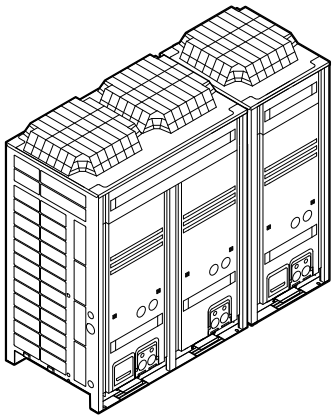
Installation and operation manual

CO_2 VRV heat pump



RXYN10B7Y1B

Installation and operation manual
CO_2 VRV heat pump

English

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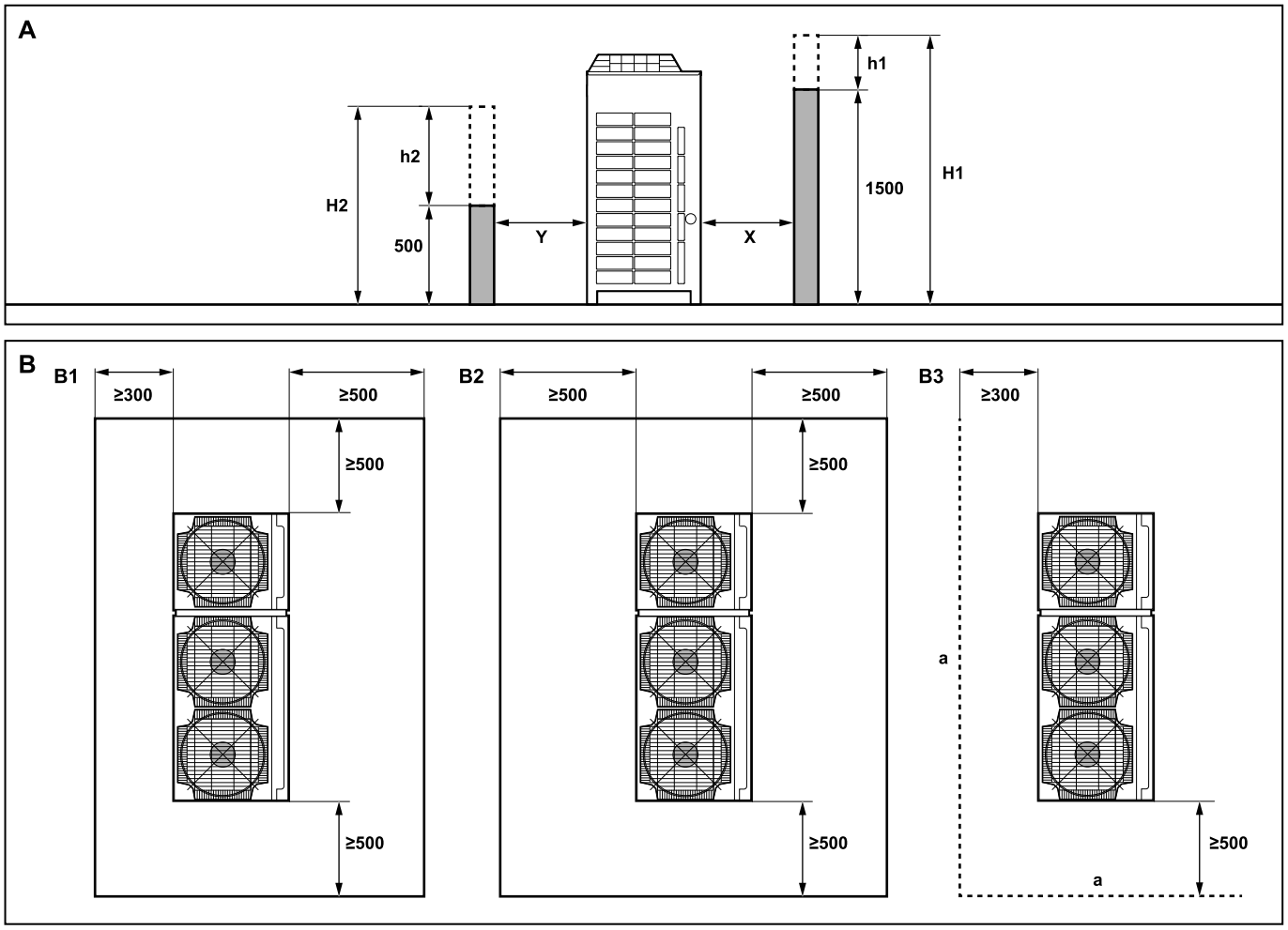
A
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1

Table of contents

1 About this document

NOTICE

Make sure to install all necessary countermeasures in case of refrigerant leakage according to standard EN378.

Target audience

Authorised installers + end users

INFORMATION

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

Documentation set

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

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

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

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

Technical engineering data

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

2 Specific installer safety instructions

Always observe the following safety instructions and regulations.

General installation requirements

WARNING

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

CAUTION

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

About the box (see "11 About the box" [▶ 16])

WARNING

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

CAUTION

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

WARNING

Do NOT use the middle opening of the outdoor unit to attach the belts.

ALWAYS use the outer openings.

WARNING

Do NOT use the outer left opening of the outdoor unit for lifting the unit with a forklift.

About the unit and options (see "12 About the units and options" [▶ 17])

WARNING

ONLY the refrigeration parts that are also designed to work with R744 (CO_2) shall be connected to the system.

Unit installation (see "13 Unit installation" [▶ 19])

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.

WARNING

Follow the service space dimensions in this manual to install the unit correctly. See "13.1.1 Installation site requirements of the outdoor unit" [▶ 20].

NOTICE

Make sure to install all necessary countermeasures in case of refrigerant leakage according to standard EN378.

WARNING

Fix the unit correctly. For instructions, see "13 Unit installation" [▶ 19].

WARNING

Fixing method of the outdoor unit MUST be in accordance with the instructions from this manual. See "13.3 Mounting the outdoor unit" [▶ 21].

CAUTION

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

The equipment meets the requirements for commercial and light-industrial locations when professionally installed and maintained.

CAUTION

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

CAUTION

Excessive concentrations of refrigerant R744 (CO_2) in a closed room can lead to unconsciousness and oxygen deficiency. Take appropriate measures.

CAUTION

If the safety valve operates inside the unit, CO_2 gas may concentrate inside the casing of the outdoor unit. Therefore, you should ALWAYS take a distance for your own safety. You can close the outdoor unit if your portable CO_2 detector confirmed that the concentration of CO_2 is at an acceptable level. For example, if 7 kg CO_2 is released inside the casing, it takes around 5 minutes until the concentration of CO_2 is low enough.

Piping installation (see "14 Piping installation" [▶ 22])

DANGER: RISK OF BURNING/SCALDING

WARNING

Field piping MUST be in accordance with the instructions from this manual. See "14 Piping installation" [▶ 22].

WARNING

The unit contains small amounts of refrigerant R744.

WARNING

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

If these instructions are NOT followed correctly it may result in property damage or personal injury, which may be serious depending on the circumstances.

WARNING

NEVER remove the spun piping by brazing.

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

WARNING

When stop valves are closed during service, the pressure of the closed circuit will increase due to high ambient temperature. Make sure the pressure is kept below the design pressure.

WARNING

- ONLY use R744 (CO_2) as refrigerant. Other substances may cause explosions and accidents.
- When installing, charging refrigerant, maintaining or performing service, ALWAYS use personal protective equipment, such as safety shoes, safety gloves and safety glasses.
- If the unit is installed indoors (for example, in a machine room), ALWAYS use a portable CO_2 detector.
- If the front panel is open, ALWAYS beware of the rotating fan. The fan will continue rotating for a while, even after the power switch has been turned off.

WARNING

- Use K65 piping for high-pressure applications with a working pressure of 120 bar gauge.
- Use K65 and fittings approved for a working pressure of 120 bar gauge.
- ONLY brazing is allowed to connect pipes. No other types of connections are allowed.
- Expanding pipes is NOT allowed.

WARNING

Serious injury and/or damage can result from the blow-off of the liquid receiver safety valve (see "20.1 Piping diagram: Outdoor unit" [▶ 44]):

- NEVER service the unit when the pressure at the liquid receiver is higher than the set pressure of the liquid receiver safety valve (90 bar gauge ±3%). If this safety valve releases refrigerant, it can cause serious injury and/or damage.
- If the pressure > set pressure, ALWAYS discharge from pressure relief devices before servicing.
- It is recommended to install and secure blow-off piping to the safety valve.
- ONLY alter the safety valve if the refrigerant has been removed.

WARNING

All installed safety valves MUST ventilate to the outdoor space and NOT into a closed area.

WARNING

Install safety valves in a proper way according the applicable national regulation.

WARNING

To ensure that the safety valve(s) and the changeover valve are properly reinstalled, a leak test is mandatory.

2 Specific installer safety instructions

WARNING

Before putting the system into service, check if all field supplied components or indoor units comply with pressure test specifications of EN378-2. If you are not sure, it is recommended to perform the test below.

CAUTION

When installing a safety valve, ALWAYS add enough support to the valve. An activated safety valve is under high pressure. If not installed securely, the safety valve may cause damage to the piping or the unit.

CAUTION

Do NOT open the stop valve until you have measured the insulation resistance of the main power supply circuit.

CAUTION

ALWAYS use nitrogen gas for leak tests.

CAUTION

ALWAYS use K65 T-joints for refrigerant branching.

CAUTION

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

CAUTION

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

Charging refrigerant (see "15 Charging refrigerant" [▶ 31])

WARNING

Charging of refrigerant MUST be in accordance with the instructions from this manual. See "15 Charging refrigerant" [▶ 31].

WARNING

- ONLY use R744 (CO_2) as refrigerant. Other substances may cause explosions and accidents.
- When installing, charging refrigerant, maintaining or performing service, ALWAYS use personal protective equipment, such as safety shoes, safety gloves and safety glasses.
- If the unit is installed indoors (for example, in a machine room), ALWAYS use a portable CO_2 detector.
- If the front panel is open, ALWAYS beware of the rotating fan. The fan will continue rotating for a while, even after the power switch has been turned off.

CAUTION

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

CAUTION

Do NOT charge liquid refrigerant directly to a gas line. Liquid compression could cause compressor operation failure.

WARNING

- Do NOT pierce or burn refrigerant cycle parts.
- Be aware that the refrigerant inside the system is odourless.

WARNING

The R744 refrigerant (CO_2) inside the unit is odourless, non-flammable and normally does NOT leak.

If the refrigerant leaks in high concentrations in the room, it may have negative effects on its occupants such as asphyxiation and carbon dioxide poisoning. 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

After charging refrigerant, keep the power supply of the outdoor unit ON to avoid a pressure increase on the low pressure (suction piping) side and to avoid pressure increase on the pressure side of the liquid receiver.

Electrical installation (see "16 Electrical installation" [▶ 32])

DANGER: RISK OF ELECTROCUTION

WARNING

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

WARNING

Electrical wiring MUST be in accordance with the instructions from:

- This manual. See "16 Electrical installation" [▶ 32].
- The wiring diagram of the outdoor unit, which is delivered with the unit, located on the inside of the top plate. For a translation of its legend, see "20.2 Wiring diagram: Outdoor unit" [▶ 46].

WARNING

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

WARNING

ALWAYS use multicore cable for power supply cables.

WARNING

- If the power supply has a missing or wrong N-phase, equipment might break down.
- Establish proper earthing. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earthing may cause electrical shocks.
- Install the required fuses or circuit breakers.
- Secure the electrical wiring with cable ties so that the cables do NOT come in contact with sharp edges or piping, particularly on the high-pressure side.
- Do NOT use taped wires, extension cords, or connections from a star system. They can cause overheating, electrical shocks or fire.
- Do NOT install a phase advancing capacitor, because this unit is equipped with an inverter. A phase advancing capacitor will reduce performance and may cause accidents.

CAUTION

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

WARNING

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

WARNING

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

CAUTION

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

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

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.

WARNING

The electrical components shall only be replaced with parts specified by the appliance manufacturer.

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.

Configuration (see "17 Configuration" [▶ 37])

DANGER: RISK OF ELECTROCUTION

Commissioning (see "18 Commissioning" [▶ 39])

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING/SCALDING

WARNING

Commissioning MUST be in accordance with the instructions from this manual. See "18 Commissioning" [▶ 39].

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

After the refrigerant is fully charged, do NOT turn off the power supply of the outdoor unit. This prevents the safety valve actuation due to an increase in internal pressure under high ambient temperature conditions.

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 "19 Troubleshooting" [▶ 41])

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING/SCALDING

WARNING

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

WARNING

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

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

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

WARNING

This unit contains electrical and hot parts.

WARNING

Do NOT keep flammable materials inside the unit. They may cause an explosion or a fire.

WARNING: FLAMMABLE MATERIAL

Do NOT place a flammable spray bottle near the unit and do NOT use sprays near the unit. **Possible consequence:** fire.

WARNING

NEVER use a flammable spray such as hair spray, lacquer or paint near the unit. It may cause a fire.

CAUTION

To avoid oxygen deficiency, ventilate the room sufficiently if equipment with burner is used together with the system.

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

- 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 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

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

CAUTION

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

About the system (see "4 About the system" [▶ 10])

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.

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

WARNING:  System contains refrigerant under very high pressure.

The system MUST be serviced by qualified persons ONLY.

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

Be careful with ladders when working in high places.

WARNING

Do NOT let the indoor unit get wet. **Possible consequence:** Electrical shock or fire.

WARNING

When turning the power OFF for a long stop period, ALWAYS remove the refrigerant from the units. If you cannot remove the refrigerant for any reason, ALWAYS keep the power turned ON.

WARNING

- Do NOT pierce or burn refrigerant cycle parts.
- Be aware that the refrigerant inside the system is odourless.

WARNING

The R744 refrigerant (CO_2) inside the unit is odourless, non-flammable and normally does NOT leak.

If the refrigerant leaks in high concentrations in the room, it may have negative effects on its occupants such as asphyxiation and carbon dioxide poisoning. 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

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.

CAUTION

Do NOT insert fingers, rods or other objects into the air inlet or outlet. 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.

CAUTION

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

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.

4 About the system

WARNING

Do NOT modify, disassemble, remove, reinstall or repair the unit yourself as incorrect dismantling or installation may cause an electrical shock or fire. Contact your dealer.

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 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.

NOTICE

Do NOT place objects that should NOT get wet below the unit. Condensation on the unit or refrigerant pipes, or drain blockage may cause dripping. **Possible consequence:** Objects under the unit can get dirty or damaged.

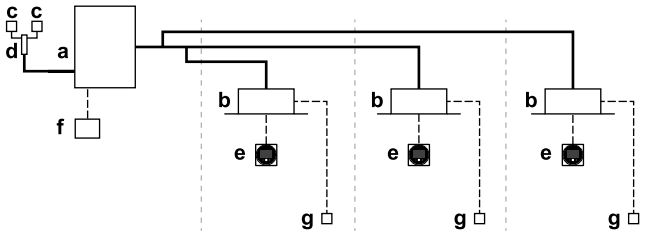
NOTICE

It is NOT allowed to cool technical rooms like server rooms and data centres, where year-round cooling is required.

4.1 System layout

INFORMATION

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



a Main outdoor unit (RXYN10*)
b VRV direct expansion (DX) indoor unit
c Safety valve (accessory)
d Changeover valve (accessory)
e Remote controller
f Centralised controller (optional)
g Option PCB (optional)
—— Refrigerant piping
----- Interconnection and user interface wiring

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	–5~43°C DB	–20~20°C DB –20~15.5°C WB
Indoor temperature	21~32°C DB 14~24°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.

6.2 Field piping pressure

Always keep the following field piping pressure in mind:

Piping	Field piping pressure
Gas	120 bar gauge
Liquid	120 bar gauge

6.3 Operating the system

6.3.1 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.

6.3.2 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).
- When the display "changeover under centralised control" flashes, refer to "6.6.1 About setting the master user interface" [▸ 12].
- 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.

6.3.3 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.

6.3.4 To operate the system

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.

6.4 Using the dry program

6.4.1 About the dry program

- The function of this program is to decrease the humidity in your room with minimal temperature decrease (minimal room cooling).
- The micro computer automatically determines temperature and fan speed (cannot be set by the user interface).
- The system does not go into operation if the room temperature is low (<20°C).

