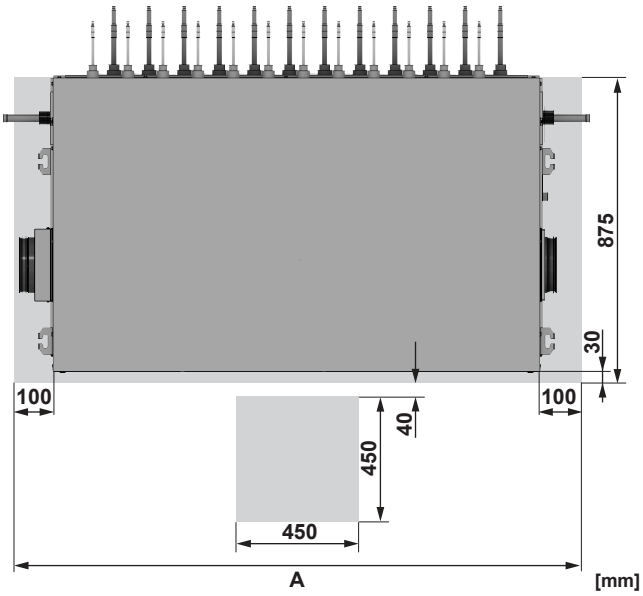
a T-joint

- **Spacing.** Respect the following requirements:



A Minimum distance to the floor
a Switch box
b Maintenance space
c Minimum connection space for refrigerant piping coming from the outdoor unit, or for piping coming from or going to another BS unit, drain piping and ducting
d Minimum connection space for the refrigerant piping to the indoor units
e False ceiling
f False ceiling opening
g Floor surface

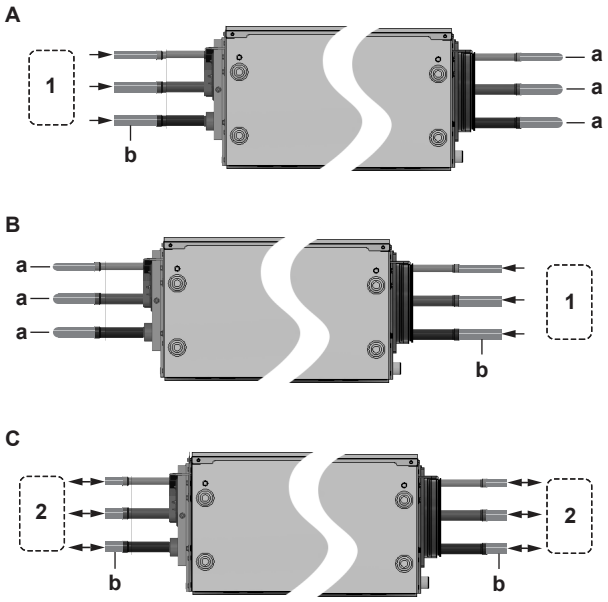
- **Ceiling strength**. Check whether the ceiling is strong enough to support the weight of the unit. If there is a risk, reinforce the ceiling before installing the unit.
  - For existing ceilings, use anchors.
  - For new ceilings, use sunken inserts, sunken anchors or other field supplied parts.
- **Ceiling openings.** Respect the following sizes and positions for the ceiling openings:



A Ceiling opening size:
800 mm (BS4A)
1200 mm (BS6~8A)
1600 mm (BS10~12A)

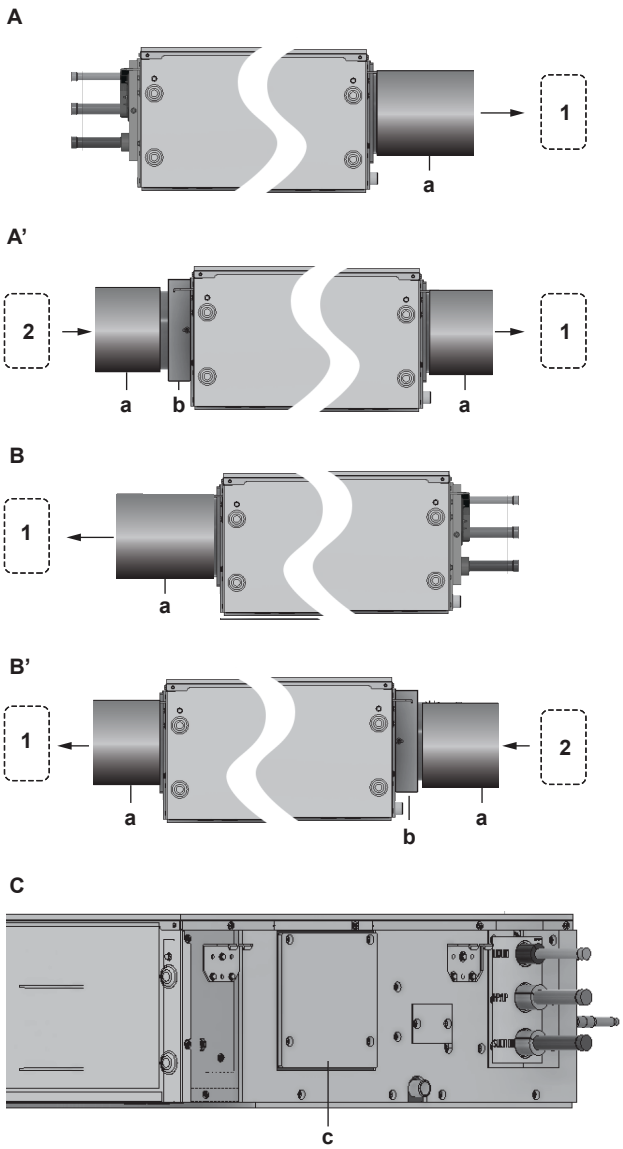
14.2 Possible configurations

Refrigerant piping



A Refrigerant piping connected to left side only
B Refrigerant piping connected to right side only
C Refrigerant piping connected to both sides (flow-through)
1 From outdoor or from BS unit
2 From outdoor or from/to BS unit
a Stopper pipes (accessory)
b Field piping (field supply)

Ducting



A Default flow. Only ducting on the air outlet side. (Default configuration)
A' Default flow. Ducting on both sides.
B Reversed flow. Only ducting on the air outlet side.
B' Reversed flow. Ducting on both sides.
C No extraction ventilation installed
1 To extraction fan or another BS unit
2 From another BS unit
a Duct (field supply)
b EKBSDCK (option kit)
c Duct closing plate (accessory)

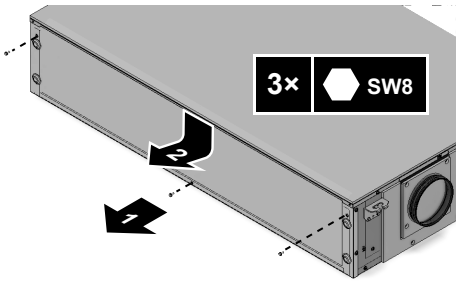
In case you need to reverse the airflow, switch the air inlet and outlet side. See "14.5.3 To switch the air in- and outlet side" [▸ 67].

INFORMATION

Some options may require additional service space. Sees the installation manual of the used option before installation.

14.3 Opening and closing the unit

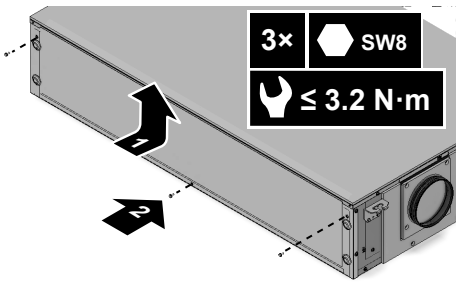
14.3.1 To open the unit



DANGER: RISK OF ELECTROCUTION

Do NOT leave the unit unattended when the service cover is removed.

14.3.2 To close the unit



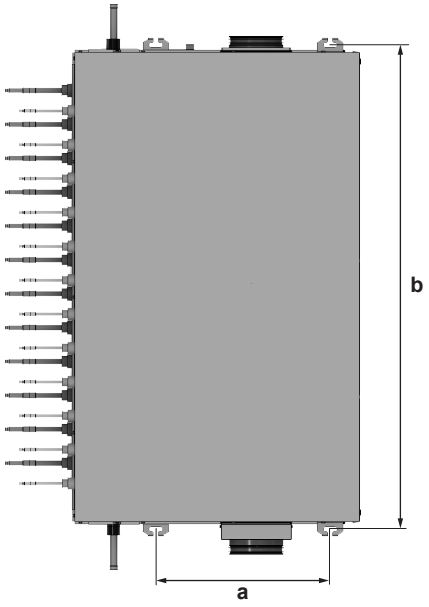
14.4 Mounting the unit

14.4.1 To mount the unit

INFORMATION

Optional equipment. When installing optional equipment, also read the installation manual of the optional equipment. Depending on the field conditions, it might be easier to install the optional equipment first.

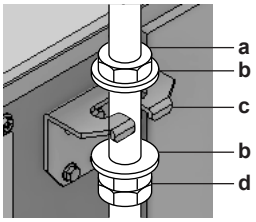
1 Install 4 M8 or M10 suspension bolts into the ceiling slab. Respect the following distances:



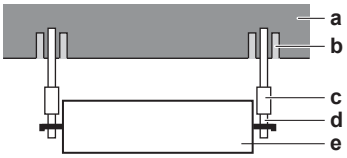
a Suspension bolt pitch (length): 513 mm
b Suspension bolt pitch (width):
630 mm (BS4A)
1030 mm (BS6~8A)
1430 mm (BS10~12A)

2 Install a nut, 2 washers and a double nut onto each suspension bolt. Leave enough space for maneuvering with the unit between the nut and double nut.

3 Position the unit by hooking the hanger brackets of the unit around the suspension bolts, in between the 2 washers.



a Nut (field supply)
b Washer (field supply)
c Hanger bracket
d Double nut (field supply)



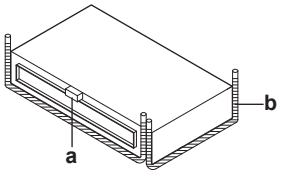
a Ceiling slab
b Anchor bolt
c Long nut or turnbuckle
d Suspension bolt
e BS unit

4 Secure the unit by tightening the nut and double nut.

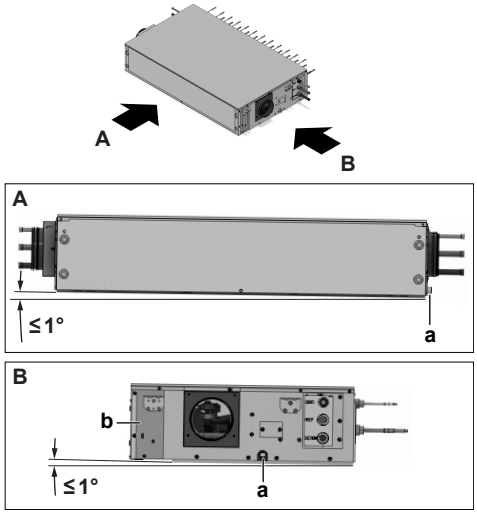
5 Level the unit at all 4 corners by turning the double nuts, the long nuts or the turnbuckles. Use a level or water-filled vinyl tube to measure if the unit hangs level. A deviation of maximum 1 degree is allowed in the direction of the drain socket and away from the switch box.

NOTICE

If the unit is installed at a bigger angle than allowed, water may drip from the unit.



a Level
b Water-filled vinyl tube



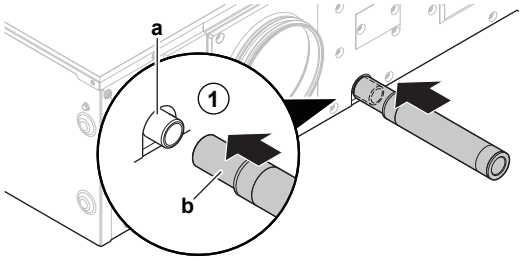
a Drain socket
b Switch box

14.4.2 To connect the drain piping

NOTICE

Incorrect connection of the drain hose might cause leaks, and damage the installation space and surroundings.

