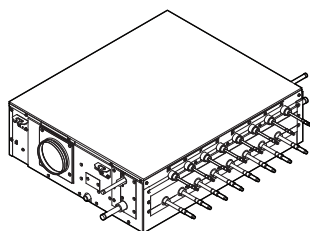




Installer and user reference guide  
VRV 5 safety valve unit



SV1A25AJV1B  
SV4A14AJV1B  
SV6A14AJV1B  
SV8A14AJV1B

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# 1 About this document



## WARNING

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

## Target audience

Authorised installers + 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 and household 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 SV unit)
- **SV unit installation and operation manual:**
  - Installation and operation instructions
  - Format: Paper (in the box of the SV 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.

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

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

## Technical engineering data

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

## 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**


A2L

**WARNING: MILDLY FLAMMABLE MATERIAL**

The refrigerant inside this unit is mildly flammable.


**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. <b>Example:</b> "▲ 1–3 Figure title" means "Figure 3 in chapter 1".
	Indicates a table title or a reference to it. <b>Example:</b> "■ 1–3 Table title" means "Table 3 in chapter 1".

## 2 General safety precautions

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### 2.1 For the installer

#### 2.1.1 General

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



#### **DANGER: RISK OF BURNING/SCALDING**

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



#### **WARNING**

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



#### **WARNING**

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



#### **WARNING**

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



#### **WARNING**

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



#### **CAUTION**

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



#### **CAUTION**

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



### CAUTION

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

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

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

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

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

### 2.1.2 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 or the refrigerant charge label of the unit. It states the type of refrigerant and necessary amount.
- Whether the unit is factory charged with refrigerant or non-charged, in both cases you might need to charge additional refrigerant, depending on the pipe sizes and pipe lengths of the system.
- ONLY use 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 switch box is connected securely.
- Make sure all covers are closed before starting up the unit.

**CAUTION**

- When connecting the power supply: connect the earth cable first, before making the current-carrying connections.
- When disconnecting the power supply: disconnect the current-carrying cables first, before separating the earth connection.
- The length of the conductors between the power supply stress relief and the terminal block itself MUST be as such that the current-carrying wires are tightened 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" [▶ 63])



### WARNING

The fixing method of the unit **MUST** be in accordance with the instructions from this manual. See "14.4 Mounting the unit" [▶ 68].



### WARNING

Follow the service space dimensions in this manual to install the unit correctly. See "14.1.1 Installation site requirements of the unit" [▶ 63].



### 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 ductwork (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 ductwork.



### WARNING

If the ventilated enclosure safety measure is applied, the SV unit must have its own ductwork and extraction fan. Do **NOT** combine this ductwork with ducting for other purposes.



### WARNING

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



### 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" [▶ 44].



### WARNING

Safety shut-off valves shall only be replaced with valves specified by the appliance manufacturer.



### 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, light industrial, household and residential environment.



#### 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" [▶ 80])



#### DANGER: RISK OF BURNING/SCALDING



#### WARNING

Field piping **MUST** be in accordance with the instructions from this manual. See "15 Piping installation" [▶ 80].



#### CAUTION

Piping **MUST** be installed according to instructions given in "15 Piping installation" [▶ 80]. Only mechanical joints (e.g. braze+flare connections) that are compliant with the latest version of ISO14903 can be used.

Low temperature solder alloys shall not be used for pipe connections.



#### 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.

**CAUTION**

- 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" [▶ 88])****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**

Electrical wiring MUST be in accordance with the instructions from this manual. See "16 Electrical installation" [▶ 88].

**WARNING**

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

**WARNING**

The electrical components shall only be replaced with parts specified by the appliance manufacturer. Replacement with other parts may result in the ignition of refrigerant in the event of a leak.

**WARNING**

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

**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, 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" [▶ 109])

**WARNING**

Commissioning **MUST** be in accordance with the instructions from this manual. See "18 Commissioning" [▶ 109].

**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).

**WARNING**

Safety shut-off valves shall only be replaced with valves specified by the appliance manufacturer.

#### Troubleshooting (see "21 Troubleshooting" [▶ 118])

**DANGER: RISK OF ELECTROCUTION****DANGER: RISK OF ELECTROCUTION**

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

**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

**A2L****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](#)" [▶ 44].

**WARNING**

Make sure installation, servicing, maintenance and repair comply with instructions from Daikin and with applicable legislation (for example national gas regulation) and are executed **ONLY** by authorised persons.

**WARNING**

Refrigerant sensors of the refrigerant detection system shall only be replaced with refrigerant sensors specified by the appliance manufacturer.

**WARNING**

Safety shut-off valves shall not be reset until the room has been ventilated. Resetting may result in additional flammable refrigerant to be released into the room.



#### WARNING

- 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.



#### CAUTION

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



#### NOTICE

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

See ["13.3 To determine the required safety measures"](#) [▶ 45] 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

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### 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 ductwork.



### 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"](#) [▶ 28])



### 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 "7.2 About the refrigerant" [▶ 28])

**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.



#### WARNING

Refrigerant sensors of the refrigerant detection system shall only be replaced with refrigerant sensors specified by the appliance manufacturer.

**Troubleshooting** (see "8 Troubleshooting" [► 30])



#### 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.



#### WARNING

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

## 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:

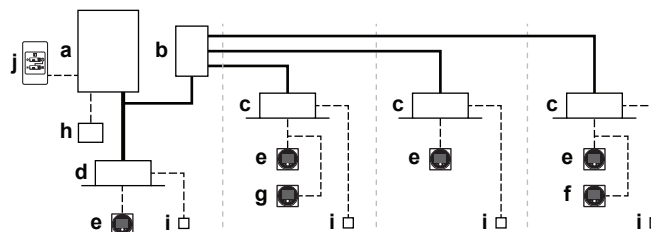
A full overview of allowable combinations (for future system extensions) is available in technical engineering data and should be consulted. Contact your installer to receive more information and professional advice.

## 5.1 System layout



### INFORMATION

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



- a Heat pump outdoor unit
- b Safety valve unit (SV)
- c VRV direct expansion (DX) indoor unit
- d VRV direct expansion (DX) indoor unit (direct connection from outdoor to indoor)
- e Remote controller in **normal mode**
- f Remote controller in **alarm only mode**
- g Remote controller in **supervisor mode** (mandatory in some situations)
- h Centralised controller (optional)
- i Option PCB (optional)
- j Cool/heat changeover remote control switch (optional)
- Refrigerant piping

- Interconnection and user interface wiring
- Direct connection of indoor units to the outdoor unit

## 6 Before operation

**CAUTION**

See "4 User safety instructions" [▶ 20] 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.....	28
7.2	About the refrigerant .....	28
7.2.1	About the refrigerant leakage sensor.....	29

## 7.1 Precautions for maintenance and service



### CAUTION

See "4 User safety instructions" [▶ 20] 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 About the refrigerant



### CAUTION

See "4 User safety instructions" [▶ 20] 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<sub>2</sub> equivalent.

**Formula to calculate the quantity in CO<sub>2</sub> equivalent tonnes:** GWP value of the refrigerant × total refrigerant charge [in kg]/1000

Contact your installer for more information.



## 7.2.1 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 SV 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 SV unit displays error "**A0-20**".
- 2 If applicable, the safety measures of the SV unit are activated. These can be the following:
  - the external alarm emits a signal, or
  - the extraction fan and damper of the SV 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 occurs, 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 <i>RD/CH</i> )	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 SV 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 SV 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



## NOTICE

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





Keep the following in mind:

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

## In this chapter

11.1	To handle the unit .....	35
11.2	To unpack the unit.....	36
11.3	To remove the accessories.....	39

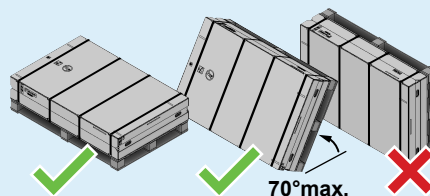
## 11.1 To handle the unit

- For easier manual carrying of the SV6~8A, 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.
  -  Use gloves when handling the unit

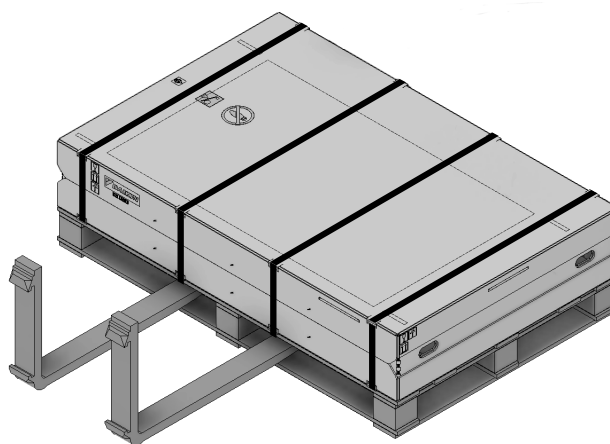


## NOTICE

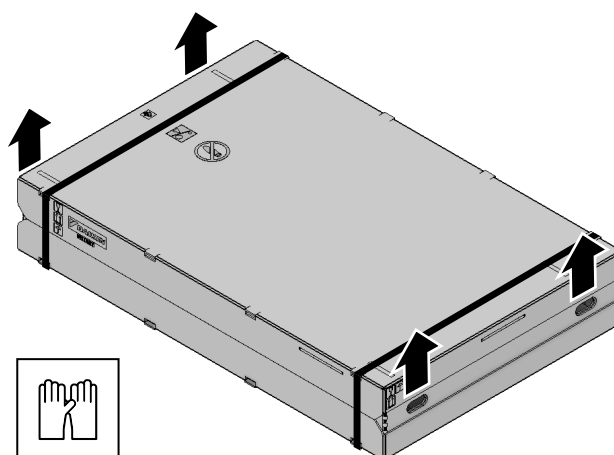
When you carry or manipulate the unit, never tilt it more than 70 degrees in any direction.



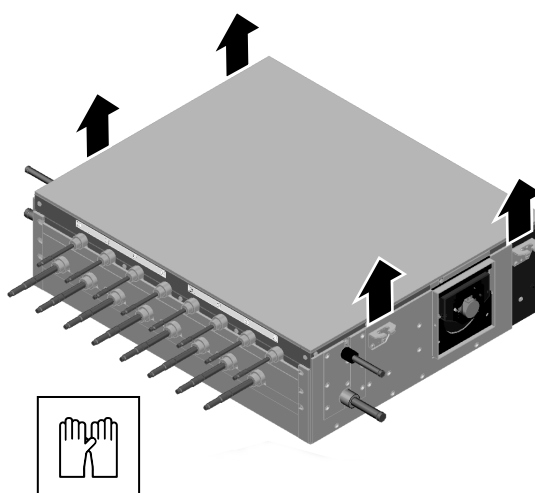
- Optionally: As long as the SV6~8A is attached to a pallet, you can use a forklift. Move slowly when transporting the unit.



- Lift the unit via the cut-outs in the cardboard.



- 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.

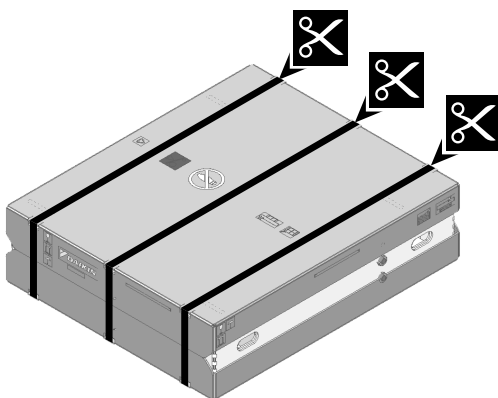


## 11.2 To unpack the unit

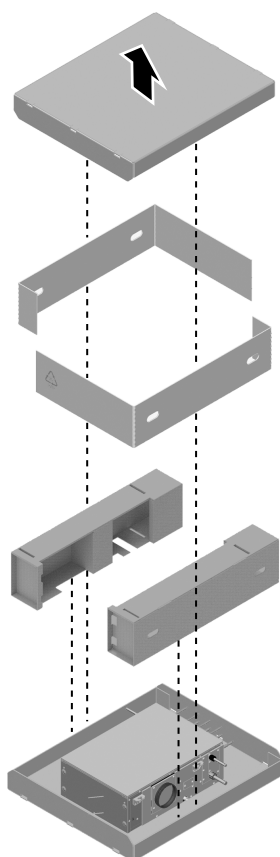
### For SV1~4A

- 1 Cut and remove the straps.



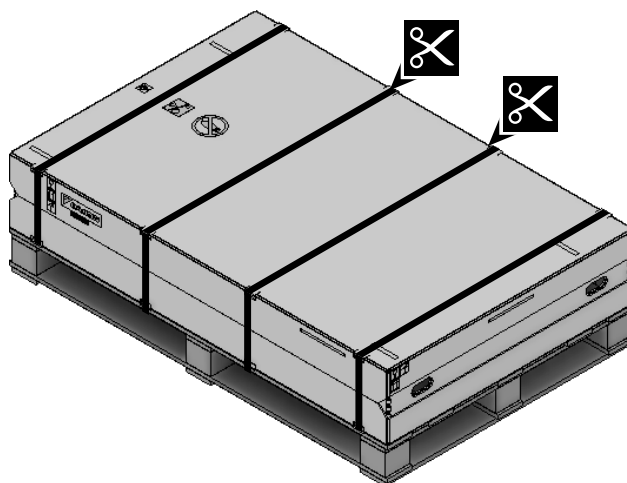


- 2** Remove the box parts as indicated in the picture.

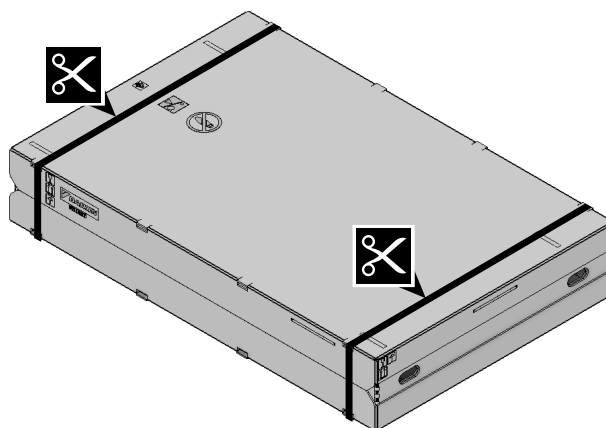


**For SV6~8A**

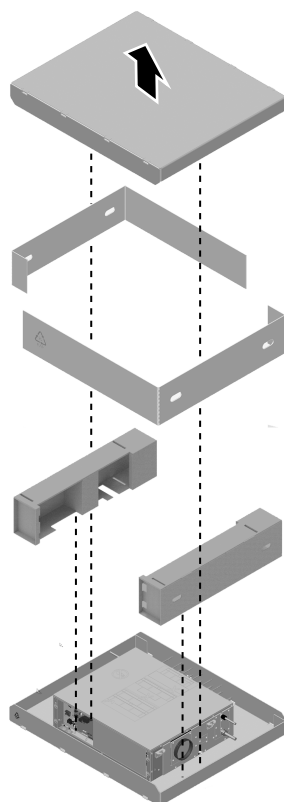
- 1** Cut and remove the inner straps.



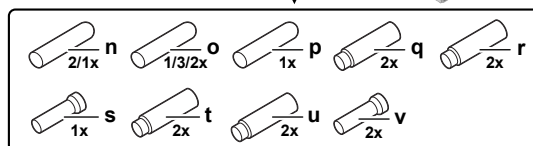
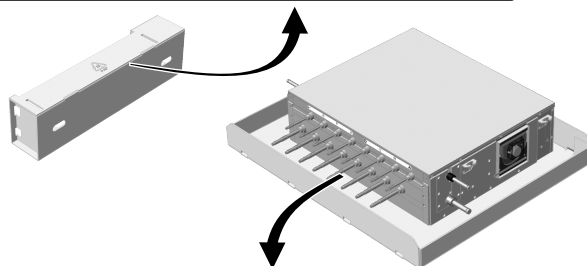
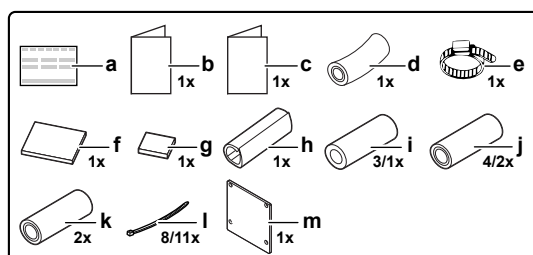
- 2 Remove the pallet.
- 3 Cut and remove the outer straps.



- 4 Remove the box parts as indicated in the picture.



### 11.3 To remove the accessories



- a Declaration of conformity
- b Installation and operation manual
- c General safety precautions
- d Drain hose
- e Metal clamp
- f Sealing material (large)
- g Sealing material (small)
- h Sealing material (thin sheet)
- i Insulation tube for stopper pipe  $\varnothing 9.5$  mm (3x for SV4A, 1x for SV1A and SV6~8A)
- n 2/1x
- o 1/3/2x
- p 1x
- q 2x
- r 2x
- s 1x
- t 2x
- u 2x
- v 2x


- j** Insulation tube for stopper pipe Ø15.9 mm (4× for SV4A, 2× for SV1A and SV6~8A)
- k** Insulation tube for stopper pipe Ø22.2 mm
- l** Cable ties (8× for SV4A, 11× for SV1A and SV6~8A)
- m** Duct closing plate
- n** Stopper pipe Ø9.5 mm (2× for SV4A, 1× for SV6~8A)
- o** Stopper pipe Ø15.9 mm (1× for SV1A, 3× for SV4A, 2× for SV6~8A)
- p** Stopper pipe Ø22.2 mm
- q** Liquid header reducer pipe (Ø15.9 → 9.5 mm)
- r** Liquid header reducer pipe (Ø15.9 → 12.7 mm)
- s** Gas branch expander pipe (Ø15.9 → 19.1 mm) (1× for SV1A for connection to FXMA200/250)
- 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..... 41
  - 12.1.1 Identification label: SV unit..... 41
- 12.2 About the operation range..... 41
- 12.3 System layout..... 41
- 12.4 Combining units and options..... 42
  - 12.4.1 Possible options for the SV unit..... 42

## 12.1 Identification

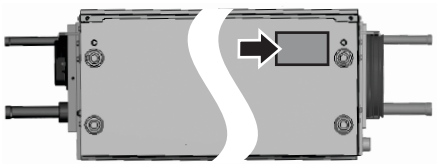


**NOTICE**


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: SV unit

Location




## 12.2 About the operation range



**INFORMATION**


For the operation limits, see ["14.1.1 Installation site requirements of the unit" \[▶ 63\]](#).