6.4.2 To use the dry program

To start

1 Press the operation mode selector button on the user interface several times and select (program dry operation).

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

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

3 Press the air flow direction adjust button (only for double-flow, multi-flow, corner, ceiling-suspended and wall-mounted). Refer to "6.5 Adjusting the air flow direction" [▸ 11] for details.

To stop

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

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

NOTICE

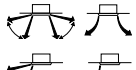
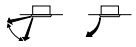
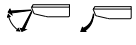
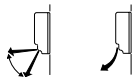
Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

6.5 Adjusting the air flow direction

Refer to the operation manual of the user interface.

6.5.1 About the air flow flap

Air flow flap types:

-  Double flow + multi-flow units
-  Corner units
-  Ceiling suspended units
-  Wall-mounted units

For the following conditions, a micro computer controls the air flow direction which may be different from the display.

Cooling	Heating
▪ When the room temperature is lower than the set temperature.	▪ When starting operation. ▪ When the room temperature is higher than the set temperature. ▪ At defrost operation.
▪ When operating continuously at horizontal air flow direction. ▪ When continuous operation with downward air flow is performed at the time of cooling with a ceiling-suspended or a wall-mounted unit, the micro computer may control the flow direction, and then the user interface indication will also change.	

The air flow direction can be adjusted in one of the following ways:

- The air flow flap itself adjusts its position.
- The air flow direction can be fixed by the user.
- Automatic and desired position .

WARNING

NEVER touch the air outlet or the horizontal blades while the swing flap is in operation. Fingers may become caught or the unit may break down.

NOTICE

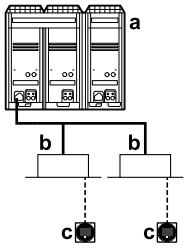
- The movable limit of the flap is changeable. Contact your dealer for details. (only for double-flow, multi-flow, corner, ceiling-suspended and wall-mounted).
- Avoid operating in the horizontal direction . It may cause dew or dust to settle on the ceiling or flap.

6.6 Setting the master user interface

6.6.1 About setting the master user interface

INFORMATION

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



a Outdoor unit
b VRV DX indoor unit
c User interface

When the system is installed as shown in the figure above, it is necessary to – for each subsystem – designate one of the user interfaces as the master user interface.

The displays of slave user interfaces show (changeover under centralised control) and slave user interfaces automatically follow the operation mode directed by the master user interface.

Only the master user interface can select heating or cooling mode (cooling/heating masterhood).

6.6.2 To designate the master user interface

1 Press the operation mode selector button of the current master user interface for 4 seconds. In case this procedure was not yet performed, the procedure can be executed on the first user interface operated.

Result: The display showing (changeover under centralised control) of all slave user interfaces connected to the same outdoor unit flashes.

2 Press the operation mode selector button of the controller that you wish to designate as the master user interface.

Result: Designation is completed. This user interface is designated as the master user interface and the display showing (changeover under centralised control) vanishes. The displays of other user interfaces show (changeover under centralised control).

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" [▶ 7] 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

This product contains refrigerant gases.

Refrigerant type: R744 (CO_2)

WARNING

- Do NOT pierce or burn refrigerant cycle parts.
- Be aware that the refrigerant inside the system is odourless.

WARNING

The R744 refrigerant (CO_2) inside the unit is odourless, non-flammable and normally does NOT leak.

If the refrigerant leaks in high concentrations in the room, it may have negative effects on its occupants such as asphyxiation and carbon dioxide poisoning. 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.

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.

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
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.	Contact your dealer or installer.
Water (other than defrost water) leaks from the unit.	Stop the operation.
The operation switch does NOT work well.	Turn OFF the power supply.
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.
The safety valve has opened.	1 Stop the operation. 2 Turn OFF the power supply. 3 Inform your installer.

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 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 the power is restored. ▪ Check if no fuse has blown or breaker is activated. Change the fuse or reset the breaker if necessary.
The system stops immediately after starting operation.	▪ 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. ▪ Check if the user interface display shows  (time to clean the air filter). (Refer to "7 Maintenance and service" [▸ 12] and "Maintenance" in the indoor unit manual.)
The system operates but cooling or heating is insufficient. (for air conditioner indoor units)	▪ 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. ▪ Check if the air filter is not clogged (refer to "Maintenance" in the indoor unit manual). ▪ Check the temperature setting. ▪ Check the fan speed setting on your user interface. ▪ Check for open doors or windows. Close doors and windows to prevent wind from coming in. ▪ Check if there are too many occupants in the room during cooling operation. Check if the heat source of the room is excessive. ▪ Check if direct sunlight enters the room. Use curtains or blinds. ▪ 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.

Code	Content
A1	EEPROM failure (indoor)
A3	Drain system malfunction (indoor)
A6	Fan motor malfunction (indoor)
A7	Swing flap motor malfunction (indoor)
A9	Expansion valve malfunction (indoor)
AF	Drain malfunction (indoor unit)
AH	Filter dust chamber 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)
CE	Movement detector or floor temperature sensor malfunction (indoor)

Code	Content
C J	User interface thermistor malfunction (indoor)
E 1	PCB malfunction (outdoor)
E2	Current leakage detector was activated (outdoor)
E3	High pressure malfunction
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 or compressor body temperature malfunction
F4	Abnormal suction temperature (outdoor)
F6	Refrigerant overcharge detection
H3	High pressure switch malfunction
H4	Low pressure switch malfunction
H7	Fan motor malfunction (outdoor)
H9	Ambient temperature sensor malfunction (outdoor)
J3	Discharge temperature sensor malfunction or compressor body temperature sensor malfunction (outdoor)
J5	Suction temperature sensor malfunction (outdoor)
J6	Gas cooler outlet sensor malfunction
J7	Heat exchanger outlet sensor malfunction
J8	Liquid temperature sensor malfunction (outdoor)
JA	High pressure sensor malfunction (S1NPH)
JC	Low pressure sensor malfunction (S1NPL)
L 1	INV PCB abnormal
L4	Fin temperature abnormal
L5	INV PCB abnormal
L8	Compressor over current detected
L9	Compressor lock (startup)
LC	Communication malfunction of the inverter circuit
P 1	INV unbalanced power supply voltage
P4	Fin thermistor malfunction
U0	Refrigerant shortage detection
U 1	Reversed power supply phase malfunction
U2	INV voltage power shortage
U4	Faulty wiring indoor/outdoor
U5	Abnormal user interface - indoor communication
U9	Warning because there is an error on another unit (indoor)

Code	Content
UA	Connection malfunction over indoor units capacity or type mismatch
UC	Centralised address duplication
UE	Malfunction in communication centralised control device - indoor unit
UH	Auto address malfunction (inconsistency)

Refer to the service manual for other malfunction codes.

If no malfunction code is displayed, check if:

- power of indoor unit is turned on,
- user interface wiring is broken or incorrectly wired,
- fuse on PCB has melted.

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.

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(s). Please wait 12 minutes maximally until this process is finished.

8.2.4 Symptom: The fan speed does not correspond to the setting

The fan speed does not change even if the fan speed adjustment button is pressed. During heating operation, when the room temperature reaches the set temperature, the outdoor unit goes off and the indoor unit changes to whisper fan speed. This is to prevent cold air blowing directly on occupants of the room. The fan speed will not change even when another indoor unit is in heating operation, if the button is pressed.

8.2.5 Symptom: The fan direction does not correspond to the setting

The fan direction does not correspond with the user interface display. The fan direction does not swing. This is because the unit is being controlled by the micro computer.

8.2.6 Symptom: White mist comes out of a unit (Indoor unit)

- When humidity is high during cooling operation. If the interior of an indoor unit is extremely contaminated, the temperature distribution inside a room becomes uneven. It is necessary to clean the interior of the indoor unit. Ask your dealer for details on cleaning the unit. This operation requires a qualified service person.
- Immediately after the cooling operation stops and if the room temperature and humidity are low. This is because warm refrigerant gas flows back into the indoor unit and generates steam.

8.2.7 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.

8.2.8 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.

8.2.9 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 continuous low "shah" sound is heard when the system is in cooling operation or at a stop. When the drain pump (optional accessories) is in operation, this noise is heard.
- 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.
- A low "sah", "choro-choro" sound is heard while the indoor unit is stopped. When another indoor unit is in operation, this noise is heard. In order to prevent oil and refrigerant from remaining in the system, a small amount of refrigerant is kept flowing.

8.2.10 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.

8.2.11 Symptom: Noise of air conditioners (Outdoor unit)

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

8.2.12 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.

8.2.13 Symptom: The units can give off odours

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

8.2.14 Symptom: The outdoor unit fan does not spin

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

8.2.15 Symptom: The display shows "88"

This is the case immediately after the main power supply switch is turned on and means that the user interface is in normal condition. This continues for 1 minute.

8.2.16 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.

8.2.17 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.

8.2.18 Symptom: Hot air can be felt when the indoor unit is stopped

Several different indoor units are being run on the same system. When another unit is running, some refrigerant will still flow through the unit.

9 Relocation

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

10 Disposal

NOTICE

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

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.
- When handling the unit, take into account the following:

  Fragile.

  Keep the unit upright in order to avoid compressor damage.

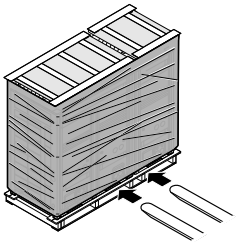
- A forklift can be used for transport as long as the unit remains on its pallet.

11.1 Outdoor unit

11.1.1 To transport the pallet

- A forklift can be used for transport as long as the unit remains on its pallet.

1 Transport the outdoor unit as shown in the figure below.



NOTICE

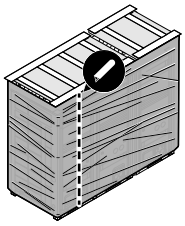
Use filler cloth on the forklift arms to prevent damage to the unit. Damage to the painting of the unit decreases the anti-corrosion protection.

11.1.2 To unpack the outdoor unit

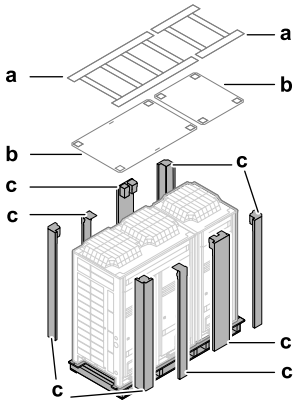
Note: This product is not designed for repacking. In case of repacking, contact your dealer.

1 Remove the packaging material from the unit.

- Remove the shrink foil. Take care not to damage the unit when removing the shrink foil with a cutter.



- Remove the 2 top pallets, 2 top trays and all supports.

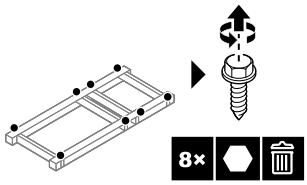


a Top pallet
b Top tray
c Support

WARNING

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

2 The unit is fixed to the pallet with bolts. Remove these bolts.



11.1.3 To handle the outdoor unit

CAUTION

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

1 Unpack the outdoor unit. See also "11.1.2 To unpack the outdoor unit" [▸ 16].

2 Make sure to read the label about handling the unit, located on the front packaging corner support.

3 There are 2 ways to lift the outdoor unit.

- with a crane and 2 belts of at least 8 m long as shown in the figure below. Always use protectors to prevent belt damage and pay attention to the centre of gravity of the unit.

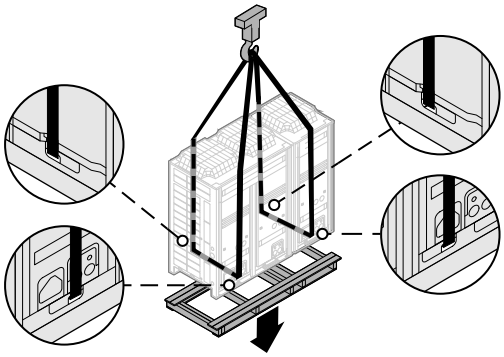
WARNING

Do NOT use the middle opening of the outdoor unit to attach the belts.

ALWAYS use the outer openings.

NOTICE

- Use a belt sling that adequately bears the weight of the unit.
- Use protection between the casing and the belts.
- The width of the holes for belts in the outdoor unit is 70 mm.



- If a forklift is used, pass the forklift arms through the middle and outer right opening on the bottom of the unit as shown in the figure below.

WARNING

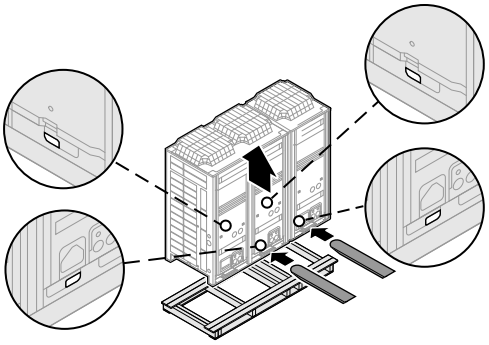
Do NOT use the outer left opening of the outdoor unit for lifting the unit with a forklift.

NOTICE

Precautions when lifting the outdoor unit with a forklift

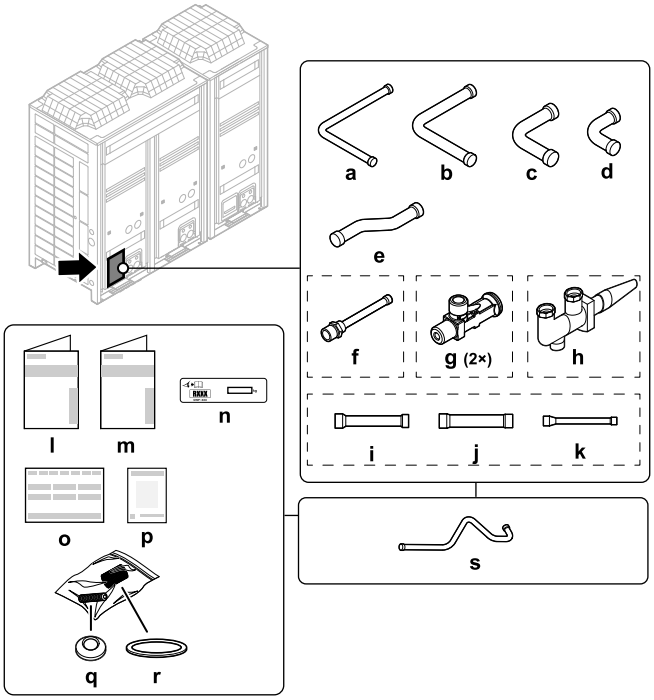
- Use filler cloth on the forklift arms to prevent damage to the unit. Damage to the painting of the unit decreases the anti-corrosion protection.
- In case of damage, remove burrs and paint the edges and areas around the holes using anti-corrosion treatment/repair paint to prevent rusting after handling the unit.

Outdoor unit



11.1.4 To remove the accessories from the outdoor unit

Outdoor unit



a	Liquid pipe, bottom (Ø15.9 mm)
b	Gas pipe, bottom (Ø22.2 mm)
c	Liquid pipe, front panel (Ø15.9 mm)
d	Gas pipe, front panel (Ø22.2 mm)
e	Safety valve pipe, front panel
f	Threaded piece (1×)
g	Safety valve (2×)
h	Changeover valve
i	Gas pipe reducer (Ø22.2 mm -> Ø15.9 mm)
j	Gas pipe reducer (Ø22.2 mm -> Ø19.1 mm)
k	Liquid pipe reducer (Ø15.9 mm -> Ø9.5 mm)
l	General safety precautions
m	Installation and operation manual
n	Refrigerant charge label
o	Declarations of conformity
p	Instruction sheet – Transport clamps removal
q	Copper packings for stop valve caps (15×)
r	Copper packings for service port caps (15×)
s	Safety valve pipe, bottom

12 About the units and options

12.1 About the outdoor unit

This installation manual concerns the CO2 VRV, full inverter driven, heat pump system.

These units are intended for outdoor installation and aimed for air to air heat pump applications.

