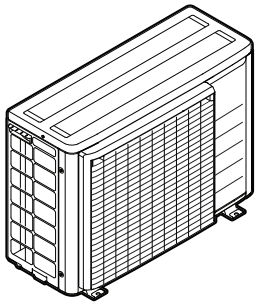
DAIKIN

altherma

# Installation manual

## Daikin Altherma 3 R



**ERLA03DAV3**

Installation manual
Daikin Altherma 3 R

**English**

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# 1 About the documentation

## 1.1 About this document

**Target audience**

Authorised installers

**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 indoor unit)
- **Operation manual:**
  - Quick guide for basic usage
  - Format: Paper (in the box of the indoor unit)
- **User reference guide:**
  - Detailed step-by-step instructions and background information for basic and advanced usage
  - Format: Digital files on https://www.daikin.eu. Use the search function to find your model.
- **Installation manual – Outdoor unit:**
  - Installation instructions
  - Format: Paper (in the box of the outdoor unit)
- **Installation manual – Indoor unit:**
  - Installation instructions
  - Format: Paper (in the box of the indoor unit)
- **Installer reference guide:**
  - Preparation of the installation, good practices, reference data, …
  - Format: Digital files on https://www.daikin.eu. Use the search function to find your model.
- **Addendum book for optional equipment:**
  - Additional info about how to install optional equipment
  - Format: Paper (in the box of the indoor unit) + Digital files on https://www.daikin.eu. Use the search function to find your model.

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

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

**Technical engineering data**

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

**Online tools**

In addition to the documentation set, some online tools are available for installers:

- **Heating Solutions Navigator**
  - Digital toolbox that offers a variety of tools to facilitate the installation and configuration of heating systems.
  - To access the Heating Solutions Navigator, registration to the Stand By Me platform is required. For more information, see https://professional.standbyme.daikin.eu.
- **Daikin e-Care**
  - Mobile app for installers and service technicians that allows you to register, configure and troubleshoot heating systems.
  - Use the QR codes below to download the mobile app for iOS and Android devices. Registration to the Stand By Me platform is required to access the app.

App Store Google Play

# 2 About the box

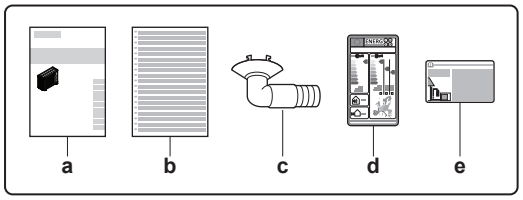
Keep the following in mind:

- At delivery, the unit MUST be checked for damage and completeness. Any damage or missing parts MUST be reported immediately to the claims agent of the carrier.

- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.
- Prepare in advance the path along which you want to bring the unit to its final installation position.

## 2.1 Outdoor unit

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




**a** Outdoor unit installation manual
**b** Multilingual fluorinated greenhouse gases label
**c** Drain plug (located on the bottom of the packing case)
**d** Energy label
**e** Fluorinated greenhouse gases label

# 3 Unit installation

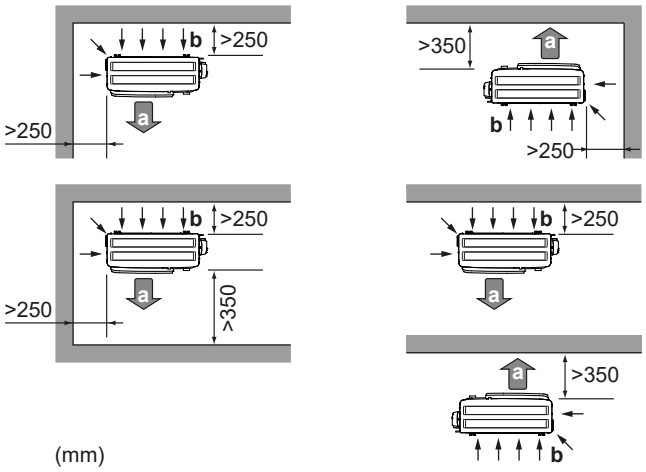
## 3.1 Preparing the installation site

**WARNING**

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

### 3.1.1 Installation site requirements of the outdoor unit

Mind the following spacing guidelines:




(mm)

**a** Air outlet
**b** Air inlet

**NOTICE**

The height of the wall on the outlet side of the outdoor unit MUST be ≤1200 mm.

