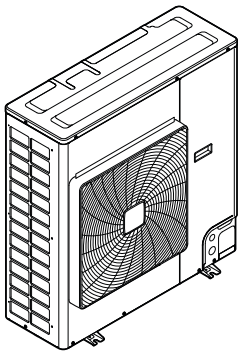
Installer reference guide

# Sky Air Advance-series



RZASG100MUV
RZASG125MUV
RZASG140MUV

RZASG100MUY
RZASG125MUY
RZASG140MUY

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# 1 About this document

### Target audience

Authorised installers

**INFORMATION**

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

### Documentation set

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

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

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

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**

**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.<br>**Example:** "1–3 Figure title" means "Figure 3 in chapter 1". |
|  | Indicates a table title or a reference to it.<br>**Example:** "1–3 Table title" means "Table 3 in chapter 1". |

## 1.2 Installer reference guide at a glance

| Chapter | Description |
|---|---|
| About the documentation | What documentation exists for the installer |
| General safety precautions | Safety instructions that you must read before installing |
| Specific installer safety instructions | |

| Chapter | Description |
|---|---|
| About the box | How to unpack the units and remove their accessories |
| About the units and options | ▪ How to identify the units<br>▪ Possible combinations of units and options |
| Unit installation | What to do and know to install the system, including information on how to prepare for an installation |
| Piping installation | What to do and know to install the piping of the system, including information on how to prepare for an installation |
| Electrical installation | What to do and know to install the electrical components of the system, including information on how to prepare for an installation |
| Charging refrigerant | What to do and know to charge refrigerant |
| Commissioning | What to do and know to commission the system after it is installed |
| Hand-over to the user | What to give and explain to the user |
| Maintenance and service | How to maintain and service the units |
| Troubleshooting | What to do in case of problems |
| Disposal | How to dispose of the system |
| Technical data | Specifications of the system |
| Glossary | Definition of terms |

# 2 General safety precautions

## In this chapter



## 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.

**NOTICE**

Works executed on the outdoor unit are best done under dry weather conditions to avoid water ingress.

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.

**Instructions for equipment using R32 refrigerant**

**WARNING: MILDLY FLAMMABLE MATERIAL**

The refrigerant inside this unit is mildly flammable.

**WARNING**

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

**WARNING**

The appliance shall be stored so as to prevent mechanical damage and in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater) and have a room size as specified below.

**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**

- 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.

### Installation space requirements

**WARNING**

If appliances contain R32 refrigerant, the floor area of the room in which the appliances are installed, operated and stored MUST be larger than the minimum floor area defined in table below A ($m^2$). This applies to:

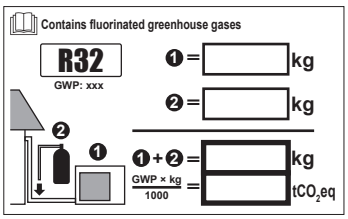
- Indoor units **without** a refrigerant leakage sensor; in case of indoor units **with** refrigerant leakage sensor, consult the installation manual
- Outdoor units installed or stored indoors (e.g. winter garden, garage, machinery room)

**NOTICE**

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

### To determine the minimum floor area

1 Determine the total refrigerant charge in the system (= factory refrigerant charge ❶ + ❷ additional refrigerant amount charged).

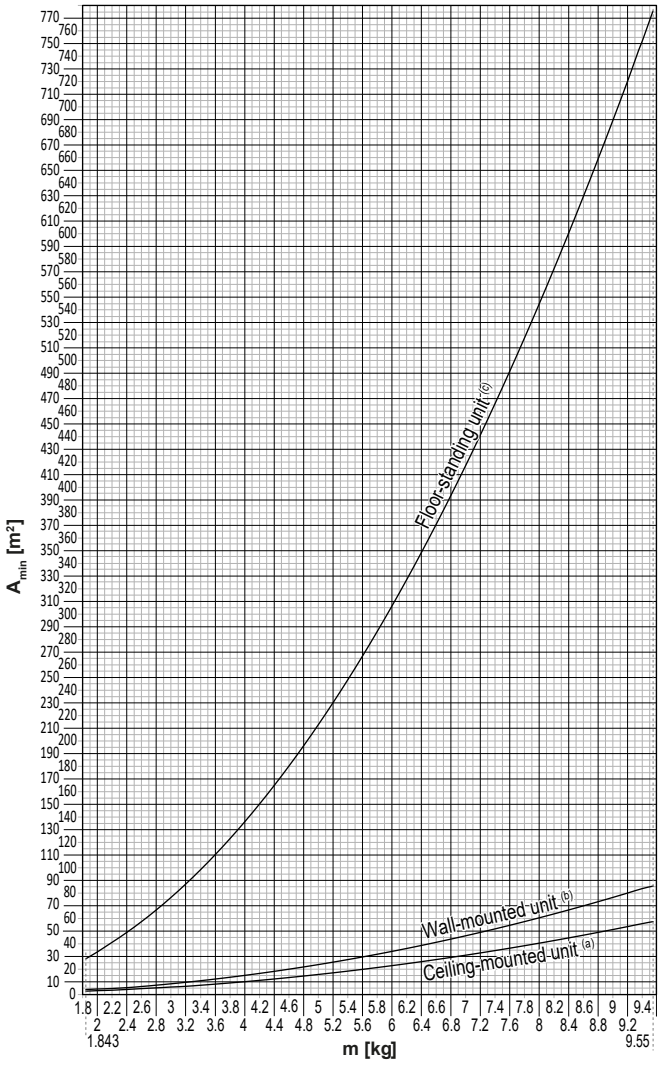



**2** Determine which graph or table to use.

- For indoor units: Is the unit ceiling-mounted, wall-mounted or floor-standing?
- For outdoor units installed or stored indoors, this depends on the installation height:

| If the installation height is… | Then use the graph or table for… |
|---|---|
| <1.8 m | Floor-standing units |
| 1.8≤x<2.2 m | Wall-mounted units |
| ≥2.2 m | Ceiling-mounted units |

**3** Use the graph or table to determine the minimum floor area.




| Ceiling-mounted unit(a) | | Wall-mounted unit(b) | | Floor-standing unit(c) | |
|---|---|---|---|---|---|
| m (kg) | $A_{min}$ (m²) | m (kg) | $A_{min}$ (m²) | m (kg) | $A_{min}$ (m²) |
| ≤1.842 | — | ≤1.842 | — | ≤1.842 | — |
| 1.843 | 3.64 | 1.843 | 4.45 | 1.843 | 28.9 |
| 2.0 | 3.95 | 2.0 | 4.83 | 2.0 | 34.0 |
| 2.2 | 4.34 | 2.2 | 5.31 | 2.2 | 41.2 |
| 2.4 | 4.74 | 2.4 | 5.79 | 2.4 | 49.0 |
| 2.6 | 5.13 | 2.6 | 6.39 | 2.6 | 57.5 |
| 2.8 | 5.53 | 2.8 | 7.41 | 2.8 | 66.7 |
| 3.0 | 5.92 | 3.0 | 8.51 | 3.0 | 76.6 |
| 3.2 | 6.48 | 3.2 | 9.68 | 3.2 | 87.2 |
| 3.4 | 7.32 | 3.4 | 10.9 | 3.4 | 98.4 |
| 3.6 | 8.20 | 3.6 | 12.3 | 3.6 | 110 |
| 3.8 | 9.14 | 3.8 | 13.7 | 3.8 | 123 |
| 4.0 | 10.1 | 4.0 | 15.1 | 4.0 | 136 |
| 4.2 | 11.2 | 4.2 | 16.7 | 4.2 | 150 |
| 4.4 | 12.3 | 4.4 | 18.3 | 4.4 | 165 |
| 4.6 | 13.4 | 4.6 | 20.0 | 4.6 | 180 |
| 4.8 | 14.6 | 4.8 | 21.8 | 4.8 | 196 |
| 5.0 | 15.8 | 5.0 | 23.6 | 5.0 | 213 |
| 5.2 | 17.1 | 5.2 | 25.6 | 5.2 | 230 |
| 5.4 | 18.5 | 5.4 | 27.6 | 5.4 | 248 |
| 5.6 | 19.9 | 5.6 | 29.7 | 5.6 | 267 |
| 5.8 | 21.3 | 5.8 | 31.8 | 5.8 | 286 |
| 6.0 | 22.8 | 6.0 | 34.0 | 6.0 | 306 |
| 6.2 | 24.3 | 6.2 | 36.4 | 6.2 | 327 |
| 6.4 | 25.9 | 6.4 | 38.7 | 6.4 | 349 |
| 6.6 | 27.6 | 6.6 | 41.2 | 6.6 | 371 |
| 6.8 | 29.3 | 6.8 | 43.7 | 6.8 | 394 |
| 7.0 | 31.0 | 7.0 | 46.3 | 7.0 | 417 |
| 7.2 | 32.8 | 7.2 | 49.0 | 7.2 | 441 |
| 7.4 | 34.7 | 7.4 | 51.8 | 7.4 | 466 |
| 7.6 | 36.6 | 7.6 | 54.6 | 7.6 | 492 |
| 7.8 | 38.5 | 7.8 | 57.5 | 7.8 | 518 |
| 8 | 40.5 | 8 | 60.5 | 8 | 545 |
| 8.2 | 42.6 | 8.2 | 63.6 | 8.2 | 572 |
| 8.4 | 44.7 | 8.4 | 66.7 | 8.4 | 601 |
| 8.6 | 46.8 | 8.6 | 69.9 | 8.6 | 629 |
| 8.8 | 49.0 | 8.8 | 73.2 | 8.8 | 659 |
| 9 | 51.3 | 9 | 76.6 | 9 | 689 |
| 9.2 | 53.6 | 9.2 | 80.0 | 9.2 | 720 |
| 9.4 | 55.9 | 9.4 | 83.6 | 9.4 | 752 |
| 9.55 | 57.7 | 9.55 | 86.2 | 9.55 | 776 |

**m** Total refrigerant charge in the system
**$A_{min}$** Minimum floor area
**(a)** Ceiling-mounted unit (= Ceiling-mounted unit)
**(b)** Wall-mounted unit (= Wall-mounted unit)
**(c)** Floor-standing unit (= Floor-standing unit)

### 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<br>(i.e., the cylinder is marked with "Liquid filling siphon attached") | Charge with the cylinder upright.<br>  |
| A siphon tube is NOT present | Charge with the cylinder upside down.<br>  |

- 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 tautened before the earth wire is in case the power supply is pulled loose from the stress relief.

**NOTICE**

Precautions when laying power wiring:

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

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

**NOTICE**

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

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

# 3 Specific installer safety instructions

Always observe the following safety instructions and regulations.

**Handling the unit (see "4.1.2 To handle the outdoor unit" [▸ 20])**

**CAUTION**

To avoid injury, do NOT touch the air inlet or aluminium fins of the unit.

**Installation site (see "6.1 Preparing the installation site" [▸ 24])**

**WARNING**

Follow the service space dimensions in this manual to install the unit correctly. See "6.1.1 Installation site requirements of the outdoor unit" [▸ 24].

**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).

**CAUTION**

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

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

**Opening and closing the unit (see "6.2 Opening and closing the unit" [▸ 27])**

**DANGER: RISK OF BURNING/SCALDING**

**DANGER: RISK OF ELECTROCUTION**

**DANGER: RISK OF ELECTROCUTION**

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

**Mounting the outdoor unit (see "6.3 Mounting the outdoor unit" [▸ 30])**

**WARNING**

Fixing method of the outdoor unit MUST be in accordance with the instructions from this manual. See "6.3 Mounting the outdoor unit" [▸ 30].

**Piping installation (see "7 Piping installation" [▸ 34])**

**DANGER: RISK OF BURNING/SCALDING**

**WARNING**

Field piping MUST be in accordance with the instructions from this manual. See "7.2 Connecting the refrigerant piping" [▸ 37].

**CAUTION**

- Incomplete flaring may cause refrigerant gas leakage.
- Do NOT re-use flares. Use new flares to prevent refrigerant gas leakage.
- Use flare nuts that are included with the unit. Using different flare nuts may cause refrigerant gas leakage.

**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.

## Electrical installation (see "8 Electrical installation" [▸ 49])

**DANGER: RISK OF ELECTROCUTION**

**WARNING**

Electrical wiring MUST be in accordance with the instructions from:

- This manual. See "8 Electrical installation" [▸ 49].
- The wiring diagram, which is delivered with the unit, located at the inside of the service cover. For a translation of its legend, see "16.3 Wiring diagram: Outdoor unit" [▸ 83].

**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**

- 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 in 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.
- Do NOT install a phase advancing capacitor, because this unit is equipped with an inverter. A phase advancing capacitor will reduce performance and may cause accidents.

**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.

**CAUTION**

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

**CAUTION**

For use of units in applications with temperature alarm settings it is recommended to foresee a delay of 10 minutes for signalling the alarm in case the alarm temperature is exceeded. The unit may stop for several minutes during normal operation for "defrosting the unit", or when in "thermostat stop" operation.

**WARNING**

Do NOT interchange the supply conductors L and the neutral conductor N.

## Charging refrigerant (see "9 Charging refrigerant" [▶ 56])

**WARNING**

Charging of refrigerant MUST be in accordance with the instructions from this manual. See "9 Charging refrigerant" [▶ 56].

**WARNING**

Some sections of the refrigerant circuit may be isolated from other sections caused by components with specific functions (e.g. valves). The refrigerant circuit therefore features additional service ports for vacuuming, pressure relief or pressurizing the circuit.

In case it is required to perform **brazing** on the unit, ensure that there is no pressure remaining inside the unit. Internal pressures need to be released with ALL the service ports indicated on the figures below opened. The location is depending on model type.

**WARNING: MILDLY FLAMMABLE MATERIAL**

The refrigerant inside this unit is mildly flammable.

**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**

- 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**

- Only use R32 as refrigerant. Other substances may cause explosions and accidents.
- R32 contains fluorinated greenhouse gases. Its global warming potential (GWP) value is 675. Do NOT vent these gases into the atmosphere.
- When charging refrigerant, ALWAYS use protective gloves and safety glasses.

## Commissioning (see "11 Commissioning" [▸ 67])

**WARNING**

Commissioning MUST be in accordance with the instructions from this manual. See "11 Commissioning" [▸ 67].

**WARNING**

If the panels on the indoor units are not installed yet, make sure to power OFF the system after finishing the test run. To do so, turn OFF operation via the user interface. Do NOT stop operation by turning OFF the circuit breakers.

## Maintenance and service (see "13 Maintenance and service" [▸ 73])

**DANGER: RISK OF ELECTROCUTION**

**DANGER: RISK OF BURNING/SCALDING**

## Troubleshooting (see "14 Troubleshooting" [▸ 75])

**DANGER: RISK OF ELECTROCUTION**

**DANGER: RISK OF BURNING/SCALDING**

**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.

**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.

Disposal (see "15 Disposal" [▸ 76])

**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.

**CAUTION**

Do not use the unit's automatic pump down function if the total piping length exceeds the chargeless length. A fraction of the refrigerant could be left in the circuit.