Specification		
Capacity	Heating	31.5 kW
	Cooling	28 kW
Ambient design temperature	Heating	–20~20°C DB –20~15.5°C WB
	Cooling	–5~43°C DB

Specification	Unit
Cooling capacity (sensible) ($P_{rated,c}$)	23.7 kW
Cooling capacity (latent) ($P_{rated,c}$)	4.3 kW

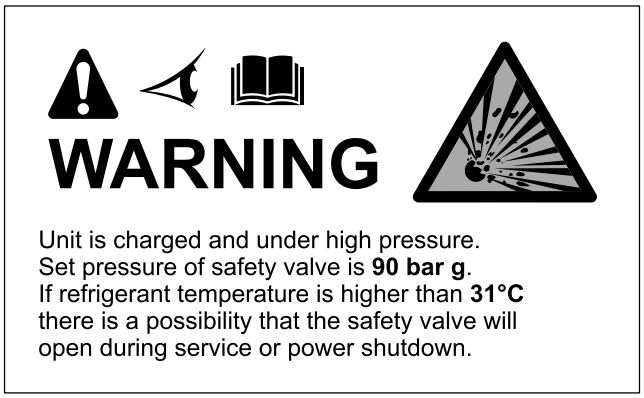
Specification	Unit
Heating capacity ($P_{rated,h}$)	31.5 kW
Total electric power input (P_{elec})	14.9 kW
Sound power level (L_{WA})	83.5 dB

12.1.1 Labels on outdoor unit

Label about service ports – left unit

Label about service ports – right unit

Label about safety valve

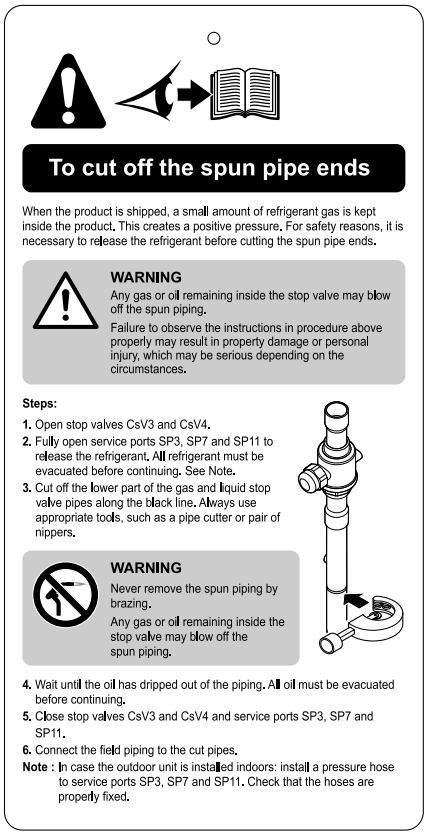


Text on warning label	Translation
Unit is charged and under high pressure.	Unit is charged and under high pressure.
Set pressure of safety valve is 90 bar g.	Set pressure of safety valve is **90 bar g**.
If refrigerant temperature is higher than 31°C there is a possibility that the safety valve will open during service or power shutdown.	If refrigerant temperature is higher than **31°C** there is a possibility that the safety valve will open during service or power shutdown.

Check the set pressure of the safety valve at the low pressure side of the refrigeration cabinet to verify a safe service temperature.

See also "14.3.4 About safety valves" [▶ 27].

Card on how to cut the spun pipe ends of the stop valve pipes



Text on card	Translation
To cut off the spun pipe ends	To cut off the spun pipe ends
When the product is shipped, a small amount of refrigerant gas is kept inside the product.	When the product is shipped, a small amount of refrigerant gas is kept inside the product.
This creates a positive pressure.	This creates a positive pressure.
For safety reasons, it is necessary to release the refrigerant before cutting the spun pipe ends.	For safety reasons, it is necessary to release the refrigerant before cutting the spun pipe ends.
Warning	Warning
Any gas or oil remaining inside the stop valve may blow off the spun piping.	Any gas or oil remaining inside the stop valve may blow off the spun piping
Failure to observe the instruction in procedure above properly may result in property damage or personal injury, which may be serious depending on the circumstances.	Failure to observe the instruction in procedure above properly may result in property damage or personal injury, which may be serious depending on the circumstances
Steps	Steps
Open stop valves CsV3 and CsV4.	Open stop valves CsV3 and CsV4.
Fully open service ports SP3, SP7 and SP11 to release the refrigerant.	Fully open service ports SP3, SP7 and SP11 to release the refrigerant
All refrigerant must be evacuated before continuing.	All refrigerant must be evacuated before continuing
See Note.	See Note.
Cut off the lower part of the gas and liquid stop valve pipes along the black line.	Cut off the lower part of the gas and liquid stop valve pipes along the black line.

Text on card	Translation
Always use appropriate tools, such as a pipe cutter or pair of nippers.	Always use appropriate tools, such as a pipe cutter or pair of nippers
Warning	Warning
NEVER remove the spun piping by brazing.	NEVER remove the spun piping by brazing.
Any gas or oil remaining inside the stop valve may blow off the spun piping.	Any gas or oil remaining inside the stop valve may blow off the spun piping.
Wait until the oil has dripped out of the piping.	Wait until the oil has dripped out of the piping.
All oil must be evacuated before continuing.	All oil must be evacuated before continuing.
Close stop valves CsV3 and CsV4 and service ports SP3, SP7 and SP11.	Close stop valves CsV3 and CsV4 and service ports SP3, SP7 and SP11.
Connect the field piping to the cut pipes.	Connect the field piping to the cut pipes.
Note:	Note:
In case the outdoor unit is installed indoors: install a pressure hose to service ports SP3, SP7 and SP11.	In case the outdoor unit is installed indoors: install a pressure hose to service ports SP3, SP7 and SP11.
Check that the hoses are properly fixed.	Check that the hoses are properly fixed.

For more information, see "14.3.1 To cut off the spun pipe ends" [▶ 25].

Card about the safety valve pipe installation

Text on the card	Translation
Warning	Warning
The safety valve included in the accessory bag must be installed on this pipe.	The safety valve included in the accessory bag must be installed on this pipe.

For more information, see "To install safety valves and changeover valve" [▶ 27].

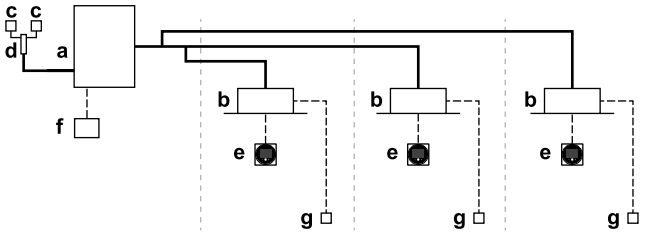
12.2 System layout

NOTICE

It is NOT allowed to cool technical rooms like server rooms and data centres, where year-round cooling is required.

INFORMATION

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



a Main outdoor unit (RXYN10*)
b VRV direct expansion (DX) indoor unit
c Safety valve (accessory)
d Changeover valve (accessory)
e Remote controller
f Centralised controller (optional)
g Option PCB (optional)
—— Refrigerant piping
----- Interconnection and user interface wiring

13 Unit installation

WARNING

Fix the unit correctly. For instructions, see "13 Unit installation" [▶ 19].

NOTICE

Make sure to install all necessary countermeasures in case of refrigerant leakage according to standard EN378.

NOTICE

Adverse effects shall be considered. For example, danger of water collecting and freezing in discharge pipes for pressure relief devices, accumulation of dirt and debris, or blockage of the discharge pipes by solid CO_2 (R744).

INFORMATION

The installer is responsible for supplying the field supply components.

NOTICE

When indoor installation of the outdoor unit is required, for example in a technical room, the following requirements MUST be met:

- Air ducts MUST be installed to guide the unit's exhaust air outside.
- Every exhaust air fan in the unit MUST have an individual airflow path. Make sure no mixture/ recirculation of airflow occurs.
- The pressure loss on the air ducts may NOT exceed the maximum static pressure value ensured by the High External Static Pressure (ESP) setting (78.40 Pa):

  - If the ESP, over duct work, is lower than or equal to 30.00 Pa, no High ESP setting activation is required.

  - If the ESP, over duct work, is higher than 30.00 Pa, the High ESP setting MUST be activated (see the service manual).
- Ensure an adequate ventilation of the technical area where the units are going to be installed, with façade air openings to allow fresh air compensation.
- For more information about the indoor installation of the outdoor unit, contact your local dealer.

13.1 Preparing the installation site

13.1.1 Installation site requirements of the outdoor unit

CAUTION

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

The equipment meets the requirements for commercial and light-industrial locations when professionally installed and maintained.

CAUTION

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

NOTICE

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

NOTICE

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

INFORMATION

The sound pressure level is less than 70 dBA.

Mind the spacing guidelines. See figure 1 on the inside of the front cover of this manual.

Description of text on figure 1:

Item	Description
A	Maintenance space
B	Possible patterns with installation spaces in case of a single outdoor unit[a][b][c][d][e]
h1	H1 (actual height)–1500 mm
h2	H2 (actual height)–500 mm
X	Front side = 500 mm+≥h1/2
Y	Air inlet side = 300 mm+≥h2/2

[a] Wall height front side: ≤1500 mm.
[b] Wall height air inlet side: ≤500 mm.
[c] Wall height other sides: no limit.
[d] Calculate h1 and h2 as shown in the figure. Add h1/2 for maintenance space to the front side. Add h2/2 for maintenance space to the back side (if wall height exceeds above values).
[e] B1: pattern for regions without heavy snowfall.
B2: pattern for regions with heavy snowfall.
B3: no limit to wall height.

13.1.2 Additional installation site requirements of the outdoor unit in cold climates

In heavy snowfall areas it is very important to select an installation site where the snow will NOT affect the unit. If lateral snowfall is possible, make sure that the heat exchanger coil is NOT affected by the snow. If necessary, install a snow cover or shed and a pedestal.

INFORMATION

For instructions on how to install the snow cover, contact your dealer.

NOTICE

If the unit is selected to operate at ambient temperatures lower than –5°C for 3 consecutive 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.

13.1.3 Additional installation site requirements for CO_2 refrigerant

NOTICE

Make sure to install all necessary countermeasures in case of refrigerant leakage according to standard EN378.

INFORMATION

For more information regarding allowable refrigerant charge and space volume calculations see the reference guide of the indoor unit.

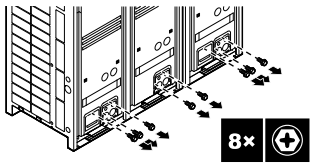
13.2 Opening and closing the unit

13.2.1 To open the outdoor unit

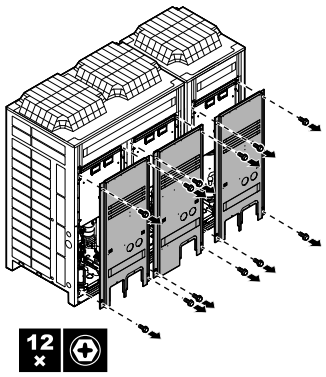
DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING/SCALDING

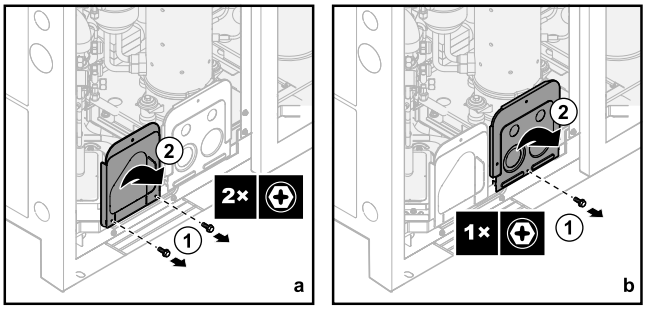
1 Remove the screws of the small front plates.



2 Remove the front panels.



3 Remove the small front plates of each removed front panel.



a (If applicable) Small front plate left
b Small front plate right

Once the front plates open, the switch box can be accessed. See "13.2.2 To open the switch box of the outdoor unit" [▶ 21].

For service purposes, the pushbuttons on the main PCB (located behind the middle front panel) need to be accessed. To access these pushbuttons, the switch box cover does not need to be opened. See "17.1.2 To access the field setting components" [▶ 37].

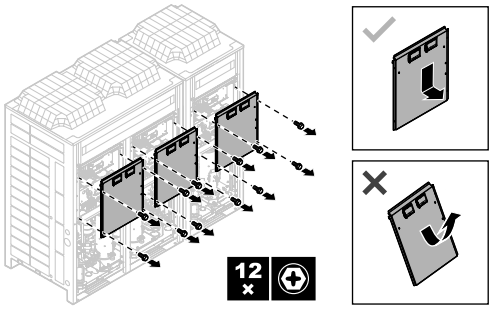
13.2.2 To open the switch box of the outdoor unit

NOTICE

Do NOT apply excessive force when opening the switch box cover. Excessive force can deform the cover, resulting in entering of water to cause equipment failure.

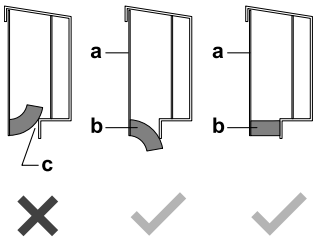
Switch boxes of the outdoor unit

The switch boxes behind the left, middle and right front panel are all opened in the same way. The main switchbox is installed behind the middle panel.



NOTICE

When closing the switch box cover, make sure that the sealing material on the lower back side of the cover is NOT caught and bent towards the inside (see figure below).



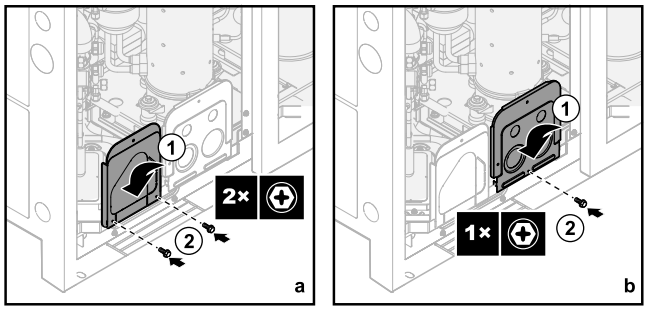
a Switch box cover
b Sealing material
c Moisture and dirt could enter
✕ NOT allowed
✓ Allowed

13.2.3 To close the outdoor unit

NOTICE

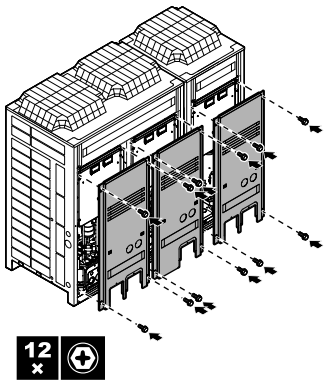
When closing the outdoor unit cover, make sure that the tightening torque does NOT exceed 3.98 N•m.

1 Reinstall the small front plates of each removed front panel.

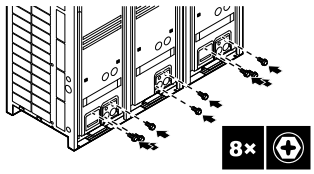


a (If applicable) Small front plate left
b Small front plate right

2 Reinstall the front panels.



3 Attach the small front plates to the front panels.



13.3 Mounting the outdoor unit

13.3.1 To provide the installation structure

Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.

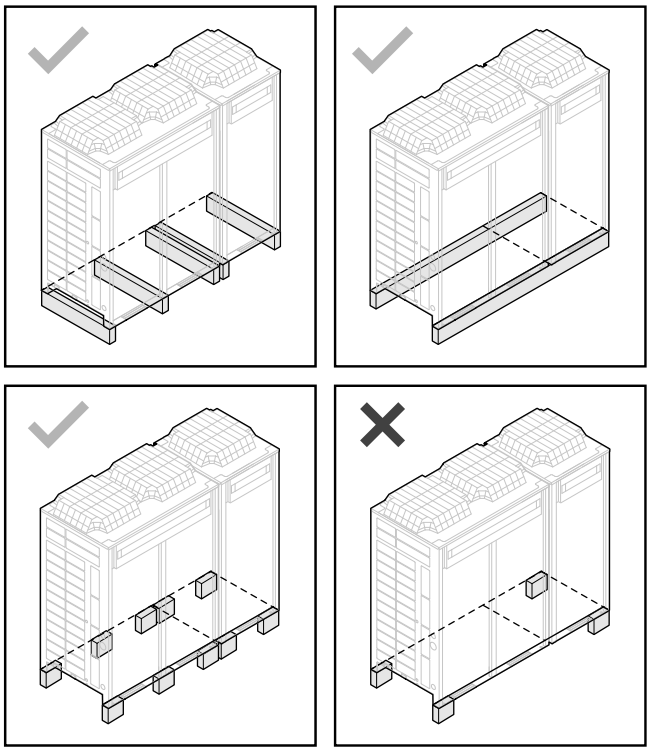
For more information, see chapter "Installation site requirements of the outdoor unit" in the installer and user reference guide.