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.

Do NOT install the unit in 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**

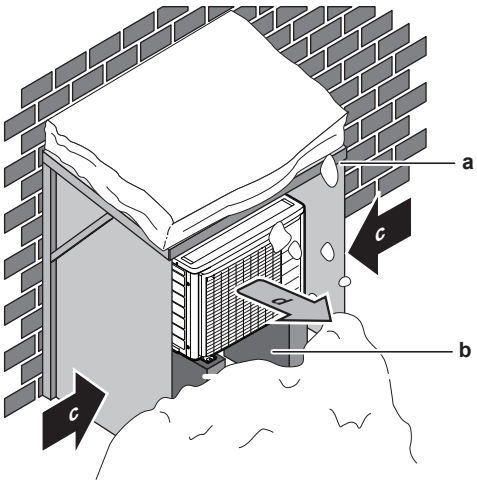
The sound pressure level is less than 70 dBA.

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

| | |
|---|---|
| Cooling mode | 10~43°C |
| Heating mode | –15~35°C |

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

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



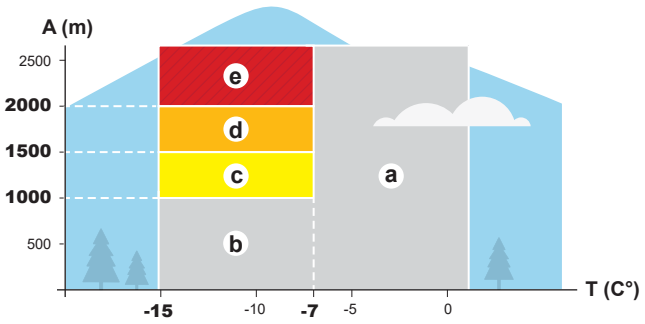

**a** Snow cover or shed
**b** Pedestal
**c** Prevailing wind direction
**d** Air outlet

It is recommended to provide at least 150 mm of free space below the unit (300 mm for heavy snowfall areas). Additionally, make sure the unit is positioned at least 100 mm above the maximum expected level of snow. If necessary, construct a pedestal. See "3.2 Mounting the outdoor unit" [▶ 4] for more details.

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

By default, the outdoor unit heat pump can operate until –7°C. Depending on the installation area, this can be lowered to –15°C by modifying the `BUH only ambient temp.` ([8-0E]) field setting. This setting can also be changed via the menu structure. See the installation manual of the indoor unit for how to change the setting.

Additionally, in areas with ambient temperatures between –7°C and –15°C, and depending on the altitude of the unit, the installation of a bottom plate heater (EKBPHT03D) may be required to guarantee outdoor unit operation.




**A** Altitude
**T** Temperature
**a** No special installation requirements
**b** Below 1000 m, no bottom plate heater is installed. Set [8-0E] = –15°C.
**c** Unit between 1000 m and 1500 m altitude — Bottom plate heater required. Set [8-0E] = –15°C.
**d** Unit between 1500 m and 2000 m altitude — Bottom plate heater required and set [8-0E] = –15°C. If the unit is within 3 km of any lakes or rivers, [8-0E] = –7°C.
**e** Outdoor unit operation not possible below –7°C (backup heater operation only). [8-0E] = –7°C.

### 3.1.3 Refrigerant piping length and height difference

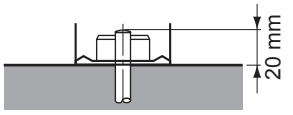
| What? | Distance |
|---|---|
| Maximum allowable pipe length | 20 m |
| Minimum allowable pipe length | 3 m |
| Maximum allowable height difference | 20 m |

