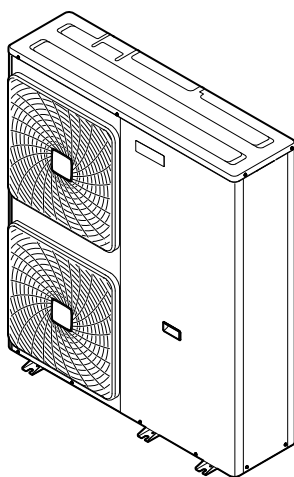


Installation manual

Daikin Altherma – Low temperature split



EPGA11DAV3
EPGA14DAV3
EPGA16DAV3

Installation manual
Daikin Altherma – Low temperature split

English

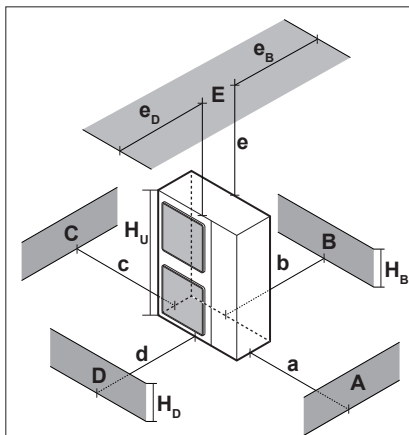


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1 About the documentation

1.1 About this document

Target audience

Authorised installers

Documentation set

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

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

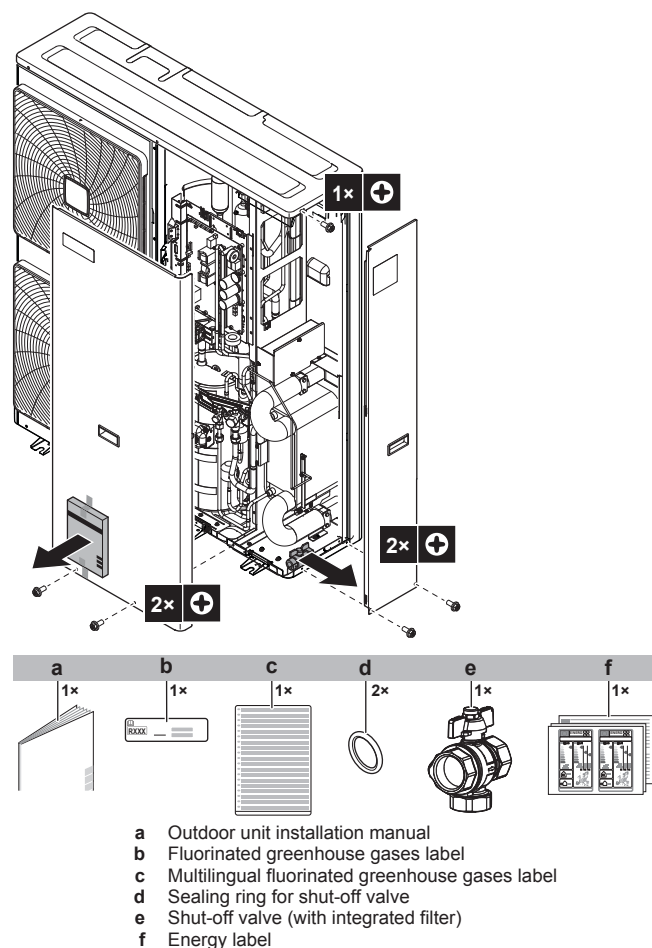
- A **subset** of the latest technical data is available on the regional Daikin website (publicly accessible).
- The **full set** of latest technical data is available on the Daikin extranet (authentication required).

2 About the box

2.1 Outdoor unit

2.1.1 To remove the accessories from the outdoor unit

- 1 Open the outdoor unit.
- 2 Remove the accessories.