NOTICE

- When the installation height of the unit needs to be increased, do NOT use stands to only support the corners.
- Stands under the unit must be at least 100 mm wide.

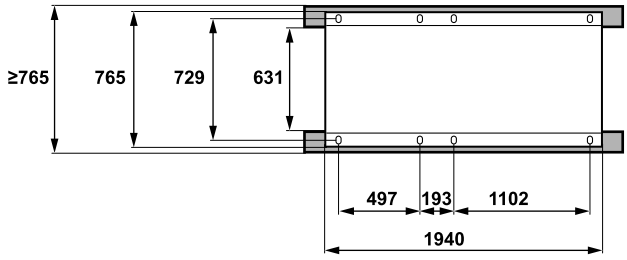
NOTICE

The height of the foundation must at least be 150 mm from the floor. In heavy snowfall areas, this height should be increased up to the average expected snow level, depending on the installation place and condition.



- The preferred installation is on a solid longitudinal foundation (steel beam frame or concrete). The foundation must be larger than the grey marked area.

mm

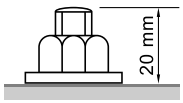


Minimum foundation

13.3.2 To install the outdoor unit

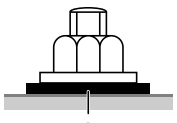
1 Position the unit onto the installation structure. See also: "11.1.3 To handle the outdoor unit" [▸ 16].

2 Fix the unit onto the installation structure. See also "13.3.1 To provide the installation structure" [▸ 21]. Fasten the unit in place using at least four foundation bolts M12. It is best to screw in the foundation bolts until their length remains 20 mm above the foundation surface.



NOTICE

When installed in a corrosive environment, use a nut with plastic washer (a) to protect the nut tightening part from rust.



13.3.3 To remove the transportation stay

NOTICE

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

The compressor transportation stays protect the unit during transport. They are located around the middle compressor (INV2). During installation they must be removed.

1 Loosen the compressor mounting bolt.

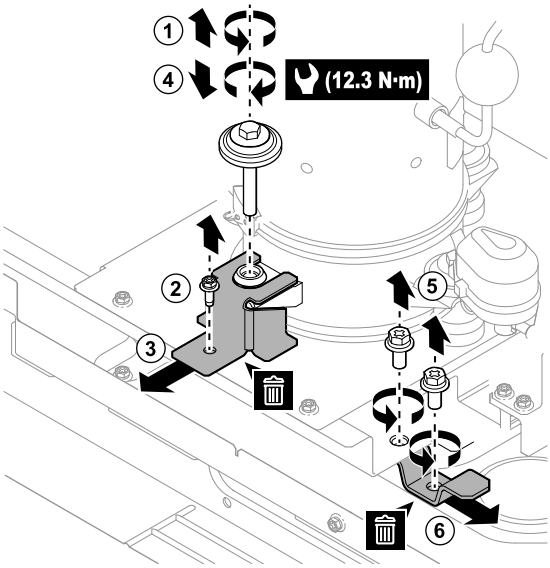
2 Remove the screw.

3 Remove and dispose of the transportation stay.

4 Tighten the mounting bolt to 12.3 N•m of torque.

5 Remove the 2 screws.

6 Remove and dispose of the transportation stay.



13.3.4 To provide drainage

Make sure that condensation water can be evacuated properly.

NOTICE

Prepare a water drainage channel around the foundation to drain waste water from around the unit. When the outdoor temperatures are negative, the drained water from the outdoor unit will freeze up. If the water drainage is not taken care of, the area around the unit might be very slippery.

14 Piping installation

CAUTION

See "2 Specific installer safety instructions" [▸ 4] to make sure this installation complies with all safety regulations.

14.1 Preparing refrigerant piping

14.1.1 Refrigerant piping requirements

WARNING

The unit contains small amounts of refrigerant R744.

NOTICE

Do NOT reuse piping from previous installations.

NOTICE

Refrigerant R744 requires strict cautions for keeping the system clean and dry. Foreign materials (including mineral oils or moisture) should be prevented from getting mixed into the system.

NOTICE

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

NOTICE

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

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

NOTICE

If the ability to close the stop valves for field piping is wanted, the installer MUST install a pressure relief valve on the liquid AND gas piping between the outdoor unit and the air conditioning indoor units.

14.1.2 Refrigerant piping material

Piping material

K65 and equivalent piping. For the maximum system operation pressure in field piping, refer to "6.2 Field piping pressure" [▶ 10].

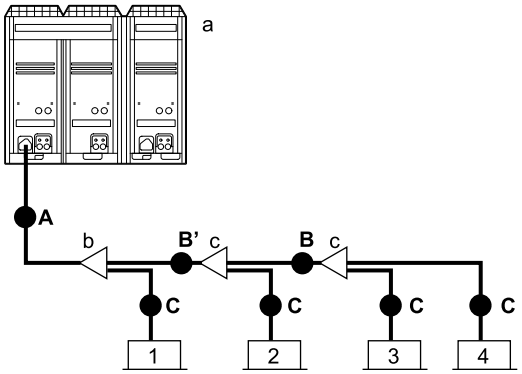
Piping temper grade and thickness

	Outer diameter (Ø)	Temper grade	Thickness (t)[a]	Design pressure	
Liquid piping	9.5 mm (3/8")	R300	0.65 mm	120 bar gauge	
Gas piping	12.7 mm (1/2")	R300	0.85 mm	120 bar gauge	
Gas piping	15.9 mm (5/8")	R300	1.05 mm	120 bar gauge	
Gas pipings (size-up)	19.1 mm (3/4")	R300	1.30 mm	120 bar gauge	

[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.

14.1.3 To select the piping size

Determine the proper size using the following tables and reference figure (only for indication).



1~4 VRV DX indoor unit
A~C Piping
a Outdoor unit
b First refrigerant branch (T-joint)
c Refrigerant branches (T-joints)

A: Piping between outdoor unit and first branch

Outdoor unit capacity type (HP)	Piping outer diameter [mm]	
	Gas pipe	Liquid pipe
10	15.9	9.5

B: Piping between two branches

Choose from the following table in accordance with the indoor unit total capacity type, connected downstream.

Example:

- Downstream capacity for B' = [capacity index of unit 2] + [unit 3] + [unit 4]
- Downstream capacity for B = [capacity index of unit 3] + [unit 4]

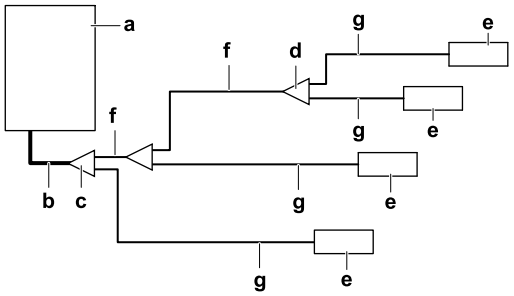
Indoor unit capacity index	Piping outer diameter size (mm)	
	Gas pipe	Liquid pipe
<150	12.7	9.5
150≤x<200	12.7	
200≤x<290	15.9	

C: Piping between branch and indoor unit

Pipe size for direct connection to indoor unit must be the same as the connection size of the indoor unit.

Indoor unit capacity index	Piping outer diameter size (mm)	
	Gas pipe	Liquid pipe
40~80	12.7	9.5

Size-up of piping



a Outdoor unit
b Main pipes (size up if equivalent length >90 m)
c First refrigerant branch
d Last refrigerant branch
e Indoor unit
f Piping between first and last refrigerant branch
g Piping between last refrigerant branch and indoor unit

If a size-up of the piping is required for the piping between the outdoor unit and the first branch, refer to the table below:

Outdoor unit capacity type (HP)	Piping outer diameter [mm]	
	Gas pipe	Liquid pipe
10	15.9 → 19.1	9.5

When the equivalent pipe length between outdoor and indoor units is more than 90 m, the size of the main pipes (gas pipe only) must be increased. Depending on the length of the piping, the capacity may drop, but even in such a case the size of the main pipes has to be increased. More specifications can be found in the technical engineering data book.

14.1.4 To select refrigerant branch

Always use K65 T-joints with a suitable design pressure for refrigerant branching.

14.2 Using stop valves and service ports

WARNING

When stop valves are closed during service, the pressure of the closed circuit will increase due to high ambient temperature. Make sure the pressure is kept below the design pressure.

14.2.1 To handle the stop valve

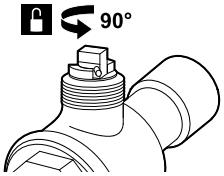
Take the following guidelines into account:

- The gas and liquid stop valves are factory open.
- 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.

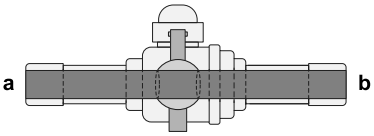
To open the stop valve

1 Remove the valve cap.

2 Turn counterclockwise to open the valve.



Result: The valve is fully open:

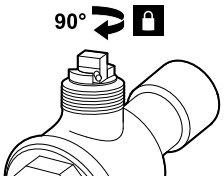


a To outdoor unit
b To indoor unit

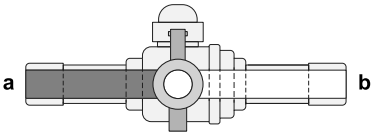
To close the stop valve

1 Turn clockwise to close the valve.

2 Screw the valve cap onto the valve.



Result: The valve is fully closed:



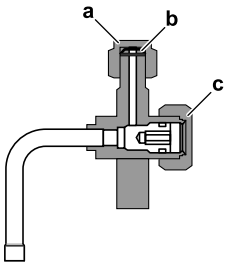
a To outdoor unit
b To indoor unit

14.2.2 To handle the service port

- All service ports are of the backseat type and do not have a valve core.
- After handling the service port, make sure to tighten the service port cap and the valve cap securely.
- Check for refrigerant leaks after tightening the service port cap and the valve cap.

Parts of the service port

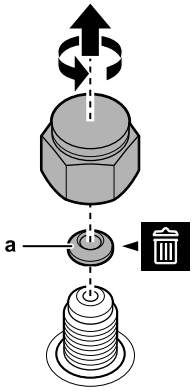
The figure below shows the name of each part required in handling service ports.



a Service port cap
b Copper packing
c Valve cap

To open the service port

1 Remove the service port cap with 2 spanners and remove the copper packing.



a Copper packing

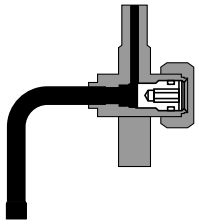
2 Connect the charge port to the service port.

3 Remove the valve cap with 2 spanners.

4 Insert a hexagonal wrench (4 mm).

5 Rotate the hexagonal wrench counterclockwise until the end.

Result: The service port is fully open.



To close the service port

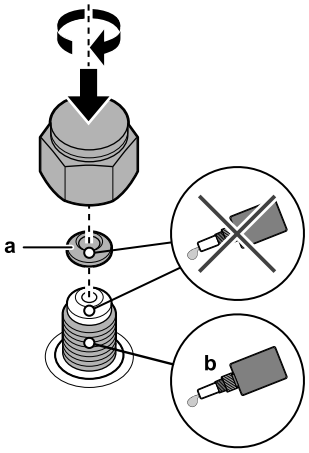
1 Insert a hexagonal wrench (4 mm).

2 Rotate the hexagonal wrench clockwise until the end.

3 Tighten the valve cap with 2 spanners. Apply screw lock agent or silicon sealant when tightening.

4 Add a new copper packing.

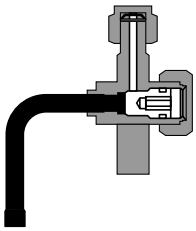
5 Apply screw lock agent or silicon sealant to the screw thread when mounting the service port cap. Without it, moisture and condensing water may penetrate and freeze between the screw thread. As a result, refrigerant may leak and the service port cap may break.



a New copper packing
b Screw lock agent or silicon sealant only on screw thread

6 Tighten the service port cap with 2 spanners.

Result: The service port is fully closed.



14.2.3 Tightening torques

Tightening torque stop valve

Stop valve size (mm)	Tightening torque (N•m) (turn clockwise to close)
	Shaft – valve cap
Ø22.2	50~55

Tightening torque service port and valve caps

Stop valve size [mm]	Tightening torque [N•m][(a)]		
	Valve body	Hexagonal wrench	Service port
Ø6.5	5.4~6.6	4 mm	13.5~16.5

[(a)] When opening or closing.

14.3 Connecting the refrigerant piping

DANGER: RISK OF BURNING/SCALDING

14.3.1 To cut off the spun pipe ends

When the product is shipped, a small amount of refrigerant gas is kept inside the product. Therefore, the pipes contain a pressure higher than the atmospheric pressure. For safety reasons, it is necessary to release the refrigerant before cutting the spun pipe ends.

WARNING

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

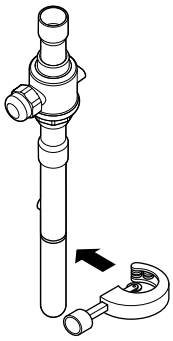
If these instructions are NOT followed correctly it may result in property damage or personal injury, which may be serious depending on the circumstances.

1 Make sure the stop valves CsV3 (gas) and CsV4 (liquid) are open. See "14.2.1 To handle the stop valve" [▸ 24].

2 In case the outdoor unit is installed indoors: install a pressure hose to service ports SP3, SP7 and SP11. Check that the hoses are properly fixed and that they lead outside.

3 Fully open service ports SP3, SP7 and SP11 to release the refrigerant. See "14.2.2 To handle the service port" [▸ 24]. All refrigerant must be evacuated before continuing.

4 Cut off the lower part of the gas and liquid stop valve pipes along the black line. Always use appropriate tools, such as a pipe cutter or pair of nippers.



WARNING

NEVER remove the spun piping by brazing.

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

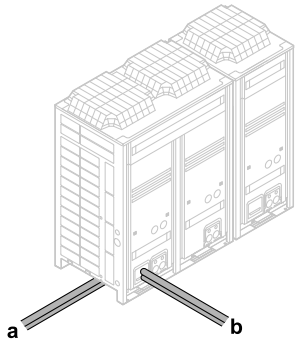
5 Wait until the oil has dripped out of the piping. All oil must be evacuated before continuing.

6 Close stop valves CsV3 and CsV4 and service ports SP3, SP7 and SP11.

7 Connect the field piping to the cut pipes.

14.3.2 To connect the refrigerant piping to the outdoor unit

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



a Left side connection
b Front connection

NOTICE

Precautions when making knockout holes:

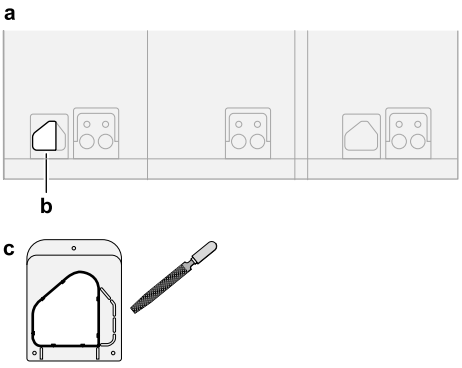
- Avoid damaging the casing.
- After making the knockout holes, we recommend you remove the burrs and paint the edges and areas around the edges using repair paint to prevent rusting.
- When passing electrical wiring through the knockout holes, wrap the wiring with protective tape to prevent damage.

Front connection

NOTICE
Protect the unit from damage during brazing.