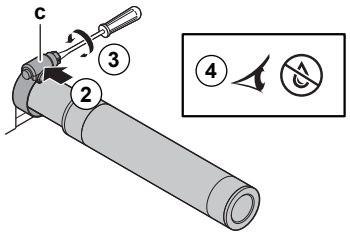
1 Push the drain hose as far as possible over the drain pipe connection.



a Drain pipe connection (attached to the unit)
b Drain hose (accessory)

2 Position the metal clamp around the drain hose, as close to the unit as possible.

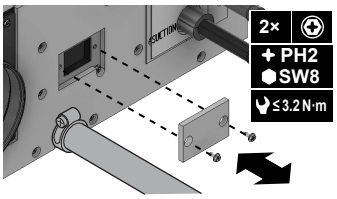
3 Tighten the metal clamp and bend the tip of the metal clamp so that the large, self-adhesive sealing pad (accessory) will not be forced outwards when applied.



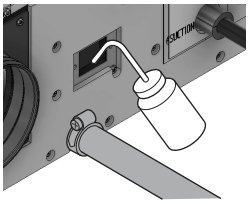
c Metal clamp (accessory)

4 Check if the water drains correctly.

- Open the inspection hole by removing the inspection hole cover.



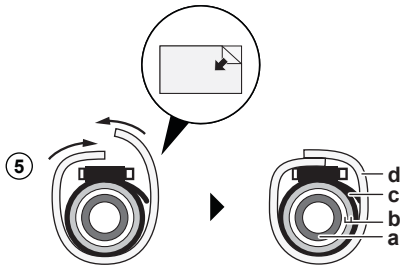
- Gradually add water through the inspection hole.



- Verify that the water flows through the drain hose and check for water leaks.
- Close the inspection hole.

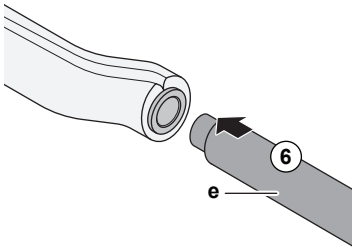
5 Wind the large, self-adhesive sealing pad (accessory) around the metal clamp and drain hose.

Note: Start on the screw part of the metal clamp, work your way around the clamp and end overlapping your starting point.



a Drain pipe connection (attached to the unit)
b Drain hose (accessory)
c Metal clamp (accessory)
d Large, self-adhesive sealing pad (accessory)

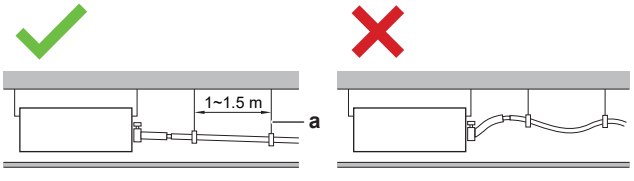
6 Connect the drain piping to the drain hose.



e Drain piping (field supply)

14.4.3 To install the drain piping

1 Install the drain piping with hanging bars as shown in the illustration.



a Hanging bar
✓ Allowed
✗ Not allowed

2 Provide a downwards slope (at least 1/100) to prevent air from being trapped in the piping. If unable to provide an adequate slope for the drain, use the drain up kit (K-KDU303KVE).

3 Insulate the complete drain piping in the building to prevent condensation.

14.5 Installing the ventilation ducting

14.5.1 To install the ducting

The ducting is field supplied.

Ducting is only necessary in case the safety measures require a ventilated enclosure. See "13.4.3 Ventilated enclosure" [▸ 46].

WARNING

Do NOT install operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater) in the duct work.

CAUTION

If the metal duct passes through a metal lath, wire lath or metal plate of the wooden structure, separate the duct and wall electrically.

1 Connect the air outlet.

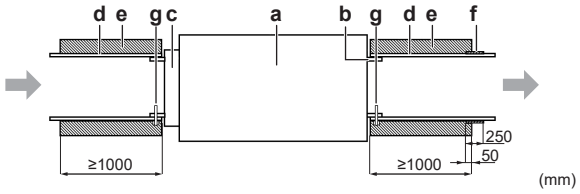
- Position a 160 mm duct of at least 1 m over the unit duct connection.
- Fix the duct to the duct connection with minimum 3 screws.
- Follow the instructions of the duct manufacturer for other connections.
- Install the first meter of the air outlet duct after the unit in such a way that it does not slope downward.
- Make sure the connections to the unit or any other connections in the system do not leak air.

2 In case of series configuration: connect the air inlet.

- Install option kit EKBSDCK onto the damper. See "12.4.1 Possible options for the BS unit" [▸ 38].
- Position a 160 mm duct over the option kit.
- Fix the duct to the option kit with minimum 3 screws.
- Follow the instructions of the duct manufacturer for other connections.
- Make sure the connections to the unit or any other connections in the system do not leak air.

3 Insulate the ducting with field supply thermal insulation and with the accessory sealing material (against condensation drops).

- Insulate at least the first meter of ducting against thermal losses with glass wool or polyethylene foam (field supply) with a minimum thickness according to the expected ambient conditions. See "15.2 Preparing refrigerant piping" [▸ 74].
- If both sides of the unit have ducting, insulate both sides.
- Install the accessory sealing material at the end of the field supply insulation of the air outlet. Apply the accessory sealing material under the field supply insulation. Create an overlap of 50 mm. If the entire outlet duct is thermally insulated from the unit to the outside wall, the accessory sealing material is not necessary.



a BS unit
b Duct connection (air outlet)
c Option kit EKBSDCK (air inlet)
d Duct (field supply)
e Insulation (field supply)
f Sealing material (accessory)
g Screw (field supply)

4 Protect the ducting against reverse airflow from wind.

5 Prevent that animals, debris and dust can enter the ducting.

6 If necessary, separate the duct and wall electrically.

7 Optionally: provide service holes in the ducting to make maintenance easier.

8 Optionally: provide sound insulation. As the ducting is only used when a refrigerant leak has been detected, it is not necessary to insulate the ducting against noise. However, when the BS unit is installed in sound-sensitive areas where additional measures are taken, it can be advised to also insulate the ducting.

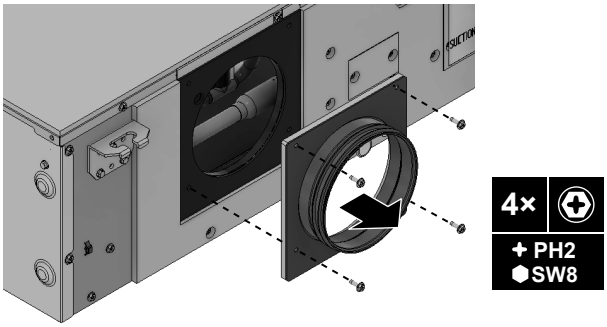
14.5.2 To install the duct closing plate

The duct closing plate is only allowed if it is not necessary to ventilate the enclosure for the BS unit. This means:

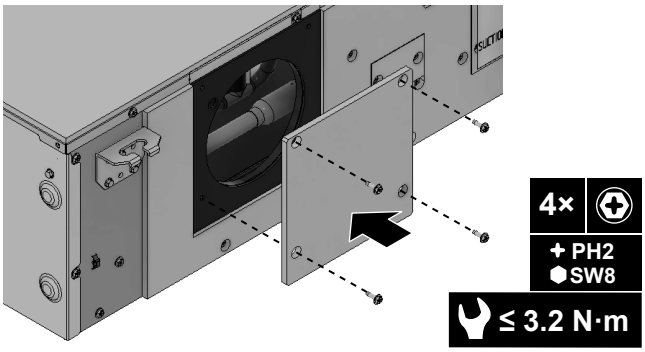
- when no safety measures are required, or
- when an external alarm is required.

See "13.3 To determine the required safety measures" [▸ 41].

1 Remove the duct connection. Do not not throw away the screws.



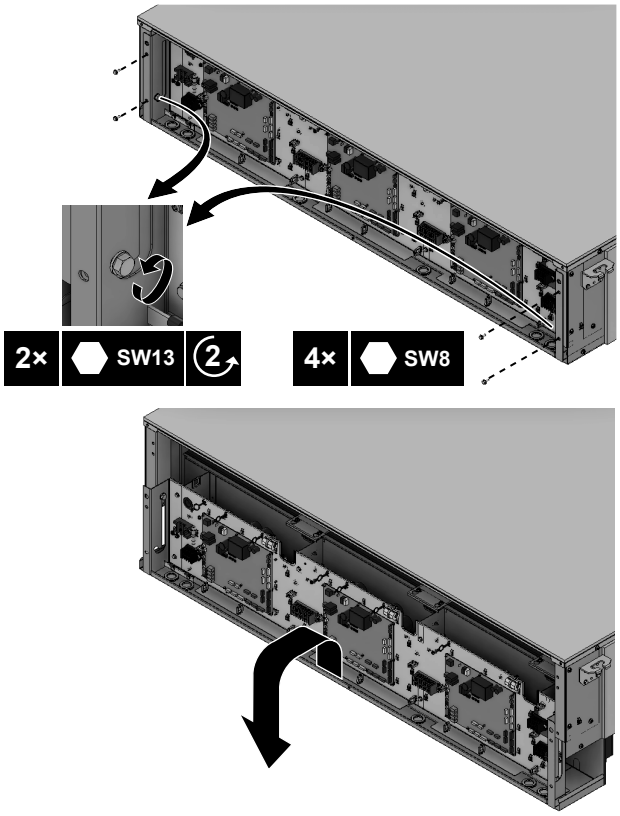
2 Install the duct closing plate (accessory) using the same 4 screws.



14.5.3 To switch the air in- and outlet side

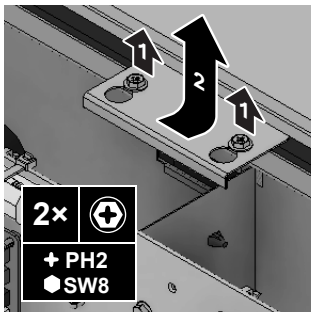
To lower the switch box

1. Open the BS unit. See "14.3.1 To open the unit" [▸ 61].
2. Remove the 4 screws.
3. Store the screws in a safe place.
4. Loosen the M8 bolts 2 turns without removing them.
5. Lift the switch box, pull it forward and lower it.

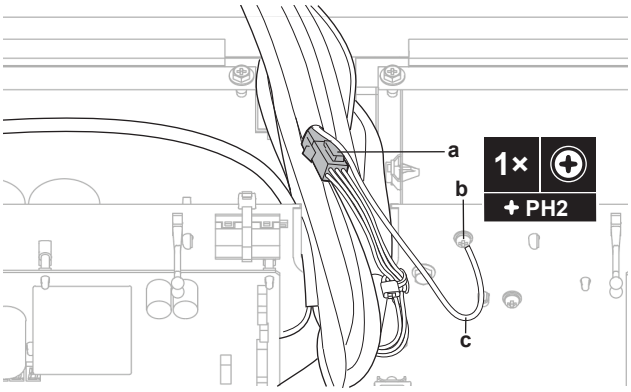


To remove the damper

1. Remove the leftmost wire fixing plate. It holds the damper wire in place.
   - Loosen the screws lightly without removing them.
   - Slide and lift the plate.