2.1.2 To remove the transportation stay



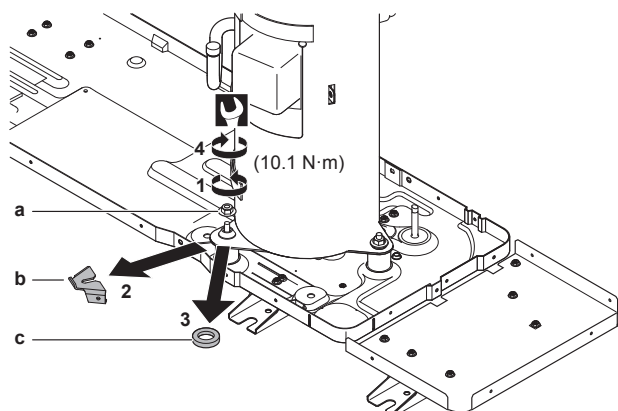
NOTICE

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

The compressor transportation stay must be removed. It is installed under the compressor leg in order to protect the unit during transport. Proceed as shown in the figure and procedure below.

- 1 Remove the nut (a) of the compressor mounting bolt.
- 2 Remove and discard the transportation stay (b).
- 3 Remove and discard the washer (c).
- 4 Re-install the nut (a) of the compressor mounting bolt and tighten to 10.1 N•m of torque.

3 Preparation



3 Preparation

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

The symbols can be interpreted as follows:

- A, C** Right side and left side obstacles (walls/baffle plates)
- B** Suction side obstacle (wall/baffle plate)
- D** Discharge side obstacle (wall/baffle plate)
- E** Top side 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 including the installation structure
- H_B, H_D** Height of obstacles B and D
- H** Height of installation structure below the unit

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

Cooling mode	10~43°C
Heating mode	-28~35°C

Special requirements for R32

The outdoor unit contains an internal refrigerant circuit (R32), but you do NOT have to do any refrigerant field piping, or refrigerant charging.

Mind the following requirements and precautions:



WARNING

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



WARNING

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



WARNING

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

4 Installation

4.1 Opening the units

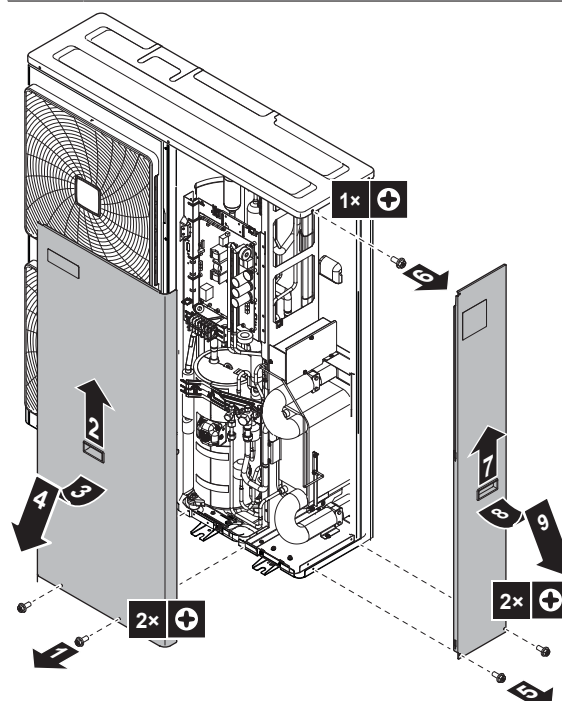
4.1.1 To open the outdoor unit



DANGER: RISK OF ELECTROCUTION



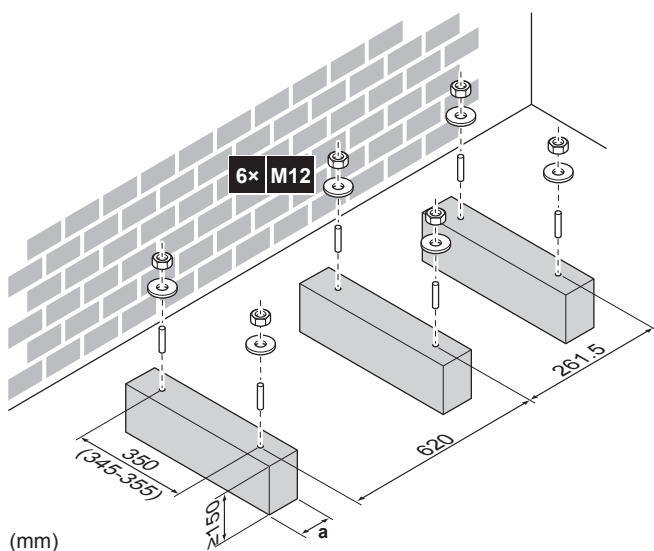
DANGER: RISK OF BURNING



4.2 Mounting the outdoor unit

4.2.1 To provide the installation structure

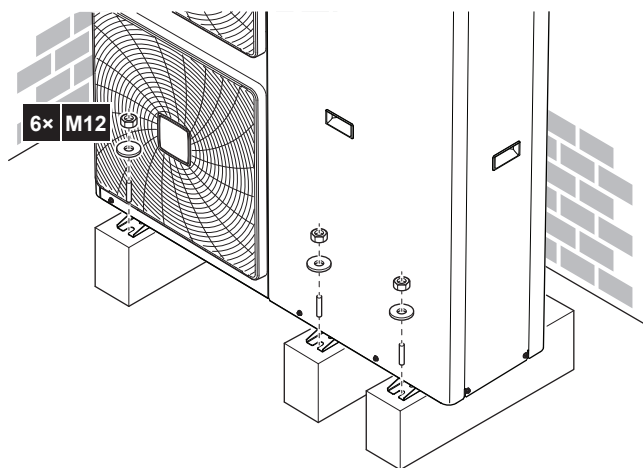
Prepare 6 sets of anchor bolts, nuts and washers (field supply) as follows:



a Make sure not to cover the drain holes.

In any case, make sure the unit is positioned at least 100 mm above the maximum expected level of snow.

4.2.2 To install the outdoor unit



4.2.3 To provide drainage

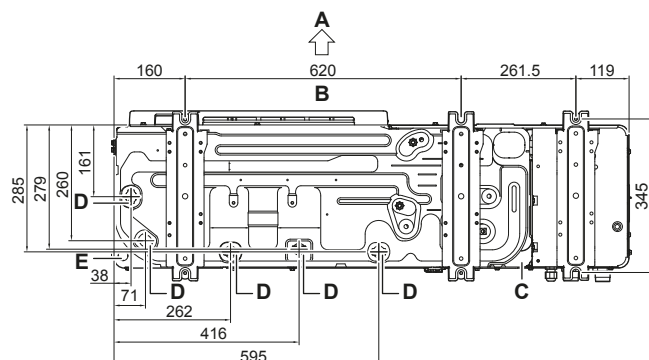
Make sure that condensate can be evacuated properly. When the unit is in cooling mode, condensate may also form in the hydro part. When providing drainage, therefore make sure to cover the entire unit.



NOTICE

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

Drain holes (dimensions in mm)

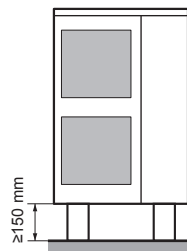


- A Discharge side
- B Distance between anchor points
- C Bottom frame
- D Drain holes
- E Knockout hole for snow



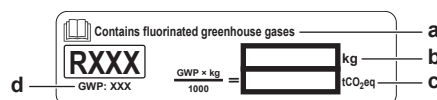
NOTICE

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.



4.2.4 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 Total refrigerant charge
- c **Greenhouse gas emissions** of the total refrigerant charge expressed as tonnes CO₂ equivalent
- d GWP = Global warming potential



NOTICE

In Europe, the **greenhouse gas emissions** of the total refrigerant charge in the system (expressed as tonnes CO₂ equivalent) is used to determine the maintenance intervals. Follow the applicable legislation.

Formula to calculate the greenhouse gas emissions:

GWP value of the refrigerant × Total refrigerant charge [in kg] / 1000

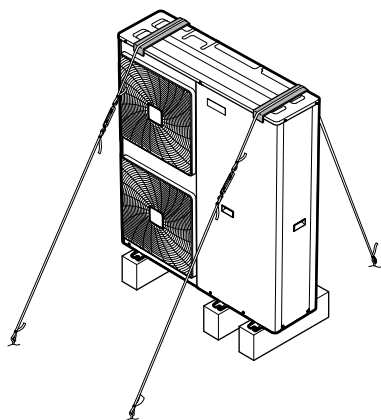
- 2 Fix the label on the inside of the outdoor unit near the gas and liquid stop valves.