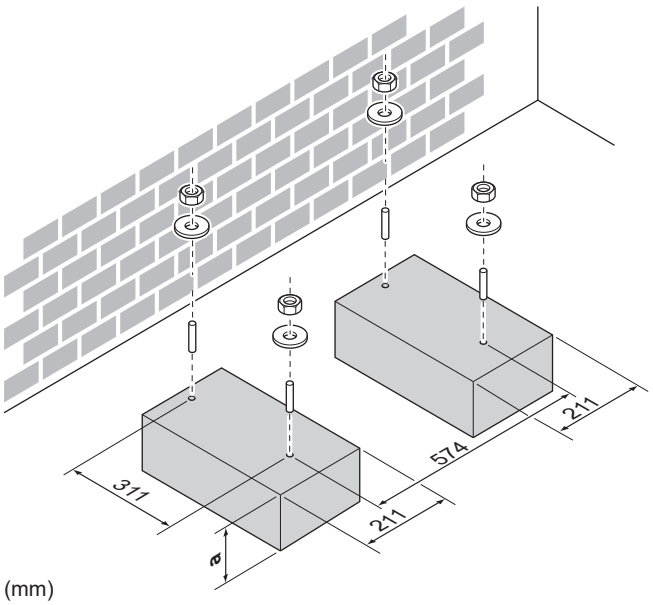
## 3.2 Mounting the outdoor unit

### 3.2.1 To provide the installation structure

Use a vibration-proof rubber (field supply) in cases where vibrations may be transmitted to the building.

Prepare 4 sets of M8 or M10 anchor bolts, nuts and washers (field supply).

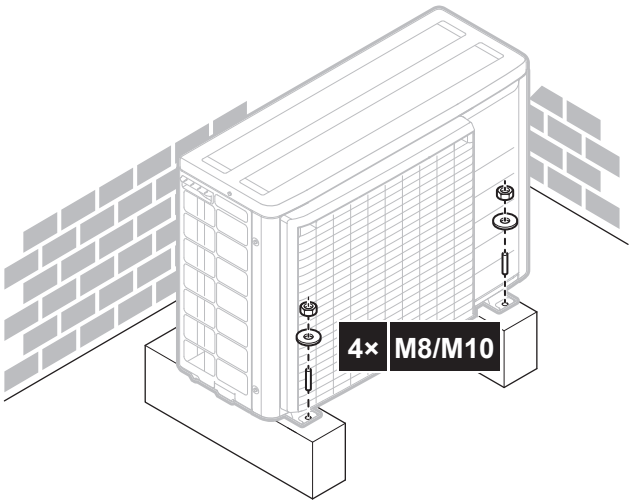



(mm)

**a** 100 mm above expected level of snow

### 3.2.2 To install the outdoor unit




### 3.2.3 To provide drainage

Make sure that condensation water can be evacuated properly.

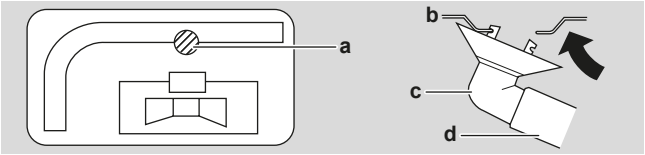
**NOTICE**

If the unit is installed in a cold climate, take adequate measures so that the evacuated condensate CANNOT freeze.

**INFORMATION**

For information on the available options, contact your dealer.

1 Use a drain plug for drainage.
2 Use a Ø16 mm hose (field supply).



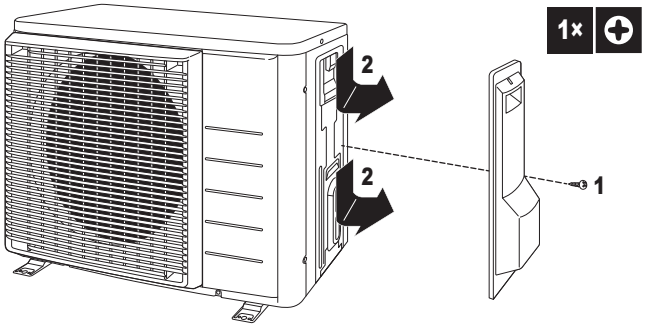

**a** Drain port
**b** Bottom frame
**c** Drain plug (accessory)
**d** Hose (field supply)

## 3.3 Opening the unit

### 3.3.1 To open the outdoor unit

**DANGER: RISK OF ELECTROCUTION**

**DANGER: RISK OF BURNING/SCALDING**



# 4 Piping installation

## 4.1 Connecting the refrigerant piping

**DANGER: RISK OF BURNING/SCALDING**

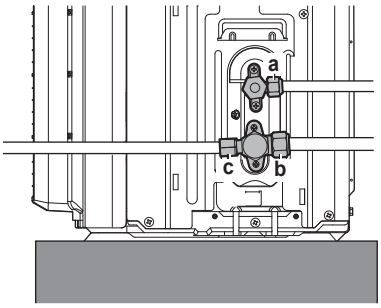
### 4.1.1 To connect the refrigerant piping to the outdoor unit

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

**WARNING**

Connect the refrigerant piping securely before running the compressor. If the refrigerant piping is NOT connected and the stop valve is open when the compressor is run, air will be sucked in. This will cause abnormal pressure in the refrigeration cycle, which may result in equipment damage and even injury.