1 Remove the left front panel of the outdoor unit. See "13.2.1 To open the outdoor unit" [▶ 20].

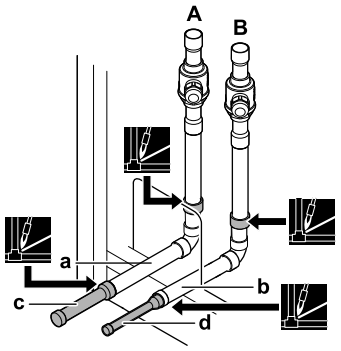
2 Remove the knockout in the small front plate of the outdoor unit. For more information, see "16.3 Guidelines for making knockout holes" [▶ 34].



a Outdoor unit
b Knockout hole for piping
c Remove burrs

3 Cut off the spun pipe ends. See "14.3.1 To cut off the spun pipe ends" [▶ 25].

4 Connect the accessory gas and liquid pipes and the accessory gas and liquid reducer for front connection to the outdoor unit. In case size-up of the gas piping, connect the reducer with the white marking at the unit side and the non-marked end at the field piping side.



A Stop valve (gas)
B Stop valve (liquid)
a Gas pipe (accessory)
b Liquid pipe (accessory)
c Gas pipe reducer (accessory)
d Liquid pipe reducer (accessory)

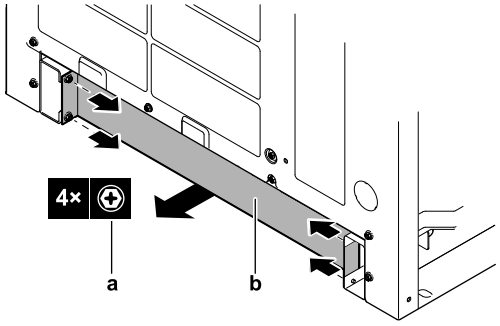
5 Connect the accessory pipes to the field piping.

Side connection

NOTICE
Protect the unit from damage during brazing.

1 Remove the left front panel of the outdoor unit. See "13.2.1 To open the outdoor unit" [▶ 20].

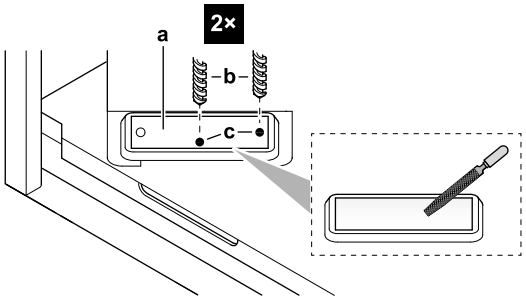
2 Unscrew the 4 screws to remove the side plate of the outdoor unit.



a Screw
b Side plate

3 Dispose of the plate and its screws.

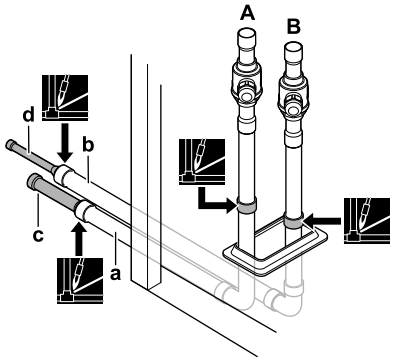
4 Remove the knockout in the bottom plate of the outdoor unit. For more information, see "16.3 Guidelines for making knockout holes" [▶ 34].



a Knockout plate
b Drill (Ø6 mm)
c Drill here

5 Cut off the spun pipe ends. See "14.3.1 To cut off the spun pipe ends" [▶ 25].

6 Connect the accessory gas and liquid pipes and the gas and liquid reducer for bottom connection to the outdoor unit. In case size-up of the gas piping, connect the reducer with the white marking at the unit side and the non-marked end at the field piping side.



A Stop valve (gas)
B Stop valve (liquid)
a Gas pipe (accessory)
b Liquid pipe (accessory)
c Gas pipe reducer (accessory)
d Liquid pipe reducer (accessory)

7 Connect the accessory pipes to the field piping.

14.3.3 Guidelines to connect T-joints

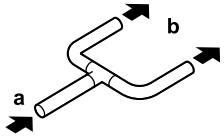
INFORMATION
Piping joints and fittings shall comply with the requirements of EN 14276-2.

CAUTION
ALWAYS use K65 T-joints for refrigerant branching.

K65 T-joints are field supplied.

Liquid piping

Always branch horizontally when connecting the branch piping.

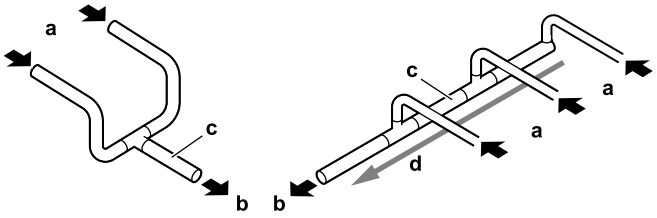


a Coming from the outdoor units
b Going to the indoor units

Gas piping

Always branch horizontally when connecting the branch piping.

To prevent refrigerant oil flowing into the indoor units, always set the branch piping above the main piping.



a Coming from the indoor units
b Going to the outdoor units
c Main refrigerant pipe
d Slanting downwards

NOTICE

Where joints are used on piping, avoid damage caused by freezing or vibration.

14.3.4 About safety valves

When installing a safety valve, always keep the design pressure of the circuit in mind. See "6 Operation" [▶ 10].

WARNING

Serious injury and/or damage can result from the blow-off of the liquid receiver safety valve (see "20.1 Piping diagram: Outdoor unit" [▶ 44]):

- NEVER service the unit when the pressure at the liquid receiver is higher than the set pressure of the liquid receiver safety valve (90 bar gauge ±3%). If this safety valve releases refrigerant, it can cause serious injury and/or damage.
- If the pressure > set pressure, ALWAYS discharge from pressure relief devices before servicing.
- It is recommended to install and secure blow-off piping to the safety valve.
- ONLY alter the safety valve if the refrigerant has been removed.

WARNING

All installed safety valves MUST ventilate to the outdoor space and NOT into a closed area.

CAUTION

When installing a safety valve, ALWAYS add enough support to the valve. An activated safety valve is under high pressure. If not installed securely, the safety valve may cause damage to the piping or the unit.

NOTICE

When installing the safety valve provided in the accessory bag, we recommend to apply 4 PTFE tape windings and tighten the safety valve in its correct position with a torque between 35 and 60 N•m. Make sure that blow off piping can be installed easily.

NOTICE

If the ability to close the stop valves for field piping is wanted, the installer MUST install a pressure relief valve on the liquid AND gas piping between the outdoor unit and the air conditioning indoor units.

To install safety valves and changeover valve

Purpose

It is obligatory to install a safety valve that protects the pressure vessel.

Accessories

The 2 safety valves and the changeover valve are part of the accessories. As the valves are threaded, they cannot be brazed onto the field piping. Therefore, the accessory bag also contains a threaded piece that acts as an intermediate between the field piping and the changeover valve.

Location

The 2 safety valves and the changeover valve have to be installed in the field piping. The safety valve piping can be connected to the outdoor unit in 2 ways: through the bottom of the unit or through the front panel.

If you do not route the safety valve piping the same way as the refrigerant piping, remove the other knockout (either the small front plate or the bottom plate of the outdoor unit). See "14.3.2 To connect the refrigerant piping to the outdoor unit" [▶ 25].

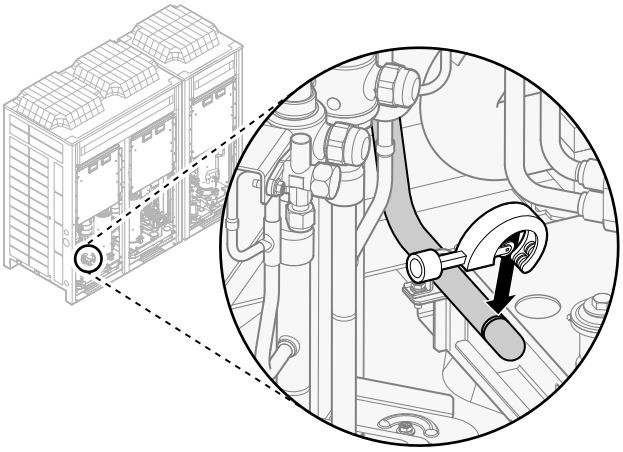
Installation

WARNING

Install safety valves in a proper way according the applicable national regulation.

Prerequisite: Connect the refrigerant piping. See "14.3 Connecting the refrigerant piping" [▶ 25]. This procedure includes how to release the refrigerant before cutting the piping.

1 Cut off the safety valve pipe end along the black line. Always use appropriate tools, such as a pipe cutter.



2 Braze the accessory safety valve pipe for front or bottom connection onto the outdoor unit piping.

3 Braze the field piping onto the accessory pipe.

4 Attach the safety valve piping to a fixed structure, to avoid that vibrations break the pipe when the safety valve opens.

5 Braze the accessory threaded piece onto a vertically installed field piping end.

6 It is recommended to apply 4 PTFE tape windings onto the thread of the threaded piece.

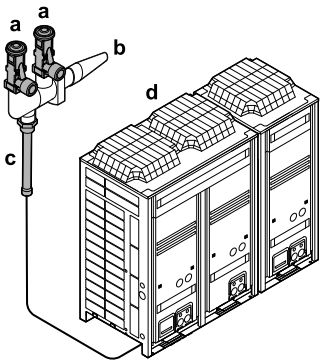
7 It is recommended to screw the changeover valve onto the threaded piece and tighten it between 35 and 60 N•m. The changeover valve has to be installed vertically so water cannot enter.

8 Connect the 2 safety valves to the changeover valve.

NOTICE

- The safety valve needs to be replaced when it is triggered or when the lifetime is finished (9 years), unless national requirements & legislations will require shorter.
- Latest safety valve calibration / replacement records should be kept till next replacement period as a reference for installers.
- It is recommended to fit two safety valves when a changeover valve is installed. The two safety valves mounted on the changeover valve must always be in good condition and with a valid certificate of conformity.

System layout



a Safety valve (2x accessory)
b Changeover valve (accessory)
c Threaded piece (accessory)
d Outdoor unit

Safety valve reference information

Take the folllowing safety valve reference information into account.

Maximum piping length

The allowed length of the safety valve piping is limited by the following elements:

- the pipe's diameter
- the number of elbows in the piping

Maximum piping length (m) for Ø19.1 mm[(a)]				
8 elbows	9 elbows	10 elbows	11 elbows	12 elbows
14	13	12	12	11

(a) K65 or equivalent piping

Maximum piping length (m) for Ø22.2 mm[(a)]				
8 elbows	9 elbows	10 elbows	11 elbows	12 elbows
16	15	15	14	13

(a) K65 or equivalent piping

Specifications safety valve

PS	Kd	Flow area	Connection	Allowable temperature range
90 bar	0.90	15.9 mm^2	1/2" NPT in 1/2" G out	-50/+150°C

14.4 Checking the refrigerant piping

Keep the following in mind:

- The test has to include the safety valve piping. It is therefore necessary that the pressure passes through the unit. Always keep both liquid and gas stop valves open during leak test and vacuum drying of the field piping.
- Only use R744 dedicated tools (such as gauge manifold and charge hose) that are designed to withstand high pressures and which will prevent water, dirt or dust entering the unit.

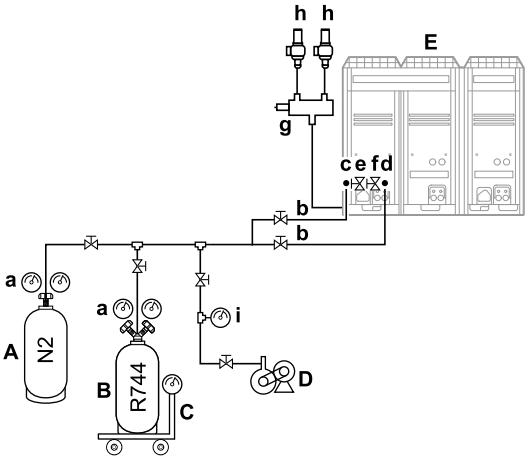
CAUTION

Do NOT open the stop valve until you have measured the insulation resistance of the main power supply circuit.

CAUTION

ALWAYS use nitrogen gas for leak tests.

14.4.1 Checking refrigerant piping: Setup



A Nitrogen (N_2)
B R744 refrigerant tank
C Weighing scales
D Vacuum pump
E Outdoor unit
a Pressure regulator
b Charge hose
c Service port SP3 (gas side)
d Service port SP7 (liquid side)
e Stop valve CsV3 (gas side)
f Stop valve CsV4 (liquid side)
g Changeover valve
h Safety valve
i Vacuum pressure gauge
Stop valve
Service port
Field piping

NOTICE

Refer to the manufacturer's data for more information about the changeover valve.

14.4.2 To perform a strength pressure test

WARNING

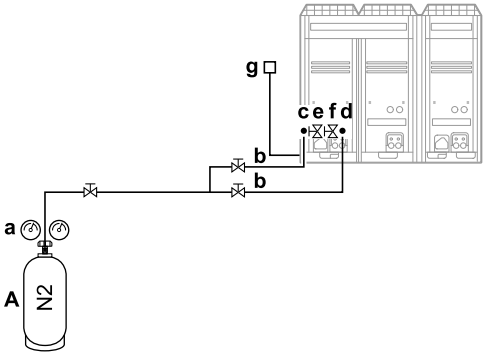
Before putting the system into service, check if all field supplied components or indoor units comply with pressure test specifications of EN378-2. If you are not sure, it is recommended to perform the test below.

Perform this test for all field piping and safety valve piping.

The test must satisfy the specifications of EN378-2.

Prerequisite: To prevent the safety valve from opening during the test, do the following:

- Remove the safety valve(s) and the changeover valve.
- Install a cap (field supplied) onto the treaded piece.
- Turn ON the power supply of the outdoor unit and all indoor units.
- Open stop valve CsV4.



A Nitrogen (N_2)
a Manifold
b Charge hose
c Service port SP3
d Service port SP7
e Stop valve CsV3 (gas side)
f Stop valve CsV4 (liquid side)
g Cap
Stop valve
Service port

1 Set field setting [2-21] of the outdoor unit to value 1 (ON) to open the expansion valves. See "17.1.6 To use mode 2" [▸ 38].

2 Connect the high pressure side of the manifold (a) to the liquid side SP7 (d).

3 Connect the common side to the pressure regulator valve of the nitro oxygen vessel (A).

4 Pressurise liquid side from service port SP7 (d).

- Always test the pressure according to EN378-2.
- For the safety valve piping, a test pressure of 99 bar gauge is mandatory.

5 Make sure there is no pressure drop.

6 If there is a pressure drop, locate the leak, repair it and repeat the test.

7 If the test was successful, remove the pressure from the unit, and replace the cap on the threaded piece with the changeover valve and safety valve(s).

8 Close the gas stop valve CsV3 (e) and the liquid stop valve CsV4 (f).

9 Pressurise liquid side from service port SP7 (d) and gas side from service port SP3 (c).

- Always test the pressure according to EN378-2.
- For the field piping, we recommended a test pressure of 132 bar gauge.

10 Make sure there is no pressure drop.

11 If there is a pressure drop, locate the leak, repair it and repeat the test.

12 Set field setting [2-21] of the outdoor unit to value 0 (OFF) to close the expansion valves. See "17.1.6 To use mode 2" [▸ 38].

WARNING

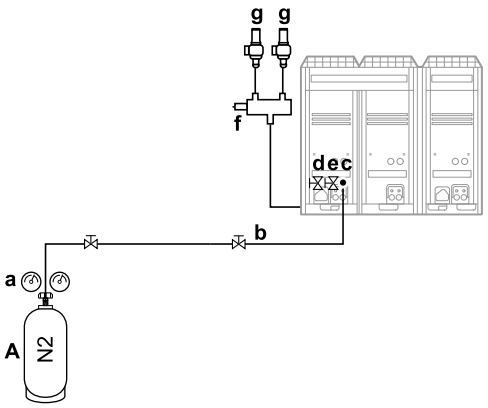
To ensure that the safety valve(s) and the changeover valve are properly reinstalled, a leak test is mandatory.

14.4.3 To perform a leak test

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

Prerequisite: To prevent the safety valve from opening during the test, do the following:

- Install the safety valve and the changeover valve.
- Turn ON the power supply of the outdoor unit and all indoor units.



