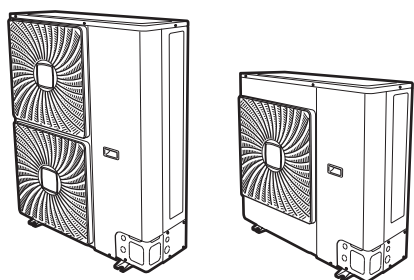




Installer reference guide

Split system air conditioners



AZQS100B8V1B
AZQS125B8V1B
AZQS140B8V1B

AZQS100B7Y1B
AZQS125B7Y1B
AZQS140B7Y1B













Installer reference guide
Split system air conditioners

English

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1	General safety precautions				
1.1	About the documentation				
	<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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.

1 General safety precautions

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



NOTICE

Precautions when laying power wiring:



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

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



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)

3 About the box

• 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	<ul style="list-style-type: none"> • 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:

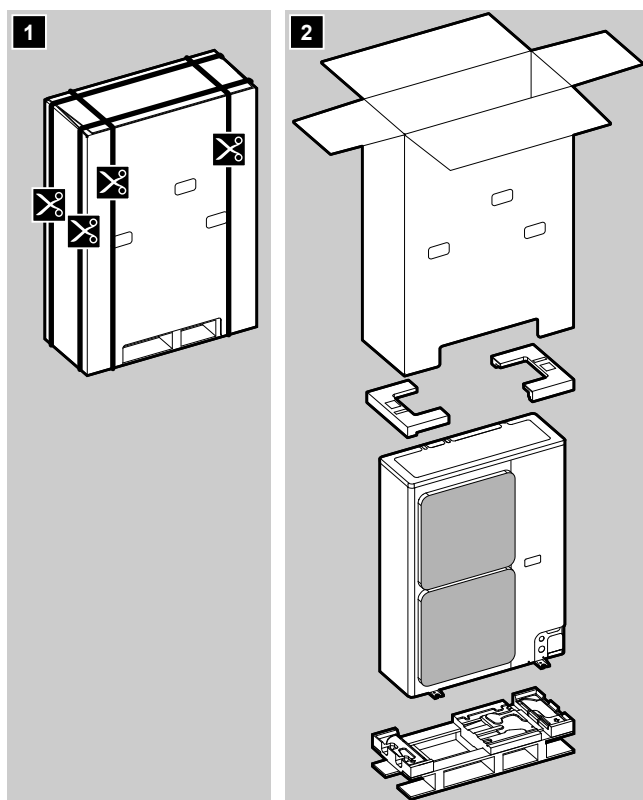
- Unpacking and handling the unit
- Removing the accessories from the unit

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



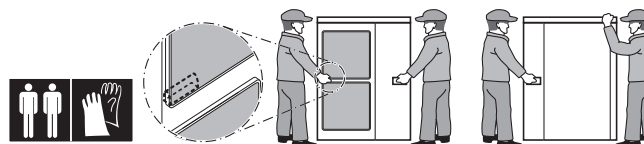
3.2.2 To handle the outdoor unit



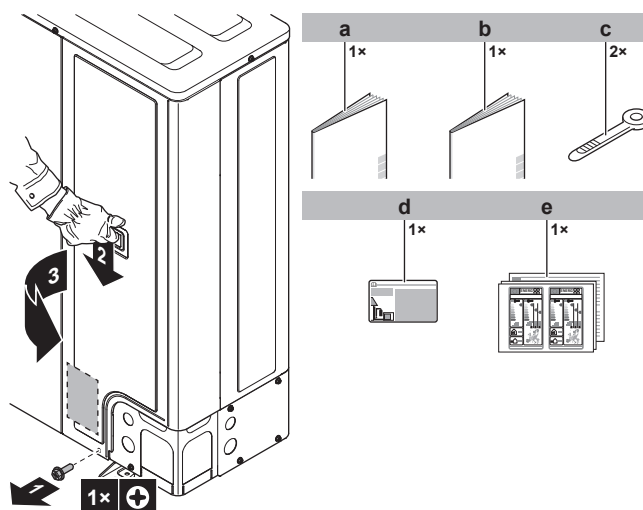
CAUTION

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

Carry the unit slowly as shown:



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 Energy label

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

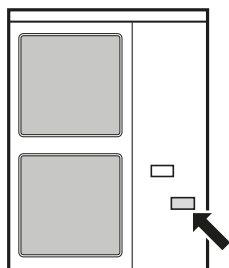


NOTICE

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



4.3 Combining units and options

4.3.1 Possible options for the outdoor unit

Demand adaptor kit

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...).

Model	Demand adaptor kit
AZQS_Y1	KRP58M51
AZQS_V1	SB.KRP58M51

For installation instructions, see the installation manual of the demand adaptor kit.

- 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.

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.

- 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.

5 Preparation

5.1 Overview: Preparation

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

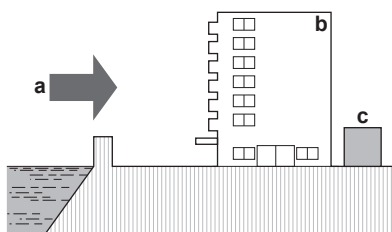
It contains information about:

- Preparing the installation site

5 Preparation

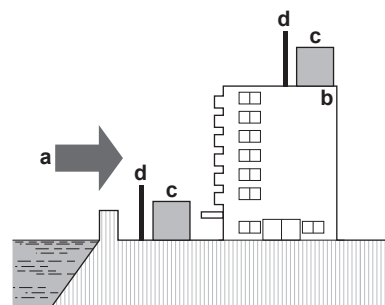
Install the outdoor unit away from direct sea winds.

Example: Behind the building.



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

- Height of windbreaker $\geq 1.5 \times$ height of outdoor unit
- Mind the service space requirements when installing the windbreaker.



