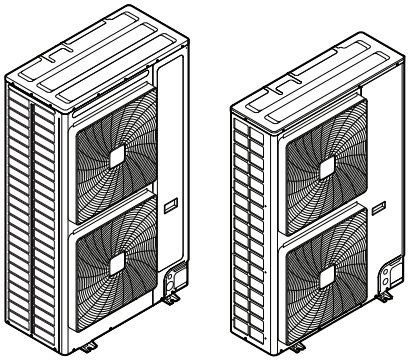
# Installation and operation manual

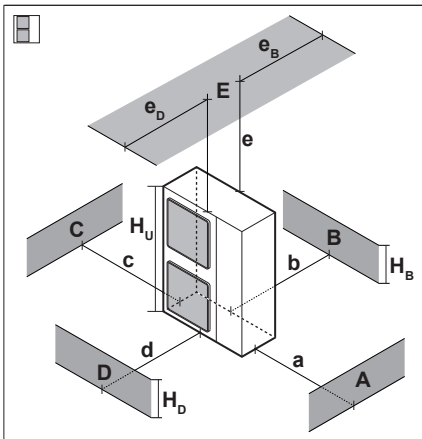

## Inverter outdoor unit for AHU option kit and air curtains



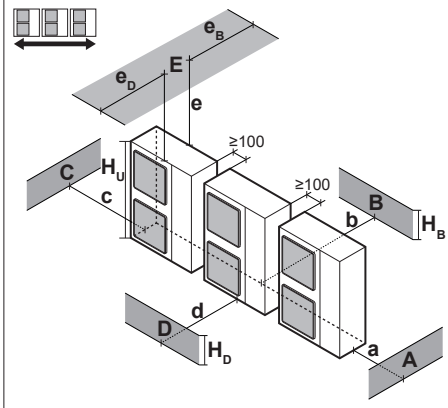
**ERA200AMYFB**
**ERA250AMYFB**
**ERA300AMYFB**

Installation and operation manual
Inverter outdoor unit for AHU option kit and air curtains

**English**

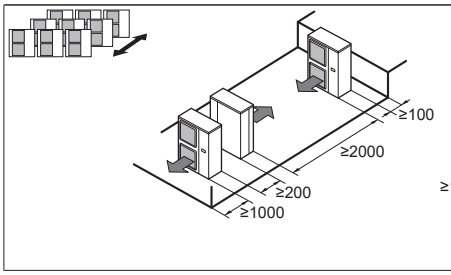



| A~E | $H_B$ $H_D$ $H_U$ | | [mm] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | a | b | c | d | e | $e_B$ | $e_D$ |
| B | — | | | ≥100 | | | | | |
| A, B, C | — | | ≥100 | ≥100 | ≥100 | | | | |
| B, E | — | | | ≥100 | | | ≥1000 | | ≤500 |
| A, B, C, E | — | | ≥150 | ≥150 | ≥150 | | ≥1000 | | ≤500 |
| D | — | | | | | ≥500 | | | |
| D, E | — | | | | | ≥1000 | ≥1000 | ≤500 | |
| B, D | — | | | ≥100 | | ≥1000 | | | |
| B, D, E | $H_B$<$H_D$ | $H_B$≤½$H_U$ | | ≥250 | | ≥1000 | ≥1000 | ≤500 | |
| | | ½$H_U$<$H_B$≤$H_U$ | | ≥250 | | ≥1250 | ≥1000 | ≤500 | |
| | | $H_B$>$H_U$ | ⊘ | | | | | | |
| | $H_B$>$H_D$ | $H_D$≤½$H_U$ | | ≥100 | | ≥1000 | ≥1000 | | ≤500 |
| | | ½$H_U$<$H_D$≤$H_U$ | | ≥200 | | ≥1000 | ≥1000 | | ≤500 |
| | | $H_D$>$H_U$ | | ≥200 | | ≥1700 | ≥1000 | | ≤500 |




| A~E | $H_B$ $H_D$ $H_U$ | | [mm] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | a | b | c | d | e | $e_B$ | $e_D$ |
| A, B, C | — | | ≥200 | ≥300 | ≥1000 | | | | |
| A, B, C, E | — | | ≥200 | ≥300 | ≥1000 | | ≥1000 | | ≤500 |
| D | — | | | | | ≥1000 | | | |
| D, E | — | | | | | ≥1000 | ≥1000 | ≤500 | |
| B, D | $H_D$>$H_U$ | | | ≥300 | | ≥1000 | | | |
| | $H_D$≤½$H_U$ | | | ≥250 | | ≥1500 | | | |
| | ½$H_U$<$H_D$≤$H_U$ | | | ≥300 | | ≥1500 | | | |
| B, D, E | $H_B$<$H_D$ | $H_B$≤½$H_U$ | | ≥300 | | ≥1000 | ≥1000 | ≤500 | |
| | | ½$H_U$<$H_B$≤$H_U$ | | ≥300 | | ≥1250 | ≥1000 | ≤500 | |
| | | $H_B$>$H_U$ | ⊘ | | | | | | |
| | $H_B$>$H_D$ | $H_D$≤½$H_U$ | | ≥250 | | ≥1500 | ≥1000 | | ≤500 |
| | | ½$H_U$<$H_D$≤$H_U$ | | ≥300 | | ≥1500 | ≥1000 | | ≤500 |
| | | $H_D$>$H_U$ | | ≥300 | | ≥2200 | ≥1000 | | ≤500 |

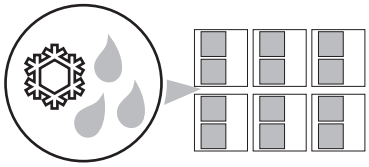
**1**



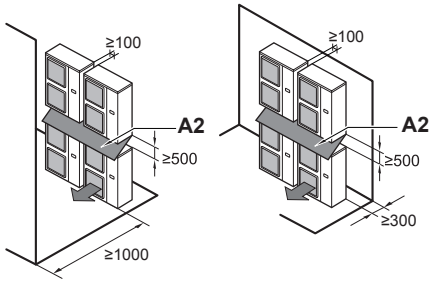

| $H_B$ $H_U$ | b [mm] |
|---|---|
| $H_B$≤½$H_U$ | b≥250 |
| ½$H_U$<$H_B$≤$H_U$ | b≥300 |
| $H_B$>$H_U$ | ⊘ |

**2**

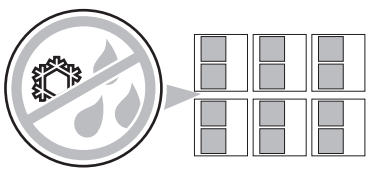
**A1**



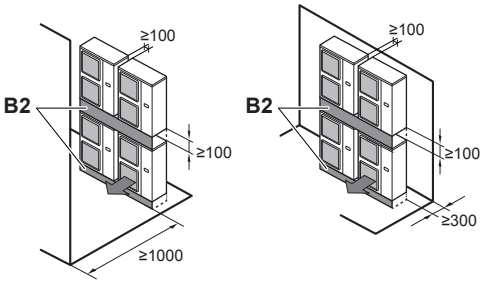
**A2**



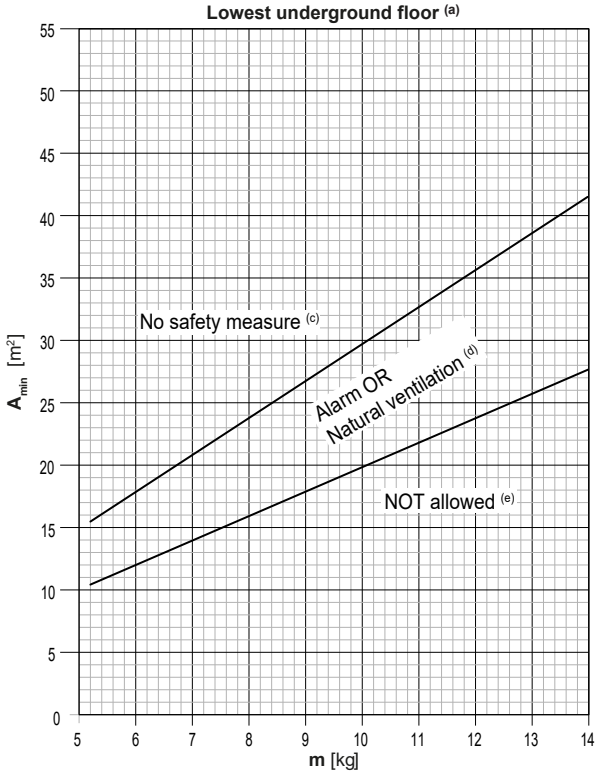

**B1**

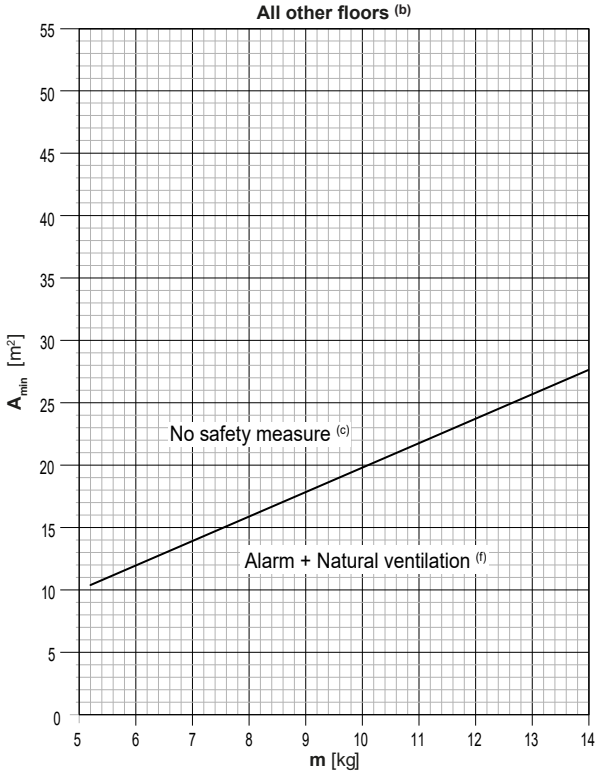


**B2**




**3**




| m [kg] | $A_{min}$ [m²] | | |
|---|---|---|---|
| | Lowest underground floor (a) | | All other floors (b) |
| | No safety measure (c) | Alarm OR Natural ventilation (d) | No safety measure (c) |
| 5.2 | 15.4 | 10.3 | 10.3 |
| 5.4 | 16.0 | 10.7 | 10.7 |
| 5.6 | 16.6 | 11.1 | 11.1 |
| 5.8 | 17.2 | 11.5 | 11.5 |
| 6.0 | 17.8 | 11.8 | 11.8 |
| 6.2 | 18.4 | 12.2 | 12.2 |
| 6.4 | 19.0 | 12.6 | 12.6 |
| 6.6 | 19.5 | 13.0 | 13.0 |
| 6.8 | 20.1 | 13.4 | 13.4 |
| 7.0 | 20.7 | 13.8 | 13.8 |
| 7.2 | 21.3 | 14.2 | 14.2 |
| 7.4 | 21.9 | 14.6 | 14.6 |
| 7.6 | 22.5 | 15.0 | 15.0 |
| 7.8 | 23.1 | 15.4 | 15.4 |
| 8.0 | 23.7 | 15.8 | 15.8 |
| 8.2 | 24.3 | 16.2 | 16.2 |
| 8.4 | 24.9 | 16.6 | 16.6 |
| 8.6 | 25.5 | 17.0 | 17.0 |
| 8.8 | 26.1 | 17.4 | 17.4 |
| 9.0 | 26.7 | 17.8 | 17.8 |
| 9.2 | 27.2 | 18.2 | 18.2 |
| 9.4 | 27.8 | 18.6 | 18.6 |
| 9.6 | 28.4 | 19.0 | 19.0 |

| m [kg] | $A_{min}$ [m²] | | |
|---|---|---|---|
| | Lowest underground floor (a) | | All other floors (b) |
| | No safety measure (c) | Alarm OR Natural ventilation (d) | No safety measure (c) |
| 9.8 | 29.0 | 19.3 | 19.3 |
| 10.0 | 29.6 | 19.7 | 19.7 |
| 10.2 | 30.2 | 20.1 | 20.1 |
| 10.4 | 30.8 | 20.5 | 20.5 |
| 10.6 | 31.4 | 20.9 | 20.9 |
| 10.8 | 32.0 | 21.3 | 21.3 |
| 11.0 | 32.6 | 21.7 | 21.7 |
| 11.2 | 33.2 | 22.1 | 22.1 |
| 11.4 | 33.8 | 22.5 | 22.5 |
| 11.6 | 34.4 | 22.9 | 22.9 |
| 11.8 | 34.9 | 23.3 | 23.3 |
| 12.0 | 35.5 | 23.7 | 23.7 |
| 12.2 | 36.1 | 24.1 | 24.1 |
| 12.4 | 36.7 | 24.5 | 24.5 |
| 12.6 | 37.3 | 24.9 | 24.9 |
| 12.8 | 37.9 | 25.3 | 25.3 |
| 13.0 | 38.5 | 25.7 | 25.7 |
| 13.2 | 39.1 | 26.1 | 26.1 |
| 13.4 | 39.7 | 26.5 | 26.5 |
| 13.6 | 40.3 | 26.8 | 26.8 |
| 13.8 | 40.9 | 27.2 | 27.2 |
| 14.0 | 41.5 | 27.6 | 27.6 |

# Table of contents

# 1 About this document

**Target audience**

Authorised installers + end users

**INFORMATION**

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

**Documentation set**

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

- **General safety precautions:**
  - Safety instructions that you must read before installing
  - Format: paper (in the box of the outdoor unit)
- **Outdoor unit installation and operation manual:**
  - Installation and operation instructions
  - Format: paper (in the box of the outdoor unit)
- **Installer and user reference guide:**
  - Preparation of the installation, reference data,…
  - Detailed step-by-step instructions and background information for basic and advanced usage
  - Format: Digital files on https://www.daikin.eu. Use the search function to find your model.

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

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

# 2 Specific installer safety instructions

Always observe the following safety instructions and regulations.

**Installation site (see "14.1 Preparing the installation site" [▶ 24])**

**WARNING**

Follow the service space dimensions in this manual to install the unit correctly. See "24.1 Service space: Outdoor unit" [▶ 45].

**WARNING**

Tear apart and throw away plastic packaging bags so that nobody, especially children, can play with them. **Possible consequence:** suffocation.

**CAUTION**

Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency.

**WARNING**

If the appliance contains R32 refrigerant, the floor area of the room in which the appliance is stored shall be at least 429 m².

**Opening and closing the unit (see "14.2 Opening and closing the unit" [▶ 24])**

**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 "14.3 Mounting the outdoor unit" [▶ 25])**

**WARNING**

Fixing method of the outdoor unit MUST be in accordance with the instructions from this manual. See "14.3 Mounting the outdoor unit" [▶ 25].

**Connecting the refrigerant piping (see "15.2 Connecting the refrigerant piping" [▶ 26])**

**WARNING**

Field piping MUST be in accordance with the instructions from this manual. See "15 Piping installation" [▶ 26].

**CAUTION**

Piping MUST be installed according to instructions given in "15 Piping installation" [▶ 26]. Only mechanical joints (e.g. braze+flare connections) that are compliant with the latest version of ISO14903 can be used.

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

**CAUTION**

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

**CAUTION**

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

**WARNING**

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**

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

**CAUTION**

Do NOT vent gases into the atmosphere.

**WARNING**

Any gas or oil remaining inside the stop valve may blow off the pinched piping.

Failure to observe the instructions in procedure below properly may result in property damage or personal injury, which may be serious depending on the circumstances.

**WARNING**

NEVER remove the pinched piping by brazing.

Any gas or oil remaining inside the stop valve may blow off the pinched piping.

**Charging refrigerant (see "16 Charging refrigerant" [▶ 30])**

**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**

Charging of refrigerant MUST be in accordance with the instructions from this manual. See "16 Charging refrigerant" [▶ 30].

**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.

**Electrical installation (see "17 Electrical installation" [▶ 33])**

**WARNING**

Electrical wiring MUST be in accordance with the instructions from:

- This manual. See "17 Electrical installation" [▶ 33].
- The wiring diagram, which is delivered with the unit, located at the inside of the service cover. For a translation of its legend, see "24.3 Wiring diagram: Outdoor unit" [▶ 46].

**WARNING**

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

**CAUTION**

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

**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**

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

**WARNING**

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

**WARNING**

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

**WARNING**

ALWAYS use multicore cable for power supply cables.

**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.

**Commissioning (see "19 Commissioning" [▶ 38])**

**WARNING**

Commissioning MUST be in accordance with the instructions from this manual. See "19 Commissioning" [▶ 38].

**CAUTION**

**Do NOT perform the test operation while working on the indoor unit(s).**

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

**CAUTION**

Do NOT insert fingers, rods or other objects into the air inlet or outlet. Do NOT remove the fan guard. When the fan is rotating at high speed, it will cause injury.

**Troubleshooting (see "22 Troubleshooting" [▶ 41])**

**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.

## 2.1 Instructions for equipment using R32 refrigerant

**WARNING: MILDLY FLAMMABLE MATERIAL**

The refrigerant inside this unit is mildly flammable.

**WARNING**

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

**WARNING**

The appliance shall be stored as follows:

- in such a way as to prevent mechanical damage.
- in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater).
- in a room with dimensions as specified in "13 Special requirements for R32 units" [▶ 17].

**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.
- ALWAYS support the piping at distances of 1 m and 2 m from the indoor unit.
- 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.

## For the user

# 3 User safety instructions

Always observe the following safety instructions and regulations.

## 3.1 General

**WARNING**

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

**WARNING**

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.

Children SHALL NOT play with the appliance.

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

**WARNING**

To prevent electrical shocks or fire:

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

**CAUTION**

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

- Units are marked with the following symbol:

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

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

- Batteries are marked with the following symbol:

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

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

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

## 3.2 Instructions for safe operation

**WARNING**

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

**WARNING**

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

**CAUTION**

- NEVER touch the internal parts of the controller.

- Do NOT remove the front panel. Some parts inside are dangerous to touch and appliance problems may happen. For checking and adjusting the internal parts, contact your dealer.

**CAUTION**

Do NOT operate the system when using a room fumigation-type insecticide. Chemicals could collect in the unit, and endanger the health of people who are hypersensitive to chemicals.

**CAUTION**

It is unhealthy to expose your body to the air flow for a long time.

**WARNING**

This unit contains electrical and hot parts.

**WARNING**

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

**Maintenance and service (see "7 Maintenance and service" [▶ 12])**

**WARNING**

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

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

**WARNING**

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

**WARNING**

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

**CAUTION**

Do NOT insert fingers, rods or other objects into the air inlet or outlet. Do NOT remove the fan guard. When the fan is rotating at high speed, it will cause injury.

**CAUTION: Pay attention to the fan!**

It is dangerous to inspect the unit while the fan is running.

Make sure to turn OFF the main switch before executing any maintenance task.

**CAUTION**

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

**About the refrigerant (see "7.2 About the refrigerant" [▶ 12])**

**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.

**After-sales service and warranty (see "7.3 After-sales service" [▶ 13])**

**WARNING**

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

**Troubleshooting (see "8 Troubleshooting" [▶ 13])**

**WARNING**

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

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

**WARNING**

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

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

**CAUTION**

NEVER expose little children, plants or animals directly to the airflow.

**CAUTION**

Do NOT touch the heat exchanger fins. These fins are sharp and could result in cutting injuries.

# 4 About the system

The ERA uses R32 refrigerant which is rated as A2L and is mildly flammable. For compliance with the requirements for enhanced tightness refrigerating systems and IEC60335-2-40 the installer must take extra measures. For more information, see "2.1 Instructions for equipment using R32 refrigerant" [▶ 7].