# 4 About the box

Keep the following in mind:

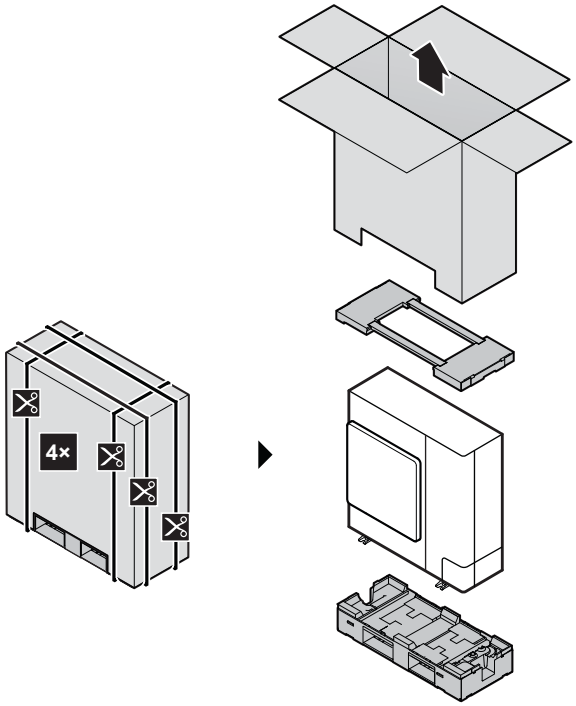
- At delivery, the unit MUST be checked for damage and completeness. Any damage or missing parts MUST be reported immediately to the claims agent of the carrier.
- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.
- Prepare in advance the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

## In this chapter



## 4.1 Outdoor unit

### 4.1.1 To unpack the outdoor unit

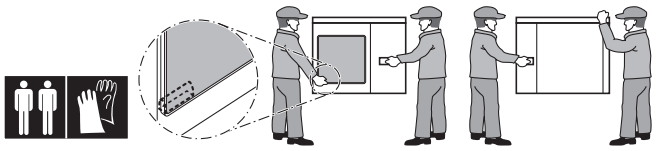



### 4.1.2 To handle the outdoor unit

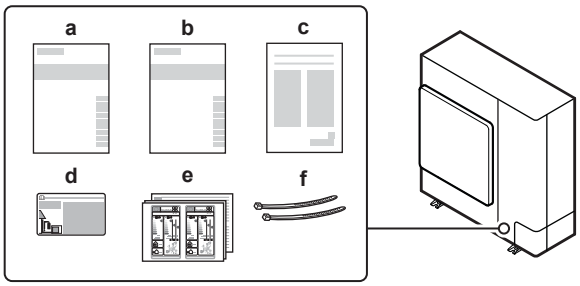
**CAUTION**

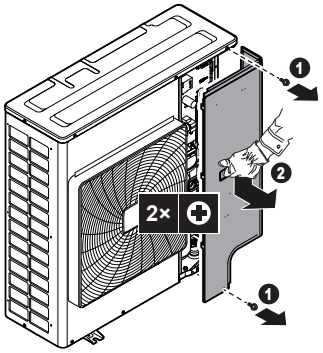
To avoid injury, do NOT touch the air inlet or aluminium fins of the unit.

Carry the unit slowly as shown:



### 4.1.3 To remove the accessories from the outdoor unit




**a** General safety precautions
**b** Outdoor unit installation manual
**c** Addendum (LOT 21)
**d** Fluorinated greenhouse gases label
**e** Energy label
**f** Tie wraps

# 5 About the units and options

## In this chapter



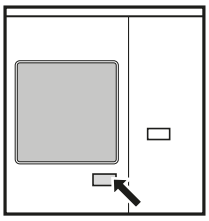
## 5.1 Identification

**NOTICE**

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

### 5.1.1 Identification label: Outdoor unit

**Location**



**Model identification**

**Example:** R Z A S G 140 MU V [*]

| Code | Explanation |
|---|---|
| R | Air-cooled split outdoor unit |
| Z | Inverter |
| A | Refrigerant R32 |
| SG | Mid-end series |
| 100~140 | Capacity class |
| MU | Model series |
| V | Power supply: 1~, 220~240 V, 50 Hz |
| Y | Power supply: 3N~, 380~415 V, 50 Hz |
| [*] | Minor model change indication |

**INFORMATION**

This unit is not intended for use in high humidity, low ambient temperature regions. For these regions the RZAG model is recommended.

## 5.2 Combining units and options

**INFORMATION**

Certain options may NOT be available in your country.

### 5.2.1 Possible options for the outdoor unit

#### Refrigerant branch kit

When connecting multiple indoor units to the outdoor unit, you need one or more refrigerant branch kits. The outdoor-indoor combination determines which and how many refrigerant branch kits to use.

| Layout | Model name |
|---|---|
| Twin | KHRQ(M)58T |
| Triple | KHRQ(M)58H |
| Double twin | KHRQ(M)58T (3×) |

For more selection details, see the catalogues. For installation instructions, see the installation manual of the refrigerant branch kit.

#### Demand adaptor kit (SB.KRP58M52)

- Includes the additional mounting plate (EKMKSA2)
- Can be used for the following:
  - Low noise: To lower the operation sound of the outdoor unit.
  - I-demand function: To limit the power consumption from the system (example: budget control, limit power consumption during peak moments…).
- For installation instructions, see the installation manual of the demand adaptor kit.

# 6 Unit installation

## In this chapter



## 6.1 Preparing the installation site

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

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

**WARNING**

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

### 6.1.1 Installation site requirements of the outdoor unit

**INFORMATION**

Also read the following requirements:

- General installation site requirements. See "2 General safety precautions" [▶ 7].
- Service space requirements. See "16 Technical data" [▶ 78].
- Refrigerant piping requirements (length, height difference). See "7.1.1 Refrigerant piping requirements" [▶ 34].

**CAUTION**

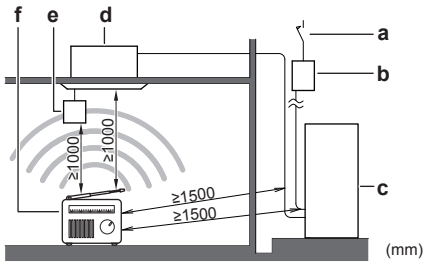
Appliance NOT accessible to the general public, install it in a secured area, protected from easy access.

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

**NOTICE**

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

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




**a** Earth leakage protector
**b** Fuse
**c** Outdoor unit
**d** Indoor unit
**e** User interface
**f** Personal computer or radio

- In places with weak reception, keep distances of 3 m or more to avoid electromagnetic disturbance of other equipment and use conduit tubes for power and transmission lines.
- Select a place where rain can be avoided as much as possible.
- Take care that in the event of a water leak, water cannot cause any damage to the installation space and surroundings.
- Choose a location where the operation noise or the hot/cold air discharged from the unit will not disturb anyone and the location is selected according the applicable legislation.
- Heat exchanger fins are sharp and injury is possible. Choose an installation location where there is no risk for injury (especially in areas where children play).

Do NOT install the unit in the following places:

- Sound sensitive areas (e.g. near a bedroom), so that the operation noise will cause no trouble.

  **Note:** If the sound is measured under actual installation conditions, the measured value might be higher than the sound pressure level mentioned in Sound spectrum in the data book due to environmental noise and sound reflections.

**INFORMATION**

The sound pressure level is less than 70 dBA.

- 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.

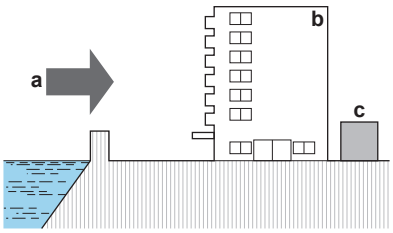
It is NOT recommended to install the unit in the following places because it may shorten the life of the unit:

- Where the voltage fluctuates a lot
- In vehicles or vessels
- Where acidic or alkaline vapour is present

**Seaside installation.** Make sure the outdoor unit is NOT directly exposed to sea winds. This is to prevent corrosion caused by high levels of salt in the air, which might shorten the life of the unit.

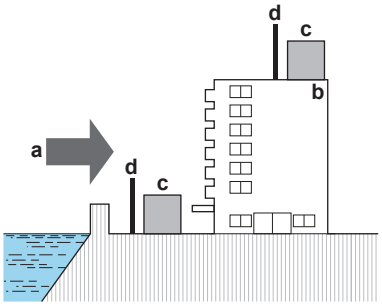
Install the outdoor unit away from direct sea winds.

**Example:** Behind the building.




If the outdoor unit is exposed to direct sea winds, install a windbreaker.

- Height of windbreaker≥1.5×height of outdoor unit
- Mind the service space requirements when installing the windbreaker.



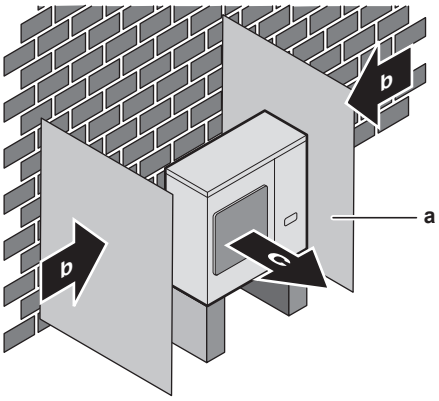

**a** Sea wind
**b** Building
**c** Outdoor unit
**d** Windbreaker

Strong winds (≥18 km/h) blowing against the outdoor unit's air outlet causes short circuit (suction of discharge air). This may result in:

- deterioration of the operational capacity;
- frequent frost acceleration in heating operation;
- disruption of operation due to decrease of low pressure or increase of high pressure;
- a broken fan (if a strong wind blows continuously on the fan, it may start rotating very fast, until it breaks).

It is recommended to install a baffle plate when the air outlet is exposed to wind.

It is recommended to install the outdoor unit with the air inlet facing the wall and NOT directly exposed to the wind.



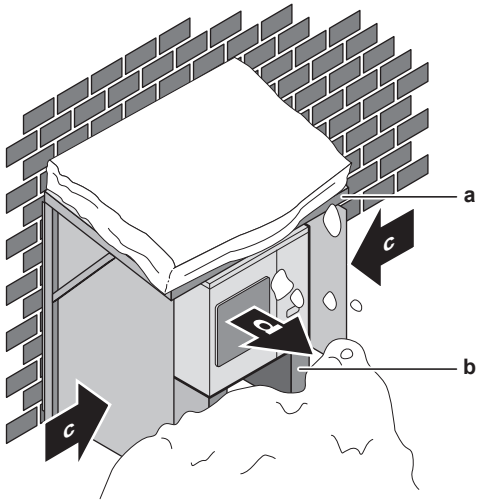
**a** Baffle plate
**b** Prevailing wind direction
**c** Air outlet

The outdoor unit is designed for outdoor installation only, and for the following ambient temperatures:

| Cooling mode | Heating mode |
|---|---|
| -15~46°C DB | –15~15.5°C WB |

### 6.1.2 Additional installation site requirements of the outdoor unit in cold climates

Protect the outdoor unit against direct snowfall and take care that the outdoor unit is NEVER snowed up.




**a** Snow cover or shed
**b** Pedestal (minimum height=150 mm)
**c** Prevailing wind direction
**d** Air outlet

## 6.2 Opening and closing the unit

### 6.2.1 About opening the units

At certain times, you have to open the unit. **Example:**

- When connecting the refrigerant piping
- When connecting the electrical wiring
- When maintaining or servicing the unit

**DANGER: RISK OF ELECTROCUTION**

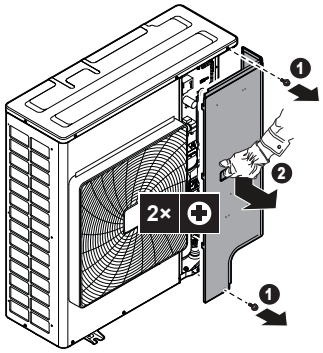
Do NOT leave the unit unattended when the service cover is removed.

### 6.2.2 To open the outdoor unit

**DANGER: RISK OF ELECTROCUTION**

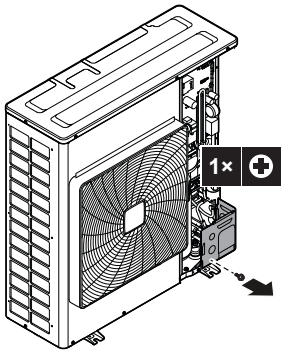
**DANGER: RISK OF BURNING/SCALDING**

1 Open the service cover.



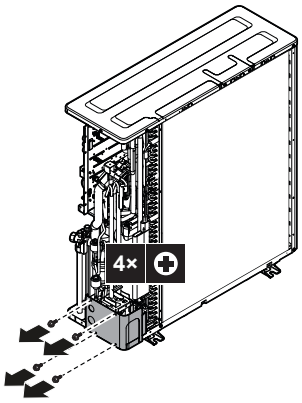

2 If necessary, remove the piping intake front plate. This is e.g. necessary in the following cases:

- "7.2 Connecting the refrigerant piping" [▸ 37].
- "8.2.2 To connect the electrical wiring to the outdoor unit" [▸ 52].
- "9 Charging refrigerant" [▸ 56].



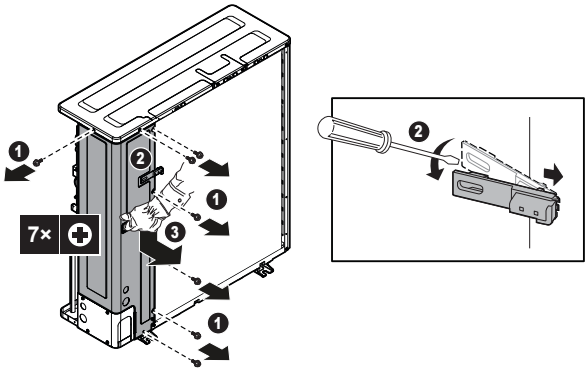

3 If necessary, remove the piping intake rear plate. This is e.g. necessary in the following cases:

- "7.2 Connecting the refrigerant piping" [▸ 37].
- "8.2.2 To connect the electrical wiring to the outdoor unit" [▸ 52].




4 If necessary, open the rear cover. This is e.g. necessary in the following cases:

- "8.2.2 To connect the electrical wiring to the outdoor unit" [▸ 52].
- "9 Charging refrigerant" [▸ 56].



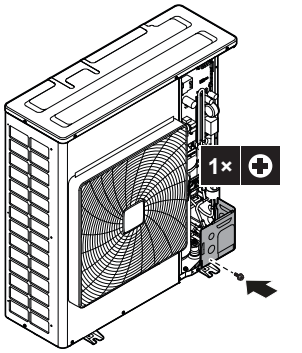

**NOTICE**

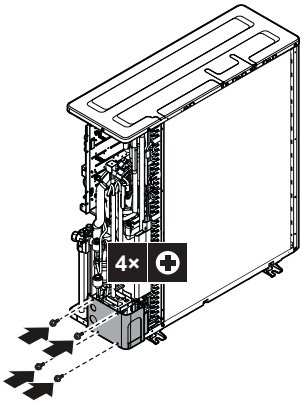
Use a flat head screwdriver to remove the thermistor fixing plate (2).

NEVER remove the lid, that covers the thermistor body.

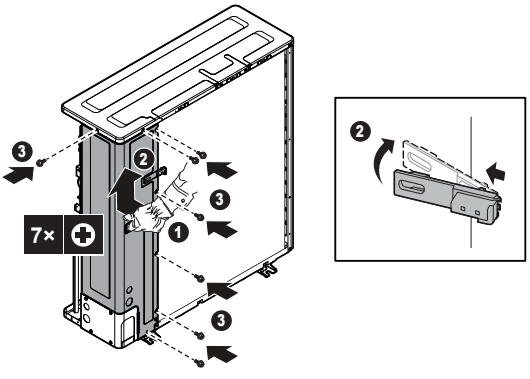
### 6.2.3 To close the outdoor unit

**1** Reinstall the piping intake front and rear plate.



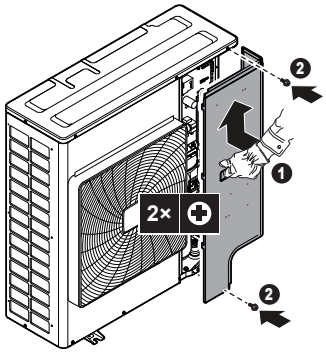

**2** Reinstall the rear cover.



**NOTICE**

Take care to mount the hooks of the thermistor fixing plate (2) correctly to the rear cover.