## 12.3 System layout



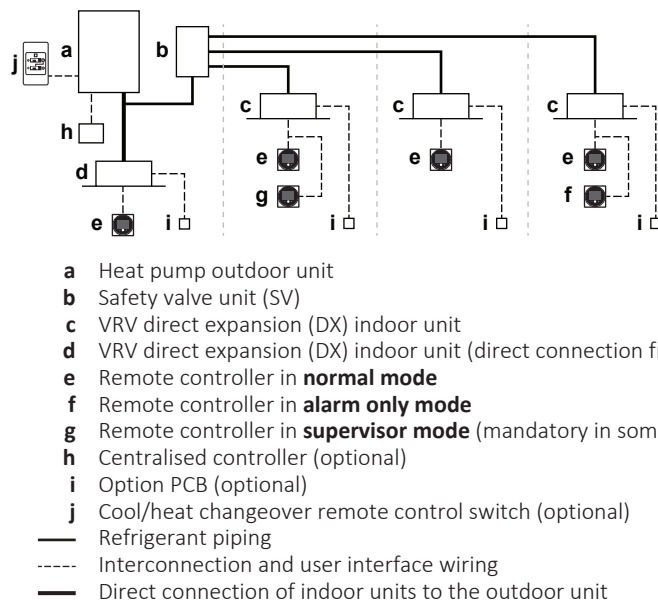
**WARNING**

The installation **MUST** comply with the requirements that apply to this R32 equipment. For more information, see ["13 Special requirements for R32 units" \[▶ 44\]](#).



**INFORMATION**

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



## 12.4 Combining units and options



### INFORMATION

Certain options may NOT be available in your country.

### 12.4.1 Possible options for the SV 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" [▶ 66] and "14.5.1 To install the ducting" [▶ 72].

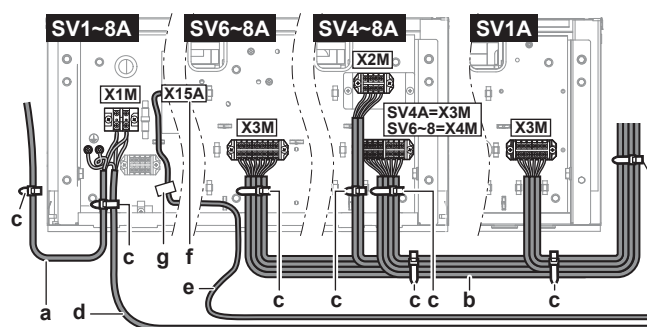
This kit can also be used when measuring the airflow. See "18.3.3 About measuring the airflow rate" [▶ 112].

#### Joint kit (EKBSJK)(only for SV4~8A)

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" [▶ 96].

#### Drain up kit (K-KDU303KVE)

- Only this optional drain up kit can be used on the SV unit. Do NOT use another drain pump kit.
- Do NOT route the interconnection wiring of the SV 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 SV 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 SV unit.




- a** Power supply for the SV unit
- b** Interconnection 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.....	44
13.2	System layout requirements .....	44
13.3	To determine the required safety measures .....	45
13.3.1	Overview: flowchart.....	48
13.4	Safety measures.....	49
13.4.1	No safety measure .....	49
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13.4.4	Ventilated enclosure .....	52
13.4.5	Overview: flowchart.....	59
13.5	Combinations of ventilated enclosure configurations.....	60
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## 13.1 Installation space requirements



**NOTICE**

- The pipework shall be securely mounted and guarded protected from physical damage.
- Keep the pipework installation to a minimum.

## 13.2 System layout requirements

The VRV 5 heat pump 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 SV unit and an alarm in the remote controller.

The safety measures that are needed for the SV unit are explained in more detail below. If they are followed, no additional safety measures for the SV unit are required. Carefully follow the installation requirements for the SV 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.

### SV unit installation

Depending on the room size in which the SV 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](#)" [▶ 45]. 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 SV unit. This SVS output can be used when additional countermeasures are needed, or when the SV 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 SV unit fails or is disconnected.

For more information about the SVS output, see "[16.5 To connect the external outputs](#)" [▶ 98].

### Piping requirements



#### CAUTION

Piping **MUST** be installed according to instructions given in "[15 Piping installation](#)" [▶ 80]. Only mechanical joints (e.g. braze+flare connections) that are compliant with the latest version of ISO14903 can be used.

Low temperature solder alloys shall not be used for pipe connections.

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

## 13.3 To determine the required safety measures

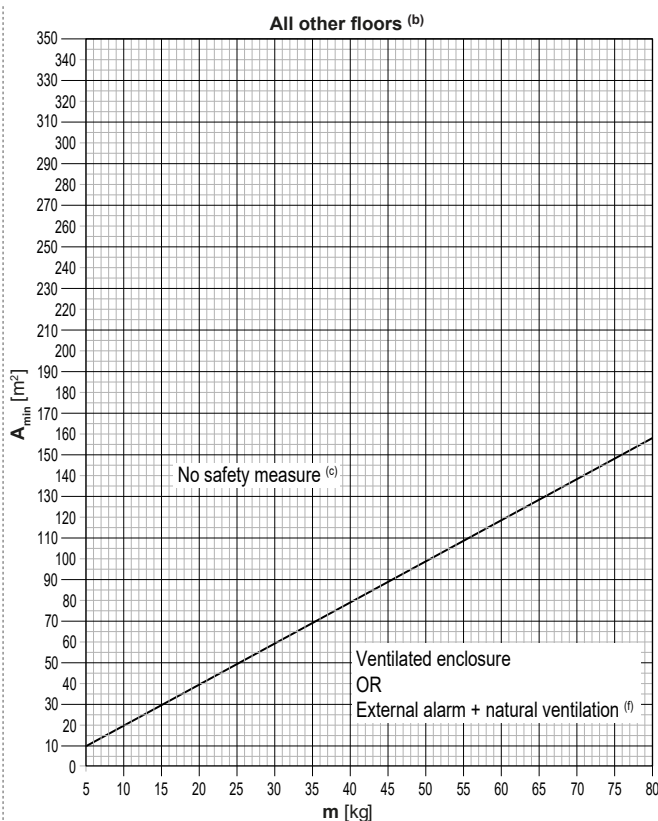
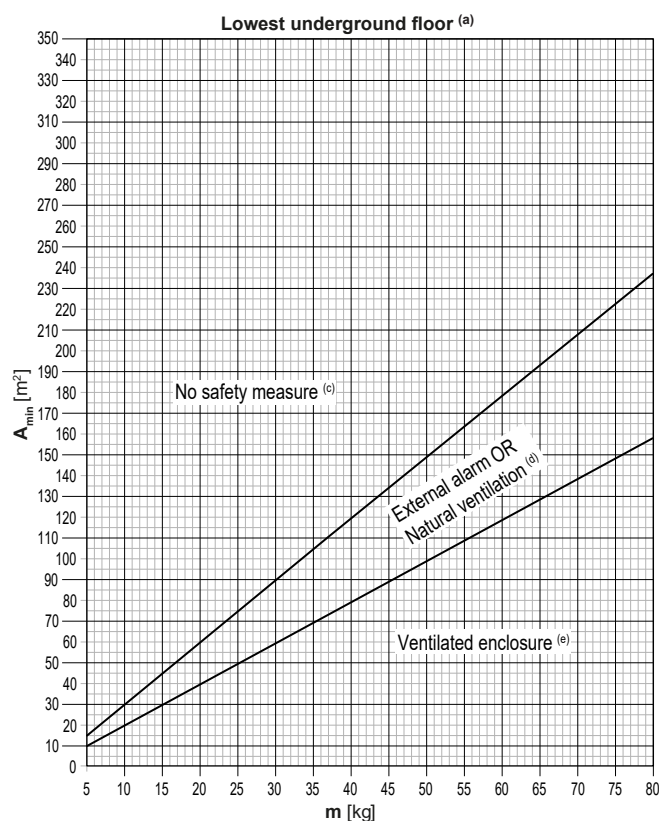
**Step 1** – Determine the total amount of refrigerant in the system. See the installation and operation manual delivered with the outdoor unit.

**Step 2** – Determine the area of the room in which the SV 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 by only false ceilings, ductwork, or similar connections are not considered a single space.

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



$m$ [kg]	$A_{min}$ [m <sup>2</sup> ]		
	Lowest underground floor (a)		All other floors (b)
	No safety measure (c)	External alarm OR Natural Ventilation (d)	No safety measure (c)
5	15	10	10
6	18	12	12
7	21	14	14
8	24	16	16
9	27	18	18
10	30	20	20
11	33	22	22
12	36	24	24
13	39	26	26
14	42	28	28
15	45	30	30
16	48	32	32
17	51	34	34
18	54	36	36
19	57	38	38
20	60	40	40
21	63	42	42
22	66	44	44
23	69	46	46
24	72	48	48
25	75	50	50
26	77	52	52
27	80	54	54
28	83	56	56
29	86	58	58
30	89	60	60
31	92	62	62
32	95	64	64
33	98	66	66
34	101	68	68
35	104	70	70
36	107	72	72
37	110	74	74
38	113	76	76
39	116	77	77
40	119	79	79
41	122	81	81
42	125	83	83

$m$ [kg]	$A_{min}$ [m <sup>2</sup> ]		
	Lowest underground floor (a)		All other floors (b)
	No safety measure (c)	External alarm OR Natural Ventilation (d)	No safety measure (c)
43	128	85	85
44	131	87	87
45	134	89	89
46	137	91	91
47	140	93	93
48	143	95	95
49	146	97	97
50	149	99	99
51	152	101	101
52	154	103	103
53	157	105	105
54	160	107	107
55	163	109	109
56	166	111	111
57	169	113	113
58	172	115	115
59	175	117	117
60	178	119	119
61	181	121	121
62	184	123	123
63	187	125	125
64	190	127	127
65	193	129	129
66	196	131	131
67	199	133	133
68	202	135	135
69	205	137	137
70	208	139	139
71	211	141	141
72	214	143	143
73	217	145	145
74	220	147	147
75	223	149	149
76	226	151	151
77	229	153	153
78	231	154	154
79	234	156	156
80	237	158	158

- m** Total refrigerant charge in the system [kg]  
 **$A_{min}$**  Minimum room area [m<sup>2</sup>]  
**(a)** Lowest underground floor (=Lowest underground floor)  
**(b)** All other floors (=All other floors)  
**(c)** No safety measure (=No safety measure)  
**(d)** External alarm OR Natural ventilation (=External alarm OR Natural ventilation)  
**(e)** Ventilated enclosure (=Ventilated enclosure)  
**(f)** Ventilated enclosure OR External alarm + natural ventilation (=Ventilated enclosure OR External alarm + natural ventilation)

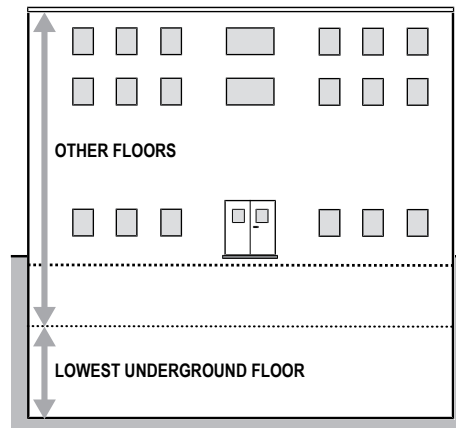
Use the total amount of refrigerant in the system and the area of the room in which the SV unit is installed to check which safety measure is required.

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

**Note:** When natural ventilation 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 first graph (Lowest underground floor<sup>(a)</sup>) in case the SV unit is installed in the lowest underground floor of a building. For other floors, use the second graph (All other floors<sup>(b)</sup>).



The graphs and table are based on an installation height of the SV unit between 1.8 m and 2.2 m. The installation height is the height of the bottom of the SV unit to the floor. See also "14.1.1 Installation site requirements of the unit" [▶ 63].

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

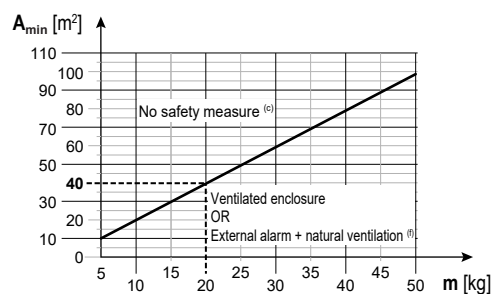
SV units cannot be installed lower than 1.8 m from the lowest point of the floor.

#### Example

The total amount of refrigerant in the VRV system is 20 kg. All SV units are installed in spaces that do NOT belong to the lowest underground floor of the building. The space in which the first SV unit is installed has a room area of 50 m<sup>2</sup>, the space in which the second SV unit is installed has a room area of 15 m<sup>2</sup>.

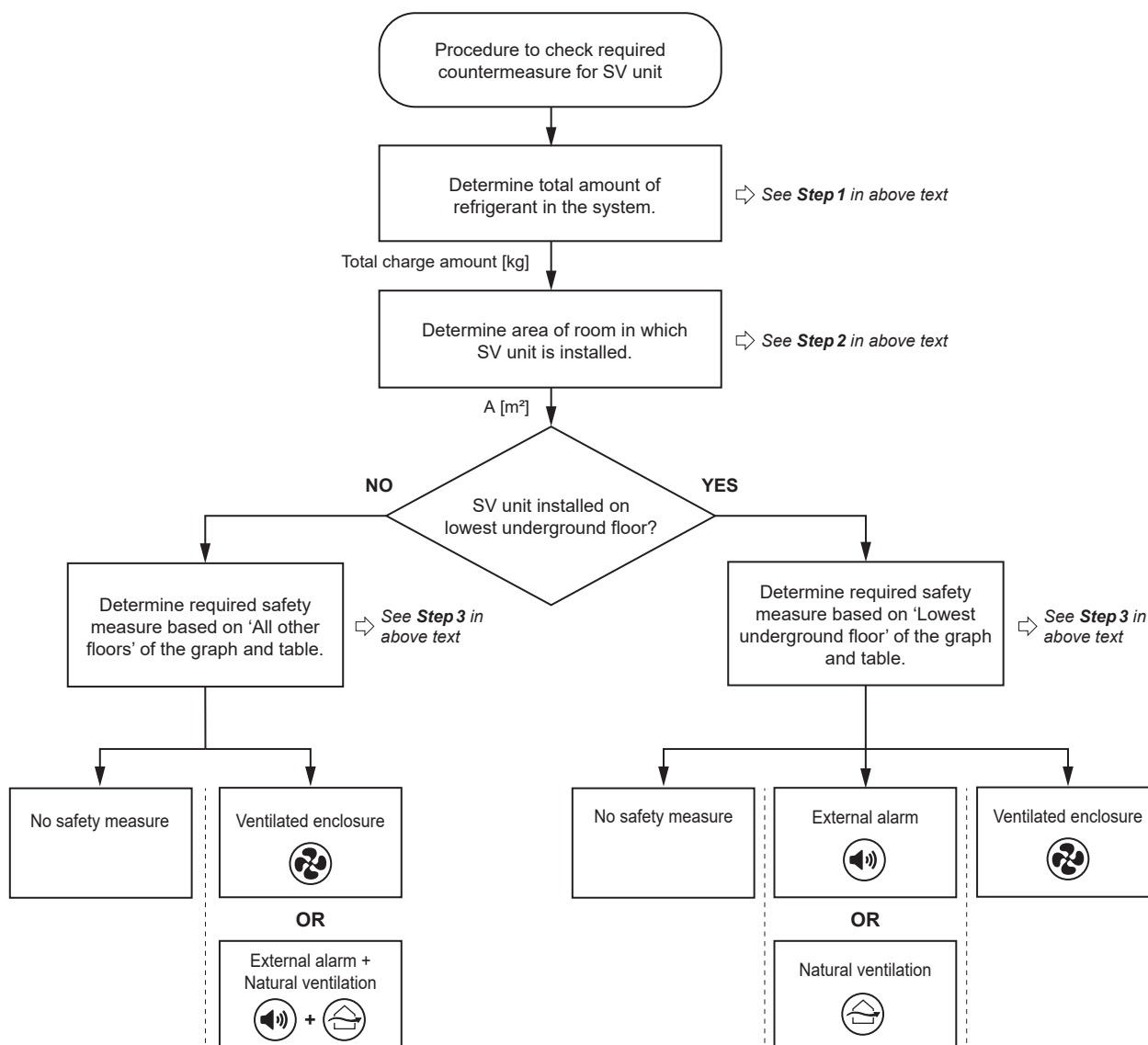
- Based on the graph for "All other floors" (All other floors), the room area limit is **40 m<sup>2</sup>** for "No safety measure" (No safety measures).
- This means that the following safety measures are required:

SV unit	Room area	Required safety measure
1	A=50 m <sup>2</sup> ≥ 40 m <sup>2</sup>	No safety measures
2	A=15 m <sup>2</sup> < 40 m <sup>2</sup>	Ventilated enclosure OR External alarm + natural ventilation



- m** Total refrigerant charge in the system [kg]  
**A<sub>min</sub>** Minimum room area [m²]  
**(a)** Lowest underground floor (=Lowest underground floor)  
**(b)** All other floors (=All other floors)  
**(c)** No safety measure (=No safety measure)  
**(d)** External alarm OR Natural ventilation (=External alarm OR Natural ventilation)  
**(e)** Ventilated enclosure (=Ventilated enclosure)  
**(f)** Ventilated enclosure OR External alarm + natural ventilation (=Ventilated enclosure OR External alarm + natural ventilation)

### 13.3.1 Overview: flowchart



**Note:** The flowchart is an overview. Always refer to the full text mentioned in this manual for clear understanding and detailed explanation.

## 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 SV 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" [▶ 73]).

#### Field settings

No safety measure		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	0 (default): disable
[2-4] <sup>(b)</sup>	Safety measures	0: disable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

**Note:** For more information, see "17.1 Making field settings" [▶ 100].

#### SV unit test run

Before SV unit operation, it is required to perform a test run that simulates a refrigerant leak. See "18.3 SV unit test run" [▶ 110] for more details.

### 13.4.2 External alarm

Do NOT use the external alarm safety measure in case the SV unit is installed 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" [▶ 73]).

An external alarm circuit (field supply) must be connected to the SVS output of the SV unit, see "16.5 To connect the external outputs" [▶ 98].