The ERA unit is intended for outdoor installation and aimed for air to air heat pump applications.

The indoor unit part of this ERA heat pump system can be used for heating/cooling, and fresh air or air curtain applications.

**NOTICE**

Only one indoor unit pair application is allowed for the ERA outdoor unit, this means:

- one AHU connection with one EKEA + EKEXVA kit,
- or one compatible air curtain.

**WARNING**

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

**WARNING**

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

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

**NOTICE**

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

**NOTICE**

For future modifications or expansions of your system:

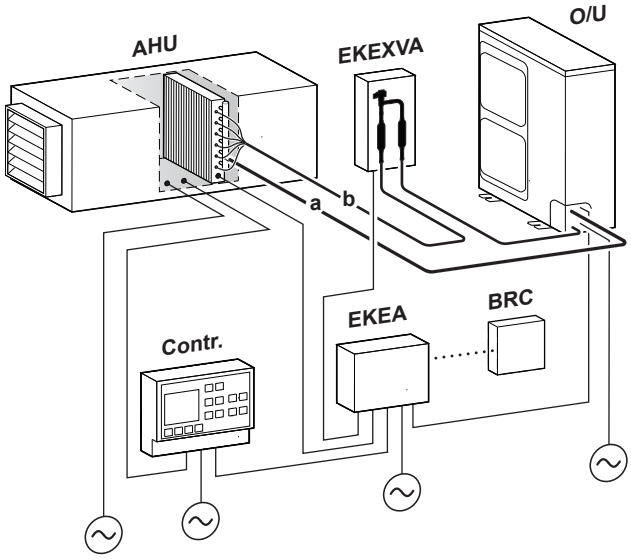
A full overview of allowable combinations (for future system extensions) is available in technical engineering data and should be consulted. Contact your installer to receive more information and professional advice.

## 4.1 System layout

**INFORMATION**

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

**AHU connection**

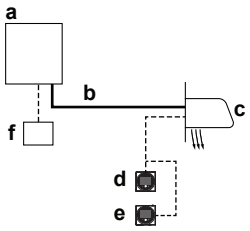



| | |
|---|---|
| **a** | Gas piping (field supply) |
| **b** | Liquid piping (field supply) |
| **AHU** | Air handling unit (field supply) |
| **BRC** | Wired remote controller |
| **Contr.** | Controller (field supply) |
| **EKEA** | Control box |
| **EKEXVA** | Expansion valve kit |
| **O/U** | Outdoor unit |

**INFORMATION**

- This equipment is not designed for year-round cooling applications with low indoor humidity conditions, such as Electronic Data Processing rooms.
- Combination of EKEA + EKEXVA + AHU is not a comfort product.

**Air curtain connection**




| | |
|---|---|
| **a** | Heat pump outdoor unit |
| **b** | Refrigerant piping |
| **c** | Compatible air curtain |
| **d** | Remote controller in normal mode |
| **e** | Remote controller in supervisor mode (mandatory in some situations) |
| **f** | Centralised controller (optional) |

**INFORMATION**

An air curtain is a heating-only product designed primarily for providing air separation. Therefore, it cannot be considered a comfort product.

# 5 User interface

**CAUTION**

- NEVER touch the internal parts of the controller.
- Do NOT remove the front panel. Some parts inside are dangerous to touch and appliance problems may happen. For checking and adjusting the internal parts, contact your dealer.

This operation manual offers a non-exhaustive overview of the main functions of the system.

Detailed information on required actions to achieve certain functions can be found in the dedicated installation and operation manual of the indoor unit.

Refer to the operation manual of the installed user interface.

# 6 Operation

## 6.1 Operation range

Use the system in the following temperature and humidity ranges for safe and effective operation.

| | Cooling | Heating |
|---|---|---|
| Outdoor temperature | –5~52°C DB | –20~21°C DB<br>–20~15.5°C WB |
| Indoor temperature | 21~32°C DB<br>14~25°C WB | 15~27°C DB |
| Indoor humidity | ≤80%[(a)] | |

[(a)] To avoid condensation and water dripping out of the unit. If the temperature or the humidity is beyond these conditions, safety devices may be put in action and the air conditioner may not operate.

Above operation range is only valid in case direct expansion indoor units are connected to the ERA system.

Special operation ranges are valid in case of using AHU. They can be found in the installation/operation manual of the dedicated unit. Latest information can be found in the technical engineering data.

## 6.2 Operating the system

### 6.2.1 About operating the system

- Operation procedure varies according to the combination of outdoor unit and user interface.
- To protect the unit, turn on the main power switch 6 hours before operation.
- If the main power supply is turned off during operation, operation will restart automatically after the power turns back on again.

### 6.2.2 About cooling, heating, fan only, and automatic operation

- Changeover cannot be made with a user interface whose display shows "changeover under centralised control" (refer to installation and operation manual of the user interface).
- The fan may keep on running for about 1 minute after the heating operation stops.
- The air flow rate may adjust itself depending on the room temperature or the fan may stop immediately. This is not a malfunction.

### 6.2.3 About the heating operation

It may take longer to reach the set temperature for general heating operation than for cooling operation.

The following operation is performed in order to prevent the heating capacity from dropping or cold air from blowing.

**Defrost operation**

In heating operation, freezing of the outdoor unit's air cooled coil increases over time, restricting the energy transfer to the outdoor unit's coil. Heating capability decreases and the system needs to go into defrost operation to be able to remove frost from the outdoor unit's coil. During defrost operation the heating capacity on the indoor unit side will temporarily drop until defrosting is completed. After defrosting, the unit will regain its full heating capacity.

The indoor unit will stop fan operation, the refrigerant cycle will reverse and energy from inside the building will be used to defrost the outdoor unit coil.

The indoor unit will indicate defrost operation on the display .

**Hot start**

In order to prevent cold air from blowing out of an indoor unit at the start of heating operation, the indoor fan is automatically stopped. The display of the user interface shows . It may take some time before the fan starts. This is not a malfunction.

### 6.2.4 To operate the system (WITHOUT cool/heat changeover remote control switch)

1 Press the operation mode selector button on the user interface several times and select the operation mode of your choice.

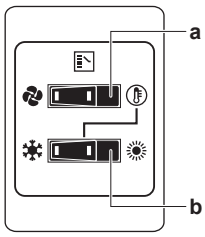
- Cooling operation
- Heating operation
- Fan only operation

2 Press the ON/OFF button on the user interface.

**Result:** The operation lamp lights up and the system starts operating.

### 6.2.5 To operate the system (WITH cool/heat changeover remote control switch)

**Overview of the changeover remote control switch**




**a** FAN ONLY/AIR CONDITIONING SELECTOR SWITCH

Set the switch to for fan only operation or to for heating or cooling operation.

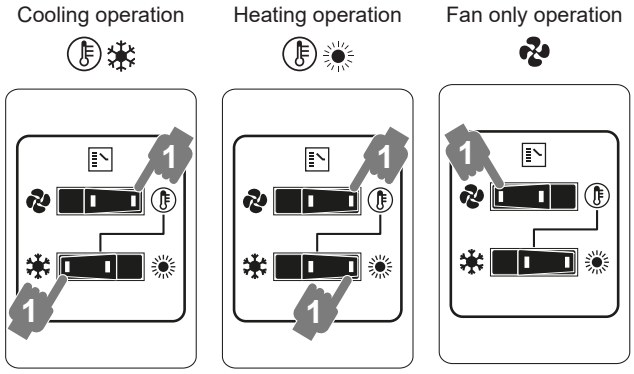
**b** COOL/HEAT CHANGEOVER SWITCH

Set the switch to for cooling or to for heating

**Note:** In case a cool/heat changeover remote control switch is used, the position of DIP switch 1 (DS1-1) on the main PCB needs to be switched to the ON position.

**To start**

1 Select operation mode with the cool/heat changeover switch as follows:




2 Press the ON/OFF button on the user interface.

**Result:** The operation lamp lights up and the system starts operating.

**To stop**

3 Press the ON/OFF button on the user interface once again.

**Result:** The operation lamp goes out and the system stops operating.

**NOTICE**

Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

**To adjust**

For programming temperature, fan speed and air flow direction refer to the operation manual of the user interface.

# 7 Maintenance and service

## 7.1 Precautions for maintenance and service

**CAUTION**

See "3 User safety instructions" [▶ 8] to acknowledge all related safety instructions.

**NOTICE**

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

**NOTICE**

Do NOT wipe the controller operation panel with benzine, thinner, chemical dust cloth, etc. The panel may get discoloured or the coating peeled off. If it is heavily dirty, soak a cloth in water-diluted neutral detergent, squeeze it well and wipe the panel clean. Wipe it with another dry cloth.

## 7.2 About the refrigerant

**CAUTION**

See "3 User safety instructions" [▶ 8] to acknowledge all related safety instructions.

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

Refrigerant type: R32

Global warming potential (GWP) value: 675

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

**NOTICE**

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

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

Contact your installer for more information.

## 7.3 After-sales service

### 7.3.1 Recommended maintenance and inspection

Since dust collects when using the unit for several years, performance of the unit will deteriorate to some extent. As taking apart and cleaning interiors of units requires technical expertise and in order to ensure the best possible maintenance of your units, we recommend to enter into a maintenance and inspection contract on top of normal maintenance activities. Our network of dealers has access to a permanent stock of essential components in order to keep your unit in operation as long as possible. Contact your dealer for more information.

**When asking your dealer for an intervention, always state:**

- The complete model name of the unit.
- The manufacturing number (stated on the nameplate of the unit).
- The installation date.
- The symptoms or malfunction, and details of the defect.

**WARNING**

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

# 8 Troubleshooting

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

**WARNING**

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

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

The system MUST be repaired by a qualified service person.

| Malfunction | Measure |
|---|---|
| If a safety device such as a fuse, a breaker or an earth leakage breaker frequently actuates or the ON/OFF switch does NOT properly work. | Turn OFF the main power switch. |
| The operation switch does NOT work well. | Turn OFF the power supply. |
| If the user interface display indicates the unit number, the operation lamp flashes and the malfunction code appears. | Notify your installer and report the malfunction code. |

If the system does NOT operate properly except for the above mentioned cases and none of the above mentioned malfunctions is evident, investigate the system in accordance with the following procedures.

| Malfunction | Measure |
|---|---|
| If a refrigerant leak occurs (error code A01/CH) | ▪ Actions will be taken by the system. Do NOT turn OFF the power supply.<br>▪ Notify your installer and report the malfunction code. |
| If the system does not operate at all. | ▪ Check if there is no power failure. Wait until power is restored. If power failure occurs during operation, the system automatically restarts immediately after power is restored.<br>▪ Check if no fuse has blown or breaker is activated. Change the fuse or reset the breaker if necessary. |
| If the system goes into fan only operation, but as soon as it goes into heating or cooling operation, the system stops. | ▪ Check if air inlet or outlet of outdoor or indoor unit is not blocked by obstacles. Remove any obstacles and make sure the air can flow freely.<br>▪ Check if the user interface display shows ⚠ on the home screen. Refer to the installation and operation manual delivered with the indoor unit. |
| The system operates but cooling or heating is insufficient. | ▪ Check if air inlet or outlet of outdoor or indoor unit is not blocked by obstacles. Remove any obstacles and make sure the air can flow freely.<br>▪ Check if the air filter is not clogged (refer to AHU or air curtain manual).<br>▪ Check the temperature setting.<br>▪ Check the fan speed setting on your user interface.<br>▪ Check for open doors or windows. Close doors and windows to prevent wind from coming in.<br>▪ Check if there are too many occupants in the room during cooling operation. Check if the heat source of the room is excessive.<br>▪ Check if direct sunlight enters the room. Use curtains or blinds.<br>▪ Check if the air flow angle is proper. |

After checking all the items above, if it is impossible to fix the problem yourself, contact your installer and state the symptoms, the complete model name of the unit (with manufacturing number if possible) and the installation date.

## 8.1 Error codes: Overview

In case a malfunction code appears on the indoor unit user interface display, contact your installer and inform the malfunction code, the unit type, and serial number (you can find this information on the nameplate of the unit).

For your reference, a list with malfunction codes is provided. You can, depending on the level of the malfunction code, reset the code by pushing the ON/OFF button. If not, ask your installer for advice.

| Main code | Contents |
|---|---|
| A0 | External protection device was activated |
| A0-11 | The R32 sensor of the compatible air curtain has detected a refrigerant leak[a] |
| A0/CH | Safety system error (leak detection)[a] |
| A1 | EEPROM failure (indoor) |
| A6 | Fan motor malfunction (indoor) |
| A9 | Expansion valve malfunction (indoor) |
| AJ | Capacity setting malfunction (indoor) |
| C1 | Transmission malfunction between main PCB and sub PCB (indoor) |
| C4 | Heat exchanger thermistor malfunction (indoor; liquid) |
| C5 | Heat exchanger thermistor malfunction (indoor; gas) |
| C9 | Suction air thermistor malfunction (indoor) |
| CA | Discharge air thermistor malfunction (indoor) |
| CH-01 | R32 sensor malfunction or disconnection (indoor)[a] |
| CH-02 | R32 sensor lifetime exceeded (indoor)[a] |
| CH-05 | R32 sensor end of lifetime<6 months (indoor)[a] |
| CH-10 | Waiting for indoor unit R32 sensor replacement input[a] |
| CJ | User interface thermistor malfunction (indoor) |
| E1 | PCB malfunction (outdoor) |
| E2 | Current leakage detector was activated (outdoor) |
| E3 | High pressure switch was activated (outdoor) |
| E4 | Low pressure malfunction (outdoor) |
| E5 | Compressor lock detection (outdoor) |
| E7 | Fan motor malfunction (outdoor) |
| E9 | Electronic expansion valve malfunction (outdoor) |
| F3 | Discharge temperature malfunction (outdoor) |
| F4 | Abnormal suction temperature (outdoor) |
| H3 | High pressure switch malfunction |
| H7 | Fan motor malfunction (outdoor) |
| H9 | Ambient temperature sensor malfunction (outdoor) |
| J3 | Discharge temperature sensor malfunction (outdoor) |
| J5 | Suction temperature sensor malfunction (outdoor) |
| J6 | De-icing temperature sensor malfunction (outdoor) or heat exchanger gas temperature sensor malfunction (outdoor) |
| J7 | Liquid temperature sensor (after subcool HE) malfunction (outdoor) |
| J8 | Liquid temperature sensor (coil) malfunction (outdoor) |
| J9 | Gas temperature sensor (after subcool HE) malfunction (outdoor) |
| JA | High pressure sensor malfunction (S1NPH) |
| JC | Low pressure sensor malfunction (S1NPL) |
| L1 | INV PCB abnormal |
| L4 | Fin temperature abnormal |
| L5 | INV PCB abnormal |
| L8 | Compressor over current detected |
| L9 | Compressor lock (startup) |
| LC | Transmission outdoor unit - inverter: INV transmission trouble |
| P1 | INV unbalanced power supply voltage |
| P4 | Fin thermistor malfunction |
| PJ | Capacity setting malfunction (outdoor) |
| U0 | Abnormal low pressure drop, faulty expansion valve |
| U1 | Reversed power supply phase malfunction |
| U2 | INV voltage power shortage |
| U3 | System test run not yet executed |
| U4 | Faulty wiring indoor/outdoor |
| U5 | Abnormal user interface - indoor communication |
| UA-03 | Connection malfunction over indoor units or type mismatch |
| UA-55 | System lock |
| UA-57 | External ventilation input error |
| UC | Centralised address duplication |
| UE | Malfunction in communication centralised control device - indoor unit |
| UH | Auto address malfunction (inconsistency) |
| UJ-37 | AHU supply airflow rate below the legal limit[b] |

[a] The error code is only shown on the user interface of the compatible air curtain where the error occurs.

[b] In case the AHU supply airflow rate is above the legal limit for 5 minutes continuously, this error is automatically solved.

## 8.2 Symptoms that are NOT system malfunctions

The following symptoms are NOT system malfunctions:

### 8.2.1 Symptom: The system does not operate

- The air conditioner does not start immediately after the ON/OFF button on the user interface is pressed. If the operation lamp lights, the system is in normal condition. To prevent overloading of the compressor motor, the air conditioner starts 5 minutes after it is turned ON again in case it was turned OFF just before. The same starting delay occurs after the operation mode selector button was used.
- If "Under Centralised Control" is displayed on the user interface, pressing the operation button causes the display to blink for a few seconds. The blinking display indicates that the user interface cannot be used.
- The system does not start immediately after the power supply is turned on. Wait one minute until the microcomputer is prepared for operation.

### 8.2.2 Symptom: Cool/Heat cannot be changed over

- When the display shows  (changeover under centralised control), it shows that this is a slave user interface.
- When the cool/heat changeover remote control switch is installed, or T3T4 input is used and the display shows  (changeover under centralised control), this is because cool/heat changeover is controlled by the cool/ heat changeover remote control switch. Ask your dealer where the remote control switch is installed.

### 8.2.3 Symptom: Fan operation is possible, but cooling and heating do not work

Immediately after the power is turned on. The micro computer is getting ready to operate and is performing a communication check with the indoor unit. Please wait 12 minutes maximally until this process is finished.

### 8.2.4 Symptom: White mist comes out of a unit (Indoor unit, outdoor unit)

When the system is changed over to heating operation after defrost operation. Moisture generated by defrost becomes steam and is exhausted.

### 8.2.5 Symptom: The user interface reads "U4" or "U5" and stops, but then restarts after a few minutes

This is because the user interface is intercepting noise from electric appliances other than the air conditioner. The noise prevents communication between the units, causing them to stop. Operation automatically restarts when the noise ceases. A power reset may help to remove this error.

### 8.2.6 Symptom: Noise of air conditioners (Indoor unit)

- A "zeen" sound is heard immediately after the power supply is turned on. The electronic expansion valve inside an indoor unit starts working and makes the noise. Its volume will reduce in about one minute.
- A "pishi-pishi" squeaking sound is heard when the system stops after heating operation. Expansion and contraction of plastic parts caused by temperature change make this noise.

### 8.2.7 Symptom: Noise of air conditioners (Indoor unit, outdoor unit)

- A continuous low hissing sound is heard when the system is in cooling or defrost operation. This is the sound of refrigerant gas flowing through both indoor and outdoor units.
- A hissing sound which is heard at the start or immediately after stopping operation or defrost operation. This is the noise of refrigerant caused by flow stop or flow change.

### 8.2.8 Symptom: Noise of air conditioners (Outdoor unit)

When the tone of operating noise changes. This noise is caused by the change of frequency.

### 8.2.9 Symptom: Dust comes out of the unit

When the unit is used for the first time in a long time. This is because dust has gotten into the unit.

### 8.2.10 Symptom: The units can give off odours

The unit can absorb the smell of rooms, furniture, cigarettes, etc., and then emit it again.

### 8.2.11 Symptom: The outdoor unit fan does not spin

During operation, the speed of the fan is controlled in order to optimise product operation.

### 8.2.12 Symptom: The compressor in the outdoor unit does not stop after a short heating operation

This is to prevent refrigerant from remaining in the compressor. The unit will stop after 5 to 10 minutes.

### 8.2.13 Symptom: The inside of an outdoor unit is warm even when the unit has stopped

This is because the crankcase heater is warming the compressor so that the compressor can start smoothly.