1 Connect the liquid refrigerant connection from the indoor unit to the liquid stop valve of the outdoor unit.




**a** Liquid stop valve
**b** Gas stop valve
**c** Service port

2 Connect the gas refrigerant connection from the indoor unit to the gas stop valve of the outdoor unit.

**NOTICE**

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

## 4.2 Checking the refrigerant piping

### 4.2.1 To check for leaks

**NOTICE**

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

1 Charge the system with nitrogen gas up to a gauge pressure of at least 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.

**NOTICE**

ALWAYS use a recommended bubble test solution from your wholesaler.

NEVER use soap water:

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

3 Discharge all nitrogen gas.

### 4.2.2 To perform 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.

## 4.3 Charging refrigerant

### 4.3.1 About charging refrigerant

The outdoor unit is factory charged with refrigerant, but in some cases you may need to completely recharge refrigerant.

**Example:**

- When relocating the system.
- After a leak.

**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.

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.

**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.

### 4.3.2 About the refrigerant

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

Refrigerant type: R32

Global warming potential (GWP) value: 675

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

**WARNING**

- The refrigerant inside the unit is mildly flammable, but normally does NOT leak. If the refrigerant leaks in the room and comes in contact with fire from a burner, a heater, or a cooker, this may result in fire, or the formation of a harmful gas.
- Turn OFF any combustible heating devices, ventilate the room, and contact the dealer where you purchased the unit.
- Do NOT use the unit until a service person confirms that the part from which the refrigerant leaked has been repaired.

**WARNING**

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

**WARNING**

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

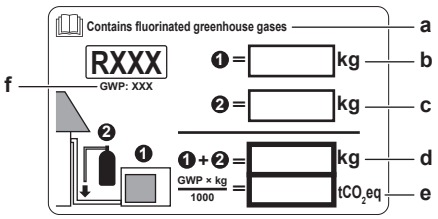
### 4.3.3 To determine the complete recharge amount

**INFORMATION**

If a complete recharge is necessary, the total refrigerant charge is equal to the factory refrigerant charge (see unit name plate).

### 4.3.4 To fix the fluorinated greenhouse gases label

**1** Fill in the label as follows:




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

**NOTICE**

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

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

Use the GWP value mentioned on the refrigerant charge label.

**2** Fix the label on the inside of the outdoor unit near the gas and liquid stop valves.

# 5 Electrical installation

**DANGER: RISK OF ELECTROCUTION**

**WARNING**

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

**WARNING**

ALWAYS use multicore cable for power supply cables.

**WARNING**

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

**WARNING**

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

**WARNING**

Do NOT connect the power supply to the indoor unit. This could result in electrical shock or fire.

**WARNING**

- Do NOT use locally purchased electrical parts inside the product.
- Do NOT branch the power supply for the drain pump, etc. from the terminal block. This could result in electrical shock or fire.

**WARNING**

Keep the interconnection wiring away from copper pipes without thermal insulation as such pipes will be very hot.

## 5.1 About electrical compliance

**Only for ERLA03D▲V3▼**

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

## 5.2 Guidelines when connecting the electrical wiring

**Tightening torques**

Outdoor unit:

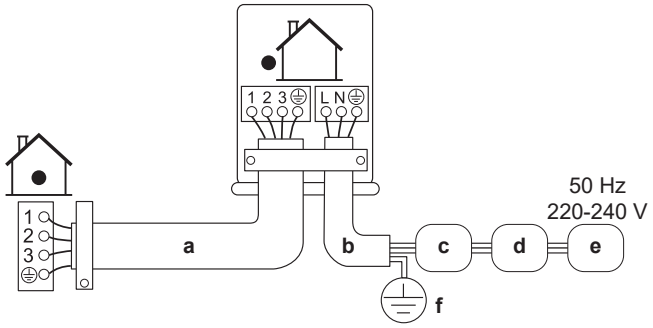
| Item | Tightening torque (N•m) |
|---|---|
| M4 (X1M) | 1.2~1.5 |
| M4 (earth) | 1.2~1.5 |