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 one alarm must be installed in the occupied space in which the SV 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 SV unit of the system. **Note:** An address number for the supervisor remote controller must be assigned to the SV unit. See "17.1 Making field settings" [▶ 100].

When the R32 sensor in the SV unit detects a refrigerant leak, the SVS output will close and activate the alarm. An error message will display on the remote controllers of the connected indoor units. See ["21 Troubleshooting"](#) [▶ 118].

### Field settings

External alarm		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	0 (default): disable
[2-4] <sup>(b)</sup>	Safety measures	1 (default): enable
[2-7] <sup>(b)</sup>	Ventilated enclosure	0: disable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

**Note:** For more information, see ["17.1 Making field settings"](#) [▶ 100].

### SV unit test run

Before SV unit operation, it is required to perform a test run that simulates a refrigerant leak. See ["18.3 SV unit test run"](#) [▶ 110] for more details.

#### 13.4.3 Natural ventilation

Natural ventilation is a safety measure where ventilation is made to a place where sufficient air is available to dilute the leaked refrigerant such as a large space.

The duct connection must be replaced with the duct closing plate accessory (see ["14.5.2 To install the duct closing plate"](#) [▶ 73]).

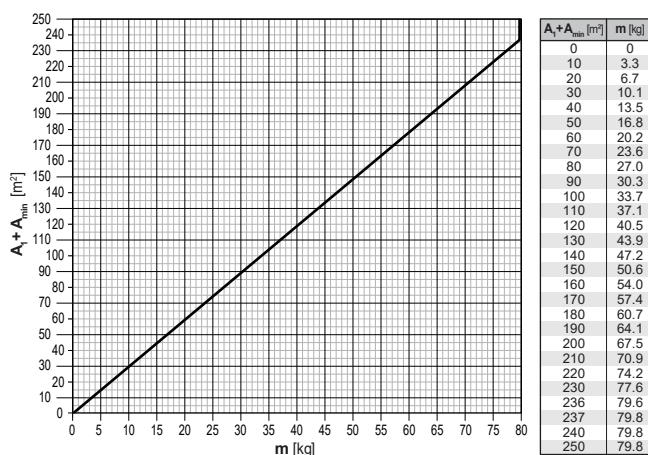
The natural ventilation safety measure can be applied by following the steps below:

**Step 1** – Determine total room area, which is the total area of the space that has natural ventilation **and** the space in which the SV unit is installed:

The respective 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.

**Step 2** – Use the graph or table below to determine the total refrigerant charge limit in the system:

**Note:** Round down the derived values.



$m$  Total refrigerant charge in the system [kg]

$A_1$  Area of the room with natural ventilation [m²]

$A_{min}$  Minimum room area of the space in which the SV unit is installed [m²]

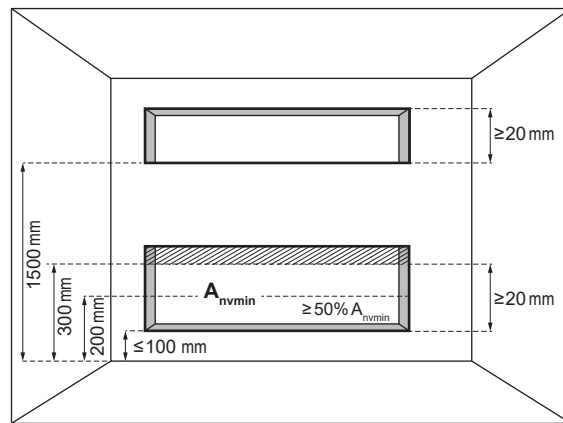
The graphs and table are based on an installation height of the SV unit between 1.8 m and 2.2 m. The installation height is the height of the bottom of the SV unit to the floor. See also "[14.1.1 Installation site requirements of the unit](#)" [► 63].

If the installation height is more than 2.2 m, higher total refrigerant charge limit of the system can apply. To know the total refrigerant charge limit of the system in case the installation height is more than 2.2 m, refer to the online tool ([VRV Xpress](#)).

**Step 3** – The total amount of refrigerant in the system **MUST** be less than the refrigerant charge limit derived from the graph above. If NOT, natural ventilation safety measure is not allowed.

**Step 4** – The partition between two rooms on the same floor **MUST** meet one of the following two requirements for natural ventilation.

- 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.
- Rooms on the same floor connected with permanent openings that fulfil the requirements listed below. The openings must consist out of two parts to allow air circulation for natural ventilation.



$A_{nvmin}$  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  $\geq 0.012 \text{ m}^2$  ( $A_{nvmin}$ )
- 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  $\leq 100 \text{ mm}$  from the floor
- The height of the opening is  $\geq 20 \text{ mm}$

For the upper opening:

- It is not an opening to the outside
- The opening cannot be closed
- The opening must be  $\geq 0.006 \text{ m}^2$  (50% of  $A_{nvmin}$ )
- The bottom of the upper opening must be  $\geq 1500 \text{ mm}$  above the floor
- The height of the opening is  $\geq 20 \text{ mm}$

**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.

**Example**

The total amount of refrigerant in the VRV system is 20 kg. The VRV system has one SV unit which is installed in space that does not belong to the lowest underground floor of the building. The space in which the SV unit is installed has a room area of 25 m<sup>2</sup>. An adjacent room has a room area of 45 m<sup>2</sup> to which air circulation is possible through a partition that meets one of the two requirements in the above text. The safety measure chosen is *External alarm + Natural ventilation* instead of *Ventilated enclosure* (based on the total amount of refrigerant and room area from the graph for "All other floors").

- 1 To apply the *External alarm* safety measure, see "[13.4.2 External alarm](#)" [► 49].
- 2 In addition, apply the *Natural ventilation* safety measure: total room areas of installed room and adjacent room where natural ventilation can be made: 25 m<sup>2</sup>+45 m<sup>2</sup>=70 m<sup>2</sup>
  - Total refrigerant charge limit for the system determined using the graph for natural ventilation is **23.6 kg**.

Total amount of refrigerant in the system (20 kg) < Total refrigerant charge limit (23.6 kg), which means that the safety measure can be applied.

**Field settings**

Natural ventilation		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	0 (default): disable
[2-4] <sup>(b)</sup>	Safety measures	0: disable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

**Note:** For more information, see "[17.1 Making field settings](#)" [► 100].

**Note:** If the natural ventilation safety measure is used in conjunction with the external alarm safety measure, then the field settings for external alarm safety measure MUST be made during configuration.

**SV unit test run**

Before SV unit operation, it is required to perform a test run that simulates a refrigerant leak. See "[18.3 SV unit test run](#)" [► 110] for more details.

**13.4.4 Ventilated enclosure****WARNING**

If the ventilated enclosure safety measure is applied, the SV unit must have its own ductwork and extraction fan. Do NOT combine this ductwork with ducting for other purposes.

A ventilated enclosure is required as a safety measure in case other safety measures (see "[13.4.1 No safety measure](#)" [► 49], "[13.4.3 Natural ventilation](#)" [► 50] and "[13.4.2 External alarm](#)" [► 49]) are not allowed.

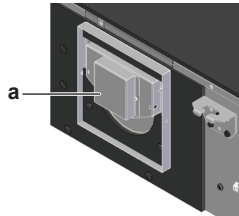
For the ventilated enclosure safety measure, ductwork and an extraction fan MUST be installed. See "[14.5 Installing the ventilation ducting](#)" [► 72] for ductwork (field supply) installation and "[16.5 To connect the external outputs](#)" [► 98] to connect the extraction fan circuit (field supply) to the SV 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"](#) [▶ 98].

When the R32 sensor in the SV 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 SV unit enables a choice between three types of configurations (see below).



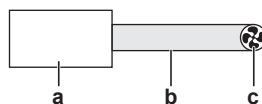
**a** Damper

Respect the following rules:

Ductwork	The evacuation ductwork <b>MUST</b> vent outside the building. Avoid that dirt, dust and small animals can enter the ductwork and lead to an obstruction. <b>Example:</b> 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. This requirement is met if the fan motor has an IP4X rating or better.
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 8 hours. This is achieved by providing a sufficiently large air volume around the SV unit or by providing sufficient replacement air around the SV unit (e.g. natural openings or a dedicated opening in the false ceiling).
Maintenance	Maintain the evacuation channel to avoid dust and dirt from building up and obstructing the flow path.

#### One SV unit – one extraction fan

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

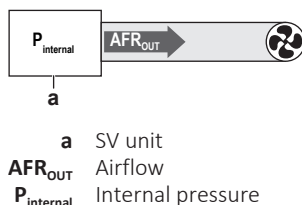


**a** SV unit  
**b** Ductwork  
**c** Extraction fan

An extraction fan must be connected to the SV unit, see ["16.5 To connect the external outputs"](#) [▶ 98].

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 SV unit and the pressure drop generated by the components of the ductwork.

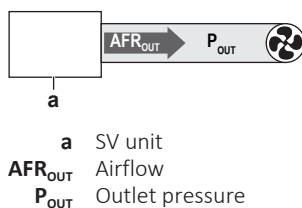
Select an airflow rate for the evacuation that meets the legal requirements. This means that the airflow rate is above the legally required minimum, and generates sufficient pressure difference inside the SV unit when compared with the pressure of the surroundings. The minimum required airflow rate ( $AFR_{OUT}$ ) is 18.8 m<sup>3</sup>/h, and the pressure drop generated by the SV unit should lead to a pressure inside the SV unit ( $P_{internal}$ ) that is more than 20 Pa below the pressure of the surroundings.



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 SV unit should not be more than 350 Pa below the pressure of the surroundings.

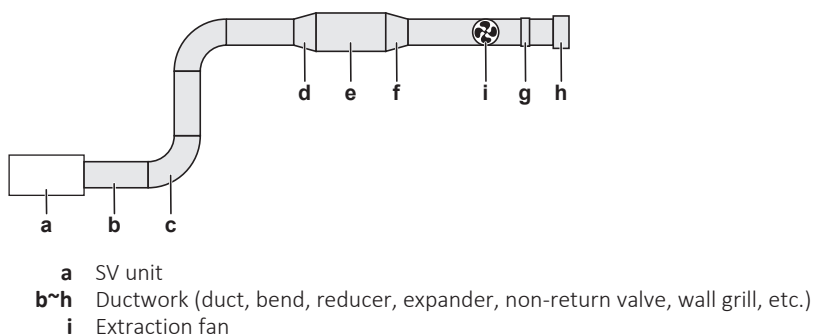
Write down the pressure drop generated by all the components in the evacuation channel for the selected airflow rate. For the SV unit, use the curve that presents the pressure at the outlet ( $P_{OUT}$ ) in function of the airflow rate ( $AFR_{OUT}$ ). See the latest version of the technical engineering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



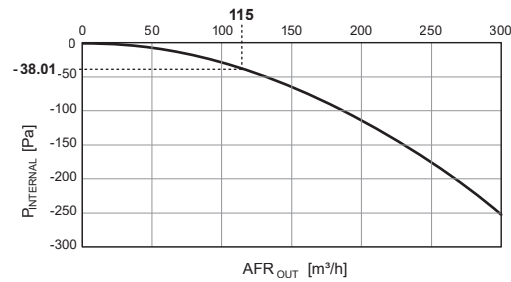
For the pressure drop caused by other components of the evacuation channel (ducts, bends, etc.), use the curves of the manufacturer.

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

### Example

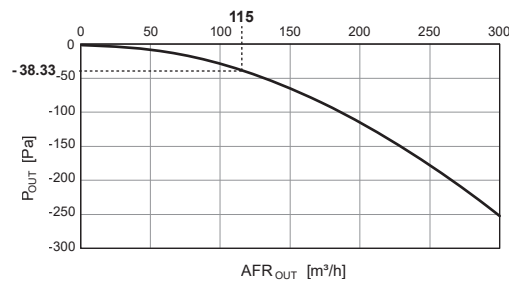


In this example we use a SV8A unit. Use the curve of the internal pressure inside the SV unit ( $P_{internal}$ ) in function of the airflow rate ( $AFR_{OUT}$ ). When an airflow rate of 115 m<sup>3</sup>/h is selected, the pressure inside the SV unit is 38 Pa below the pressure of the surroundings. So this airflow rate is above the required 18.8 m<sup>3</sup>/h and the pressure inside the SV unit is within the range of 20~350 Pa below the pressure of the surroundings. We use this 115 m<sup>3</sup>/h airflow rate for further calculations.

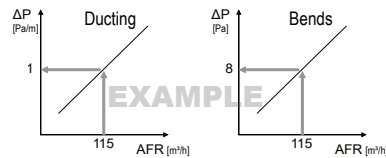


**Note:** These curves present the internal pressure of the SV unit compared to an ambient pressure of 101325 Pa.

Use the curve of the outlet pressure ( $P_{OUT}$ ) in function of the airflow rate ( $AFR_{OUT}$ ) for the SV unit. With an airflow rate of 115 m³/h, the resulting pressure drop generated by the SV unit is 38.3 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.

Nº	Indication	Type	AFR [m³/h]	Length [m]	ΔP [Pa/m]	ΔP [Pa]
1	a	SV unit	115	-	-	38.3
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)						<b>114.3</b>

Select a fan with the required flow of 115 m³/h and a total pressure rise of 114.3 Pa.

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

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.

### Field settings

One SV unit – one extraction fan		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	0 (default): disable
[2-4] <sup>(b)</sup>	Safety measures	1 (default): enable
[2-7] <sup>(b)</sup>	Ventilated enclosure	1 (default): enable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

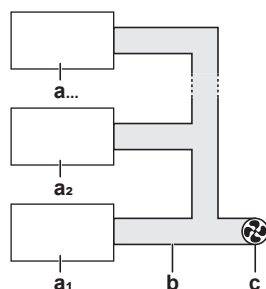
**Note:** For more information, see ["17.1 Making field settings"](#) [▶ 100].

### SV unit test run

Before SV unit operation, it is required to perform a test run that simulates a refrigerant leak. See ["18.3 SV unit test run"](#) [▶ 110] for more details.

### Multiple SV units in parallel – one extraction fan

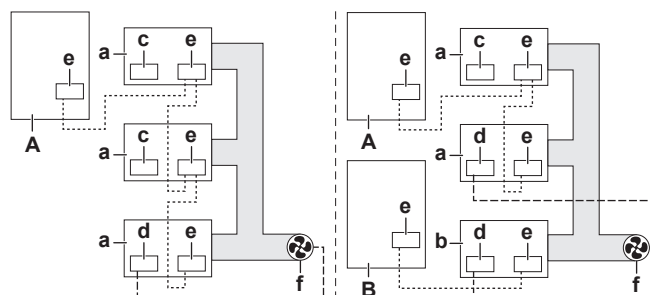
In this configuration, multiple parallel SV units are connected to a single extraction fan. Each SV unit benefits from a direct airflow path to the extraction fan. In case of a refrigerant leak in any SV unit, the damper of that SV unit will open and allow direct air evacuation to the extraction fan.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



- a<sub>#</sub>** SV unit #
- b** Ductwork
- c** Extraction fan

It is sufficient to connect the extraction fan circuit to only one SV unit of the cluster (=SV units that belong to the same ductwork and extraction fan) (see ["16.5 To connect the external outputs"](#) [▶ 98]). If in a cluster there are SV units that belong to different outdoor unit systems, the fan circuit must be connected to one SV unit (in the cluster) of each outdoor unit system.

### Example



- a** SV unit belonging to outdoor unit A
- b** SV unit belonging to outdoor unit B
- c** Extraction fan output terminal – NOT connected

- d** Extraction fan output terminal – connected
- e** Interconnection wiring terminal
- f** Extraction fan
- A** Outdoor unit A
- B** Outdoor unit B
- ..... Interconnection 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.

### Field settings

Multiple SV units in parallel – one extraction fan		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	1: enable
[2-1] <sup>(a)</sup>	Cluster number	# <sup>(b)</sup>
[2-2] <sup>(a)</sup>	Cluster configuration	0 (default): parallel
[2-4] <sup>(c)</sup>	Safety measures	1 (default): enable
[2-7] <sup>(c)</sup>	Ventilated enclosure	1 (default): enable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Assign a unique cluster number to each cluster in the system. All SV units in the same cluster MUST have the same cluster number.

<sup>(c)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

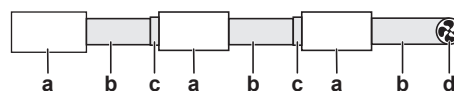
**Note:** For more information, see "[17.1 Making field settings](#)" [▶ 100].

### SV unit test run

Before SV unit operation, it is required to perform a test run that simulates a refrigerant leak. See "[18.3 SV unit test run](#)" [▶ 110] for more details.

### Multiple SV units in series – one extraction fan

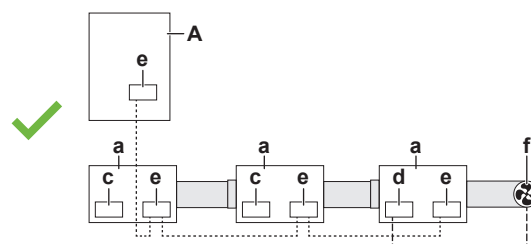
In this configuration, multiple SV units are connected in series to a single extraction fan. The air flows through every SV unit to the extraction fan. In case of a refrigerant leak in any SV unit, the dampers of all SV units will open and allow air evacuation to the extraction fan.

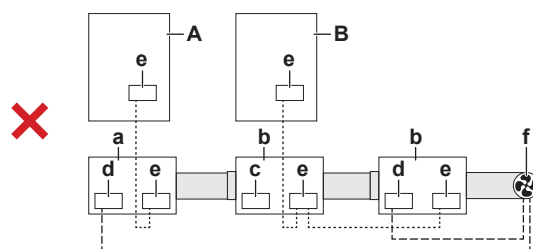


- a** SV unit
- b** Ductwork
- c** EKBSDCK
- d** Extraction fan

It is sufficient to connect the extraction fan circuit to only one SV unit of the cluster (see "[16.5 To connect the external outputs](#)" [▶ 98]). It is not allowed to have SV units in the same series cluster that belong to different outdoor unit systems.

### Example





- a** SV unit belonging to outdoor unit A
- b** SV unit belonging to outdoor unit B
- c** Extraction fan output terminal – NOT connected
- d** Extraction fan output terminal – connected
- e** Interconnection wiring terminal
- f** Extraction fan
- A** Outdoor unit A
- B** Outdoor unit B
- ..... Interconnection 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 SV 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.