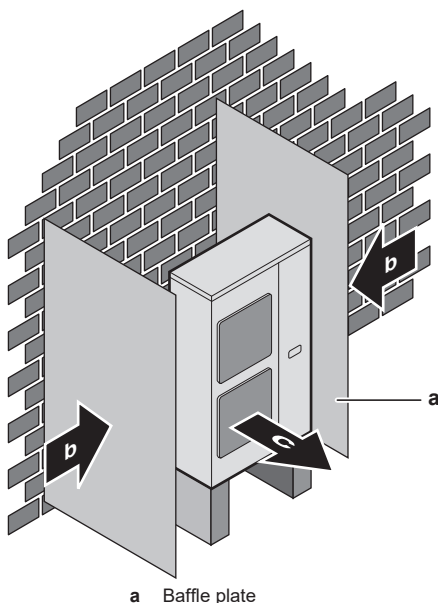
- a Sea wind
- b Building
- c Outdoor unit
- d Windbreaker

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

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

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

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



a Baffle plate

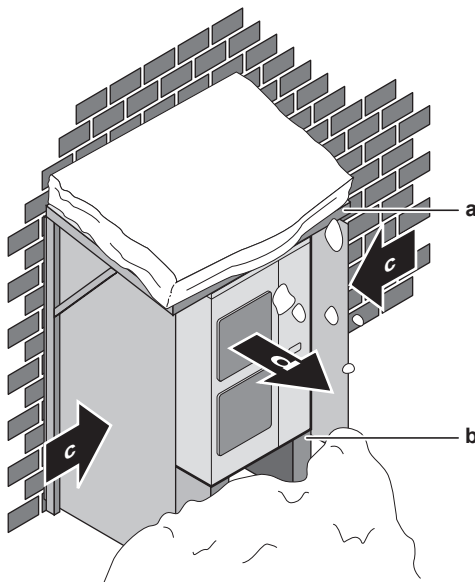
- b Prevailing wind direction
- c Air outlet

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

Model	Cooling	Heating
AZQS	-5~46°C	-15~15.5°C

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

5.3 Preparing refrigerant piping

5.3.1 Refrigerant piping requirements



INFORMATION

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



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.

Refrigerant piping material

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

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

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

Refrigerant piping diameter

Use the same diameters as the connections on the outdoor units:

L1 liquid piping	Ø9.5 mm
L1 gas piping	Ø15.9 mm

Refrigerant piping length and height difference

The piping length and height difference must comply with the following requirements:

	Total one-way piping length: $5 \text{ m} \leq L1 \leq 50 \text{ m (70 m)}^{(a)(b)}$
	Height difference between the highest indoor unit and the outdoor unit: $H1 \leq 30 \text{ m}$

- (a) Parenthesised figure represents the equivalent length.
(b) For details about the combination of your outdoor and indoor unit, see the engineering databook.

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
$\leq 30^\circ\text{C}$	75% to 80% RH	15 mm
$> 30^\circ\text{C}$	$\geq 80\%$ 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 "6.7.5 Specifications of standard wiring components" on page 18.



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

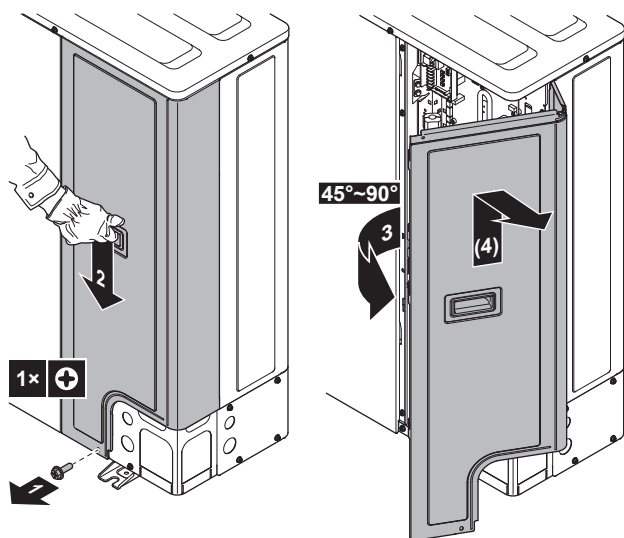


DANGER: RISK OF ELECTROCUTION



DANGER: RISK OF BURNING

6 Installation



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" on page 7](#).

6.3.2 Precautions when mounting the outdoor unit



INFORMATION

Also read the precautions and requirements in the following chapters:

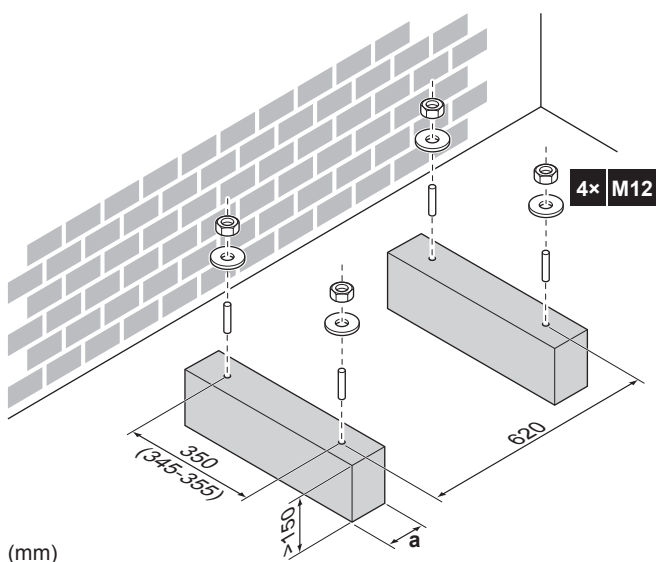
- General safety precautions
- Preparation

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:

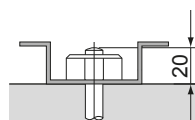


a Make sure not to cover the drain holes of the bottom plate of the unit.



INFORMATION

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

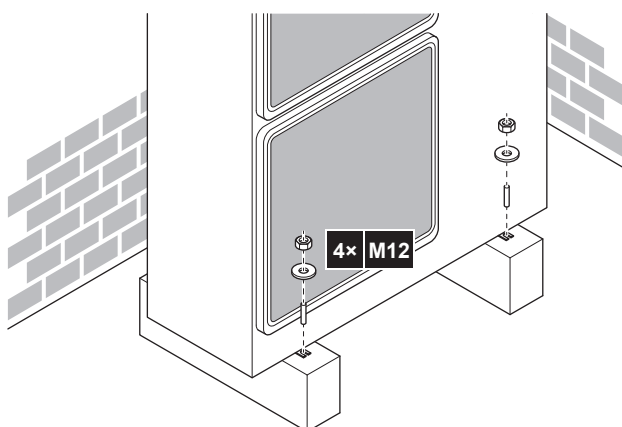


NOTICE

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



6.3.4 To install the outdoor unit



6.3.5 To provide drainage

- Make sure that condensation water can be evacuated properly.
- Install the unit on a base to make sure that there is proper drainage in order to avoid ice accumulation.
- Prepare a water drainage channel around the foundation to drain waste water away from the unit.
- Avoid drain water flowing over the footpath, so that it does NOT become slippery in case of ambient freezing temperatures.

