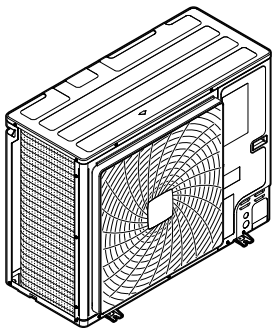
Installer reference guide

Sky Air Advance-series



RZA200D7Y1B
RZA250D7Y1B

Installer reference guide
Sky Air Advance-series

English

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1 General safety precautions

1.1 About the documentation

- The original documentation is written in English. All other languages are translations.
- The precautions described in this document cover very important topics, follow them carefully.
- The installation of the system, and all activities described in the installation manual and in the installer reference guide MUST be performed by an authorised installer.

1.1.1 Meaning of warnings and symbols

DANGER

Indicates a situation that results in death or serious injury.

DANGER: RISK OF ELECTROCUTION

Indicates a situation that could result in electrocution.

DANGER: RISK OF BURNING

Indicates a situation that could result in burning because of extreme hot or cold temperatures.

DANGER: RISK OF EXPLOSION

Indicates a situation that could result in explosion.

WARNING

Indicates a situation that could result in death or serious injury.

WARNING: FLAMMABLE MATERIAL

CAUTION

Indicates a situation that could result in minor or moderate injury.

NOTICE

Indicates a situation that could result in equipment or property damage.

INFORMATION

Indicates useful tips or additional information.

Symbol	Explanation
	Before installation, read the installation and operation manual, and the wiring instruction sheet.
	Before performing maintenance and service tasks, read the service manual.
	For more information, see the installer and user reference guide.

1.2 For the installer

1.2.1 General

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

NOTICE

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

WARNING

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

CAUTION

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

WARNING

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

DANGER: RISK OF BURNING

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

WARNING

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

CAUTION

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

NOTICE

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

NOTICE

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

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

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

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

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

1.2.2 Installation site

- Provide sufficient space around the unit for servicing and air circulation.
- Make sure the installation site withstands the weight and vibration of the unit.
- Make sure the area is well ventilated. Do NOT block any ventilation openings.
- Make sure the unit is level.

Do NOT install the unit in the following places:

- In potentially explosive atmospheres.
- In places where there is machinery that emits electromagnetic waves. Electromagnetic waves may disturb the control system, and cause malfunction of the equipment.
- In places where there is a risk of fire due to the leakage of flammable gases (example: thinner or gasoline), carbon fibre, ignitable dust.
- In places where corrosive gas (example: sulphurous acid gas) is produced. Corrosion of copper pipes or soldered parts may cause the refrigerant to leak.

Instructions for equipment using R32 refrigerant

If applicable.

WARNING

- Do NOT pierce or burn.
- Do NOT use means to accelerate the defrosting process or to clean the equipment, other than those recommended by the manufacturer.
- Be aware that R32 refrigerant does NOT contain an odour.

WARNING

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

NOTICE

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

WARNING

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

Installation space requirements

NOTICE

- Pipework shall be protected from physical damage.
- Installation of pipework shall be kept to a minimum.

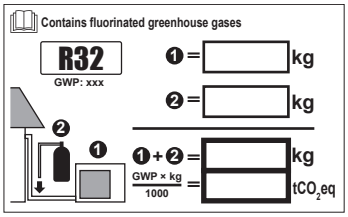
WARNING

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

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

To determine the minimum floor area

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

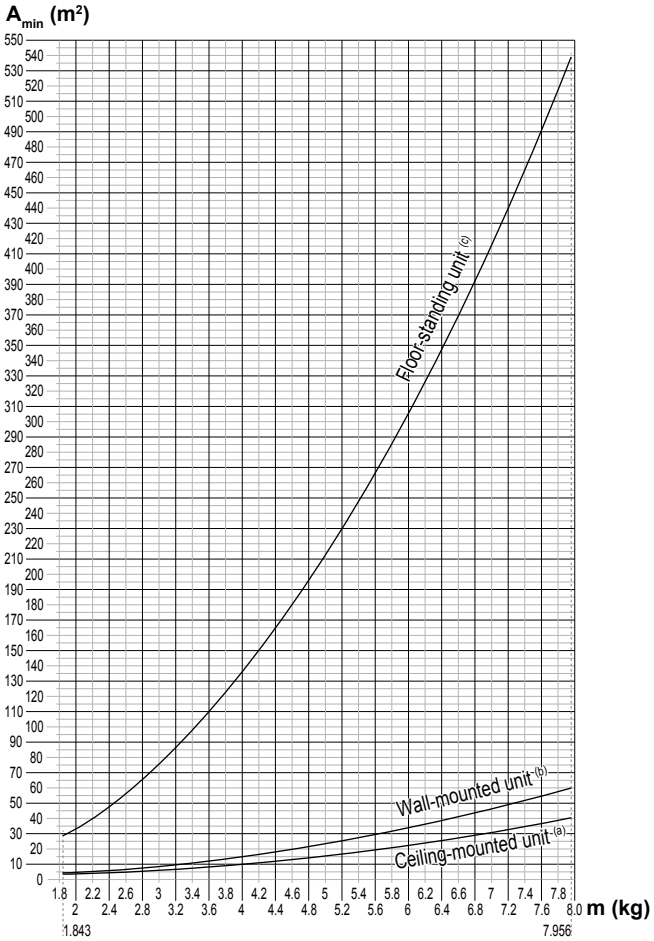


2 Determine which graph or table to use.

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

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

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



Ceiling-mounted unit[a]		Wall-mounted unit[b]		Floor-standing unit[c]	
m (kg)	A_{min} (m^2)	m (kg)	A_{min} (m^2)	m (kg)	A_{min} (m^2)
≤1.842	—	≤1.842	—	≤1.842	—
1.843	3.64	1.843	4.45	1.843	28.9
2.0	3.95	2.0	4.83	2.0	34.0
2.2	4.34	2.2	5.31	2.2	41.2
2.4	4.74	2.4	5.79	2.4	49.0
2.6	5.13	2.6	6.39	2.6	57.5
2.8	5.53	2.8	7.41	2.8	66.7
3.0	5.92	3.0	8.51	3.0	76.6
3.2	6.48	3.2	9.68	3.2	87.2
3.4	7.32	3.4	10.9	3.4	98.4
3.6	8.20	3.6	12.3	3.6	110
3.8	9.14	3.8	13.7	3.8	123
4.0	10.1	4.0	15.1	4.0	136
4.2	11.2	4.2	16.7	4.2	150
4.4	12.3	4.4	18.3	4.4	165
4.6	13.4	4.6	20.0	4.6	180
4.8	14.6	4.8	21.8	4.8	196
5.0	15.8	5.0	23.6	5.0	213
5.2	17.1	5.2	25.6	5.2	230
5.4	18.5	5.4	27.6	5.4	248
5.6	19.9	5.6	29.7	5.6	267
5.8	21.3	5.8	31.8	5.8	286
6.0	22.8	6.0	34.0	6.0	306
6.2	24.3	6.2	36.4	6.2	327
6.4	25.9	6.4	38.7	6.4	349
6.6	27.6	6.6	41.2	6.6	371
6.8	29.3	6.8	43.7	6.8	394
7.0	31.0	7.0	46.3	7.0	417
7.2	32.8	7.2	49.0	7.2	441
7.4	34.7	7.4	51.8	7.4	466
7.6	36.6	7.6	54.6	7.6	492
7.8	38.5	7.8	57.5	7.8	518
7.956	40.1	7.956	59.9	7.956	539

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

1.2.3 Refrigerant

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

NOTICE

Make sure refrigerant piping installation complies with applicable legislation. In Europe, EN378 is the applicable standard.

NOTICE

Make sure the field piping and connections are NOT subjected to stress.

WARNING

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

WARNING

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

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

DANGER: RISK OF EXPLOSION

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

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

WARNING

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

NOTICE

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

NOTICE

- To avoid compressor breakdown, do NOT charge more than the specified amount of refrigerant.
- When the refrigerant system is to be opened, refrigerant MUST be treated according to the applicable legislation.

WARNING

Make sure there is no oxygen in the system. Refrigerant may only be charged after performing the leak test and the vacuum drying.

- In case recharge is required, see the nameplate of the unit. It states the type of refrigerant and necessary amount.
- The unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant.
- Only use tools exclusively for the refrigerant type used in the system, this to ensure pressure resistance and prevent foreign materials from entering into the system.
- Charge the liquid refrigerant as follows:

If	Then
A siphon tube is present (i.e., the cylinder is marked with "Liquid filling siphon attached")	Charge with the cylinder upright. 
A siphon tube is NOT present	Charge with the cylinder upside down. 

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

CAUTION

When the refrigerant charging procedure is done or when pausing, close the valve of the refrigerant tank immediately. If the valve is NOT closed immediately, remaining pressure might charge additional refrigerant. **Possible consequence:** Incorrect refrigerant amount.

1.2.4 Brine

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

WARNING

The selection of the brine MUST be in accordance with the applicable legislation.

WARNING

Take sufficient precautions in case of brine leakage. If brine leaks, ventilate the area immediately and contact your local dealer.

WARNING

The ambient temperature inside the unit can get much higher than that of the room, e.g. 70°C. In case of a brine leak, hot parts inside the unit can create a hazardous situation.

WARNING

The use and installation of the application MUST comply with the safety and environmental precautions specified in the applicable legislation.

1.2.5 Water

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

NOTICE

Make sure water quality complies with EU directive 98/83 EC.

1.2.6 Electrical

DANGER: RISK OF ELECTROCUTION

- Turn OFF all power supply before removing the switch box cover, connecting electrical wiring or touching electrical parts.
- Disconnect the power supply for more than 1 minute, and measure the voltage at the terminals of main circuit capacitors or electrical components before servicing. The voltage MUST be less than 50 V DC before you can touch electrical components. For the location of the terminals, see the wiring diagram.
- Do NOT touch electrical components with wet hands.
- Do NOT leave the unit unattended when the service cover is removed.

WARNING

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

WARNING

- ONLY use copper wires.
- Make sure the field wiring complies with the applicable legislation.
- All field wiring MUST be performed in accordance with the wiring diagram supplied with the product.
- NEVER squeeze bundled cables and make sure they do NOT come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections.
- Make sure to install earth wiring. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock.
- Make sure to use a dedicated power circuit. NEVER use a power supply shared by another appliance.
- Make sure to install the required fuses or circuit breakers.
- Make sure to install an earth leakage protector. Failure to do so may cause electric shock or fire.
- When installing the earth leakage protector, make sure it is compatible with the inverter (resistant to high frequency electric noise) to avoid unnecessary opening of the earth leakage protector.

CAUTION

When connecting the power supply, the earth connection must be made before the current-carrying connections are established. When disconnecting the power supply, the current-carrying connections must be separated before the earth connection is. The length of the conductors between the power supply stress relief and the terminal block itself must be as such that the current-carrying wires are tautened before the earth wire is in case the power supply is pulled loose from the stress relief.

NOTICE

Precautions when laying power wiring:

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

WARNING

- After finishing the electrical work, confirm that each electrical component and terminal inside the electrical components box is connected securely.
- Make sure all covers are closed before starting up the unit.