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

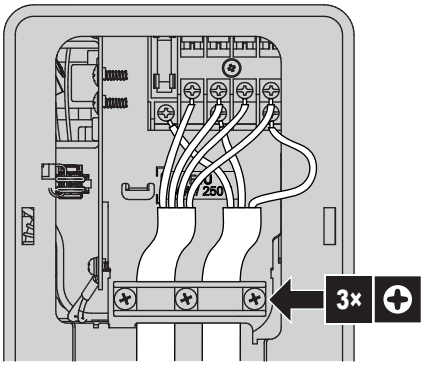
1 Remove the service cover.

2 Open the wire clamp.

3 Connect the interconnection cable and power supply as follows:




**a** Interconnection cable
**b** Power supply cable
**c** Circuit breaker (field provided fuse with 16 A rating)
**d** Residual current device
**e** Power supply
**f** Earth

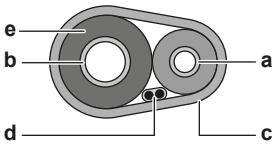



4 Tighten the terminal screws securely. We recommend using a Phillips screwdriver.

# 6 Finishing the outdoor unit installation

## 6.1 To finish the outdoor unit installation

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




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

2 Install the service cover.

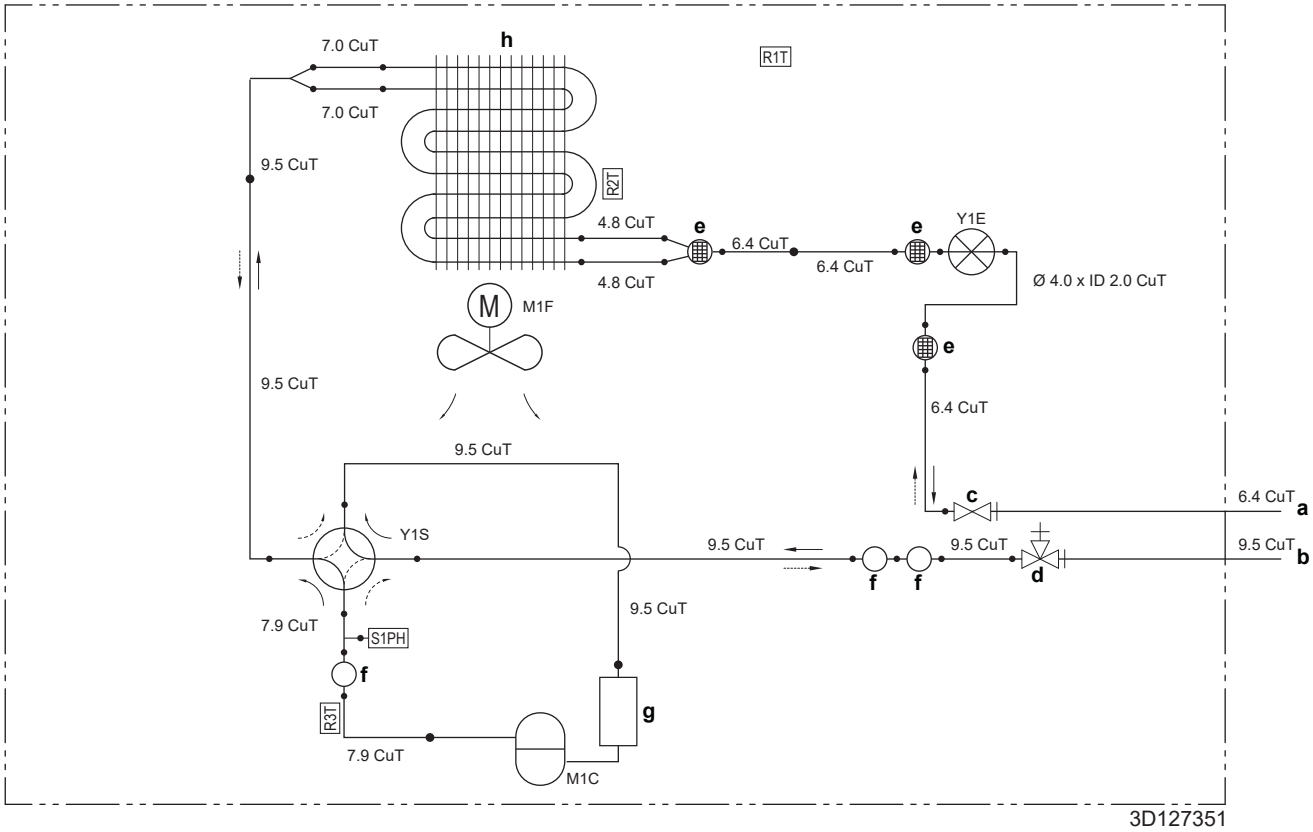
# 7 Starting up the outdoor unit

See the indoor unit installation manual for configuration and commissioning of the system.

# 8 Technical data

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

## 8.1 Piping diagram: Outdoor unit




| | |
|---|---|
| **a** | Field piping (liquid: Ø6.4 mm flare connection) |
| **b** | Field piping (gas: Ø9.5 mm flare connection) |
| **c** | Stop valve (liquid) |
| **d** | Stop valve with service port (gas) |
| **e** | Muffler with filter |
| **f** | Muffler |
| **g** | Accumulator |
| **h** | Heat exchanger |
| **M1C** | Compressor |
| **M1F** | Fan |
| **R1T** | Thermistor (outdoor air) |
| **R2T** | Thermistor (heat exchanger) |
| **R3T** | Thermistor (compressor discharge) |
| **S1PH** | High pressure switch (automatic reset) |
| **Y1E** | Electronic expansion valve |
| **Y1S** | Solenoid valve (4-way valve) (ON: cooling) |
| --► | Heating |
| ——► | Cooling |

## 8.2 Wiring diagram: Outdoor unit

See the internal wiring diagram supplied with the unit (on the inside of the top plate). The abbreviations used are listed below.