### Field settings

Multiple SV units in series – one extraction fan		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	1: enable
[2-1] <sup>(a)</sup>	Cluster number	# <sup>(b)</sup>
[2-2] <sup>(a)</sup>	Cluster configuration	1: series
[2-4] <sup>(c)</sup>	Safety measures	1 (default): enable
[2-7] <sup>(c)</sup>	Ventilated enclosure	1 (default): enable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Assign a unique cluster number to each cluster in the system. All SV units in the same cluster MUST have the same cluster number.

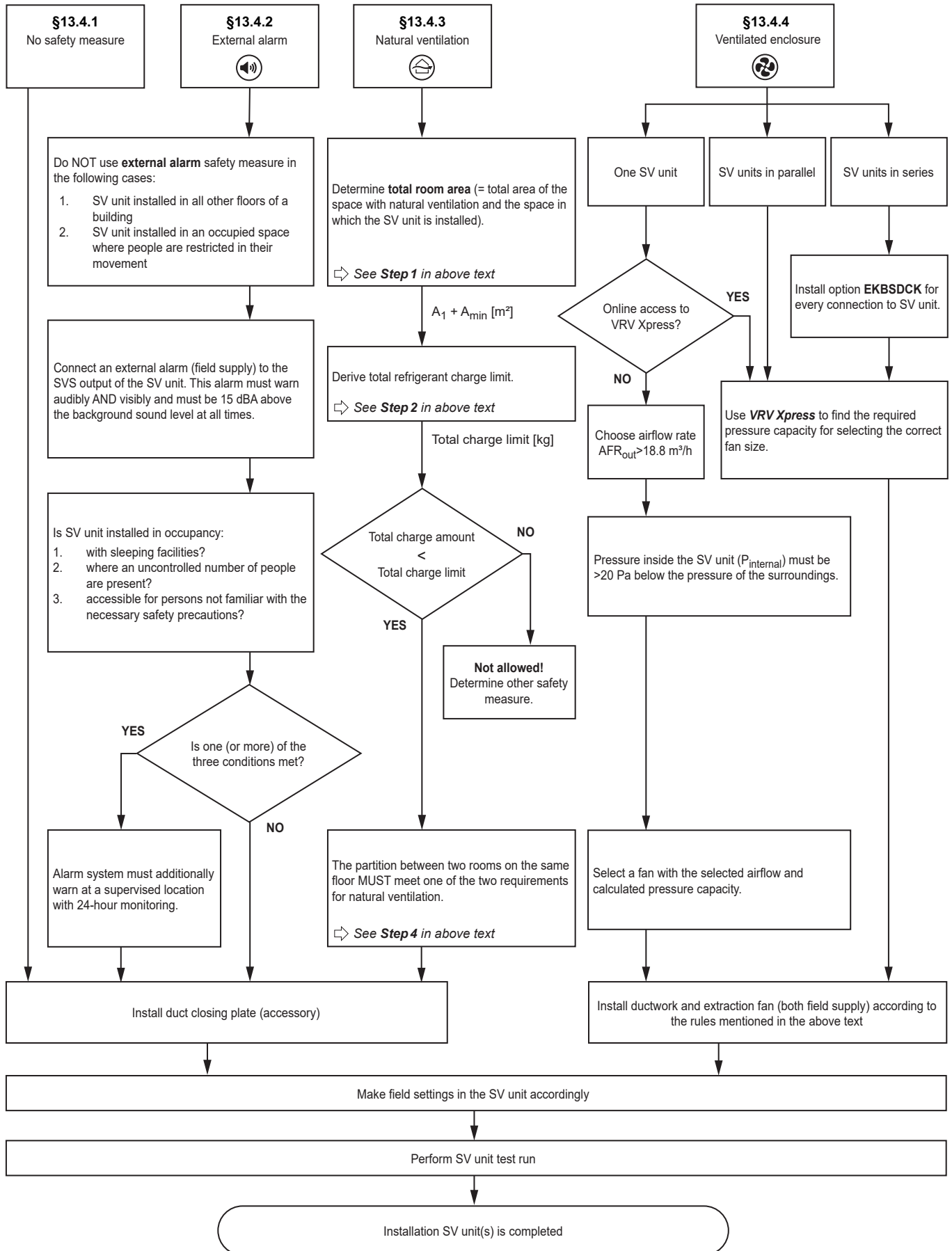
<sup>(c)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

**Note:** For more information, see "17.1 Making field settings" [▶ 100].

### SV unit test run

Before SV unit operation, it is required to perform a test run that simulates a refrigerant leak. See "18.3 SV unit test run" [▶ 110] for more details.

## 13.4.5 Overview: flowchart

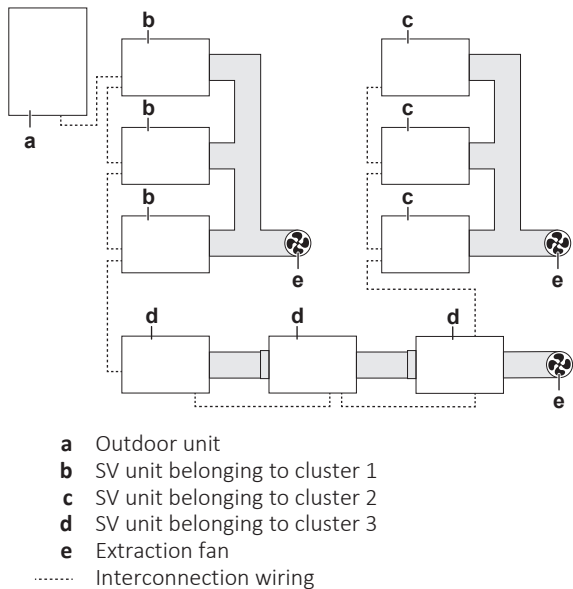


**Note:** The flowchart is an overview. Always refer to the full text mentioned in this manual for clear understanding and detailed explanation.

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 SV units in the same cluster need to be assigned the same cluster number.

Example



Field settings of above example

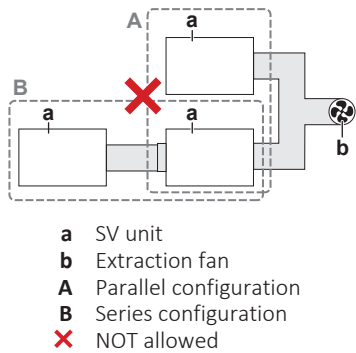
Code	Description	Value <sup>(a)</sup>		
[2-0] <sup>(b)</sup>	Cluster indication	1: enable		
[2-1] <sup>(b)</sup>	Cluster number	1	2	3
[2-2] <sup>(b)</sup>	Cluster configuration	0 (default): parallel		1: series
[2-4] <sup>(c)</sup>	Safety measures	1 (default): enable		
[2-7] <sup>(c)</sup>	Ventilated enclosure	1 (default): enable		

- <sup>(a)</sup> For clusters 1~3.
- <sup>(b)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.
- <sup>(c)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

**Note:** For more information, see "17.1 Making field settings" [▶ 100].

Example

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



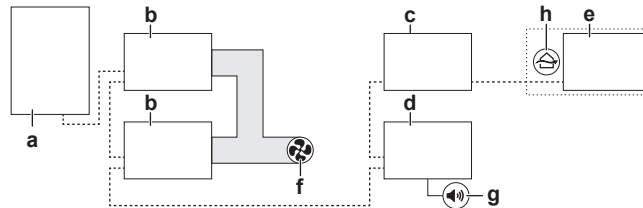


**SV unit test run**

Before SV unit operation, it is required to perform a test run that simulates a refrigerant leak. See "18.3 SV unit test run" [▶ 110] for more details.

## 13.6 Combinations of safety measures

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

**Example**

- a** Outdoor unit
- b** SV unit with ventilated enclosure safety measure
- c** SV unit without safety measures
- d** SV unit with external alarm safety measure
- e** SV unit with natural ventilation
- f** Extraction fan
- g** External alarm
- h** Natural ventilation
- ..... Interconnection wiring

**Field settings**

SV units (b) with ventilated enclosure safety measure		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	1: enable
[2-1] <sup>(a)</sup>	Cluster number	1
[2-2] <sup>(a)</sup>	Cluster configuration	0 (default): parallel
[2-4] <sup>(b)</sup>	Safety measures	1 (default): enable
[2-7] <sup>(b)</sup>	Ventilated enclosure	1 (default): enable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

SV units (c) without safety measures		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	0 (default): disable
[2-4] <sup>(b)</sup>	Safety measures	0: disable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

SV units (d) with external alarm safety measure		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	0 (default): disable
[2-4] <sup>(b)</sup>	Safety measures	1 (default): enable
[2-7] <sup>(b)</sup>	Ventilated enclosure	0: disable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

SV units (e) with natural ventilation		
Code	Description	Value
[2-0] <sup>(a)</sup>	Cluster indication	0 (default): disable
[2-4] <sup>(b)</sup>	Safety measures	0: disable
[2-7] <sup>(b)</sup>	Ventilated enclosure	1 (default): enable

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

<sup>(b)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

**Note:** For more information, see "17.1 Making field settings" [▶ 100].

### SV unit test run

Before SV unit operation, it is required to perform a test run that simulates a refrigerant leak. See "18.3 SV unit test run" [▶ 110] for more details.

# 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](#)" [▶ 44].

## In this chapter

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## 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 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](#)" [▶ 44].

### 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, industrial, household and residential environment.



## INFORMATION

The sound pressure level is less than 70 dBA.



INFORMATION

Also read the general installation site requirements. See the "2 General safety precautions" [ 7] chapter.



INFORMATION

Also read the following requirements:

- Service space requirements. See below in this topic.
- Refrigerant piping requirements. See "15 Piping installation" [ 80].

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" [ 45].

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

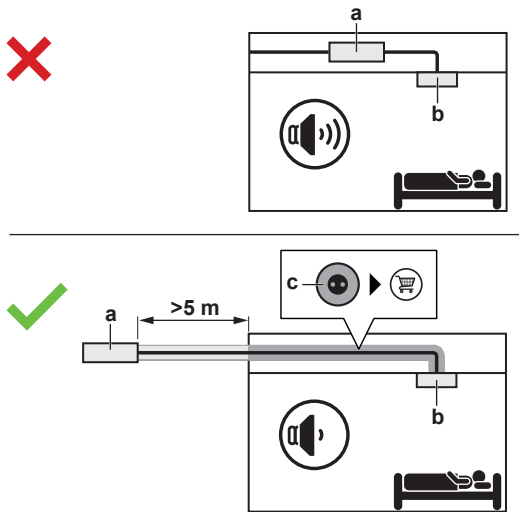
Ambient condition	Value
Indoor temperature	5~32°C DB
Indoor humidity	≤80%

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:

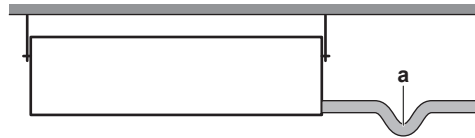
- In places where voltage fluctuates a lot.
- **Water leakage.** Take care that in the event of a water leak, water CANNOT cause any damage to the installation space and its surroundings.
- **Noise.** Choose a location where the operation noise of the unit does not disturb the room occupants. To avoid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



a SV unit

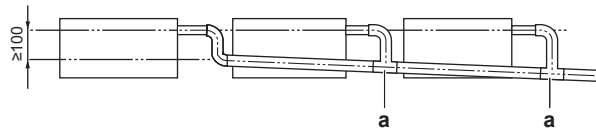
- b Indoor unit
- c Sound insulation (field supply)

- **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.



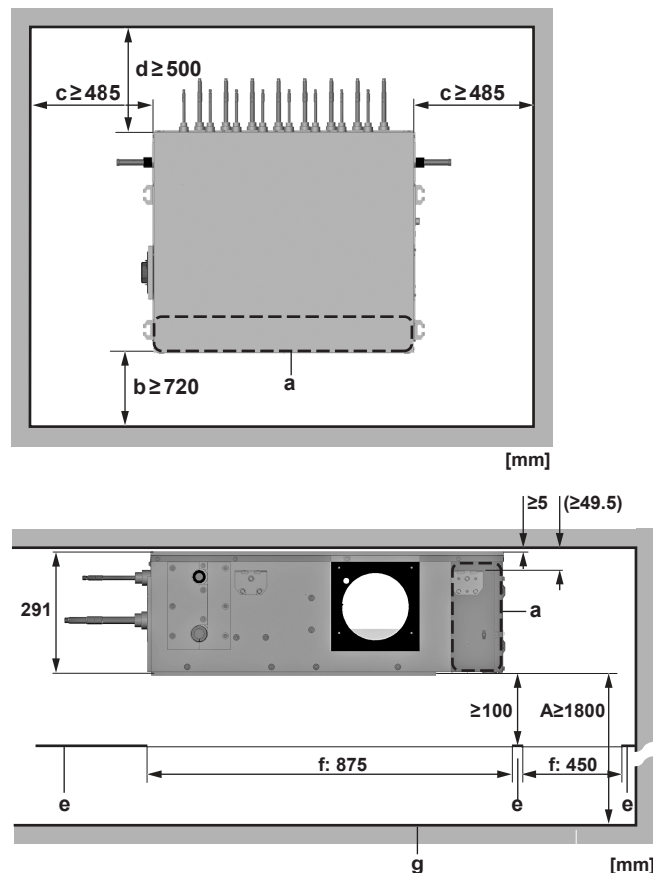
a Trap

- **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

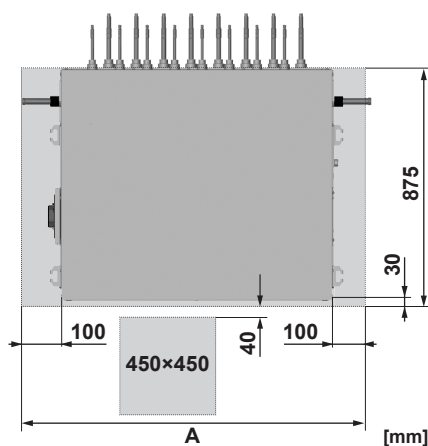
- **Spacing.** Respect the following requirements:



- 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 SV 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

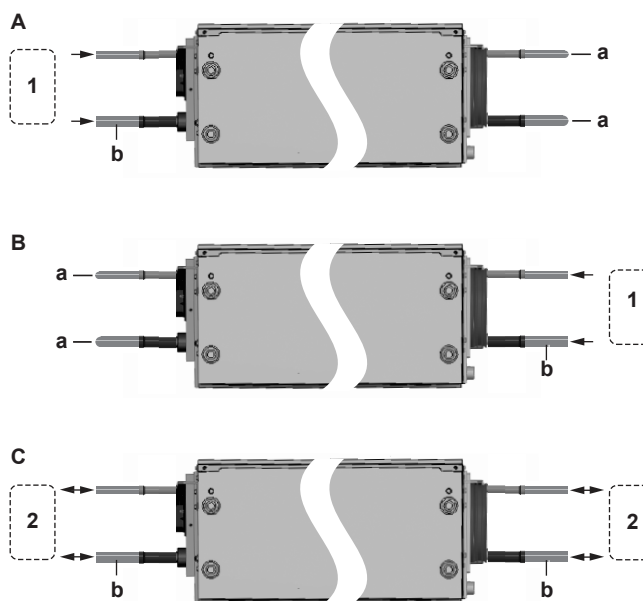
- **Ceiling strength.** Check whether the ceiling is strong enough to support the weight of the unit. If there is a risk, reinforce the ceiling before installing the unit.
  - For existing ceilings, use anchors.
  - For new ceilings, use sunken inserts, sunken anchors or other field supplied parts.
-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



- A** Ceiling opening size:  
 800 mm (SV1~4A)  
 1200 mm (SV6~8A)

## 14.2 Possible configurations

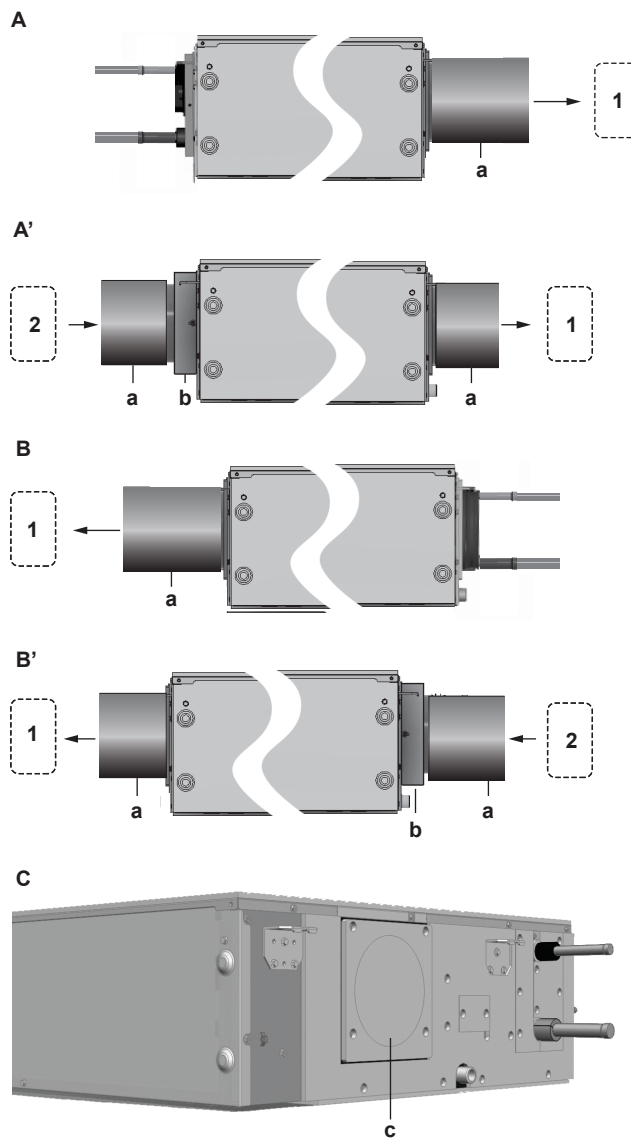
### Refrigerant piping



- 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 SV unit  
**2** From outdoor or from/to SV 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 SV unit  
**2** From another SV 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" \[▶ 74\]](#).