NOTICE

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

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

2 About the documentation

2.1 About this document

Target audience

Authorised installers

INFORMATION

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

Documentation set

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

- **General safety precautions:**
  - Safety instructions that you MUST read before installing
  - Format: Paper (in the box of the outdoor unit)
- **Outdoor unit installation manual:**
  - Installation instructions
  - Format: Paper (in the box of the outdoor unit)
- **Installer reference guide:**
  - Preparation of the installation, reference data,…
  - Format: Digital files on http://www.daikineurope.com/support-and-manuals/product-information/

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

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

Technical engineering data

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

2.2 Installer reference guide at a glance

Chapter	Description
General safety precautions	Safety instructions that you must read before installing
About the documentation	What documentation exists for the installer
About the box	How to unpack the units and remove their accessories
About the units and options	▪ How to identify the units ▪ Possible combinations of units and options
Preparation	What to do and know before going on-site
Installation	What to do and know to install the system
Commissioning	What to do and know to commission the system after it is installed
Hand-over to the user	What to give and explain to the user
Maintenance and service	How to maintain and service the units
Troubleshooting	What to do in case of problems
Disposal	How to dispose of the system
Technical data	Specifications of the system
Glossary	Definition of terms

3 About the box

3.1 Overview: About the box

This chapter describes what you have to do after the box with the outdoor unit is delivered on-site.

It contains information about:

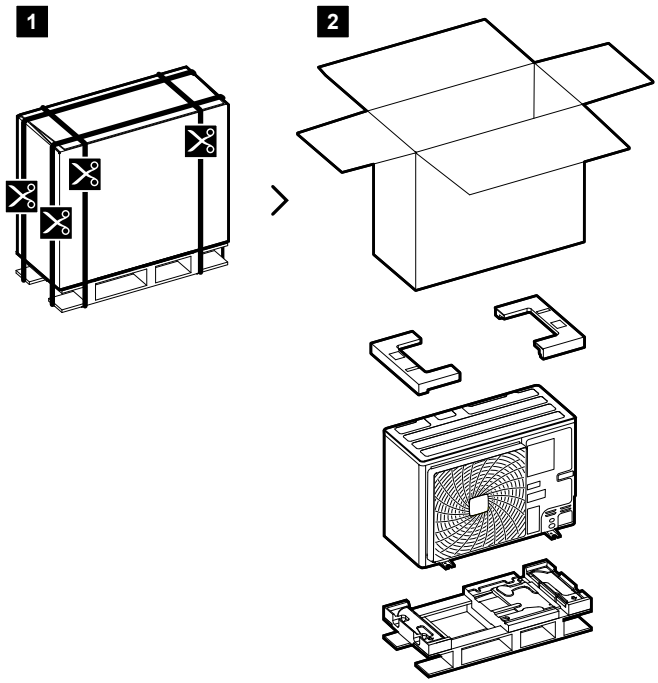
- Unpacking and handling the unit
- Removing the accessories from the unit

Keep the following in mind:

- At delivery, the unit MUST be checked for damage. Any damage 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 the path along which you want to bring the unit inside in advance.

3.2 Outdoor unit

3.2.1 To unpack the outdoor unit

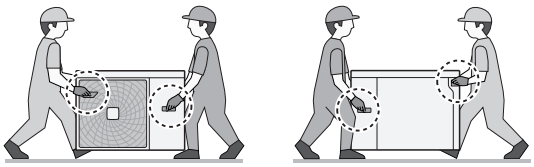


3.2.2 To handle the outdoor unit

CAUTION

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

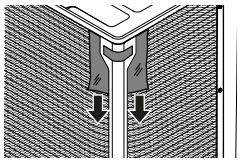
Carry the unit slowly as shown:



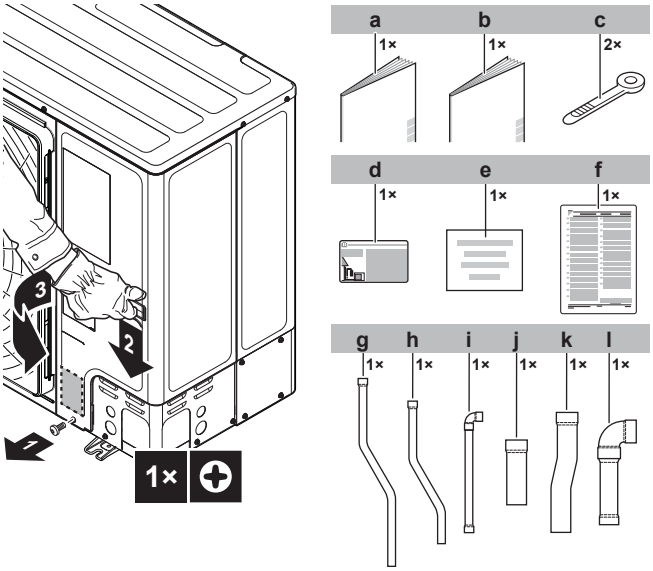
NOTICE

The cloth inside the left handle is intended to protect the hand from being cut by the aluminium fins of the unit.

ONLY remove the cloth when the unit is completely mounted:



3.2.3 To remove the accessories from the outdoor unit



a General safety precautions
b Outdoor unit installation manual
c Cable tie
d Fluorinated greenhouse gases label
e Additional refrigerant charge label
f Addendum (LOT21)
g Liquid line piping — long
h Liquid line piping — short
i Liquid line piping — bend
j Gas line piping — short
k Gas line piping — long
l Gas line piping — bend

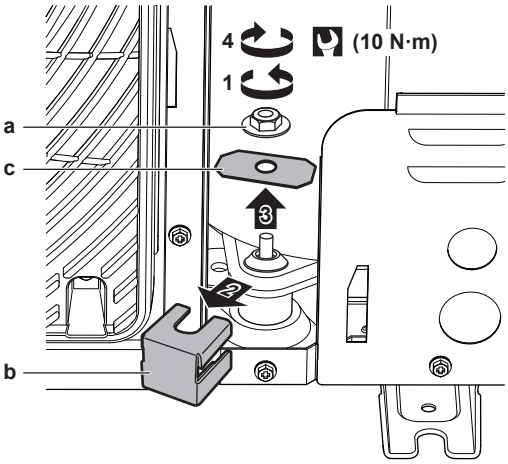
3.3 To remove the transportation stay

NOTICE

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

The transportation stay protects the unit during transport. During installation it must be removed.

Prerequisite: Open the service cover. See "6.2.2 To open the outdoor unit" [▶ 13].



a Nut
b Transportation stay
c Spacer

1 Remove the nut (a) of the compressor mounting bolt.
2 Remove and discard the transportation stay (b).
3 Remove and discard the spacer (c).
4 Re-install the nut (a) of the compressor mounting bolt and tighten to 10 N•m of torque.

4 About the units and options

4.1 Overview: About the units and options

This chapter contains information about:

- Identifying the outdoor unit
- Combining the outdoor unit with options

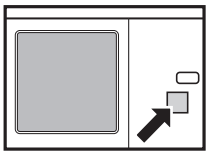
4.2 Identification

NOTICE

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

4.2.1 Identification label: Outdoor unit

Location



Model identification

Example: R Z A 250 D7 Y1 B [*]

Code	Explanation
R	Air-cooled split outdoor unit
Z	Inverter
A	Refrigerant R32
200~250	Capacity class
D7	Model series
Y1	Power supply: 3N~, 380~415 V, 50 Hz

Code	Explanation
B	European market
[*]	Minor model change indication

4.3 Combining units and options

4.3.1 Possible options for the outdoor unit

Refrigerant branch kit

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

Layout	Model name
Twin	KHRQ22M20TA
Triple	KHRQ250H7
Double twin	KHRQ22M20TA (3×)

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

Bottom plate heater (EKBPH250D7)

- Prevents freeze-up of the bottom plate.
- Recommended in areas with low ambient temperature and high humidity.
- For installation instructions, see the installation manual of the bottom plate heater.

Demand adaptor PCB (KRP58M51)

- Also order the EKMKSA3 demand adaptor mounting plate to fix the demand adaptor PCB.
- Can be used for the following:
  - Low noise: To lower the operation sound of the outdoor unit.
  - I-demand function: To limit the power consumption from the system (example: budget control, limit power consumption during peak moments…).
- For installation instructions, see the installation manual of the demand adaptor kit.

5 Preparation

5.1 Overview: Preparation

This chapter describes what you have to do and know before going on-site.

It contains information about:

- Preparing the installation site
- Preparing the refrigerant piping
- Preparing the electrical wiring

5.2 Preparing the installation site

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

Choose an installation location with sufficient space for carrying the unit in and out of the site.

WARNING

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

5.2.1 Installation site requirements of the outdoor unit

INFORMATION

Also read the following requirements:

- General installation site requirements. See the "General safety precautions" chapter.
- Service space requirements. See the "Technical data" chapter.
- Refrigerant piping requirements (length, height difference). See further in this "Preparation" chapter.

CAUTION

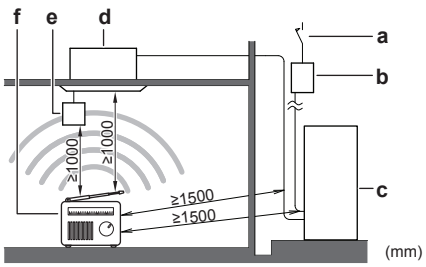
Appliance not accessible to the general public, install it in a secured area, protected from easy access.

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

NOTICE

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

It is therefore recommended to install the equipment and electric wires keeping proper distances away from stereo equipment, personal computers, etc.



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

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

Do NOT install the unit in the following places:

- Sound sensitive areas (e.g. near a bedroom), so that the operation noise will cause no trouble.
  Note: If the sound is measured under actual installation conditions, the measured value might be higher than the sound pressure level mentioned in Sound spectrum in the data book due to environmental noise and sound reflections.

INFORMATION

The sound pressure level is less than 70 dBA.

- In places where a mineral oil mist, spray or vapour may be present in the atmosphere. Plastic parts may deteriorate and fall off or cause water leakage.

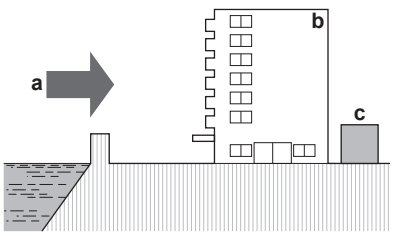
It is NOT recommended to install the unit in the following places because it may shorten the life of the unit:

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

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

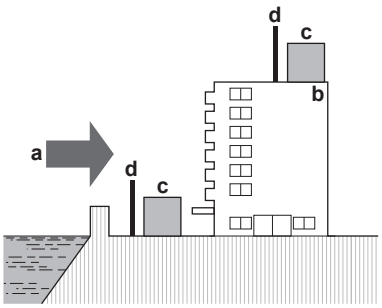
Install the outdoor unit away from direct sea winds.

Example: Behind the building.