4.2.5 To prevent the outdoor unit from falling over

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

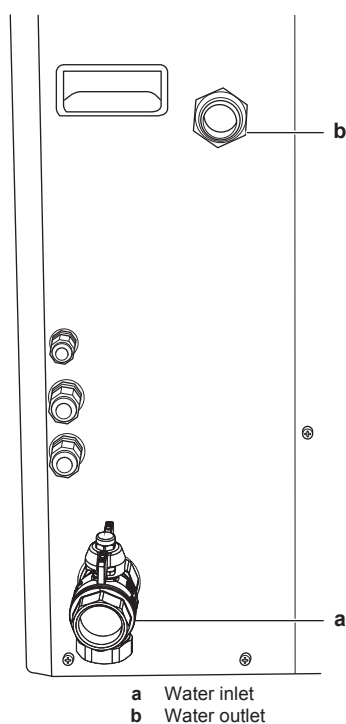
- 1 Prepare 2 cables as indicated in the following illustration (field supply).
- 2 Place the 2 cables over the outdoor unit.
- 3 Insert a rubber sheet between the cables and the outdoor unit to prevent the cables from scratching the paint (field supply).
- 4 Attach the ends of the cables and tighten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

4 Installation



4.3 Connecting the water piping

4.3.1 To connect the water piping



NOTICE

About the shut-off valve with integrated filter (delivered as accessory):

- The installation of the valve at the water inlet is mandatory.
- Mind the flow direction of the valve

- 1 Connect the O-rings and shut-off valve to the outdoor unit water inlet.
- 2 Connect the field piping to the shut-off valve.
- 3 Connect the field piping to the outdoor unit water outlet.



NOTICE

Install air purge valves at all local high points.

4.3.2 To fill the water circuit

For information on filling the water circuit, refer to the installation manual of the indoor unit, or the installer reference guide.

4.3.3 To protect the water circuit against freezing

About freeze protection

Frost can damage the system. To prevent the hydraulic components from freezing, the software is equipped with special frost protection functions such as water pipe freeze prevention and drain prevention (see installer reference guide) that include the activation of pump in case of low temperatures.

However, in case of a power failure, these functions cannot guarantee protection.

Do one of the following to protect the water circuit against freezing:

- Add glycol to the water. Glycol lowers the freezing point of the water.
- Install freeze protection valves. Freeze protection valves drain the water from the system before it can freeze.



NOTICE

If you add glycol to the water, do NOT install freeze protection valves. **Possible consequence:** Glycol leaking out of the freeze protection valves.

Freeze protection by glycol

Adding glycol to the water lowers the freezing point of the water.

The required concentration depends on the lowest expected outdoor temperature, and on whether you want to protect the system from bursting or from freezing. To prevent the system from freezing, more glycol is required. Add glycol according to the table below.



INFORMATION

- Protection against bursting: the glycol will prevent the piping from bursting, but NOT the liquid inside the piping from freezing.
- Protection against freezing: the glycol will prevent the liquid inside the piping from freezing.

Lowest expected outdoor temperature	Prevent from bursting	Prevent from freezing
-5°C	10%	15%
-10°C	15%	25%
-15°C	20%	35%
-20°C	25%	—
-25°C	30%	—



NOTICE

- The required concentration might differ depending on the type of glycol. ALWAYS compare the requirements from the table above with the specifications provided by the glycol manufacturer. If necessary, meet the requirements set by the glycol manufacturer.
- The added concentration of glycol should NEVER exceed 35%.
- If the liquid in the system is frozen, the pump will NOT be able to start. Mind that if you only prevent the system from bursting, the liquid inside might still freeze.
- When water is at standstill inside the system, the system is very likely to freeze and get damaged.

The types of glycol that can be used depend on whether the system contains a domestic hot water tank:

If...	Then...
The system contains a domestic hot water tank	Only use propylene glycol ^(a)

If...	Then...
The system does NOT contain a domestic hot water tank	You can use either propylene glycol ^(a) or ethylene glycol

(a) Propylene glycol, including the necessary inhibitors, classified as Category III according to EN1717.

**WARNING**

Ethylene glycol is toxic.

**NOTICE**

Glycol absorbs water from its environment. Therefore do NOT add glycol that has been exposed to air. Leaving the cap off the glycol container causes the concentration of water to increase. The glycol concentration is then lower than assumed. As a result, the hydraulic components might freeze up after all. Take preventive actions to ensure a minimal exposure of the glycol to air.