#### INFORMATION

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

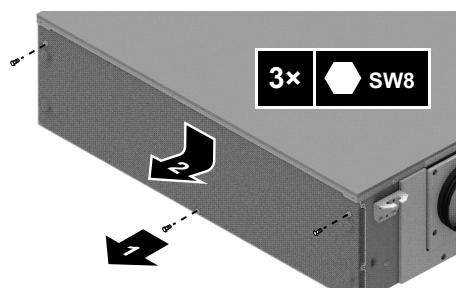
## 14.3 Opening and closing the unit

### 14.3.1 To open the unit

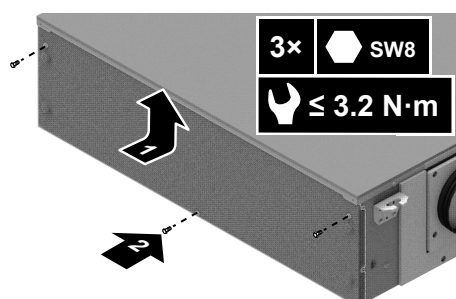


**DANGER: RISK OF ELECTROCUTION**

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



### 14.3.2 To close the unit



## 14.4 Mounting the unit

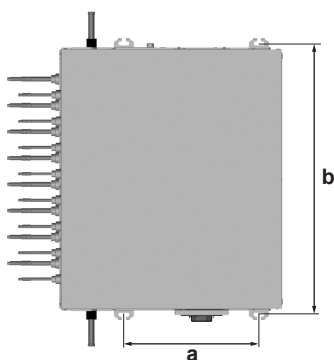
### 14.4.1 To mount the unit

**i**

**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:

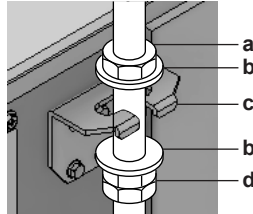


**a** Suspension bolt pitch (length): 513 mm

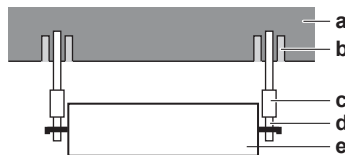


- b** Suspension bolt pitch (width):  
630 mm (SV1~4A)  
1030 mm (SV6~8A)

- 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)

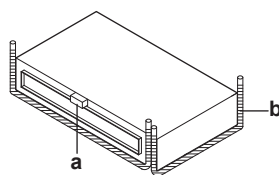


- a** Ceiling slab  
**b** Anchor bolt  
**c** Long nut or turnbuckle  
**d** Suspension bolt  
**e** SV unit

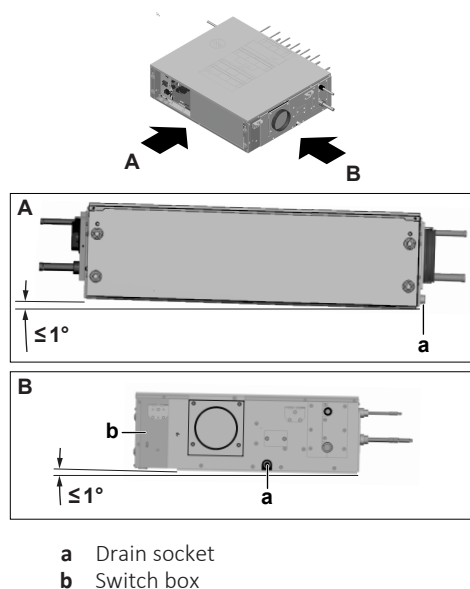
- 4** Secure the unit by tightening the nut and double nut.
- 5** Level the unit at all 4 corners by turning the double nuts, the long nuts or the turnbuckles. Use a level or water-filled vinyl tube to measure if the unit hangs level. A deviation of maximum 1 degree is allowed in the direction of the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



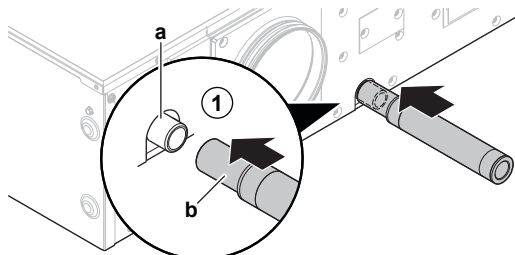
#### 14.4.2 To connect the drain piping



#### NOTICE

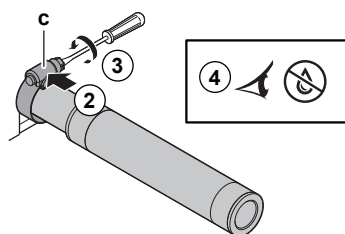
Incorrect connection of the drain hose might cause leaks, and damage the installation space and surroundings.

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



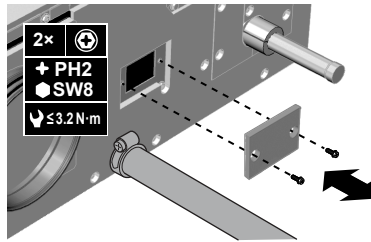
- a Drain pipe connection (attached to the unit)  
b Drain hose (accessory)

- 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.

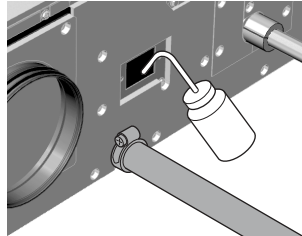


- c Metal clamp (accessory)

- 4 Check if the water drains correctly.
  - Open the inspection hole by removing the inspection hole cover.



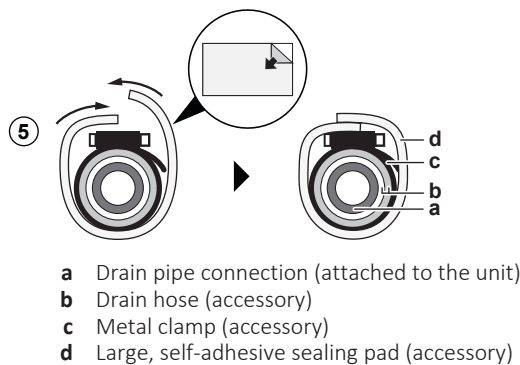
- Gradually add water through the inspection hole.



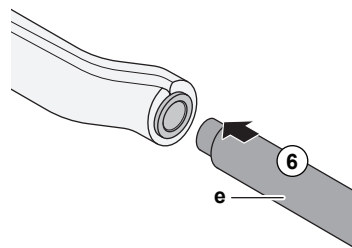
- Verify that the water flows through the drain hose and check for water leaks.
- Close the inspection hole.

- 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.



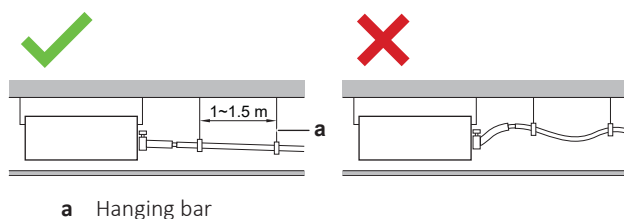
- 6 Connect the drain piping to the drain hose.

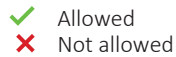


e Drain piping (field supply)

#### 14.4.3 To install the drain piping

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





- 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 "[13.4.4 Ventilated enclosure](#)" [▶ 52].



#### WARNING

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

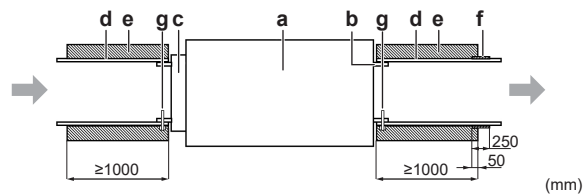


#### CAUTION

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 SV unit](#)" [▶ 42].
  - 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"](#) [▶ 83].
- 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 SV 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 SV unit is installed in sound-sensitive areas where additional measures are taken, it can be advised to also insulate the ducting.

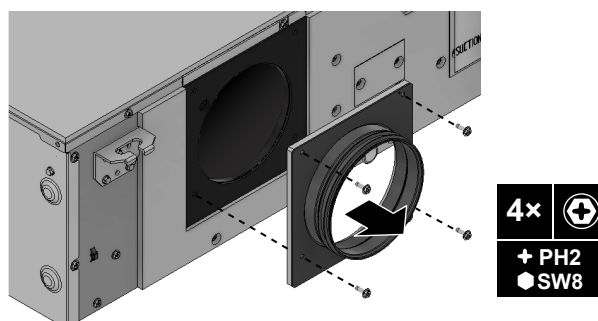
#### 14.5.2 To install the duct closing plate

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

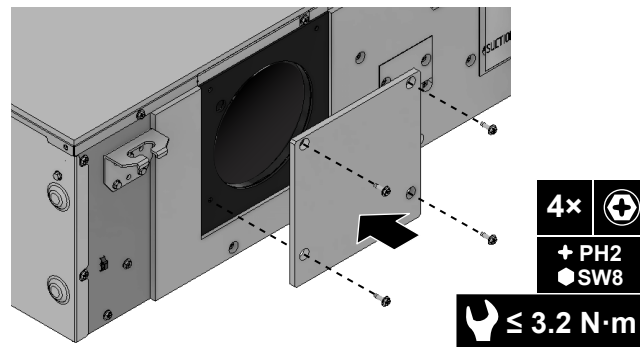
- when no safety measures are required, or
- when natural ventilation safety measure is required, or
- when an external alarm is required.

See ["13.3 To determine the required safety measures"](#) [▶ 45].

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



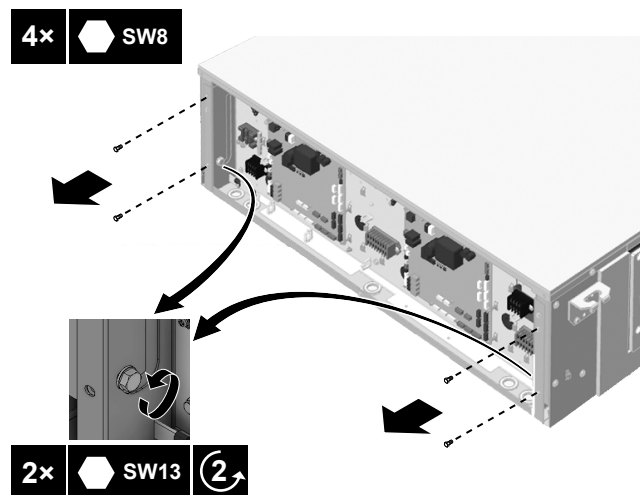
- 2 Install the duct closing plate (accessory) using the same 4 screws.



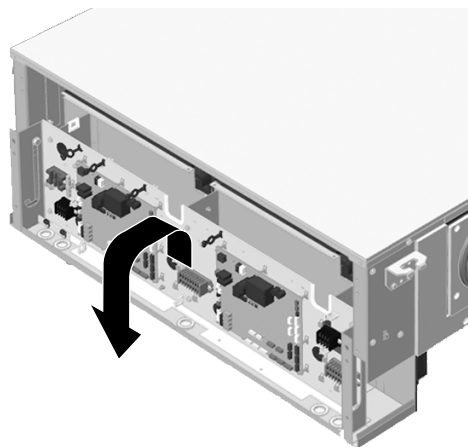
### 14.5.3 To switch the air in- and outlet side

#### To lower the switch box

- 1 Open the SV unit. See "14.3.1 To open the unit" [▶ 68].
- 2 Remove the four screws.
- 3 Store the screws in a safe place.
- 4 Loosen the M8 bolts two turns without removing them.



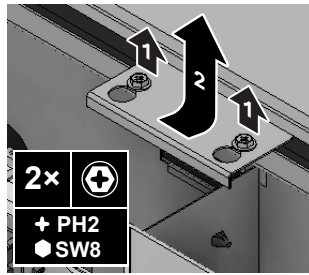
- 5 Lift the switch box, pull it forward and lower it.



#### To remove the damper

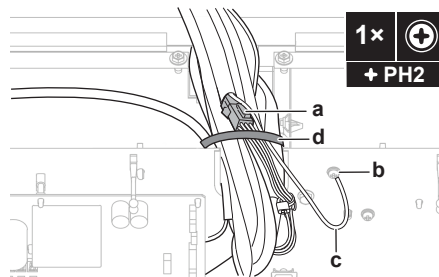
- 1 Remove the leftmost wire fixing plate. It holds the damper wire in place.

- Loosen the screws lightly without removing them.
- Slide and lift the plate.



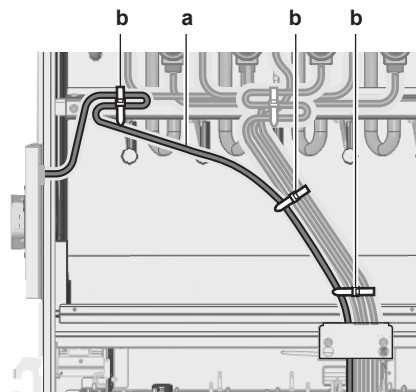
**2** Loosen the damper wires in the switch box:

- Cut the cable tie that fixes the connector.
- Unplug the damper wire from the connector.
- Loosen and remove the damper earth wire screw and detach the damper earth wire.
- Store the screw in a safe place.



- a** Connector
- b** Earth wire screw
- c** Damper earth wire
- d** Cable tie

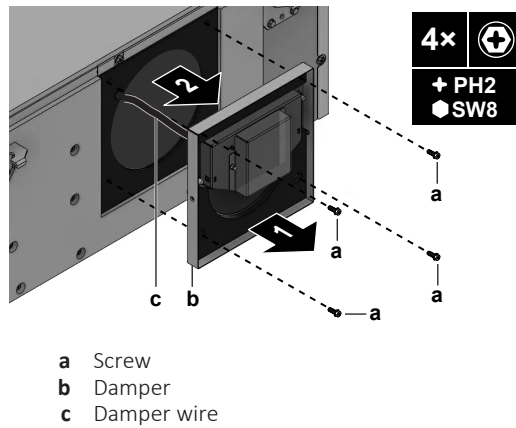
**3** Cut the cable ties that fix the damper wire to the pipe, and the one that bundles the damper wire.



- a** Damper wire
- b** Cable tie

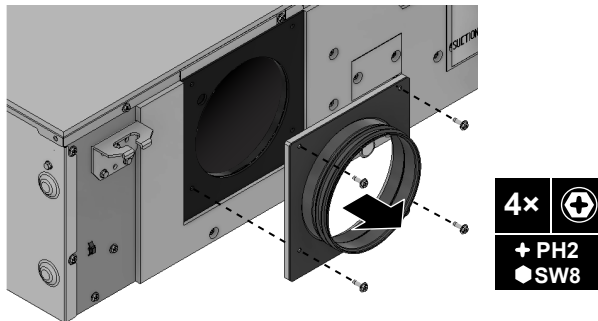
**4** Remove the damper:

- Remove the four 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.



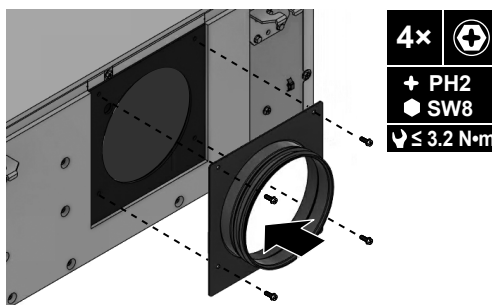
### To remove the duct connection

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



### To install the duct connection

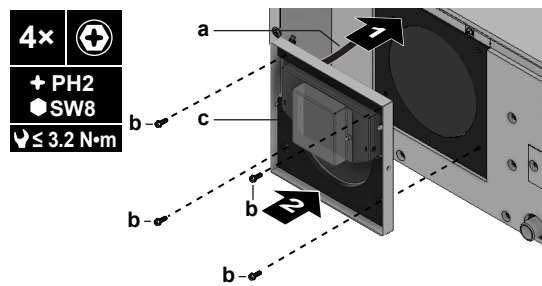
- 1 Position the duct connection onto the other side of the unit.
- 2 Attach the duct connection with four screws.



### 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 four screws.

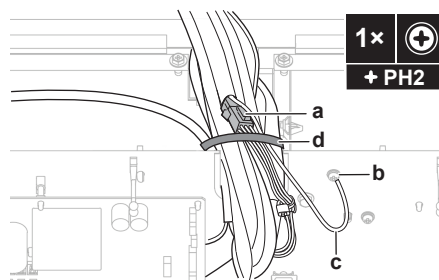




- a Damper wire  
b Screw  
c Damper

**2** Connect the damper wires in the switch box:

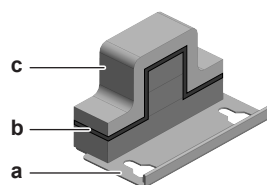
- Connect the damper wire to the connector.
- Position the damper earth wire and tighten the damper earth wire screw.
- Install a cable tie to fix the connector. Make sure the wire and connector do not touch any sharp edges.



- a Connector  
b Earth wire screw  
c Damper earth wire  
d Cable tie

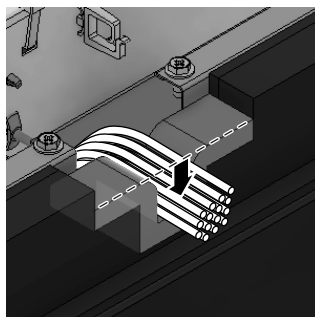
**3** Install the leftmost wire fixing plate. It holds the damper wire in place.

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

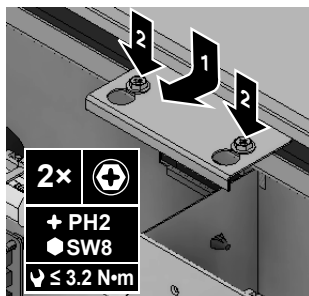


- a Wire fixing plate  
b Old flattened insulation  
c New insulation (accessory)

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



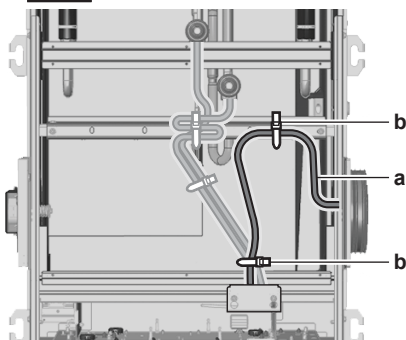
- Position the wire fixing plate over the screws and slide it in place. Make sure the backside is aligned properly with the insulation of the switch box, in order to make it airtight.
- Tighten the two screws.



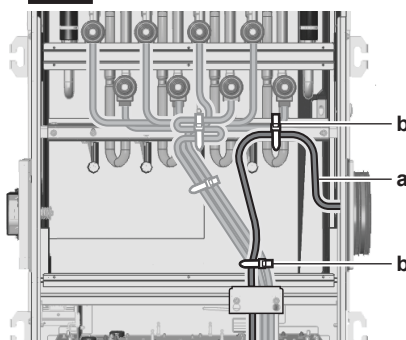
#### 4 Attach the damper wires.

- 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.