**3** Reinstall the service cover.




## 6.3 Mounting the outdoor unit

### 6.3.1 About mounting the outdoor unit

#### Typical workflow

Mounting the outdoor unit typically consists of the following stages:

1 Providing the installation structure.
2 Installing the outdoor unit.
3 Providing drainage.
4 Preventing the unit from falling over.

### 6.3.2 Precautions when mounting the outdoor unit

**INFORMATION**

Also read the precautions and requirements in the following chapters:

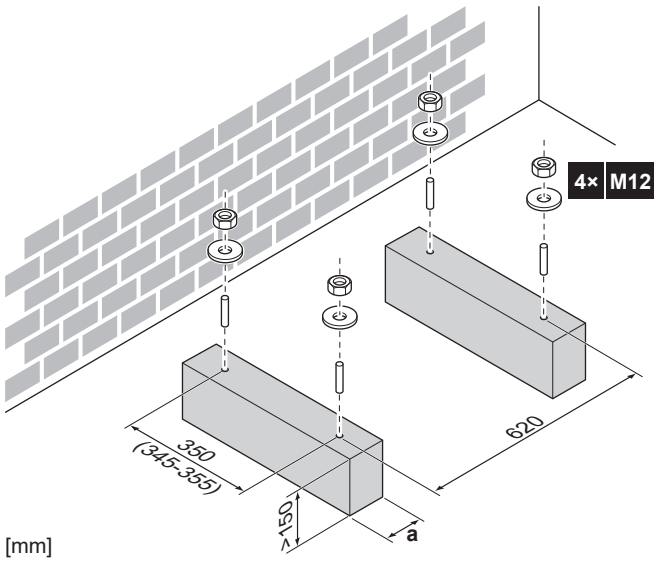
- "2 General safety precautions" [▶ 7]
- "6.1 Preparing the installation site" [▶ 24]

### 6.3.3 To provide the installation structure

Check the strength and level of the installation ground so that the unit will not cause any operating vibration or noise.

Fix the unit securely by means of foundation bolts in accordance with the foundation drawing.

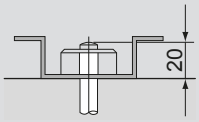
Prepare 4 sets of anchor bolts, nuts and washers (field supply) as follows:




**a** Make sure not to cover the drain holes of the bottom plate of the unit.

**INFORMATION**

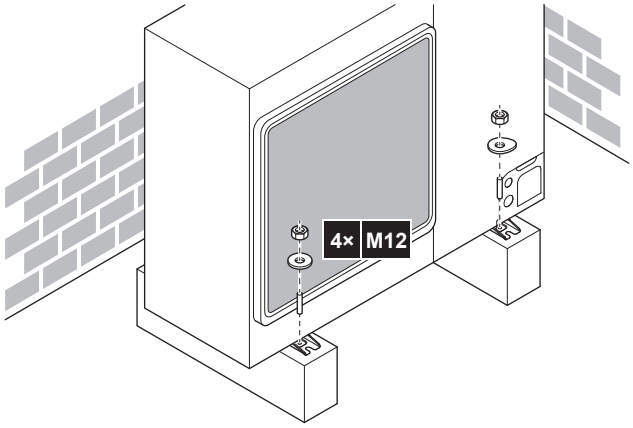
The recommended height of the upper protruding part of the bolts is 20 mm.




**NOTICE**

Fix the outdoor unit to the foundation bolts using nuts with resin washers (a). If the coating on the fastening area is stripped off, the metal can rust easily.


### 6.3.4 To install the outdoor unit




### 6.3.5 To provide drainage

- Make sure that condensation water can be evacuated properly.
- Install the unit on a base to make sure that there is proper drainage in order to avoid ice accumulation.
- Prepare a water drainage channel around the foundation to drain waste water away from the unit.

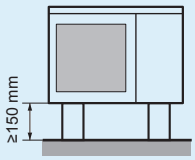
- Avoid drain water flowing over the footpath, so that it does NOT become slippery in case of ambient freezing temperatures.
- If you install the unit on a frame, install a waterproof plate within 150 mm of the bottom side of the unit in order to prevent water from getting into the unit and to avoid drain water dripping (see the following figure).

**INFORMATION**

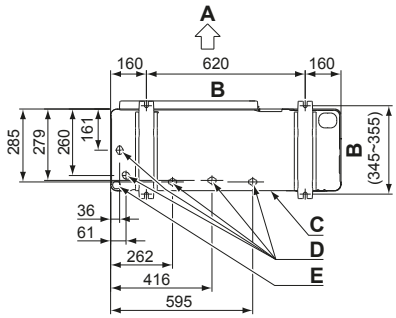
If necessary, you can use a drain plug kit (field supply) to prevent drain water from dripping.

**NOTICE**

If drain holes of the outdoor unit are covered by a mounting base or by floor surface, raise the unit to provide a free space of more than 150 mm under the outdoor unit.




## Drain holes (dimensions in mm)

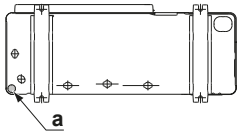



**A** Discharge side
**B** Distance between anchor points
**C** Bottom frame
**D** Drain holes
**E** Knockout hole for snow

## Snow

In regions with snowfall, snow might build up and freeze between the heat exchanger and the external plate. This might decrease the operating efficiency. To prevent this:

1 Remove the knockout hole (a) by tapping on the attachment points with a flat head screwdriver and a hammer.

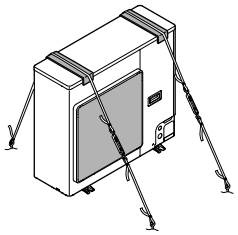



2 Remove the burrs, and paint the edges and areas around the edges using repair paint to prevent rusting.

### 6.3.6 To prevent the outdoor unit from falling over

In case the unit is installed in places where strong wind can tilt the unit, take following measure:

1. Prepare 2 cables as indicated in the following illustration (field supply).
2. Place the 2 cables over the outdoor unit.
3. Insert a rubber sheet between the cables and the outdoor unit to prevent the cables from scratching the paint (field supply).
4. Attach the ends of the cables.
5. Tighten the cables.



# 7 Piping installation

## In this chapter



## 7.1 Preparing refrigerant piping

### 7.1.1 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**

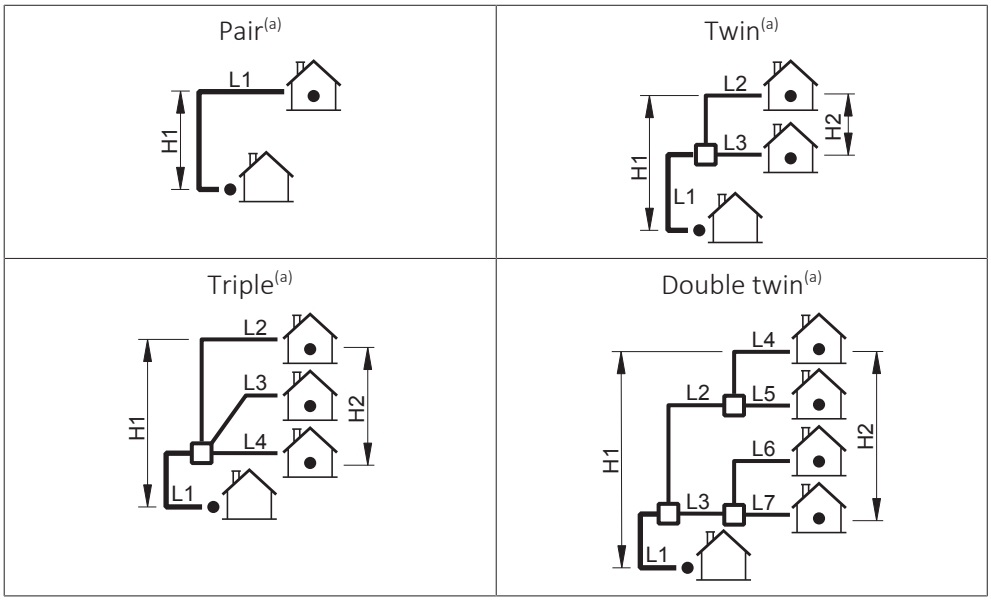
Also read the precautions and requirements in the "2 General safety precautions" [▶ 7].

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

When connecting multiple indoor units to the outdoor unit, mind the following:

| | |
|---|---|
| Refrigerant branch kit | One or more refrigerant branch kits are required. See "5.2.1 Possible options for the outdoor unit" [▶ 23]. |
| Upward and downward piping | Perform upward and downward piping only on the main piping line (L1). |
| Branch pipes | ▪ Install the branch pipes horizontally (with a maximum inclination of 15°) or vertically.<br>▪ Make the length of the branch pipes to the indoor units as short as possible.<br>▪ Try to keep length of the branch pipes to the indoor units equal. |

### 7.1.2 Definitions: L1~L7, H1, H2




[a] Assume that the longest line in the illustration corresponds with the actual longest pipe, and the highest unit in the illustration corresponds with the actual highest unit.

**L1** Main piping
**L2~L7** Branch piping
**H1** Height difference between the highest indoor unit and the outdoor unit
**H2** Height difference between the highest and the lowest indoor unit
Refrigerant branch kit

### 7.1.3 Refrigerant piping material

- **Piping material:** phosphoric acid deoxidised seamless copper
- **Flare connections:** Only use annealed material.
- **Piping temper grade and thickness:**

| Outer diameter (Ø) | Temper grade | Thickness (t)[a] | |
|---|---|---|---|
| 6.4 mm (1/4")<br>9.5 mm (3/8")<br>12.7 mm (1/2") | Annealed (O) | ≥0.8 mm |  |
| 15.9 mm (5/8") | Annealed (O) | ≥1.0 mm | |
| 19.1 mm (3/4") | Half hard (1/2H) | | |



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

### 7.1.4 Refrigerant piping diameter

The refrigerant piping diameters must comply with the following:

| Piping | Diameter |
|---|---|
| L1 (pair, twin, triple, double twin) | See below. |
| L2,L3 (twin)<br>L2~L4 (triple)<br>L4~L7 (double twin) | Use the same diameters as the connections (liquid, gas) on the indoor units. |

| Piping | Diameter |
|---|---|
| L2,L3 (double twin) | Liquid piping: Ø9.5 mm<br>Gas piping: Ø15.9 mm |

L1 (pair, twin, triple, double twin):

| Model | New[(a)]/ Existing[(b)] | L1 liquid piping | L1 gas piping |
|---|---|---|---|
| RZASG100~140 | Standard | Ø9.5 mm | Ø15.9 mm |

[(a)] When installing **new piping**, use the same diameters as the connections on the outdoor units (i.e. **standard** diameters for liquid and gas piping).

[(b)] When reusing **existing piping**, you may use the **size-up** or **size-down** diameters, but then capacity might decrease, and stricter piping length requirements are applicable. Assess these limitations in relation to the complete installation.

### 7.1.5 Refrigerant piping length and height difference

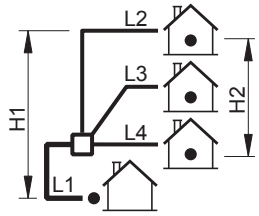
The piping lengths and height differences must comply with the following requirements:

| Requirement | | | Limit | |
|---|---|---|---|---|
| | | | RZASG100 | RZASG125 + RZASG140 |
| 1 | Minimum total one-way piping length | Pair: Limit≤L1<br>Twin: Limit≤L1+L3<br>Triple: Limit≤L1+L4<br>Double twin: Limit≤L1+L3+L7 | 5 m | |
| 2 | Maximum total one-way piping length | Pair: L1≤Limit | 50 m (70 m)[(a)] | |
| | | Twin and triple: L1+L2≤Limit<br>Double twin: L1+L2+L4≤Limit | 50 m (70 m)[(a)] | |
| 3 | Maximum allowable piping length | Pair: N/A | — | |
| | | Twin: L1+L2+L3≤Limit | 50 m | |
| | | Triple: L1+L2+L3+L4≤Limit | 50 m | |
| | | Double twin: L1+L2+L3+L4+L5+L6+L7≤Limit | — | 50 m |
| 4 | Maximum branch piping length | Pair: N/A<br>Twin and triple: L2≤Limit<br>Double twin: L2+L4≤Limit | 20 m | |
| 5 | Maximum difference between branch lengths | Pair: N/A | — | |
| | | Twin: L2–L3≤Limit | 10 m | |
| | | Triple: L2–L4≤Limit | 10 m | |
| | | Double twin:<br>▪ L2–L3≤Limit<br>▪ L4–L5≤Limit<br>▪ L6–L7≤Limit<br>▪ (L2+L4)–(L3+L7)≤Limit | — | 10 m |

| Requirement | | | Limit | |
|---|---|---|---|---|
| | | | RZASG100 | RZASG125 + RZASG140 |
| 6 | Maximum height between indoor and outdoor | Pair, twin, triple and double twin: H1≤Limit | 30 m | |
| 7 | Maximum height between indoors | Pair: N/A<br>Twin, triple and double twin: H2≤Limit | 0.5 m | |

(a) Parenthesised figure represents the equivalent length.

**Example**

| If the system layout is as follows... | Then the requirements are... | |
|---|---|---|
| ▪ RZASG125<br>▪ Triple:<br>  <br><br>▪ Ø standard | 1 | 5 m≤L1+L4 |
| | 2 | L1+L2≤50 m (70 m) |
| | 3 | L1+L2+L3+L4≤50 m |
| | 4 | L2≤20 m |
| | 5 | L2–L4≤10 m |
| | 6 | H1≤30 m |
| | 7 | H2≤0.5 m |

### 7.1.6 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 70°C for liquid piping and at least 120°C for gas piping
- Insulation thickness:

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

## 7.2 Connecting the refrigerant piping

### 7.2.1 About connecting the refrigerant piping

**Before connecting the refrigerant piping**

Make sure the outdoor and indoor unit are mounted.

**Typical workflow**

Connecting the refrigerant piping involves:

- Connecting the refrigerant piping to the outdoor unit
- Connecting the refrigerant piping to the indoor unit
- Installing oil traps
- Insulating the refrigerant piping

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

### 7.2.2 Precautions when connecting the refrigerant piping

**INFORMATION**

Also read the precautions and requirements in the following chapters:

- "2 General safety precautions" [▶ 7]
- "7.1 Preparing refrigerant piping" [▶ 34]

**DANGER: RISK OF BURNING/SCALDING**

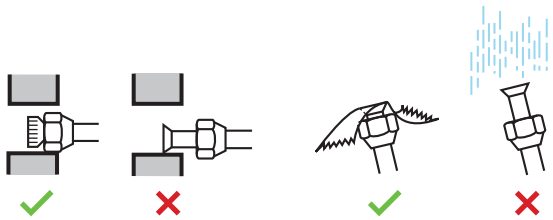
**NOTICE**

- Do NOT use mineral oil on flared part.
- Do NOT reuse piping from previous installations.
- NEVER install a drier to this R32 unit to guarantee its lifetime. The drying material may dissolve and damage the system.

**NOTICE**

Take the following precautions on refrigerant piping into account:

- Avoid anything but the designated refrigerant to get mixed into the refrigerant cycle (e.g. air).
- Only use R32 when adding refrigerant.
- Only use installation tools (e.g. manifold gauge set) that are exclusively used for R32 installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils and moisture) from mixing into the system.
- Install the piping so that the flare is NOT subjected to mechanical stress.
- Do NOT leave pipes unattended at the site. If the installation is NOT done within 1 day, protect the piping as described in the following table to prevent dirt, liquid or dust from entering the piping.
- Use caution when passing copper tubes through walls (see figure below).