- If you install the unit on a frame, install a waterproof plate within 150 mm of the bottom side of the unit in order to prevent water from getting into the unit and to avoid drain water dripping (see the following figure).



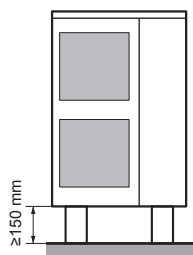
INFORMATION

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

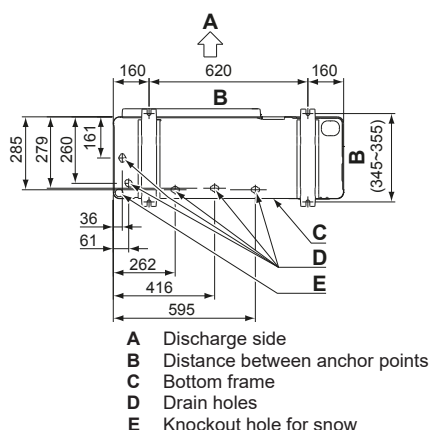


NOTICE

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



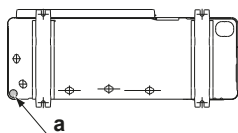
Drain holes (dimensions in mm)



Snow

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

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

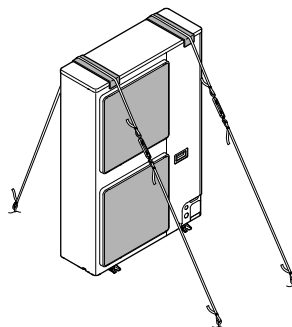


- Remove the burrs, and paint the edges and areas around the edges using repair paint to prevent rusting.

6.3.6 To prevent the outdoor unit from falling over

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

- Prepare 2 cables as indicated in the following illustration (field supply).
- Place the 2 cables over the outdoor unit.
- Insert a rubber sheet between the cables and the outdoor unit to prevent the cables from scratching the paint (field supply).
- 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 unit
- Installing oil traps
- Insulating the refrigerant piping
- Keeping in mind the guidelines for:
 - Pipe bending
 - Flaring pipe ends
 - Brazing
 - Using the stop valves

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

- Do NOT use mineral oil on flared part.
- NEVER install a drier to this R410A unit to guarantee its lifetime. The drying material may dissolve and damage the system.

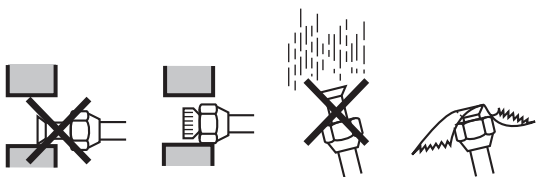
6 Installation



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 R410A when adding refrigerant.
- Only use installation tools (e.g. manifold gauge set) that are exclusively used for R410A installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils and moisture) from mixing into the system.
- Install the piping so that the flare is NOT subjected to mechanical stress
- Protect the piping as described in the following table to prevent dirt, liquid or dust from entering the piping.
- Use caution when passing copper tubes through walls (see figure below).



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



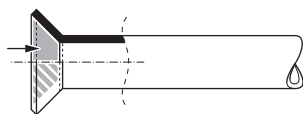
INFORMATION

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.

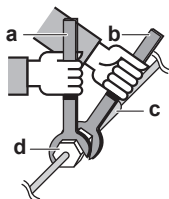
6.4.3 Guidelines when connecting the refrigerant piping

Take the following guidelines into account when connecting pipes:

- Coat the flare inner surface with ether oil or ester oil when connecting a flare nut. Tighten 3 or 4 turns by hand, before tightening firmly.



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



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

Piping size (mm)	Tightening torque (N·m)	Flare dimensions (A) (mm)	Flare shape (mm)
Ø6.4	15~17	8.7~9.1	
Ø9.5	33~39	12.8~13.2	
Ø12.7	50~60	16.2~16.6	
Ø15.9	63~75	19.3~19.7	
Ø19.1	90~110	23.6~24.0	

6.4.4 Pipe bending guidelines

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

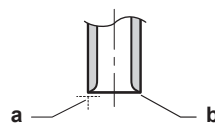
6.4.5 To flare the pipe end



CAUTION

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

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



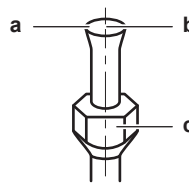
- a Cut exactly at right angles.
- b Remove burrs.

- 3 Remove the flare nut from the stop valve and put the flare nut on the pipe.
- 4 Flare the pipe. Set exactly at the position as shown in the following figure.



	Flare tool for R410A (clutch type)	Conventional flare tool	
		Clutch type (Ridgid-type)	Wing nut type (Imperial-type)
A	0~0.5 mm	1.0~1.5 mm	1.5~2.0 mm

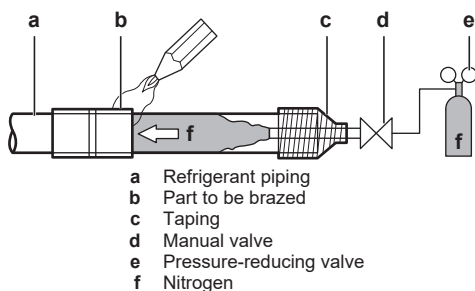
- 5 Check that the flaring is properly made.



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

6.4.6 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.