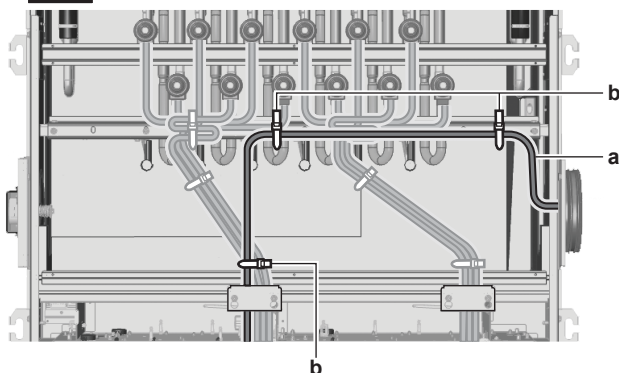
SV1A

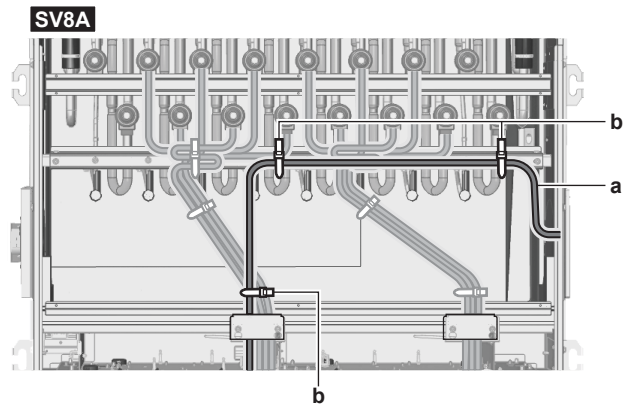


SV4A



SV6A

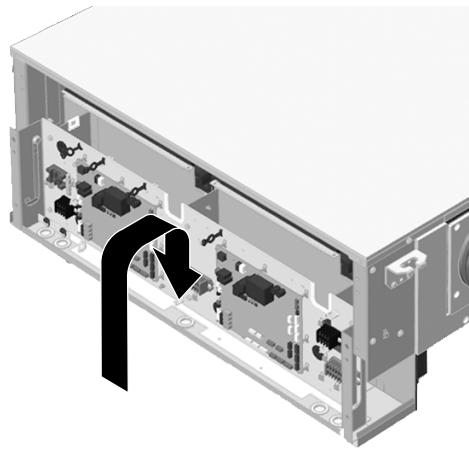




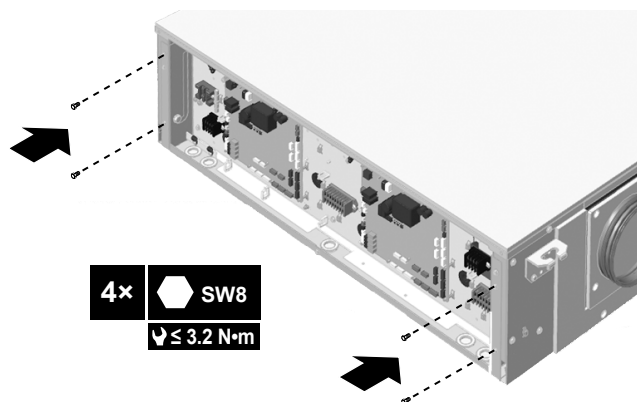
- a Damper wire
- b Cable tie to fix damper wire to piping (field supply)
- c Cable tie to bundle the damper wire (field supply)
- d Leftmost wire fixing plate

### 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 four screws. It is not required to tighten the M8 bolts again.



- 3 Close the SV unit. See "14.3.2 To close the unit" [▶ 68].

# 15 Piping installation



**CAUTION**

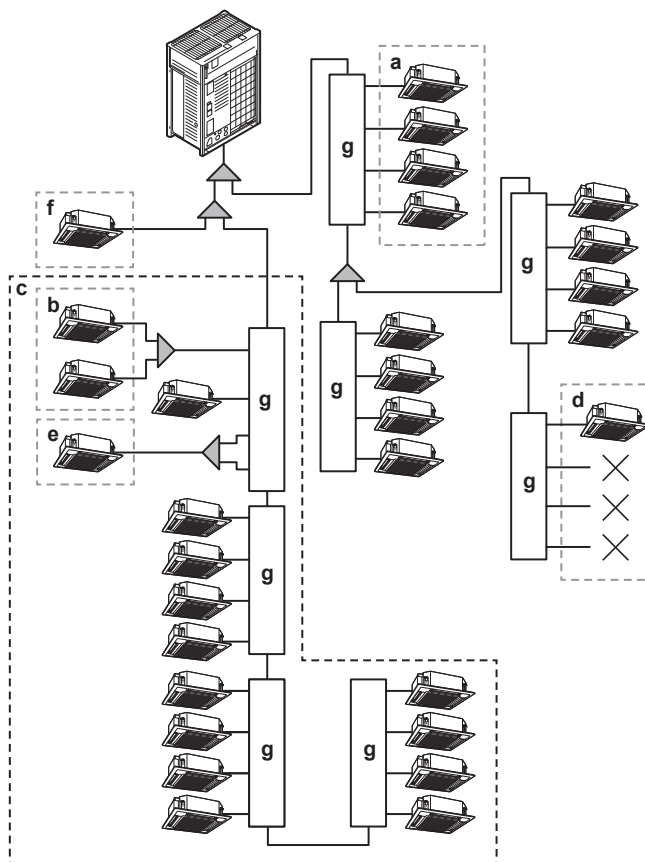
See "3 Specific installer safety instructions" [▶ 13] to make sure this installation complies with all safety regulations.

## In this chapter

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## 15.1 Installation limitations

The illustration and table below show the installation limitations.



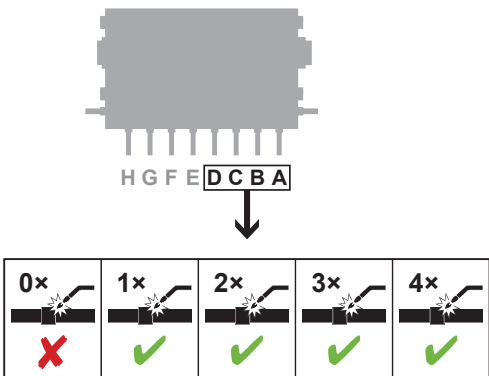
- a, b** See table below.
- c** Maximum limit of 16 downstream ports of SV units in refrigerant flow-through. Unused ports must also be counted. E.g. 16 ports=SV8A+SV4A+SV4A.
- d** At least one indoor unit must be connected to a SV unit (SV6A and SV8A: always start from one of the first four ports).
- e** Combine two ports when indoor unit capacity is over 140 except when SV1A is used. Refer to the table below.
- f** Direct connection to the outdoor unit. See the installation and operation manual of the outdoor unit.
- g** SV unit

Description	Model			
	SV1	SV4	SV6	SV8
Maximum number of connectable indoor units per SV unit <b>(a)</b>	5	20	30	40
Maximum number of connectable indoor units per SV unit branch <b>(b)</b>	5			
Maximum capacity index of connectable indoor units per SV unit <b>(a)</b>	250	400	600	650
Maximum capacity index of connectable indoor units per branch <b>(b)</b>	250	140		
Maximum capacity index of connectable indoor units per branch if two branches are combined <b>(e)</b>	—	250		
Maximum capacity index of indoor units connected to SV units in refrigerant flow-through <b>(c)</b>	650			

Description	Model			
	SV1	SV4	SV6	SV8
Maximum number of allowable SV units in refrigerant flow-through (c)	4			
Maximum number of ports of SV units in refrigerant flow-through (c)	16			
Maximum number of indoor units connected to SV units in refrigerant flow-through (c)	64			

15.1.1 Piping installation limitation

In case of models **SV6A** and **SV8A**: at least one of the first four ports of the SV unit MUST be connected. In case none of the first four ports are connected, the 7-segment display will show 'Err'.



Model	Branch pipe port							
	A	B	C	D	E	F	G	H
SV6A	≥1 port MUST be connected				free use			
SV8A					free use			

## 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](#)" [▶ 7].

- Foreign materials inside pipes (including oils for fabrication) must be  $\leq 30$  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) <sup>(a)</sup>	
6.4 mm (1/4") 9.5 mm (3/8") 12.7 mm (1/2")	Annealed (O)	$\geq 0.80$ mm	
15.9 mm (5/8")	Annealed (O)	$\geq 0.99$ mm	
19.1 mm (3/4") 22.2 mm (7/8")	Half hard (1/2H)	$\geq 0.80$ mm	
28.6 mm (1 1/8")	Half hard (1/2H)	$\geq 0.99$ mm	

<sup>(a)</sup> Depending on the applicable legislation and the maximum working pressure of the unit (as indicated on the unit nameplate), larger piping thickness might be required.

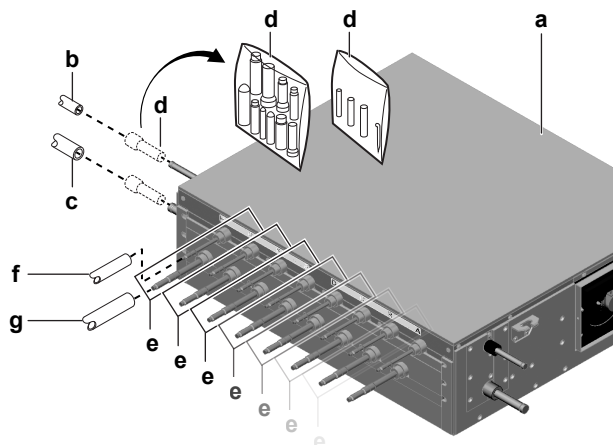
### 15.2.3 Refrigerant piping insulation

- 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
$\leq 30^{\circ}\text{C}$	75% to 80% RH	15 mm
$> 30^{\circ}\text{C}$	$\geq 80\%$ RH	20 mm

## 15.3 Connecting the refrigerant piping

### 15.3.1 To connect the refrigerant piping



- a SV unit
- b Liquid pipe (field supply)
- c Gas pipe (field supply)
- d Reducing joints and insulation tubes (accessory)
- e Indoor unit connection set
- f Liquid pipe (field supply)
- g 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 SV units.

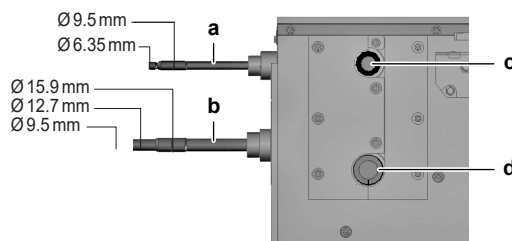
**Prerequisite:** Read the instructions in the outdoor unit's manual for information on how to install piping between the outdoor unit and the SV unit, selecting a refrigerant branch kit, and installing piping between the refrigerant branch kit and the SV units.

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

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

- 1 Connect the header pipes to the appropriate field supply pipes. Use a reducing joint (accessory) if the field supply pipe size does not match the header pipe size of the SV unit. The diameters of the header pipes of the SV unit are:
  - Liquid pipe: 15.9 mm
  - 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 SV unit are indicated in the illustration.





- a Liquid branch pipe
- b Gas branch pipe
- c Liquid header pipe
- d Gas header pipe

- 3 Connect the branch pipes. The liquid and gas branch pipe diameters to be used depend on the connected indoor unit capacity class. For information on which branch pipes to connect, see "[To set the DIP switches when joining branch pipe ports](#)" [▶ 97].
- 4 Install stopper pipes (accessory) for unused header pipes (when the SV unit is not connected in refrigerant flow-through with another SV unit) and unused branch pipes (when no indoor unit is connected to that branch pipe port).

### 15.3.2 To braze the pipe end

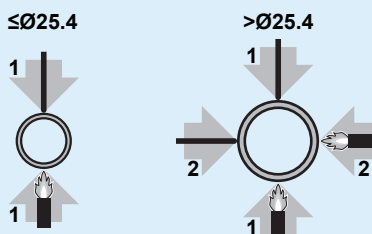


**DANGER: RISK OF BURNING/SCALDING**

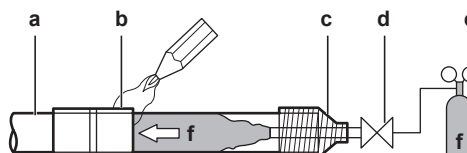


#### NOTICE

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.

**Note:** When using the joint kit, change the DIP switch settings. See "[16.4 To set the DIP switches](#)" ▶ 96].

Model	Possible port combinations			
SV4A	A+B	C+D		
SV6A			E+F	
SV8A			G+H	

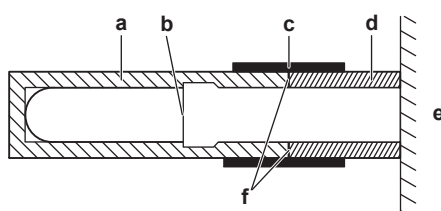
## 15.4 To insulate the refrigerant piping

After finishing the leak test and vacuum drying, the piping must be insulated. Take into account the following points:

### 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.

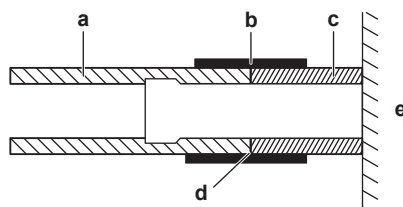
- Attach an insulation tube against the tube on the SV unit.
- Apply a tape to close the seam so that air does not enter.



- a Insulation tube (accessory)
- b Cut surface (branch pipes only)
- c Tape (field supply)
- d Insulation tube (attached to the SV unit)
- e SV 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.

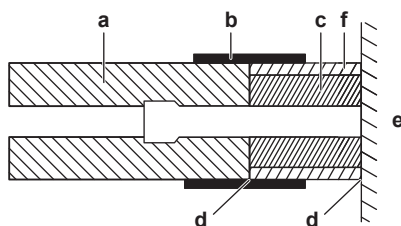


- a** Insulation tube (field supply)
- b** Tape (field supply)
- c** Insulation tube (SV unit)
- d** Adherence surface
- e** SV unit

- 1** Install an insulation tube (a) over the pipe and against the insulation tube (c) on the SV 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"](#) [▶ 83]), 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 (SV unit)
- d** Adherence surface
- e** SV 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 SV 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" [▶ 13] to make sure this installation complies with all safety regulations.

## In this chapter

16.1	About connecting the electrical wiring .....	88
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16.1.2	Specifications of standard wiring components .....	89
16.1.3	Guidelines when connecting the electrical wiring .....	91
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16.4	To set the DIP switches.....	96
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## 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 SV 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 national wiring regulation.
- Make electrical connections to the fixed wiring.
- All components procured on-site and all electrical construction **MUST** comply with the applicable legislation.



**WARNING**

**ALWAYS** use multicore cable for power supply cables.



**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, 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 interconnection 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.

Component		Units			
		SV1A	SV4A	SV6A	SV8A
Power supply cable	MCA <sup>(a)</sup>	0.1 A	0.2 A	0.3 A	0.3 A
	Voltage	220-240 V			
	Phase	1~			
	Frequency	50 Hz			
	Wire size	Must comply with national wiring regulation. 3-core cable Wire size based on the rated current, but not less than 0.5 mm <sup>2</sup> .			

Component		Units			
		SV1A	SV4A	SV6A	SV8A
Interconnection wiring	Voltage	220-240 V			
	Wire size	Only use harmonised wire providing double insulation and suitable for the applicable voltage. 2-core cable 0.75 mm <sup>2</sup> -1.5 mm <sup>2</sup>			
Recommended field fuse		6 A			
Residual current device		Must comply with national wiring regulation.			

<sup>(a)</sup> MCA=Minimum circuit ampacity. Stated values are maximum values.

### 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 above.

### Interconnection wiring

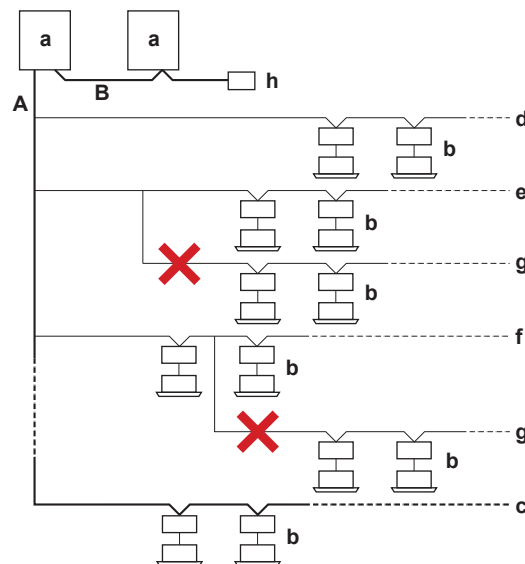
The interconnection wiring outside the unit should be wrapped and routed together with the field piping. See "16.3 To finish the electrical wiring" [► 96] for more information.

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

Interconnection wiring specification and limits <sup>(a)</sup>	
Maximum wiring length between SV unit and indoor units	1000 m
Maximum wiring length between SV unit and outdoor unit	1000 m
Maximum wiring length between SV units	1000 m
Total wiring length	2000 m

<sup>(a)</sup> If the total interconnection wiring exceeds these limits, communication errors might occur.

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



- a Outdoor unit
- b Indoor unit + SV 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 interconnection wiring
- B Master/slave interconnection wiring

### 16.1.3 Guidelines when connecting the electrical wiring



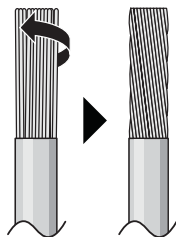
#### NOTICE

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

#### To prepare stranded conductor wire for installation

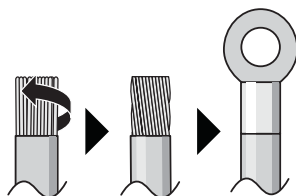
##### Method 1: Twisting conductor

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

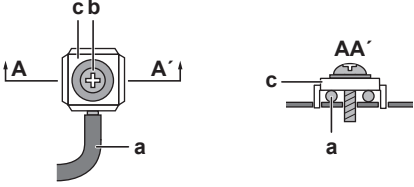
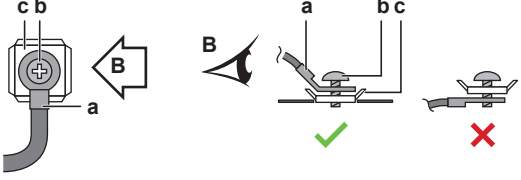


##### Method 2: Using round crimp-style terminal

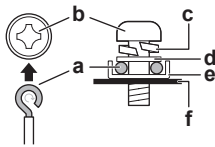
- 1 Strip insulation from wires and slightly twist the end of each wire.
- 2 Install a round crimp-style terminal on the end of the wire. Place the round crimp-style terminal on the wire up to the covered part and fasten the terminal with the appropriate tool.