## 9 Relocation

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

## 10 Disposal

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

**NOTICE**

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

# For the installer

## 11 About the box

Keep the following in mind:

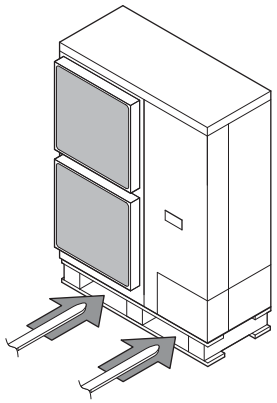
- At delivery, the unit MUST be checked for damage and completeness. Any damage or missing parts MUST be reported immediately to the claims agent of the carrier.
- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.
- Prepare in advance the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

### 11.1 To handle the outdoor unit

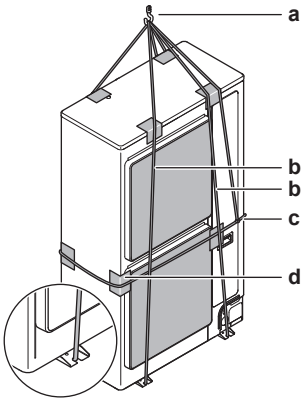
**CAUTION**

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

**Forklift.** If the unit remains on its pallet, you can also use a forklift.



**Crane.** For ERA250+300 models, you can also use a crane and lift the unit as follows:

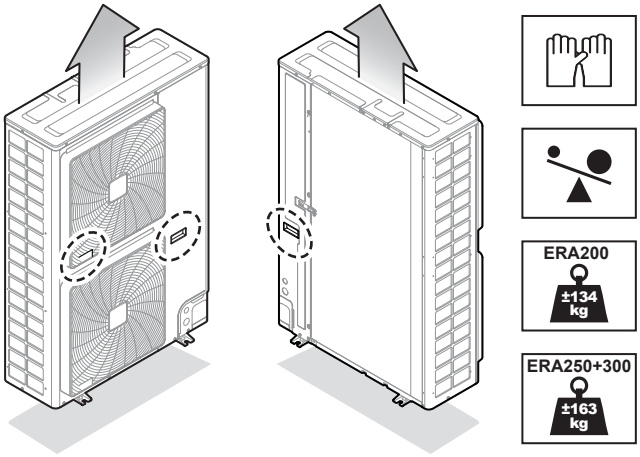



- **a** Lifting hook
- **b** Two vertical ropes (at least 8 m and Ø20 mm) to lift the unit
- **c** One horizontal rope (also fixed to the lifting hook) to prevent the unit from dropping
- **d** Protective material (rags, soft material) between the ropes and the casing to protect the casing

**WARNING**

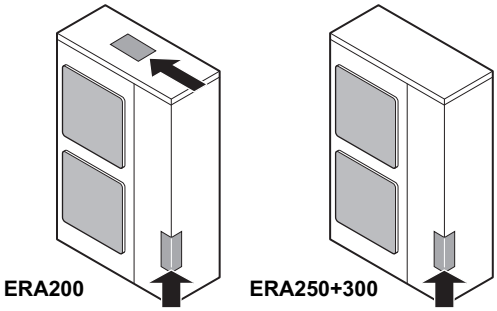
The unit's center of gravity deviates to the right side (compressor side). If you lift the unit using a crane and you do not fix a horizontal rope to the lifting hook as shown, the unit might drop.

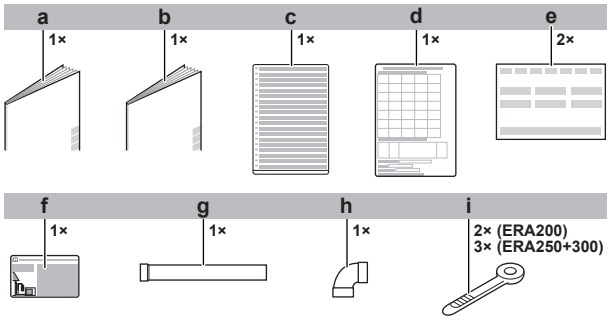
Carry the unit slowly as shown:




## 11.2 To remove the accessories from the outdoor unit

1. Remove the service cover. See "14.2.1 To open the outdoor unit" [▶ 24].
2. Remove the accessories.




- **a** General safety precautions
- **b** Outdoor unit installation and operation manual
- **c** Multilingual fluorinated greenhouse gases label
- **d** Installation information leaflet
- **e** Declaration of conformity
- **f** Fluorinated greenhouse gases label
- **g** Gas piping accessory 1 (only for ERA250: Ø19.1 mm)
- **h** Gas piping accessory 2 (ERA200: Ø19.1 mm; ERA250+300: Ø22.2 mm)
- **i** Cable tie (ERA200: 2×; ERA250+300: 3×)

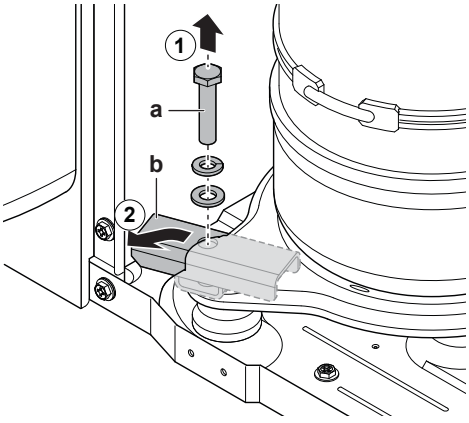
## 11.3 To remove the transportation stay

**NOTICE**

If the unit is operated with the transportation stay attached, abnormal vibration or noise may be generated.

The transportation stay for protecting the unit during transport must be removed. Proceed as shown in the figure and procedure below.

1. Remove the bolt (a) and washers.
2. Remove the transportation stay (b) as shown in the figure below.




- **a** Bolt
- **b** Transportation stay

# 12 About the units and options

## 12.1 About the outdoor unit

This installation manual concerns the ERA , full inverter driven, heat pump system.

These units are intended for outdoor installation and aimed for heating/cooling, and fresh air or air curtain applications.

| Specification | | |
|---|---|---|
| Capacity | Heating | 25~37.5 kW |
| | Cooling | 22.4~33.5 kW |
| Ambient design temperature | Heating | –20~21°C DB<br>–20~15.5°C WB |
| | Cooling | –5~52°C DB |

## 12.2 System layout

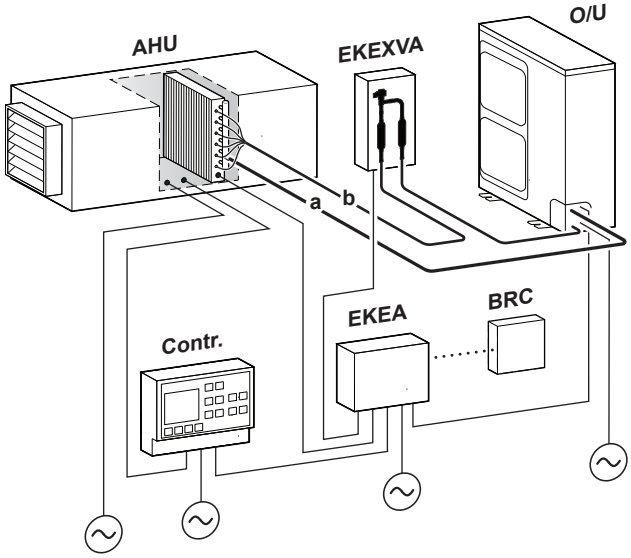
**WARNING**

The installation MUST comply with the requirements that apply to this R32 equipment. For more information, see "13 Special requirements for R32 units" [▶ 17].

**INFORMATION**

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

**AHU connection**

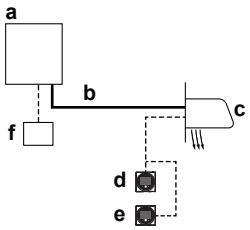



| | |
|---|---|
| **a** | Gas piping (field supply) |
| **b** | Liquid piping (field supply) |
| **AHU** | Air handling unit (field supply) |
| **BRC** | Wired remote controller |
| **Contr.** | Controller (field supply) |
| **EKEA** | Control box |
| **EKEXVA** | Expansion valve kit |
| **O/U** | Outdoor unit |

**INFORMATION**

- This equipment is not designed for year-round cooling applications with low indoor humidity conditions, such as Electronic Data Processing rooms.
- Combination of EKEA + EKEXVA + AHU is not a comfort product.

**Air curtain connection**




| | |
|---|---|
| **a** | Heat pump outdoor unit |
| **b** | Refrigerant piping |
| **c** | Compatible air curtain |
| **d** | Remote controller in normal mode |
| **e** | Remote controller in supervisor mode (mandatory in some situations) |
| **f** | Centralised controller (optional) |

**INFORMATION**

An air curtain is a heating-only product designed primarily for providing air separation. Therefore, it cannot be considered a comfort product.

# 13 Special requirements for R32 units

## 13.1 Requirements for compatible air curtains

**INFORMATION**

In this section, the term "indoor unit" is used for air curtain applications.

### 13.1.1 Installation space requirements

**WARNING**

If the appliance contains R32 refrigerant, the floor area of the room in which the appliance is stored shall be at least 429 m².

**NOTICE**

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

### 13.1.2 System layout requirements

The ERA uses R32 refrigerant which is rated as A2L and is mildly flammable.

To comply with the requirements of enhanced tightness refrigerating systems of the IEC 60335-2-40, this system is equipped with an alarm in the remote controller and natural ventilation can be used as a safety measure. Both safety measures are installation specific and can be determined using the requirements mentioned in this manual. In case the requirements of this manual are followed, no additional safety measures are needed.

A big range of charge and room area combinations is allowed thanks to the countermeasures that are implemented in the system by default.

Follow the installation requirements below to ensure that the complete system is compliant to legislation.

**Outdoor unit installation**

The outdoor unit must be installed outside. For indoor installation of the outdoor unit, additional measures can be necessary to comply with the applicable legislation.

A terminal for external output is available in the outdoor unit. This SVS output can be used when additional countermeasures are needed. The SVS output is a contact on terminal X2M that closes in case a leak is detected, failure or disconnection of an R32 sensor (located in the air curtain).

For more information about the SVS output, see "17.5 To connect the external outputs" [▶ 35].

**Indoor unit installation**

For installation of the compatible air curtain, refer to the installation and operation manual delivered with the air curtain. For compatibility of air curtain refer to the latest version of the technical data book of this outdoor unit.

Depending on the room size in which the air curtain is installed and the total amount of refrigerant in the system, other safety measures are necessary for these indoor units. See "13.1.3 To determine the required safety measures" [▶ 18].

An optional output, if available on a compatible air curtain, can be used for an external device. The output will trigger in case a leak is detected, the R32 sensor fails or when the sensor is disconnected. For more information about this output, refer to the installation manual of the compatible air curtain unit.

**Piping requirements**

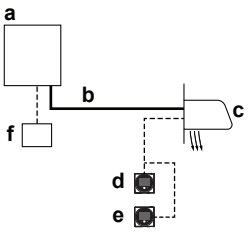
**CAUTION**

Piping MUST be installed according to instructions given in "15 Piping installation" [▶ 26]. Only mechanical joints (e.g. braze+flare connections) that are compliant with the latest version of ISO14903 can be used.

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

For piping installed in the occupied space, make sure that the piping is protected against accidental damage. Piping should be checked according to the procedure as mentioned in "15.3 Checking the refrigerant piping" [▶ 29].

**Remote controller requirements for compatible air curtains equipped with R32 sensor**




- **a** Heat pump outdoor unit
- **b** Refrigerant piping
- **c** Compatible air curtain
- **d** Remote controller in normal mode
- **e** Remote controller in supervisor mode (mandatory in some situations)
- **f** Centralised controller (optional)

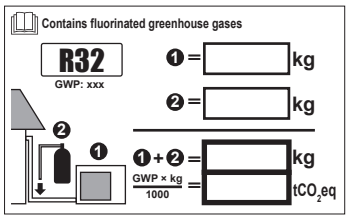
For installation of the remote controller, please refer to the installation and operation manual delivered with the remote controller. Any compatible air curtain equipped with a R32 sensor must be connected with a R32 safety system compatible remote controller (e.g. BRC1H52/82* or later type). In case of air curtains, the remote controllers have implemented safety measures that will warn the user visually and audibly in case of a leak.

For installation of the remote controller of an air curtain, it is mandatory to follow the requirements:

1. Only a safety system compatible remote controller can be used. See technical data sheet for remote controller compatibility (e.g. BRC1H52/82*).
2. The air curtain must be connected to a compatible remote controller.

### 13.1.3 To determine the required safety measures

**Step 1** – Determine the total amount of refrigerant in the system. Use the values on the unit nameplate to determine the total amount of refrigerant in the system.




Total charge=Factory charge ❶[(a)]+additional charge ❷[(b)]

(a) The factory charge value can be found on the nameplate.

(b) The R value (additional refrigerant to be charged) is calculated in "16.2 To determine the additional refrigerant amount" [▶ 31].

**NOTICE**

The total refrigerant charge amount in the system MUST always be lower than 79.8 kg.

**Step 2** – Determine the area of the room (A) where an air curtain is installed/serving.

The room area can be determined by projecting the walls, doors and partitions to the floor and calculating the enclosed area. Spaces connected by only false ceilings, ductwork, or similar connections are not considered a single space.

**Step 3** – Use the graphs or tables (see "Figure 4" [▶ 3] at the beginning of this manual) to determine the required safety measures for the air curtain.

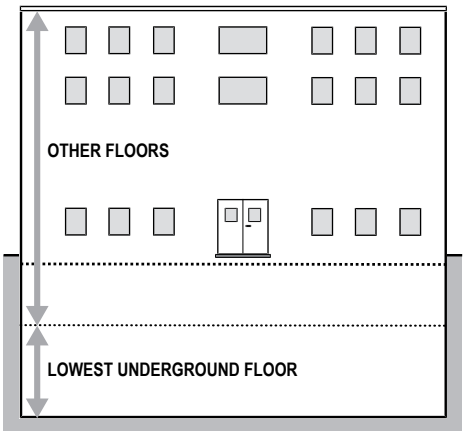
- **m** Total refrigerant charge in the system [kg]
- **$A_{min}$** Minimum room area limit [m²]
- **(a)** Lowest underground floor (=Lowest underground floor)
- **(b)** All other floors (=All other floors)
- **(c)** No safety measure (=No safety measure)
- **(d)** Alarm OR Natural ventilation (=Alarm OR Natural ventilation)
- **(e)** NOT allowed (=NOT allowed)
- **(f)** Alarm + Natural ventilation (=Alarm + Natural ventilation)

Use the total amount of refrigerant in the system and the area of the room in which the air curtain is installed/serving, to check which safety measure is required.

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

**Note:** When natural ventilation is required, it is still allowed to apply alarm) if wanted. Follow the respective instructions as described further below.

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




The graphs and table are based on an installation height of the air curtain between 1.8 m and 2.2 m (bottom of the air curtain). See "14.1.1 Installation site requirements of the outdoor unit" [▶ 24].

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

**NOTICE**

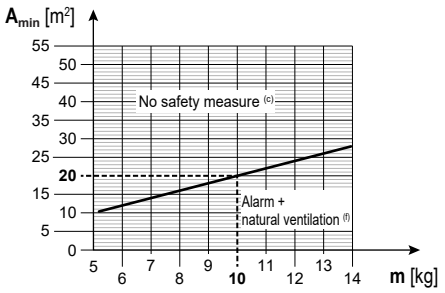
A compatible air curtain cannot be installed lower than 1.8 m from the lowest point of the floor.

**Example**

The total amount of refrigerant in the ERA system is 10 kg. The air curtain is installed in spaces that do NOT belong to the lowest underground floor of the building. The space in which the air curtain is installed has a room area of 50 m².

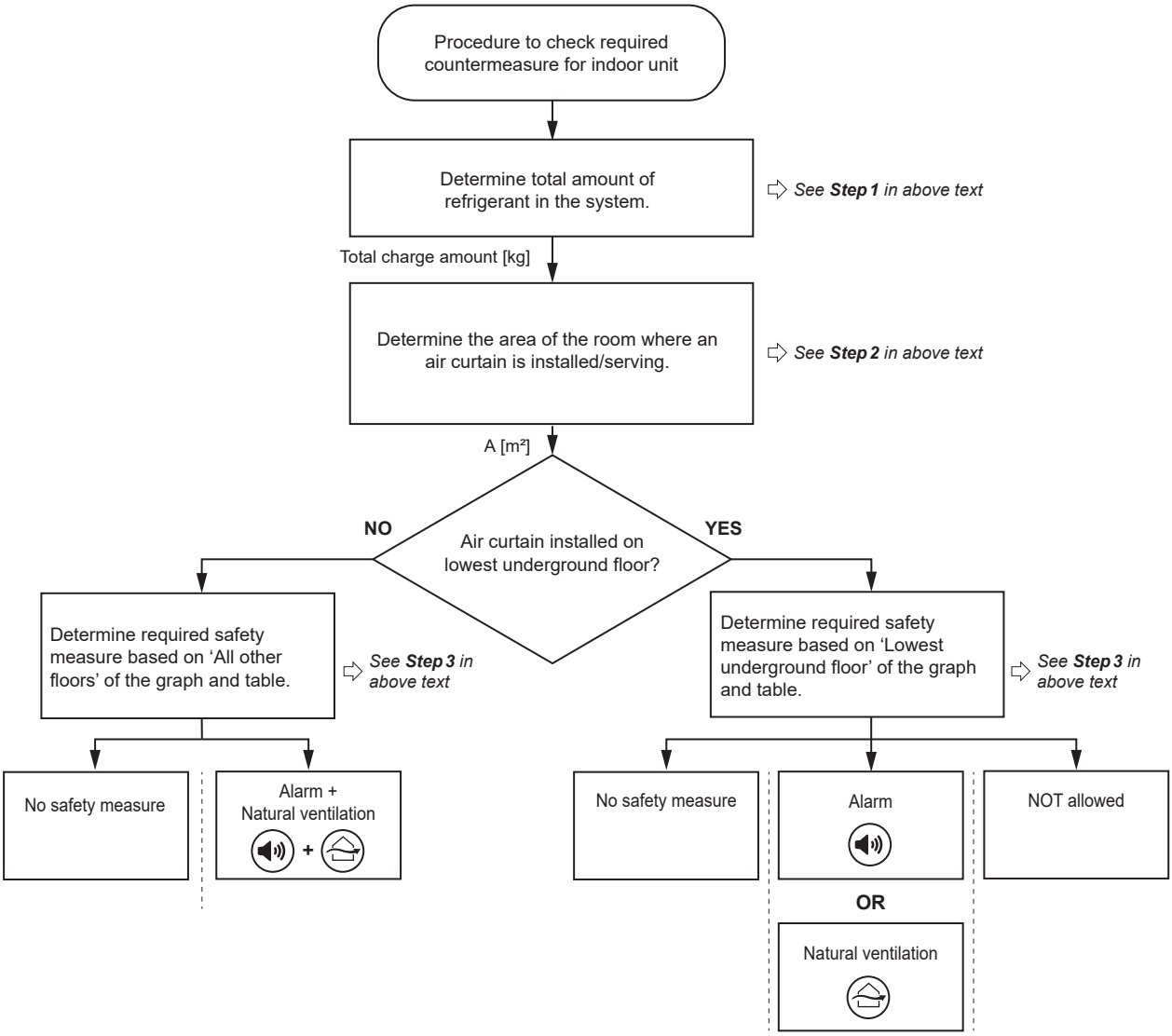
- Based on the graph for "All other floors" (All other floors), the room area limit is **19.7 m²** (approx. **20 m**$^2$) for "No safety measure" (No safety measures).
- This means that the following safety measures are required:

| Room area | Required safety measure |
|---|---|
| A=50 m²≥20 m² | No safety measures |




**m** Total refrigerant charge in the system [kg]
**$A_{min}$** Minimum room area limit [m²]
**(c)** No safety measure (=No safety measure)
**(f)** Alarm + Natural ventilation (=Alarm + Natural ventilation)

## Overview: flowchart




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

### 13.1.4 Safety measures

## No safety measure

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

Therefore the R32 safety system in the indoor unit in a sufficiently large room can be deactivated (active by default) by changing the setting in the user interface as shown below:

**Field settings**

| No safety measure | | | | |
|---|---|---|---|---|
| **Setting** | **1st code** | **Function** | **2nd code** | **Description** |
| 15/25 | 13 | R32 leak safety system setting | 01 | Disabled |

**Note:** For more information, see "18.1.8 Indoor unit field setting" [▸ 38].

## Alarm

**WARNING**

- ✓ Do NOT use 'Alarm' as the ONLY safety measure in case the indoor unit is installed in an occupied space where people are restricted in their movement.
- Combine or use another safety measure.