A Nitrogen (N_2)
a Manifold
b Charge hose
c Service port SP7
d Stop valve CsV3 (gas side)
e Stop valve CsV4 (liquid side)
f Changeover valve
g Safety valve
Stop valve
Service port

1 Set field setting [2-21] of the outdoor unit to value 1 (ON) to open the expansion valves. See "17.1.6 To use mode 2" [▸ 38].

2 Open the gas stop valve CsV3 (d) and the liquid stop valve CsV4 (e).

3 Connect to the liquid side SP7 (c).

4 Pressurise liquid side from service ports SP7 (c). Recommended test pressure is 3.0 MPaG (30 bar gauge).

5 Apply a bubble test solution to all piping connections.

NOTICE

ALWAYS use a recommended bubble test solution from your wholesaler.

NEVER use soap water:

- Soap water may cause cracking of components, such as flare nuts or stop valve caps.
- Soap water may contain salt, which absorbs moisture that will freeze when the piping gets cold.
- Soap water contains ammonia which may lead to corrosion of parts.

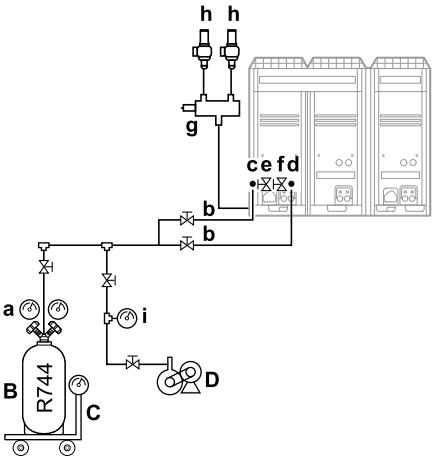
6 If there is a pressure drop, locate the leak, repair it and repeat the strength pressure test (see "14.4.2 To perform a strength pressure test" [▸ 29]) and the leak test (see "14.4.3 To perform a leak test" [▸ 29]).

7 Set field setting [2-21] of the outdoor unit to value 0 (OFF) to close the expansion valves. See "17.1.6 To use mode 2" [▶ 38].

14.4.4 To perform vacuum drying

Prerequisite: To prevent the safety valve from opening during the test, do the following:

- Install the safety valve and the changeover valve.
- Turn ON the power supply of the outdoor unit and all indoor units.
- Make sure stop valves CsV3 and CsV4 are open.



B R744 refrigerant tank
C Weighing scales
D Vacuum pump
a Pressure regulator
b Charge hose
c Service port SP3 (gas side)
d Service port SP7 (liquid side)
e Stop valve CsV3 (gas side)
f Stop valve CsV4 (liquid side)
g Changeover valve
h Safety valve
i Vacuum pressure gauge
Stop valve
Service port

1 Connect a vacuum pump to service ports SP3 (c) and SP7 (d).

2 Vacuum the unit until you reach –100.7 kPaG (-1.007 bar gauge) or less.

3 Leave the unit for more than 2 hours with a vacuum pressure of –100.7 kPaG (-1.007 bar gauge) or less. On the vacuum gauge (i), check if the pressure does not increase. If the pressure rises, the system has a leak or moisture remained into the piping.

In case of a leak

1 Find and repair the leak.

2 When done, perform the leak test and vacuum test again. See "14.4.3 To perform a leak test" [▶ 29] and "14.4.4 To perform vacuum drying" [▶ 30].

In case of remaining moisture

When the unit is installed on rainy days, moisture may still remain in the piping after a first vacuum drying is performed. If so, conduct the following procedure:

1 Pressurise the nitrogen gas up to 0.05 MPa (for breaking vacuum) and vacuum for at least 2 hours.

2 Afterwards, vacuum dry the unit to –100.7 kPaG (-1.007 bar gauge) or less for at least 1 hour.

3 Repeat breaking vacuum and vacuum drying if the pressure does not reach –100.7 kPaG (-1.007 bar gauge) or less.

4 Leave the unit for more than 1 hour with a vacuum pressure of –100.7 kPaG (-1.007 bar gauge) or less. On the vacuum gauge, check if the pressure does not increase.

14.4.5 To insulate the refrigerant piping

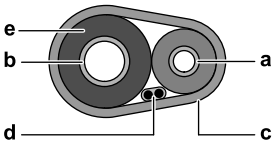
After finishing the leak test and vacuum drying, the piping must be insulated. Take into account the following points:

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

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

Between outdoor and indoor unit

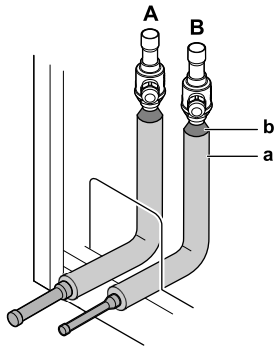
1 Insulate and fix the refrigerant piping and cables as follows:



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

Inside the outdoor unit

To insulate the refrigerant piping, proceed as follows:



A Stop valve (gas)
B Stop valve (liquid)
a Insulation
b Sealant

1 Insulate the liquid and gas piping.

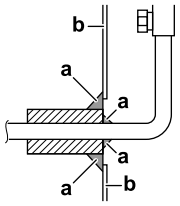
2 Wind heat insulation around the curves, and then cover it with vinyl tape.

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 To prevent rain and condensed water entering the unit, add a sealing between the insulation and the front panel of the unit.



a Sealing material
b Front panel

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.

15 Charging refrigerant

15.1 Precautions when charging refrigerant

WARNING

- ONLY use R744 (CO_2) as refrigerant. Other substances may cause explosions and accidents.
- When installing, charging refrigerant, maintaining or performing service, ALWAYS use personal protective equipment, such as safety shoes, safety gloves and safety glasses.
- If the unit is installed indoors (for example, in a machine room), ALWAYS use a portable CO_2 detector.
- If the front panel is open, ALWAYS beware of the rotating fan. The fan will continue rotating for a while, even after the power switch has been turned off.

CAUTION

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

CAUTION

Do NOT charge liquid refrigerant directly to a gas line. Liquid compression could cause compressor operation failure.

NOTICE

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

NOTICE

Only when charging the unit for the first time, turn ON the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.

NOTICE

Before starting charging procedures, check if the 7-segment display is as normal (see "17.1.4 To access mode 1 or 2" [▶ 38]). If a malfunction code is present, see "19.1 Solving problems based on error codes" [▶ 41].

NOTICE

Close the front panel before any refrigerant charge operation is executed. Without the front panel attached the unit cannot judge correctly whether it is operating properly or not.

NOTICE

Do NOT fully close the stop valve for field piping after the refrigerant has been charged into the unit.

NOTICE

Do NOT fully close the liquid stop valve while the unit is stopping. The field liquid piping might burst because of liquid seal. Furthermore, continuously keep a connection between the safety valve and the field liquid piping to avoid bursting of the piping (if pressure increases too much).

INFORMATION

For the operation method of the stop valves, refer to "14.2 Using stop valves and service ports" [▶ 24].

15.2 To determine the refrigerant amount

INFORMATION

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

INFORMATION

After charging, add the total amount of refrigerant to the refrigerant charge label. See "15.4 To fix the refrigerant charge label" [▶ 32].

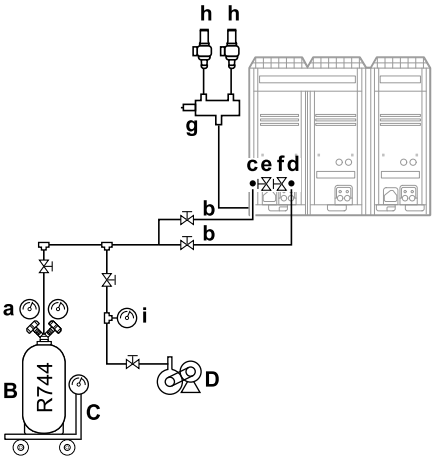
Calculation table: outdoor unit capacity class 10 HP

Factory charged amount of refrigerant into outdoor unit (kg):					**0** kg [1]
Standard charged amount of refrigerant for outdoor unit (kg):					**19.9** kg [2]
Amount of refrigerant for liquid and gas piping					
	Outer diameter size liquid piping (mm)	**Outer diameter size gas piping (mm)**	**Charge amount per meter of piping (kg/m)**	**Piping length (m)**	**Total amount of refrigerant (kg)**
	Ø9.5	Ø12.7	0.050		(a)
	Ø9.5	Ø15.9	0.058		(b)
	Ø9.5	Ø19.1	0.066		(c)
	Subtotal (a)+(b)+(c):				[3]
Total amount of refrigerant [1]+[2]+[3] (kg)					[4]

15.3 To charge refrigerant

Prerequisite: Before charging, do the following:

- Calculate the amount of charge based on the calculation table in "15.2 To determine the refrigerant amount" [▶ 31].
- Turn ON the power supply of the outdoor unit and all indoor units.



B	R744 refrigerant tank
C	Weighing scales
D	Vacuum pump
a	Pressure regulator
b	Charge hose
c	Service port SP3 (gas side)
d	Service port SP7 (liquid side)
e	Stop valve CsV3 (gas side)
f	Stop valve CsV4 (liquid side)
g	Changeover valve
h	Safety valve
i	Vacuum pressure gauge
⋈	Stop valve
●	Service port

1 Set field setting [2-21] of the outdoor unit to value 1 (ON) to open the expansion valves. See "17.1.6 To use mode 2" [▸ 38].

2 Open the gas stop valve CsV3 (e) and the liquid stop valve CsV4 (f).

3 Pre-charge with R744 in gas state from the service port SP7 (d) into the liquid side, until a pressure of a least 6 bar is reached.

4 When you reach 6 bar, close the gas line of the charging R744 refrigerant tank (B).

5 Continue charging liquid R744 through the service port SP7 (d) into the liquid line until you reach the desired amount of refrigerant.

6 Set field setting [2-21] of the outdoor unit to value 0 (OFF) to close the expansion valves. See "17.1.6 To use mode 2" [▸ 38].

If the pressure difference between the R744 refrigerant tank (B) and refrigerant piping is too low, you cannot charge anymore. To continue charging proceed as follows:

7 Start operating the indoor units in cooling mode.

8 Adjust the opening of the liquid stop valve CsV4 (f) until the flow from the R744 refrigerant tank (B) starts again.

NOTICE

In case of long field piping length, the outdoor unit automatically stops when charging refrigerant with the liquid stop valve fully closed. Adjusting the liquid stop valve avoids an unwanted stop.

Remark: Do not close the liquid stop valve CsV4 (f) completely because you can overpressure the unit which can damage the safety valve of the unit liquid receiver vessel.

9 When charging is finished, open all stop valves.

10 Close SP7 (d).

11 Attach the valve caps to the stop valves and service ports.

WARNING

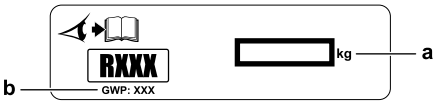
After charging refrigerant, keep the power supply of the outdoor unit ON to avoid a pressure increase on the low pressure (suction piping) side and to avoid pressure increase on the pressure side of the liquid receiver.

INFORMATION

After charging, add the total amount of refrigerant to the refrigerant charge label. See "15.4 To fix the refrigerant charge label" [▸ 32].

15.4 To fix the refrigerant charge label

1 Fill in the label as follows:



a	Total refrigerant charge
b	GWP value of the refrigerant GWP = Global Warming Potential

2 Fix the label on the outdoor unit near the nameplate.

16 Electrical installation

DANGER: RISK OF ELECTROCUTION

WARNING

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

WARNING

ALWAYS use multicore cable for power supply cables.

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

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

NOTICE

The distance between the high voltage and low voltage cables should be at least 50 mm.

NOTICE

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

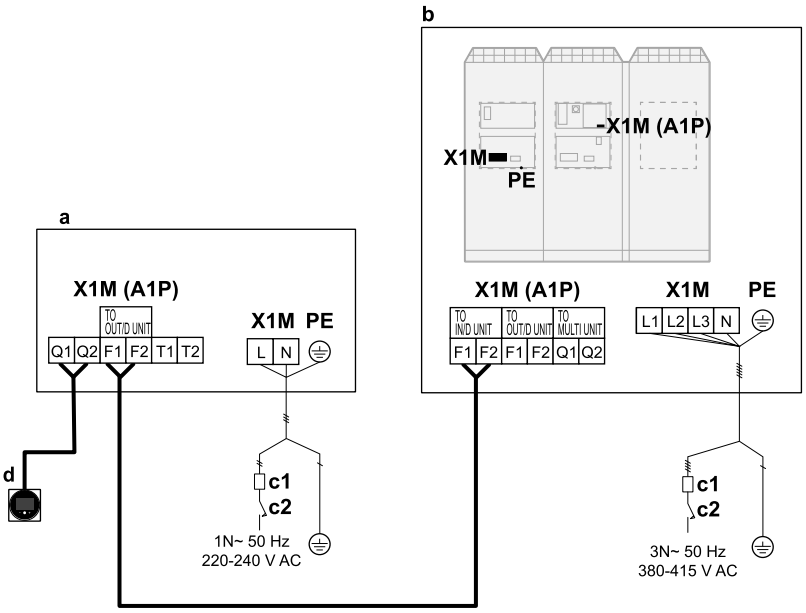
16.1 About electrical compliance

This equipment (LREN* and LRNUN*) complies with:

- **EN/IEC 61000-3-11** provided that the system impedance Z_{sys} is less than or equal to Z_{max} at the interface point between the user's supply and the public system.
  - EN/IEC 61000-3-11 = European/International Technical Standard setting the limits for voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤75 A.
  - 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 system impedance Z_{sys} less than or equal to Z_{max}.
- **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	Z_{max}	Minimum S_{sc} value
RXYN10*	–	5819

16.2 Field wiring: Overview

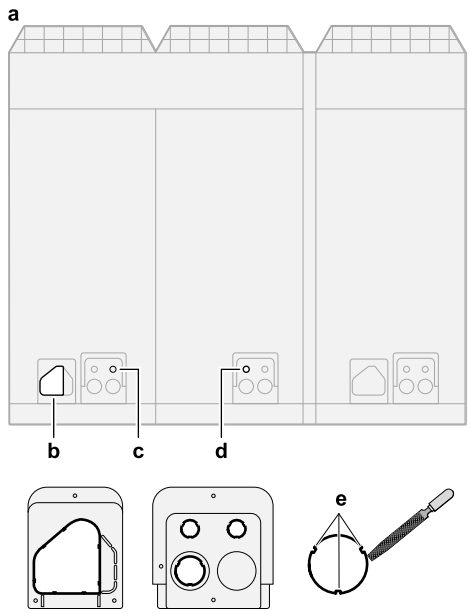


a Indoor unit
b Outdoor unit (RXYN10*)
c1 Overcurrent fuse (field supply)
c2 Earth leakage circuit breaker (field supply)
d Remote controller
Wiring:
Interconnection wiring (no polarity)

16.3 Guidelines for making knockout holes

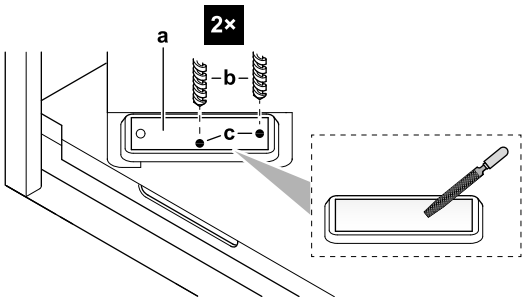
- To punch a knockout hole in a front panel, hit on it with a hammer.
- To punch a knockout hole in the bottom panel, drill holes where indicated.
- After knocking out the holes, we recommend removing any burrs and paint the edges and areas around the holes using repair paint to prevent rusting.
- When passing electrical wiring through the knockout holes, prevent damage to the wires by wrapping the wiring with protective tape, putting the wires through field supplied protective wire conduits at that location, or install suitable field supplied wire nipples or rubber bushings into the knockout holes.