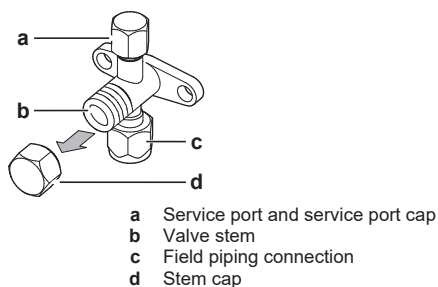
- Do NOT use anti-oxidants when brazing pipe joints. Residue can clog pipes and break equipment.
- Do NOT use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (BCuP), which does not require flux. Flux has an extremely harmful influence on refrigerant piping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

6.4.7 Using the stop valve and service port

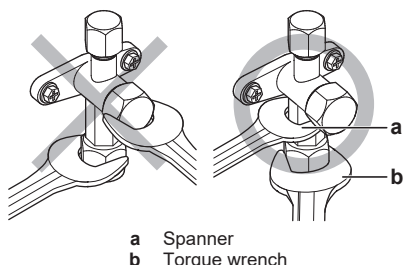
To handle the stop valve

Take the following guidelines into account:

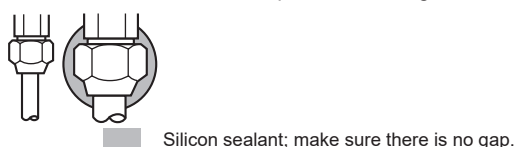
- The stop valves are factory closed.
- The following figure shows the stop valve parts required when handling the valve.



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

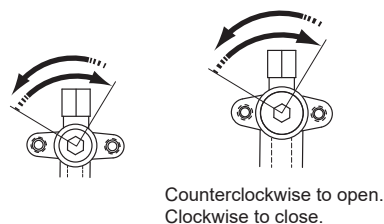


- When it is expected that the operating pressure will be low (e.g. when cooling will be performed while the outside air temperature is low), sufficiently seal the flare nut in the stop valve on the gas line with silicon sealant to prevent freezing.



To open/close the stop valve

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

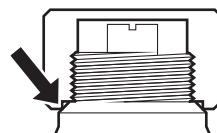


- When the stop valve CANNOT be turned any further, stop turning.
- Install the stop valve cover.

Result: The valve is now open/closed.

To handle the stem cap

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



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

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

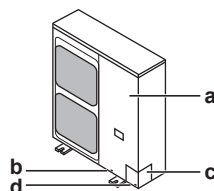
To handle the service cap

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

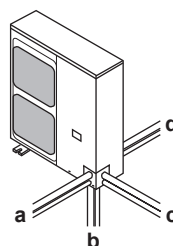
Item	Tightening torque (N·m)
Service port cap	11.5~13.9

6.4.8 To connect the refrigerant piping to the outdoor unit

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

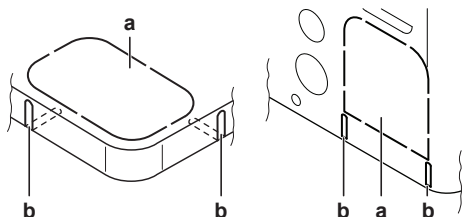


- Choose a piping route (a, b, c or d).



6 Installation

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.

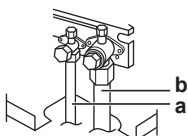
NOTICE

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.

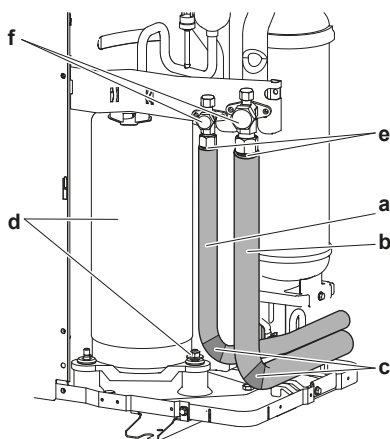
3 Do the following:

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



4 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 (d).
- Seal the insulation ends (sealant etc.) (e).

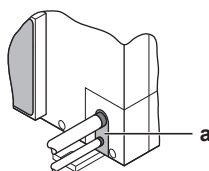


- 5 If the outdoor unit is installed above the indoor unit, cover the stop valves (f, see above) with sealing material to prevent condensed water on the stop valves from moving to the indoor unit.

NOTICE

Any exposed piping might cause condensation.

- Reattach the service cover and the piping intake plate.
- Seal all gaps (example: a) to prevent snow and small animals from entering the system.



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.

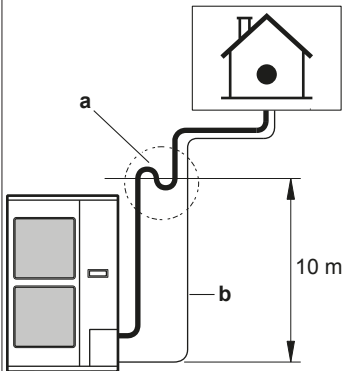


NOTICE

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.

6.4.9 To determine if oil traps are required

If oil flows back into the outdoor unit's compressor, this might cause liquid compression or deterioration of oil return. Oil traps in the rising gas piping can prevent this.

If	Then
The indoor unit is installed higher than the outdoor unit	<p>Install an oil trap every 10 m (height difference).</p>  <p>a Rising gas piping with oil trap b Liquid piping</p>
The outdoor unit is installed higher than the indoor unit	Oil traps are NOT required.

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:

- Checking for leaks in the refrigerant piping.
- 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

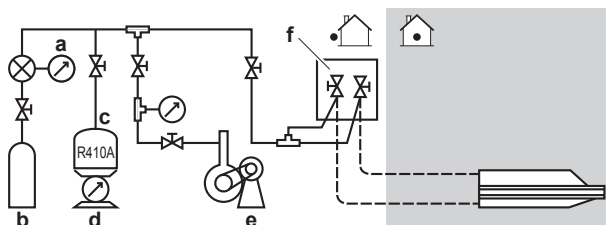
Use this vacuum pump for R410A exclusively. Using the same pump for other refrigerants may damage the pump and the unit.



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 Pressure gauge
- b Nitrogen
- c Refrigerant
- d Weighing machine
- e Vacuum pump
- f Stop valve

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).

- 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.

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

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

- Vacuum the system for at least 2 hours to a manifold pressure of -0.1 MPa (-1 bar).
- After turning the pump OFF, check the pressure for at least 1 hour.
- 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 Charging refrigerant

6.6.1 About charging refrigerant

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

What	When
Charging additional refrigerant	When the total liquid piping length is more than specified (see later).
Completely recharging refrigerant	Example: <ul style="list-style-type: none"> 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).