R32 safety system compatible remote controllers (e.g. BRC1H52/82* or later type) used with the air curtain have a built-in alarm as a safety measure. For installation of the remote controller, please refer to the installation and operation manual delivered with the remote controller.

The compatible air curtain must be connected with a R32 safety system compatible remote controller (e.g. BRC1H52/82* or later type). These remote controllers have implemented safety measures that will warn the user visually and audibly in case of a leak.

For installation of the remote controller, it is mandatory to follow the requirements.

1. Only a safety system compatible remote controller can be used. See technical data sheet for remote controller compatibility (e.g. BRC1H52/82*).
2. The remote controller put in the room served by the air curtain must be in 'fully functional' or 'alarm only' mode. For details about the different remote controller modes and how to set up, please refer to the installation and operation manual delivered with the remote controller.
3. For buildings where sleeping facilities are offered (e.g. hotel), where persons are restricted in their movements (e.g. hospitals), an uncontrolled number of persons is present or buildings where people are not aware of the safety precautions it is mandatory to install one of the following devices at a location with 24-hour monitoring:
   - a supervisor remote controller
   - or a centralised controller. E.g., iTM with external alarm via WAGO module, iTM with built-in alarm, …

**Note:** The remote controllers with built-in alarm will generate a visible and audible warning. E.g. the BRC1H52/82* remote controllers can generate an alarm of 65 dB (sound pressure, measured at 1 m distance of the alarm). Sound data is available in the technical data sheet of the remote controller. **The alarm should always be 15 dB louder than the background noise of the room.**

A field supply external alarm with a sound output 15 dB louder than the background noise of the room MUST be installed in the following cases:

- The sound output of the remote controller is not sufficient to guarantee the 15 dB difference. This alarm can be connected to the SVS output channel of the outdoor unit, or to the optional output of the air curtain, if available. The outdoor SVS will trigger when a R32 leak is detected. For more information on the SVS output signal, see "17.5 To connect the external outputs" [▸ 35].
- A centralised controller without built-in alarm is used, or the sound output of the centralised controller with built-in alarm is not sufficient to guarantee the 15 dB difference. Please refer to the installation manual of the centralised controller for the correct procedure to install the external alarm.

**Note:** Depending on configuration, the remote controller is operable in three possible modes. Each mode offers different controller functionality. For detailed information about setting the operation mode of the remote controller and its function, please refer to the installer and user reference guide of the remote controller.

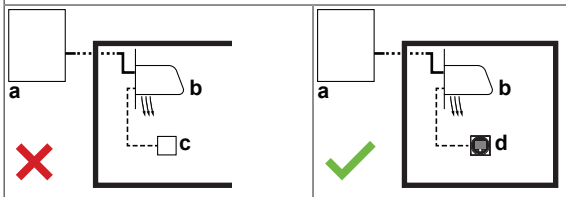
| Mode | Function |
|---|---|
| Fully functional | The controller is fully functional. All normal functionality is available. |
| Alarm only | The controller only acts as leak detection alarm (for a single indoor unit). No functionality is available. The remote controller should always be put in the same room as the indoor unit. |
| Supervisor | The controller only acts as leak detection alarm. No other functionality is available. The remote controller should be placed at a supervised location.<br>**Note:** In order to add a supervisor remote controller to the system, a field setting must be set on remote controller and outdoor unit. The air curtain needs to be assigned an address number. |

**Note:** Incorrect use of remote controllers can result in occurrence of error codes, non-operating system or system that is not compliant to applicable legislation.

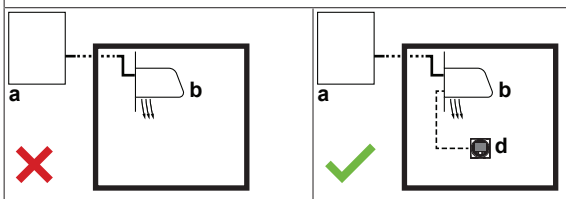
**Note:** Some centralised controllers can also be used as supervisor remote controller. For further details on installation, please refer to the installation manual of the centralised controllers.

**Examples**

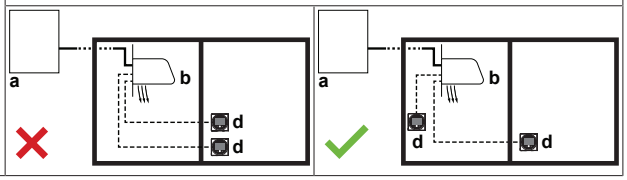
1 Remote controller is not R32 safety system compatible.



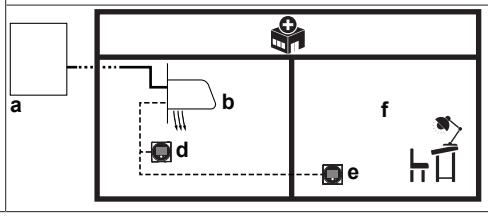

2 Indoor units without remote controller are not allowed.




3 In case of two R32 safety system compatible remote controllers, at least one remote controller should be in the room of the indoor.



| | |
|---|---|
| 4 | In particular situations it is mandatory to install a remote controller at a supervised location.<br>In room: master remote controller in fully functional OR alarm only.<br>In supervisor room: supervisor remote controller. |




**a** Outdoor unit
**b** Compatible air curtain
**c** Remote controller NOT compatible with R32 safety system
**d** Remote controller compatible with R32 safety system
**e** Remote controller in supervisor mode
**f** Supervisor room
✗ NOT allowed
✓ Allowed

## Natural ventilation

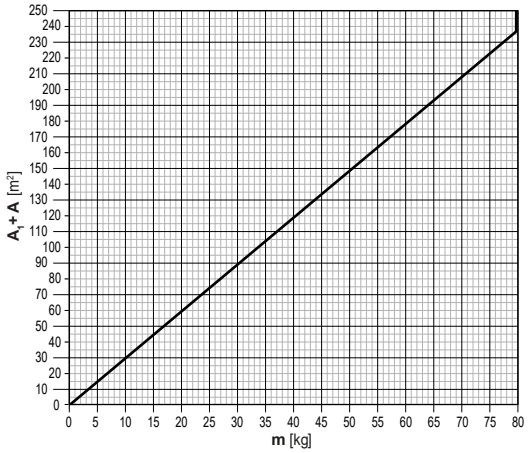
Natural ventilation is a safety measure where ventilation is made to a place where sufficient air is available to dilute the leaked refrigerant such as a large space.

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

**Step 1** – Determine total room area, which is the total area of the space that has natural ventilation **and** the space in which the air curtain is installed/serving:

The respective room area can be determined by projecting the walls, doors and partitions to the floor and calculating the enclosed area. Spaces connected only through false ceilings, ductwork, or similar connections are not considered a single space.

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




| $A_1+A$ [m²] | m [kg] |
|---|---|
| 0 | 0 |
| 10 | 3.3 |
| 20 | 6.7 |
| 30 | 10.1 |
| 40 | 13.5 |
| 50 | 16.8 |
| 60 | 20.2 |
| 70 | 23.6 |
| 80 | 27.0 |
| 90 | 30.3 |
| 100 | 33.7 |
| 110 | 37.1 |
| 120 | 40.5 |
| 130 | 43.9 |
| 140 | 47.2 |
| 150 | 50.6 |
| 160 | 54.0 |
| 170 | 57.4 |
| 180 | 60.7 |
| 190 | 64.1 |
| 200 | 67.5 |
| 210 | 70.9 |
| 220 | 74.2 |
| 230 | 77.6 |
| 236 | 79.6 |
| 237 | 79.8 |
| 240 | 79.8 |
| 250 | 79.8 |

**m** Total refrigerant charge limit in the system [kg]
**$A_1$** Area of the room with natural ventilation [m²]
**A** Area of the room where an air curtain is installed/serving [m²]

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

The graphs and table are based on an installation height of the air curtain between 1.8 m and 2.2 m (bottom of air curtain or bottom of duct openings).

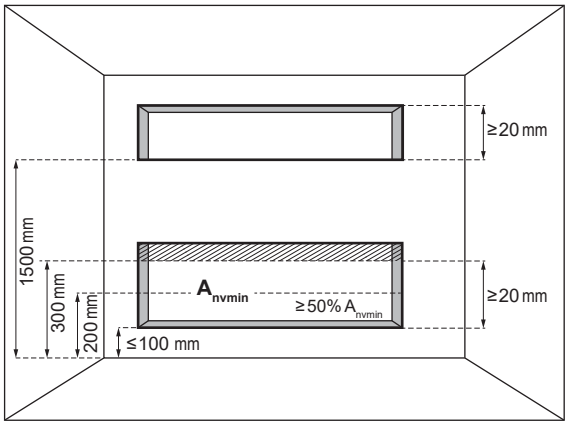
If the installation height is more than 2.2 m, higher total refrigerant charge limit of the system can apply. To know the total refrigerant charge limit of the system in case the installation height is more than 2.2 m, refer to the online tool (VRV Xpress).

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

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

1 Rooms on the same floor that are connected with a permanent opening that extends to the floor and is intended for people to walk through.

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




**$A_{nvmin}$** Minimal natural ventilation area

For the lower opening:

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

For the upper opening:

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

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

**Example**

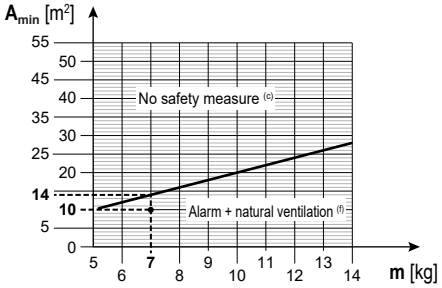
The total amount of refrigerant in the ERA system is 7 kg. The ERA system has an air curtain which is installed in a space that does not belong to the lowest underground floor of the building. The space in which the air curtain is installed has a room area of 10 m². An adjacent room has a room area of 40 m² to which air circulation is possible through a partition that meets one of the two requirements in the above text. The available safety measure is *Alarm + Natural ventilation* (based on the total amount of refrigerant and room area from the graph for "All other floors").

**1** To apply the *Alarm* safety measure, see "Alarm" [▸ 20].

**2** In addition, apply the *Natural ventilation* safety measure: total room areas of installed room and adjacent room where natural ventilation can be made: $A+A_1$=10 m²+40 m²=50 m²

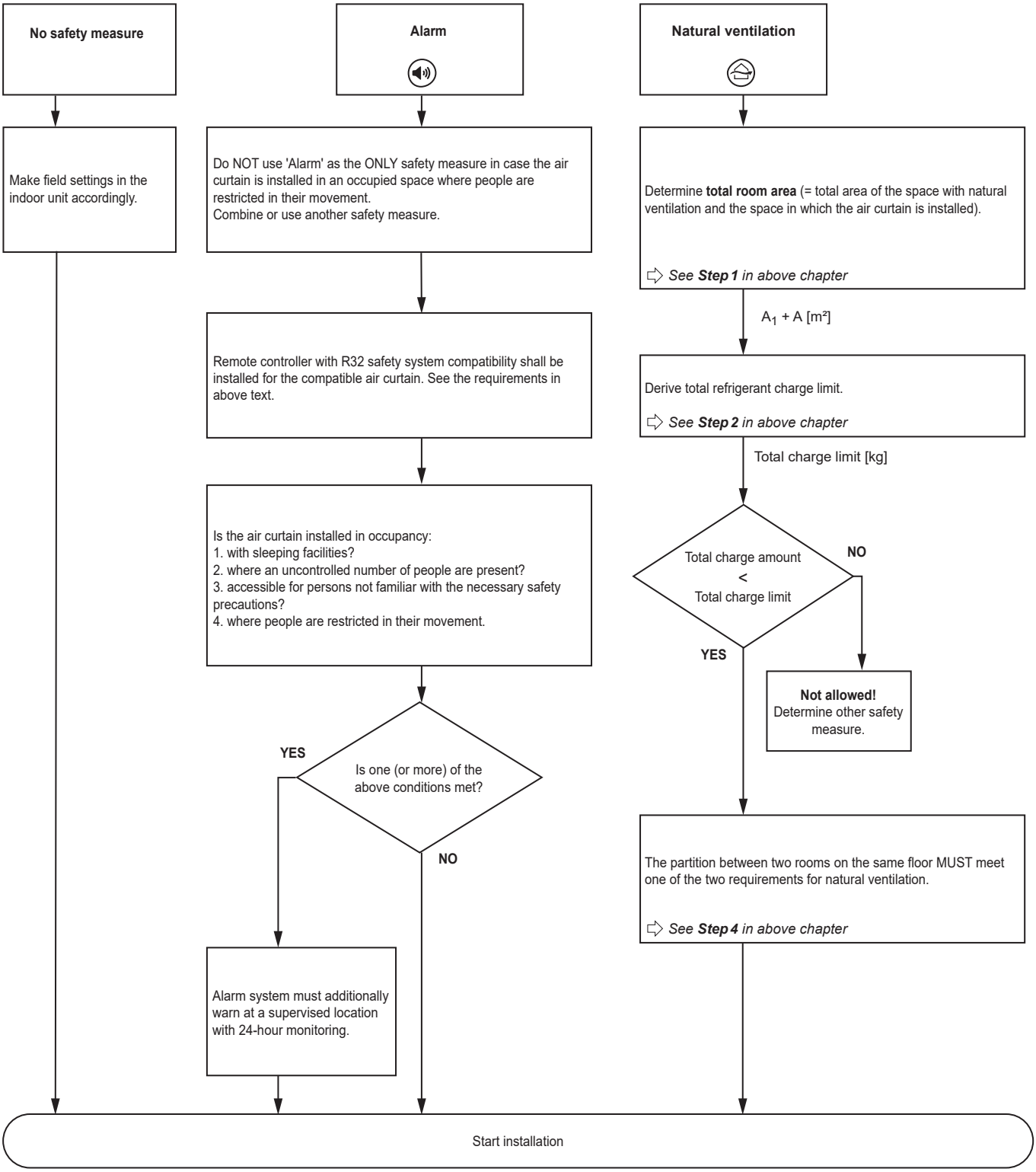
**Result:** Total refrigerant charge limit for the system determined using the graph for natural ventilation is **16.8 kg**.

Total amount of refrigerant in the system (7 kg) < Total refrigerant charge limit (16.8 kg), which means that the *Natural ventilation* safety measure can be applied.




**m** Total refrigerant charge in the system [kg]
**$A_{min}$** Minimum room area limit [m²]
**(c)** No safety measure (=No safety measure)
**(f)** Alarm + Natural ventilation (=Alarm + Natural ventilation)

### Overview: flowchart




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

## 13.2 Requirements for air handling units

For special R32 requirements in case of an AHU connection, refer to the EKEA installation and operation manual.

# 14 Unit installation

**WARNING**

The installation MUST comply with the requirements that apply to this R32 equipment. For more information, see "13 Special requirements for R32 units" [▶ 17].

## 14.1 Preparing the installation site

**WARNING**

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

**WARNING**

The appliance shall be stored as follows:

- in such a way as to prevent mechanical damage.
- in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater).
- in a room with dimensions as specified in "13 Special requirements for R32 units" [▶ 17].

### 14.1.1 Installation site requirements of the outdoor unit

Mind the spacing guidelines. See the "Technical data" chapter, and the figures on the inside of the front cover.

**INFORMATION**

The sound pressure level is less than 70 dBA.

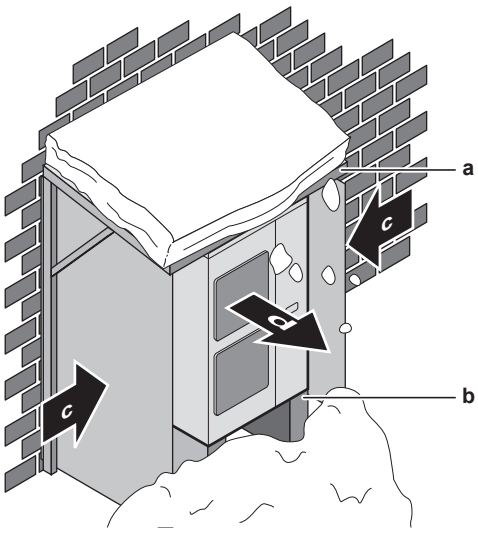
- Make sure the area is well ventilated. Do NOT block any ventilation openings.
- The outdoor unit is designed for outdoor installation only, and for the following ambient temperatures:

| | |
|---|---|
| Heating | –20~21°C DB<br>–20~15.5°C WB |
| Cooling | –5~52°C DB |

**Note:** For indoor installation of the outdoor unit, check the applicable legislation.

### 14.1.2 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.

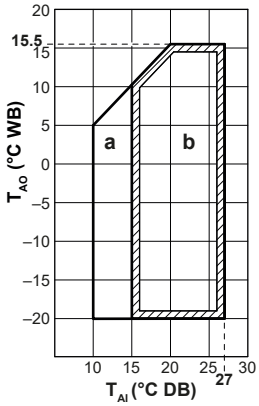



**a** Snow cover or shed
**b** Pedestal (minimum height=150 mm)
**c** Prevailing wind direction
**d** Air outlet

Snow might build up and freeze between the heat exchanger and the casing of the unit. This might decrease the operating efficiency. For instructions on how to prevent this (after mounting of the unit), see "14.3.3 To provide drainage" [▶ 25].

**NOTICE**

When operating the unit **in heating** in a low outdoor ambient temperature with high humidity conditions, make sure to take precautions to keep the drain holes of the unit free by using proper equipment.




**a**: Warming up operation range; **b**: Heating operation range; $T_{AI}$: Ambient indoor temperature; $T_{AO}$: Ambient outdoor temperature

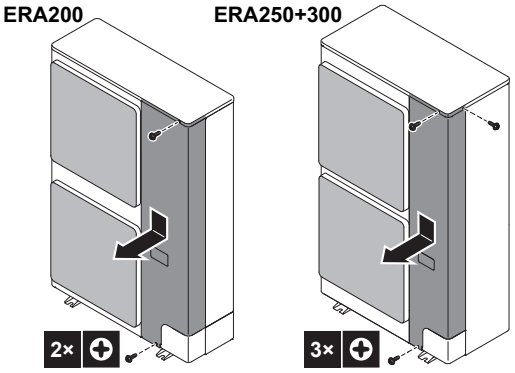
If the unit is selected to operate at ambient temperatures lower than –5°C for 5 days or longer, with relative humidity levels exceeding 95%, we recommend to apply a Daikin range specifically designed for such application and/or to contact your dealer for further advice.

## 14.2 Opening and closing the unit

### 14.2.1 To open the outdoor unit

**DANGER: RISK OF ELECTROCUTION**

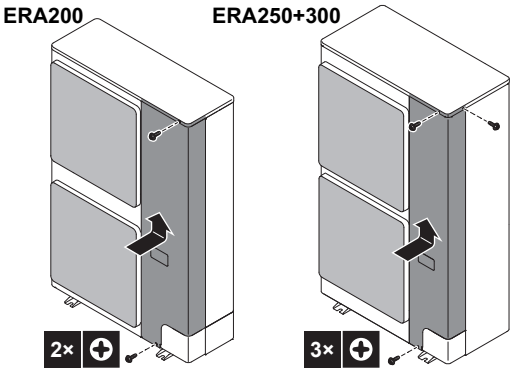
**DANGER: RISK OF BURNING/SCALDING**




### 14.2.2 To close the outdoor unit

**NOTICE**

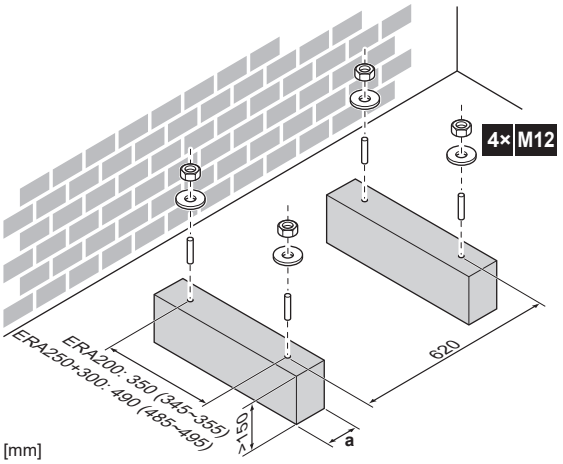
When closing the outdoor unit cover, make sure that the tightening torque does NOT exceed 4.1 N•m.