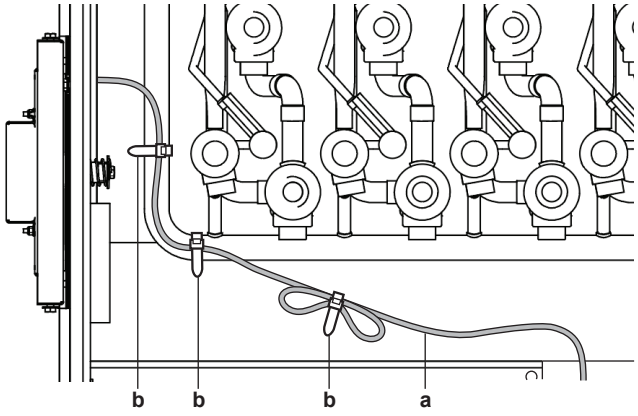


2 Loosen the damper wires.



a Connector
b Earth wire screw
c Damper earth wire

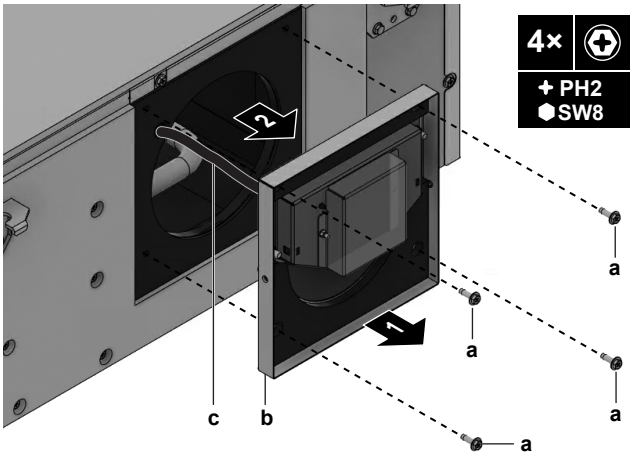
- Unplug the damper wire from the intermediate connector.
- Loosen and remove the damper earth wire screw and detach the damper earth wire.
- Store the screw in a safe place.
- Cut the cable ties that fix the damper wire to the pipe, and the one that bundles the damper wire.



a Damper wire
b Cable ties

3 Remove the damper.

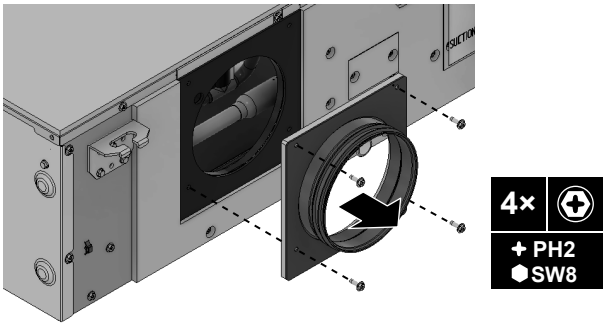
- Remove the 4 screws.
- Store the screws in a safe place.
- Pull the damper from the unit. Do not use excessive force, as the wires on the back of the damper can get stuck inside the unit.
- Carefully guide the wires from the inside to the outside through the small hole in the unit's metal plate. Take care not to damage the connector and the earth wire connection.



a Screw
b Damper
c Damper wire

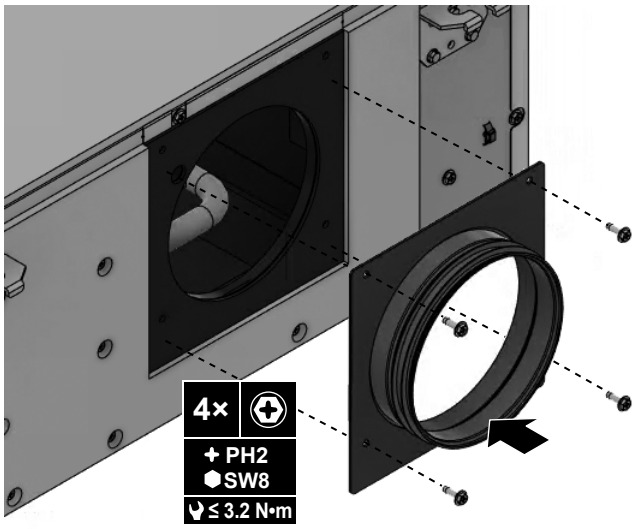
To remove the duct connection

1. Remove the 4 screws.
2. Store the screws in a safe place.
3. Pull the duct connection from the unit.



To install the duct connection

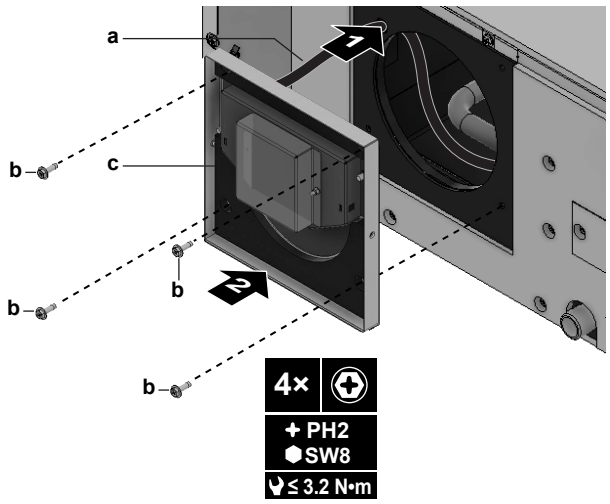
1. Position the duct connection onto the other side of the unit.
2. Attach the duct connection with 4 screws.



To install the damper

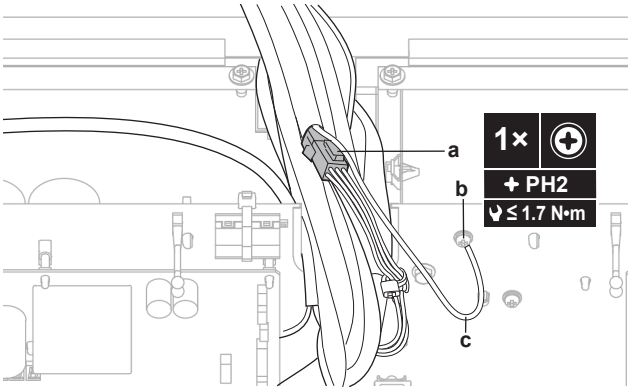
1 Install the damper on the other side of the unit.

- Carefully guide the wires from the outside to the inside through the small hole in the unit's metal plate. Take care not to damage the connector and the earth wire connection.
- Position the damper onto the unit. Take care not to pinch and damage the wires between the damper and the unit.
- Pull the wires through until the foam insulation fits properly in the small hole in the unit's metal plate. This makes the connection airtight.
- Attach the damper with 4 screws.



a Damper wire
b Screw
c Damper

2 Connect the damper wires.

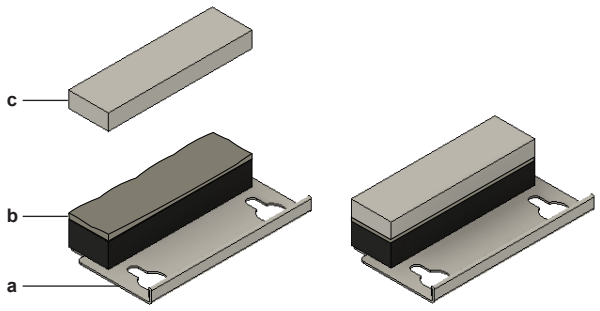


a Connector
b Earth wire screw
c Damper earth wire

- Connect the damper wire to the intermediate connector.
- Position the damper earth wire and tighten the damper earth wire screw.

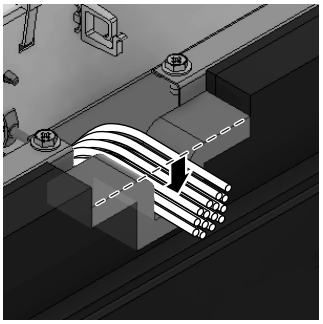
3 Install the leftmost wire fixing plate. It holds the damper wire in place.

- Restore the insulation of the wiring fixing plate by applying the small accessory insulation piece on top of the old, flattened insulation.

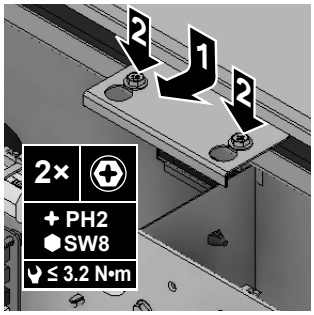


a Wire fixing plate
b Old insulation
c New insulation (accessory)

- Position the wires as far down as possible in the opening on top of which the wire fixing plate will be installed.

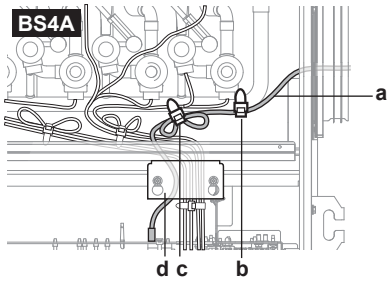


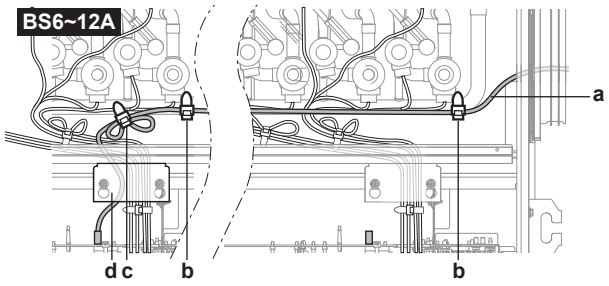
- Position the wire fixing plate over the screws and slide it in place. Make sure the backside is aligned properly with the insulation of the switch box, in order to make it airtight.
- Tighten the 2 screws.



4 Attach the damper wires.

- Attach the damper wire on the refrigerant piping, in the indicated places. Make sure the wire is tight, but do not pull on it excessively.
- Leave 20 cm of wire between the fixation on the pipe and the entry into the switch box in order to be able to put back the switch box.
- Bundle the damper wire if needed.

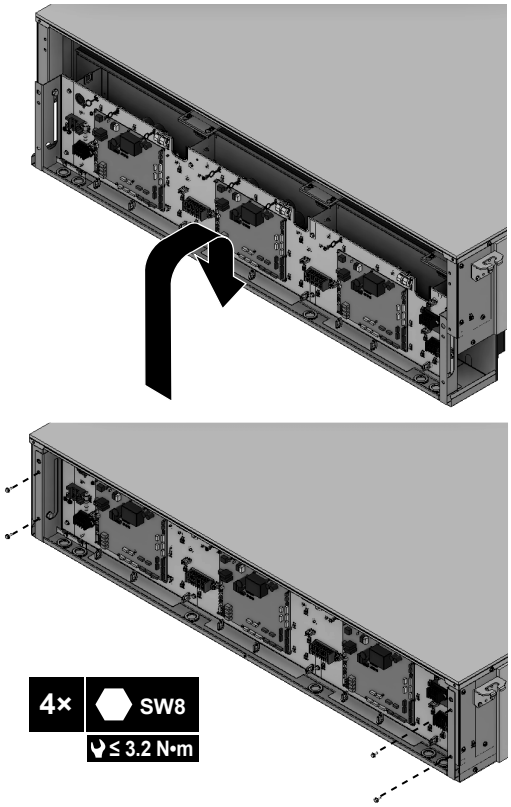




a Damper wire
b Tie wrap to fix damper wire to piping (field supply)
c Tie wrap to bundle the damper wire (field supply)
d Leftmost wire fixing plate

To re-install the switch box

1. Lift the switch box, slide it backwards and lower it a short distance.
2. Install and tighten the 4 screws. It is not required to tighten the M8 bolts again.