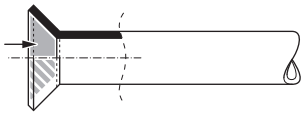
| Unit | Installation period | Protection method |
|---|---|---|
| Outdoor unit | >1 month | Pinch the pipe |
| | <1 month | Pinch or tape the pipe |
| Indoor unit | Regardless of the period | |

**NOTICE**

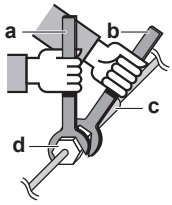
Do NOT open the refrigerant stop valve before checking the refrigerant piping. When you need to charge additional refrigerant it is recommended to open the refrigerant stop valve after charging.

### 7.2.3 Guidelines when connecting the refrigerant piping

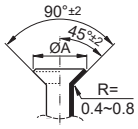
Take the following guidelines into account when connecting pipes:



- ALWAYS use 2 wrenches together when loosening a flare nut.
- ALWAYS use a spanner and torque wrench together to tighten the flare nut when connecting the piping. This to prevent nut cracking and leaks.




**a** Torque wrench
**b** Spanner
**c** Piping union
**d** Flare nut

| Piping size (mm) | Tightening torque (N•m) | Flare dimensions (A) (mm) | Flare shape (mm) |
|---|---|---|---|
| Ø9.5 | 33~39 | 12.8~13.2 |  |
| Ø15.9 | 62~75 | 19.3~19.7 | |



### 7.2.4 Pipe bending guidelines

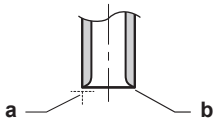
Use a pipe bender for bending. All pipe bends should be as gentle as possible (bending radius should be 30~40 mm or larger).

### 7.2.5 To flare the pipe end

**CAUTION**

- Incomplete flaring may cause refrigerant gas leakage.
- Do NOT re-use flares. Use new flares to prevent refrigerant gas leakage.
- Use flare nuts that are included with the unit. Using different flare nuts may cause refrigerant gas leakage.

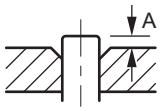
1. Cut the pipe end with a pipe cutter.
2. Remove burrs with the cut surface facing down so that the chips do NOT enter the pipe.



**a** Cut exactly at right angles.
**b** Remove burrs.

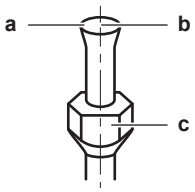
**3** Remove the flare nut from the stop valve and put the flare nut on the pipe.

**4** Flare the pipe. Set exactly at the position as shown in the following figure.




| | Flare tool for R32 (clutch type) | Conventional flare tool | |
|---|---|---|---|
| | | Clutch type (Ridgid-type) | Wing nut type (Imperial-type) |
| A | 0~0.5 mm | 1.0~1.5 mm | 1.5~2.0 mm |

**5** Check that the flaring is properly made.

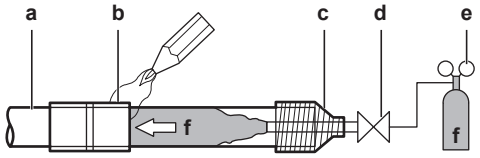



**a** Flare's inner surface MUST be flawless.
**b** The pipe end MUST be evenly flared in a perfect circle.
**c** Make sure the flare nut is fitted.

### 7.2.6 To braze the pipe end

The indoor unit and outdoor unit have flare connections. Connect both ends without brazing. If brazing should be needed, take the following into account:

- 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.

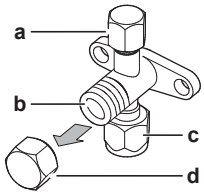
  Flux has an extremely harmful influence on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will deteriorate the refrigerant oil.
- ALWAYS protect the surrounding surfaces (e.g. insulation foam)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

### 7.2.7 Using the stop valve and service port

**To handle the stop valve**

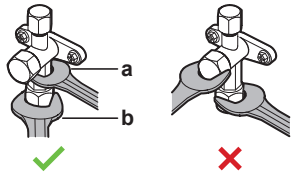
Take the following guidelines into account:

- The stop valves are factory closed.
- The following figure shows the stop valve parts required when handling the valve.



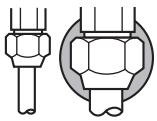

**a** Service port and service port cap
**b** Valve stem
**c** Field piping connection
**d** Stem cap

- Keep both stop valves open during operation.
- Do NOT apply excessive force to the valve stem. Doing so may break the valve body.
- ALWAYS make sure to secure the stop valve with a spanner, then loosen or tighten the flare nut with a torque wrench. Do NOT place the spanner on the stem cap, as this could cause a refrigerant leak.




**a** Spanner
**b** Torque wrench

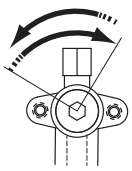
- When it is expected that the operating pressure will be low (e.g. when cooling will be performed while the outside air temperature is low), sufficiently seal the flare nut in the stop valve on the gas line with silicon sealant to prevent freezing.



Silicon sealant, make sure there is no gap.

**To open/close the stop valve**

1. Remove the stop valve cover.
2. Insert a hexagon wrench (liquid side: 4 mm, gas side: 6 mm) into the valve stem and turn the valve stem:



Counterclockwise to open
Clockwise to close

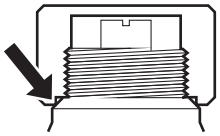
3. When the stop valve CANNOT be turned any further, stop turning.

4 Install the stop valve cover.

**Result:** The valve is now open/closed.

**To handle the stem cap**

- The stem cap is sealed where indicated with the arrow. Do NOT damage it.



- After handling the stop valve, tighten the stem cap, and check for refrigerant leaks.

| Item | Tightening torque (N·m) |
|---|---|
| Stem cap, liquid side | 13.5~16.5 |
| Stem cap, gas side | 22.5~27.5 |

**To handle the service cap**

- ALWAYS use a charge hose equipped with a valve depressor pin, since the service port is a Schrader type valve.
- After handling the service port, tighten the service port cap, and check for refrigerant leaks.

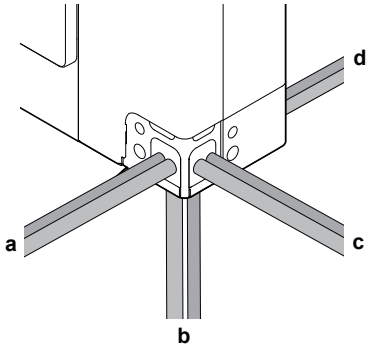
| Item | Tightening torque (N·m) |
|---|---|
| Service port cap | 11.5~13.9 |

### 7.2.8 To connect the refrigerant piping to the outdoor unit

Keep the following in mind:

- **Piping length.** Keep field piping as short as possible.
- **Piping protection.** Protect the field piping against physical damage.

You can route the refrigerant piping to the front, bottom, side or rear of the unit.

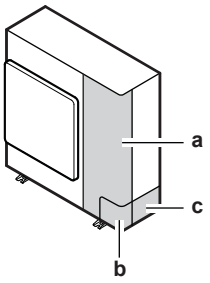



**a** Front connection
**b** Bottom connection
**c** Side connection
**d** Rear connection

1 Remove the following plates:

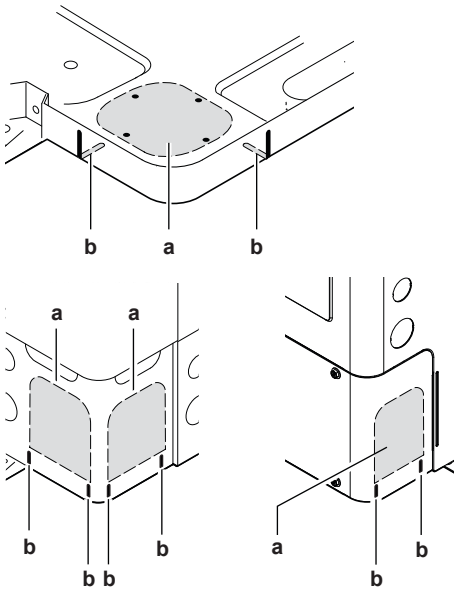
For details, see "6.2.2 To open the outdoor unit" [▸ 27].

- Remove the service cover (a) and the piping intake front plate (b).
- In case the refrigerant piping is routed to the rear side of the unit, also remove the piping intake rear plate (c).




**a** Service cover
**b** Piping intake front plate
**c** Piping intake rear plate

**2** Remove the knockout hole(a) in the bottom plate or in the piping intake plate by tapping on the attachment points with a small flat screwdriver and a hammer. Optionally, cut out the slits (b) with a metal saw.




**a** Knockout hole for piping
**b** Slit

**NOTICE**

Precautions when making knockout holes:

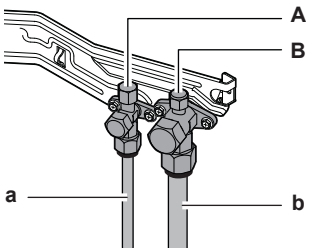
- Avoid damaging the casing and underlying piping.
- After making the knockout holes, we recommend to remove the burrs and paint the edges and areas around the edges using repair paint to prevent rusting.
- When passing electrical wiring through the knockout holes, wrap the wiring with protective tape to prevent damage.

**NOTICE**

Avoid bending the bottom plate when removing the knockout hole.

**3** Connect the gas and liquid piping.

- Connect the liquid piping (a) to the liquid stop valve (A).
- Connect the gas piping (b) to the gas stop valve (B).

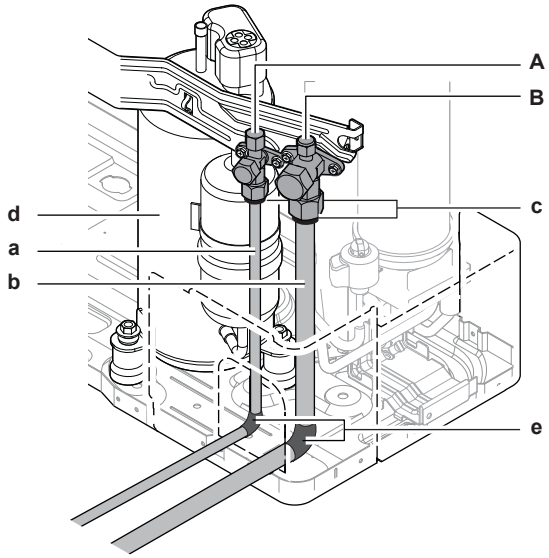



**A** Stop valve (liquid)
**B** Stop valve (gas)
**a** Liquid piping
**b** Gas piping

**4** Insulate the refrigerant piping:

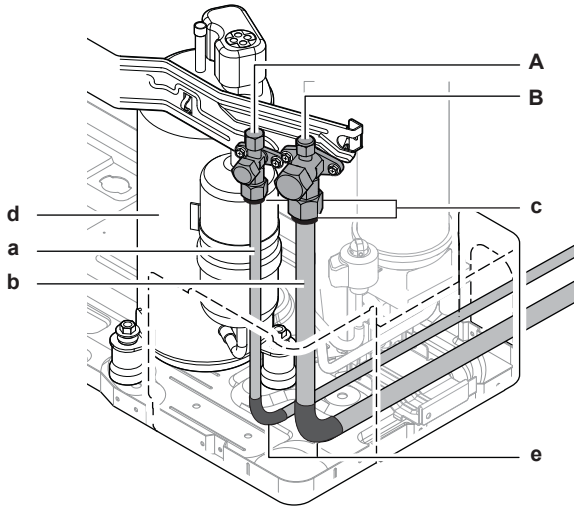
- Insulate the liquid piping (a) and the gas piping (b).
- Wind heat insulation around the curves, and then cover it with vinyl tape (e).
- Make sure the field piping does not touch any compressor components (d).
- Seal the insulation ends (sealant etc.) (c).

**Example: Front connection**




**A** Stop valve (liquid)
**B** Stop valve (gas)
**a** Liquid piping
**b** Gas piping
**c** Insulation ends
**d** Compressor
**e** Vinyl tape

**Example: Rear connection**




**A** Stop valve (liquid)
**B** Stop valve (gas)
**a** Liquid piping
**b** Gas piping
**c** Insulation ends
**d** Compressor
**e** Vinyl tape

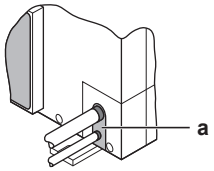
**5** If the outdoor unit is installed above the indoor unit, cover the stop valves (A,B see above) with sealing material to prevent condensed water on the stop valves from moving to the indoor unit.

**NOTICE**

Any exposed piping can cause condensation.

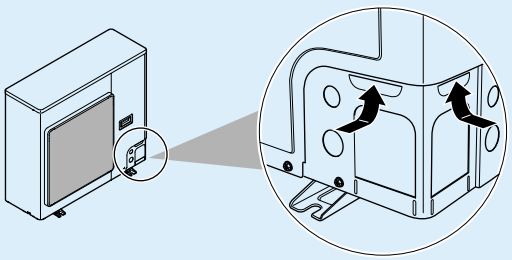
**6** Reattach the service cover and the piping intake plate.

**7** Seal all gaps (example: a) to prevent snow and small animals from entering the system.




**NOTICE**

Do not block the air vents. This could affect air circulation inside the unit.



**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.

**NOTICE**

Make sure to open the stop valves after installing the refrigerant piping and performing vacuum drying. Running the system with the stop valves closed may break the compressor.

## 7.3 Checking the refrigerant piping

### 7.3.1 About checking the refrigerant piping

The outdoor unit's **internal** refrigerant piping has been factory tested for leaks. You only have to check the outdoor unit's **external** refrigerant piping.

#### Before checking the refrigerant piping

Make sure the refrigerant piping is connected between the outdoor unit and the indoor unit.

#### Typical workflow

Checking the refrigerant piping typically consists of the following stages:

1 Checking for leaks in the refrigerant piping.

2 Performing vacuum drying to remove all moisture, air or nitrogen from the refrigerant piping.

If there is a possibility of moisture being present in the refrigerant piping (for example, water may have entered the piping), first carry out the vacuum drying procedure below until all moisture has been removed.

### 7.3.2 Precautions when checking the refrigerant piping

**INFORMATION**

Also read the precautions and requirements in the following chapters:

- "2 General safety precautions" [▶ 7]
- "7.1 Preparing refrigerant piping" [▶ 34]

**NOTICE**

Use a 2-stage vacuum pump with a non-return valve that can evacuate to a gauge pressure of −100.7 kPa (−1.007 bar)(5 Torr absolute). Make sure the pump oil does not flow oppositely into the system while the pump is not working.

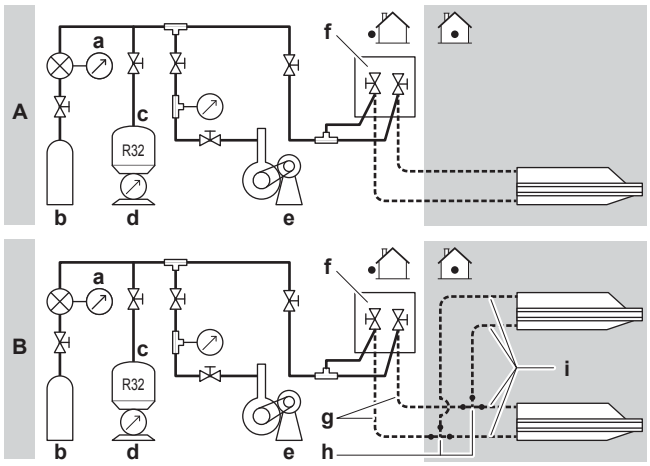
**NOTICE**

Use this vacuum pump for R32 exclusively. Using the same pump for other refrigerants may damage the pump and the unit.

**NOTICE**

- Connect the vacuum pump to **both** the service port of the gas stop valve and the service port of the liquid stop valve to increase efficiency.
- Make sure that the gas stop valve and liquid stop valve are firmly closed before performing the leak test or vacuum drying.