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

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



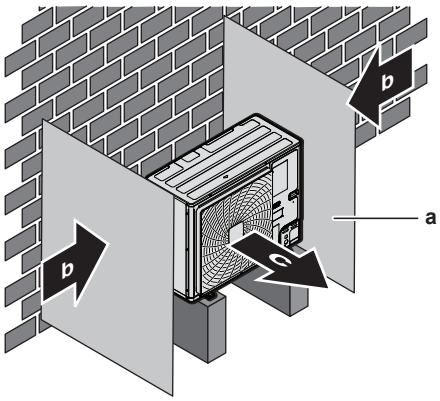
a Sea wind
b Building
c Outdoor unit
d Windbreaker

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

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

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

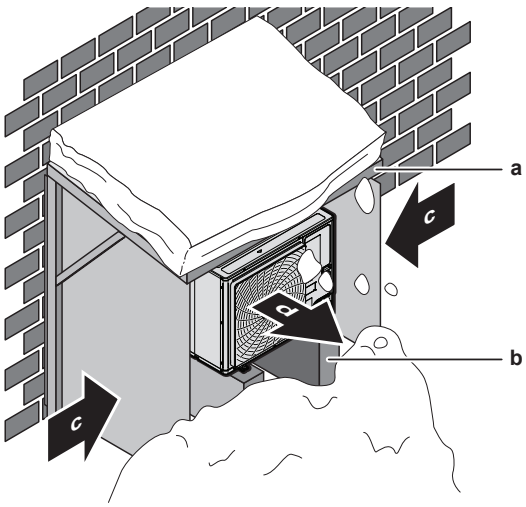
It is recommended to install the outdoor unit with the air inlet facing the wall and NOT directly exposed to the wind.



a Baffle plate
b Prevailing wind direction
c Air outlet

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

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



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

Snow might build up and freeze between the heat exchanger and the casing of the unit. This might decrease the operating efficiency. For instructions on how to prevent this (after mounting of the unit), see "6.3.5 To provide drainage" [▶ 14].

5.3 Preparing refrigerant piping

5.3.1 Refrigerant piping requirements

INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

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

Refrigerant branch kit	One or more refrigerant branch kits are required. See "4.3.1 Possible options for the outdoor unit" [▶ 9].
Upward and downward piping	Perform upward and downward piping only on the main piping line (L1).

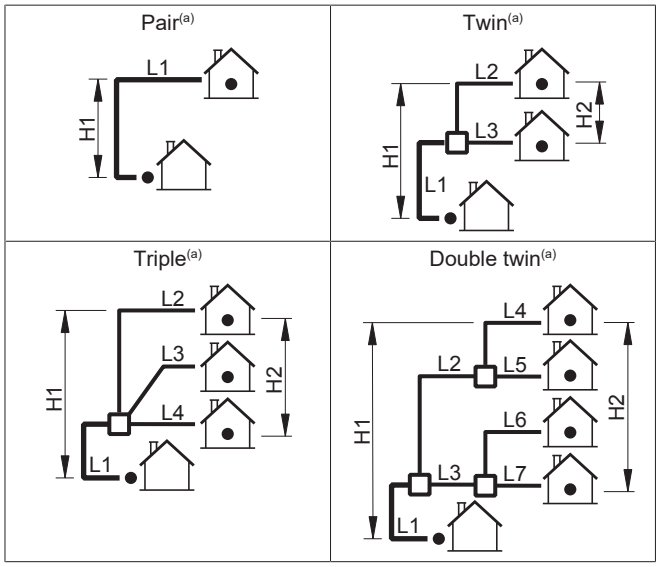
Branch pipes	▪ Install the branch pipes horizontally (with a maximum inclination of 15°) or vertically. ▪ Make the length of the branch pipes to the indoor units as short as possible. ▪ Try to keep length of the branch pipes to the indoor units equal.

NOTICE

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

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

Definitions: L1~L7, H1, H2



(a) Assume that the longest line in the illustration corresponds with the actual longest pipe, and the highest unit in the illustration corresponds with the actual highest unit.
L1 Main piping
L2~L7 Branch piping
H1 Height difference between the highest indoor unit and the outdoor unit
H2 Height difference between the highest and the lowest indoor unit

☐ Refrigerant branch kit

Refrigerant piping material

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

Outer diameter (Ø)	Temper grade	Thickness (t)(a)	
6.4 mm (1/4") 9.5 mm (3/8") 12.7 mm (1/2")	Annealed (O)	≥0.8 mm	
15.9 mm (5/8")	Annealed (O)	≥1.0 mm	
22.2 mm (7/8")	Half hard (1/2H)		

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

Refrigerant piping diameter

The refrigerant piping diameters must comply with the following:

Piping	Diameter
L1 (pair, twin, triple, double twin)	See below.
L2,L3 (twin) L2~L4 (triple) L4~L7 (double twin)	Use the same diameters as the connections (liquid, gas) on the indoor units.
L2,L3 (double twin)	Liquid piping: Ø9.5 mm Gas piping: Ø22.2 mm

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

Model	New(a)/ Existing(b)	L1 liquid piping	L1 gas piping
RZA200+250D7	Standard	Ø9.5 mm	Ø22.2 mm
	Size-up	Ø12.7 mm	Ø25.4 mm

(a) When installing **new piping**, use the same diameters as the connections on the outdoor units (i.e. **standard** diameters for liquid and gas piping).
(b) When reusing **existing piping**, you may use the **size-up** diameters, but then capacity might decrease, and stricter piping length requirements are applicable. Assess these limitations in relation to the complete installation.

Refrigerant piping length and height difference

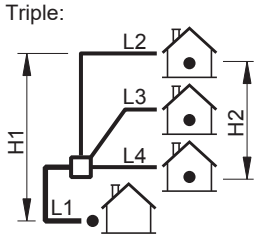
The piping lengths and height differences must comply with the following requirements:

	Requirement			Limit
1	Minimum total one-way piping length	Pair: Limit≤L1 Twin: Limit≤L1+L3 Triple: Limit≤L1+L4 Double twin: Limit≤L1+L3+L7		5 m(a)
2	Maximum total piping length	Pair: L1≤limit Twin: L1+L2+L3≤limit Triple: L1+L2+L3+L4≤limit Double twin: L1+L2+L3+L4+L5+L6+L7≤limit	Ø standard	100 m
			Ø size-up gas pipe	100 m
			Ø size-up liquid pipe	50 m
3	Maximum branch piping length	Twin and triple: L2≤limit		20 m
		Double twin: L2+L4≤limit		

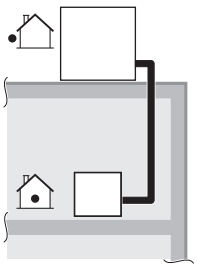
	Requirement		Limit
4	Maximum difference between branch piping length	Twin: L2–L3≤limit	10 m
		Triple: L2–L4≤limit	10 m
		Double twin: ▪ L2–L3≤limit ▪ L4–L5≤limit ▪ L6–L7≤limit ▪ (L2+L4)–(L3+L7)≤limit	10 m
5	Maximum height between indoor and outdoor	Pair, twin, triple and double twin: H1≤limit	30 m
6	Maximum height between indoors	Twin, triple and double twin: H2≤limit	0.5 m

(a) When piping length is <5 m, a complete recharge of the unit is required. If the distance between indoor and outdoor unit is less than 5 m, make sure that the piping length is more than 5 m by additional bending of the pipes.

Example

If the system layout is as follows…	Then the requirements are…	
▪ Triple:  ▪ Ø standard	1	5 m≤L1+L4
	2	L1+L2+L3+L4≤100 m
	3	L2≤20 m
	4	L2–L4≤10 m
	5	H1≤30 m
	6	H2≤0.5 m

If size-up of liquid pipes is used, the indoor unit must be installed on a lower location than the outdoor unit.



5.3.2 Refrigerant piping insulation

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

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

5.4 Preparing electrical wiring

5.4.1 About preparing electrical wiring

INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

INFORMATION

Also read "6.8.5 Specifications of standard wiring components" [▸ 24].

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 shock.
- 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, stranded conductor wires, extension cords, or connections from a star system. They can cause overheating, electrical shock or fire.
- Do NOT install a phase advancing capacitor, because this unit is equipped with an inverter. A phase advancing capacitor will reduce performance and may cause accidents.

WARNING

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

WARNING

ALWAYS use multicore cable for power supply cables.

6 Installation

6.1 Overview: Installation

This chapter describes what you have to do and know on-site to install the system.

Typical workflow

Installation typically consists of the following stages:

- Mounting the outdoor unit.
- Mounting the indoor units.
- Connecting the refrigerant piping.
- Checking the refrigerant piping.
- Charging refrigerant.
- Connecting the electrical wiring.
- Finishing the outdoor installation.
- Finishing the indoor installation.

INFORMATION

For installation of the indoor unit (mounting the indoor unit, connecting the refrigerant piping to the indoor unit, connecting the electrical wiring to the indoor unit …), see the installation manual of the indoor unit.

6.2 Opening the units

6.2.1 About opening the units

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

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

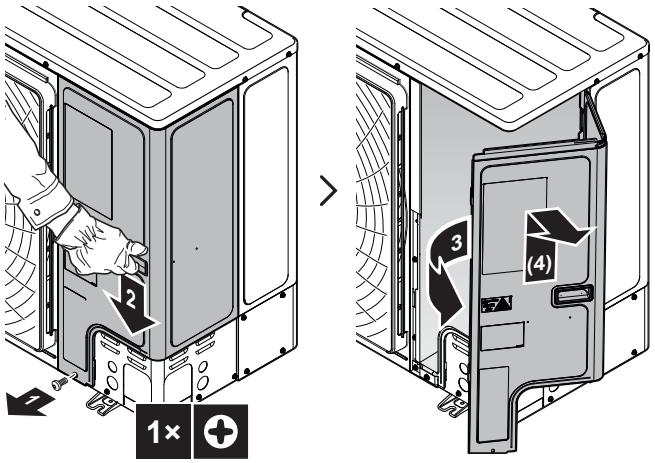
DANGER: RISK OF ELECTROCUTION

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

6.2.2 To open the outdoor unit

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING



6.3 Mounting the outdoor unit

6.3.1 About mounting the outdoor unit

Typical workflow

Mounting the outdoor unit typically consists of the following stages:

1 Providing the installation structure.
2 Installing the outdoor unit.
3 Providing drainage.
4 Preventing the unit from falling over.
5 Protecting the unit against snow and wind by installing a snow cover and baffle plates. See "Preparing installation site" in "5 Preparation" [▸ 9].