## 14.3 Mounting the outdoor unit

### 14.3.1 To provide the installation structure

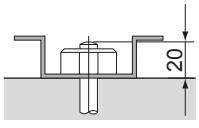
Prepare four sets of anchor bolts, nuts, and washers (field supply) as follows:




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

**INFORMATION**

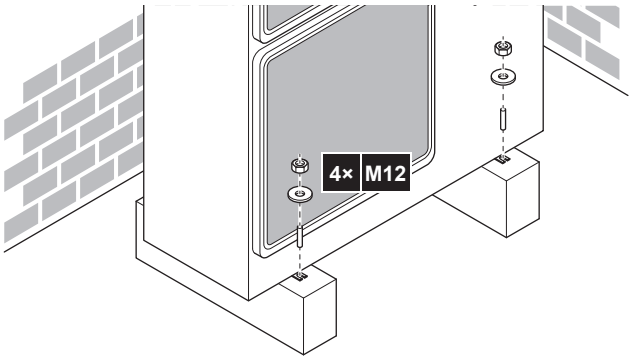
The recommended height of the upper protruding part of the bolts is 20 mm.




**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.

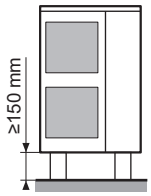

### 14.3.2 To install the outdoor unit



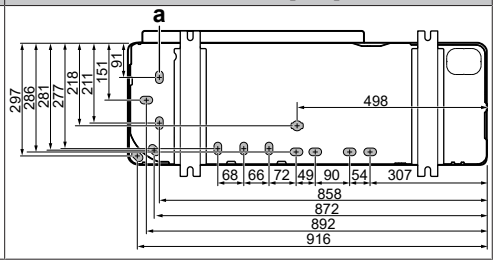
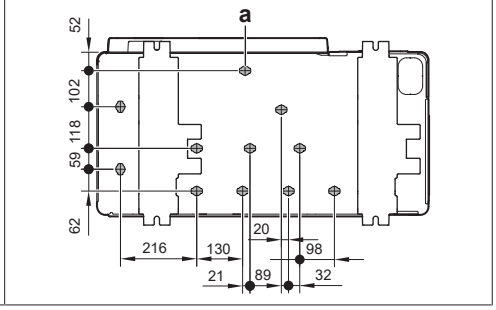

### 14.3.3 To provide drainage

**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)**

| Model | Bottom view [mm] |
|---|---|
| ERA200 |  |
| ERA250+300 |  |

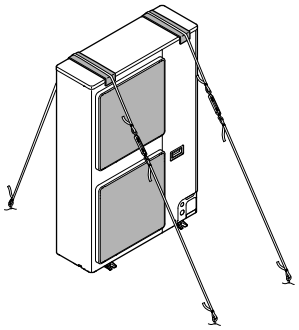


**a** Drain holes

### 14.3.4 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.



# 15 Piping installation

**CAUTION**

See "2 Specific installer safety instructions" [▶ 5] to make sure this installation complies with all safety regulations.

## 15.1 Preparing refrigerant piping

### 15.1.1 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.

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

### 15.1.2 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] | |
|---|---|---|---|
| 9.5 mm (3/8")<br>12.7 mm (1/2") | Annealed (O) | ≥0.80 mm |  |
| 15.9 mm (5/8") | Annealed (O) | ≥0.99 mm | |
| 19.1 mm (3/4")<br>22.2 mm (7/8") | Half hard (1/2H) | ≥0.80 mm | |

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

### 15.1.3 Refrigerant piping insulation

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

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

### 15.1.4 Combination table and heat exchanger volume limitations

The ERA outdoor unit can only be combined with one expansion valve kit EKEXVA according to the combination table shown below:

| | Expansion valve kit EKEXVA | | | |
|---|---|---|---|---|
| | 140 | 200 | 250 | 300 |
| ERA200 | P (2.94) | P (3.02) | — | — |
| ERA250 | — | P (3.02) | P (3.97) | — |
| ERA300 | — | P (3.49) | P (3.97) | P (4.53) |

— Not allowed
P () Pair AHU layout (value for minimum AHU heat exchanger volume [dm³])

### 15.1.5 To select the piping size

In case the required pipe sizes (inch sizes) are not available, it is also allowed to use other diameters (mm sizes), taken the following into account:

- Select the pipe size nearest to the required size.
- Use the suitable adapters for the changeover from inch to mm pipes (field supply).
- The additional refrigerant calculation has to be adjusted as mentioned in "16.2 To determine the additional refrigerant amount" [▶ 31].

Choose from the following table in accordance with the outdoor unit capacity type:

| Outdoor unit capacity type | Piping outer diameter [mm] | |
|---|---|---|
| | Gas pipe | Liquid pipe |
| ERA200 | 19.1 | 9.5 |
| ERA250 | | |
| ERA300 | 22.2 | 12.7 |

## 15.2 Connecting the refrigerant piping

**DANGER: RISK OF BURNING/SCALDING**

### 15.2.1 Using the stop valve and service port

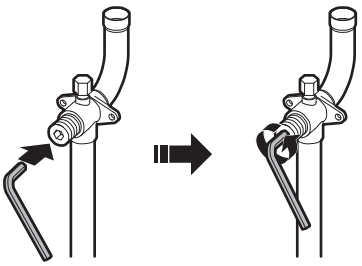
#### To handle the stop valve

Take the following guidelines into account:

- The gas and liquid stop valves are factory closed.
- Make sure to keep all stop valves open during operation.
- Do NOT apply excessive force to the stop valve. Doing so may break the valve body.

#### To open the stop valve

1 Remove the dust cap.
2 Insert a hexagon wrench into the stop valve.
3 FULLY turn the stop valve counterclockwise and tighten until the correct tightening torque value is achieved (see "Tightening torques" [▶ 27]).



**NOTICE**

Stop valves need to be opened on torque specified in this manual. It is not allowed to turn valve "a quarter turn" back when opening it.

4 Install the dust cap.

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

**NOTICE**

Reinstall dust cap to prevent aging of O-ring and risk of leakage.

### To close the stop valve

1 Remove the stop valve cover.

2 Insert a hexagon wrench into the stop valve and turn the stop valve clockwise.

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

4 Install the stop valve cover.

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

### To handle the service port

- 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, make sure to tighten the service port cover securely. For the tightening torque, refer to the table below.
- Check for refrigerant leaks after tightening the service port cover.

### Tightening torques

| Stop valve size [mm] | Tightening torque [N•m][(a)] | | |
|---|---|---|---|
| | Valve body | Hexagonal wrench | Service port |
| Ø9.5 | 5~7 | 4 mm | 10.7~14.7 |
| Ø12.7 | 8~10 | | |
| Ø15.9 | 14~16 | 6 mm | |
| Ø19.1 | 19~21 | 8 mm | |
| Ø25.4 | | | |

[(a)] When opening or closing.

## 15.2.2 To remove the pinched pipes

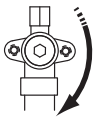
**WARNING**

Any gas or oil remaining inside the stop valve may blow off the pinched piping.

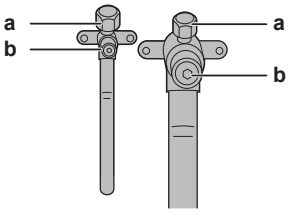
Failure to observe the instructions in procedure below properly may result in property damage or personal injury, which may be serious depending on the circumstances.

Use the following procedure to remove the pinched piping:

1 Make sure that the stop valves are fully closed.



2 Connect the vacuuming/recovery unit through a manifold to the service port of all stop valves.




**a** Service port
**b** Stop valve

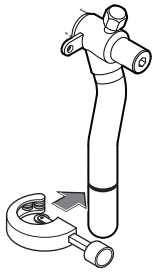
3 Recover gas and oil from the pinched piping by using a recovery unit.

**CAUTION**

Do NOT vent gases into the atmosphere.

4 When all gas and oil is recovered from the pinched piping, disconnect the charge hose and close the service ports.

5 Cut off the lower part of the gas and liquid stop valve pipes along the black line. Use an appropriate tool (e.g. a pipe cutter).



**WARNING**

NEVER remove the pinched piping by brazing.

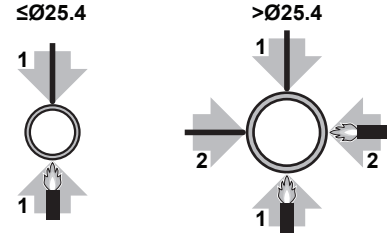
Any gas or oil remaining inside the stop valve may blow off the pinched piping.

6 Wait until all oil has dripped out before continuing with the connection of the field piping in case the recovery was not complete.

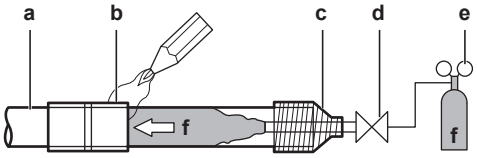
## 15.2.3 To braze the pipe end

**NOTICE**

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



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




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

- Do NOT use anti-oxidants when brazing pipe joints. Residue can clog pipes and break equipment.
- Do NOT use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (BCuP), which does NOT require flux.

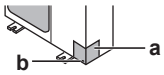
  Flux has an extremely harmful influence on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will deteriorate the refrigerant oil.
- ALWAYS protect the surrounding surfaces (e.g. insulation foam)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

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

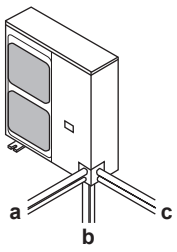
- **Piping length.** Keep field piping as short as possible.
- **Piping protection.** Protect the field piping against physical damage.

**1** Do the following:

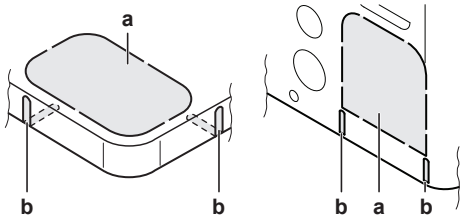
- Remove the service cover. See "14.2.1 To open the outdoor unit" [▶ 24].
- Remove the piping intake plate (a) with screw (b).




**2** Choose a piping route (a, b or c).




**INFORMATION**




- Punch out the knockout (a) in the bottom plate or cover plate by tapping on the attachment points with a flat head screwdriver and a hammer.
- Optionally, cut out the slits (b) with a metal saw.

**NOTICE**

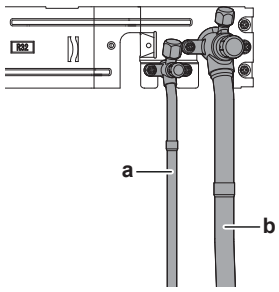
Precautions when making knockout holes:

- 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.

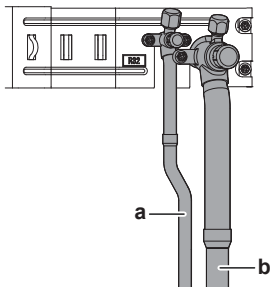
**3** Do the following:

- Connect the liquid pipe (a) to the liquid stop valve. (brazing)
- Connect the gas pipe (b) to the gas stop valve. (brazing)

**ERA200**

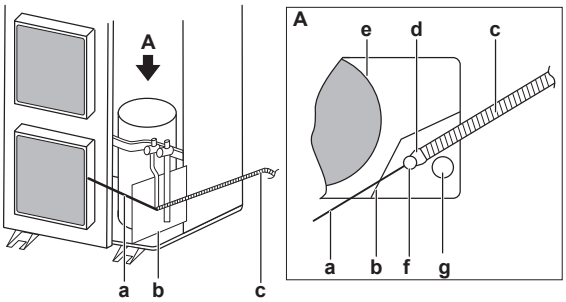



**ERA250+300**



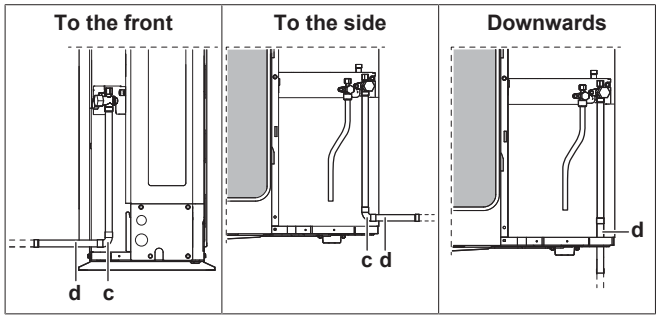

**NOTICE**

**When brazing:** First braze the liquid side piping, then the gas side piping. Enter the electrode from the front of the unit and the welding torch from the right side to braze with the flames facing outside and avoid the compressor sound insulation and other piping.




**a** Electrode
**b** Burning-resistant plate
**c** Welding torch
**d** Flames
**e** Compressor sound insulation
**f** Liquid side piping
**g** Gas side piping

- Connect the gas piping accessories c and d (d: only for ERA250 ). There are three possibilities:




**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.

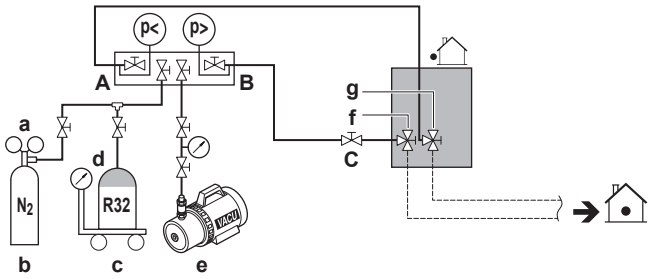
**NOTICE**

- Be sure to use the supplied accessory pipes when carrying out piping work in the field.
- Be sure that the field installed piping does not touch other pipes, the bottom panel or side panel. Especially for the bottom and side connection, be sure to protect the piping with suitable insulation, to prevent it from coming into contact with the casing.

The connections to the branch kits are the responsibility of the installer (field piping).

## 15.3 Checking the refrigerant piping

### 15.3.1 Checking refrigerant piping: Setup




**a** Pressure reducing valve
**b** Nitrogen
**c** Weighing scales
**d** Refrigerant R32 tank (siphon system)
**e** Vacuum pump
**f** Liquid line stop valve
**g** Gas line stop valve
**A** Valve A
**B** Valve B
**C** Valve C

| Valve | Status |
|---|---|
| Valve A | Open |
| Valve B | Open |
| Valve C | Open |
| Liquid line stop valve | Close |
| Gas line stop valve | Close |

**NOTICE**

Indoor units should also be leak and vacuum tested. Keep any possible (field supplied) field piping valves open as well.

### 15.3.2 To perform a leak test

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

#### Vacuum leak test

1. Evacuate the system from the liquid and gas piping to a gauge pressure of –100.7 kPa (–1.007 bar) for more than 2 hours.
2. Once reached, turn off the vacuum pump and check that the pressure does not rise for at least 1 minute.
3. Should the pressure rise, the system may either contain moisture (see vacuum drying below) or have leaks.

#### Pressure leak test

1. Break the vacuum by pressurising with nitrogen gas to a minimum gauge pressure of 0.2 MPa (2 bar). Never set the gauge pressure higher than the maximum operation pressure of the unit, i.e. 4.0 MPa (40 bar).
2. Test for leaks by applying a bubble test solution to all piping connections.
3. Discharge all nitrogen gas.

**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).

### 15.3.3 To perform vacuum drying

To remove all moisture from the system, proceed as follows:

1. Evacuate the system for at least 2 hours to a target vacuum of –100.7 kPa (–1.007 bar)(5 Torr absolute).
2. Check that, with the vacuum pump turned off, the target vacuum is maintained for at least 1 hour.
3. Should you fail to reach the target vacuum within 2 hours or maintain the vacuum for 1 hour, the system may contain too much moisture. In that case, break the vacuum by pressurising with nitrogen gas to a gauge pressure of 0.05 MPa (0.5 bar) and repeat steps 1 to 3 until all moisture has been removed.
4. Depending on whether you want to immediately charge refrigerant through the refrigerant charge port or first pre-charge a portion of refrigerant through the liquid line, either open the outdoor unit stop valves, or keep them closed. See "16.3 To charge refrigerant" [▸ 31] for more information.

### 15.3.4 To insulate the refrigerant piping

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

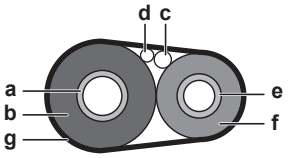
- Make sure to insulate the connection piping entirely.
- Be sure to insulate the liquid and gas piping.

- 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**

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

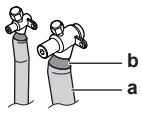



**a** Gas pipe
**b** Gas pipe insulation
**c** Interconnection cable
**d** Field wiring (if applicable)
**e** Liquid pipe
**f** Liquid pipe insulation
**g** Finishing tape

2 Install the service cover.

**Inside the outdoor unit**

To insulate the refrigerant piping, proceed as follows:




**a** Insulation material
**b** Caulking etc.

1 Insulate the liquid and gas piping.

2 Wind heat insulation around the curves, and then cover it with vinyl tape.

3 Make sure the field piping does not touch any compressor components.

4 Seal the insulation ends (sealant etc.) (b, see above).

5 Where necessary, wrap the field piping with vinyl tape to protect the insulation against sharp edges.

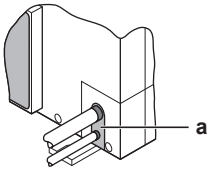
6 If the outdoor unit is installed above the indoor unit, cover the stop valves with sealing material to prevent condensed water on the stop valves from moving to the indoor unit.

**NOTICE**

Any exposed piping can cause condensation.

7 Reattach the service cover and the piping intake plate.

8 Seal all gaps to prevent snow and small animals from entering the system.



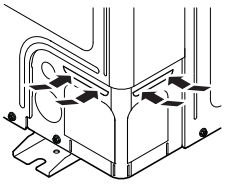

**a** Seal

**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**

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



### 15.3.5 To check for leaks after charging refrigerant

After charging refrigerant in the system an additional leak test must be performed. Refer to "16.6 To check refrigerant piping joints for leaks after charging refrigerant" [▶ 32].

# 16 Charging refrigerant

## 16.1 Precautions when charging 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**

If the power of some units is turned off, the charging procedure cannot be finished properly.

**NOTICE**

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

**NOTICE**

If operation is performed within 12 minutes after the indoor and outdoor units are powered on, the compressor will not operate before the communication is established in a correct way between outdoor unit(s) and indoor units.

**NOTICE**

Before starting charging procedures, check if the 7-segment display indication of the outdoor unit A1P PCB is as normal (see "18.1.3 To access mode 1 or 2" [▶ 37]). If a malfunction code is present, see "22.1 Solving problems based on error codes" [▶ 41].

**NOTICE**

Make sure all connected indoor units are recognised (see setting [1-10] in "18.1.6 Mode 1: monitoring settings" [▶ 37]).

**NOTICE**

In case of maintenance and the system (outdoor unit+field piping+indoor units) does not contain any refrigerant any more (e.g., after refrigerant reclaim operation), the unit has to be charged with its original amount of refrigerant (refer to the nameplate on the unit) and the determined additional refrigerant amount.