**WARNING**

Due to presence of glycol, corrosion of the system is possible. Uninhibited glycol will turn acidic under the influence of oxygen. This process is accelerated by the presence of copper and high temperatures. The acidic uninhibited glycol attacks metal surfaces and forms galvanic corrosion cells that cause severe damage to the system. Therefore it is important that:

- the water treatment is correctly executed by a qualified water specialist,
- a glycol with corrosion inhibitors is selected to counteract acids formed by the oxidation of glycols,
- no automotive glycol is used because their corrosion inhibitors have a limited lifetime and contain silicates which can foul or plug the system,
- galvanized pipes are NOT used in glycol systems since the presence may lead to the precipitation of certain components in the glycol's corrosion inhibitor.

Adding glycol to the water circuit reduces the maximum allowed water volume of the system. For more information, refer to the chapter "To check the water volume and flow rate" in the installer reference guide.

**NOTICE**

If glycol is present in the system, setting [E-0D] must be set to 1. If the glycol setting is NOT set correctly, the liquid inside the piping can freeze.

Freeze protection by freeze protection valves

When no glycol is added to the water, you can use freeze protection valves to drain the water from the system before it can freeze.

- Install freeze protection valves (field supply) at all lowest points of the field piping.
- Normally closed valves (located indoors near the piping entry/exit points) can prevent that all water from indoor piping is drained when the freeze protection valves open.

**NOTICE**

When freeze protection valves are installed, do NOT select a minimum cooling setpoint lower than 8°C (8°C=default). If lower, freeze protection valves can open during cooling operation.

Consult the installer reference guide of the unit for more detailed information.

Heater tape (field supply)

- 1 Install heater tape to the outdoor field piping.

- 2 Provide external power supply for the heater tape.

**NOTICE**

- For the internal heater tape to operate, the power to the unit MUST be ON. For this reason, during cold periods, never disconnect the power, nor turn off the main switch.
- In case of a power failure, power to the heater tape (both internal and external) will be aborted and the water circuit will NOT be protected. To guarantee a full protection, it is always possible to add glycol to the water circuit or to use freeze protection valves, even when installing heater tape to the outdoor field piping.

4.3.4 To insulate the water piping

The piping in the complete water circuit MUST be insulated to prevent condensation during cooling operation and reduction of the heating and cooling capacity.

Outdoor water piping

For piping in free air, it is recommended to use the insulation thickness as shown in below table as a minimum (with $\lambda=0.039$ W/mK).

Piping length (m)	Minimum insulation thickness (mm)
<20	19
20~30	32
30~40	40
40~50	50

For other cases the minimum insulation thickness can be determined using the Hydronic Piping Calculation tool.

The Hydronic Piping Calculation tool also calculates the maximum hydronic piping length from the indoor unit to the outdoor unit based on the emitter pressure drop or the other way around.

The Hydronic Piping Calculation tool is part of the Heating Solutions Navigator which can be reached via <https://professional.standbyme.daikin.eu>.

Please contact your dealer if you have no access to Heating Solutions Navigator.

This recommendation ensures good operation of the unit, however, local regulations may differ and shall be followed.

4.4 Connecting the electrical wiring**DANGER: RISK OF ELECTROCUTION****WARNING**

ALWAYS use multicore cable for power supply cables.

4.4.1 About electrical compliance**Only for EPGA11~16DAV3**

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.).

5 Starting up the outdoor unit

4.4.2 Guidelines when connecting the electrical wiring

Tightening torques

Item	Tightening torque (N·m)
M4 (X1M)	1.2~1.5
M4 (earth)	

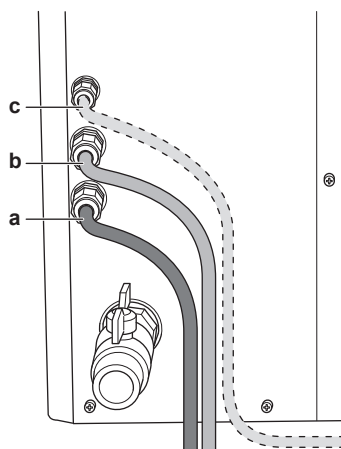
4.4.3 Specifications of standard wiring components

Component		EPGA11~16DAV3
Power supply cable	MCA ^(a)	30.7 A
	Voltage	230 V
	Phase	1~
	Frequency	50 Hz
	Wire sizes	Must comply with applicable legislation
Interconnection cable		Minimum cable section of 1.5 mm ² and applicable for 230 V
Recommended field fuse ^(b)		32 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).
 (b) The minimum allowed field fuse is 20 A.