6.3.2 Precautions when mounting the outdoor unit

INFORMATION

Also read the precautions and requirements in the following chapters:

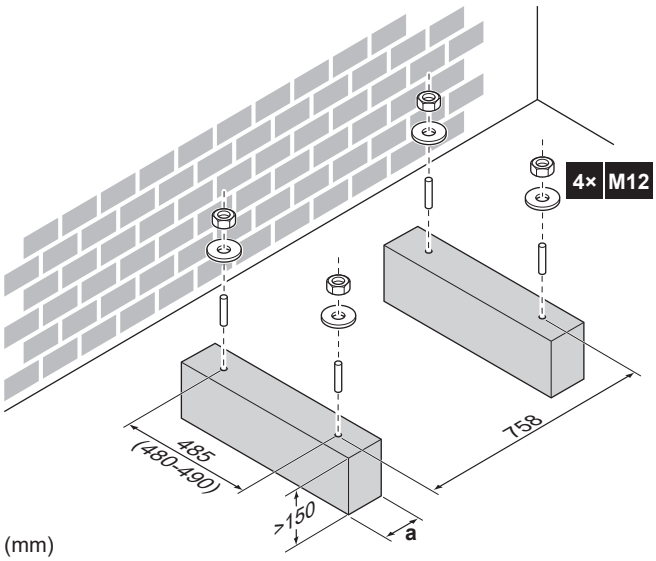
- General safety precautions
- Preparation

6.3.3 To provide the installation structure

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

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

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

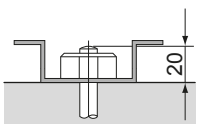


(mm)

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

INFORMATION

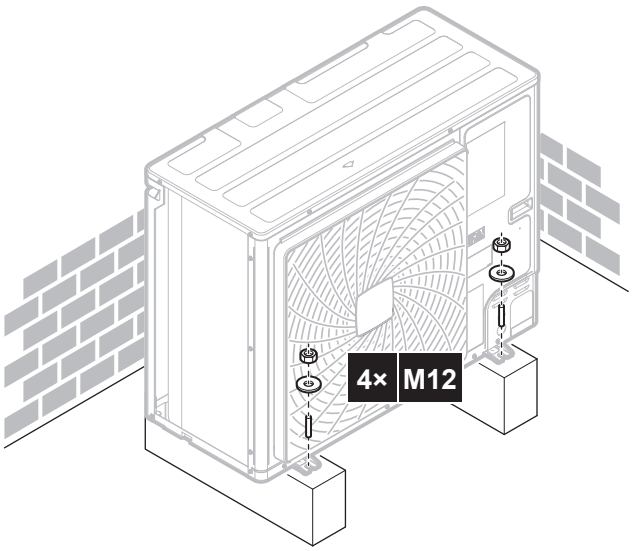
The recommended height of the upper protruding part of the bolts is 20 mm.



NOTICE

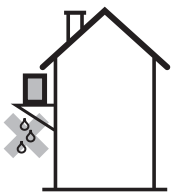
Fix the outdoor unit to the foundation bolts using nuts with resin washers (a). If the coating on the fastening area is stripped off, the metal can rust easily.

6.3.4 To install the outdoor unit



6.3.5 To provide drainage

- Make sure that condensation water can be evacuated properly.
- Install the unit on a base to make sure that there is proper drainage in order to avoid ice accumulation.
- Prepare a water drainage channel around the foundation to drain waste water away from the unit.
- Avoid drain water flowing over the footpath, so that it does NOT become slippery in case of ambient freezing temperatures.
- If you install the unit on a frame, install a waterproof plate within 150 mm of the bottom side of the unit in order to prevent water from getting into the unit and to avoid drain water dripping (see the following figure).



INFORMATION

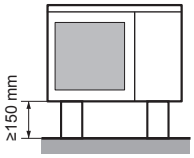
If necessary, you can use a drain pan (field supply) to prevent drain water from dripping.

NOTICE

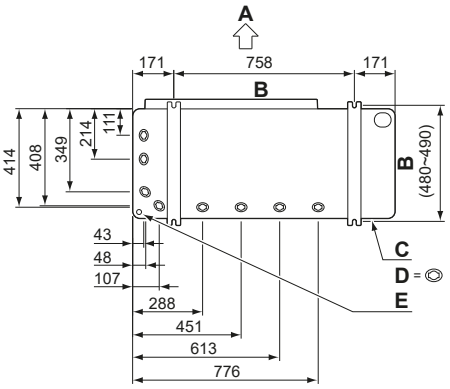
If the unit CANNOT be installed fully level, always make sure that the inclination is towards the backside of the unit. This is required to guarantee proper drainage.

NOTICE

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



Drain holes (dimensions in mm)



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

Snow

In regions with snowfall, snow might build up and freeze between the heat exchanger and the casing of the unit. This might decrease the operating efficiency.

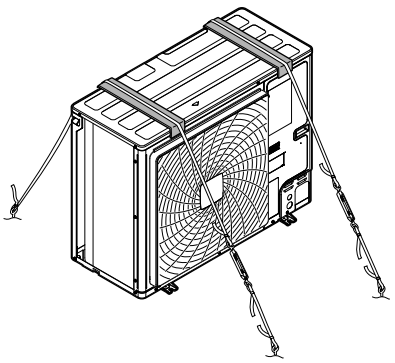
INFORMATION

We suggest to install the optional bottom plate heater (EKBPH250D7) when the unit is installed in cold climates.

6.3.6 To prevent the outdoor unit from falling over

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

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



6.4 Connecting the refrigerant piping

6.4.1 About connecting the refrigerant piping

Before connecting the refrigerant piping

Make sure the outdoor and indoor unit are mounted.

Typical workflow

Connecting the refrigerant piping involves:

- Connecting the refrigerant piping to the outdoor unit
- Connecting the refrigerant piping to the indoor units (see the installation manual of the indoor units)
- Connecting refrigerant branch kits
- Keeping in mind the guidelines for:
  - Pipe bending
  - Brazing
  - Using the stop valves
  - Removing pinched pipes

6.4.2 Precautions when connecting the refrigerant piping

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

DANGER: RISK OF BURNING

CAUTION

NEVER install a drier to this unit to guarantee its lifetime. The drying material may dissolve and damage the system.

NOTICE

Take the following precautions on refrigerant piping into account:

- Avoid anything but the designated refrigerant to get mixed into the refrigerant cycle (e.g. air).
- Only use R32 when adding refrigerant.
- Only use installation tools (e.g. manifold gauge set) that are exclusively used for R32 installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils and moisture) from mixing into the system.
- Protect the piping as described in the following table to prevent dirt, liquid or dust from entering the piping.
- Use caution when passing copper tubes through walls.

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

INFORMATION

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

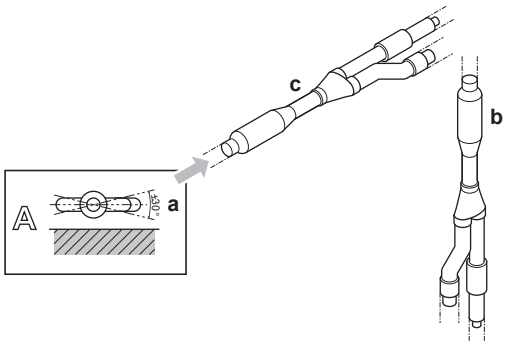
6.4.3 Pipe bending guidelines

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

6.4.4 To connect the refrigerant branching kit

For installation of the refrigerant branching kit, refer to the installation manual delivered with the kit.

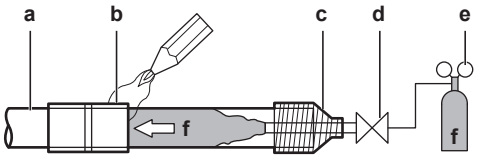
- Mount the refnet joint so that it branches either horizontally (see view A) or vertically.



a Horizontal surface
b Refnet joint mounted vertically
c Refnet joint mounted horizontally

6.4.5 To braze the pipe end

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



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

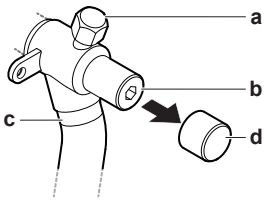
- Do NOT use anti-oxidants when brazing pipe joints.
  Residue can clog pipes and break equipment.
- Do NOT use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (BCuP), which does not require flux.
  Flux has an extremely harmful influence on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will deteriorate the refrigerant oil.
- Always protect the surrounding surfaces (e.g. insulation foam) from heat when brazing.

6.4.6 Using the stop valve and service port

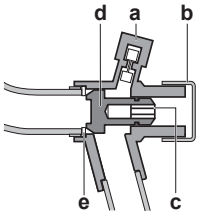
To handle the stop valve

Take the following guidelines into account:

- Make sure to keep all stop valves open during operation.
- The gas and liquid stop valves are factory closed.
- The figures below show the name of each part required in handling the stop valve.



a Service port and service port cover
b Stop valve
c Field piping connection
d Dust cap



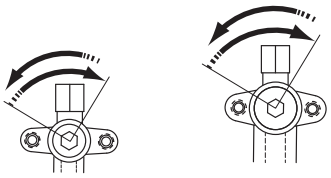
a Service port
b Dust cap
c Hexagon hole
d Shaft
e Seal

- Do NOT apply excessive force to the stop valve. Doing so may break the valve body.

To open/close the stop valve

1 Remove the dust cap.

2 Insert a hexagon wrench (liquid side: 4 mm, gas side: 8 mm) into the stop valve and turn the stop valve:



Counterclockwise to open.
Clockwise to close.

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

4 Tighten the stop valve securely when opening or closing the stop valve. For the correct tightening torque value, refer to the table below.

NOTICE

Inadequate torque may cause leakage of refrigerant and breakage of the stop valve.

5 Install the dust cap.

Result: The valve is now open/closed.

To handle the service port

- Always use a charge hose equipped with a valve depressor pin, since the service port is a Schrader type valve.
- After handling the service port, make sure to tighten the service port cover securely. For the tightening torque, refer to the table below.
- Check for refrigerant leaks after tightening the service port cover.

Tightening torques

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

6.4.7 To remove the pinched pipes

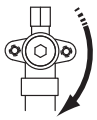
WARNING

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

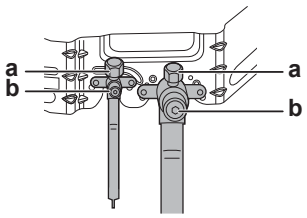
Failure to observe the instructions in procedure below properly may result in property damage or personal injury, which may be serious depending on the circumstances.

Use the following procedure to remove the pinched piping:

1 Make sure that the stop valves are fully closed.



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



a Service port
b Stop valve

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

CAUTION

Do not vent gases into the atmosphere.

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

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

WARNING

Never remove the pinched piping by brazing.

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

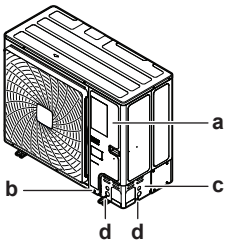
6 Wait until all oil has dripped out before continuing with the connection of the field piping in case the recovery was not complete.

6.4.8 To connect the refrigerant piping to the outdoor unit

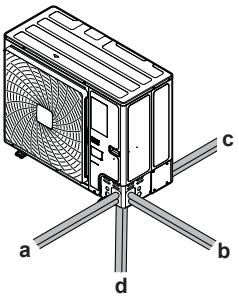
- **Piping length.** Keep field piping as short as possible.
- **Piping protection.** Protect the field piping against physical damage.

1 Do the following:

- Remove the service cover (a) with screw (b).
- Remove the piping intake plate (c) with screws (d).

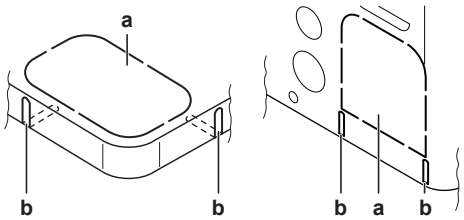


2 Choose a piping route (a, b, c or d).



a Front
b Side
c Rear
d Bottom

INFORMATION



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

NOTICE

Precautions when making knockout holes:

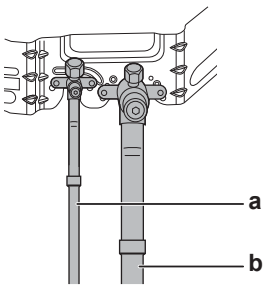
- Avoid damaging the casing and underlying piping.
- After making the knockout holes, we recommend to remove the burrs and paint the edges and areas around the edges using repair paint to prevent rusting.
- When passing electrical wiring through the knockout holes, wrap the wiring with protective tape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

3 Select the correct accessory pipes, depending on the chosen route:

- Front, side and rear route: **short** liquid and gas pipes.
- Bottom route: **long** liquid and gas pipes.