**NOTICE**

- Ensure that contamination of different refrigerants does not occur when using charging equipment.
- Charging hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant. See "17.4 To connect the electrical wiring to the outdoor unit" [▶ 34].
- Label the system when charging is complete.
- Extreme care shall be taken not to overfill the refrigerating system.

**NOTICE**

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

## 16.2 To determine the additional refrigerant amount

**WARNING**

In case the system serves the lowest underground floor of a building, there is an extra limit to the maximum allowable total refrigerant amount. This maximum refrigerant amount is determined based on the area of the smallest room on the lowest underground floor.

See "13 Special requirements for R32 units" [▶ 17] to determine the maximum allowable total refrigerant amount.

**INFORMATION**

For final charge adjustment in the test laboratory, please contact your local dealer.

**INFORMATION**

Note down the amount of additional refrigerant that is calculated here, for later use on the additional refrigerant charge label. See "16.5 To fix the fluorinated greenhouse gases label" [▶ 32].

**NOTICE**

The refrigerant charge of the system must be less than 79.8 kg. For factory charge, refer to the unit name plate.

**Formula:**

$R = [(X_1 \times \textbf{Ø12.7}) \times 0.10 + (X_2 \times \textbf{Ø9.5}) \times 0.053]$

| | |
|---|---|
| **R** | Additional refrigerant to be charged [kg] (rounded off to one decimal place) |
| $\mathbf{X_{1...2}}$ | Total length [m] of liquid piping size at **Øa** |

**Metric piping.** When using metric piping, replace the weight factors in the formula by the ones from the following table:

| Inch piping | | Metric piping | |
|---|---|---|---|
| **Piping** | **Weight factor** | **Piping** | **Weight factor** |
| Ø9.5 mm | 0.053 | Ø10 mm | 0.058 |
| Ø12.7 mm | 0.10 | Ø12 mm | 0.088 |

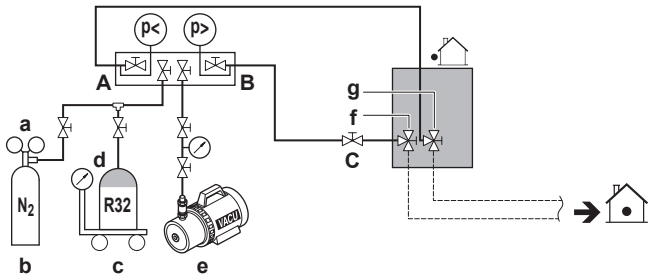
## 16.3 To charge refrigerant

To speed up the refrigerant charging process, it is in case of larger systems recommended to first pre-charge a portion of refrigerant through the liquid line before proceeding with the manual charging. It can be skipped, but charging will take longer then.

**Pre-charging refrigerant**

Pre-charging can be done without compressor operation, by connecting the refrigerant bottle to the service port of the liquid stop valve.

1 Connect as shown. Make sure that all outdoor unit stop valves, as well as valve A are closed.




| | |
|---|---|
| **a** | Pressure reducing valve |
| **b** | Nitrogen |
| **c** | Weighing scales |
| **d** | Refrigerant R32 tank (siphon system) |
| **e** | Vacuum pump |
| **f** | Liquid line stop valve |
| **g** | Gas line stop valve |
| **A** | Valve A |
| **B** | Valve B |
| **C** | Valve C |

2 Open valves C and B.

3 Pre-charge refrigerant until the determined additional refrigerant amount is reached or pre-charging is not possible anymore, and then close valves C and B.

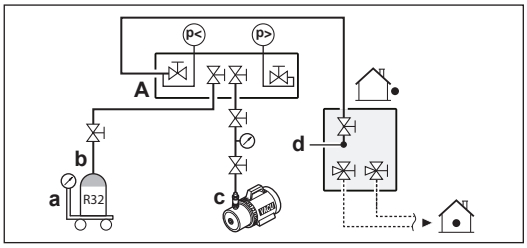
4 Do one of the following:

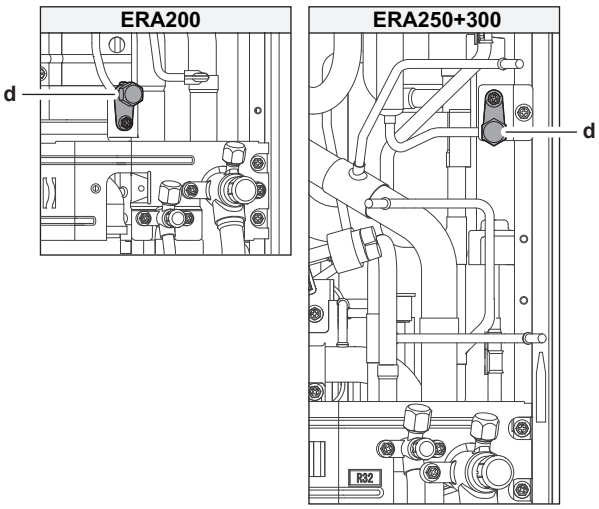
| If | Then |
|---|---|
| The determined additional refrigerant amount is **reached** | Disconnect the manifold from the liquid line.<br>You do not have to perform the "Charging refrigerant (in manual additional refrigerant charge mode)" instructions. |
| **Too much** refrigerant is charged | Recover refrigerant.<br>Disconnect the manifold from the liquid line.<br>You do not have to perform the "Charging refrigerant (in manual additional refrigerant charge mode)" instructions. |
| The determined additional refrigerant amount is **not reached** yet | Disconnect the manifold from the liquid line.<br>Continue with the "Charging refrigerant (in manual additional refrigerant charge mode)" instructions. |

**Charging refrigerant (in manual additional refrigerant charge mode)**

The remaining additional refrigerant charge can be charged by operating the outdoor unit by means of the manual additional refrigerant charge mode.

5 Connect as shown. Make sure valve A is closed.




**a** Weighing scales
**b** Refrigerant R32 tank (siphon system)
**c** Vacuum pump
**d** Refrigerant charge port (heat exchanger)
**A** Valve A

**NOTICE**

The refrigerant charging port is connected to the piping inside the unit. The unit's internal piping is already factory charged with refrigerant, so be careful when connecting the charge hose.

6 Open all outdoor unit stop valves. At this point, valve A must remain closed!

7 Take all the precautions mentioned in "18 Configuration" [▸ 36] and "19 Commissioning" [▸ 38] into account.

8 Turn on the power of the indoor unit(s) and outdoor unit.

9 Activate setting [2-20] to start the manual additional refrigerant charge mode. For details, see "18.1.7 Mode 2: field settings" [▸ 38].

**Result:** The unit will start operation.

**INFORMATION**

The manual refrigerant charge operation will automatically stop within 30 minutes. If charging is not completed after 30 minutes, perform the additional refrigerant charging operation again.

10 Open valve A.

11 Charge refrigerant until the remaining determined additional refrigerant amount is added, and then close valve A.

12 Press BS3 to stop the manual additional refrigerant charge mode.

**NOTICE**

Make sure to open all stop valves after (pre-) charging the refrigerant.

Operating with the stop valves closed will damage the compressor.

**NOTICE**

After adding the refrigerant, do not forget to close the lid of the refrigerant charging port. The tightening torque for the lid is 11.5 to 13.9 N•m.

## 16.4 Error codes when charging refrigerant

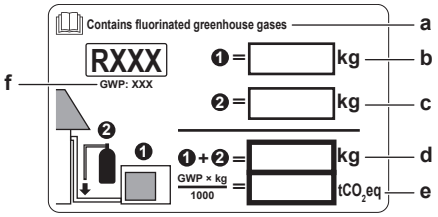
**INFORMATION**

If a malfunction occurs, the error code is displayed on the outdoor unit's 7-segments display and on the user interface of the indoor unit.

If a malfunction occurs, close valve A immediately. Confirm the malfunction code and take corresponding action, "22.1 Solving problems based on error codes" [▸ 41].

## 16.5 To fix the fluorinated greenhouse gases label

1 Fill in the label as follows:




**a** If a multilingual fluorinated greenhouse gases label is delivered with the unit (see accessories), peel off the applicable language and stick it on top of **a**.
**b** Factory refrigerant charge: see unit name plate
**c** Additional refrigerant amount charged
**d** Total refrigerant charge
**e** **Quantity of fluorinated greenhouse gases** of the total refrigerant charge expressed as tonnes $CO_2$ equivalent.
**f** 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.

## 16.6 To check refrigerant piping joints for leaks after charging refrigerant

**Tightness test of field-made refrigerant joints indoors**

1 Use a leakage test method with a minimum sensitivity of 5 g of refrigerant/year. Test leaks using a pressure of at least 0.25 times the maximum working pressure (see "PS High" on the unit nameplate).

**If a leak is detected**

1 Recover the refrigerant, repair the joint, and repeat the test.
2 Perform the leak tests see "15.3.2 To perform a leak test" [▶ 29].
3 Charge refrigerant.
4 Check for refrigerant leaks after charging (see above).

# 17 Electrical installation

**CAUTION**

See "2 Specific installer safety instructions" [▶ 5] to make sure this installation complies with all safety regulations.

## 17.1 About electrical compliance

**This equipment complies with:**

- **EN/IEC 61000-3-12** provided that the short-circuit power $S_{sc}$ is greater than or equal to the minimum $S_{sc}$ value at the interface point between the user's supply and the public system.
  - 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.
  - It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected ONLY to a supply with a short-circuit power $S_{sc}$ greater than or equal to the minimum $S_{sc}$ value.

| Model | Minimum $S_{sc}$ value |
|---|---|
| ERA200 | 2685 kVA |
| ERA250 | 3137 kVA |
| ERA300 | 3422 kVA |

## 17.2 Specifications of standard wiring components

**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. Details are described in "Guidelines when connecting the electrical wiring" in the installer reference guide.

| Component | | Outdoor unit | | |
|---|---|---|---|---|
| | | ERA200 | ERA250 | ERA300 |
| Power supply cable | MCA[a] | 18.5 A | 22 A | 24 A |
| | Voltage | 380-415 / 400 V | | |
| | Phase | 3N~ | | |
| | Frequency | 50/60 Hz | | |
| | Wire size | 5 core cable | | |
| | | Must comply with national wiring regulation. | | |
| | | Wire size based on the current, but not less than: | | |
| | | 2.5 mm² | | 4 mm² |

| Component | | Outdoor unit | | |
|---|---|---|---|---|
| | | ERA200 | ERA250 | ERA300 |
| Interconnection cable | Voltage | 220-240 V | | |
| | Wire size | Only use harmonised wire providing double insulation and suitable for applicable voltage.<br>2-core shielded cable<br>0.75-1.5 mm² | | |
| Recommended field fuse | | 25 A | | 32 A |
| Earth leakage circuit breaker/ residual current circuit breaker | | Must comply with national wiring regulation. | | |

[a] MCA=Minimum circuit ampacity. Stated values are maximum values.

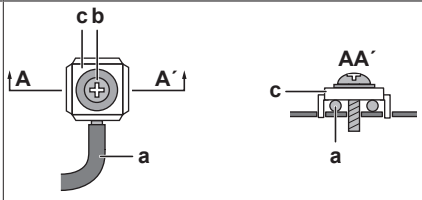
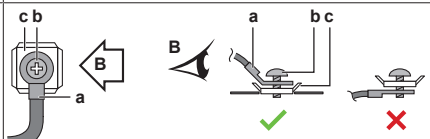
Please use the table above to specify the requirements for the power supply wiring.

**NOTICE**

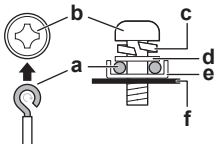
When using residual current operated circuit breakers, be sure to use a high-speed type 300 mA rated residual operating current.

## 17.3 Connecting the electrical wiring

**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 |

For earth connections, use the following method:

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

**Tightening torques**

| Wiring | Screw size | Tightening torque |
|---|---|---|
| Transmission wiring | M3.5 | 0.8~0.97 N•m |
| Power supply wiring | ERA200 : M5 | 2.2~2.7 N•m |
| | ERA250+300 : M8 | 5.5~7.3 N•m |

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

**CAUTION**

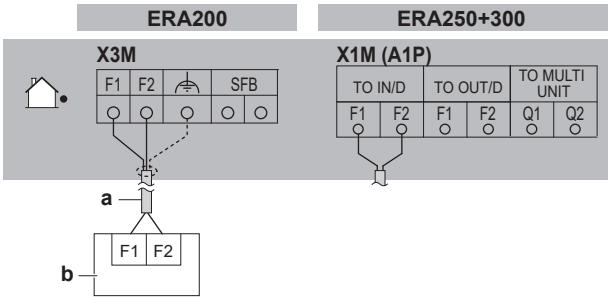
- When connecting the power supply: connect the earth cable first, before making the current-carrying connections.
- When disconnecting the power supply: disconnect the current-carrying cables first, before separating the earth connection.
- The length of the conductors between the power supply stress 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**

- 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 "14.2.1 To open the outdoor unit" [▸ 24].

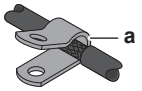
2 Connect the transmission wiring as follows:




**a** Use the conductor of sheathed wire (2 wire) (no polarity)
**b** Terminal board (field supply)

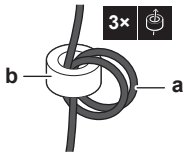
**Note:** The indoor F1/F2 interconnection cable MUST be shielded:

- ERA200 : the shielding is earthed (only at outdoor unit side of the cable) via the middle screw on the terminal X3M.
- ERA250+300 : the shielding is earthed (only at outdoor unit side of the cable) via a metal P-clamp. Strip the insulation up to the shielding mesh, to provide full contact of the earth with the shielding. See illustration below:



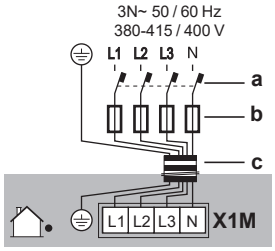

**a** P-clamp for cable shield earthing

**Note:** For ERA250+300 , the interconnection cable MUST pass through the ferrite core 3 times (3 passes, 2 turns). See illustration below:



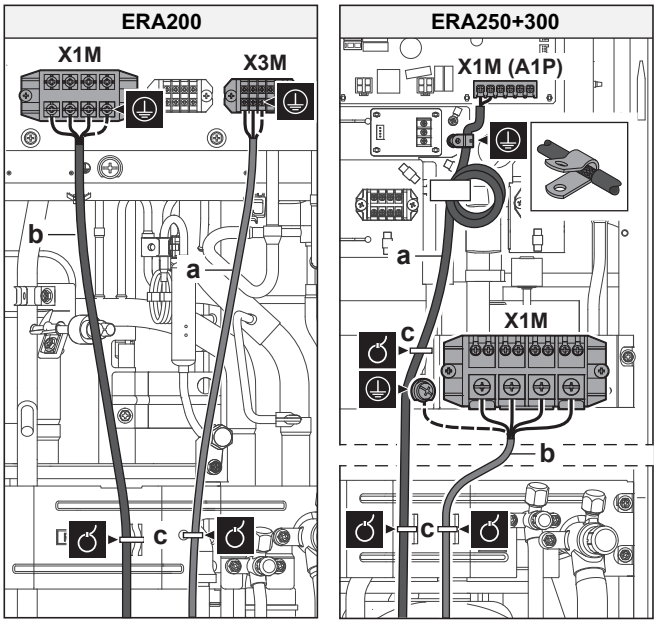

**a** Interconnection cable
**b** Ferrite core

3 Connect the power supply as follows:




**a** Earth leakage circuit breaker
**b** Fuse
**c** Power supply cable

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 below.



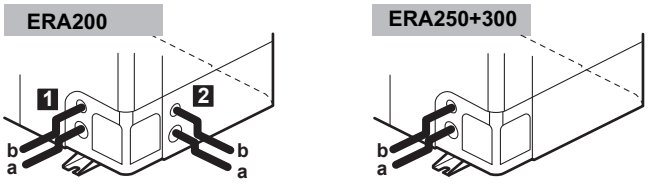

**a** Interconnection cable
**b** Power supply cable
**c** Cable tie

**WARNING**

Do NOT strip the outer cable jacket lower than the fixation point on the stop valve attachment plate.

5 Route the cables through the frame according to the illustration below.

**Note:** for ERA200, choose one of the two possibilities to route the cables through the frame.

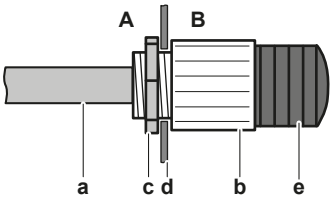



**a** Interconnection cable
**b** Power supply cable

6 Remove the selected knockout holes by tapping on the attachment points with a flat head screwdriver and a hammer.

7 Install a cable protection in the knockout hole:

- It is recommended to install a PG type cable gland in the knockout hole.
- When you do not use a cable gland, protect the cables with vinyl tubes to prevent the edge of the knockout hole from cutting the wires:




**A** Inside of the outdoor unit
**B** Outside of the outdoor unit
**a** Cable
**b** Bush
**c** Nut
**d** Frame
**e** Tube

8 Route the cables out of the unit.

9 Reattach the service cover. See "14.2.2 To close the outdoor unit" [▸ 25].

10 Connect an earth leakage circuit breaker and fuse to the power supply line as specified in "17.2 Specifications of standard wiring components" [▸ 33].

## 17.5 To connect the external outputs

**SVS and SVEO output**

The SVS and SVEO outputs are contacts on terminal X2M.

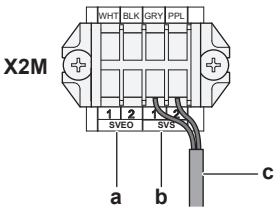
The SVS output is a contact on terminal X2M that closes in case a leak is detected, failure or disconnection of the R32 sensor (located in the indoor unit).

The SVEO output is a contact on terminal X2M that closes in case of occurrence of general errors. See "8.1 Error codes: Overview" [▸ 13] and "22.1.1 Error codes: Overview" [▸ 42] for errors that will trigger this output.

| Outdoor output connection requirements | |
|---|---|
| Voltage | 220~240 V |
| Maximum current | 0.5 A |
| Wire size | Only use harmonised wiring providing double insulation and suitable for the applicable voltage. |
| | 2-core cable |
| | Minimum cable section of 0.75 mm² |

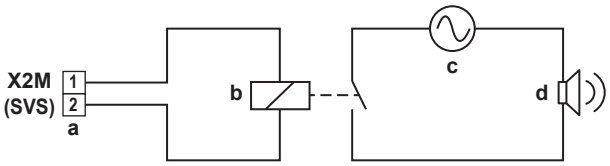
**NOTICE**

Do NOT use the outputs as a power source. Instead, use each output to energize a relay that controls the external circuit.




**a** SVEO output terminals (1 and 2)
**b** SVS output terminals (1 and 2)
**c** Cable to SVS output device (example)

**Example:**




**a** SVS output terminal
**b** Relay
**c** AC power supply 220~240 V AC
**d** External alarm

**INFORMATION**

Sound data about the refrigerant leakage alarm are available in the technical data sheet of the user interface. E.g. the BRC1H52* controller generates an alarm of 65 dB (sound pressure, measured at 1 m distance from the alarm).

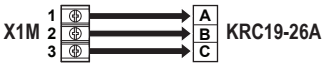
## 17.6 To connect the cool/heat selector switch option

**NOTICE**

Do NOT use the cool/heat selector switch in case the T3T4 input is used.