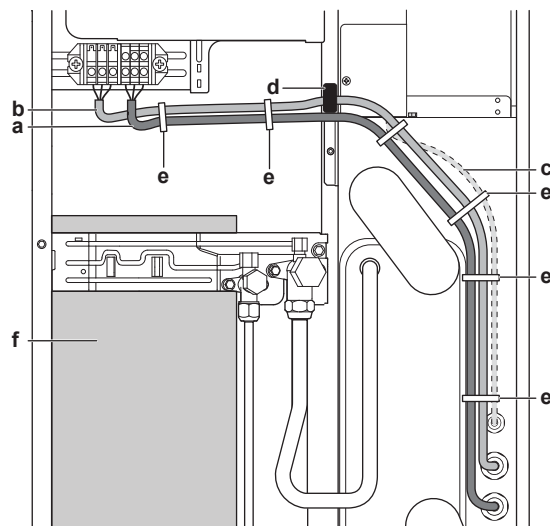
4.4.4 To connect the electrical wiring on the outdoor unit

- 1 Remove the switch box cover. See ["4.1.1 To open the outdoor unit" on page 6](#).
- 2 Insert the wiring at the back of the unit:



- a Power supply cable (high voltage)
 b Communication cable (high voltage)
 c Cable for bottom plate heater (optional)

- 3 Inside the unit, route the wiring as follows:



- a Power supply cable
 b Communication cable
 c Cable for bottom plate heater (optional)
 d Ferrite core
 e Tie strap
 f Compressor



NOTICE

To guarantee electromagnetic compatibility:

- Make sure both power supply and communication cables run parallel to one another. Use tie straps to hold the cables together.
- Make sure the cables are located as far away from the compressor as possible.
- The communication cable **MUST** pass through the ferrite core.

- 4 Make sure that the cable does NOT come in contact with sharp edges or hot gas piping.

- 5 Install the switch box cover.



INFORMATION

When installing field supply or option cables, foresee sufficient cable length. This will make it possible to remove/reposition the switch box and gain access to other components during service.



CAUTION

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

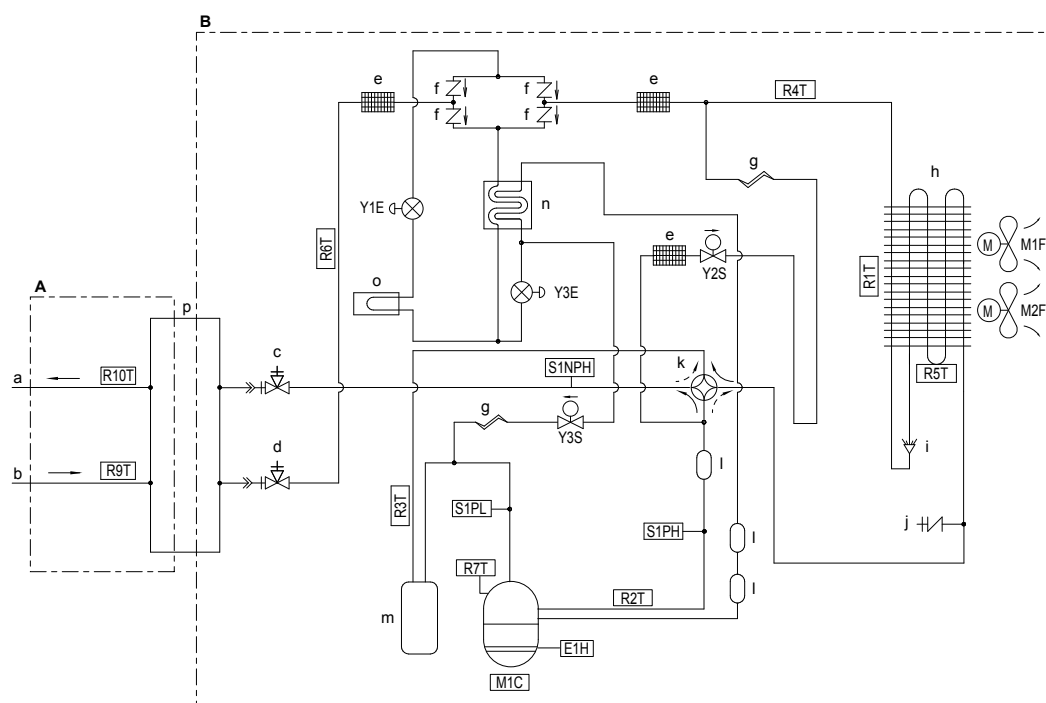
5 Starting up the outdoor unit

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

6 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).