### 7.3.3 Checking refrigerant piping: Setup




**A** Setup in case of pair
**B** Setup in case of twin
**a** Pressure gauge
**b** Nitrogen
**c** Refrigerant
**d** Weighing scale
**e** Vacuum pump
**f** Stop valve
**g** Main piping
**h** Refrigerant branch kit
**i** Branch piping

### 7.3.4 To perform a leak test

The leak test must satisfy the specifications of EN378-2.

**Pressure leak test**

**NOTICE**

Do NOT exceed the unit's maximum working pressure (see "PS High" on the unit name plate).

1 Charge the system with nitrogen gas up to a gauge pressure of at least 0.2 MPa (2 bar). It is recommended to pressurize to 3.0 MPa (30 bar) in order to detect small leaks.

2 Check for leaks by applying the bubble test solution to all connections.

**NOTICE**

ALWAYS use a recommended bubble test solution from your wholesaler.

NEVER use soap water:

- Soap water may cause cracking of components, such as flare nuts or stop valve caps.
- Soap water may contain salt, which absorbs moisture that will freeze when the piping gets cold.
- Soap water contains ammonia which may lead to corrosion of flared joints (between the brass flare nut and the copper flare).

3 Discharge all nitrogen gas.

### 7.3.5 To perform vacuum drying

**NOTICE**

- Connect the vacuum pump to **both** the service port of the gas stop valve and the service port of the liquid stop valve to increase efficiency.
- Make sure that the gas stop valve and liquid stop valve are firmly closed before performing the leak test or vacuum drying.

1. Vacuum the system until the pressure on the manifold indicates −0.1 MPa (−1 bar).
2. Leave as is for 4-5 minutes and check the pressure:

| If the pressure... | Then... |
|---|---|
| Does not change | There is no moisture in the system. This procedure is finished. |
| Increases | There is moisture in the system. Go to the next step. |

3. Vacuum the system for at least 2 hours to a manifold pressure of −0.1 MPa (−1 bar).
4. After turning the pump OFF, check the pressure for at least 1 hour.
5. If you do NOT reach the target vacuum or CANNOT maintain the vacuum for 1 hour, do the following:
   - Check for leaks again.
   - Perform vacuum drying again.

**NOTICE**

Make sure to open the stop valves after installing the refrigerant piping and performing vacuum drying. Running the system with the stop valves closed may break the compressor.

**INFORMATION**

After opening the stop valve, it is possible that the pressure in the refrigerant piping does NOT increase. This might be caused by e.g. the closed state of the expansion valve in the outdoor unit circuit, but does NOT present any problem for correct operation of the unit.

# 8 Electrical installation

## In this chapter



## 8.1 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 indoor units.
4 Connecting the main power supply.

### 8.1.1 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.

**INFORMATION**

Also read the precautions and requirements in the "2 General safety precautions" [▸ 7].

**INFORMATION**

Also read "8.2.1 Specifications of standard wiring components" [▸ 52].

**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 in 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.
- Do NOT install a phase advancing capacitor, because this unit is equipped with an inverter. A phase advancing capacitor will reduce performance and may cause accidents.

**CAUTION**

Do NOT push or place redundant cable length into 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.

**CAUTION**

For use of units in applications with temperature alarm settings it is recommended to foresee a delay of 10 minutes for signalling the alarm in case the alarm temperature is exceeded. The unit may stop for several minutes during normal operation for "defrosting the unit", or when in "thermostat stop" operation.

**WARNING**

Do NOT interchange the supply conductors L and the neutral conductor N.

### 8.1.2 Guidelines when connecting the electrical wiring

**NOTICE**

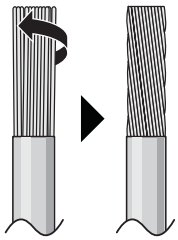
We recommend using solid (single-core) wires. If stranded wires are used, slightly twist the strands to consolidate the end of the conductor for either direct use in the terminal clamp or insertion in a round crimp-style terminal.

#### To prepare stranded conductor wire for installation

**Method 1: Twisting conductor**

1 Strip insulation (20 mm) from the wires.

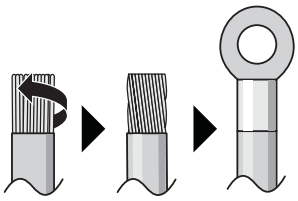
2 Slightly twist the end of the conductor to create a "solid-like" connection.



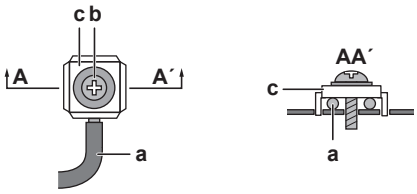
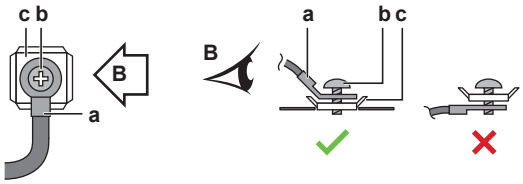
**Method 2: Using round crimp-style terminal**

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

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



### Use the following methods for installing wires:

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

### Tightening torques

| Item | Tightening torque (N•m) |
|---|---|
| M4 (X1M) | 1.2~1.8 |
| M4 (earth) | 1.2~1.4 |
| M5 (X1M) | 2.0~3.0 |
| M5 (earth) | 2.4~2.9 |

**NOTICE**

If limited space is available at the wire terminal, use bended crimp-style ring terminals.

### 8.1.3 About electrical compliance

**RZASG100~140MUV**

Equipment complying with EN/IEC 61000-3-12 (European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤75 A per phase.).

**RZASG100~140MUY**

Equipment complying with EN/IEC 61000-3-2 (European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current ≤16 A per phase.).

## 8.2 Connections to the outdoor unit

### 8.2.1 Specifications of standard wiring components

| Component | | RZASG100~140MUV | | | RZASG100~140MUY | | |
|---|---|---|---|---|---|---|---|
| | | 100 | 125 | 140 | 100 | 125 | 140 |
| Power supply cable | MCA[(a)] | 22.7 A | 29.2 A | 28.5 A | 14.9 A | 15.7 A | 15.4 A |
| | Voltage range | 220~240 V | | | 380~415 V | | |
| | Phase | 1~ | | | 3N~ | | |
| | Frequency | 50 Hz | | | | | |
| | Wire sizes | Must comply with national wiring regulation | | | | | |
| | | 3-core cable | | | 5-core cable | | |
| | | Wire size based on the current, but not less than: | | | | | |
| | | Minimum 4.0 $mm^2$ | | | Minimum 2.5 $mm^2$ | | |
| Interconnection cable (indoor ↔ outdoor) | Voltage | 220-240 V | | | | | |
| | Wire size | Only use harmonised wire providing double insulation and suitable for applicable voltage.<br>4-core cable<br>Minimum 2.5 $mm^2$ | | | | | |
| Recommended field fuse | | 25 A | 32 A | | 16 A | | |
| Earth leakage circuit breaker / residual current device | | Must comply with national wiring regulation | | | | | |

[(a)] MCA=Minimum circuit ampacity. Stated values are maximum values (see electrical data of combination with indoor units for exact values).

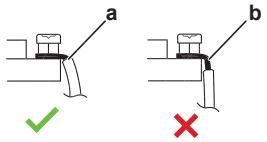
### 8.2.2 To connect the electrical wiring to the outdoor unit

**NOTICE**

- Follow the wiring diagram (delivered with the unit, located at the inside of the service cover).
- Make sure the electrical wiring does NOT obstruct proper reattachment of the service cover.

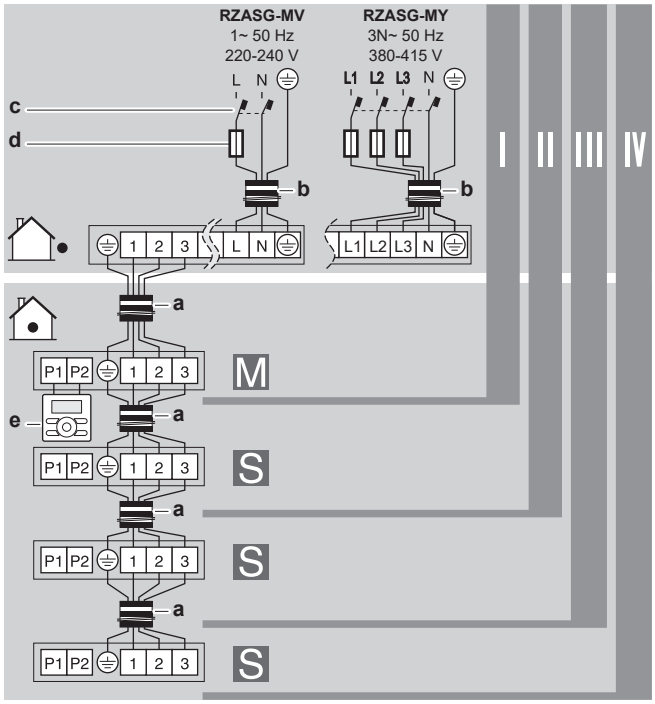
1 Remove the service cover. See "6.2.2 To open the outdoor unit" [▸ 27].

2 Strip insulation (20 mm) from the wires.



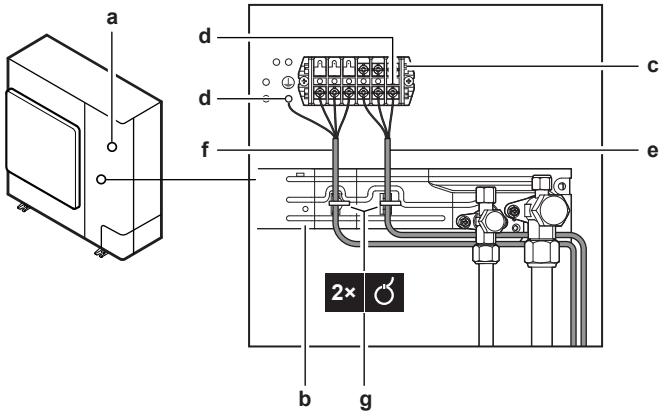

**a** Strip wire end to this point
**b** An excessive strip length may cause electrical shock or leakage

3 Connect the interconnection cables and power supply as follows:




**I, II, III, IV** Pair, twin, triple, double twin
**M, S** Master, slave
**a** Interconnection cables
**b** Power supply cable
**c** Earth leakage circuit breaker
**d** Fuse
**e** User interface

**Example:** RZASG100~140MUV



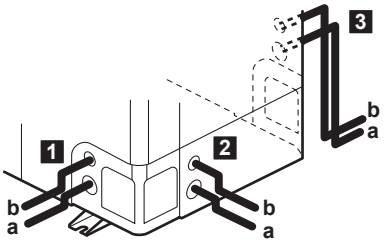
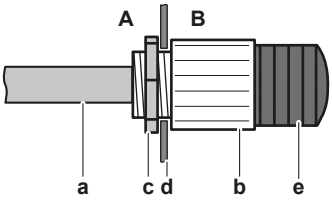

**a** Switch box
**b** Stop valve attachment plate
**c** Terminal block
**d** Earth wire
**e** Power supply cable
**f** Interconnection cable

**g** Tie wrap

4 Fix the cables (power supply and interconnection cable) with a cable tie to the stop valve attachment plate and route the wiring according to the illustration above.

5 Choose a knockout hole and remove the knockout hole by tapping on the attachment points with a flat head screwdriver and a hammer.

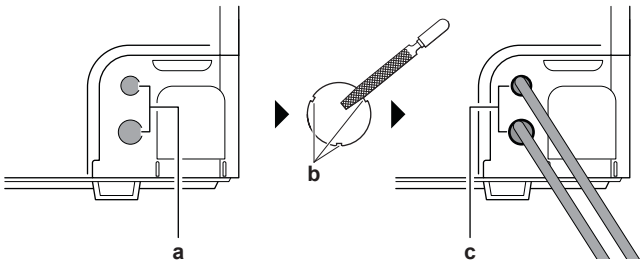
6 Route the wiring through the frame and connect the wiring to the frame at the knockout hole.

| | |
|---|---|
| Routing through the frame | Choose one of the 3 possibilities:<br>  <br><br>**a** Power supply cable<br>**b** Interconnection cable |
| Connecting to the frame | When cables are routed from the unit, a protection sleeve for the conduits (PG insertions) can be inserted at the knockout hole.<br>When you do not use a wire conduit, protect the wires with vinyl tubes to prevent the edge of the knockout hole from cutting the wires.<br>  <br><br>**A** Inside of the outdoor unit<br>**B** Outside of the outdoor unit<br>**a** Wire<br>**b** Bush<br>**c** Nut<br>**d** Frame<br>**e** Hose |

**NOTICE**

Precautions when making knockout holes:

- Avoid damaging the casing and underlying piping.
- After making the knockout holes, we recommend to remove the burrs and paint the edges and areas around the edges using repair paint to prevent rusting.
- When passing electrical wiring through the knockout holes, wrap the wiring with protective tape to prevent damage.




**a** Knockout hole
**b** Burr
**c** Sealant etc.

**7** Reattach the service cover. See "6.2.3 To close the outdoor unit" [▸ 29].

**8** Connect an earth leakage circuit breaker and fuse to the power supply line.

# 9 Charging refrigerant

## In this chapter



## 9.1 About charging refrigerant

The outdoor unit is factory charged with refrigerant, but in some cases the following might be necessary:

| What | When |
|---|---|
| Charging additional refrigerant | When the total liquid piping length is more than specified (see later). |
| Completely recharging refrigerant | **Example:**<br>▪ When relocating the system.<br>▪ After a leak. |

### Charging additional refrigerant

Before charging additional refrigerant, make sure the outdoor unit's **external** refrigerant piping is checked (leak test, vacuum drying).

**INFORMATION**

Depending on the units and/or the installation conditions, it might be necessary to connect electrical wiring before you can charge refrigerant.

Typical workflow – Charging additional refrigerant typically consists of the following stages:

1 Determining if and how much you have to charge additionally.

2 If necessary, charging additional refrigerant.

3 Filling in the fluorinated greenhouse gases label, and fixing it to the inside of the outdoor unit.

### Completely recharging refrigerant

Before completely recharging refrigerant, make sure the following is done:

1 All refrigerant is recovered from the system.

2 The outdoor unit's **external** refrigerant piping is checked (leak test, vacuum drying).

3 Vacuum drying on the outdoor unit's **internal** refrigerant piping is performed.

**NOTICE**

Before completely recharging, perform vacuum drying on the outdoor unit's **internal** refrigerant piping as well.

**NOTICE**

To perform vacuum drying or a complete recharge of the outdoor unit's internal refrigerant piping it is necessary to activate the vacuum mode (see "9.6.2 To activate/deactivate the vacuum mode field setting" [▶ 62]) which will open required valves in the refrigerant circuit so the vacuuming process or recharge of refrigerant can be done properly.

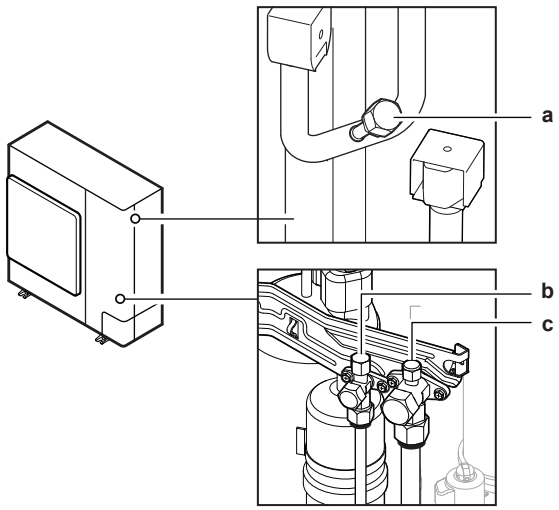
- Before vacuum drying or recharging, activate field setting "vacuum mode".
- After finishing vacuum drying or recharging, deactivate field setting "vacuum mode".