6 Installation

i 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.

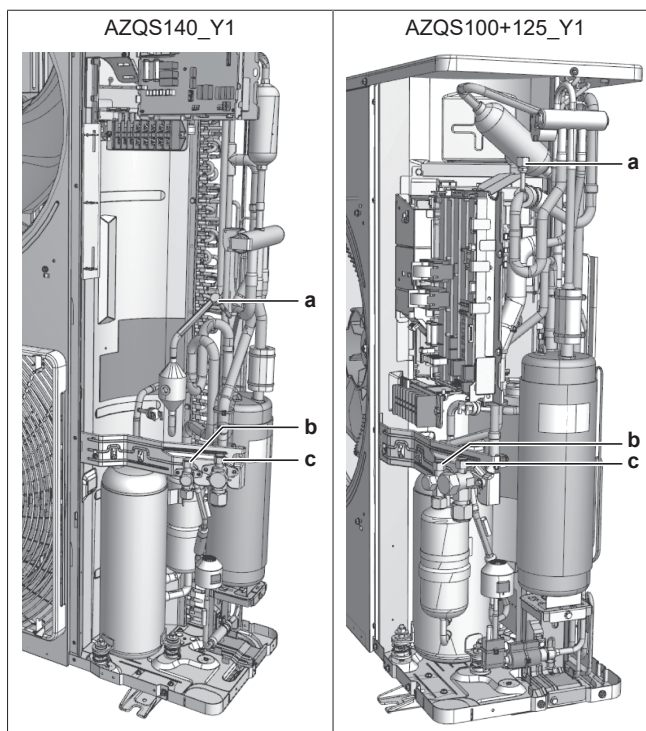
! NOTICE

Before completely recharging, perform vacuum drying on the outdoor unit's **internal** refrigerant piping as well. To do so, use the internal service port of the outdoor unit (between the heat exchanger and the 4-way valve). Do NOT use the service ports of the stop valves, because vacuum drying cannot be performed properly from these ports.

! 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.



- 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.

6.6.2 Precautions when charging refrigerant

i INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

6.6.3 To determine the additional refrigerant amount

To determine if adding additional refrigerant is necessary

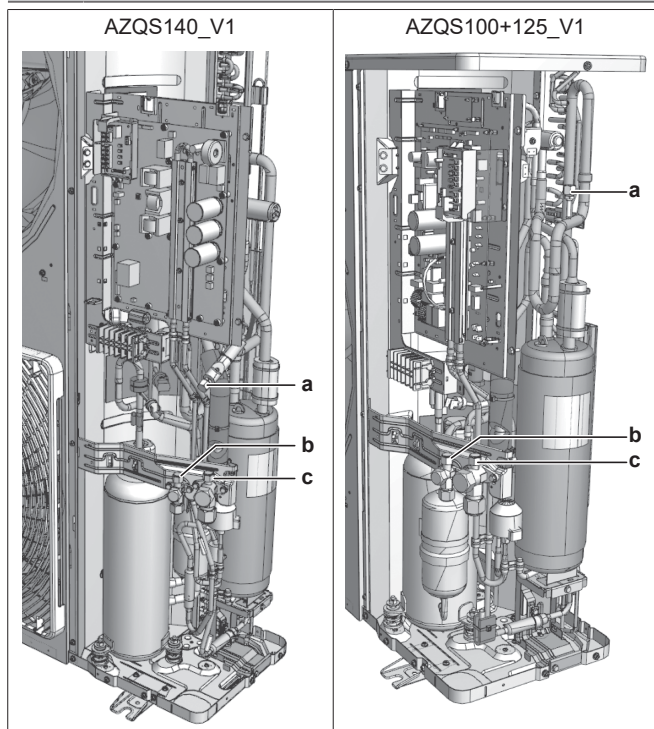
If	Then
$L1 \leq 30$ m (chargeless length)	You do not have to add additional refrigerant.
$L1 > 30$ m	You must add additional refrigerant. For future servicing, encircle the selected amount in the tables below.

i INFORMATION

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

To determine the additional refrigerant amount (R in kg)

	30~40 m	40~50 m
R:	0.5 kg	1.0 kg



**INFORMATION**

For details about the combination of your outdoor and indoor unit, see the engineering databook.

6.6.4 To determine the complete recharge amount

Model	L1 (m)				
	5~10	10~20	20~30	30~40	40~50
AZQS100+125	1.9	2.4	2.9	3.4	3.9
AZQS140	3.0	3.5	4.0	4.5	5.0

**INFORMATION**

For details about the combination of your outdoor and indoor unit, see the engineering databook.

6.6.5 Charging refrigerant: Setup

See "6.5.3 Checking refrigerant piping: Setup" on page 15.

6.6.6 To charge additional refrigerant

**WARNING**

- Only use R410A as refrigerant. Other substances may cause explosions and accidents.
- R410A contains fluorinated greenhouse gases. Its global warming potential (GWP) value is 2087.5. 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).

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

If pump down is needed in case of dismantling or relocating the system, see To pump down for more details.

6.6.7 To fix the fluorinated greenhouse gases label

- Fill in the label as follows:

The diagram shows a label with the following fields and labels:

- a**: Contains fluorinated greenhouse gases
- b**: $\text{①} = \text{[] kg}$
- c**: $\text{②} = \text{[] kg}$
- d**: $\text{①} + \text{②} = \text{[] kg}$
- e**: $\frac{\text{GWP} \times \text{kg}}{1000} = \text{[] tCO}_2\text{eq}$
- f**: GWP: XXX

- 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**.
- Factory refrigerant charge: see unit name plate
- Additional refrigerant amount charged
- Total refrigerant charge
- Quantity of fluorinated greenhouse gases** of the total refrigerant charge expressed as tonnes CO₂ equivalent.
- 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 CO₂ equivalent.

Formula to calculate the quantity in CO₂ 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.

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

6.7 Connecting the electrical wiring

6.7.1 About connecting the electrical wiring

Before connecting the electrical wiring

Make sure the refrigerant piping is connected and checked.

Typical workflow

Connecting the electrical wiring typically consists of the following stages:

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

6.7.2 About electrical compliance

AZQS_V1 + AZQS125_Y1

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

AZQS140_Y1

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
AZQS140_Y1	1170 kVA ^(a)

(a) This is the most stringent value. For specific product data, see the databooks.