4 Do the following:

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



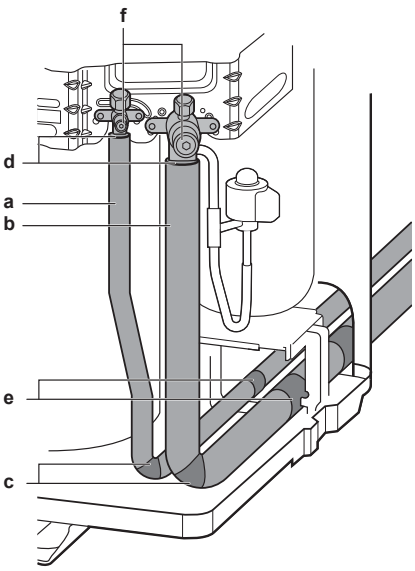
5 Connect the field piping to the accessory pipes using the accessory bend pipes (brazing). Mind the orientation of the bends.

NOTICE

Always protect the surrounding surfaces (e.g. wiring, insulation foam, …) from heat when brazing.

6 Do the following:

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



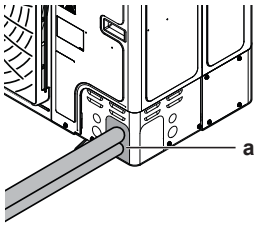
7 If the outdoor unit is installed above the indoor unit, cover the stop valves (f, see above) with sealing material to prevent condensed water on the stop valves from moving to the indoor unit.

NOTICE

Any exposed piping might cause condensation.

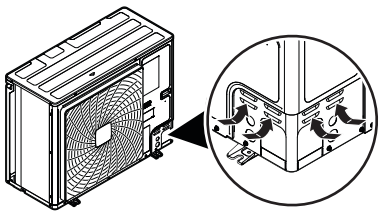
8 Reattach the service cover and the piping intake plate.

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



NOTICE

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



WARNING

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

NOTICE

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

6.5 Checking the refrigerant piping

6.5.1 About checking the refrigerant piping

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

Before checking the refrigerant piping

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

Typical workflow

Checking the refrigerant piping typically consists of the following stages:

1 Checking for leaks in the refrigerant piping.

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

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

6.5.2 Precautions when checking the refrigerant piping

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

NOTICE

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

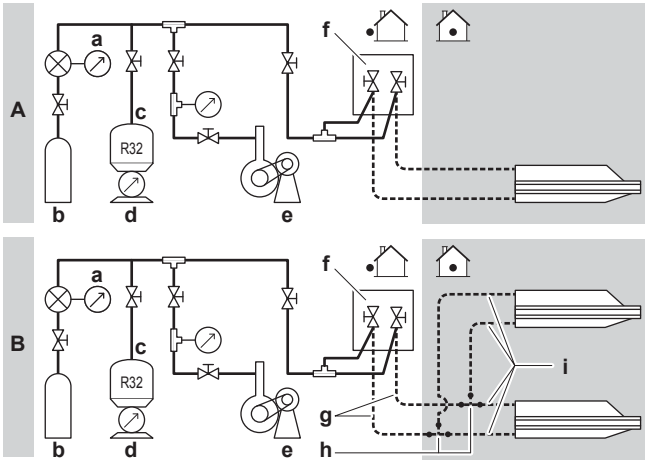
NOTICE

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

NOTICE

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

6.5.3 Checking refrigerant piping: Setup



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

6.5.4 To check for leaks

NOTICE

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

NOTICE

Make sure to use a recommended bubble test solution from your wholesaler. Do not use soap water, which may cause cracking of flare nuts (soap water may contain salt, which absorbs moisture that will freeze when the piping gets cold), and/or lead to corrosion of flared joints (soap water may contain ammonia which causes a corrosive effect between the brass flare nut and the copper flare).

1 Charge the system with nitrogen gas up to a gauge pressure of at least 200 kPa (2 bar). It is recommended to pressurize to 3000 kPa (30 bar) in order to detect small leaks.

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

3 Discharge all nitrogen gas.

6.5.5 To perform vacuum drying

NOTICE

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

1 Vacuum the system until the pressure on the manifold indicates −0.1 MPa (−1 bar).

2 Leave as is for 4-5 minutes and check the pressure:

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

3 Vacuum the system for at least 2 hours to a manifold pressure of −0.1 MPa (−1 bar).

4 After turning the pump OFF, check the pressure for at least 1 hour.

5 If you do NOT reach the target vacuum or CANNOT maintain the vacuum for 1 hour, do the following:

- Check for leaks again.
- Perform vacuum drying again.

NOTICE

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

INFORMATION

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

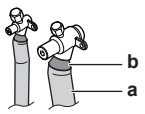
6.6 To insulate the refrigerant piping

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 branch kits 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

- If there is a possibility that condensation on the stop valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, this must be prevented by sealing up the connections. See below figure.



a Insulation material
b Caulking etc.

6.7 Charging refrigerant

6.7.1 About charging refrigerant

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

What	When
Charging additional refrigerant	When the total liquid piping length is more than specified (see later).

What	When
Completely recharging refrigerant	**Example:** ▪ When relocating the system. ▪ After a leak.

Charging additional refrigerant

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

INFORMATION

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

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

1 Determining if and how much you have to charge additionally.
2 If necessary, charging additional refrigerant.
3 Filling in the fluorinated greenhouse gases label, and fixing it to the inside of the outdoor unit.

Completely recharging refrigerant

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

1 All refrigerant is recovered from the system.
2 The outdoor unit's **external** refrigerant piping is checked (leak test, vacuum drying).
3 Vacuum drying on the outdoor unit's **internal** refrigerant piping is performed.

NOTICE

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

NOTICE

To perform vacuum drying or a complete recharge of the outdoor unit's internal refrigerant piping it is necessary to activate the vacuum mode (see "To activate/deactivate the vacuum mode field setting" [▸ 22]) which will open required valves in the refrigerant circuit so the vacuuming process or recharge of refrigerant can be done properly.

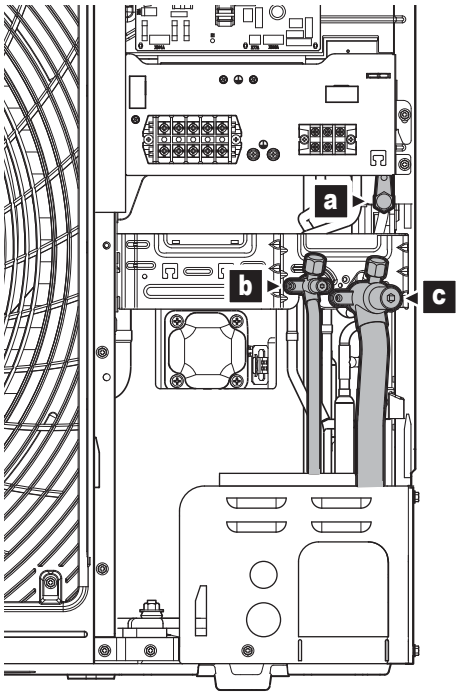
- Before vacuum drying or recharging, activate field setting "vacuum mode".
- After finishing vacuum drying or recharging, deactivate field setting "vacuum mode".

WARNING

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

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

Location of service ports:



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

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

1 Determining how much refrigerant to charge.
2 Charging refrigerant.
3 Filling in the fluorinated greenhouse gases label, and fixing it to the inside of the outdoor unit.

6.7.2 About the refrigerant

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

Refrigerant type: R32

Global warming potential (GWP) value: 675

WARNING: FLAMMABLE MATERIAL

The refrigerant inside this unit is mildly flammable.

WARNING

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

WARNING

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

WARNING

The refrigerant inside the unit is mildly flammable, but normally does NOT leak. If the refrigerant leaks in the room and comes in contact with fire from a burner, a heater, or a cooker, this may result in fire, or the formation of a harmful gas.

Turn off any combustible heating devices, ventilate the room, and contact the dealer where you purchased the unit.

Do NOT use the unit until a service person confirms that the part from which the refrigerant leaked has been repaired.

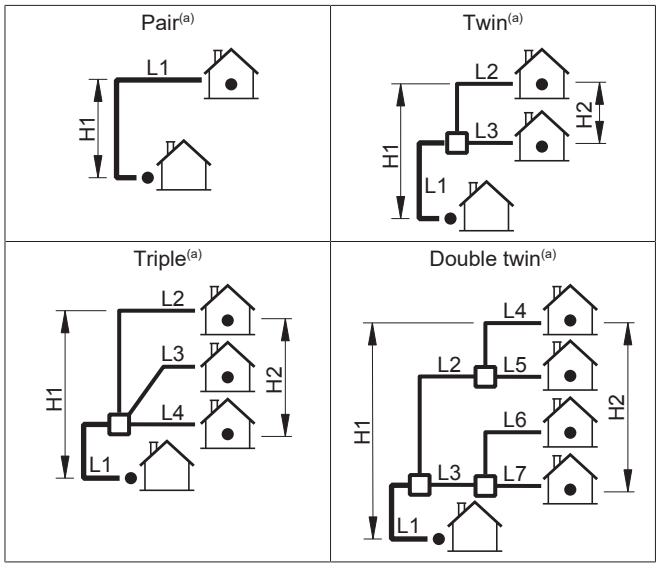
6.7.3 Precautions when charging refrigerant

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

6.7.4 Definitions: L1~L7, H1, H2



(a) Assume that the longest line in the illustration corresponds with the actual longest pipe, and the highest unit in the illustration corresponds with the actual highest unit.
L1 Main piping
L2~L7 Branch piping
H1 Height difference between the highest indoor unit and the outdoor unit
H2 Height difference between the highest and the lowest indoor unit
□ Refrigerant branch kit

6.7.5 Charging additional refrigerant

To determine the additional refrigerant amount

To determine if adding additional refrigerant is necessary

Chargeless length	
Ø standard	30 m
Ø size-up of **gas** piping	30 m
Ø size-up of **liquid** piping	20 m

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

INFORMATION

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

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

Standard piping size:

Standard piping size							
	L1 (m)						
L1:	**30~40**	**40~50**	**50~60**	**60~70**	**70~80**	**80~90**	**90~100**
R:	0.45	0.9	1.35	1.8	2.25	2.7	3.15

Size-up piping size:

Size-up piping size						
	L1 (m)					
L1:	**20~25**	**25~30**	**30~35**	**35~40**	**40~45**	**40~45**
R:	0.35	0.7	1.05	1.4	1.75	2.1

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

1 Determine G1 and G2.

G1 (m)	Total length of <x> liquid piping x=**Ø9.5 mm** (standard) x=**Ø12.7 mm** (size-up)
G2 (m)	Total length of **Ø6.4** mm liquid piping

2 Determine R1 and R2.

If	Then
G1>30 m(a)	Use the table below to determine R1 (length=**G1−30 m**)(a) and R2 (length=**G2**).
G1≤30 m(a) (and G1+G2>30 m)(a)	R1=0.0 kg. Use the table below to determine R2 (length=**G1+G2−30 m**)(a).