Front connection



a Outdoor unit
Knockout holes for:
b Piping
c High voltage wiring
d Low voltage wiring
e Remove burrs

Side connection



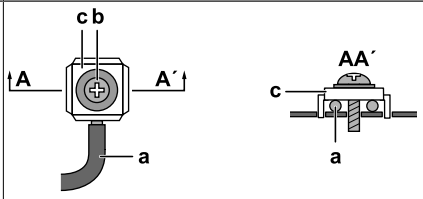
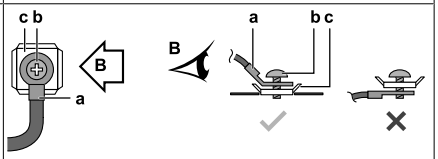
a Knockout plate
b Drill (Ø6 mm)
c Drill here

WARNING

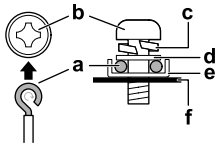
Provide adequate measures to prevent that the unit can be used as a shelter by small animals. Small animals that make contact with electrical parts can cause malfunctions, smoke or fire.

16.4 Guidelines when connecting the electrical wiring

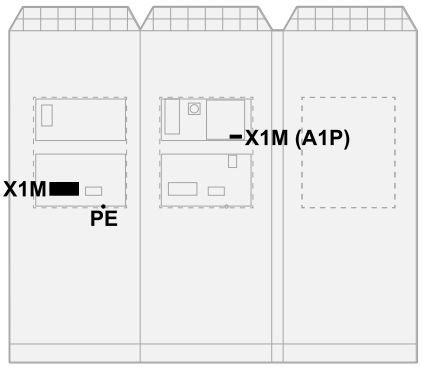
Use the following methods for installing wires:

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

For earth connections, use the following method:

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

Tightening torques



Terminal	Screw size	Tightening torque (N•m)
X1M: Power supply	M8	5.5~7.3
PE: Protective earth (screw)	M8	
X1M (A1P): Interconnection wiring	M3.5	0.80~0.96

16.5 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 RXYN10*
Power supply cable	MCA[(a)]	34 A
	Voltage	380-415 V
	Phase	3N~
	Frequency	50 Hz
	Wire size	Must comply with national wiring regulation. 5 core cable Wire size based on the current, but not less than 6 mm²
Interconnection cable	Voltage	220-240 V
	Wire size	Only use harmonised wire providing double insulation and suitable for applicable voltage. 2-core cable 0.75-1.5 mm²
Recommended field fuse		40 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.

16.6 Connections to the outdoor unit

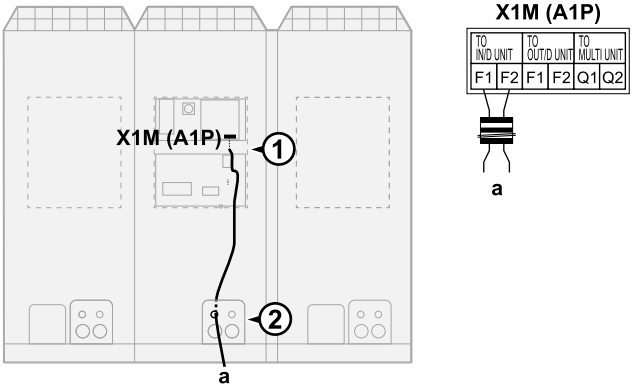
NOTICE

- Be sure to keep the power line and transmission line apart from each other (≥50 mm). Transmission wiring and power supply wiring may cross, but may not run parallel.
- Transmission wiring and power supply wiring may NOT touch internal piping in order to avoid wire damage due to high temperature piping.
- Firmly close the lid and arrange the electrical wires so as to prevent the lid or other parts from coming loose.

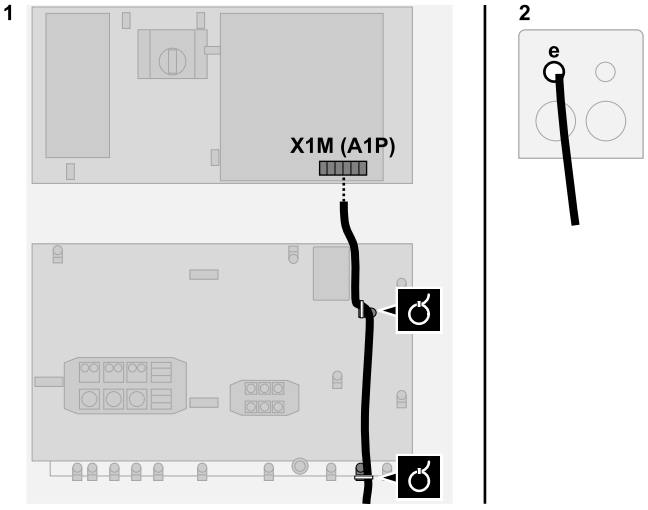
Low voltage wiring	▪ Interconnection wiring
High voltage wiring	▪ Power supply (including earth)

16.6.1 Low voltage wiring – Outdoor unit

Connections/routing/fixing



X1M (A1P) Interconnection wiring:
a: To indoor unit



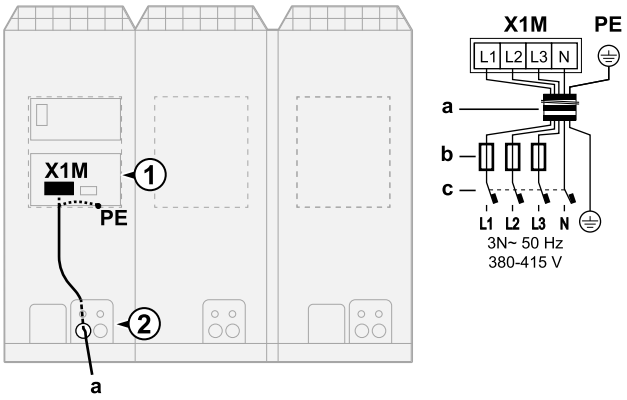
e Wiring intake (knockout hole) for low voltage. See "16.3 Guidelines for making knockout holes" [▶ 34].

Details – Interconnection wiring

See "16.5 Specifications of standard wiring components" [▶ 35].

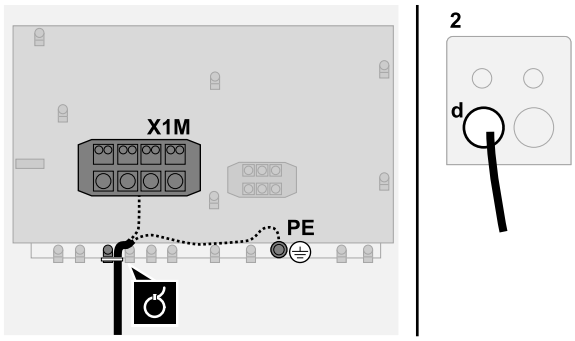
16.6.2 High voltage wiring – Outdoor unit

Connections/routing/fixing



X1M Power supply:
a: Power supply cable
b: Overcurrent fuse
c: Earth leakage circuit breaker

PE Protective earth (screw)



d Wiring intake (knockout hole) for high voltage. See "16.3 Guidelines for making knockout holes" [▶ 34].

Details – Power supply

See "16.5 Specifications of standard wiring components" [▶ 35].

16.7 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.

17 Configuration

DANGER: RISK OF ELECTROCUTION

INFORMATION

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

17.1 Making field settings

17.1.1 About making field settings

To continue the configuration of the outdoor unit, it is required to give some input to the PCB of the outdoor 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 display.

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

See also:

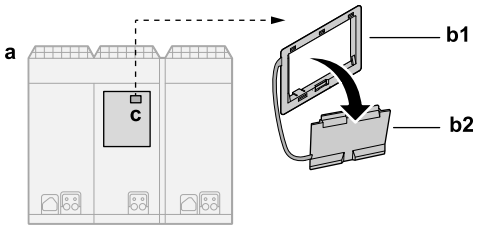
- "17.1.2 To access the field setting components" [▶ 37]
- "17.1.3 Field setting components" [▶ 37]

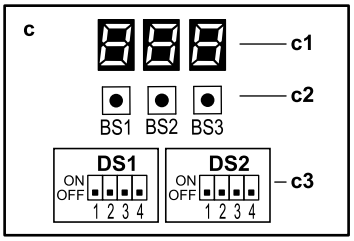
17.1.2 To access the field setting components

You do not have to open the complete switch box to access the field setting components.

1 Open the front panel (middle front panel of outdoor unit). See "13.2.1 To open the outdoor unit" [▶ 20].

2 Open the inspection hole cover, and make the field settings.



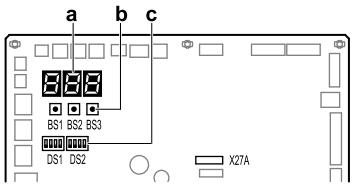


a Outdoor unit
b1 Inspection hole
b2 Inspection hole cover
c Field setting components

c1 7-segment displays: ON ( ) OFF ( ) Flashing ( )
c2 Push buttons:
BS1: MODE : For changing the set mode
BS2: SET : For field setting
BS3: RETURN: For field setting
c3 DIP switches: DS1, DS2

3 After making the field settings, reattach the inspection hole cover and the front plate.

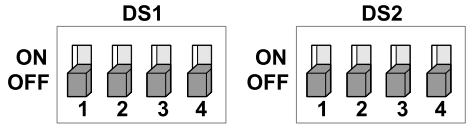
17.1.3 Field setting components



a 7-segment display
b Push buttons: BS1, BS2, BS3
c DIP switches: DS1, DS2

DIP switches

Use DS1 to set the target evaporating and condensation temperatures. Do NOT change DS2.



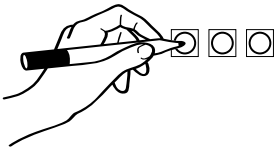
DS1 (1~2)	Target evaporating temperature
ON OFF 1 2	Auto (default)
ON OFF 1 2	6°C
ON OFF 1 2	9°C
ON OFF 1 2	11°C

DS1 (3~4)	Target condensation temperature
ON OFF 3 4	Auto (default)
ON OFF 3 4	42°C
ON OFF 3 4	44°C
ON OFF 3 4	46°C

- DS2 (1~4): NOT USED. DO NOT CHANGE THE FACTORY SETTING.

Push buttons

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



- BS1: MODE : For changing the set mode.
- BS2: SET : For field setting.
- BS3: RETURN: For field setting.

7-segment display

The display gives feedback about the field settings, which are defined as [Mode-Setting]=Value. Value is the value we want to know/change.

Mode	Description
Mode 1 (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 (field settings)	Mode 2 is used to change the field settings of the system. Consulting the current field setting value and changing the current field setting value is possible. In general, normal operation can be resumed without special intervention after changing field settings. Some field settings are used for special operation (e.g., release/vacuuming setting). 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:

- "17.1.4 To access mode 1 or 2" [▶ 38]
- "17.1.5 To use mode 1" [▶ 38]
- "17.1.6 To use mode 2" [▶ 38]
- "17.1.7 Mode 1: monitoring settings" [▶ 39]
- "17.1.8 Mode 2: field settings" [▶ 39]

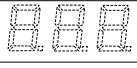
17.1.4 To access mode 1 or 2

Initialisation: default situation

NOTICE

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

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

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

INFORMATION

If you get confused in the middle of the process, push BS1 to return to the default situation (no indication on 7-segment displays: blank, see "17.1.4 To access mode 1 or 2" [▶ 38].

17.1.5 To use mode 1

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

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

17.1.6 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. ▪ Push BS2 to select the required setting. ▪ 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. ▪ Push BS2 to select the required setting. ▪ Push BS3 one time to access the selected setting's value. ▪ Push BS2 to select the required value of the selected setting. ▪ Push BS3 one time to validate the change. ▪ Push BS3 again to start operation with the chosen value.

17.1.7 Mode 1: monitoring settings

[1-32] [1-33] [1-34]

Code	Shows ...
[1-32]	The latest malfunction code
[1-33]	The 2nd last malfunction code
[1-34]	The 3rd last malfunction code

17.1.8 Mode 2: field settings

[2-1]

Low noise operation level via the external control adaptor.

If the system needs to be running under low noise operation conditions when an external signal is sent to the unit, this setting defines the level of low noise that will be applied.

This setting will only be effective when the optional external control adaptor (DTA104A61/62) is installed and the setting [2-24] was activated.

[2-1]	Description	
0 (default)	Deactivated	
1	Level 1	Level 2<Level 1<OFF
2	Level 2	

[2-21]

Refrigerant release/vacuuming mode.

In order to achieve a free pathway to release refrigerant out of the system or to remove residual substances or to vacuum the system it is necessary to apply a setting which will open required valves in the refrigerant circuit so the release of refrigerant or vacuuming process can be done properly.

[2-21]	Description
0 (default)	Deactivated.
1	Activated. To stop the refrigerant release/vacuuming mode, push BS3. If BS3 is not pushed, the system will remain in refrigerant release/ vacuuming mode.

18 Commissioning

CAUTION

See "2 Specific installer safety instructions" [▶ 4] 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.

18.1 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.

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

18.2 Checklist before commissioning

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

2 Close the unit.

3 Power up the unit.

☐	You have read the complete installation and operation instructions described in the **installer and user reference guide**.
☐	**Installation** Check that the unit is properly installed, to avoid abnormal noises and vibrations when starting up the unit.
☐	**Transportation stay** Check that the outdoor unit's transportation stay is removed.
☐	**Field wiring** Check that the field wiring has been carried out according to the instructions described in the chapter "16 Electrical installation" [▶ 32], according to the wiring diagrams and according to the applicable national wiring regulation.
☐	**Power supply voltage** 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** Be sure that the earth wires have been connected properly and that the earth terminals are tightened.
☐	**Insulation test of the main power circuit** 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 transmission wiring.
☐	**Fuses, circuit breakers, or protection devices** Check that the fuses, circuit breakers, or the locally installed protection devices are of the size and type specified in the chapter "16 Electrical installation" [▶ 32]. Be sure that no fuse or protection device is bypassed.
☐	**Internal wiring** Visually check the switch box and the inside of the unit for loose connections or damaged electrical components.
☐	**Safety valve (accessory)** Check that the safety valve (accessory) has been installed correctly according to standards EN378-2 and EN13136.

☐	**Pipe size and pipe insulation** Be sure that correct pipe sizes are installed and that the insulation work is properly executed.
☐	**Stop valves** Be sure that the stop valves (2 in total) are open on the liquid and gas side between the outdoor unit and indoor unit.
☐	**Damaged equipment** Check the inside of the unit for damaged components or squeezed pipes.
☐	**Refrigerant leak** 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. **Remark:** All refrigerant MUST be released before you do repair work.
☐	**Oil leak** 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. **Remark:** All refrigerant MUST be released before you do repair work.
☐	**Air inlet/outlet** Check that the air inlet and outlet of the unit is NOT obstructed by paper sheets, cardboard, or any other material.
☐	**Refrigerant charge** The amount of refrigerant to be added to the unit shall be written in the logbook. Add the total amount of refrigerant to the refrigerant charge label.
☐	**Installation of indoor units** Check that the units are properly installed.
☐	**Field settings** Make sure all field settings you want are set. See "17.1 Making field settings" [▶ 37].
☐	**Installation date and field setting** Be sure to keep record of the installation date in the logbook.

18.3 About the system test run

Make sure to carry out the system test operation after the first installation.

The procedure below describes the test operation of the complete system.

18.4 To perform a test run (7-segment display)

To perform a test run of the outdoor unit

1. Check that all the stop valves between the outdoor unit and indoor unit are fully open: gas and liquid stop valves.
2. Check that all electrical components and refrigerant piping is installed correctly, for the indoor units and outdoor unit.
3. Turn ON the power supply of all units: the indoor units and outdoor unit.
4. Wait for about 10 minutes until the communication between the outdoor unit and indoor units is confirmed. The 7-segment display is blinking during the communication test:
   - If communication is confirmed, the display will be OFF.
   - If communication is not confirmed, an error code will be displayed on the remote controller of the indoor units. See "19.1.1 Error codes: Overview" [▶ 41].
5. Turn ON the remote controller of the air conditioner. See the operation manual of the indoor unit for more information about the temperature settings.
6. Check that the unit functions without error codes. See "18.4.1 Test run checks" [▶ 40].