6 Installation

6.7.3 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.



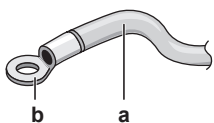
CAUTION

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.

6.7.4 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	<p>a Curled single-core wire b Screw c Flat washer</p>
Stranded conductor wire with round crimp-style terminal	<p>a Terminal b Screw c Flat washer</p> <p>O Allowed X NOT allowed</p>

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

6.7.5 Specifications of standard wiring components

Component		AZQS_V1			AZQS_Y1		
		100	125	140	100	125	140
Power supply cable	MCA ^(a)	29.5 A	31.5 A	32.8 A	15.2 A	17.2 A	21.8 A
	Voltage	230 V			400 V		
	Phase	1~			3N~		
	Frequency	50 Hz					
	Wire sizes	Must comply with applicable legislation					
Interconnection cables		Minimum cable section of 2.5 mm² and applicable for 230 V					
Recommended field fuse		32 A		40 A	16 A	20 A	25 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).

6.7.6 To connect the electrical wiring on the outdoor unit



NOTICE

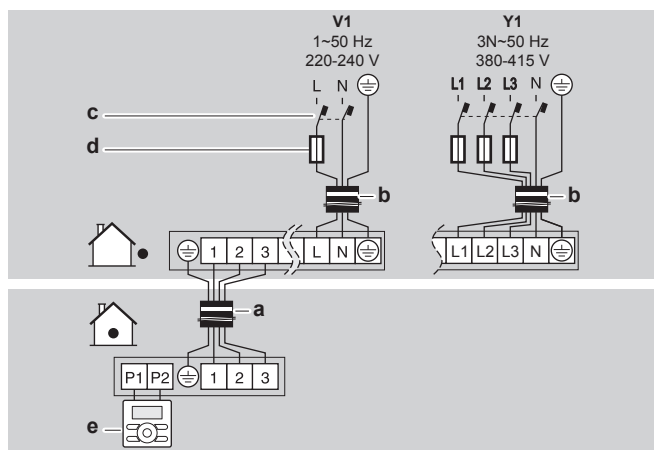
- Follow the wiring diagram (delivered with the unit, located at the inside of the service cover).
- Make sure the electrical wiring does NOT obstruct proper reattachment of the service cover.



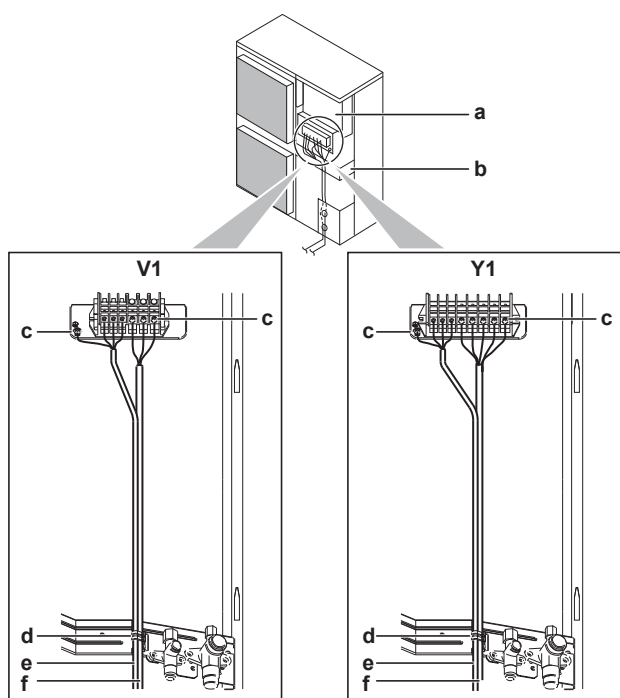
- a Strip wire end to this point
- b Excessive strip length may cause electrical shock or leakage.

- Connect the interconnection cable and power supply as follows:

- Remove the service cover. See "6.2.2 To open the outdoor unit" on page 9.
- Strip insulation (20 mm) from the wires.



- a Interconnection cable
- b Power supply cable
- c Earth leakage circuit breaker
- d Fuse
- e User interface

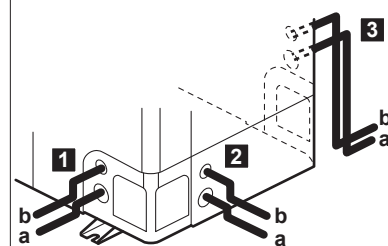


- a Switch box
- b Stop valve attachment plate
- c Earth
- d Cable tie
- e Interconnection cable
- f Power supply cable

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

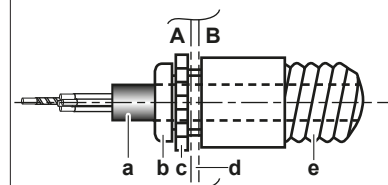


- a Power supply cable
- b Interconnection cable

Connecting to the frame

When cables are routed from the unit, a protection sleeve for the conduits (PG insertions) can be inserted at the knockout hole.

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.



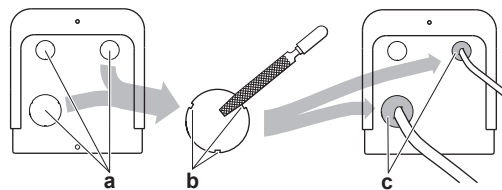
- A Inside of the outdoor unit
- B Outside of the outdoor unit
- a Wire
- b Bush
- c Nut
- d Frame
- e Hose



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.

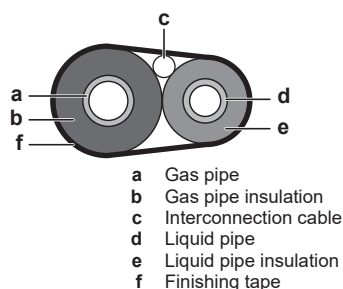
- 7 Reattach the service cover. See ["6.8.2 To close the outdoor unit" on page 20](#).
- 8 Connect an earth leakage circuit breaker and fuse to the power supply line.