**(1) Wiring diagram**

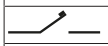
| English | Translation |
|---|---|
| Wiring diagram | Wiring diagram |
| For the power requirements, refer to the nameplate. | For the power requirements, refer to the nameplate. |
| Field wiring | Field wiring |
| Indoor | Indoor |
| Outdoor | Outdoor |
| Condenser | Condenser |
| Discharge | Discharge |

**(2) Notes**

1 Size: 140×80

2 Refer to purchasing specification AS303002, unless otherwise specified.

**(3) Legend**

| | |
|---|---|
| L | Live |
| N | Neutral |
|  | Protective earth |
|  | Earth |
|  | Field wiring |
|  | Circuit breaker |
|  | Connection |
|  | Terminal strip |
|  | Connector |
|  | Terminal |
| BLK | Black |
| WHT | White |
| BRN | Brown |
| RED | Red |
| GRN | Green |
| YLW | Yellow |
| ORG | Orange |
| BLU | Blue |
| GRY | Grey |
| A1P | Printed circuit board |
| C7 | Capacitor |
| DB1 | Diode bridge |
| E* | Connector |
| FU1, FU2 | Fuse T 3.15 A 250 V |
| F4U | Fuse T 30 A 250 V |
| H* | Connector |
| IPM* | Intelligent power module |
| M1C | Compressor motor |
| M1F | Fan motor |
| MR4, MR30 | Magnetic relay |
| MRM10, MRM20 | Magnetic relay |
| PAM | Pulse-amplitude modulation |
| PS | Switching power supply |
| Q1L | Overload protector |
| R1T | Thermistor (outdoor air) |
| R2T | Thermistor (heat exchanger) |
| R3T | Thermistor (compressor discharge) |
| S1PH | High pressure switch |
| S* | Connector |
| SA1 | Surge arrestor |
| U, V, W | Connector |
| V2, V3, V150 | Varistor |
| X11A | Connector |
| X1M | Terminal strip |
| Y1E | Electronic expansion valve coil |
| Y1S | Reversing solenoid valve coil |
| Z*C | Noise filter (ferrite core) |
| Z1F | Noise filter |

**DAIKIN EUROPE N.V.**

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