3. Close the BS unit. See "14.3.2 To close the unit" [▸ 61].

15 Piping installation

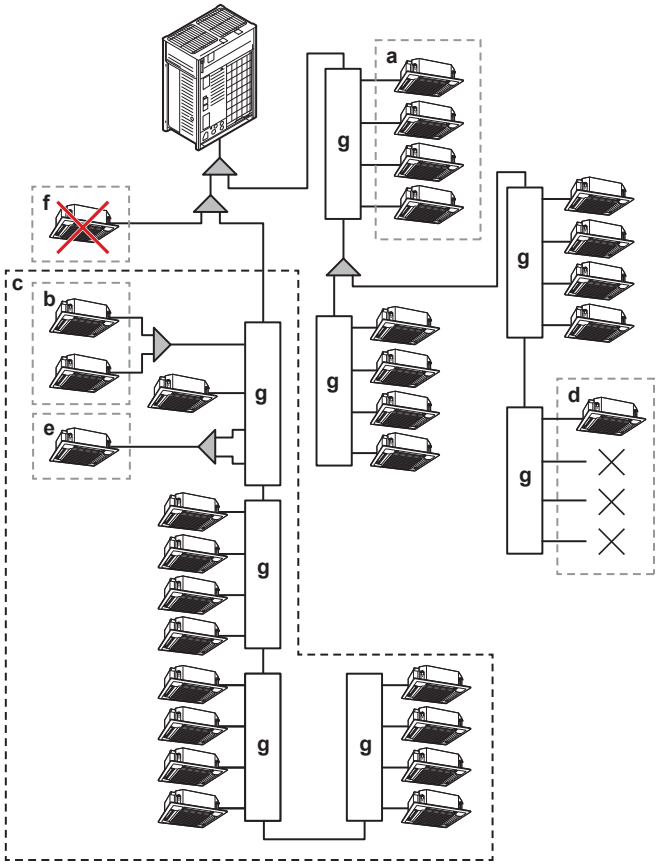
CAUTION

See "3 Specific installer safety instructions" [▶ 10] to make sure this installation complies with all safety regulations.

In this chapter

15.1 Installation limitations

The illustration and table below show the installation limitations.



a, b See table below
c Maximum limit of 16 downstream ports of BS units in refrigerant flow-through. Unused ports must also be counted. E.g. 16 ports=BS12A+BS4A or BS8A+BS4A +BS4A
d At least 1 indoor unit must be connected to a BS unit
e Combine 2 ports when indoor unit capacity is over 140
f Cooling only indoor units cannot be installed. All indoor units must be connected to the branch pipes of a BS unit
g BS unit

Description	Model				
	BS4A	BS6A	BS8A	BS10A	BS12A
Maximum number of connectable indoor units per BS unit (**a**)	20	30	40	50	60
Maximum number of connectable indoor units per BS unit branch (**b**)	5				
Maximum capacity index of connectable indoor units per BS unit (**a**)	400	600	750		
Maximum capacity index of connectable indoor units per branch (**b**)	140				
Maximum capacity index of connectable indoor units per branch if 2 branches are combined (**e**)	250				
Maximum capacity index of indoor units connected to BS units in refrigerant flow-through (**c**)	750				
Maximum number of ports of BS units in refrigerant flow-through (**c**)	16				
Maximum number of indoor units connected to BS units in refrigerant flow-through (**c**)	64				

15.2 Preparing refrigerant piping

15.2.1 Refrigerant piping requirements

NOTICE

The piping and other pressure-containing parts shall be suitable for refrigerant. Use phosphoric acid deoxidised seamless copper for refrigerant piping.

INFORMATION

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

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

15.2.2 Refrigerant piping material

- **Piping material:** phosphoric acid deoxidised seamless copper
- **Piping temper grade and thickness:**

Outer diameter (Ø)	Temper grade	Thickness (t)FN	
6.4 mm (1/4") 9.5 mm (3/8") 12.7 mm (1/2")	Annealed (O)	≥0.80 mm	
15.9 mm (5/8")	Annealed (O)	≥0.99 mm	
19.1 mm (3/4") 22.2 mm (7/8")	Half hard (1/2H)	≥0.80 mm	
28.6 mm (1 1/8")	Half hard (1/2H)	≥0.99 mm	

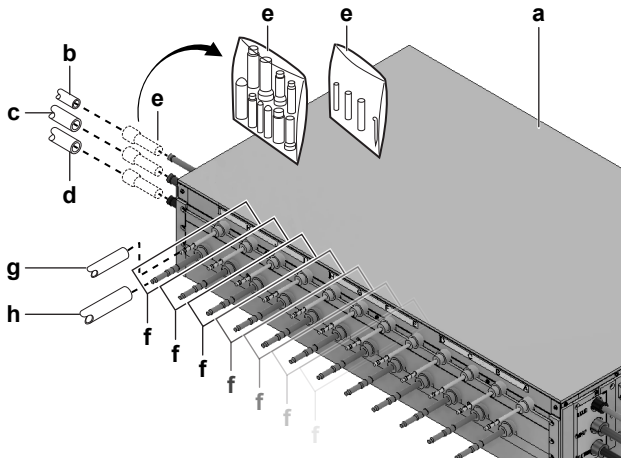
15.2.3 Refrigerant piping insulation

- 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

Ambient temperature	Humidity	Minimum thickness
≤30°C	75% to 80% RH	15 mm
>30°C	≥80% RH	20 mm

15.3 Connecting the refrigerant piping

15.3.1 To connect the refrigerant piping



a BS unit
b Liquid pipe (field supply)
c HP/LP gas pipe (field supply)
d Suction gas pipe (field supply)
e Reducing joints and insulation tubes (accessory)
f Indoor unit connection set
g Liquid pipe (field supply)
h Gas pipe (field supply)

WARNING

Bent header or branch pipes can lead to refrigerant leakage. **Possible consequence:** asphyxiation, suffocation and fire.

- NEVER bend the branch and header pipes sticking out of the unit. They have to remain straight.
- ALWAYS support the branch and header pipes at a distance of 1 m from the unit.

Prerequisite: Mount the indoor, outdoor and BS units.

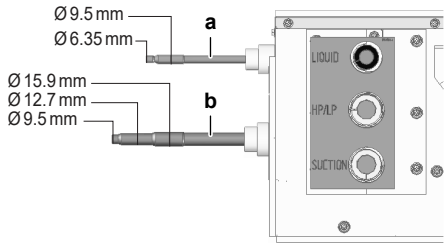
Prerequisite: Read the instructions in the outdoor unit's manual for information on how to install piping between the outdoor unit and the BS unit, selecting a refrigerant branch kit, and installing piping between the refrigerant branch kit and the BS units.

Prerequisite: Read the instructions in the indoor unit's manual for information on how to install piping between the indoor unit and the BS unit.

Prerequisite: When connecting piping, respect the guidelines for pipe bending and brazing.

Prerequisite: Remove the yellow paper from around the header pipes to avoid fire during brazing.

1. Connect the header pipes to the appropriate field supply pipes. The type of pipe is indicated on the removed yellow paper. Use a reducing joint (accessory) if the field supply pipe size does not match the header pipe size of the BS unit. The diameters of the header pipes of the BS unit are:
   - Liquid pipe: 15.9 mm
   - HP/LP gas pipe: 22.2 mm
   - Suction gas pipe: 22.2 mm
2. If necessary, cut the branch pipes as indicated in the illustration below. The diameters of the branch pipes of the BS unit are indicated in the illustration.



a Liquid branch pipe
b Gas branch pipe

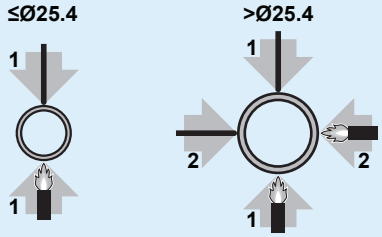
3. Connect the branch pipes. The liquid and gas branch pipe diameters to be used depend on the connected indoor unit capacity class. See to the outdoor unit's installation manual.
4. Install stopper pipes (accessory) for unused header pipes (when the BS unit is not connected in refrigerant flow-through with another BS unit) and unused branch pipes (when no indoor unit is connected to that branch pipe port).

15.3.2 To braze the pipe end

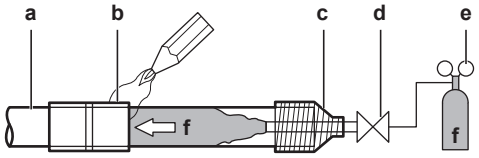
DANGER: RISK OF BURNING/SCALDING

NOTICE

Precautions when connecting field piping. Add brazing material as shown in the figure.



- When brazing, blow through with nitrogen to prevent creation of large quantities of oxidised 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 (BCuP), which does NOT require flux.

  Flux has an extremely harmful influence on refrigerant piping systems. For instance, if 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. insulation foam) from heat when brazing.

15.3.3 Joining branch pipe ports

To make a connection with e.g. FXMA200A and FXMA250A, join branches with joint kit EKBSJK. Only the following combinations are possible. E.g.: it is not possible to join ports B and C.

Unit type	Possible combinations					
	Port A with port B	Port C with port D	Port E with port F	Port G with port H	Port I with port J	Port K with port L
BS4A						
BS6A						
BS8A						
BS10A						
BS12A						

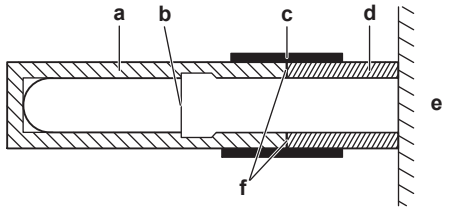
Note: When using the joint kit, change the DIP switch settings. See "16.4 To set the DIP switches" [▸ 87].

15.4 To insulate the refrigerant piping

To insulate stopper pipes

In case of stopper pipes: install stopper pipe insulation tubes (accessory). Adding additional insulation might be required depending on the ambient conditions. Follow the rules for the total minimum insulation thickness.

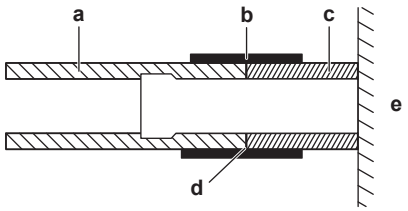
1. Attach an insulation tube against the tube on the BS unit.
2. Apply a tape to close the seam so that air does not enter.



a Insulation tube (accessory)
b Cut surface (branch pipes only)
c Tape (field supply)
d Insulation tube (attached to the BS unit)
e BS unit
f Adherence surface

To insulate the header and branch pipes (standard insulation)

The header pipes and branch pipes MUST be insulated (field supply). Make sure that the insulation is properly mounted over the header and branch pipes of the unit as shown in the image below. Always use tape (field supply) to prevent air gaps in the seam between the insulation tubes.



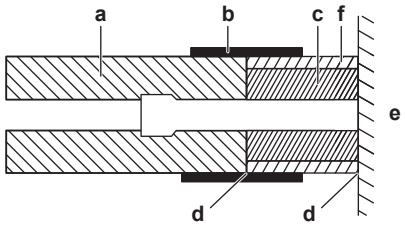
a Insulation tube (field supply)
b Tape (field supply)
c Insulation tube (BS unit)
d Adherence surface
e BS unit

1. Install an insulation tube (a) over the pipe and against the insulation tube (c) on the BS unit.
2. Apply tape (b) to close the seam.

To insulate the header and branch pipes (extra insulation)

Depending on ambient conditions (see "15.2.3 Refrigerant piping insulation" [▸ 75]), it can be required to add extra insulation material. Make sure that the insulation is properly mounted over the header and branch pipes of the unit as shown in the image below. In order to level out the difference in thickness,

an extra insulation tube must be installed over the insulation tube coming out of the unit. Always use tape (field supply) to prevent air gaps in the seam between the insulation tubes.



a Insulation tube (extra thick)(field supply)
b Tape (field supply)
c Insulation tube (BS unit)
d Adherence surface
e BS unit
f Insulation tube for levelling out thickness (field supply)

1. Install an insulation tube (a) over the pipe and against the insulation tube (c) on the BS unit.
2. Attach an extra layer of insulation tube (f) to level out the thickness.
3. Apply tape (b) to close the seam.