7 Commissioning

6.8 Finishing the outdoor unit installation

6.8.1 To finish the outdoor unit installation

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



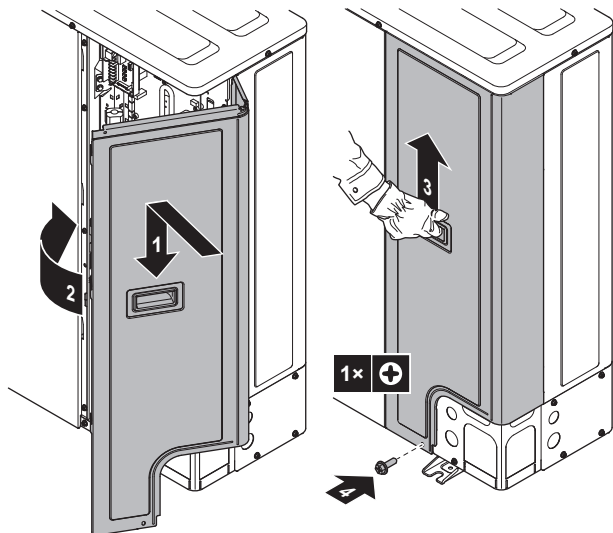
- 2 Install the service cover.

6.8.2 To close the outdoor unit



NOTICE

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



6.8.3 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

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

NEVER operate the unit without thermistors and/or pressure sensors/switches. Burning of the compressor might result.



NOTICE

Do **NOT** operate the unit until the refrigerant piping is complete (when operated this way, 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" on page 21](#).



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 following items. Once all below checks are fulfilled, the unit **MUST** be closed, **ONLY** then can the unit be powered up.



You read the complete installation instructions, as described in the **installer reference guide**.

<input type="checkbox"/>	The indoor units are properly mounted.
<input type="checkbox"/>	In case a wireless user interface is used: The indoor unit decoration panel with infrared receiver is installed.
<input type="checkbox"/>	The outdoor unit is properly mounted.
<input type="checkbox"/>	The following field wiring has been carried out according to this document and the applicable legislation: <ul style="list-style-type: none"> Between the local supply panel and the outdoor unit Between the outdoor unit and the indoor unit
<input type="checkbox"/>	There are NO missing phases or reversed phases .
<input type="checkbox"/>	The system is properly earthed and the earth terminals are tightened.
<input type="checkbox"/>	The fuses or locally installed protection devices are installed according to this document, and have NOT been bypassed.
<input type="checkbox"/>	The power supply voltage matches the voltage on the identification label of the unit.
<input type="checkbox"/>	There are NO loose connections or damaged electrical components in the switch box.
<input type="checkbox"/>	The insulation resistance of the compressor is OK.
<input type="checkbox"/>	There are NO damaged components or squeezed pipes on the inside of the indoor and outdoor units.
<input type="checkbox"/>	There are NO refrigerant leaks .
<input type="checkbox"/>	The correct pipe size is installed and the pipes are properly insulated.
<input type="checkbox"/>	The stop valves (gas and liquid) on the outdoor unit are fully open.

7.4 To perform a test run



NOTICE

Do not interrupt the test run.



INFORMATION

In case you have to redo the test run, see the service manual.

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 On the user interface, turn ON the unit.

Result: The test run starts automatically. During the test run, the H2P test LED is ON. When the test run is done, the LED turns OFF.

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)	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> The stop valves are closed. The air inlet or air outlet is blocked.
E7	<p>There is a missing phase in case of three-phase power supply units.</p> <p>Note: Operation will be impossible. Turn OFF the power, recheck the wiring, and switch two of the three electrical wires.</p>
L4	The air inlet or air outlet is blocked.
U0	The stop valves are closed.
U2	<ul style="list-style-type: none"> 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.



NOTICE

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

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.

10 Troubleshooting



NOTICE

Applicable legislation on **fluorinated greenhouse gases** requires that the refrigerant charge of the unit is indicated both in weight and CO₂ equivalent.

Formula to calculate the quantity in CO₂ 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.

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" on page 21.
- See the service manual.

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.

- 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 (BS4) for at least 8 seconds. BS4 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**.

Result: The pump down operation is finished. The user interface may display "U4" and the indoor pump 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

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: <ul style="list-style-type: none"> • 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	≥100	≥100				
	B, E	—		≥100			≥1000		≤500
	A, B, C, E	—	≥150	≥150	≥150		≥1000		≤500
	D	—				≥500			
	D, E	—				≥500	≥1000	≤500	
	B, D	—		≥100		≥500			
	B, D, E	$H_B < H_D$	$H_B \leq \frac{1}{2}H_U$	≥250		≥750	≥1000	≤500	
		$\frac{1}{2}H_U < H_B \leq H_U$		≥250		≥1000	≥1000	≤500	
		$H_B > H_U$	⊘						
		$H_B > H_D$	$H_D \leq \frac{1}{2}H_U$	≥100		≥1000	≥1000		≤500
		$\frac{1}{2}H_U < H_D \leq H_U$		≥200		≥1000	≥1000		≤500
		$H_D > H_U$		⊘					
	A, B, C	—	≥200	≥300	≥1000				
	A, B, C, E	—	≥200	≥300	≥1000		≥1000		≤500
	D	—				≥1000			
	D, E	—				≥1000	≥1000	≤500	
	B, D	$H_B < H_D$	$H_D > H_U$	≥300		≥1000			
		$H_B > H_D$		≥250		≥1500			
		$\frac{1}{2}H_U < H_D \leq H_U$	≥300		≥1500				
		$H_D > H_U$	⊘						
	B, D, E	$H_B < H_D$	$H_B \leq \frac{1}{2}H_U$	≥300		≥1000	≥1000	≤500	
		$\frac{1}{2}H_U < H_B \leq H_U$		≥300		≥1250	≥1000	≤500	
		$H_B > H_U$	⊘						
		$H_B > H_D$	$H_D \leq \frac{1}{2}H_U$	≥250		≥1500	≥1000		≤500
		$\frac{1}{2}H_U < H_D \leq H_U$		≥300		≥1500	≥1000		≤500
		$H_D > H_U$		⊘					

A, B, C, D Obstacles (walls/baffle plates)

E Obstacle (roof)

a, b, c, d, e Minimum service space between the unit and obstacles A, B, C, D and E

e_B Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle B

e_D Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle D

H_U Height of the unit

H_B, H_D Height of obstacles B and D

1 Seal the bottom of the installation frame to prevent discharged air from flowing back to the suction side through the bottom of the unit.