18.4.1 Test run checks

Check visually

Check the following:

- Air conditioners are blowing hot or cold air.
- The compressor does not switch on and off in less than 10 minutes.

Check error code

Check the remote controller of the indoor units.

The remote controller displays …	Description
Room temperature	The remote controller operates correctly.
Error code	See "19.1.1 Error codes: Overview" [▶ 41].
Nothing	Check that: ▪ Power supply of indoor unit is turned ON. ▪ The cable of the power supply cable is not broken and connected correctly. ▪ The cable of the remote controller (indoor unit) is not broken and connected correctly. ▪ Fuses and circuit breakers on the indoor unit PCB did not trip.

18.4.2 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.

18.5 Logbook

In accordance with the applicable legislation, the installer must provide a logbook upon installation of the system. The logbook shall be updated following any maintenance or repair of the system. In Europe, EN378 provides the necessary guidance for this logbook.

Content of the logbook

The following information must be provided:

- Details of the maintenance and repair works
- Quantities and kind of (new, reused, recycled, reclaimed) refrigerant which have been charged on each occasion
- Quantities of refrigerant which have been transferred from the system on each occasion

- Results of any analysis of a reused refrigerant
- Source of reused refrigerant
- Changes and replacements of components of the system
- Results of all periodic routine tests
- Significant periods of non-use

Furthermore, you can add:

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

Location of the logbook

The logbook shall either be kept in the machinery room, or the data shall be stored digitally by the operator with a printout in the machinery room, in which case the information shall be accessible to the competent person when servicing or testing.

19 Troubleshooting

19.1 Solving problems based on error codes

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

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.

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

INFORMATION

See the service manual for:

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

19.1.1 Error codes: Overview

In case other error codes appear, contact your dealer.

Main code	Sub code	Cause	Solution
E2	-01	Earth leakage detection	Restart the unit. If problem reoccurs, contact your dealer.
	-02		
	-03		
E3	-03	High pressure rise abnormality Closed stop valve / refrigerant overcharge	Check stop valve situation or abnormalities in (field) piping or airflow over air cooled coil.
	-04	Receiver pressure rise abnormality	
	-05	Medium pressure rise abnormality	
	-06	High pressure switch activated	
	-07		
	-08		
E4	-01	Low pressure drop abnormality	▪ Open stop valves. ▪ Check refrigerant amount+recharge unit. ▪ Check the user interface's display or interconnection wiring between the outdoor unit and the indoor unit.

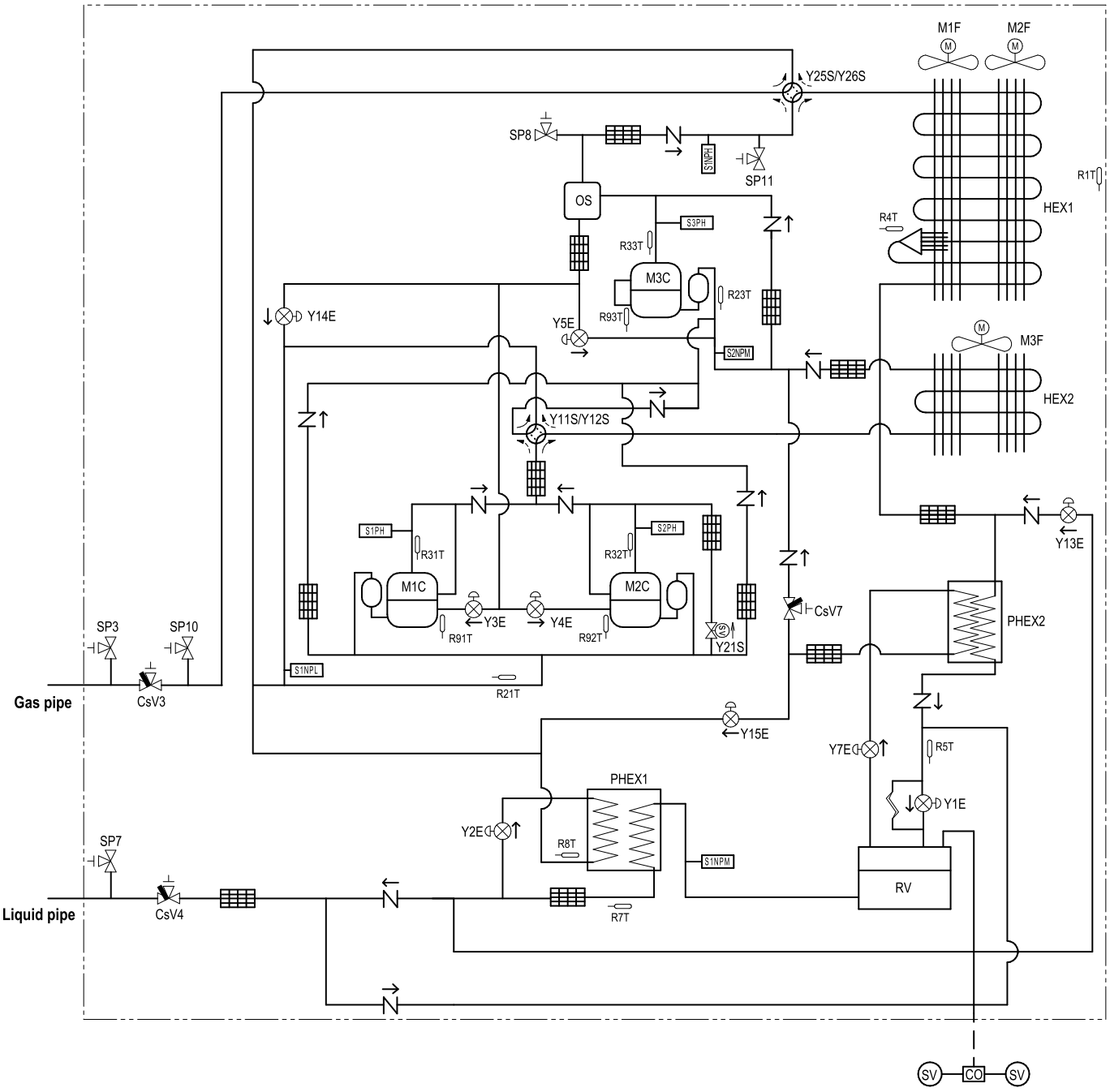
Main code	Sub code	Cause	Solution
E7	-01	M1F fan motor abnormality - instantaneous overcurrent	Check connection on PCB or actuator.
	-02	M2F fan motor abnormality - instantaneous overcurrent	
	-03	M3F fan motor abnormality - instantaneous overcurrent	
	-04	M1F fan motor abnormality - inverter current waveform abnormality	
	-05	M2F fan motor abnormality - inverter current waveform abnormality	
	-06	M3F fan motor abnormality - inverter current waveform abnormality	
	-07	M1F fan motor abnormality - inverter overcurrent detection	
	-08	M2F fan motor abnormality - inverter overcurrent detection	
	-09	M3F fan motor abnormality - inverter overcurrent detection	
E9	-01	Y1E expansion valve coil abnormality	Check connection on PCB or actuator.
	-02	Y2E expansion valve coil abnormality	
	-03	Y3E oil return valve coil abnormality	
	-04	Y4E oil return valve coil abnormality	
	-05	Y5E oil return valve coil abnormality	
	-07	Y7E expansion valve coil abnormality	
	-13	Y13E expansion valve coil abnormality	
	-14	Y14E oil return valve coil abnormality	
	-15	Y15E expansion valve coil abnormality	
F3	-01	M1C discharge temperature too high	▪ Open stop valves. ▪ Check refrigerant amount+recharge unit.
	-02	M2C discharge temperature too high	
	-03	M3C discharge temperature too high	
	-04	M1C body temperature too high	
	-05	M2C body temperature too high	
	-06	M3C body temperature too high	
F6	00	Refrigerant overcharge detection	Check the refrigerant amount.
H9	00	R1T thermistor abnormality	Check connection on PCB or actuator.
J3	-01	M1C discharge thermistor abnormality	Check connection on PCB or actuator.
	-02	M2C discharge thermistor abnormality	
	-03	M3C discharge thermistor abnormality	
	-04	M1C body thermistor abnormality	
	-05	M2C body thermistor abnormality	
	-06	M3C body thermistor abnormality	
J5	-01	M1C suction thermistor abnormality	Check connection on PCB or actuator.
	-03	M3C suction thermistor abnormality	
J6	00	Gas cooler outlet thermistor abnormality	Check connection on PCB or actuator
J7	00	Subcool heat exchanger outlet thermistor abnormality	Check connection on PCB or actuator.
J8	00	Liquid thermistor abnormality	Check connection on PCB or actuator.
JA	00	High pressure sensor abnormality	Check connection on PCB or actuator.
JC	-01	Low pressure sensor abnormality	Check connection on PCB or actuator.
	-04	Receiver pressure sensor abnormality	
	-05	Medium pressure sensor abnormality	
LC	-01	INV1 -control PCB	Check connection.
	-02	INV2/INV3 -control PCB	
P1	-01	M1C inverter PCB power supply abnormality	Check the power supply.
	-02	M2C inverter PCB power supply abnormality	
	-03	M3C inverter PCB power supply abnormality	
U0	00	Refrigerant shortage detection	Check the refrigerant amount.

Main code	Sub code	Cause	Solution
U1	-01	M1C inverter PCB power supply frequency abnormality	Check the connection of the power supply cable.
	-02	M2C inverter PCB power supply frequency abnormality	
	-03	M3C inverter PCB power supply frequency abnormality	
	-04	M1C inverter PCB missing or reverse phase detection	
	-05	M2C inverter PCB missing or reverse phase detection	
	-06	M3C inverter PCB missing or reverse phase detection	
U2	-01	M1C inverter PCB power supply voltage abnormality	Check the power supply.
	-02	M2C inverter PCB power supply voltage abnormality	
	-03	M3C inverter PCB power supply voltage abnormality	
	-04	M1C inverter PCB power supply voltage abnormality	
	-05	M2C inverter PCB power supply voltage abnormality	
	-06	M3C inverter PCB power supply voltage abnormality	
	-07	M1C inverter PCB power supply voltage abnormality	
	-08	M2C inverter PCB power supply voltage abnormality	
	-09	M3C inverter PCB power supply voltage abnormality	

20 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).

20.1 Piping diagram: Outdoor unit



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- S1NPL — Pressure sensor (low)
- S*NPM — Pressure sensor (middle)
- S1NPH — Pressure sensor (high)
- S*PH — High pressure switch
- Check valve
- Stop valve
- S*PH — High pressure switch
- Thermistor
- Compressor with accumulator
- Heat exchanger
- OS — Oil separator
- RV — Liquid receiver


Service port


Safety valve


Changeover valve


Solenoid valve


Electronic expansion valve


Distributor


Filter


Plate heat exchanger


4-way valve

Cooling

Heating


Propeller fan

Capillary tube

20.2 Wiring diagram: Outdoor unit

The wiring diagram is delivered with the unit, located at the inside of the switch box covers.

Notes:

1	This wiring diagram applies only to the outdoor unit.	
2	Field wiring	
3	Terminal block	
	Connector	
	Terminal	
	Protective earth (screw)	
4	S1S is factory set to OFF. Set to ON or REMOTE to operate.	
5	Use a voltage-free contact for microcurrent (≤1 mA, 12 V DC). For more information about the remote switches, see details in "16.6.1 Low voltage wiring – Outdoor unit" [▶ 36].	
6	Output (caution, warning, run, operation) is 220-240 V AC, with a maximum load of 0.5 A.	
7	For more information about the BS1~BS3 push buttons and the DS1+DS2 DIP switches, see "17.1 Making field settings" [▶ 37].	
8	Do not operate the unit by short-circuiting protection devices (S1PH, S2PH and S3PH).	
9	Colours:	
	BLK	Black
	RED	Red
	BLU	Blue
	WHT	White
	GRN	Green
	YLW	Yellow
	PNK	Pink

Legend:

A1P	Printed circuit board (main 1)
A2P	Printed circuit board (main 2)
A3P	Printed circuit board (M1C)
A4P	Printed circuit board (M2C)
A5P	Printed circuit board (M3C)
A6P	Printed circuit board (noise filter) (M1C)
A7P	Printed circuit board (noise filter) (M2C)
A8P	Printed circuit board (noise filter) (M3C)
A9P	Printed circuit board (M1F)
A10P	Printed circuit board (M2F)
A11P	Printed circuit board (M3F)
A14P	Printed circuit board (earth leakage detector)
BS*[(a)]	Push button switch (A1P, A2P)
C507	Film capacitor (A3P)
C503, C506	Capacitor (A3P)
DS*[(a)]	DIP switch (A1P, A2P)
E1HC	Crankcase heater (M1C)
E2HC	Crankcase heater (M2C)
E3HC	Crankcase heater (M3C)
F1U, F2U	Fuse (T, 6, 3 A, 250 V) (A1P, A2P)
F3U, F4U	Fuse (1 A, 250 V)
F101U	Fuse (A9P,A10P,A11P)
F401U, F403U	Fuse (T, 6, 3 A, 250 V) (A6P, A7P, A8P)
F601U	Fuse (A3P, A4P, A5P)
HAP	Pilot lamp (service monitor-green) (A1P, A2P, A3P, A4P, A5P, A9P, A10P, A11P)
K1R	Magnetic relay (A14P)
K3R	Magnetic relay (A3P)
L1R	Reactor (A3P)
L2R	Reactor (A4P)
L3R	Reactor (A5P)
M1C	Motor (compressor) (INV1)
M2C	Motor (compressor) (INV2)
M3C	Motor (compressor) (INV3)
M1F	Motor (fan) (FAN1)
M2F	Motor (fan) (FAN2)
M3F	Motor (fan) (FAN3)
PS	Switching power supply (A3P)
R10	Resistor (current sensor) (A9P)
R300	Resistor (A3P)
R1T	Thermistor (air) (A1P)
R4T	Thermistor (de-icer)
R5T	Thermistor (gas-cooler outlet)
R7T	Thermistor (liquid)
R8T	Thermistor (sub-cool heat exchanger outlet)
R21T	Thermistor (M1C suction)
R22T	Thermistor (M2C suction)
R23T	Thermistor (M3C suction)
R31T	Thermistor (M1C discharge)
R32T	Thermistor (M2C discharge)
R33T	Thermistor (M3C discharge)
R91T	Thermistor (M1C body)
R92T	Thermistor (M2C body)
R93T	Thermistor (M3C body)
S1NPH	High pressure sensor
S1NPL	Low pressure sensor
S1NPM	Medium pressure sensor (liquid)
S2NPM	Medium pressure sensor (M3C suction)
S1PH	Pressure switch (high pressure protection) (M1C)
S2PH	Pressure switch (high pressure protection) (M2C)
S3PH	Pressure switch (high pressure protection) (M3C)
SEG*	7-segment display (A1P, A2P)
T1A	Current sensor (A14P)
T2A	Current sensor (A1P)
T3A	Current sensor (A2P)
V1D	Diode (A3P)
V1R	Diode bridge (A3P)
V1R	Power Module (A3PA9P)
X*A	Connector
X*M	Terminal block
Y1E	Electronic expansion valve (transcritical)
Y2E	Electronic expansion valve (economiser)
Y3E	Electronic expansion valve (oil return) (M1C)

Y4E	Electronic expansion valve (oil return) (M2C)
Y5E	Electronic expansion valve (oil return) (M3C)
Y7E	Electronic expansion valve (gas relief)
Y13E	Electronic expansion valve (outdoor evaporation)
Y14E	Electronic expansion valve (suction oil return)
Y15E	Electronic expansion valve (equalisation)
Y21S	Solenoid valve (pressure equiliser)
Y11S	Solenoid valve (IC 4-way valve left)
Y12S	Solenoid valve (IC 4-way valve right)
Y25S	Solenoid valve (main 4-way valve left)
Y26S	Solenoid valve (main 4-way valve right)
Z*C	Ferrite core
ZF	Noise filter (with surge absorber) (A9P)

[a] For more information about the BS1~BS3 push buttons and the DS1+DS2 DIP switches, see "17.1 Making field settings" [▶37].

DAIKIN EUROPE N.V.
Zandvoordestraat 300, B-8400 Oostende, Belgium

4P773663-1 2025.02