16 Electrical installation

CAUTION

See "3 Specific installer safety instructions" [▸ 10] to make sure this installation complies with all safety regulations.

In this chapter

16.1 About connecting the electrical wiring

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 BS units.
4. Connecting the electrical wiring to the indoor units.
5. Connecting the main power supply.

16.1.1 Precautions when connecting the electrical wiring

DANGER: RISK OF ELECTROCUTION

WARNING

The appliance MUST be installed in accordance with national wiring regulations.

WARNING

- All wiring MUST be performed by an authorised electrician and MUST comply with the applicable legislation.
- 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.

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

- 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.
- Do NOT use taped wires, stranded conductor wires, extension cords, or connections from a star system. They can cause overheating, electrical shocks or fire.

CAUTION

Do NOT push or place redundant cable length into the unit.

INFORMATION

Also read the precautions and requirements in the "general safety precautions" chapter in the installer and user reference guide.

16.1.2 Specifications of standard wiring components

Field wiring consists of:

- power supply wiring (including earth),
- DIII transmission wiring between units.

NOTICE

- Keep the power line and transmission line apart from each other. Transmission wiring and power supply wiring may cross, but may NOT run parallel.
- In order to avoid any electrical interference, the distance between both wirings should ALWAYS be at least 50 mm.

Power supply wiring

The power supply wiring must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leakage protector in accordance with the applicable legislation.

Selection and sizing of the wiring should be done in accordance with the applicable legislation based on the information mentioned in the table below.

Component		Unit				
		BS4A	BS6A	BS8A	BS10A	BS12A
Power supply cable	MCA[(a)]	0.5	0.6	0.8	1.0	1.1
	Voltage	220-240 V				
	Phase	1~				
	Frequency	50 Hz				

Component	Unit				
	BS4A	BS6A	BS8A	BS10A	BS12A
Recommended field fuse	6 A				
Residual current device	Must comply with applicable legislation.				

(a) MCA=Minimum circuit ampacity. Stated values are maximum values.

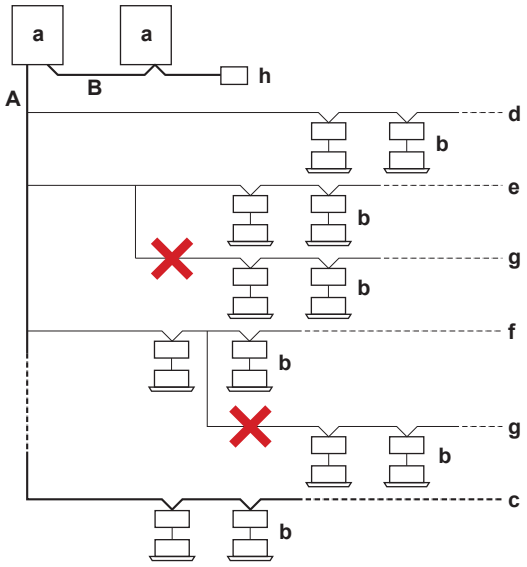
Transmission wiring

The transmission wiring outside the unit should be wrapped and routed together with the field piping. See "16.3 To finish the electrical wiring" [▸ 86] for more information.

Transmission wiring specification and limits(a)	
Vinyl cords with 0.75 to 1.25 mm² sheath or cables (2-core wires)	
Maximum wiring length between BS unit and indoor units	1000 m
Maximum wiring length between BS unit and outdoor unit	1000 m
Maximum wiring length between BS units	1000 m
Total wiring length	2000 m

(a) If the total transmission wiring exceeds these limits, communication errors might occur.

Up to 16 branches are possible for unit-unit cabling. No secondary branchings are allowed after any transmission wire branching.

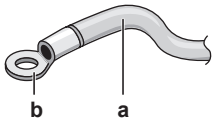


a Outdoor unit
b Indoor unit + BS unit
c Main line
d Branch line 1
e Branch line 2
f Branch line 3
g No branch is allowed after branch
h Central user interface (etc. ...)
A Outdoor/indoor transmission wiring
B Master/slave transmission wiring

16.1.3 Guidelines when connecting the electrical wiring

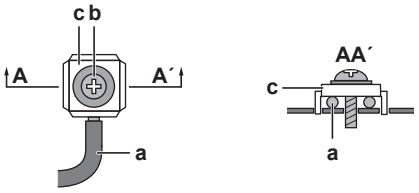
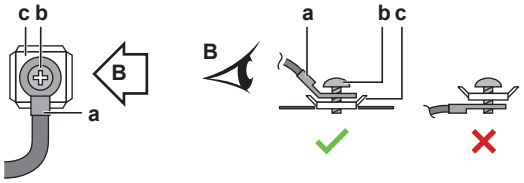
Keep the following in mind:

- If stranded conductor wires are used, 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 Stranded conductor wire
b Round crimp-style terminal

- Use the following methods for installing wires:

Wire type	Installation method
Single-core wire	 **a** Curled single-core 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

Terminal	Wiring	Screw size	Tightening torque (N•m)
X1M	Power supply wiring	M4	1.32~1.62
Earth screw	Earth wiring	M4	1.52~1.86
X2M~X5M	Transmission wiring	M3.5	0.79~0.97
X6M	External output		

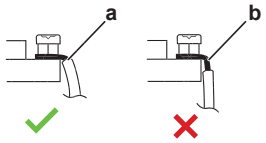
16.2 To connect the electrical wiring

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.

1 Remove the service cover. See "14.3.1 To open the unit" [▸ 61].

2 Strip insulation from the wires.



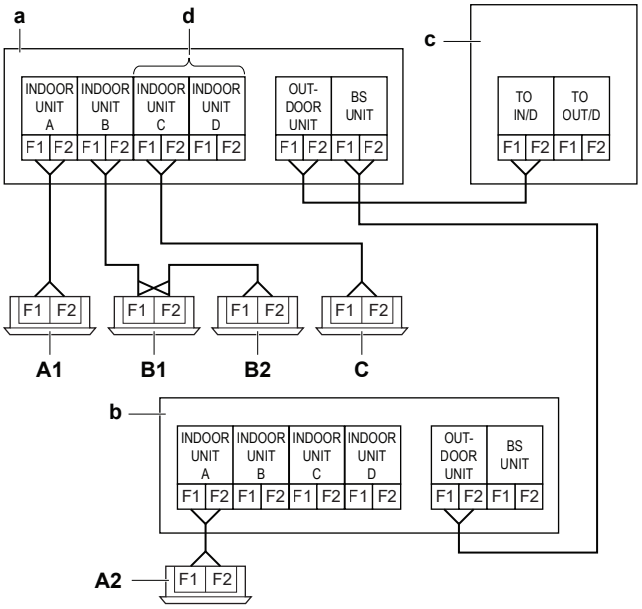
a Strip wire end to this point
b An excessive strip length may cause electrical shock or leakage
✓ Allowed
✗ Not allowed

3 Connect the transmission wiring as follows:

- Connect the terminals F1/F2 **(TO IN/D) on the control PCB in the outdoor unit's switch box** to the terminals F1/F2 **(Outdoor unit)** on terminal block X2M of the first BS unit. See also the installation manual delivered with the outdoor unit.
- In case of multiple BS units in the system that are connected to the same transmission wiring branch line, connect the terminals F1/F2 **(BS unit)** on terminal block X2M of the first BS unit to the terminals F1/F2 **(Outdoor unit)** on terminal block X2M on the second BS unit. Repeat the same procedure for further BS units, where each time the terminals F1/F2 **(BS unit)** on terminal block X2M on the n^{th} BS unit are connected to the terminals F1/F2 **(Outdoor unit)** on terminal block X2M on the $(n+1)^{th}$ BS unit.
- Connect the terminals F1/F2 **(Indoor unit X)** on terminal blocks X3M~X5M to the corresponding indoor units:

In case of…	connect…
one indoor unit where branch pipes are NOT joined	the terminals F1/F2 **(Indoor unit X)** on the BS unit to the F1/F2 terminals on the corresponding indoor unit.
multiple indoor units connected to the same branch	the terminals F1/F2 **(Indoor unit X)** on the BS unit to the F1/F2 terminals on the first indoor unit. Connect the F1/F2 terminals on the first indoor unit to the F1/F2 terminals on the second indoor unit, and so on.
joined branch pipes	1 of the 2 terminals F1/F2 **(Indoor unit X)** of the branches that are joined on the BS unit to the F1/F2 terminals on the corresponding indoor unit.

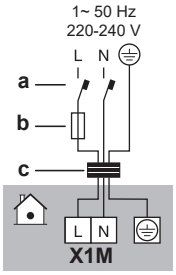
Example



a BS unit 1
b BS unit 2
c Outdoor unit
d When joining branch pipes C and D
A1/A2 Indoor unit A connected to the branch pipe A of BS unit 1 and BS unit 2 respectively
B1/B2 Indoor units B1 and B2 connected to the same branch pipe B of BS unit 1
C Indoor unit C connected to joint branch pipes C and D of BS unit 1. The F1/F2 terminals of the indoor unit only have to be connected to 1 of the 2 F1/F2 terminals inside BS unit 1.

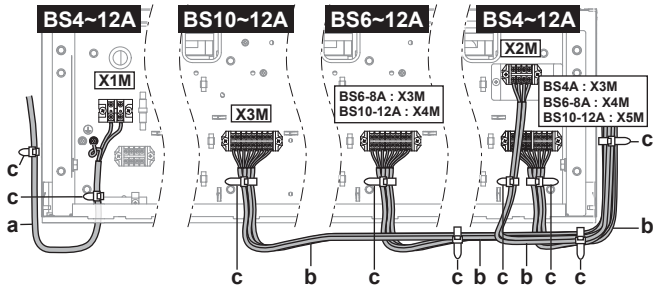
Note: The DIP switches of each control PCB in the BS unit switch box have to be set accordingly to the transmission wiring. See "16.4 To set the DIP switches" [▸ 87].

4 Connect the power supply as follows. The earth wire needs to be attached to the cup washer:



a Earth leakage circuit breaker
b Fuse
c Power supply cable

5 Attach the cables (power supply and transmission cables) with a tie-wrap to the foreseen fixation points. Route the wiring according to the illustration below.



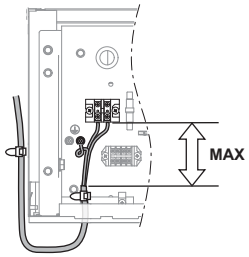
a Power supply cable (field supply)

b Transmission cable (field supply)
c Tie-wrap (accessory)

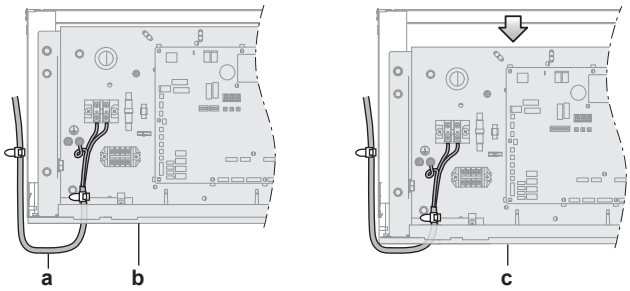
Guidelines

- Make sure the length of the earth wire between the fixation point and the terminal is longer than the length of the power supply wires between the fixation point and the terminal.

- Cut a slit in the rubber bushing where cables enter the switch box.
- Attach the cables onto the outer cable jacket and NOT onto the wires.
- Do NOT strip the outer cable jacket lower than the fixation point.