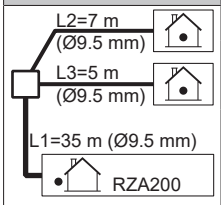
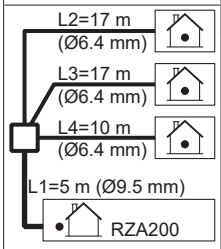
(a) In case of size-up: replace 30 m by 20 m.

Standard liquid pipe size							
	Length (m)						
	0~10	**10~20**	**20~30**	**30~40**	**40~50**	**50~60**	**60~70**
R1:	0.45	0.9	1.35	1.8	2.25	2.7	3.15
R2:	0.2	0.4	0.6	0.8	1	1.2	1.4

Size-up liquid pipe size						
	Length (m)					
	0~5	**5~10**	**10~15**	**15~20**	**20~25**	**25~30**
R1:	0.35	0.7	1.05	1.1	1.75	2.1
R2:	0.18	0.35	0.53	0.7	0.88	1.05

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

Examples

Layout			
	Case: Twin, standard liquid pipe size		
	1	G1	Total Ø9.5 => G1=35+7+5=47 m
		G2	Total Ø6.4 => G2=0 m
	2	Case: G1>30 m	
		R1	Length=G1–30 m=47–30 m=17 m => R1=0.9 kg
		R2	Length=G2=0 m => R2=0 kg
	3	R	R=R1+R2=0.9+0=0.9 kg
	Case: Triple, standard liquid pipe size		
	1	G1	Total Ø9.5 => G1=5 m
		G2	Total Ø6.4 => G2=10+17+17=44 m
	2	Case: G1≤30 m (and G1+G2>30 m)	
		R1	R1=0.0 kg
		R2	Length=G1+G2–30=5+44–30=19 m => R2=0.4 kg
	3	R	R=R1+R2=0.0+0.4=0.4 kg

Charging refrigerant: Setup

See "6.5.3 Checking refrigerant piping: Setup" [▶ 19].

To charge additional refrigerant

WARNING

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

CAUTION

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

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

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

6.7.6 Completely recharging refrigerant

To determine the complete recharge amount

For the complete charging amount refer to the additional refrigerant charge sticker mounted on the unit.

To activate/deactivate the vacuum mode field setting

Description

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

To activate vacuum mode:

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

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

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

   Result: You will reach the setting mode, the 7 segment display will show '2 0 0'.
2. Press the BS2 button until you reach page **2–17**.
3. When **2–17** is reached, press the BS3 button once.
4. Change the setting to '**2**' by pressing the BS2 button once .
5. Push the BS3 button once.
6. When the display is not blinking anymore, press the BS3 button again to activate vacuum mode.

To deactivate vacuum mode:

After charging or vacuuming the unit, please deactivate the vacuum mode:

7. Press the BS2 button until you reach page **2–17**.
8. When **2–17** is reached, press the BS3 button once.
9. Change the setting to '**1**' by pressing the BS2 button once.
10. Push the BS3 button once.
11. When the display is not blinking anymore, press the BS3 button again to deactivate vacuum mode.
12. Press the BS1 button to leave the setting mode.

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

NOTICE

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

Close the lid of the electrical component box firmly before turning on the power.

Charging refrigerant: Setup

See "6.5.3 Checking refrigerant piping: Setup" [▶ 19].

To completely recharge refrigerant

WARNING

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

CAUTION

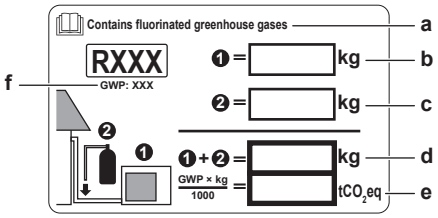
To avoid compressor breakdown, do NOT charge more than the specified amount of refrigerant.

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

1 If not already done (for vacuum drying of the unit), activate the vacuum mode (see "To activate/deactivate the vacuum mode field setting" [▶ 22])
2 Connect the refrigerant cylinder to the service port of the liquid stop valve.
3 Open the liquid stop valve.
4 Charge the complete refrigerant amount.
5 Deactivate the vacuum mode (see "To activate/deactivate the vacuum mode field setting" [▶ 22]).
6 Open the gas stop valve.

6.7.7 To fix the fluorinated greenhouse gases label

1 Fill in the label as follows:



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

NOTICE

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

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

Use the GWP value mentioned on the refrigerant charge label. That GWP is based on the current legislation on fluorinated greenhouse gases. The GWP mentioned in the manual might be outdated.

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

6.8 Connecting the electrical wiring

6.8.1 About connecting the electrical wiring

Typical workflow

Connecting the electrical wiring typically consists of the following stages:

1 Making sure the power supply system complies with the electrical specifications of the units.
2 Connecting the electrical wiring to the outdoor unit.
3 Connecting the electrical wiring to the indoor units.
4 Connecting the main power supply.

6.8.2 About electrical compliance

Equipment complying with:

- **EN/IEC 61000-3-12** provided that the short-circuit power S_{sc} is greater than or equal to the minimum S_{sc} value at the interface point between the user's supply and the public system.
  - EN/IEC 61000-3-12 = European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤75 A per phase.
  - It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power S_{sc} greater than or equal to the minimum S_{sc} value.

Model	Minimum S_{sc} value
RZA200D7Y1B	2169 kVA
RZA250D7Y1B	2169 kVA

6.8.3 Precautions when connecting the electrical wiring

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

DANGER: RISK OF ELECTROCUTION

WARNING

ALWAYS use multicore cable for power supply cables.

CAUTION

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

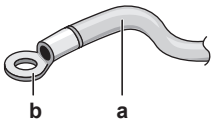
WARNING

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

6.8.4 Guidelines when connecting the electrical wiring

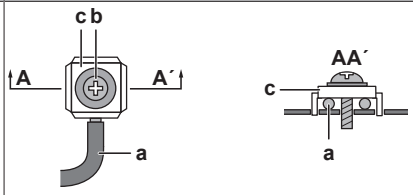
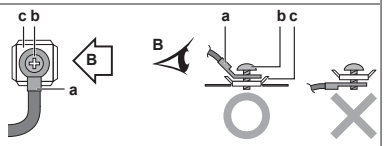
Keep the following in mind:

- If stranded conductor wires are used, install a round crimp-style terminal on the end of the wire. Place the round crimp-style terminal on the wire up to the covered part and fasten the terminal with the appropriate tool.



a Stranded conductor wire
b Round crimp-style terminal

- Use the following methods for installing wires:

Wire type	Installation method
Single-core wire	 **a** Curled single-core wire **b** Screw **c** Flat washer
Stranded conductor wire with round crimp-style terminal	 **a** Terminal **b** Screw **c** Flat washer **O** Allowed **X** NOT allowed

Tightening torques

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

NOTICE

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

6.8.5 Specifications of standard wiring components

Component		RZA200	RZA250
Power supply cable	MCA[a]	18.6 A	19.9 A
	Voltage range	380~415 V	
	Phase	3N~	
	Frequency	50 Hz	
	Wire sizes	Must comply with applicable legislation	
Interconnection cables		H05VV-U4G2.5	
Recommended field fuse		20 A	
Earth leakage circuit breaker		Must comply with applicable legislation	

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

6.8.6 To connect the electrical wiring on the outdoor unit

NOTICE

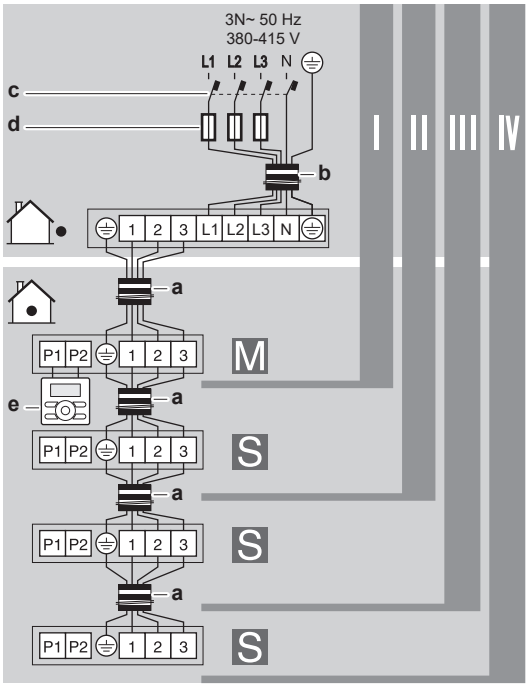
- Follow the wiring diagram (delivered with the unit, located at the inside of the service cover).
- Make sure the electrical wiring does NOT obstruct proper reattachment of the service cover.

1 Remove the service cover. See "6.2.2 To open the outdoor unit" [▶ 13].

2 Strip insulation (20 mm) from the wires.

a Strip wire end to this point
b Excessive strip length may cause electrical shock or leakage.

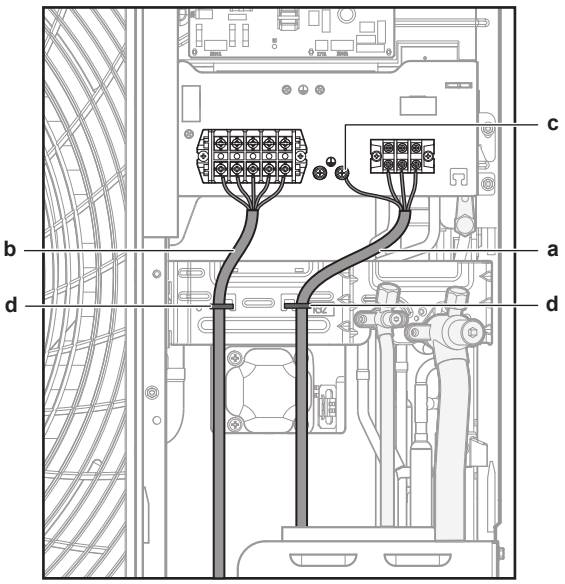
3 Connect the interconnection cables and power supply as follows:



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

INFORMATION

Some indoor units may need a separate power supply in order to guarantee maximum capacity. See the installation manual of the indoor unit.



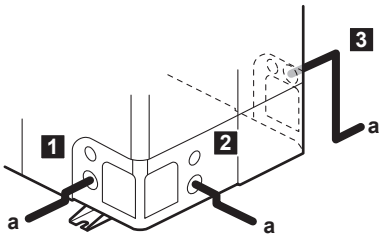
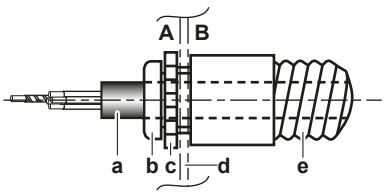
a Interconnection cable
b Power supply cable
c Earth

d Cable tie

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

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

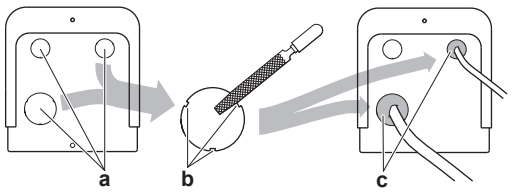
6 Route the wiring through the frame and connect the wiring to the frame at the knockout hole.