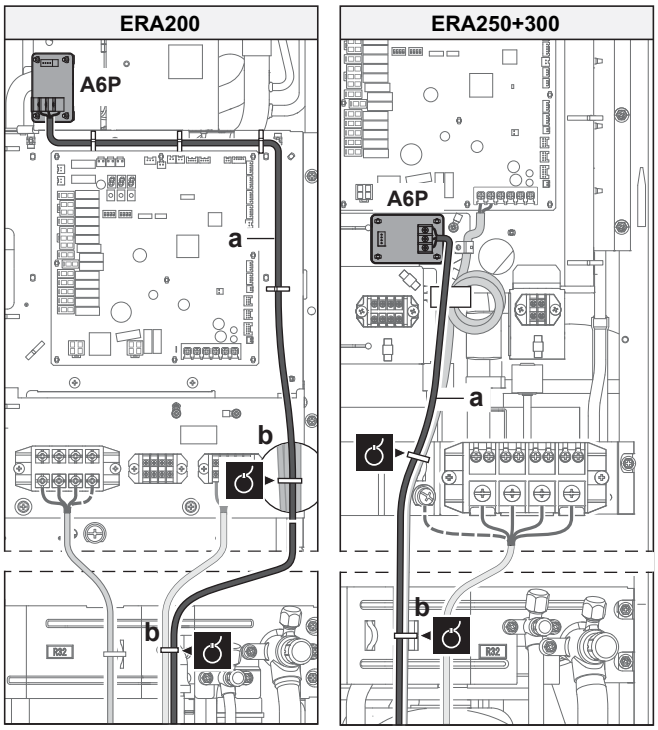
In order to control the cooling or heating operation from a central location, the following optional cool/heat selector switch (KRC19-26A) can be connected:

1 Connect the cool/heat selector switch to terminal X1M of the cool/heat selector PCB.



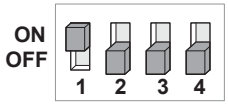

**X1M** Terminal on the PCB
**KRC19-26A** Cool/heat selector switch

2 Route the wires in the switchbox as shown:




**A6P** Printed circuit board (cool/heat selector)
**a** Cable to cool/heat selector switch (KRC19-26A )
**b** Cable tie

3 Turn ON the DIP switch (DS1-1). See "18.1.2 Field setting components" [▸ 37] for more information on the DIP switch.




**DS1** DIP switch 1

## 17.7 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.

# 18 Configuration

**DANGER: RISK OF ELECTROCUTION**

**INFORMATION**

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

## 18.1 Making field settings

### 18.1.1 About making field settings

To continue the configuration of the ERA system, it is required to give some input to the PCB of the unit. This chapter will describe how manual input is possible by operating the push buttons on the PCB and reading the feedback from the 7-segment displays.

Next to making field settings it is also possible to confirm the current operation parameters of the unit.

**Push buttons and DIP switches**

| Item | Description |
|---|---|
| Push buttons | By operating the push buttons it is possible to:<br>▪ Perform special actions (refrigerant charge, testrun, etc).<br>▪ Perform field settings (demand operation, low noise, etc). |
| DIP switches | By operating the DIP switches it is possible to:<br>▪ DS1 (1): COOL/HEAT selector (refer to the manual of the cool/heat selector switch). OFF=not installed=factory setting<br>▪ DS1 (2~4): NOT USED. DO NOT CHANGE THE FACTORY SETTING.<br>▪ DS2 (1~4): NOT USED. DO NOT CHANGE THE FACTORY SETTING. |

See also:

- "18.1.2 Field setting components" [▸ 37]

**Mode 1 and 2**

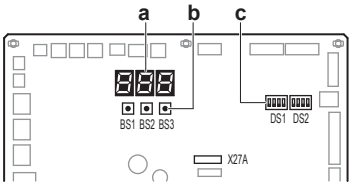
| Mode | Description |
|---|---|
| Mode 1<br>(monitoring settings) | Mode 1 can be used to monitor the current situation of the outdoor unit. Some field setting contents can be monitored as well. |
| Mode 2<br>(field settings) | Mode 2 is used to change the field settings of the system. Consulting the current field setting value and changing the current field setting value is possible.<br>In general, normal operation can be resumed without special intervention after changing field settings.<br>Some field settings are used for special operation (e.g., one time operation, recovery/ vacuuming setting, manual adding refrigerant setting, etc.). In such a case, it is required to abort the special operation before normal operation can restart. It will be indicated in below explanations. |

See also:

- "18.1.3 To access mode 1 or 2" [▸ 37]
- "18.1.4 To use mode 1" [▸ 37]
- "18.1.5 To use mode 2" [▸ 37]
- "18.1.6 Mode 1: monitoring settings" [▸ 37]
- "18.1.7 Mode 2: field settings" [▸ 38]

### 18.1.2 Field setting components

Location of the 7-segment displays, buttons and DIP switches:




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

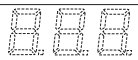
### 18.1.3 To access mode 1 or 2

**Initialisation: default situation**

**NOTICE**

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

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

| Stage | Display |
|---|---|
| When turning on the power supply: blinking as indicated. First checks on power supply are executed (8~10 min). |  |
| When no trouble occurs: lighted as indicated (1~2 min). |  |
| Ready for operation: blank display indication as indicated. |  |

Off
Blinking
On

In case of malfunction, the malfunction code is displayed on the indoor unit user interface and the outdoor unit 7-segment display. Solve the malfunction code accordingly. The communication wiring should be checked at first.

**Access**

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

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

**INFORMATION**

If you get confused in the middle of the process, push BS1 to return to the default situation (no indication on 7-segment displays: blank, see "18.1.3 To access mode 1 or 2" [▶ 37].

### 18.1.4 To use mode 1

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

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

### 18.1.5 To use mode 2

Mode 2 is used to set field settings of the outdoor unit and system.

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

### 18.1.6 Mode 1: monitoring settings

**[1-1]**

Shows the status of low noise operation.

| [1-1] | Description |
|---|---|
| 0 | Unit is currently not operating under low noise restrictions. |
| 1 | Unit is currently operating under low noise restrictions. |

**[1-2]**

Shows the status of power consumption limitation operation.

| [1-2] | Description |
|---|---|
| 0 | Unit is currently not operating under power consumption limitations. |
| 1 | Unit is currently operating under power consumption limitation. |

**[1-5] [1-6]**

| Code | Shows ... |
|---|---|
| [1-5] | The current $T_e$ target parameter position |
| [1-6] | The current $T_c$ target parameter position |

**[1-10]**

Shows the total number of connected indoor units.

**[1-17] [1-18] [1-19]**

| Code | Shows ... |
|---|---|
| [1-17] | The latest malfunction code |
| [1-18] | The 2nd last malfunction code |
| [1-19] | The 3rd last malfunction code |

**[1-40] [1-41]**

| Code | Shows ... |
|---|---|
| [1-40] | The current cooling comfort setting |
| [1-41] | The current heating comfort setting |

### 18.1.7 Mode 2: field settings

**[2-8]**

$T_e$ target temperature during cooling operation.

| [2-8] | $T_e$ target [°C] |
|---|---|
| 0 (default) | Auto |
| 2 | 6 |
| 3 | 7 |
| 4 | 8 |
| 5 | 9 |
| 6 | 10 |
| 7 | 11 |

**[2-9]**

$T_c$ target temperature during heating operation.

| [2-9] | $T_c$ target [°C] |
|---|---|
| 0 (default) | Auto |
| 1 | 41 |
| 2 | 42 |
| 3 | 43 |
| 4 | 44 |
| 5 | 45 |
| 6 | 46 |

**[2-20]**

Manual additional refrigerant charge.

| [2-20] | Description |
|---|---|
| 0 (default) | Deactivated. |
| 1 | Activated.<br>To stop the manual additional refrigerant charge operation (when the required additional refrigerant amount is charged), push BS3. If this function was not aborted by pushing BS3, the unit will stop its operation after 30 minutes. If 30 minutes was not sufficient to add the needed refrigerant amount, the function can be reactivated by changing the field setting again. |

**[2-22]**

Automatic low noise setting and level during night time.

By changing this setting, you activate the automatic low noise operation function of the unit and define the level of operation. Depending on the chosen level, the noise level will be lowered. The start and stop moments for this function are defined under setting [2-26] and [2-27]. For more details about settings [2-26] and [2-27], see installer user reference guide

| [2-22] | Description | |
|---|---|---|
| 0 (default) | Deactivated | |
| 1 | Level 1 | Level 5<Level 4<Level 3<Level 2<Level 1 |
| 2 | Level 2 | |
| 3 | Level 3 | |
| 4 | Level 4 | |
| 5 | Level 5 | |

**[2-35]**

Height difference setting.

| [2-35] | Description |
|---|---|
| 0 | In case the outdoor unit is installed in the lowest position (indoor units are installed on a higher position than outdoor units) and the height difference between the highest indoor unit and the outdoor unit exceeds 40 m, the setting [2-35] should be changed to 0. |
| 1 (default) | — |

**[2-60]**

Supervisor remote controller setting. A power reset is required to save this setting.

For details about the supervisor remote controller, see "13.1.2 System layout requirements" [▸ 17] or refer to the remote controller installation and user reference guide.

| [2-60] | Description |
|---|---|
| 0 (default) | No supervisor remote controller connected to the system |
| 1 | Supervisor remote controller connected to system |

### 18.1.8 Indoor unit field setting

**15(25)-13**

Safety system deactivation.

When the room where the indoor unit is installed is big enough that no safety measure is required, the R32 leak safety system in that indoor unit can be deactivated by this setting.

| Safety system deactivation | | | | |
|---|---|---|---|---|
| Setting | 1st code | Function | 2nd code | Description |
| 15/25 | 13 | R32 leak safety system setting | 01 | Disabled |
| | | | 02 | Enabled |

# 19 Commissioning

**CAUTION**

See "2 Specific installer safety instructions" [▸ 5] to make sure commissioning complies with all safety regulations.

**NOTICE**

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

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

## 19.1 Precautions when commissioning

**CAUTION**

**Do NOT perform the test operation while working on the indoor unit(s).**

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

**NOTICE**

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

**NOTICE**

Test run is possible for ambient temperatures between –10°C and 50°C.

During test operation, the outdoor unit and the indoor unit will start up. Make sure that the preparation of the indoor unit is finished (field piping, electrical wiring, air purge, ...). See installation manual of the indoor unit for details.

## 19.2 Checklist before commissioning

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

2 Close the unit.

3 Power up the unit.

| | |
|---|---|
| ☐ | You have read the complete installation and operation instructions described in the **installer and user reference guide**. |
| ☐ | **Installation**<br>Check that the unit is properly installed, to avoid abnormal noises and vibrations when starting up the unit. |
| ☐ | **Transportation stay**<br>Check that the outdoor unit's transportation stay is removed. |
| ☐ | **Field wiring**<br>Check that the field wiring has been carried out according to the instructions described in the chapter "17 Electrical installation" [▶ 33], according to the wiring diagrams and according to the applicable national wiring regulation. |
| ☐ | **Power supply voltage**<br>Check the power supply voltage on the local supply panel. The voltage MUST correspond to the voltage on the nameplate of the unit. |
| ☐ | **Earth wiring**<br>Be sure that the earth wires have been connected properly and that the earth terminals are tightened. |
| ☐ | **Insulation test of the main power circuit**<br>Using a megatester for 500 V, check that the insulation resistance of 2 MΩ or more is attained by applying a voltage of 500 V DC between power terminals and earth. NEVER use the megatester for the interconnection wiring. |
| ☐ | **Fuses, circuit breakers, or protection devices**<br>Check that the fuses, circuit breakers, or the locally installed protection devices are of the size and type specified in the chapter "17.2 Specifications of standard wiring components" [▶ 33]. Be sure that neither a fuse nor a protection device has been bypassed. |
| ☐ | **Internal wiring**<br>Visually check the switch box and the inside of the unit for loose connections or damaged electrical components. |
| ☐ | **Pipe size and pipe insulation**<br>Be sure that correct pipe sizes are installed and that the insulation work is properly executed. |
| ☐ | **Stop valves**<br>Be sure that the stop valves are open on both liquid and gas side. |
| ☐ | **Damaged equipment**<br>Check the inside of the unit for damaged components or squeezed pipes. |
| ☐ | **Refrigerant leak**<br>Check the inside of the unit on refrigerant leakage. If there is a refrigerant leak, try to repair the leak. If the repair is unsuccessful, call your local dealer. Do not touch any refrigerant which has leaked out from refrigerant piping connections. This may result in frostbite. |
| ☐ | **Oil leak**<br>Check the compressor for oil leakage. If there is an oil leak, try to repair the leak. If the repairing is unsuccessful, call your local dealer. |
| ☐ | **Air inlet/outlet**<br>Check that the air inlet and outlet of the unit is NOT obstructed by paper sheets, cardboard, or any other material. |
| ☐ | **Additional refrigerant charge**<br>The amount of refrigerant to be added to the unit shall be written on the included "Added refrigerant" plate and attached to the rear side of the front cover. |
| ☐ | **Requirements for R32 equipment**<br>Make sure the system meets all requirements that are described in the following chapter: "2.1 Instructions for equipment using R32 refrigerant" [▶ 7]. |
| ☐ | **Field settings**<br>Make sure all field settings you want are set. See "18.1 Making field settings" [▶ 36]. |
| ☐ | **Installation date and field setting**<br>Be sure to keep record of the installation date on the sticker on the rear of the upper front panel according to EN60335-2-40 and keep record of the contents of the field setting(s). |

## 19.3 Checklist during commissioning

| | |
|---|---|
| ☐ | To perform a **test run**. |

## 19.4 About the system test run

**NOTICE**

Make sure to carry out the test run after the first installation. Otherwise, the malfunction code U3 will be displayed on the user interface and normal operation or individual indoor unit test run cannot be carried out.

The procedure below describes the test operation of the complete system. This operation checks and judges following items:

- Check for incorrect wiring (communication check with indoor units).
- Check of the stop valves opening.
- Judgement of piping length.

- After the test operation is finished, check the indoor unit by performing a normal operation using the user interface. Refer to the indoor unit installation manual for more details concerning the individual test run.

**INFORMATION**

- It may take 10 minutes to achieve a uniform refrigerant state before the compressor starts.
- During the test operation, the refrigerant running sound or the magnetic sound of a solenoid valve may become loud and the display indication may change. These are not malfunctions.

### 19.4.1 To perform a test run

1 Close all front panels to prevent misjudgement.

2 Make sure all field settings you want are set; see "18.1 Making field settings" [▶ 36].

3 Turn ON the power to the outdoor unit and the connected indoor units.

**NOTICE**

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

4 Make sure the default (idle) situation is existing; see "18.1.3 To access mode 1 or 2" [▶ 37]. Push BS2 for 5 seconds or more. The unit will start test operation.

**Result:** The test operation is automatically carried out, the outdoor unit display will indicate "t01" and the indication "Test operation" and "Under centralised control" will display on the user interface of indoor units.

Steps during the automatic system test run procedure:

| Step | Description |
|---|---|
| t01 | Control before start up (pressure equalisation) |
| t02 | Cooling start up control |
| t03 | Cooling stable condition |
| t04 | Communication check and stop valve check |
| t06 | Pipe length check |
| t09 | Pump down operation |
| t10 | Unit stop |

**INFORMATION**

During the test operation, it is not possible to stop the unit operation from a user interface. To abort the operation, press BS3. The unit will stop after ±30 seconds.

5 Check the test operation results on the outdoor unit 7-segment display.

| Completion | Description |
|---|---|
| Normal completion | No indication on the 7-segment display (idle). |
| Abnormal completion | Indication of malfunction code on the 7-segment display.<br>Refer to "19.4.2 Correcting after abnormal completion of the test run" [▶ 40] to take actions for correcting the abnormality. When the test operation is fully completed, normal operation will be possible after 5 minutes. |

### 19.4.2 Correcting after abnormal completion of the test run

The test operation is only completed if there is no malfunction code displayed on the user interface or outdoor unit 7-segment display. In case of a displayed malfunction code, perform correcting actions as explained in the malfunction code table. Carry out the test operation again and confirm that the abnormality is properly corrected.

**INFORMATION**

Refer to the installation manual of the indoor unit for detailed malfunction codes related to indoor units.

# 20 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.

# 21 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

## 21.1 Maintenance safety precautions

**DANGER: RISK OF ELECTROCUTION**

**DANGER: RISK OF BURNING/SCALDING**

**WARNING**

Prior to start working on systems containing flammable refrigerant, safety checks are necessary to ensure that the risk of ignition is minimised. Therefore, some instructions should be followed.

Please refer to the service manual for more information.

**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.

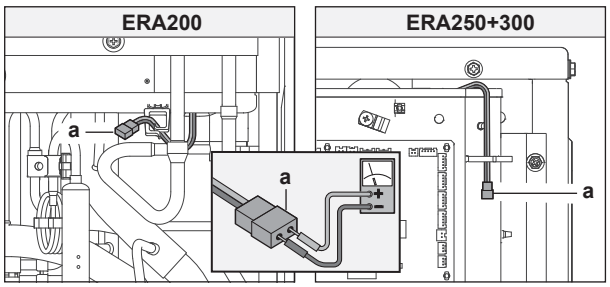
### 21.1.1 To prevent electrical hazards

When performing service to inverter equipment:

1 Do NOT perform electrical work 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.




**a** Connector for capacitor voltage check

3 Pull out junction connectors X1A, X2A for the fan motors 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.)

4 After the service is finished, plug the junction connector back in. Otherwise the malfunction code E7 will be displayed on the user interface or on the outdoor unit 7-segment display and normal operation will NOT be performed.

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

Pay attention to the fan. It is dangerous to inspect the unit while the fan is running. Make sure to turn off the main switch and to remove the fuses from the control circuit located in the outdoor unit.

## 21.2 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.

## 21.3 About service mode operation

Refrigerant recovery operation/vacuuming operation is possible by applying setting [2-21]. Refer to "18.1 Making field settings" [▶ 36] for details how to set mode 2.

When vacuuming/recovery mode is used, check very carefully what should be vacuumed/recovered before starting. See installation manual of the indoor unit for more information about vacuuming and recovery.

### 21.3.1 To use vacuum mode

1 When the unit is at standstill, set the unit in [2-21]=1.

**Result:** When confirmed, the indoor and outdoor unit expansion valves will fully open. At that moment the 7-segment display indication=E0 1 and the user interface of the indoor unit indicate TEST (test operation) and (external control) and the operation will be prohibited.

2 Evacuate the system with a vacuum pump.

3 Press BS3 to stop vacuuming mode.

### 21.3.2 To recover refrigerant

This should be done with a refrigerant recovery unit. Follow the same procedure as for vacuuming method.

**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.

**NOTICE**

Make sure to NOT recover any oil while recovering refrigerant. **Example:** By using an oil separator.

# 22 Troubleshooting

**CAUTION**

See "2 Specific installer safety instructions" [▶ 5] to make sure troubleshooting complies with all safety regulations.

## 22.1 Solving problems based on error codes

In case of a displayed malfunction code, perform correcting actions as explained in the malfunction code table.

After correcting the abnormality, press BS3 to reset the malfunction code and retry operation.

The malfunction code which is displayed on the outdoor unit will indicate a main malfunction code and a sub code. The sub code indicates more detailed information about the malfunction code. The malfunction code will be displayed intermittent.

**Example:**

| Code | Example |
|---|---|
| Main code | E3 |
| Sub code | -01 |

With an interval of 1 second, the display will switch between main code and sub code.