### Use the following methods for installing wires:

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

For earth connections, use the following method:

Wire type	Installation method
Single-core wire Or Stranded conductor wire twisted to "solid-like" connection	 <p><b>a</b> Clockwise curled wire (single-core or twisted stranded conductor wire)  <b>b</b> Screw  <b>c</b> Spring washer  <b>d</b> Flat washer  <b>e</b> Coupling washer  <b>f</b> Sheet metal</p>

### Tightening torques

Terminal	Wiring	Screw size	Tightening torque (N•m)
X1M	Power supply wiring	M4	1.32~1.62



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

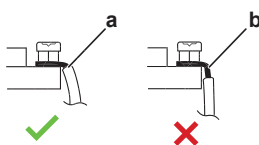
## 16.2 To connect the electrical wiring



### 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.

- Remove the service cover. See "14.3.1 To open the unit" [▶ 68].
- Strip insulation from the wires.



- a** Strip wire end to this point  
**b** Excessive strip length may cause electrical shock or leakage  
 Allowed  
 Not allowed

- Connect the interconnection wiring as follows:

### Connection for SV4A~SV8A

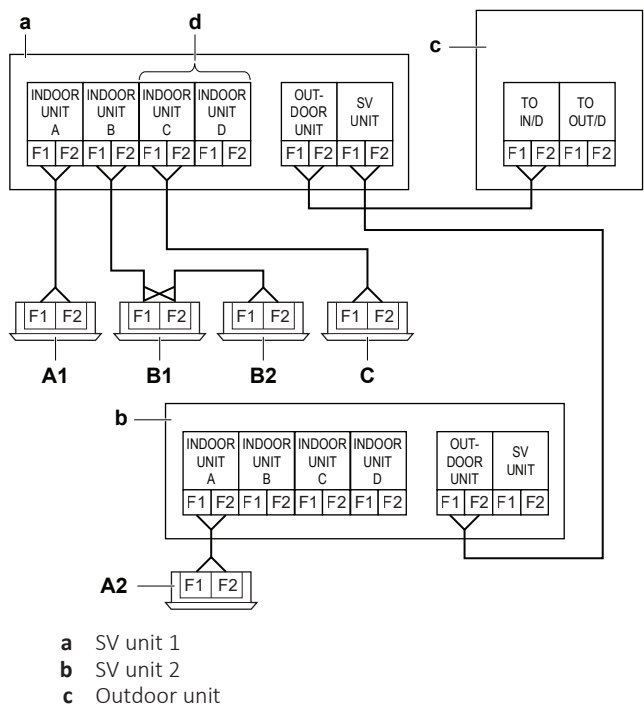
- Connect the terminals F1/F2 (**TO IN/D**) on the control PCB in the outdoor unit's switch box to the terminals F1/F2 (**Outdoor unit**) on terminal block **X2M** of the first SV unit. See also the installation manual delivered with the outdoor unit.
- In case of multiple SV units in the system that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

Connection for SV1A

- 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 **X3M** of the first SV unit. See also the installation manual delivered with the outdoor unit.
  - In case of multiple SV units in the system that are connected to the same interconnection wiring branch line, connect the terminals F1/F2 (**SV unit**) on terminal block **X3M** of the first SV unit to the terminals F1/F2 (**Outdoor unit**) on terminal block **X3M** on the second SV unit. Repeat the same procedure for further SV units, where each time the terminals F1/F2 (**SV unit**) on terminal block **X3M** on the n<sup>th</sup> SV unit are connected to the terminals F1/F2 (**Outdoor unit**) on terminal block **X3M** on the (n+1)<sup>th</sup> SV unit.
- 4 For all SV units, continue the interconnection wiring as follows:
- Connect the terminals F1/F2 (**Indoor unit X**) on terminal blocks **X3M** and **X4M** to the corresponding indoor units:

In case of...	connect...
one indoor unit where branch pipes are NOT joined	the terminals F1/F2 ( <b>Indoor unit X</b> ) on the SV unit to the F1/F2 terminals on the corresponding indoor unit.
multiple indoor units connected to the same branch	the terminals F1/F2 ( <b>Indoor unit X</b> ) on the SV 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	one of the two terminals F1/F2 ( <b>Indoor unit X</b> ) of the branches that are joined on the SV unit to the F1/F2 terminals on the corresponding indoor unit.

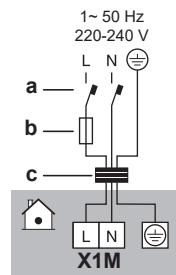
Example



- d When joining branch pipes C and D
- A1/A2** Indoor unit A connected to the branch pipe A of SV unit 1 and SV unit 2 respectively
- B1/B2** Indoor units B1 and B2 connected to the same branch pipe B of SV unit 1
- C** Indoor unit C connected to joint branch pipes C and D of SV unit 1. The F1/F2 terminals of the indoor unit only have to be connected to one of the two F1/F2 terminals inside SV unit 1.

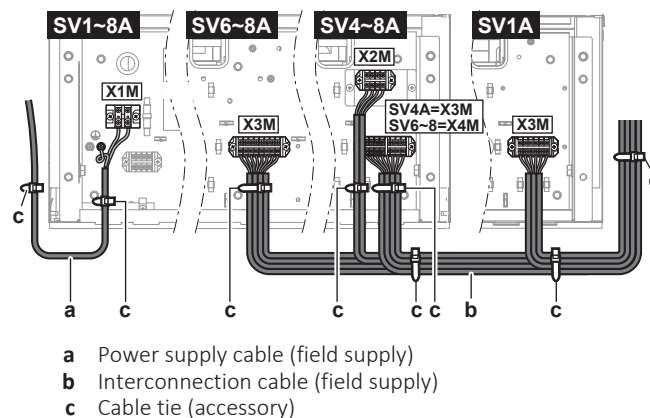
**Note:** The DIP switches of each control PCB in the SV unit switch box have to be set accordingly to the interconnection wiring. See "[16.4 To set the DIP switches](#)" [[▶ 96](#)].

- 5 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

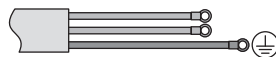
- 6 Attach the cables (power supply and interconnection cables) with a cable tie to the provided fixation points. Route the wiring according to the illustration below.



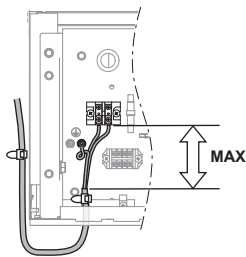
- a Power supply cable (field supply)
- b Interconnection cable (field supply)
- c Cable tie (accessory)

### Guidelines

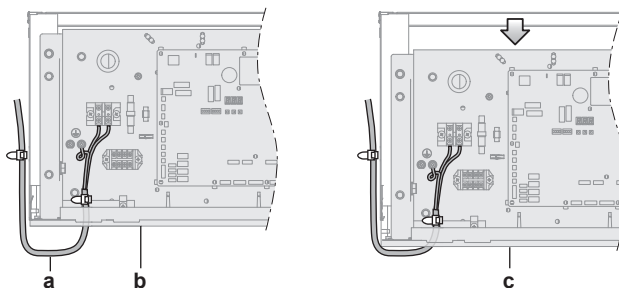
- Make sure the length of the earth wire between the fixation point and the terminal is longer than the length of the power supply wires between the fixation point and the terminal.



- 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 ( $\pm 20$  cm additionally) for all cables between the fixation point inside the switch box and the fixation point on the side of the SV 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

7 Reattach the service cover. See "14.3.2 To close the unit" [▶ 68].

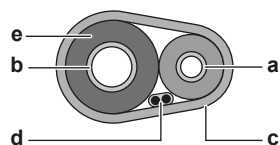


#### CAUTION

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

## 16.3 To finish the electrical wiring

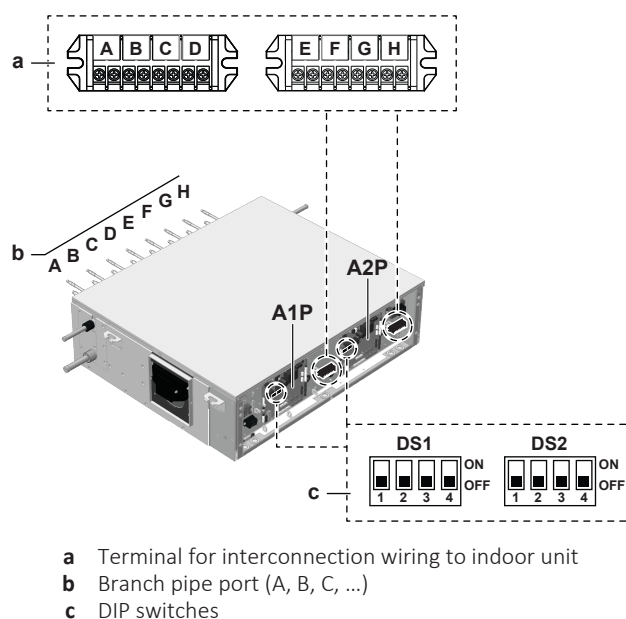
After installing the interconnection wiring, wrap it along with the onsite refrigerant piping using finishing tape, as shown in the illustration below.



- a Liquid piping
- b Gas piping
- c Finishing tape
- d Interconnection cable (F1/F2)
- e Insulation

## 16.4 To set the DIP switches

The DIP switches are located on the PCBs A1P, A2P (SV6~8A).



**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 <sup>(a)</sup>									
	DS1 (A1P)				DS1 (A2P)				
	1	2	3	4	1	2	3	4	
SV1A	A								
SV4A		B	C	D					
SV6A						E	F		
SV8A								G	H
	Target branch pipe port								

<sup>(a)</sup> **ON**=NOT connected / **OFF**=connected (factory default)

**Note:** The SV1A unit requires no DIP switch setting. The factory default setting can be used for any indoor unit connected to the branch port.

<b>Example</b>	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. FXMA200 and FXMA250.

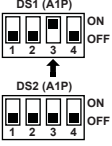
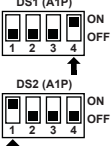
Setting when joining branch pipe ports <sup>(a)</sup>				
	DS2 (A1P)		DS2 (A2P)	
	1	2	1	2
SV1A				
SV4A	A+B	C+D		
SV6A			E+F	
SV8A			G+H	
	Target branch pipe ports			

<sup>(a)</sup> **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.

<b>Example</b>	When joining branch pipe ports A and B.	
----------------	---	---

Examples

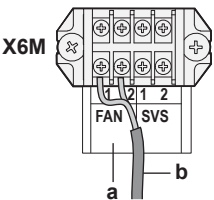
<b>1.</b>	When connecting an indoor unit to branch pipe ports A, B, and D, but NOT connecting an indoor unit to branch pipe port C.	
<b>2.</b>	When joining branch pipe ports A and B. Connecting an indoor unit to the joined branch pipe ports A and B, also to branch pipe port C, but NOT connecting an indoor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

The FAN output must be used when a ventilated enclosure is required (see "13.3 To determine the required safety measures" [▶ 45]).



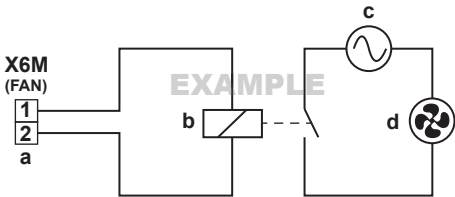
- a FAN output terminals (1 and 2)
- b Cable to extraction fan circuit

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.



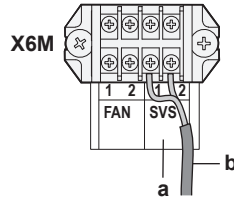
- a FAN output terminal
- b Relay
- c Extraction fan power supply

## 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 SV unit.

The SVS output must be used when an external alarm is required (see "[13.3 To determine the required safety measures](#)" [▶ 45]).



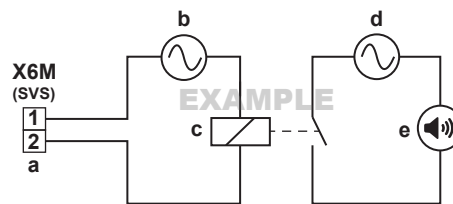
- a SVS output terminals (1 and 2)
- b Cable to external alarm circuit



## NOTICE

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

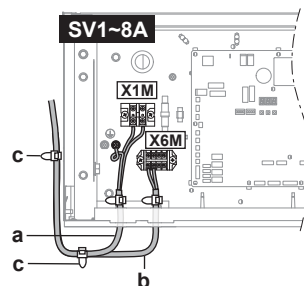
Do NOT directly use the SVS contact in the alarm circuit. Instead, use the SVS contact in conjunction with a power supply to energise a relay that controls the external alarm circuit.



- 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  $\pm 20$  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 Cable tie (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.

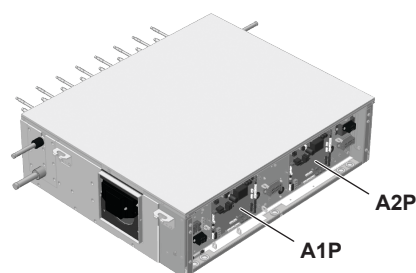
## 17.1 Making field settings

### 17.1.1 About making field settings

To configure the SV unit, you **MUST** give input to the SV unit's main PCBs (A1P and A2P, 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

The PCBs are located as shown below:



**A1P** Main PCB A1P

**A2P** Main PCB A2P (only for SV6~8A)

**Note:** Some field settings need to be made on all main PCBs (A1P and A2P) of the same SV unit. For more information, see ["17.1 Making field settings"](#) [▶ 100].

### Mode 1 – monitoring settings

Mode 1 can be used to monitor the current situation of the SV 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.

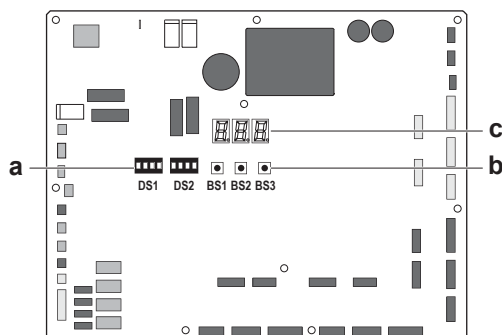
### 17.1.2 To access the field setting components

See ["14.3.1 To open the unit"](#) [▶ 68].

### 17.1.3 Field setting components

Location of the 7-segment displays and push buttons:

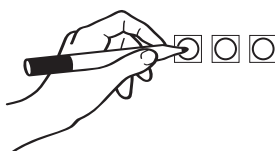




- BS1** MODE: for changing the set mode  
**BS2** SET: for field setting  
**BS3** RETURN: for field setting  
**DS1, DS2** DIP switches  
**a** DIP switches  
**b** Push buttons  
**c** 7-segment displays

### 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

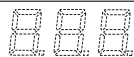
### Initialisation: default situation






#### 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 SV unit, outdoor unit and all indoor units. When the communication between SV 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).

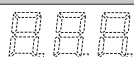


Stage	Display
Ready for operation: blank display indication as indicated.	

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	<ul style="list-style-type: none"> <li>Push BS1 one time.</li> </ul> <p>The 7-segment display indication changes to:</p>  <ul style="list-style-type: none"> <li>Push BS1 one more time to return to the default situation.</li> </ul>
Mode 2	<ul style="list-style-type: none"> <li>Push BS1 for at least 5 seconds.</li> </ul> <p>The 7-segment display indication changes to:</p>  <ul style="list-style-type: none"> <li>Push BS1 one more time (short) to return to the default situation.</li> </ul>



#### INFORMATION

If you get confused in the middle of the process, press BS1 to return to the default situation.

### 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	<ol style="list-style-type: none"> <li>1 Push BS1 one time to select mode 1.</li> <li>2 Push BS2 to select the required setting.</li> <li>3 Push BS3 one time to access the selected setting's value.</li> </ol>
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 SV unit.

What	How
Changing and accessing the setting in mode 2	<ul style="list-style-type: none"> <li>▪ Push BS1 for more than five seconds to select mode 2.</li> <li>▪ Push BS2 to select the required setting.</li> <li>▪ Push BS3 one time to access the selected setting's value.</li> </ul>
To quit and return to the initial status	Push BS1.
Changing the value of the selected setting in mode 2	<ul style="list-style-type: none"> <li>▪ Push BS1 for more than five seconds to select mode 2.</li> <li>▪ Push BS2 to select the required setting.</li> <li>▪ Push BS3 one time to access the selected setting's value.</li> <li>▪ Push BS2 to select the required value of the selected setting.</li> <li>▪ Push BS3 one time to validate the change.</li> <li>▪ Push BS3 again to start operation with the chosen value.</li> </ul>


**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 (or push BS2 until seven appears on the 7-segment display).

**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 until the required value appears on the 7-segment display.
- 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 SV unit belongs to a cluster or not.

In case the SV unit belongs to a parallel or series cluster, this setting has to be put on "1" to enable it. See "[13.4.4 Ventilated enclosure](#)" [▶ 52].

[2-0] <sup>(a)</sup>	Description
0 (default)	Cluster disabled
1	Cluster enabled

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

#### [2-1]

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

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

[2-1] <sup>(a)</sup>	Description
0 (default)~63	Cluster number

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

## [2-2]

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

This can be either a parallel or series cluster. This setting must be configured for all SV units in the same cluster, and has to be the same value. See "[13.4.4 Ventilated enclosure](#)" [▶ 52].

<b>[2-2]<sup>(a)</sup></b>	<b>Description</b>
0 (default)	Parallel cluster
1	Series cluster

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

## [2-3]

Setting to simulate a refrigerant leak.

- Choose value "1" during commissioning of the SV unit. This activates the safety measures of the SV 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 SV unit test run](#)" [▶ 110].

<b>[2-3]<sup>(a)</sup></b>	<b>Simulate refrigerant leak</b>
0 (default)	OFF
1	ON

<sup>(a)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

## [2-4]

Setting to enable or disable all SV 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](#)" [▶ 45].

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

<b>[2-4]<sup>(a)</sup></b>	<b>Safety measures</b>
0	Disable
1 (default)	Enable
2	Temporarily disable (24 hours or until power reset)

<sup>(a)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

## [2-6]

Setting to confirm the completion of the commissioning check.