- Leave sufficient spare cable (± 20 cm additionally) for all cables between the fixation point inside the switch box and the fixation point on the side of the BS unit. This spare cable is required to lower the switch box.



a Spare cable
b Switch box in upper position
c Switch box in lower position

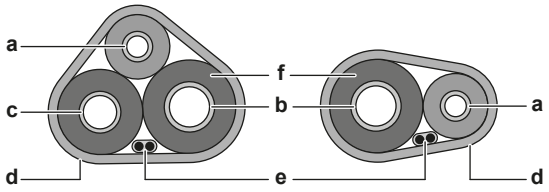
6 Reattach the service cover. See "14.3.2 To close the unit" [▸ 61].

CAUTION

Be careful NOT to pinch cables between the service cover and the switch box.

16.3 To finish the electrical wiring

After installing the transmission wires, wrap them along with the onsite refrigerant pipes using finishing tape, as shown in the illustration below.

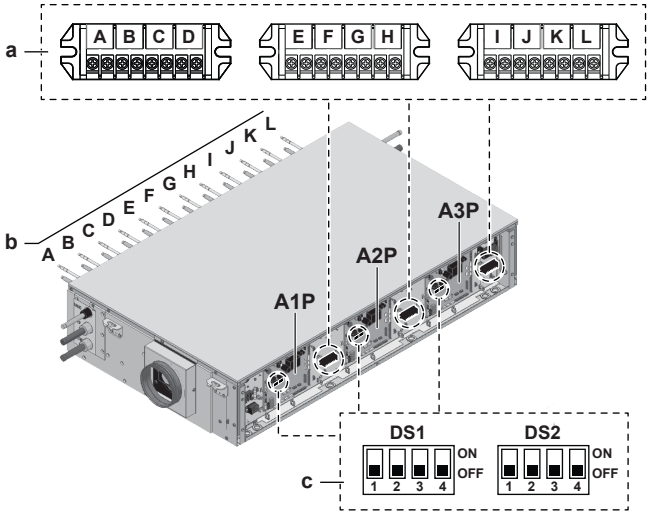


a Liquid pipe
b Gas pipe
c High pressure / low pressure gas pipe

d Finishing tape
e Transmission wiring (F1/F2)
f Insulation

16.4 To set the DIP switches

The DIP switches are located on the PCBs A1P, A2P (BS6~12A) and A3P (BS10-12A).



a Terminal for transmission wiring to indoor unit
b Branch pipe port number
c DIP switches

To set the DIP switches for branch pipe ports to which NO indoor unit is connected

Setting for branch pipe ports to which NO indoor unit is connected[a]												
	DS1 (A1P)				DS1 (A2P)				DS1 (A3P)			
	1	2	3	4	1	2	3	4	1	2	3	4
BS4A												
BS6A												
BS8A												
BS10A												
BS12A												
	Unit A	Unit B	Unit C	Unit D	Unit E	Unit F	Unit G	Unit H	Unit I	Unit J	Unit K	Unit L
	Target branch pipe port											

[a] **ON**=NOT connected / **OFF**=connected (factory default)

Example	When connecting an indoor unit to branch pipe ports A and B, but NOT connecting an indoor unit to branch pipe ports C and D.	

To set the DIP switches when joining branch pipe ports

This is required for connection with e.g. FXMA200A and FXMA250A.

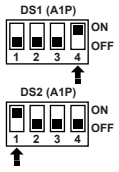
Setting when joining branch pipe ports[a]						
	DS2 (A1P)		DS2 (A2P)		DS2 (A3P)	
	1	2	1	2	1	2
BS4A	A and B ports are joined	C and D ports are joined	E and F ports are joined	G and H ports are joined	I and J ports are joined	K and L ports are joined
BS6A						
BS8A						
BS10A						
BS12A						
	Target branch pipe port					

[a] **ON**=joined / **OFF**=NOT joined (factory default)

Note: When joining branch pipe ports, ONLY the combinations in above table are possible. E.g.: it is NOT possible to join ports B and C.

Example	When joining branch pipe ports A and B.	

Examples

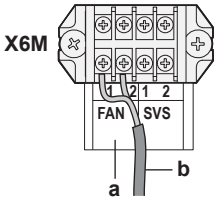
1.	When connecting an indoor unit to branch pipe ports A, B, and D, but NOT connecting an indoor unit to branch pipe port C.	
2.	When joining branch pipe ports A and B. Connecting an indoor unit to the joined branch pipe ports A and B, also to branch pipe port C, but NOT connecting an indoor unit to branch pipe port D.	

16.5 To connect the external outputs

FAN output (extraction fan)

The extraction FAN output is a contact on terminal X6M that closes in case a leak is detected, or when there is a failure or disconnection of the R32 sensor in the BS unit.

The FAN output must be used when a ventilated enclosure is required (see "13.3 To determine the required safety measures" [▸ 41]).



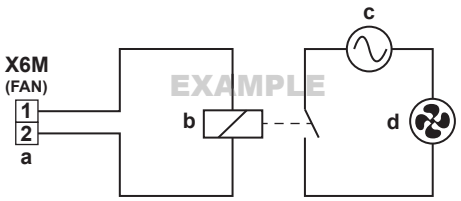
a FAN output terminals (1 and 2)
b Cable to extraction fan circuit

Select and dimension the wiring in accordance with the applicable legislation based on the information in the notice below:

NOTICE

The FAN output has a limited capacity of 220~240 V AC – 0.5 A.

Do NOT use the FAN output to directly power the fan. Instead, use the output to energise a relay that controls the fan circuit.

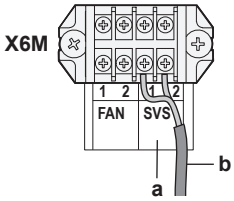


a FAN output terminal
b Relay
c Extraction fan power supply
d Extraction fan

SVS output (external alarm)

The SVS output is a potential-free contact on terminal X6M that closes in case a leak is detected in the BS unit.

The SVS output must be used when an external alarm is required (see "13.3 To determine the required safety measures" [▸ 41]).

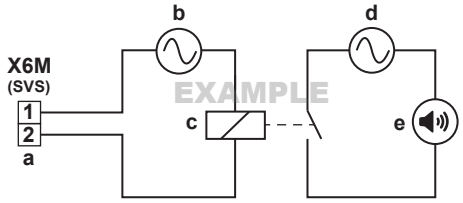


a SVS output terminals (1 and 2)
b Cable to external alarm circuit

NOTICE

The SVS output is a potential-free contact with a limited capacity of 220~240 V AC – 0.5 A.

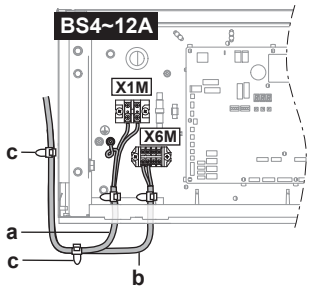
Do NOT directly use the SVS contact in the alarm circuit. Instead, use the SVS contact in conjunction with a power supply to energise a relay that controls the external alarm circuit.



a SVS output terminal
b Relay power supply
c Relay
d External alarm power supply
e External alarm

Cable routing

Route the FAN or SVS output cable as indicated below. Leave ±20 cm additional length of cable to lower the switch box.



a Power supply cable (field supply)
b Output cable (FAN cable shown)(field supply)
c Tie-wrap (accessory)

17 Configuration

DANGER: RISK OF ELECTROCUTION

INFORMATION

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

17.1 Making field settings

17.1.1 About making field settings

To configure the BS unit, you MUST give input to the BS unit's main PCBs (A1P, A2P and A3P, depending on the unit). This involves the following field setting components:

- Push buttons to give input to the PCB
- A display to read feedback from the PCB
- DIP switches

Mode 1 and 2

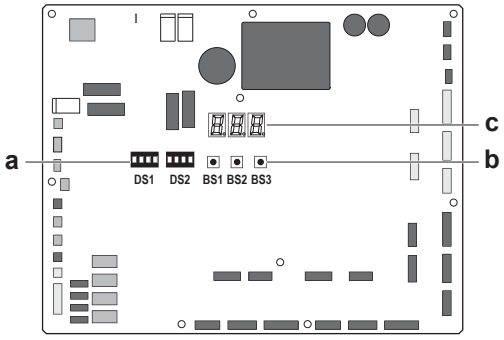
Mode	Description
Mode 1 (monitoring settings)	Mode 1 can be used to monitor the current situation of the BS unit
Mode 2 (field settings)	Mode 2 is used to change the field settings of the system. Consulting the current field setting value and changing the current field setting value is possible. In general, normal operation can be resumed without special intervention after changing field settings.

17.1.2 To access the field setting components

See "14.3.1 To open the unit" [▸ 61].

17.1.3 Field setting components

Location of the 7-segment displays and push buttons:

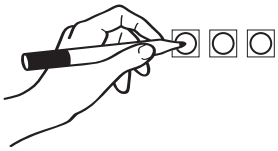


BS1 MODE: for changing the set mode

BS2 SET: for field setting
BS3 RETURN: for field setting
DS1, DS2 DIP switches
a DIP switches
b Push buttons
c 7-segment displays

Push buttons

Use the push buttons to make the field settings. Operate the push buttons with an insulated stick (such as a closed ball-point pen) to avoid touching live parts.



7-segment displays

The display gives feedback about the field settings, which are defined as [Mode-Setting]=Value.

Example

	Description
	Default situation
	Mode 1
	Mode 2
	Setting 8 (in mode 2)
	Value 4 (in mode 2)

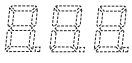
17.1.4 To access mode 1 or 2

Initialisation: default situation

NOTICE

Turn ON the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.

Turn on the power supply of the BS unit, outdoor unit and all indoor units. When the communication between BS units, indoor units and outdoor unit(s) is established and normal, the 7-segment display indication state will be as below (default situation when shipped from factory).

Stage	Display
Ready for operation: blank display indication as indicated.	

7-segment display indications:

	Off

	Blinking
	On

Access

BS1 is used to switch between the default situation, mode 1 and mode 2.

Access	Action
Default situation	
Mode 1	▪ Push BS1 one time. The 7-segment display indication changes to:  ▪ Push BS1 one more time to return to the default situation.
Mode 2	▪ Push BS1 for at least five seconds. The 7-segment display indication changes to:  ▪ Push BS1 one more time (short) to return to the default situation.

INFORMATION

If you get confused in the middle of the process, push BS1 to return to the default situation (no indication on 7-segment displays: blank, see "17.1.4 To access mode 1 or 2" [▸ 92].

17.1.5 To use mode 1

Mode 1 is used to set basic settings and to monitor the status of the unit.

What	How
Changing and accessing the setting in mode 1	1 Push BS1 1 time to select mode 1. 2 Push BS2 to select the required setting. 3 Push BS3 1 time to access the selected setting's value.
To quit and return to the initial status	Push BS1.

Example

Checking the content of parameter [1-2] (to know the software version).

[Mode-Setting]=Value in this case defined as: Mode=1; Setting=2; Value=the value we want to know/monitor:

1. Make sure the 7-segment display indication is in the default situation (normal operation).
2. Push BS1 one time.

   Result: Mode 1 is accessed: 

3 Push BS2 two times.

Result: Mode 1 setting 2 is addressed: 

4 Push BS3 one time. The displays shows the software version.

Result: Mode 1 setting 2 is addressed and selected, return value is monitored information.

5 Push BS1 one time to quit mode 1.

17.1.6 To use mode 2

Mode 2 is used to set field settings of the BS unit.

What	How
Changing and accessing the setting in mode 2	▪ Push BS1 for more than 5 seconds to select mode 2. ▪ Push BS2 to select the required setting. ▪ Push BS3 1 time to access the selected setting's value.
To quit and return to the initial status	Push BS1.
Changing the value of the selected setting in mode 2	▪ Push BS1 for more than 5 seconds to select mode 2. ▪ Push BS2 to select the required setting. ▪ Push BS3 1 time to access the selected setting's value. ▪ Push BS2 to select the required value of the selected setting. ▪ Push BS3 1 time to validate the change. ▪ Push BS3 again to start operation with the chosen value.