Routing through the frame	Choose one of the 3 possibilities:  **a** Power supply cable **Note:** Route the interconnection cable together with the refrigerant piping. See "6.9.1 To finish the outdoor unit installation" [▶ 25].
Connecting to the frame	When cables are routed from the unit, a protection sleeve for the conduits (PG insertions) can be inserted at the knockout hole. When you do not use a wire conduit, protect the wires with vinyl tubes to prevent the edge of the knockout hole from cutting the wires.  **A** Inside of the outdoor unit **B** Outside of the outdoor unit **a** Wire **b** Bush **c** Nut **d** Frame **e** Hose

NOTICE

Precautions when making knockout holes:

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



a Knockout hole
b Burr
c Sealant etc.

7 Reattach the service cover. See "6.9.2 To close the outdoor unit" [▶ 25].

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

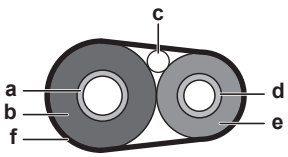
6.9 Finishing the outdoor unit installation

6.9.1 To finish the outdoor unit installation

NOTICE

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

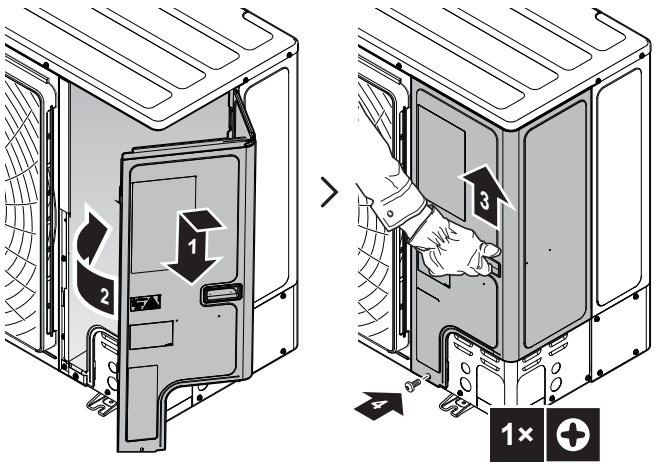
1 Insulate and fix the refrigerant piping and interconnection cable as follows:



a Gas pipe
b Gas pipe insulation
c Interconnection cable
d Liquid pipe
e Liquid pipe insulation
f Finishing tape

2 Install the service cover.

6.9.2 To close the outdoor unit



6.9.3 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.

7 Commissioning

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 the commissioning and hand-over to the user.

7.1 Overview: Commissioning

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

Typical workflow

Commissioning typically consists of the following stages:

1 Checking the "Checklist before commissioning".

2 Performing a test run for the system.

7.2 Precautions when commissioning

INFORMATION

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

NOTICE

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

NOTICE

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

NOTICE

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

NOTICE

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

NOTICE

If you cannot operate the unit in test run, see "7.5 Error codes when performing a test run" [▸ 27].

WARNING

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

7.3 Checklist before commissioning

After the installation of the unit, first check the items listed below. Once all checks are fulfilled, the unit must be closed. Power-up the unit after it is closed.

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

7.4 To perform a test run

This task is only applicable when using the BRC1E52 or BRC1E53 user interface. When using any other user interface, see the installation manual or service manual of the user interface.

NOTICE

Do not interrupt the test run.

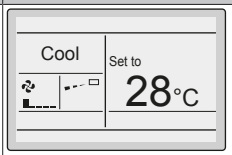
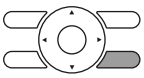
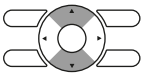
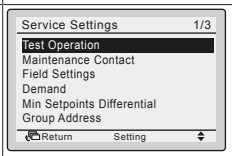
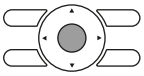
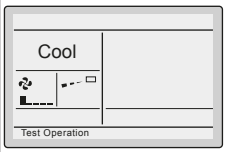
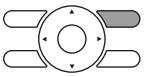
INFORMATION

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

1 Perform introductory steps.

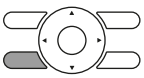
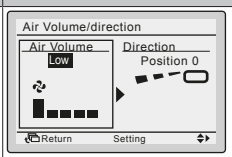
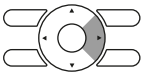
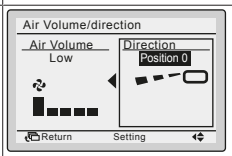
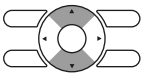
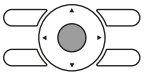
#	Action
1	Open the liquid stop valve and gas stop valve by removing the cap and turning counterclockwise with a hex wrench until it stops.
2	Close the service cover to prevent electric shocks.
3	Turn ON power for at least 6 hours before starting operation to protect the compressor.
4	On the user interface,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

2 Start the test run

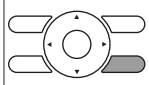
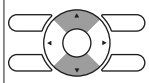
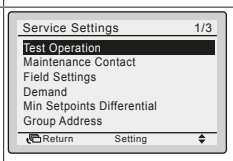
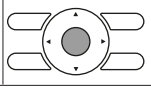
#	Action	Result
1	Go to the home menu.	
2	Press at least 4 seconds. 	The Service Settings menu is displayed.
3	Select Test Operation. 	
4	Press. 	Test Operation is displayed on the home menu. 
5	Press within 10 seconds. 	Test run starts.

3 Check operation for 3 minutes.

4 Check operation of the airflow direction (only applicable for indoor units with swing flaps).

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

5 Stop the test run.

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

7.5 Error codes when performing a test run

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

Error code	Possible cause
Nothing displayed (the currently set temperature is not displayed)	▪ The wiring is disconnected or there is a wiring error (between power supply and outdoor unit, between outdoor unit and indoor units, between indoor unit and user interface). ▪ The fuse on the outdoor unit PCB has blown out.
E3, E4 or L8	▪ The stop valves are closed. ▪ The air inlet or air outlet is blocked.
U1 or E7	There is a missing phase in case of three-phase power supply units. **Note:** Operation will be impossible. Turn OFF the power, recheck the wiring, and switch two of the three electrical wires.
L4	The air inlet or air outlet is blocked.
U0	The stop valves are closed.
U2	▪ There is a voltage imbalance. ▪ There is a missing phase in case of three-phase power supply units. **Note:** Operation will be impossible. Turn OFF the power, recheck the wiring, and switch two of the three electrical wires.
U4 or UF	The inter-unit branch wiring is not correct.
UA	The outdoor and indoor unit are incompatible.

8 Hand-over to the user

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

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

9 Maintenance and service

NOTICE

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

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

NOTICE

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

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

9.1 Overview: Maintenance and service

This chapter contains information about:

- Maintenance safety precautions
- The yearly maintenance of the outdoor unit

9.2 Maintenance safety precautions

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING

NOTICE: Risk of electrostatic discharge

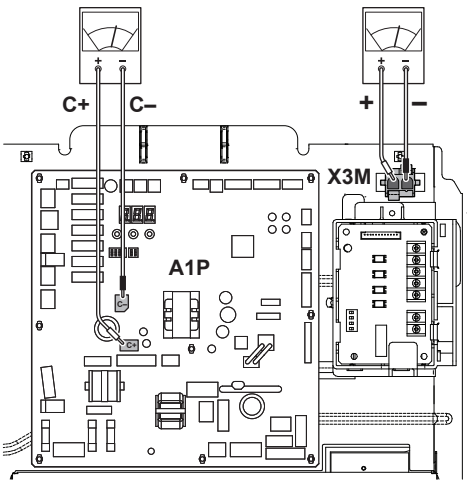
Before performing any maintenance or service work, touch a metal part of the unit in order to eliminate static electricity and to protect the PCB.

9.2.1 To prevent electrical hazards

When performing service to inverter equipment:

1 Do NOT open the electrical component box cover for 10 minutes after turning off the power supply.

2 Measure the voltage between terminals on the terminal block for power supply with a tester and confirm that the power supply is shut off. In addition, measure points as shown in the figure, with a tester and confirm that the voltage of the capacitor in the main circuit is less than 50 V DC.



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

4 Pull out junction connector X1A (A4P) for the fan motor in the outdoor unit before starting service operation on the inverter equipment. Be careful not to touch the live parts. (If a fan rotates due to strong wind, it may store electricity in the capacitor or in the main circuit and cause electric shock.)

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

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

NOTICE

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

9.3 Checklist for yearly maintenance of the outdoor unit

Check the following at least once a year:

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

10 Troubleshooting

10.1 Overview: Troubleshooting

In case of problems:

- See "7.5 Error codes when performing a test run" [▸ 27].
- See the service manual.

INFORMATION

The outdoor unit can generate some transient noises during operation. These sounds are NOT system malfunctions:

- A “shah” noise is heard at the start of defrost operation. This is the sound of the 4-way valve.
- 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 gurgling sound is heard after defrost operation. This is the sound of refrigerant gas flowing through the refrigerant pipe system.
- 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.

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

Before troubleshooting

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

10.2 Precautions when troubleshooting

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.

DANGER: RISK OF ELECTROCUTION

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.

DANGER: RISK OF BURNING

11 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.

11.1 Overview: Disposal

Typical workflow

Disposing of the system typically consists of the following stages:

1 Pumping down the system.

2 Bringing the system to a specialized treatment facility.

INFORMATION

For more details, see the service manual.

11.2 About pump down

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

NOTICE

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

11.3 To pump down

DANGER: RISK OF EXPLOSION

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

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

CAUTION

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

1 Turn ON the main power supply switch.

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

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

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

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

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

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

6 Turn OFF the main power supply switch.

NOTICE

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

12 Technical data

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

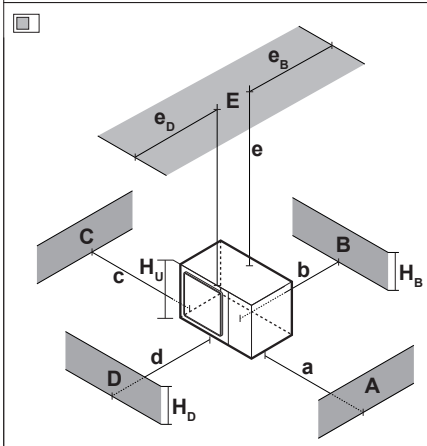
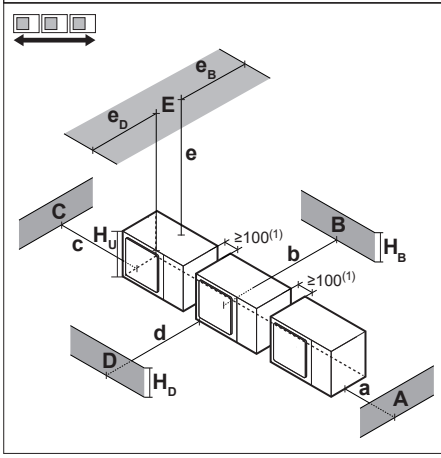
12.1 Overview: Technical data

This chapter contains information about:
- Service space
- Piping diagram
- Wiring diagram
- Information requirements for Eco Design