6.1 Piping diagram: Outdoor unit



- a Water OUT
- b Water IN
- c Gas stop valve with service port
- d Liquid stop valve with service port
- e Refrigerant filter
- f One-way valve
- g Capillary tube
- h Heat exchanger
- i Distributor
- j Service port 5/16" flare
- k 4-way valve
- l Muffler
- m Accumulator
- n Economiser heat exchanger
- o Inverter PCB heat sink
- p Plate heat exchanger
- E1H Crankcase heater
- M1C Compressor
- M1F Upper fan motor
- M2F Lower fan motor
- R1T Thermistor (outdoor air)
- R2T Thermistor (compressor discharge)
- R3T Thermistor (compressor suction)
- R4T Thermistor (air heat exchanger liquid pipe)
- R5T Thermistor (air heat exchanger middle)
- R6T Thermistor (refrigerant liquid)
- R7T Thermistor (compressor protection)
- R9T Thermistor (entering water)
- R10T Thermistor (leaving water)
- S1PH High pressure switch
- S1PL Low pressure switch
- S1NPH High pressure sensor
- Y1E Electronic expansion valve (main)
- Y2S Solenoid valve (hot gas bypass)
- Y3E Electronic expansion valve (injection)
- Y3S Solenoid valve (injection bypass)
- A Water side
- B Refrigerant side
- Heating
- ⇌ Cooling

6 Technical data

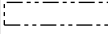
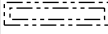
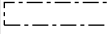
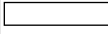
6.2 Wiring diagram: Outdoor unit

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

(1) Connection diagram

English	Translation
Connection diagram	Connection diagram
Only for ***	Only for ***
See note ***	See note ***
Outdoor	Outdoor
Indoor	Indoor
Position of compressor terminal	Position of compressor terminal
Position in switch box	Position in switch box
Front	Front
Right	Right
Back	Back
Upper	Upper
Lower	Lower
Fan	Fan
ON	ON
OFF	OFF

(2) Notes

English	Translation
Notes	Notes
L	Live
N	Neutral
	Connection
	Connector
-----	Earth wiring
-----	Field supply
	Protective earth
	Noiseless earth
	Field wire
	Terminal
	Terminal strip
	Wiring depending on model
	Option
	Switch box
	PCB

NOTES:

- Colours: BLK: black, RED: red, BLU: blue, WHT: white, GRN: green, YLW: yellow, PNK: pink, ORG: orange.
- This wiring diagram applies only to the outdoor unit.
- When operating, do not short-circuit protective devices S1PH and S1PL.
- Refer to the combination table and the option manual for how to connect the wiring to X6A, X4A and X41A.
- Refer to the service manual for instructions on how to set the selector switches (DS1). The factory setting of all switches is OFF.