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

The same setting is required for all SV units, even if no safety measures are installed. The test run of the outdoor unit checks if all SV 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.

[2-6] <sup>(a)</sup>	Commissioning check
0 (default)	Incomplete
1	Completed

<sup>(a)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

## [2-7]

Setting to enable or disable the ventilated enclosure safety measure of the SV 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](#)" [▶ 45].

[2-7] <sup>(a)</sup>	Ventilated enclosure
0	Disable
1 (default)	Enable

<sup>(a)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

## [2-8]

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

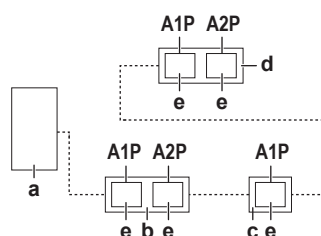
In case supervisor remote controllers are used in the system, it is necessary to assign an address value to the SV unit.

- Assign a different address to different SV 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 SV units with address 00.

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

<sup>(a)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

## Example



- A1P** Main PCB 1  
**A2P** Main PCB 2  
**a** Outdoor unit  
**b** SV6A unit  
**c** SV4A unit  
**d** SV8A unit  
**e** Address value for supervisor remote controller assigned to main PCB  
 ..... Interconnection wiring

The table below shows an example of address values assigned:

SV	Main PCB	Address value (e)
SV8A	A1P	<b>01</b>
	A2P	-
SV6A	A1P	<b>02</b>
	A2P	-
SV4A	A1P	<b>03</b>

### [2-9]

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

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



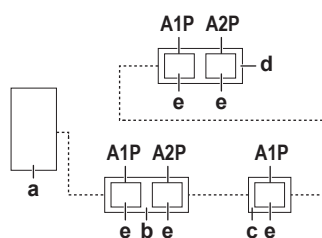
#### NOTICE

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

[2-9] <sup>(a)</sup>	Description
0 (default)~63	Address for error handling

<sup>(a)</sup> Set on ALL main PCBs (A1P and A2P) of the SV unit.

### Example



- A1P** Main PCB 1
- A2P** Main PCB 2
- a** Outdoor unit
- b** SV6A unit
- c** SV4A unit
- d** SV8A unit
- e** Address value for supervisor remote controller assigned to main PCB
- ..... Interconnection wiring

The table below shows an example of address values assigned:

SV	Main PCB	Address value (e)
SV8A	A1P	<b>1</b>
	A2P	
SV6A	A1P	<b>2</b>
	A2P	
SV4A	A1P	<b>3</b>

### [2-10]

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

This setting is only to be used during the test run of the SV unit when a ventilated enclosure is used as a safety measure of the SV unit and an external alarm is added as an additional measure. During the SV 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 SV unit test run is finished (setting [2-3] changed to "0"), setting [2-10] automatically returns to its default value "0".

<b>[2-10]<sup>(a)</sup></b>	<b>External alarm output forced OFF</b>
0 (default)	Disable
1	Enable

<sup>(a)</sup> Set ONLY on the LEFTMOST main PCB (A1P) of the SV unit.

### 17.1.9 Mode 2: default field settings

The table below shows the default field settings for A1P and A2P (A2P only for SV6A and SV8A).

In case of wrong field settings made during the configuration process, it is recommended to revert to the default field settings and then restart the configuration.

Field setting	Description	Value	
		A1P	A2P
[2-0]	SV unit clustering	0	0
[2-1]	SV unit cluster number	0	0
[2-2]	SV unit cluster configuration	0	0
[2-3]	Simulate refrigerant leak	0	0
[2-4]	SV unit safety measures	1	0
[2-6]	Completion of commissioning check	0	1
[2-7]	Ventilated enclosure safety measure	1	0
[2-8]	Address value to SV unit for supervisor remote controller	0	0
[2-9]	Address value to SV unit for error handling	0	0
[2-10]	External alarm output during SV unit test run	0	0



# 18 Commissioning



## CAUTION

See "3 Specific installer safety instructions" [▶ 13] 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.....	109
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## 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**.

<input type="checkbox"/>	The SV <b>unit</b> is properly mounted.
<input type="checkbox"/>	The <b>field wiring</b> has been carried out according to the instructions described in this document, according to the wiring diagram and according to the applicable national wiring legislation.
<input type="checkbox"/>	The <b>drain piping</b> is properly installed and insulated, and drainage flows smoothly. Check for water leaks. <b>Possible consequence:</b> condensate water might drip.
<input type="checkbox"/>	There are NO <b>missing phases</b> or <b>reversed phases</b> .
<input type="checkbox"/>	The system is properly <b>earthed</b> and the earth terminals are tightened.
<input type="checkbox"/>	The <b>fuses</b> or locally installed protection devices are installed according to this document, and have NOT been bypassed.
<input type="checkbox"/>	The <b>power supply voltage</b> matches the voltage on the identification label of the unit.
<input type="checkbox"/>	There are NO <b>loose connections</b> or damaged electrical components in the switch box.
<input type="checkbox"/>	In case no safety measures are required, the following measures are correctly applied: <ul style="list-style-type: none"> <li>▪ No safety measures are attached.</li> <li>▪ The correct field settings are made.</li> </ul>
<input type="checkbox"/>	In case an external alarm is required, the following safety measures are correctly applied: <ul style="list-style-type: none"> <li>▪ The external alarm is connected and powered.</li> <li>▪ The correct field settings are made.</li> </ul>
<input type="checkbox"/>	In case natural ventilation is required as safety measure, the following safety measures are correctly applied: <ul style="list-style-type: none"> <li>▪ Partition between rooms for natural ventilation meets the requirements.</li> <li>▪ The correct field settings are made.</li> </ul>
<input type="checkbox"/>	In case a ventilated enclosure is required, the following safety measures are correctly applied: <ul style="list-style-type: none"> <li>▪ The ducting is properly installed and insulated.</li> <li>▪ The extraction fan is connected and powered.</li> <li>▪ The air inlet (damper) is not obstructed.</li> <li>▪ The correct field settings are made.</li> </ul>
<input type="checkbox"/>	Also follow the outdoor unit's checklist. See the installation and operation manual delivered with the outdoor unit.

## 18.3 SV unit test run

### 18.3.1 About the SV unit test run

The SV unit test run has to be performed on all SV units in the system, before the test run of the outdoor unit. The SV 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 SV unit test run and confirm the result, because the test run of the outdoor unit checks this confirmation for all SV units in the system.

Depending on the safety measure and the configuration of the SV unit, it is required to perform the SV unit test run on a specific SV unit of the system.

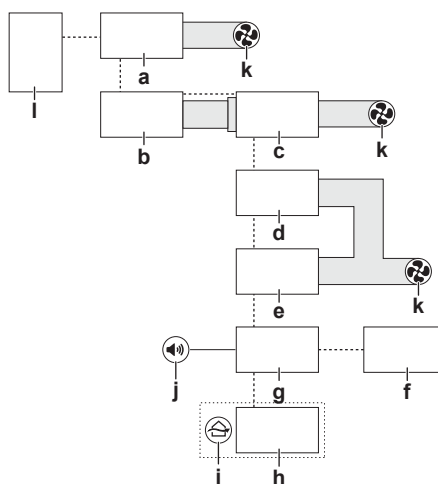
**Note:** Do not perform a SV unit test run on more than one SV unit at a time.

- **No safety measure:** all SV units with no safety measures.

- **External alarm:** all SV units with an external alarm.
- **Natural ventilation:** all SV units with natural ventilation
- **Ventilated enclosure – one SV unit to one extraction fan configuration:** all SV units with a ventilated enclosure – one-to-one configuration.
- **Ventilated enclosure – multiple SV units to one extraction fan, parallel configuration:** all SV units with a ventilated enclosure – parallel configuration.
- **Ventilated enclosure – multiple SV units to one extraction fan, series configuration:** only one SV unit with a ventilated enclosure – series configuration. Tip: choose the SV 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 SV units: a, b, d, e, f, g and h.



- a SV unit in one-to-one configuration
- b SV unit in series configuration
- c SV unit in series configuration
- d SV unit in parallel configuration
- e SV unit in parallel configuration
- f SV unit without safety measures
- g SV unit with external alarm
- h SV unit with natural ventilation
- i Natural ventilation
- j External alarm
- k Extraction fan
- l Outdoor unit

..... Interconnection wiring

In case the safety measures demand a ventilated enclosure, the SV 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, SV 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, FIRST activate setting [2-21] on the outdoor unit to open the expansion valves again THEN power off the unit to conduct the SV unit test run.

### 18.3.2 About airflow requirements

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

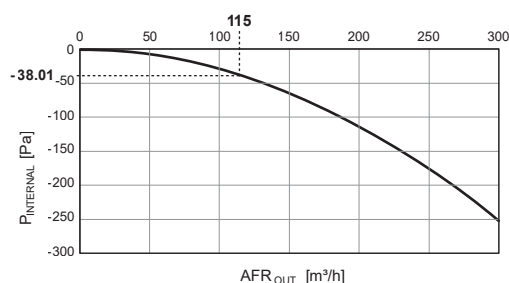
- pressure inside the SV unit has to be more than 20 Pa below the ambient pressure,
- minimum airflow rate:

Model	Minimum airflow rate [m <sup>3</sup> /h]
SV1A	82
SV4A	82
SV6~8A	84

### Example

A SV8A unit with an airflow rate during the test run of 115 m<sup>3</sup>/h. The pressure drop graph shows that this results in an internal pressure which is 38 Pa below the ambient pressure. Both requirements are met:

- The pressure inside the SV unit is more than 20 Pa below the ambient pressure (38 Pa).
- The airflow rate is higher than 84 m<sup>3</sup>/h (115 m<sup>3</sup>/h).



**AFR<sub>OUT</sub>** Airflow rate [m<sup>3</sup>/h]  
**P<sub>internal</sub>** Internal pressure below ambient pressure [Pa]

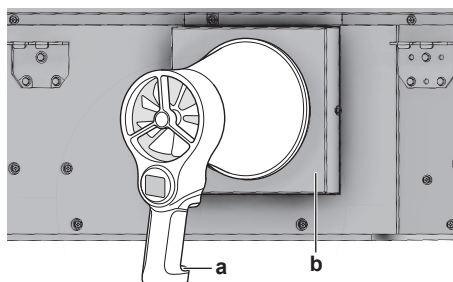
See the latest version of the technical engineering data for the SV unit's pressure drop curves.

### 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 two ways in the sections below, but the installer is entirely free on how to perform the measurement.

#### About measuring with a vane anemometer

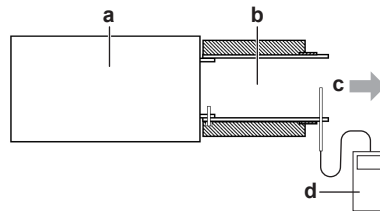
- Where: Measure the airflow rate at the air inlet (damper) of the SV unit.
- Tip: Use the duct connection kit (EKBSDCK) and an anemometer with a funnel to conduct the entire airflow through the anemometer.
- Postrequisite: Remove the kit once the measurement is finished.



**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 SV unit.
- Postrequisite: Close the holes properly once the measurement is finished.



- a** SV unit
- b** Air outlet duct
- c** Direction airflow
- d** Hot wire probe anemometer

#### 18.3.4 To perform a SV unit test run

See ["17.1.8 Mode 2: field settings"](#) [▶ 104] for more information on the settings that are used.

Respect the sequence indicated in ["18.3.1 About the SV unit test run"](#) [▶ 110]. Do not perform a test run on more than one SV 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 SV unit test run"](#) [▶ 110] 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"](#) [▶ 112] 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 SV units of the system, even those where the test run was not activated (e.g. downstream SV 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 SV 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 SV 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 SV units in a cluster need to be made correctly.
Fan extraction circuit broken	<ul style="list-style-type: none"> <li>▪ Check that the circuit exists.</li> <li>▪ Check that the circuit is connected correctly.</li> <li>▪ Check that the circuit is powered.</li> </ul>

**Symptom: The airflow rate is too low**

Possible causes	Corrective action
Incorrect field settings	<p>Check if all field settings are made correctly. When in parallel or series configuration, the field settings of all SV units in a cluster need to be made correctly.</p> <ul style="list-style-type: none"> <li>▪ When in parallel configuration: check that no dampers of other SV units in the same cluster have opened.</li> <li>▪ When in series configuration: check that all dampers of other SV units in the same cluster have opened.</li> </ul>
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 to the user only a certified installer is allowed to perform maintenance on the unit.



## 20 Maintenance and service

### In this chapter

20.1	Before the maintenance and service of the SV unit .....	117
20.2	SV unit maintenance and service label .....	117

### 20.1 Before the maintenance and service of the SV unit

Before starting the maintenance and service, field setting must be applied on the VRV 5 heat pump outdoor unit. For more information, see the installation and operation manual of the outdoor unit.

If field setting is applied, the shut-off valves of the SV unit will close. The compressor, outdoor fan and indoor unit will stop operating and the 7-segment display will show code "E0 I".

To confirm the full closure of the shut-off valves, "EH" will be shown on the 7-segment display of the outdoor unit.

The system power supply must be turned off for maintenance.

### 20.2 SV unit maintenance and service label

**WARNING**

Never power off the unit for maintenance and service before the shut-off valves are closed.

3P736525-1

**a** Caution for maintenance and servicing of SV unit

**b** Consult the installation manual or service manual

**c** Apply the field setting on the outdoor unit

**d** Wait for two minutes to allow the system to close the valves

**e** Turn off the system power

**f** Perform maintenance and servicing on the SV unit

# 21 Troubleshooting



## CAUTION

See "3 Specific installer safety instructions" [▶ 13] to make sure troubleshooting complies with all safety regulations.

## 21.1 Solving problems based on error codes

If the SV unit runs into a problem, the user interface of the indoor unit(s) connected to the SV 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

### 21.1.1 Prerequisites: Troubleshooting

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

### 21.1.2 Error codes: Overview

In case other error codes appear, contact your dealer.

Code	Description
<i>R0-20</i>	The R32 sensor has detected a refrigerant leak in the SV unit.
<i>R0/CH</i>	Safety system error (leak detection)
<i>R3-01</i>	SV unit drain water abnormality (X15A is opened)
<i>CH-21</i>	SV unit R32 sensor malfunction
<i>CH-22</i>	Less than 6 months before the SV unit R32 sensor end of lifetime
<i>CH-23</i>	SV unit R32 sensor end of lifetime
<i>E1-15</i>	Malfunction of the SV unit's PCB
<i>EA-27</i>	SV unit damper malfunction
<i>F9</i>	Malfunction of the SV unit's electronic expansion valve
<i>UP-62</i>	SV unit power supply failure

## 22 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.







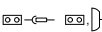












## 23 Technical data

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

### 23.1 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





Symbol	Meaning
PTC*	PTC thermistor
Q*	Insulated gate bipolar transistor (IGBT)
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



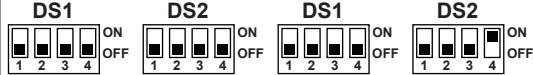

Symbol	Meaning
ZF, Z*F	Noise filter

### Specific SV unit wiring diagram legend

Symbol	Meaning
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 SV 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
SV1A	<p><b>A1P</b></p> <p><b>DS1</b> <b>DS2</b></p> 
SV4A	<p><b>A1P</b></p> <p><b>DS1</b> <b>DS2</b></p> 
SV6A	<p><b>A1P</b> <b>A2P</b></p> <p><b>DS1</b> <b>DS2</b> <b>DS1</b> <b>DS2</b></p> 
SV8A	<p><b>A1P</b> <b>A2P</b></p> <p><b>DS1</b> <b>DS2</b> <b>DS1</b> <b>DS2</b></p> 
To set the DIP switches (DS1~2) and push buttons (BS1~3), see the installation manual	

## 24 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.

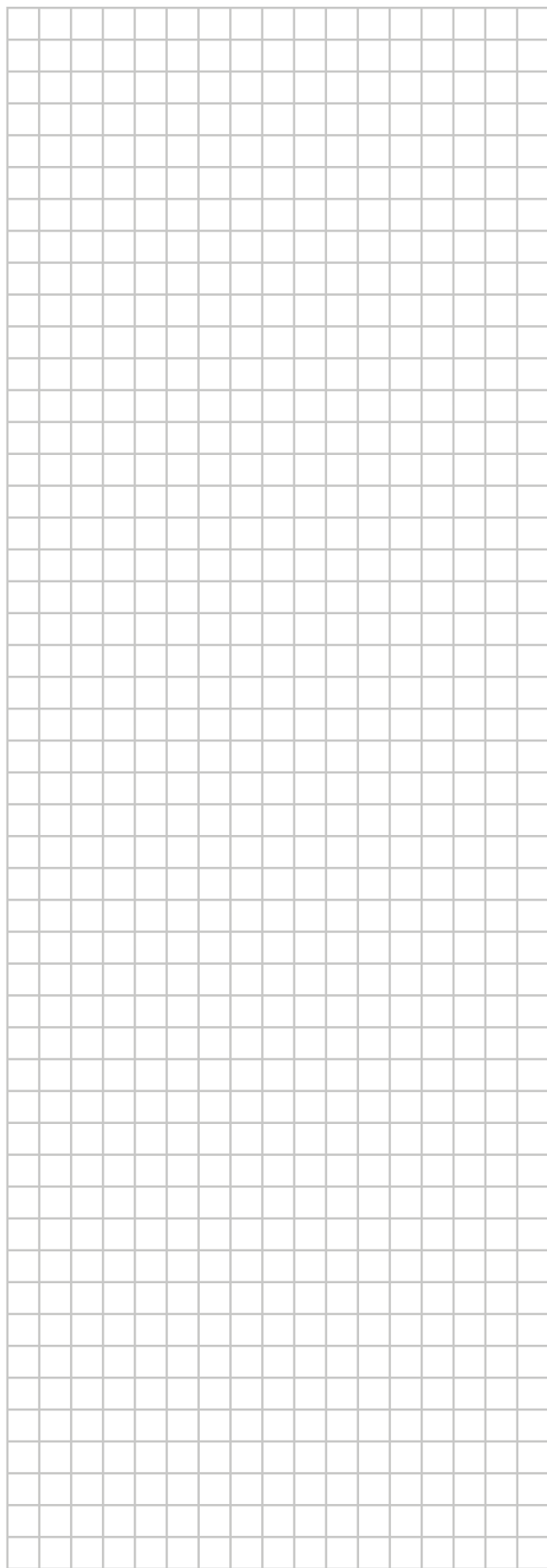
**Optional equipment**

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.









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