Example

Checking the content of parameter [2-7] (to enable or disable the ventilated enclosure function).

[Mode-Setting]=Value in this case is defined as: Mode=2; Setting=7; Value=the value we want to know/change.

1 Make sure the 7-segment display indication is in the default situation (normal operation).

2 Push BS1 for more than five seconds.

Result: Mode 2 is accessed: 

3 Push BS2 seven times.

Result: Mode 2 setting 7 is addressed: 

4 Push BS3 one time. The display shows the status of the setting (depending on the actual field situation). In the case of [2-7], the default value is "1", which means the ventilated enclosure function is enabled.

Result: Mode 2 setting 7 is addressed and selected, return value is the current setting situation.

5 To change the value of the setting, push BS2 till the required value appears on the 7-segment display indication.

6 Push BS3 one time to validate the change.

7 Push BS3 to start operation according to the chosen setting.

8 Push BS1 one time to quit mode 2.

17.1.7 Mode 1: monitoring settings

[1-0]

Shows the remaining lifetime of the R32 sensor.

The remaining lifetime is displayed in months ranging from 0 to 120.

INFORMATION

The sensor has a lifetime of 10 years. The user interface displays error "**CH-22**" 6 months before the end of the sensor lifetime and error "**CH-23**" after the end of the sensor lifetime. For more information, see the reference guide of the user interface and contact your dealer.

17.1.8 Mode 2: field settings

[2-0]

Setting to define if the BS unit belongs to a cluster or not.

In case the BS unit belongs to a parallel or series cluster, this setting has to be put on "1" to enable it. See "13.4.3 Ventilated enclosure" [▸ 46].

This setting must be configured on all main PCBs (A1P, A2P and A3P) of the BS unit.

[2-0]	Definition
0 (default)	Cluster disabled
1	Cluster enabled

[2-1]

Setting to define the cluster number the BS unit belongs to.

In case there are multiple clusters in the system, all BS units belonging to the same cluster need to have the same cluster number as value for this setting. BS units belonging to different clusters need to have a different cluster number.

This setting must be configured on all main PCBs (A1P, A2P and A3P) of the BS unit.

[2-1]	Definition
0 (default)~15	Cluster number

[2-2]

Setting to define the cluster configuration the BS unit belongs to.

This can be either a parallel or series cluster. This setting must be configured for all BS units in the same cluster, and has to be the same value. See "13.4.3 Ventilated enclosure" [▸ 46].

This setting must be configured on all main PCBs (A1P, A2P and A3P) of the BS unit.

[2-2]	Definition
0 (default)	Parallel cluster
1	Series cluster

[2-3]

Setting to simulate a refrigerant leak.

- Choose value "1" during commissioning of the BS unit. This activates the safety measures of the BS unit and confirms that the safety measures are working as intended and are conform with the applicable legislation.
- After confirmation, reset it to value "0" and change setting [2-6] to confirm the completion of the commissioning check.

See "18.3.1 About the BS unit test run" [▸ 101].

This setting only has to be configured on the leftmost main PCB (A1P) of the BS unit.

[2-3]	Simulate refrigerant leak
0 (default)	OFF
1	ON

[2-4]

Setting to enable or disable all BS unit safety measures.

- Choose value "1" if safety measures are required (ventilated enclosure or external alarm).
- Choose value "0" if no safety measures are required.

See "13.3 To determine the required safety measures" [▸ 41].

In case of "0", the output of the R32 sensor in the BS unit will be ignored, and there is no system response in case of a refrigerant leak in the BS unit.

This setting only has to be configured on the leftmost main PCB (A1P) of the BS unit.

[2-4]	Safety measures
0	Disable
1 (default)	Enable
2	Temporarily disable (24 hours or until power reset)

[2-6]

Setting to confirm the completion of the commissioning check.

After confirmation that the safety measures of the BS unit are working as intended, this setting must be changed to "1".

The same setting is required for all BS units, even if no safety measures are installed. The test run of the outdoor unit checks if all BS units of the system have "1" as a value for this setting. If not, the 7-segment display of the outdoor unit shows an error.

This setting only has to be configured on the leftmost main PCB (A1P) of each BS unit.

[2-6]	Commissioning check
0 (default)	Incomplete

[2-6]	Commissioning check
1	Completed

[2-7]

Setting to enable or disable the ventilated enclosure safety measure of the BS unit.

- Choose value "1" if the ventilated enclosure is a necessary safety measure.
- Choose value "0" if only an external alarm is required.

See "13.3 To determine the required safety measures" [▸ 41].

This setting only has to be configured on the leftmost main PCB (A1P) of the BS unit.

[2-7]	Ventilated enclosure
0	Disable
1 (default)	Enable

[2-8]

Setting to assign an address value to the BS unit for the supervisor remote controller.

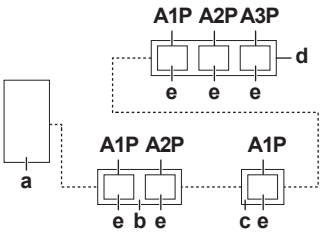
In case supervisor remote controllers are used in the system, it is necessary to assign an address value to the BS unit.

- Assign a different address to different BS units.
- Use address values that are NOT used in the system elsewhere (e.g. indoor units).
- Do not use address 00. The supervisor remote controller does not display errors from BS units with address 00.

This setting only has to be configured on the leftmost main PCB (A1P) of the BS unit.

[2-8]	Description
00~FF (address in HEX format)	Address for supervisor remote controller

Example



A1P Main PCB 1
A2P Main PCB 2
A3P Main PCB 3
a Outdoor unit
b BS8A unit
c BS4A unit
d BS12A unit
e Address value for supervisor remote controller assigned to main PCB
····· Transmission wiring

The table below shows an example of address values assigned:

BS unit	Main PCB	Address value (e)
BS12A	A1P	**01**
	A2P	-
	A3P	-
BS8A	A1P	**02**
	A2P	-
BS4A	A1P	**03**

[2-9]

Setting to assign an address value to the BS unit for error handling.

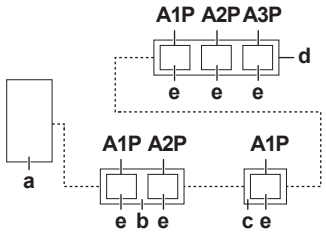
Assign the same address to the main PCBs (A1P, A2P and A3P) of 1 BS unit, and another address to the other BS units.

NOTICE

Field setting [2-9] is mandatory for all BS units and has to be made on all main PCBs (A1P, A2P and A3P) of the BS unit.

[2-9]	Description
0 (default)~15	Address for error handling

Example



A1P Main PCB 1
A2P Main PCB 2
A3P Main PCB 3
a Outdoor unit
b BS8A unit
c BS4A unit
d BS12A unit
e Address value for error handling assigned to main PCB
..... Transmission wiring

The table below shows an example of address values assigned:

BS unit	Main PCB	Address value (e)
BS12A	A1P	**1**
	A2P	
	A3P	
BS8A	A1P	**2**
	A2P	
BS4A	A1P	**3**

[2-10]

Setting to enable or disable the external alarm output during the BS unit test run.

This setting is only to be used during the test run of the BS unit when a ventilated enclosure is used as a safety measure of the BS unit and an external alarm is added as an additional measure. During the BS unit test run, which is started by setting [2-3] to "1", the external fan and external alarm are both active. To disable the external alarm during the airflow rate measurements, change setting [2-10] to "1".

Once the BS unit test run is finished (setting [2-3] changed to "0"), setting [2-10] automatically returns to its default value "0".

This setting only has to be configured on the leftmost main PCB (A1P) of the BS unit.

[2-10]	External alarm output forced OFF
0 (default)	Disable
1	Enable

18 Commissioning

CAUTION

See "3 Specific installer safety instructions" [▶ 10] to make sure commissioning complies with all safety regulations.

NOTICE

General commissioning checklist. Next to the commissioning instructions in this chapter, a general commissioning checklist is also available on the Daikin Business Portal (authentication required).

The general commissioning checklist is complementary to the instructions in this chapter and can be used as a guideline and reporting template during commissioning and hand-over to the user.

In this chapter

18.1 Precautions when commissioning

NOTICE

Before starting up the system, the unit MUST be energised for at least 6 hours to avoid compressor breakdown during startup.

NOTICE

ALWAYS complete the refrigerant piping of the unit before operating. If NOT, the compressor will break.

INFORMATION

During the first running period of the unit, the required power may be higher than stated on the nameplate of the unit. This phenomenon is caused by the compressor, that needs a continuous run time of 50 hours before reaching smooth operation and stable power consumption.

18.2 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 have read the complete installation and operation instructions described in the **installer and user reference guide**.

☐	The **BS unit** is properly mounted.
☐	The **field wiring** has been carried out according to the instructions described in this document, according to the wiring diagram and according to the applicable legislation.
☐	The **drain piping** is properly installed and insulated, and drainage flows smoothly. Check for water leaks. **Possible consequence:** condensate water might drip.
☐	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.
☐	In case no safety measures are required, the following measures are correctly applied: ▪ No safety measures are attached. ▪ The correct field settings are made.
☐	In case an external alarm is required, the following safety measures are correctly applied: ▪ The external alarm is connected and powered. ▪ The correct field settings are made.
☐	In case a ventilated enclosure is required, the following safety measures are correctly applied: ▪ The ducting is properly installed and insulated. ▪ The extraction fan is connected and powered. ▪ The air inlet (damper) is not obstructed. ▪ The correct field settings are made.
☐	Also follow the outdoor unit's checklist. See the installation and operation manual delivered with the outdoor unit.

18.3 BS unit test run

18.3.1 About the BS unit test run

The BS unit test run has to be performed on all BS units in the system, before the test run of the outdoor unit. The BS unit test run has to confirm that the required safety measures are properly installed. Even when no safety measures are required, it is necessary to perform this BS unit test run and confirm the result, because the test run of the outdoor unit checks this confirmation for all BS units in the system.

Depending on the safety measure and the configuration of the BS unit, it is required to perform the BS unit test run on a specific BS unit of the system. Respect the sequence indicated below.

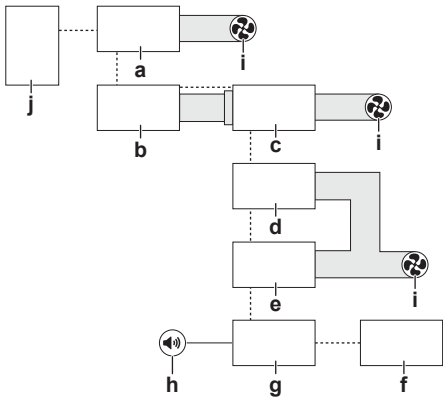
Note: Do not perform a BS unit test run on more than 1 BS unit at a time.

- **No safety measure:** all BS units with no safety measures.
- **External alarm:** all BS units with an external alarm.
- **Ventilated enclosure – 1 BS unit to 1 extraction fan configuration:** all BS units with a ventilated enclosure – one-to-one configuration.

- **Ventilated enclosure – multiple BS units to 1 extraction fan, parallel configuration:** all BS units with a ventilated enclosure – parallel configuration.
- **Ventilated enclosure – multiple BS units to 1 extraction fan, series configuration:** only 1 BS unit with a ventilated enclosure – series configuration. Tip: choose the BS unit which is most upstream, where the air inlet (damper) is free and you can measure the airflow rate.