**WARNING**

Some sections of the refrigerant circuit may be isolated from other sections caused by components with specific functions (e.g. valves). The refrigerant circuit therefore features additional service ports for vacuuming, pressure relief or pressurizing the circuit.

In case it is required to perform **brazing** on the unit, ensure that there is no pressure remaining inside the unit. Internal pressures need to be released with ALL the service ports indicated on the figures below opened. The location is depending on model type.

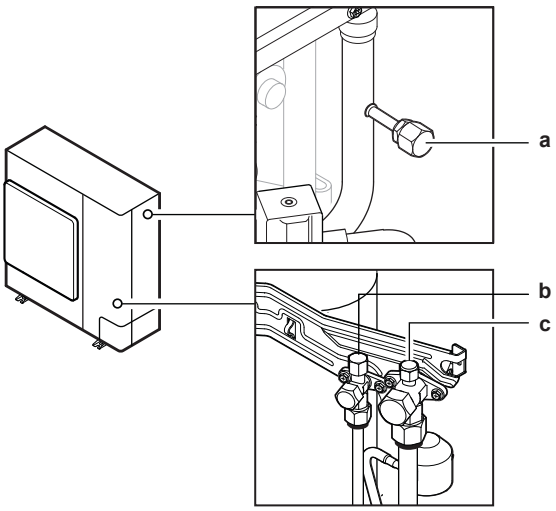
### 4-5 HP




**a** Internal service port
**b** Stop valve with service port (liquid)
**c** Stop valve with service port (gas)

Remove the service cover to access all service ports. See "6.2.2 To open the outdoor unit" [▶ 27].

**6 HP**




**a** Internal service port
**b** Stop valve with service port (liquid)
**c** Stop valve with service port (gas)

Remove the service cover and the rear cover to access all service ports. See "6.2.2 To open the outdoor unit" [▶ 27].

Typical workflow – Completely recharging refrigerant typically consists of the following stages:

1 Determining how much refrigerant to charge.

2 Charging refrigerant.

3 Filling in the fluorinated greenhouse gases label, and fixing it to the inside of the outdoor unit.

## 9.2 About the refrigerant

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.

**WARNING: MILDLY FLAMMABLE MATERIAL**

The refrigerant inside this unit is mildly flammable.

**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**

- 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.

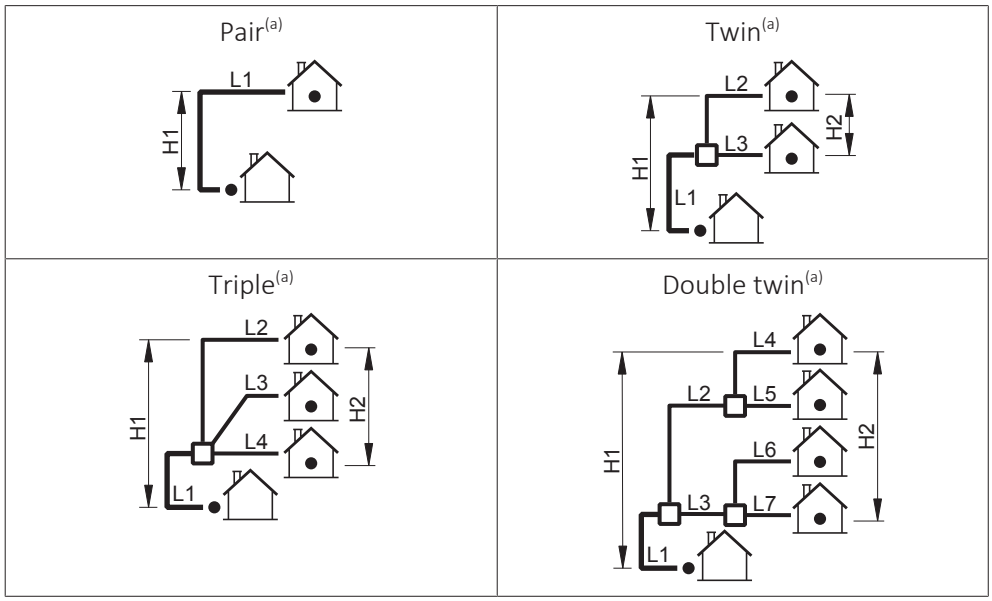
## 9.3 Precautions when charging refrigerant

**INFORMATION**

Also read the precautions and requirements in the following chapters:

- "2 General safety precautions" [▸ 7]
- "7.1 Preparing refrigerant piping" [▸ 34]

## 9.4 Definitions: L1~L7, H1, H2




(a) Assume that the longest line in the illustration corresponds with the actual longest pipe, and the highest unit in the illustration corresponds with the actual highest unit.

**L1** Main piping
**L2~L7** Branch piping
**H1** Height difference between the highest indoor unit and the outdoor unit
**H2** Height difference between the highest and the lowest indoor unit
Refrigerant branch kit

## 9.5 Charging additional refrigerant

### 9.5.1 To determine the additional refrigerant amount

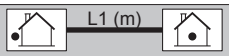
**To determine if adding additional refrigerant is necessary**

| If | Then |
|---|---|
| (L1+L2+L3+L4+L5+L6+L7)≤ 30 m (chargeless length) | You do not have to add additional refrigerant. |
| (L1+L2+L3+L4+L5+L6+L7)> 30 m (chargeless length) | You must add additional refrigerant.<br>For future servicing, encircle the selected amount in the tables below. |

**INFORMATION**

Piping length is the largest one-way length of liquid piping.

**To determine the additional refrigerant amount (R in kg) (in case of pair)**

| |  | |
|---|---|---|
| **L1:** | **30~40 m** | **40~50 m** |
| **R:** | 0.35 kg | 0.7 kg |

**To determine the additional refrigerant amount (R in kg) (in case of twin, triple and double twin)**

**1** Determine R1 and R2.

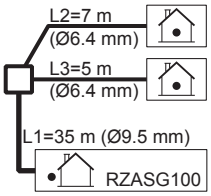
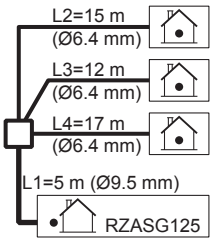
| If | Then |
|---|---|
| G1>30 m | Use the table below to determine R1 |
| G1≤30 m<br>(and G1+G2>30 m) | R1=0.0 kg.<br>Use the table below to determine R2 |

| | Length (total length of liquid piping−30 m) | | | | |
|---|---|---|---|---|---|
| | **0~10 m** | **10~20 m** | **20~30 m** | **30~40 m** | **40~45 m** |
| **R1:** | 0.35 kg | 0.7 kg | 1.05 kg | 1.4 kg | |
| **R2:** | 0.2 kg | 0.4 kg | 0.6 kg | 0.8 kg | 1 kg[(a)] |

[(a)] Only for RZASG100+125.

**2** Determine the additional refrigerant amount: R=R1+R2.

**Examples**

| Layout | | | |
|---|---|---|---|
|  | Case: Twin, standard liquid pipe size | | |
| | 1 | G1 | Total Ø9.5 => G1=35 m |
| | | G2 | Total Ø6.4 => G2=7+5=12 m |
| | 2 | Case: G1>30 m | |
| | | R1 | Length=G1−30 m=5 m<br>=> R1=0.35 kg |
| | | R2 | Length=G2=12 m<br>=> R2=0.4 kg |
| | 3 | R | R=R1+R2=0.35+0.4=0.75 kg |
|  | Case: Triple, standard liquid pipe size | | |
| | 1 | G1 | Total Ø9.5 => G1=5 m |
| | | G2 | Total Ø6.4 => G2=15+12+17=44 m |
| | 2 | Case: G1≤30 m (and G1+G2>30 m) | |
| | | R1 | R1=0.0 kg |
| | | R2 | Length=G1+G2−30 m = 5+44−30=19 m<br>=> R2=0.4 kg |
| | 3 | R | R=R1+R2=0.0+0.4=0.4 kg |

### 9.5.2 Charging refrigerant: Setup

See "7.3.3 Checking refrigerant piping: Setup" [▸ 47].

### 9.5.3 To charge additional refrigerant

**WARNING**

- Only use R32 as refrigerant. Other substances may cause explosions and accidents.
- R32 contains fluorinated greenhouse gases. Its global warming potential (GWP) value is 675. Do NOT vent these gases into the atmosphere.
- When charging refrigerant, ALWAYS use protective gloves and safety glasses.

**NOTICE**

To avoid compressor breakdown, do NOT charge more than the specified amount of refrigerant.

**Prerequisite:** Before charging refrigerant, make sure the refrigerant piping is connected and checked (leak test and vacuum drying).

1. Connect the refrigerant cylinder to both the service port of the gas stop valve and the service port of the liquid stop valve.
2. Charge the additional refrigerant amount.
3. Open the stop valves.

If pump down is needed in case of dismantling or relocating the system, see "15.3 To pump down" [▶ 76] for more details.

## 9.6 Completely recharging refrigerant

### 9.6.1 To determine the complete recharge amount

**To determine the complete recharge amount (kg)**

| Model | Length[(a)] | | |
|---|---|---|---|
| | 5~30 m | 30~40 m | 40~50 m |
| RZASG100-125 | 2.6 kg | 2.95 kg | 3.3 kg |
| RZASG140 | 2.9 kg | 3.25 kg | 3.6 kg |

(a) Length=L1 (pair); L1+L2 (twin, triple); L1+L2+L4 (double twin)

### 9.6.2 To activate/deactivate the vacuum mode field setting

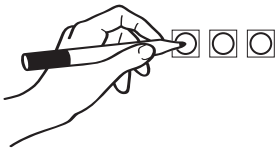
**Description**

To perform vacuum drying or a complete recharge of the outdoor unit's internal refrigerant piping it is necessary to activate the vacuum mode which will open required valves in the refrigerant circuit so the vacuuming process or recharge of refrigerant can be done properly.

**To activate vacuum mode:**

Activating the vacuum mode is done by operating the push buttons BS* on the PCB (A1P) and reading the feedback from the 7-segment displays.

Operate the switches and push buttons with an insulated stick (such as a closed ball-point pen) to avoid touching of live parts.



1. When the unit is powered on and not running, hold down the BS1 pushbutton for 5 seconds.

   **Result:** You will reach the setting mode, the 7 segment display will show '2 0 0'.
2. Press the BS2 button until you reach page **2–28**.
3. When **2–28** is reached, press the BS3 button once.
4. Change the setting to '**1**' by pressing the BS2 button once.
5. Push the BS3 button once.
6. When the display is not blinking anymore, press the BS3 button again to activate vacuum mode.

**To deactivate vacuum mode:**

After charging or vacuuming the unit, please deactivate the vacuum mode by changing the setting back to '**0**'.

Make sure to reattach the electronic component box cover and to install the front cover after the job is finished.

**NOTICE**

Make sure that all outside panels, except for the service cover on the switch box, are closed while working.

Close the lid of the switch box firmly before turning on the power.

### 9.6.3 Charging refrigerant: Setup

See "7.3.3 Checking refrigerant piping: Setup" [▸ 47].

### 9.6.4 To completely recharge refrigerant

**WARNING**

- Only use R32 as refrigerant. Other substances may cause explosions and accidents.
- R32 contains fluorinated greenhouse gases. Its global warming potential (GWP) value is 675. Do NOT vent these gases into the atmosphere.
- When charging refrigerant, ALWAYS use protective gloves and safety glasses.

**NOTICE**

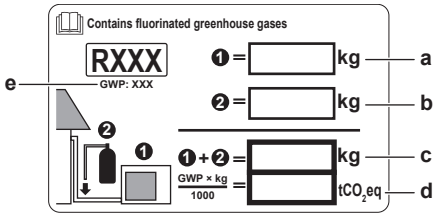
To avoid compressor breakdown, do NOT charge more than the specified amount of refrigerant.

**Prerequisite:** Before completely recharging refrigerant, make sure the system is pumped down, the outdoor unit's **external** refrigerant piping is checked (leak test, vacuum drying) and vacuum drying on the outdoor unit's **internal** refrigerant piping is performed.

1. If not already done (for vacuum drying of the unit), activate the vacuum mode (see "9.6.2 To activate/deactivate the vacuum mode field setting" [▸ 62])
2. Connect the refrigerant cylinder to the service port of the liquid stop valve.
3. Open the liquid stop valve.
4. Charge the complete refrigerant amount.
5. Deactivate the vacuum mode (see "9.6.2 To activate/deactivate the vacuum mode field setting" [▸ 62]).
6. Open the gas stop valve.

## 9.7 To fix the fluorinated greenhouse gases label

1. Fill in the label as follows:




**a** Factory refrigerant charge: see unit name plate
**b** Additional refrigerant amount charged
**c** Total refrigerant charge
**d** **Quantity of fluorinated greenhouse gases** of the total refrigerant charge expressed as tonnes $CO_2$ equivalent.

**e** GWP = Global Warming Potential

**NOTICE**

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

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

Use the GWP value mentioned on the refrigerant charge label.

**2** Fix the label on the inside of the outdoor unit. There is a dedicated place for it on the wiring diagram label.

# 10 Finishing the outdoor unit installation

## In this chapter



## 10.1 To insulate the refrigerant piping

After finishing the charging procedure, the piping must be insulated. Take into account the following points:

- Be sure to insulate the liquid and gas piping (for all units).
- Use heat resistant polyethylene foam which can withstand a temperature of 70°C for liquid piping and polyethylene foam which can withstand a temperature of 120°C for gas piping.
- Reinforce the insulation on the refrigerant piping according to the installation environment.

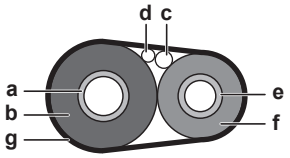
| Ambient temperature | Humidity | Minimum thickness |
|---|---|---|
| ≤30°C | 75% to 80% RH | 15 mm |
| >30°C | ≥80% RH | 20 mm |

### Between outdoor and indoor unit

**NOTICE**

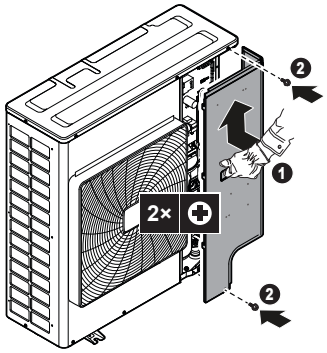
It is recommended that the refrigerant piping between indoor and outdoor unit is installed in a ducting or the refrigerant piping is wrapped with finishing tape.

**1** Insulate and fix the refrigerant piping and cables as follows:




**a** Gas pipe
**b** Gas pipe insulation
**c** Interconnection cable
**d** Field wiring (if applicable)
**e** Liquid pipe
**f** Liquid pipe insulation
**g** Finishing tape

**2** Install the service cover.



## 10.2 To check the insulation resistance of the compressor

**NOTICE**

If, after installation, refrigerant accumulates in the compressor, the insulation resistance over the poles can drop, but if it is at least 1 MΩ, then the unit will not break down.

- Use a 500 V mega-tester when measuring insulation.
- Do NOT use a mega-tester for low voltage circuits.

**1** Measure the insulation resistance over the poles.

| If | Then |
|---|---|
| ≥1 MΩ | Insulation resistance is OK. This procedure is finished. |
| <1 MΩ | Insulation resistance is not OK. Go to the next step. |

**2** Turn ON the power and leave it on for 6 hours.

**Result:** The compressor will heat up and evaporate any refrigerant in the compressor.

**3** Measure the insulation resistance again.

# 11 Commissioning

## In this chapter



## 11.1 Overview: Commissioning

This chapter describes what you have to do and know to commission the system after it is installed.