2 Maximum two units can be installed.

$H_B \ H_U$	$b \text{ (mm)}$
$H_B \leq \frac{1}{2} H_U$	$b \geq 250$
$\frac{1}{2} H_U < H_B \leq H_U$	$b \geq 300$
$H_B > H_U$	\otimes

A1

A2

B1

B2

(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.

(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.

- | | |
|---------|--|
| a | Field piping (liquid: Ø9.5 flare connection) |
| b | Field piping (gas: Ø15.9 flare connection) |
| c | Stop valve (with service port 5/16") |
| d | Accumulator |
| e | Filter |
| f | Heat exchanger |
| g | Internal service port 5/16" |
| h | Switch box cooling (only for AZQS_V1) |
| i | Compressor accumulator |
| j | Check valve (only for AZQS100 and AZQS125) |
| M1C | Motor (compressor) |
| M1F-M2F | Motor (upper and lower fan) |
| R1T | Thermistor (air) |
| R2T | Thermistor (discharge) |
| R3T | Thermistor (suction) |
| R4T | Thermistor (heat exchanger) |
| R5T | Thermistor (heat exchanger middle) |
| R6T | Thermistor (liquid) |
| S1PH | High pressure switch |
| S1PL | Low pressure switch (only for AZQS_V1) |
| Y1E | Electronic expansion valve |
| Y1S | Solenoid valve (4-way valve) |
| → | Heating |
| → | Cooling |

12 Technical data

12.4 Wiring diagram: Outdoor unit

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

Notes for AZQS_V1:

- 1 Symbols (see legend).
- 2 Colours (see legend).
- 3 This wiring diagram applies only to the outdoor unit.
- 4 Refer to the wiring diagram sticker (on the back of the service cover) for how to use the BS1~BS4 and DS1 switches.
- 5 When operating, do not short-circuit protective devices S1PH and S1PL.
- 6 Refer to the service manual for instructions on how to set the selector switches (DS1). The factory setting of all switches is OFF.
- 7 Refer to the combination table and the option manual for how to connect the wiring to X6A, X28A and X77A.

Notes for AZQS_Y1:

- 1 This wiring diagram applies only to the outdoor unit.
- 2 Refer to the combination table and the option manual for how to connect the wiring to X6A, X28A and X77A.
- 3 Refer to the wiring diagram sticker (on the back of the service cover) for how to use the BS1~BS4 and DS1 switches.
- 4 When operating, do not short-circuit protective device S1PH.
- 5 Refer to the service manual for instructions on how to set the selector switches (DS1). The factory setting of all switches is OFF.
- 6 Only for 71 class.

Legend for wiring diagrams:

A1P~A2P	Printed circuit board
BS1~BS4	Push button switch
C1~C3	Capacitor
DS1	DIP switch
E1H	Bottom plate heater (option)
F1U~F8U (AZQS100_V1)	<ul style="list-style-type: none"> F1U, F2U: Fuse F6U: Fuse (T 3.15 A / 250 V) F7U, F8U: Fuse (F 1.0 A / 250 V)
F1U~F8U (AZQS125+140_V1)	<ul style="list-style-type: none"> F1U~F4U: Fuse F6U: Fuse (T 5.0 A / 250 V) F7U, F8U: Fuse (F 1.0 A / 250 V)
F1U~F8U (AZQS_Y1)	<ul style="list-style-type: none"> F1U, F2U: Fuse (31.5 A / 250 V) F1U (A2P): Fuse (T 5.0 A / 250 V) F3U~F6U: Fuse (T 6.3 A / 250 V) F7U, F8U: Fuse (F 1.0 A / 250 V)
H1P~H7P	Light-emitting diode (service monitor is orange)
HAP	Light-emitting diode (service monitor is green)
K1M, K11M	Magnetic contactor
K1R (AZQS_V1)	Magnetic relay (Y1S)
K1R (AZQS_Y1)	<ul style="list-style-type: none"> K1R (A1P): Magnetic relay (Y1S) K1R (A2P): Magnetic relay
K2R (AZQS100_V1)	Magnetic relay

K2R (AZQS_Y1)	<ul style="list-style-type: none"> K2R (A1P): Magnetic relay (E1H option) K2R (A2P): Magnetic relay
K10R, K13R~K15R	Magnetic relay
K4R	Magnetic relay E1H (option)
L1R~L3R	Reactor
M1C	Motor (compressor)
M1F	Motor (upper fan)
M2F	Motor (lower fan)
PS	Switching power supply
Q1DI	Earth leakage circuit breaker (field supply)
R1~R6	Resistor
R1T	Thermistor (air)
R2T	Thermistor (discharge)
R3T	Thermistor (suction)
R4T	Thermistor (heat exchanger)
R5T	Thermistor (heat exchanger middle)
R6T	Thermistor (liquid)
R7T	Thermistor (fin)
(AZQS125+140_V1)	
R7T, R8T (AZQS100_V1)	Thermistor (Positive Temperature Coefficient)
R10T (AZQS_Y1)	Thermistor (fin)
RC	Signal receiver circuit
S1PH	High pressure switch
S1PL	Low pressure switch
TC	Signal transmission circuit
V1D~V4D	Diode
V1R	IGBT power module
V2R, V3R	Diode module
V1T~V3T	Insulated gate bipolar transistor (IGBT)
X6A	Connector (option)
X1M	Terminal strip
Y1E	Electronic expansion valve
Y1S	Solenoid valve (4-way valve)
Z1C~Z6C	Noise filter (ferrite core)
Z1F~Z6F	Noise filter

Symbols:

L	Live
N	Neutral
⎓	Field wiring
□□□□	Terminal strip
⊞	Connector
⎓⎓	Relay connector
•	Connection
⏏	Protective earth
⏏	Noiseless earth
○	Terminal
⎓⎓⎓⎓	Option

Colours:

BLK	Black
BLU	Blue

BRN	Brown
GRN	Green
ORG	Orange
RED	Red
WHT	White
YLW	Yellow

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 LOT21", click "Generate your data".

Result: You are directed to the "Seasonal efficiency (LOT21)" 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.

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.

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.

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