12.2 Service space: Outdoor unit

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

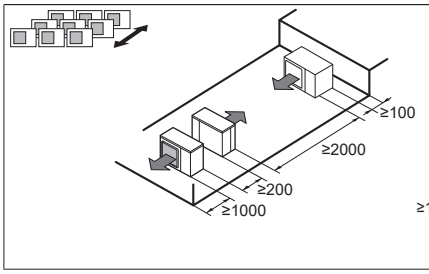
Single unit (□) | Single row of units (□□□)

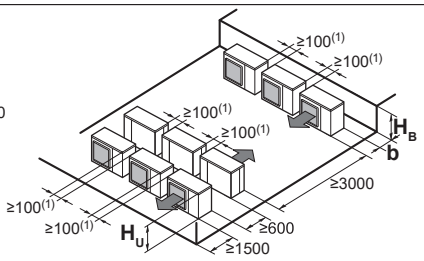
	A~E	H_B H_D H_U		(mm)							
				a	b	c	d	e	e_B	e_D	
	B	—			≥100						
	A, B, C	—		≥100(1)	≥100	≥100					
	B, E	—			≥100			≥1000		≤500	
	A, B, C, E	—		≥150(1)	≥150	≥150		≥1000		≤500	
	D	—					≥500				
	D, E	—					≥500	≥1000	≤500		
	B, D	$H_D>H_U$			≥100		≥500				
		$H_D≤H_U$			≥100		≥500				
	B, D, E	$H_D>H_U$	$H_B≤½H_U$		≥250		≥750	≥1000	≤500		1
			$½H_U<H_B≤H_U$		≥250		≥1000	≥1000	≤500		
			$H_B>H_U$	⊘							
		$H_D≤H_U$	$H_D≤½H_U$		≥100		≥1000	≥1000		≤500	
			$½H_U<H_D≤H_U$		≥200		≥1000	≥1000		≤500	
			$H_D>H_U$	⊘							
	A, B, C	—		≥200(1)	≥300	≥1000					
	A, B, C, E	—		≥200(1)	≥300	≥1000		≥1000		≤500	
	D	—					≥1000				
	D, E	—					≥1000	≥1000	≤500		
	B, D	$H_D>H_U$			≥300		≥1000				
		$H_D≤H_U$	$H_D≤½H_U$		≥250		≥1500				
			$½H_U<H_D≤H_U$		≥300		≥1500				
	B, D, E	$H_D>H_U$	$H_B≤½H_U$		≥300		≥1000	≥1000	≤500		1+2
			$½H_U<H_B≤H_U$		≥300		≥1250	≥1000	≤500		
			$H_B>H_U$	⊘							
		$H_D≤H_U$	$H_D≤½H_U$		≥250		≥1500	≥1000		≤500	
			$½H_U<H_D≤H_U$		≥300		≥1500	≥1000		≤500	
			$H_D>H_U$	⊘							

(1) For better serviceability, use a distance ≥250 mm
A,B,C,D Obstacles (walls/baffle plates)
E Obstacle (roof)
a,b,c,d,e Minimum service space between the unit and obstacles A, B, C, D and E
e_B Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle B
e_D Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle D
H_U Height of the unit
H_B,H_D Height of obstacles B and D
1 Seal the bottom of the installation frame to prevent discharged air from flowing back to the suction side through the bottom of the unit.

2 Maximum two units can be installed.
Not allowed

Multiple rows of units ( )

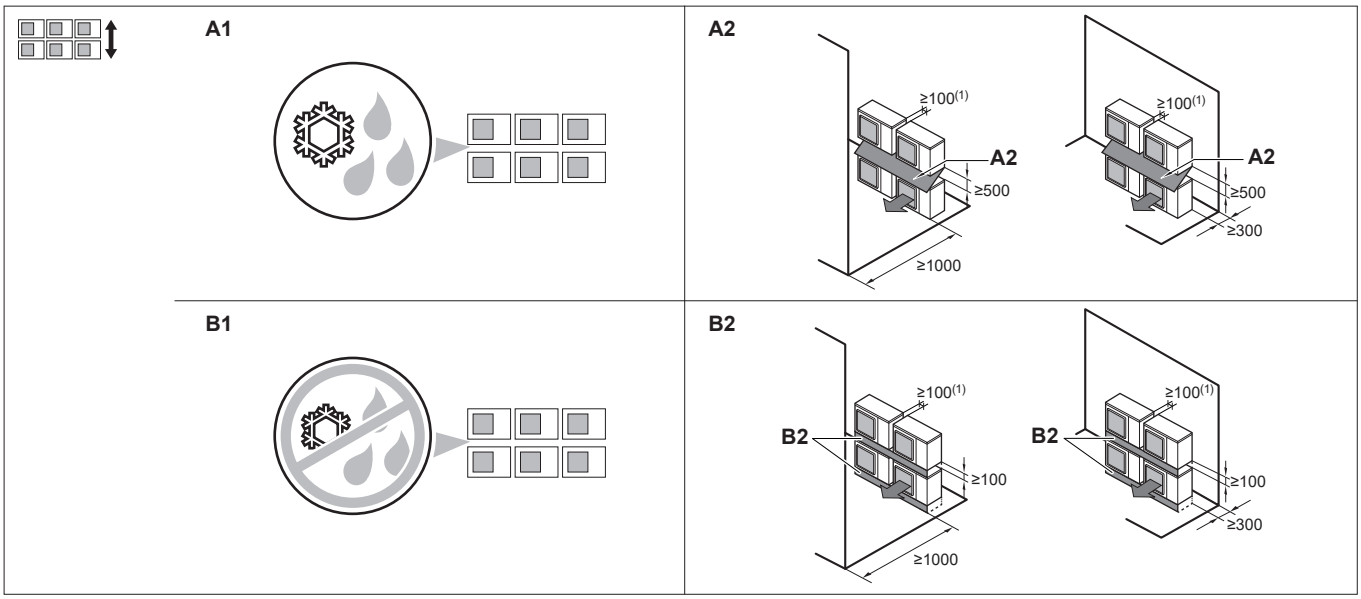




H_B H_U	b (mm)
$H_B \leq ½H_U$	b≥250
$½H_U < H_B \leq H_U$	b≥300
$H_B > H_U$	⊘

(1) For better serviceability, use a distance ≥250 mm

Stacked units (max. 2 levels) ( )

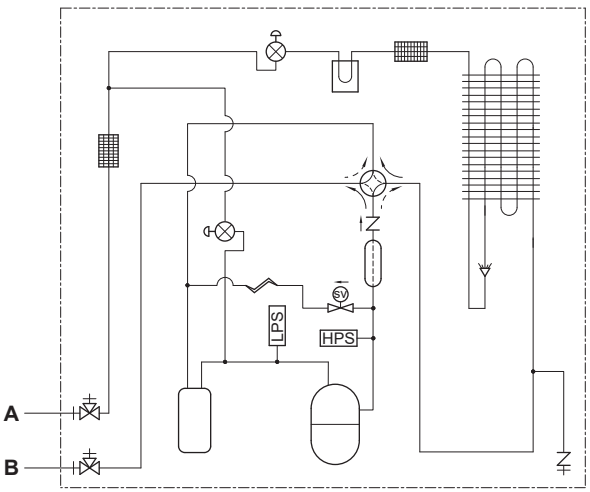


(1) For better serviceability, use a distance ≥250 mm

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

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

12.3 Piping diagram: Outdoor unit



Service port (with 5/16" flare)

Stop valve

Filter

Check valve

Muffler

Solenoid valve

PCB cooling

Capillary tube

Electronic expansion valve

4-way valve

HPS High pressure switch

LPS Low pressure switch

Heat exchanger

Compressor

Distributor

	Accumulator
A	Field piping (liquid: Ø9.5 mm pinched pipe)
B	Field piping (gas: Ø25.4 mm pinched pipe)
	Heating
	Cooling

12.4 Wiring diagram: Outdoor unit

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

(1) Connection diagram

English	Translation
Connection diagram	Connection diagram
Only for ***	Only for ***
See note ***	See note ***
Outdoor	Outdoor
Indoor	Indoor
Upper EEV	Upper electronic expansion valve
Lower EEV	Lower electronic expansion valve
Fan	Fan
ON	ON
OFF	OFF

(2) Layout

English	Translation
Layout	Layout
Front	Front
Left	Left
Back	Back
Position of compressor terminal	Position of compressor terminal

(3) Notes

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

NOTES:

1 Refer to the wiring diagram sticker (on the back of the front plate) for how to use the BS1~BS3 and DS1+DS2 switches.

2 When operating, do not short-circuit protective devices S1PH and S1PL.

3 Refer to the combination table and the option manual for how to connect the wiring to X6A, X15A and X77A.

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

(4) Legend

English	Translation
Legend	Legend
Optional	Optional
Part n°	Part n°
Description	Description

A1P		Printed circuit board (main)
A2P		Printed circuit board (noise filter)
A3P		Printed circuit board (inverter)
A4P		Printed circuit board (fan)
A5P	*	Printed circuit board (demand)
C503, C506 C507 (A3P)		Capacitor
DS1,DS2 (A1P)		DIP switch
E1H	*	Bottom plate heater
E1HC		Crankcase heater
F1U (A1P)		Fuse (T 3.15 A 250 V)
F8U, F9U	*	Fuse (F)
F101U (A4P)		Fuse
F101U, F102U (A2P)		Fuse
F601U (A3P)		Fuse
HAP (A1P, A3P, A4P)		LED (service monitor is green)
K1R (A1P)		Magnetic relay (Y2S)
K3R (A3P)		Magnetic relay
K3R (A1P)		Magnetic relay (Y3S)
K5R (A1P)		Magnetic relay (E1HC)
K7R (A1P)		Magnetic relay (E1H)
L1R		Reactor
M1C		Compressor motor
M1F		Fan motor
PS (A1P,A3P)		Switching power supply
Q1DI		Earth leakage circuit breaker
Q1LD (A1P)		Earth current detector
R1T (A1P)		Thermistor (air)
R2T		Thermistor (discharge pipe)
R3T		Thermistor (suction pipe)
R4T		Thermistor (heat exchanger exit)
R5T		Thermistor (heat exchanger branch)
R6T		Thermistor (liquid pipe)
R7T		Thermistor (M1C body)
R24 (A4P)		Resistor (current sensor)
R300 (A3P)		Resistor (current sensor)
S1PH		High pressure switch
S1PL		Low pressure switch
SEG1~SEG3 (A1P)		7-segment display
T1A		Current sensor
V1D (A3P)		Diode
V1R (A3P, A4P)		Diode module
X*A		Connector
X*M		Terminal block
Y1E		Electronic expansion valve (main)
Y2E		Electronic expansion valve (injection)
Y2S		Solenoid valve (4-way valve)

Y3S	Solenoid valve (pressure equalization)
Z*C	Noise filter (ferrite core)
Z1F	Noise filter

12.5 Information requirements for Eco Design

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

1 Open the following webpage: https://energylabel.daikin.eu/

2 To continue, choose:

- "Continue to Europe" for the international website.
- "Other country" for a country related site.

Result: You are directed to the "Seasonal efficiency" webpage.

3 Under "Eco Design – Ener LOT 21", click "Generate your data".

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

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

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

INFORMATION

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

13 Glossary

Dealer
Sales distributor for the product.

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

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

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

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

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

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

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

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

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

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

EAC

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