### Typical workflow

Commissioning typically consists of the following stages:

1 Checking the "Checklist before commissioning".
2 Performing a test run for the system.

## 11.2 Precautions when commissioning

**WARNING**

If the panels on the indoor units are not installed yet, make sure to power OFF the system after finishing the test run. To do so, turn OFF operation via the user interface. Do NOT stop operation by turning OFF the circuit breakers.

**NOTICE**

Before starting up the system, the unit MUST be energised for at least 6 hours. The crankcase heater needs to heat up the compressor oil to avoid oil shortage and compressor breakdown during startup.

**NOTICE**

ALWAYS operate the unit with thermistors and/or pressure sensors/switches. If NOT, burning of the compressor might be the result.

**NOTICE**

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

**NOTICE**

**Cooling operation mode**. Perform the test run in cooling operation mode so that stop valves failing to open can be detected. Even if the user interface was set to heating operation mode, the unit will run in cooling operation mode during 2-3 minutes (although the user interface will display the heating icon), and then automatically switch to heating operation mode.

**NOTICE**

If you cannot operate the unit in test run, see "11.5 Error codes when performing a test run" [▶ 70].

**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.

## 11.3 Checklist before commissioning

1 After the installation of the unit, check the items listed below.

2 Close the unit.

3 Power up the unit.

| | |
|---|---|
| ☐ | You read the complete installation instructions, as described in the **installer reference guide**. |
| ☐ | The **indoor units** are properly mounted. |
| ☐ | In case a wireless user interface is used: The **indoor unit decoration panel** with infrared receiver is installed. |
| ☐ | The **outdoor unit** is properly mounted. |
| ☐ | The following **field wiring** has been carried out according to this document and the applicable legislation:<br>▪ Between the local supply panel and the outdoor unit<br>▪ Between the outdoor unit and the indoor unit (master)<br>▪ Between the indoor units |
| ☐ | There are NO **missing phases** or **reversed phases**. |
| ☐ | The system is properly **earthed** and the earth terminals are tightened. |
| ☐ | The **fuses** or locally installed protection devices are installed according to this document, and have NOT been bypassed. |
| ☐ | The **power supply voltage** matches the voltage on the identification label of the unit. |
| ☐ | There are NO **loose connections** or damaged electrical components in the switch box. |
| ☐ | The **insulation resistance** of the compressor is OK. |
| ☐ | There are NO **damaged components** or **squeezed pipes** on the inside of the indoor and outdoor units. |
| ☐ | There are NO **refrigerant leaks**. |
| ☐ | The correct pipe size is installed and the **pipes** are properly insulated. |
| ☐ | The **stop valves** (gas and liquid) on the outdoor unit are fully open. |

## 11.4 To perform a test run

This task is only applicable when using the BRC1E52 user interface.

- When using BRC1E51, see the installation manual of the user interface.
- When using BRC1D, see the service manual of the user interface.

**NOTICE**

Do NOT interrupt the test run.

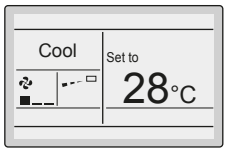
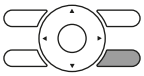
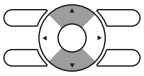
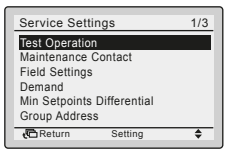
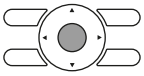
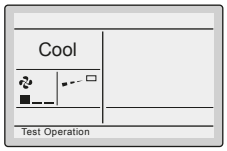
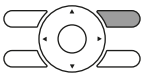
**INFORMATION**

**Backlight.** To perform an ON/OFF action on the user interface, the backlight does not need to be lit. For any other action, it needs to be lit first. The backlight is lit for ±30 seconds when you press a button.

**1** Perform introductory steps.

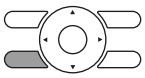
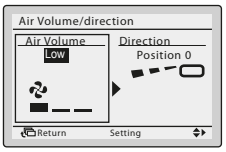
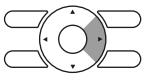
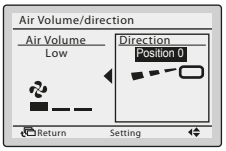
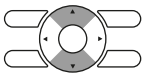
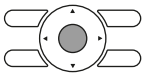
| # | Action |
|---|---|
| 1 | Open the liquid stop valve and gas stop valve by removing the cap and turning counterclockwise with a hex wrench until it stops. |
| 2 | Close the service cover to prevent electric shocks. |
| 3 | Turn ON power for at least 6 hours before starting operation to protect the compressor. |
| 4 | On the user interface, set the unit to cooling operation mode. |

**2** Start the test run.

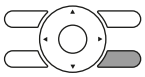
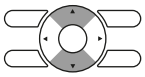
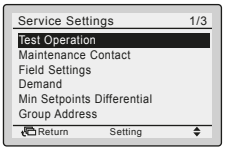
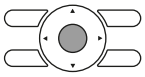
| # | Action | Result |
|---|---|---|
| 1 | Go to the home menu. |  |
| 2 | Press at least 4 seconds.<br>  | The Service Settings menu is displayed. |
| 3 | Select Test Operation.<br>  |  |
| 4 | Press.<br>  | Test Operation is displayed on the home menu.<br>  |
| 5 | Press within 10 seconds.<br>  | Test run starts. |

**3** Check operation for 3 minutes.

**4** Check operation of the airflow direction.

| # | Action | Result |
|---|---|---|
| 1 | Press.<br>  |  |
| 2 | Select Position 0.<br>  |  |
| 3 | Change the position.<br>  | If the airflow flap of the indoor unit moves, operation is OK.<br>If not, operation is not OK. |
| 4 | Press.<br>  | The home menu is displayed. |

**5** Stop the test run.

| # | Action | Result |
|---|---|---|
| 1 | Press at least 4 seconds.<br>  | The Service Settings menu is displayed. |
| 2 | Select Test Operation.<br>  |  |
| 3 | Press.<br>  | The unit returns to normal operation, and the home menu is displayed. |

## 11.5 Error codes when performing a test run

If the installation of the outdoor unit has NOT been done correctly, the following error codes may be displayed on the user interface:

| Error code | Possible cause |
|---|---|
| Nothing displayed<br>(the currently set temperature is not displayed) | ▪ The wiring is disconnected or there is a wiring error (between power supply and outdoor unit, between outdoor unit and indoor units, between indoor unit and user interface).<br>▪ The fuse on the outdoor unit PCB has blown out. |
| E3, E4 or L8 | ▪ The stop valves are closed.<br>▪ The air inlet or air outlet is blocked. |

| Error code | Possible cause |
|---|---|
| E7 | There is a missing phase in case of three-phase power supply units.<br>**Note:** Operation will be impossible. Turn OFF the power, recheck the wiring, and switch two of the three electrical wires. |
| L4 | The air inlet or air outlet is blocked. |
| U0 | The stop valves are closed. |
| U2 | ▪ There is a voltage imbalance.<br>▪ There is a missing phase in case of three-phase power supply units. **Note:** Operation will be impossible. Turn OFF the power, recheck the wiring, and switch two of the three electrical wires. |
| U4 or UF | The inter-unit branch wiring is not correct. |
| UA | The outdoor and indoor unit are incompatible. |

**NOTICE**

- The reversed phase protection detector of this product only functions when the product starts up. Consequently reversed phase detection is not performed during normal operation of the product.
- The reversed phase protection detector is designed to stop the product in the event of an abnormality when the product is started up.
- Replace 2 of the 3 phases (L1, L2, and L3) during reverse-phase protection abnormality.

# 12 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.
- Show the user what to do for the maintenance of the unit.

# 13 Maintenance and service

**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.

**NOTICE**

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

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

## In this chapter



## 13.1 Maintenance safety precautions

**DANGER: RISK OF ELECTROCUTION**

**DANGER: RISK OF BURNING/SCALDING**

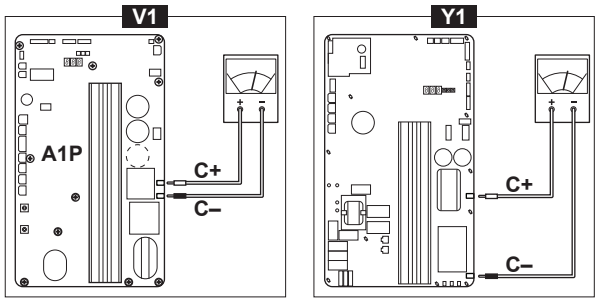
**NOTICE: Risk of electrostatic discharge**

Before performing any maintenance or service work, touch a metal part of the unit in order to eliminate static electricity and to protect the PCB.

### 13.1.1 To prevent electrical hazards

When performing service to inverter equipment:

1. Do NOT open the switch box cover for 10 minutes after turning off the power supply.
2. Measure the voltage between terminals on the terminal block for power supply with a tester and confirm that the power supply is shut off. In addition, measure points as shown in the figure, with a tester and confirm that the voltage of the capacitor in the main circuit is less than 50 V DC. If the voltage measured is still higher than 50 V DC, discharge the capacitors in a safe manner by using a dedicated capacitor discharge pen to avoid possibility of sparking.




3 To prevent damaging the PCB, touch a non-coated metal part to eliminate static electricity before pulling out or plugging in connectors.

4 Pull out the junction connector X106A for the fan motor M1F in the outdoor unit before starting service operation on the inverter equipment. Be careful NOT to touch the live parts. (If a fan rotates due to strong wind, it may store electricity in the capacitor or in the main circuit and cause electrical shock.)

5 After the service is finished, plug the junction connector back in. Otherwise the malfunction code E7 will be displayed and normal operation will NOT be performed.

For details refer to the wiring diagram labelled on the back of the service cover.

**NOTICE**

NEVER directly connect power supply cables to compressors (U, V, W). This can result in a compressor burnout.

## 13.2 Checklist for yearly maintenance of the outdoor unit

Check the following at least once a year:

- Heat exchanger

  The heat exchanger of the outdoor unit can get blocked up due to dust, dirt, leaves, etc. It is recommended to clean the heat exchanger yearly. A blocked heat exchanger can lead to too low pressure or too high pressure leading to worse performance.

# 14 Troubleshooting

## In this chapter



## 14.1 Overview: Troubleshooting

In case of problems:

- See "11.5 Error codes when performing a test run" [▸ 70].
- See the service manual.

This section provides useful information for diagnosing and correcting certain problems which may occur with the unit. This troubleshooting and related corrective actions may ONLY be carried out by the installer or service agent.

### Before troubleshooting

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

## 14.2 Precautions when troubleshooting

**DANGER: RISK OF ELECTROCUTION**

**DANGER: RISK OF BURNING/SCALDING**

**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.

**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.

# 15 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.

## In this chapter



## 15.1 Overview: Disposal

### Typical workflow

Disposing of the system typically consists of the following stages:

1 Pumping down the system.
2 Bringing the system to a specialized treatment facility.

**INFORMATION**

For more details, see the service manual.

## 15.2 About pump down

The unit is equipped with an automatic pump down function, with which you can collect all refrigerant from the system into the outdoor unit.

**NOTICE**

The outdoor unit is equipped with a low pressure switch or a low pressure sensor to protect the compressor by turning it OFF. NEVER short-circuit the low pressure switch during pump down operation.

## 15.3 To pump down

**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.

**CAUTION**

Do not use the unit's automatic pump down function if the total piping length exceeds the chargeless length. A fraction of the refrigerant could be left in the circuit.

1 Turn ON the main power supply switch.

2 Make sure the liquid stop valve and the gas stop valve are open.

3 Press the pump down button (BS2) for at least 8 seconds. BS2 is located on the PCB in the outdoor unit (see wiring diagram).

**Result:** The compressor and outdoor unit fan start automatically, and the indoor unit fan might start automatically.

4 ±2 minutes after the compressor started, close the **liquid stop valve**. If it is not closed properly during compressor operation, the system cannot be pumped down.

5 Once the compressor stops (after 2~5 minutes), close the **gas stop valve** within 3 minutes after the compressor has stopped.

**Result:** The pump down operation is finished. The user interface may display "U4" and the indoor unit may continue operating. This is NOT a malfunction. Even if you press the ON button on the user interface, the unit will NOT start. To restart the unit, turn OFF the main power supply switch and turn it ON again.

6 Turn OFF the main power supply switch.

**NOTICE**

Make sure to reopen both stop valves before restarting the unit.

# 16 Technical data

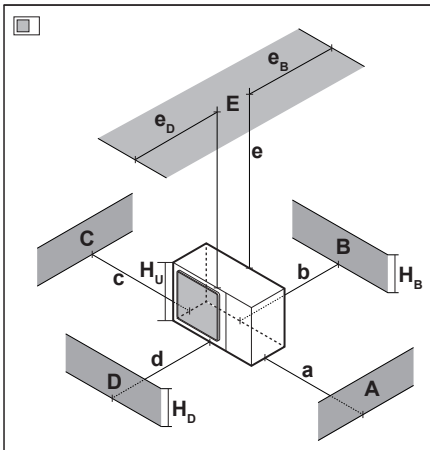
A **subset** of the latest technical data is available on the regional Daikin website (publicly accessible). The **full set** of the latest technical data is available on the Daikin Business Portal (authentication required).

## In this chapter

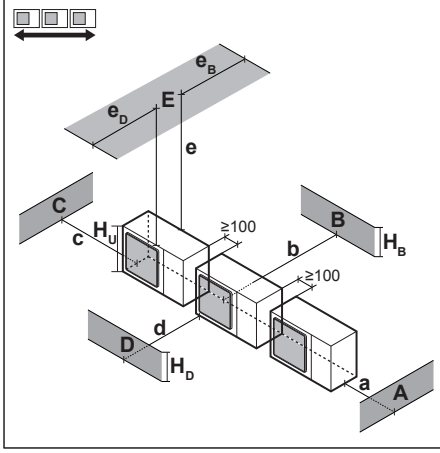
## 16.1 Service space: Outdoor unit

| | |
|---|---|
| **Suction side** | In the illustrations below, the service space at the suction side is based on 35°C DB and cooling operation. Foresee more space in the following cases:<br>▪ When the suction side temperature regularly exceeds this temperature.<br>▪ When the heat load of the outdoor units is expected to regularly exceed the maximum operating capacity. |
| **Discharge side** | Take refrigerant piping work into account when positioning the units. If your layout does not match with any of the layouts below, contact your dealer. |

**Single unit (▣) | Single row of units (▣▣▣ ⟷)**



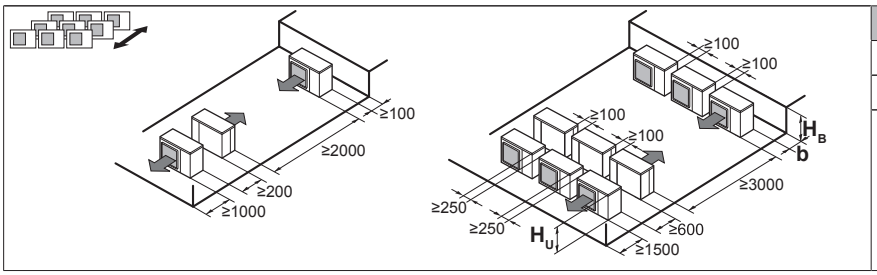

| A~E | $H_B$ $H_D$ $H_U$ | | (mm) a | b | c | d | e | $e_B$ | $e_D$ | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | — | | | ≥100 | | | | | | |
| A, B, C | — | | ≥250 | ≥100 | ≥100 | | | | | |
| B, E | — | | | ≥100 | | | ≥1000 | | ≤500 | |
| A, B, C, E | — | | ≥250 | ≥150 | ≥150 | | ≥1000 | | ≤500 | |
| D | — | | | | | ≥500 | | | | |
| D, E | — | | | | | ≥500 | ≥1000 | ≤500 | | |
| B, D | — | | | ≥100 | | ≥500 | | | | |
| B, D, E | $H_B<H_D$ | $H_B≤½H_U$ | | ≥250 | | ≥750 | ≥1000 | ≤500 | | |
| | | $½H_U<H_B≤H_U$ | | ≥250 | | ≥1000 | ≥1000 | ≤500 | | |
| | | $H_B>H_U$ | ⊘ | | | | | | | 1 |
| | $H_B>H_D$ | $H_D≤½H_U$ | | ≥100 | | ≥1000 | ≥1000 | | ≤500 | |
| | | $½H_U<H_D≤H_U$ | | ≥200 | | ≥1000 | ≥1000 | | ≤500 | |
| | | $H_D>H_U$ | ⊘ | | | | | | | |