Example

In the example below: change the setting [2-3] to start the test run for the following BS units: a, b, d, e, f and g.



a BS unit in one-to-one configuration
b BS unit in series configuration
c BS unit in series configuration
d BS unit in parallel configuration
e BS unit in parallel configuration
f BS unit without safety measures
g BS unit with external alarm
h External alarm
i Extraction fan
j Outdoor unit
..... Transmission wiring

In case the safety measures demand a ventilated enclosure, the BS unit test run has to include a measurement of the actual extraction airflow rate to confirm that it meets the legal requirements.

NOTICE

It is very important that all refrigerant piping work is done before the units (outdoor, BS or indoor) are powered. When the units are powered, the expansion valves initialise. This means that the valves close.

If any part of the system had already been powered before, setting [2-21] on the outdoor unit has to be activated to open the expansion valves again.

18.3.2 About airflow requirements

When a ventilated enclosure is required, the following requirements apply:

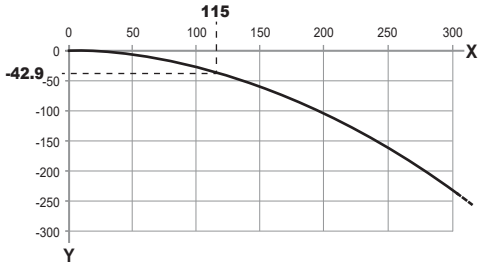
- pressure inside the BS unit has to be more than 20 Pa below the ambient pressure,
- minimum airflow rate:

Model	Minimum airflow rate [m³/h]
BS4A	90
BS6~8A	87
BS10~12A	77

Example

A BS12A unit with an airflow rate during the test run of 115 m³/h. The pressure drop graph shows that this results in an internal pressure which is 42.9 Pa below the ambient pressure. Both requirements are met:

- The pressure inside the BS unit is more than 20 Pa below the ambient pressure (42.9 Pa).
- The airflow rate is higher than 77 m³/h (115 m³/h).



X Airflow rate [m³/h]
Y Internal pressure below ambient pressure [Pa]

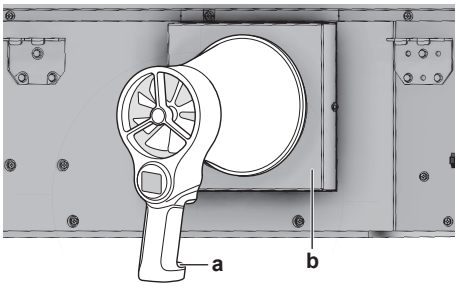
See the latest version of the technical engineering data for the BS unit's pressure drop curves.

18.3.3 About measuring the airflow rate

It is up to the installer to measure the airflow rate and provide correct data. We advise 2 ways in the sections below, but the installer is entirely free on how to perform the measurement.

About measuring with a vane anemometer

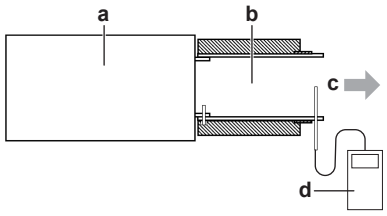
- Where: Measure the airflow rate at the air inlet (damper) of the BS unit.
- Tip: Use the duct connection kit (EKBSDCK) and an anemometer with a funnel to conduct the entire airflow through the anemometer.
- Postrequisite: Remove the kit once the measurement is finished.



a Vane anemometer
b Duct connection kit (EKBSDCK)

About measuring with a hot wire probe anemometer

- Attention: In case you need to drill holes in the ducting, choose a location without thermal insulation.
- Where: Measure the airflow rate in the duct connected to the air outlet of the BS unit.
- Postrequisite: Close the holes properly once the measurement is finished.



a BS unit
b Air outlet duct
c Direction airflow
d Hot wire probe anemometer

18.3.4 To perform a BS unit test run

See "17.1.8 Mode 2: field settings" [▸ 95] for more information on the settings that are used.

Respect the sequence indicated in "18.3.1 About the BS unit test run" [▸ 101]. Do not perform a test run on more than 1 BS unit at a time.

Prerequisite: All refrigerant piping work is finished.

1. Change field setting [2-3] to "1". This setting simulates a refrigerant leak and activates the safety measures according to the field settings that have been made. See "18.3.1 About the BS unit test run" [▸ 101] to check which units need a setting change.
2. In case of a configuration with an external alarm, check that the external alarm warns both audibly (15 dBA above the sound of the surroundings) and visibly.
3. In case of a configuration with a ventilated enclosure, measure the airflow rate. See "18.3.3 About measuring the airflow rate" [▸ 103] for more information.
4. In all configurations, check if no safety measures are activated that are not intended to activate.
5. Change field setting [2-3] to "0". This setting deactivates the test run.
6. Change field setting [2-6] to "1" for all BS units of the system, even those where the test run was not activated (e.g. downstream BS units in a ventilated enclosure series configuration). This setting confirms that the safety measures are working correctly and - in the case of ventilated enclosure – it confirms that the extraction airflow rate complies to the legal limits.

18.3.5 Troubleshooting during a BS unit test run

Symptom: The damper does not open

Possible causes	Corrective action
Incorrect field settings	Check if all field settings are made correctly. When in parallel or series configuration, the field settings of all BS units in a cluster need to be made correctly.
Damper wiring is loose	Reattach any loose damper wiring.
Damper blocked	Remove blocking objects.

Symptom: The extraction fan does not turn ON

Possible causes	Corrective action
Incorrect field settings	Check if all field settings are made correctly. When in parallel or series configuration, the field settings of all BS units in a cluster need to be made correctly.
Fan extraction circuit broken	▪ Check that the circuit exists. ▪ Check that the circuit is connected correctly. ▪ Check that the circuit is powered.

Symptom: The airflow rate is too low

Possible causes	Corrective action
Incorrect field settings	Check if all field settings are made correctly. When in parallel or series configuration, the field settings of all BS units in a cluster need to be made correctly. ▪ When in parallel configuration: check that no dampers of other BS units in the same cluster have opened. ▪ When in series configuration: check that all dampers of other BS units in the same cluster have opened.
Flow blocked	Remove blocking objects.
Incorrect fan size	Check if the sizing of the fan is appropriate. Adapt if necessary.
Incorrect fan speed	Check if the fan has different speed settings. Select a higher speed if necessary.

18.4 System test run

NOTICE

Do NOT interrupt the test run.

INFORMATION

- Perform the test run according to the instructions in the outdoor unit manual.
- The test run is only completed if there is no malfunction code displayed on the user interface or the outdoor unit 7-segment display.
- See the service manual for the complete list of error codes and a detailed troubleshooting guideline for each error.

19 Hand-over to the user

Once the test run is finished and the unit operates properly, make sure the following is clear for the user:

- Make sure that the user has the printed documentation and ask him/her to keep it for future reference. Inform the user that he can find the complete documentation at the URL mentioned earlier in this manual.
- Explain the user how to properly operate the system and what to do in case of problems.
- Explain the user only a certified installer is allowed to perform maintenance on the unit.

20 Troubleshooting

CAUTION

See "3 Specific installer safety instructions" [▶ 10] to make sure troubleshooting complies with all safety regulations.

20.1 Solving problems based on error codes

If the BS unit runs into a problem, the user interface of the indoor unit(s) connected to the BS unit displays an error code. It is important to understand the problem and to take measures before resetting an error code. This should be done by a licensed installer or by your local dealer.

This chapter gives you an overview of the most frequent error codes and their descriptions as they appear on the user interface.

INFORMATION

See the service manual for:

- The complete list of error codes
- A more detailed troubleshooting guideline for each error

20.1.1 Prerequisites: Troubleshooting

1 Carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

20.1.2 Error codes: Overview

In case other error codes appear, contact your dealer.

Code	Description
A0-20	The R32 sensor has detected a refrigerant leak in the BS unit.
A0/CH	Safety system error (leak detection)
A3-01	BS unit drain water abnormality (X15A is opened)
CH-21	BS unit R32 sensor malfunction
CH-22	Less than 6 months before the BS unit R32 sensor end of lifetime
CH-23	BS unit R32 sensor end of lifetime
E1-15	Malfunction of the BS unit's PCB
EA-27	BS unit damper malfunction
F9	Malfunction of the BS unit's electronic expansion valve
UA-60	Malfunction of the BS unit's back-up/capacitor PCB
UA-61	No power from the BS unit's back-up/capacitor PCB
UA-62	BS unit power supply failure

21 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.

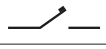
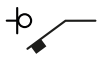
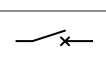
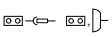
22 Technical data

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

22.1 Wiring diagram

The wiring diagram is delivered with the unit, located at the inside of the service cover.

For applied parts and numbering, see 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		

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
		YLW	Yellow

Symbol	Meaning
A*P	Printed circuit board (PCB)
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, see 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*	Contact
K*R, KCR, KFR, KHuR, K*M	Magnetic relay
L	Live
L*	Coil
L*R	Reactor
M*	Stepper motor
M*C	Compressor motor
M*D	Damper 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
NE*	Functional earth
PAM	Pulse-amplitude modulation
PCB*	Printed circuit board
PM*	Power module
PS	Switching power supply
PTC*	PTC thermistor
Q*	Insulated gate bipolar transistor (IGBT)

Symbol	Meaning
Q*C	Circuit breaker
Q*DI, KLM	Earth leak circuit breaker
Q*L	Overload protector
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
SEG*	7-segment display
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)
X*Y	Connector
Y*E	Electronic expansion valve coil
Y*R, Y*S	Reversing solenoid valve coil
Z*C	Ferrite core
ZF, Z*F	Noise filter

Specific BS unit wiring diagram legend

Symbol	Meaning
EVL	Electronic expansion valve (suction)
EVH	Electronic expansion valve (HP/LP)
EVSC	Electronic expansion valve (subcool)
EVSG	Electronic expansion valve (gas shut-off valve)
EVSL	Electronic expansion valve (liquid shut-off valve)
X15A	Connector (drain up kit abnormal signal)

Notes

1 This wiring diagram applies to the BS unit only.

2 Symbols:

□□□□: terminal block

⊠: connector

: field wiring

⏚: earth terminal

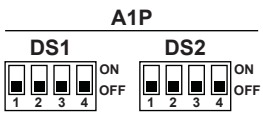
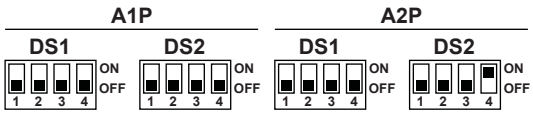
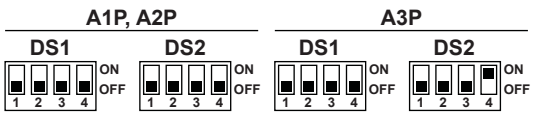
3 For wiring for the terminal block on X2M ~ X6M (operation), see the installation manual attached to the product.

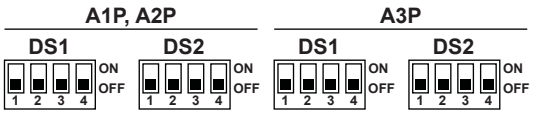
4 For X15A (A1P), remove the short circuit connector and connect the air conditioner stop signal (optional product) when using the drain up kit (optional product). For details, see the operation manual attached to the kit.

5 The capacity of the contact is 220~240V AC-0.5A.

6 Digital output: max 220~240V AC-0.5A. To use this output, see the installation manual.

7 The factory settings of DIP switch (DS1, DS2) are as follows:

Model	DS1, DS2 factory settings
BS4A	
BS6A	
BS8A	
BS10A	

Model	DS1, DS2 factory settings
BS12A	
To set the DIP switches (DS1~2) and push buttons (BS1~3), see the installation manual	

23 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.

Maintenance instructions
Instruction manual specified for a certain product or application, which explains (if relevant) how to install, configure, operate and/or maintain the product or application.

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.

EAC

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4P695527-1 2022.02