**INFORMATION**

See the service manual for:

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

### 22.1.1 Error codes: Overview

| Main code | Sub code | Cause | Solution | SVEO[a] | SVS[b] |
|---|---|---|---|---|---|
| A0 | - 11 | The R32 sensor of the compatible air curtain has detected a refrigerant leak[c] | Possible R32 leak. The compressor will shut down and the unit will stop operating. Service is needed to repair the leak and activate the system. Refer to the service manual for more information. | | ✓ |
| | /CH | Safety system error (leak detection)[c] | An error related to the safety system occurred.<br>Refer to the service manual for more information. | | |
| CH | -01 | R32 sensor malfunction or disconnection (indoor)[c] | Check connection on PCB or actuator.<br>The system will stop operating, together with the indoor unit. Refer to the service manual for more information. | | ✓ |
| | -02 | R32 sensor lifetime exceeded (indoor)[c] | The sensor is at the end of lifetime and must be replaced.<br>Refer to the service manual for more information. | | |
| | -05 | R32 sensor end of lifetime<6 months (indoor)[c] | The sensor is almost at the end of lifetime and must be replaced.<br>Refer to the service manual for more information. | | |
| | - 10 | Waiting for indoor unit R32 sensor replacement input[c] | Refer to the service manual for more information. | | |
| E2 | -01 | Earth leakage detector activated | Restart the unit. If the problem reoccurs, contact your dealer. | | |
| | -06 | Earth leakage detector malfunction (open circuit) - A1P (X101A) | Check connection on PCB or actuator. | | |
| E3 | -01 | High pressure switch was activated (S1PH) – main PCB (X2A) | Check stop valve situation or abnormalities in (field) piping or airflow over air cooled coil. | | |
| | -02 | ▪ Refrigerant overcharge<br>▪ Stop valve closed | ▪ Check refrigerant amount+recharge unit.<br>▪ Open stop valves | | |
| | - 13 | Stop valve closed (liquid) | Open liquid stop valve. | | |
| | - 18 | ▪ Refrigerant overcharge<br>▪ Stop valve closed | ▪ Check refrigerant amount+recharge unit.<br>▪ Open stop valves. | | |
| E4 | -01 | Low pressure malfunction:<br>▪ Stop valve closed<br>▪ Refrigerant shortage<br>▪ Indoor unit malfunction | ▪ Open stop valves.<br>▪ Check refrigerant amount+recharge unit.<br>▪ Check the user interface's display or interconnection wiring between the outdoor unit and the indoor unit. | | |
| E9 | -01 | Electronic expansion valve malfunction (heat exchanger) (Y1E) – main PCB (X21A) | Check connection on PCB or actuator. | | |
| | -04 | Electronic expansion valve malfunction (inverter cooling) (Y3E) – main PCB (X23A) | Check connection on PCB or actuator. | | |
| | -26 | Electronic expansion valve malfunction (liquid injection) (Y4E) – main PCB (X25A) | Check connection on PCB or actuator. | | |
| | -29 | Electronic expansion valve malfunction (subcool heat exchanger) (Y2E) – main PCB (X26A) | Check connection on PCB or actuator. | | |
| F3 | -01 | Discharge temperature too high (R21T) – main PCB (X33A):<br>▪ Stop valve closed<br>▪ Refrigerant shortage | ▪ Open stop valves.<br>▪ Check refrigerant amount+recharge unit. | | |
| | -20 | Compressor casing temperature too high (R8T) – main PCB (X33A):<br>▪ Stop valve closed<br>▪ Refrigerant shortage | ▪ Open stop valves.<br>▪ Check refrigerant amount+recharge unit. | | |
| H9 | -01 | Ambient temperature sensor malfunction (R1T) – main PCB (X18A) | Check connection on PCB or actuator. | | |

| Main code | Sub code | Cause | Solution | SVEO[a] | SVS[b] |
|---|---|---|---|---|---|
| J3 | -16 | Discharge temperature sensor malfunction (R21T): open circuit – main PCB (X33A) | Check connection on PCB or actuator. | | |
| | -17 | Discharge temperature sensor malfunction (R21T): short circuit - main PCB (X33A) | Check connection on PCB or actuator. | | |
| | -47 | Compressor casing temperature sensor malfunction (R8T): open circuit - main PCB (X33A) | Check connection on PCB or actuator. | | |
| | -48 | Compressor casing temperature sensor malfunction (R8T): short circuit - main PCB (X33A) | Check connection on PCB or actuator. | | |
| J5 | -18 | Suction temperature sensor (R3T) – main PCB (X30A) | Check connections on PCB or actuator. | | |
| J6 | -01 | Heat exchanger deicer temperature sensor (R7T) – main PCB (X30A) | Check connection on PCB or actuator | | |
| J7 | -06 | Subcool heat exchanger – liquid - temperature sensor (R5T) - main PCB (X30A) | Check connection on PCB or actuator. | | |
| J8 | -01 | Heat exchanger – liquid -temperature sensor (R4T ) - main PCB (X30A) | Check connection on PCB or actuator. | | |
| J9 | -01 | Subcool heat exchanger – gas - temperature sensor (R6T) – main PCB (X30A) | Check connection on PCB or actuator. | | |
| JA | -06 | High pressure sensor malfunction (S1NPH): open circuit - main PCB (X32A) | Check connection on PCB or actuator. | | |
| | -07 | High pressure sensor malfunction (S1NPH): short circuit - main PCB (X32A) | Check connection on PCB or actuator. | | |
| JC | -06 | Low pressure sensor malfunction (S1NPL): open circuit - main PCB (X31A) | Check connection on PCB or actuator. | | |
| | -07 | Low pressure sensor malfunction (S1NPL): short circuit - main PCB (X31A) | Check connection on PCB or actuator. | | |
| LC | -14 | Transmission outdoor unit - inverter: INV1 transmission trouble - main PCB (X20A, X28A, X40A) | Check connection. | | |
| | -19 | Transmission outdoor unit - inverter: FAN1 transmission trouble - main PCB (X20A, X28A, X40A) | Check connection. | | |
| | -24 | Transmission outdoor unit - inverter: FAN2 transmission trouble - main PCB (X20A, X28A, X40A) | Check connection. | | |
| P1 | -01 | INV1 unbalanced power supply voltage | Check if power supply is within range. | | |
| U1 | -01 | Reversed power supply phase malfunction | Correct phase order. | | |
| | -04 | Reversed power supply phase malfunction | Correct phase order. | | |
| U2 | -01 | INV1 voltage power shortage | Check if power supply is within range. | | |
| | -02 | INV1 power phase loss | Check if power supply is within range. | | |
| U3 | -03 | Malfunction code: system test run not yet executed (system operation not possible) | Execute system test run. | | |
| | -04 | An error occurred during the test run | Re-execute the test run. | | |
| | -05, -06 | Test run aborted | Re-execute the test run. | | |
| | -07, -08 | Test run aborted due to communication issues | Check the communication wires and re-execute the test run. | | |
| U4 | -03 | Indoor unit communication error | Check user interface connection. | | |
| U9 | -01 | Warning because there is an error on another indoor unit | Check if other indoor units have a malfunction and confirm if indoor unit mix is allowed. | | |
| UA | -03 | Connection malfunction over indoor units or type mismatch | Check the type of indoor unit that is currently connected. Make sure that a correct indoor unit (only one EKEA or one compatible air curtain) is connected. If an incorrect type of indoor unit is connected, replace it with the correct one. After the correct indoor unit is connected long-press BS3 to complete the identification of indoor unit. | | |
| | -18 | Connection malfunction over indoor units or type mismatch | Check if other indoor units have a malfunction and confirm if indoor unit mix is allowed. | | |
| | -20 | Wrong outdoor unit connected | Disconnect the outdoor unit. | | |

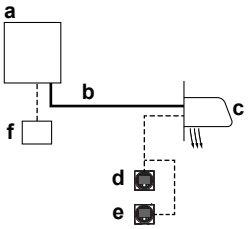
| Main code | Sub code | Cause | Solution | SVEO[a] | SVS[b] |
|---|---|---|---|---|---|
| UH | -01 | Auto address malfunction (inconsistency) | Check if interconnected unit amount matches with powered unit amount (by monitor mode) or wait until initialisation is finished. | | |
| UJ | -37 | AHU supply airflow rate below the legal limit[d] | Make sure the T5T6 digital input is set correctly, refer to EKEA installation and operation manual. | ✓ | |
| In case other error codes appear, contact your dealer. | | | | | |

[a] The SVEO terminal provides an electrical contact that closes in case the indicated error occurs.
[b] The SVS terminal provides an electrical contact that closes in case the indicated error occurs.
[c] The error code is only shown on the user interface of the compatible air curtain where the error occurs.
[d] In case the AHU supply airflow rate is above the legal limit for 5 minutes continuously, this error is automatically solved.

## 22.2 Refrigerant leak detection system

**Normal operation**

During normal operation, the alarm only and supervisor remote controller have no functionality. The screen of the remote controller in alarm only and supervisor mode will be off. Operation of the remote controller can be checked by pushing the ○ button to open the installer menu.




**a** Heat pump outdoor unit
**b** Refrigerant piping
**c** Compatible air curtain
**d** Remote controller in normal mode
**e** Remote controller in supervisor mode (mandatory in some situations)
**f** Centralised controller (optional)

**Note:** During start-up of the system, the mode of the remote control can be verified from the screen.

**Leak detection operation**

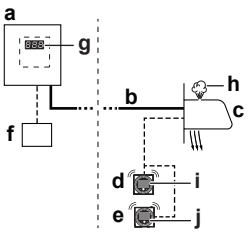
If the R32 sensor in the air curtain unit detects a refrigerant leak, the user will be warned by both audible and visible signals of the remote controller of the leaking indoor unit (and the supervisor remote controller, if applicable). At the same time the compressor will be shut down and the system cannot operate anymore. Service is needed to repair the leak and activate the system. Refer to the service manual for more information.

Feedback of the remote controller after leak detection operation will depend on its mode.

**WARNING**

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

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




**a** Heat pump outdoor unit
**b** Refrigerant piping
**c** Compatible air curtain
**d** Remote controller in normal mode and alarm only mode
**e** Remote controller in supervisor mode (mandatory in some situations)
**f** Centralised controller (optional)
**g** Outdoor unit error code on 7-segment display
**h** Refrigerant leak
**i** Error code 'A0–11' and audible alarm and red warning signal is generated from this remote controller.
**j** Error code 'A0–11' and audible alarm and red warning signal is generated from this **supervisor** remote controller. The unit **address** is displayed on this remote controller.

**Note:** It is possible to stop the leak detection alarm from the remote controller and from the app. To stop the alarm from the remote controller, press + for 3 seconds.

**Note:** Leak detection will trigger SVS output. For more information, see "17.5 To connect the external outputs" [▸ 35].

**Note:** An optional output, if available on a compatible air curtain, can be used for an external device. This output will trigger in case a leak is detected. For more information about this output, refer to the installation manual of the compatible air curtain unit.

**Note:** Some centralised controllers can also be used as supervisor remote controller. For further details on installation, please refer to the installation manual of the centralised controllers.

**NOTICE**

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

# 23 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.

# 24 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).

## 24.1 Service space: Outdoor unit

When mounting units side by side, the piping route must be to the front or downwards. In this case the piping route to the side is not possible.

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

→ See "figure 1" [▸ 2] on the inside of the front cover of this manual.

| | |
|---|---|
| **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 |

**Note:** For better serviceability, use a distance ≥250 mm for all dimensions marked with '**a**'.

**Multiple rows of units (  )**

→ See "figure 2" [▸ 2] on the inside of the front cover of this manual.

**Note:** For better serviceability, use a side by side distance ≥250 mm (instead of ≥100 mm as shown on the figures above).

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

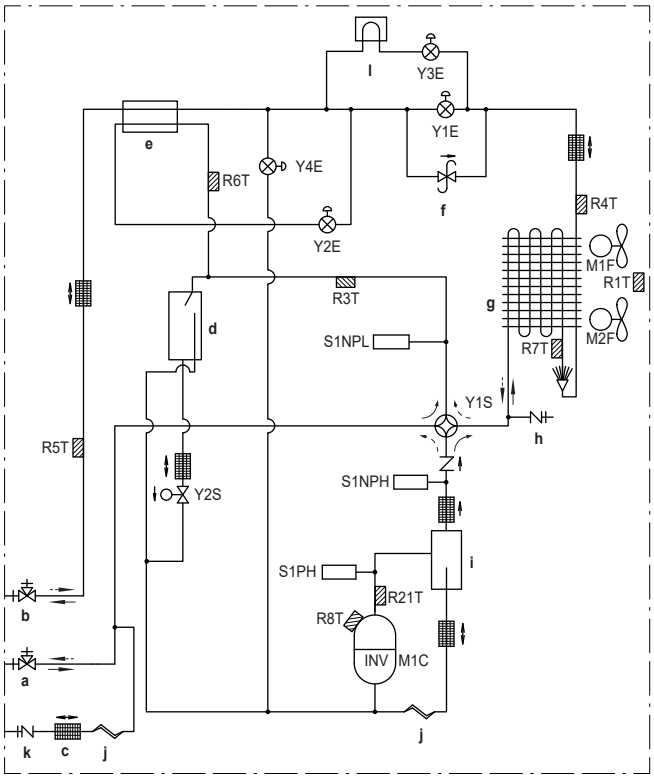
→ See "figure 3" [▸ 2] on the inside of the front cover of this manual.

| | |
|---|---|
| **A1=>A2** | (A1) If there is danger of drainage dripping and freezing between the upper and lower units…<br>(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…<br>(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. |

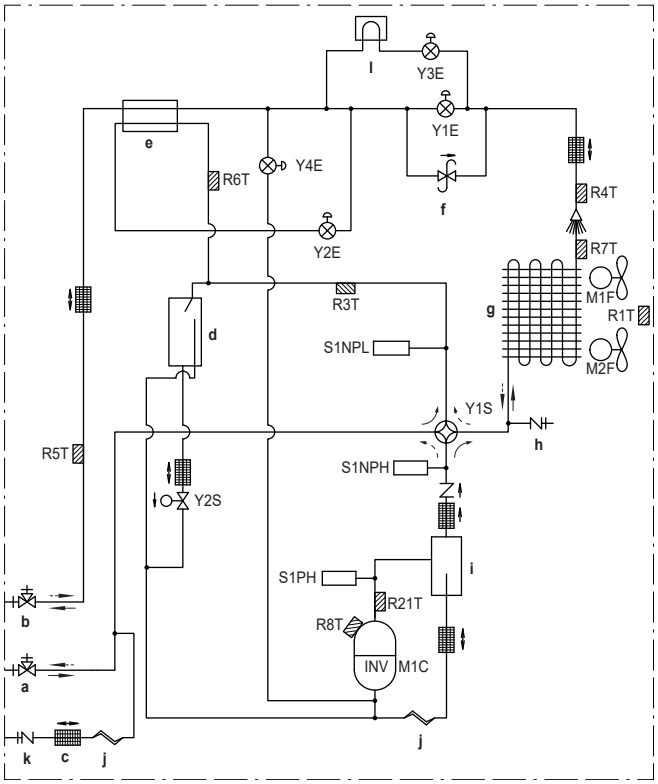
**Note:** For better serviceability, use a side by side distance ≥250 mm (instead of ≥100 mm as shown on the figures above).

## 24.2 Piping diagram: Outdoor unit

**Piping diagram: ERA200**




**Piping diagram: ERA250+300**




**Legend:**

| | |
|---|---|
| **a** | Stop valve (gas) |
| **b** | Stop valve (liquid) |
| **c** | Filter (6×) |
| **d** | Accumulator |
| **e** | Subcool tube heat exchanger |
| **f** | Pressure regulating valve |
| **g** | Heat exchanger |
| **h** | Service port |
| **i** | Oil separator |

| | |
|---|---|
| **j** | Capillary tube (2×) |
| **k** | Charge port |
| **l** | Heat sink |
| **M1C** | Compressor |
| **M1F-M2F** | Fan motor |
| **R1T** | Thermistor (air) |
| **R3T** | Thermistor (suction accumulator) |
| **R4T** | Thermistor (heat exchanger, liquid) |
| **R5T** | Thermistor (liquid) |
| **R6T** | Thermistor (subcool heat exchanger, gas) |
| **R7T** | Thermistor (de-icer) |
| **R8T** | Thermistor (M1C body) |
| **R21T** | Thermistor (M1C discharge pipe) |
| **S1NPH** | High pressure sensor |
| **S1NPL** | Low pressure sensor |
| **S1PH** | High pressure switch |
| **Y1E** | Electronic expansion valve (main) |
| **Y2E** | Electronic expansion valve (subcool heat exchanger) |
| **Y3E** | Electronic expansion valve (inverter cooling) |
| **Y4E** | Electronic expansion valve (liquid injection) |
| **Y1S** | Solenoid valve (4-way valve) |
| **Y2S** | Solenoid valve (accumulator oil return) |
| —► | Cooling |
| --► | Heating |

## 24.3 Wiring diagram: Outdoor unit

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

**Notes:**

1 Symbols (see below).

2 Refer to the installation or service manual on how to use the BS1~BS3 push buttons and DS1~DS2 switches.

3 Do not operate the unit by short-circuiting protection device S1PH.

4 Refer to the installation manual for indoor-outdoor transmission F1-F2 wiring.

5 When using the central control system, connect outdoor-outdoor transmission F1-F2.

6 The capacity of the contact is 220~240 VAC – 0.5 A. (Rush current needs 3 A or less)

7 Use dry contact for micro-current (1 mA or less 12VDC).

**Symbols:**

| | |
|---|---|
| X1M | Main terminal |
| —·—·—·— | Earth wiring |
| 15 | Wire number 15 |
| - - - - - - - | Field wire |
| | Field cable |
| —> **/12.2 | Connection ** continues on page 12 column 2 |
| ① | Several wiring possibilities |
| | Option |
| | Not mounted in switch box |
| | Wiring depending on model |
| | PCB |

**Colours:**

| | |
|---|---|
| BLK | Black |
| BLU | Blue |
| BRN | Brown |
| GRN | Green |
| ORG | Orange |
| RED | Red |
| WHT | White |
| YLW | Yellow |

**Legend for wiring diagram:**

| | |
|---|---|
| A1P | Printed circuit board (main) |
| A2P | Printed circuit board (noise filter) |
| A3P | Printed circuit board (inverter) |
| A4P | Printed circuit board (fan 1) |
| A5P | Printed circuit board (fan 2) |
| A6P | Printed circuit board (cool/heat selector) |
| BS* (A1P) | Push button switch |
| DS* (A1P) | DIP switch |
| E1HC | Crankcase heater |
| F1U (A1P) | Fuse (T 10 A / 250 V) |
| F1U, F2U | Fuse (T 1 A / 250 V) |
| F3U | Field fuse (field supply) |
| HAP (A1P) | Light-emitting diode (service monitor is green) |
| K*R (A*P) | Relay on PCB |
| L1R | Reactor |
| M1C | Motor (compressor) |
| M1F, M2F | Motor (upper and lower fan) |
| Q1DI | Earth leakage circuit breaker (field supply) |
| R1T | Thermistor (air) |
| R3T | Thermistor (suction accumulator) |
| R4T | Thermistor (heat exchanger liquid) |
| R5T | Thermistor (liquid) |
| R6T | Thermistor (subcool heat exchanger gas) |
| R7T | Thermistor (de-icer) |
| R8T | Thermistor (M1C body) |
| R21T | Thermistor (M1C discharge pipe) |
| S1NPH | High pressure sensor |
| S1NPL | Low pressure sensor |
| S1PH | High pressure switch |
| S1S | Air control switch (optional) |
| S2S | Cool/heat switch (optional) |
| SEG* (A1P) | 7-segment display |
| SFB | Mechanical ventilation error input (field supply) |
| T1A | Current sensor |
| X*A | Connector |
| X*M | Terminal strip |
| Y1E | Electronic expansion valve (heat exchanger) |
| Y2E | Electronic expansion valve (subcool heat exchanger) |
| Y3E | Electronic expansion valve (inverter cooling) |
| Y4E | Electronic expansion valve (liquid injection) |
| Y1S | Solenoid valve (4-way valve) |
| Y2S | Solenoid valve (accumulator oil return) |
| Y3S | Error operation output (SVEO)(field supply) |
| Y4S | Leak sensor output (SVS)(field supply) |
| Z*C | Noise filter (ferrite core) |

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