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| A, B, C | — | | ≥250 | ≥300 | ≥1000 | | | | | |
| A, B, C, E | — | | ≥250 | ≥300 | ≥1000 | | ≥1000 | | ≤500 | |
| D | — | | | | | ≥1000 | | | | |
| D, E | — | | | | | ≥1000 | ≥1000 | ≤500 | | |
| B, D | $H_D>H_U$ | | | ≥300 | | ≥1000 | | | | |
| | $H_D≤½H_U$ | | | ≥250 | | ≥1500 | | | | |
| | $½H_U<H_D≤H_U$ | | | ≥300 | | ≥1500 | | | | |
| B, D, E | $H_B<H_D$ | $H_B≤½H_U$ | | ≥300 | | ≥1000 | ≥1000 | ≤500 | | |
| | | $½H_U<H_B≤H_U$ | | ≥300 | | ≥1250 | ≥1000 | ≤500 | | |
| | | $H_B>H_U$ | ⊘ | | | | | | | 1+2 |
| | $H_B>H_D$ | $H_D≤½H_U$ | | ≥250 | | ≥1000 | ≥1000 | | ≤500 | |
| | | $½H_U<H_D≤H_U$ | | ≥300 | | ≥1000 | ≥1000 | | ≤500 | |
| | | $H_D>H_U$ | ⊘ | | | | | | | |

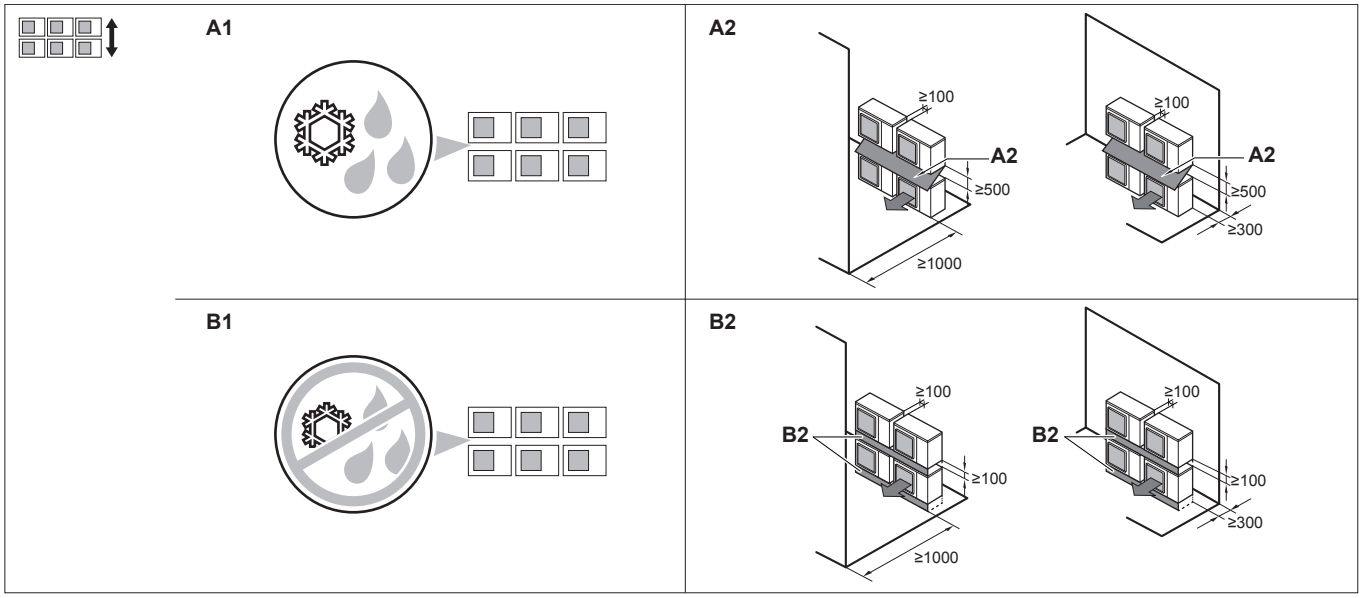
**A,B,C,D** Obstacles (walls/baffle plates)
**E** Obstacle (roof)
**a,b,c,d,e** Minimum service space between the unit and obstacles A, B, C, D and E
**$e_B$** Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle B
**$e_D$** Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle D
**$H_U$** Height of the unit
**$H_B$,$H_D$** Height of obstacles B and D
**1** Seal the bottom of the installation frame to prevent discharged air from flowing back to the suction side through the bottom of the unit.
**2** Maximum two units can be installed.
⊘ Not allowed

## Multiple rows of units ( )




| $H_B$ $H_U$ | b (mm) |
|---|---|
| $H_B \leq ½H_U$ | b≥250 |
| $½H_U < H_B \leq H_U$ | b≥300 |
| $H_B > H_U$ | ⊘ |

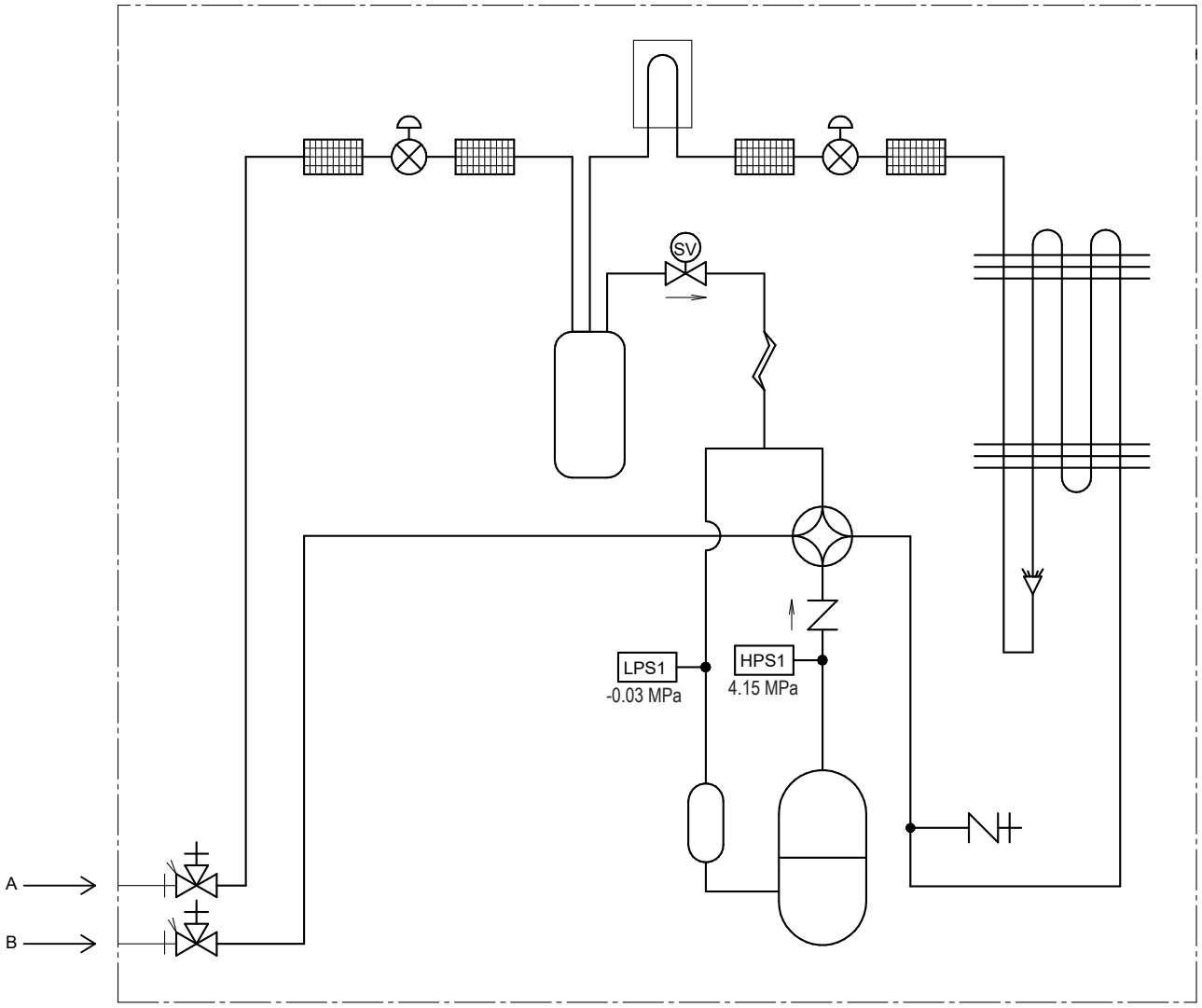
## Stacked units (max. 2 levels) ( )




**A1=>A2** (A1) If there is danger of drainage dripping and freezing between the upper and lower units…
(A2) Then install a **roof** between the upper and lower units. Install the upper unit high enough above the lower unit to prevent ice buildup at the upper unit's bottom plate.

**B1=>B2** (B1) If there is no danger of drainage dripping and freezing between the upper and lower units…
(B2) Then it is not required to install a roof, but **seal the gap** between the upper and lower units to prevent discharged air from flowing back to the suction side through the bottom of the unit.

## 16.2 Piping diagram: Outdoor unit




3D146949A

| | |
|---|---|
| | Charge port / Service port (with 5/16" flare) |
| | Stop valve |
| | Filter |
| | Check valve |
| SV | Solenoid valve |
| | Heat sink (PCB) |
| | Capillary tube |
| | Electronic expansion valve |
| | 4-way valve |
| HPS | High pressure switch |
| LPS | Low pressure switch |

| | |
|---|---|
|  | Compressor accumulator |
|  | Heat exchanger |
|  | Compressor |
|  | Distributor |
|  | Liquid receiver |
|  | Flare connection |
| **A** | Field piping (liquid: Ø9.5 flare connection) |
| **B** | Field piping (gas: Ø15.9 flare connection) |
|  | Heating |
|  | Cooling |

## 16.3 Wiring diagram: Outdoor unit

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

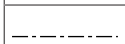
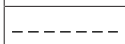
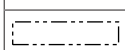
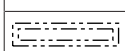
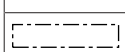
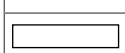
### (1) Connection diagram

| English | Translation |
|---|---|
| Connection diagram | Connection diagram |
| Only for *** | Only for *** |
| See note *** | See note *** |
| Outdoor | Outdoor |
| Indoor | Indoor |
| Upper | Upper |
| Lower | Lower |
| Fan | Fan |
| ON | ON |
| OFF | OFF |

### (2) Layout

| English | Translation |
|---|---|
| Layout | Layout |
| Front | Front |
| Back | Back |
| Position of compressor terminal | Position of compressor terminal |

### (3) Notes

| English | Translation |
|---|---|
| Notes | Notes |
|  | Connection |
| X1M | Indoor/outdoor communication |
|  | Earth wiring |
|  | Field supply |
|  | Several wiring possibilities |
|  | Protective earth |
|  | Field wire |
|  | Wiring depending on model |
|  | Option |
|  | Switch box |
|  | PCB |

NOTES:

1 Refer to the wiring diagram sticker (on the back of the front plate) for how to use the BS1~BS3 and DS1 switches.

2 When operating, do not short-circuit protective devices S1PH S1PLand Q1E.

3 Refer to the combination table and the option manual for how to connect the wiring to X6A, X28A and X77A.

4 Colours: BLK: black, RED: red, BLU: blue, WHT: white, GRN: green, YLW: yellow.

### (4) Legend

| English | Translation |
|---|---|
| Legend | Legend |
| Field supply | Field supply |
| Optional | Optional |
| Part n° | Part n° |
| Description | Description |

| | |
|---|---|
| A1P | Printed circuit board (main) |
| A2P | Printed circuit board (noise filter) |
| BS1~BS3 (A1P) | Push button switch on PCB |
| C* (A1P) (Y only) | Capacitor |
| DS1 (A1P) | Dipswitch |
| E* (A1P) | Terminal (noiseless earth) |
| F*U | Fuse |
| H*P (A1P) | Light-emitting diode (service monitor is green) |
| K1M, K3M (A1P) (Y only) | Magnetic contactor |
| K1R (A1P) | Magnetic relay (Y1S) |
| K2R (A1P) | Magnetic relay (Y2S) |
| K10R, K13R~K15R (A1P) | Magnetic relay |
| K11M (A1P) (V only) | Magnetic contactor |
| L* (A1P) | Terminal (live) |
| L1R (Y only) | Reactor |
| M1C | Compressor motor |
| M1F | Fan motor |
| N* (A1P) | Terminal (neutral) |
| PFC (A1P) (V only) | Power factor correction |
| PS (A1P) | Switching power supply |
| Q1 | Overload protection |
| Q1DI | Earth leakage circuit breaker (30 mA) |
| R1~R8 (A1P) (Y only) | Resistor |
| R1T | Thermistor (air) |

| | |
|---|---|
| R2T | Thermistor (discharge) |
| R3T | Thermistor (suction) |
| R4T | Thermistor (heat exchanger) |
| R5T | Thermistor (heat exchanger middle) |
| R6T | Thermistor (liquid) |
| R7T | Thermistor (fin) |
| R8T~R10T (A1P ) | Thermistor (PTC) |
| R11T (A1P ) (Y only) | Thermistor (PTC) |
| R501~R962 (A1P ) (V only) | Resistor |
| R2~R981 (A1P ) (Y only) | Resistor |
| R*V (A2P ) (V only) | Varistor |
| S1PH | High pressure switch |
| S1PL | Low pressure switch |
| SEG* (A1P) | 7-segment display |
| TC1 (A1P) | Signal transmission circuit |
| V1D (A1P) (V only) | Diode |
| V1D~V2D (A1P) (Y only) | Diode |
| V*R (A1P) | Diode module/ IGBT power module |
| X*A | Connector |
| X1M | Terminal strip |
| Y1E, Y3E | Electronic expansion valve |
| Y1S | Solenoid valve (4-way valve) |
| Y2S | Solenoid valve (gas receiver) |
| Z*C | Noise filter (ferrite core) |
| Z*F | Noise filter |
| L*, L*A, L*B, NA, NB, E*, U, V, W, X*A (A1P~A2P) | Connector |

## 16.4 Eco Design requirements

Follow the steps below to consult the Energy Label – Lot 21 data of the unit and outdoor/indoor combinations.

1. Open the following webpage: https://energylabel.daikin.eu/
2. To continue, choose:
   - "Continue to Europe" for the international website.
   - "Other country" for a country related site.

   **Result:** You are directed to the "Seasonal efficiency" webpage.
3. Under "Eco Design – Ener LOT 21", click "Generate your data".

   **Result:** You are directed to the "Seasonal efficiency (LOT 21)" webpage.

4 Follow the instructions on the webpage to select the correct unit.

**Result:** When the selection is done, the LOT 21 datasheet can be viewed as a PDF or a HTML webpage.

**INFORMATION**

Other documents (e.g. manuals, ...) can also be consulted from the resulting webpage.

# 17 Glossary

**Dealer**
Sales distributor for the product.

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

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

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

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

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

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

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

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

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

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

EAC



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4P743506-1 2023.08