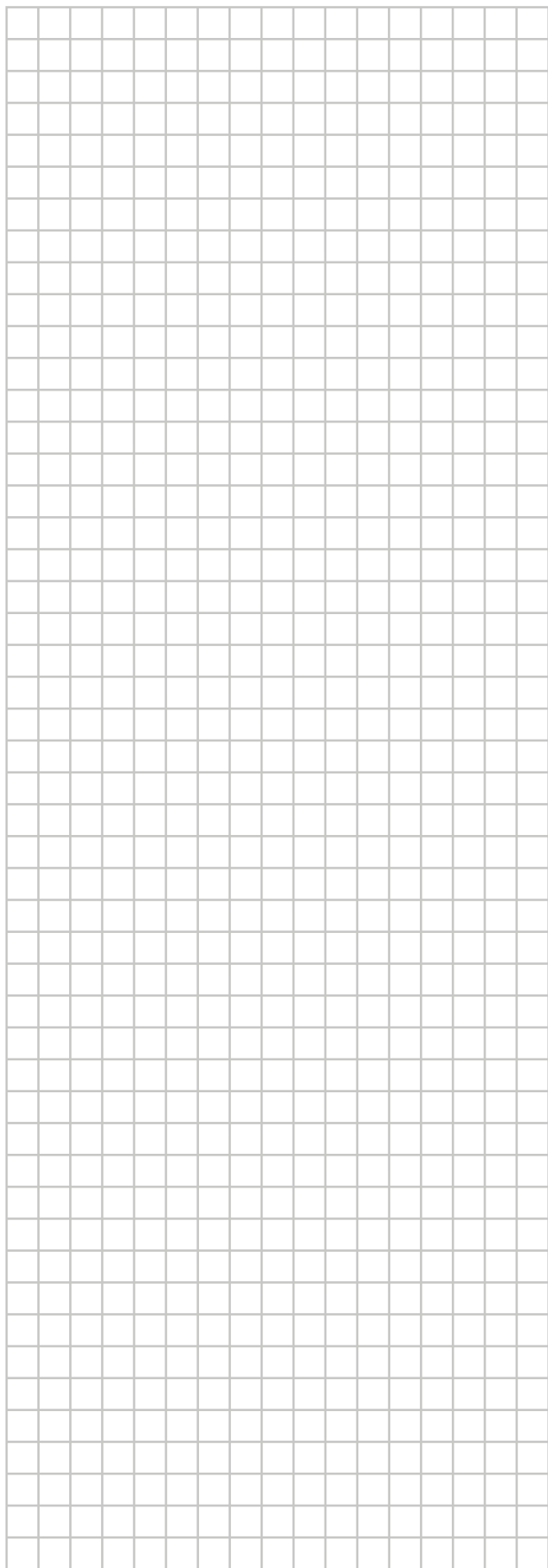
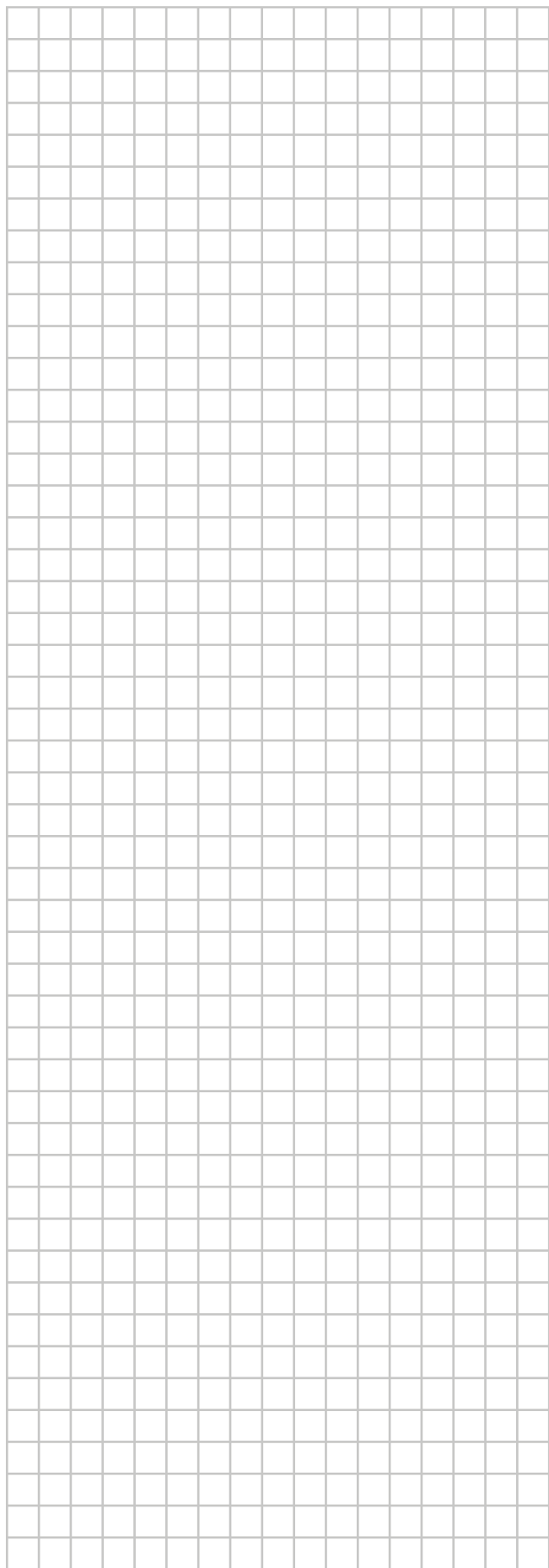
(3) Legend

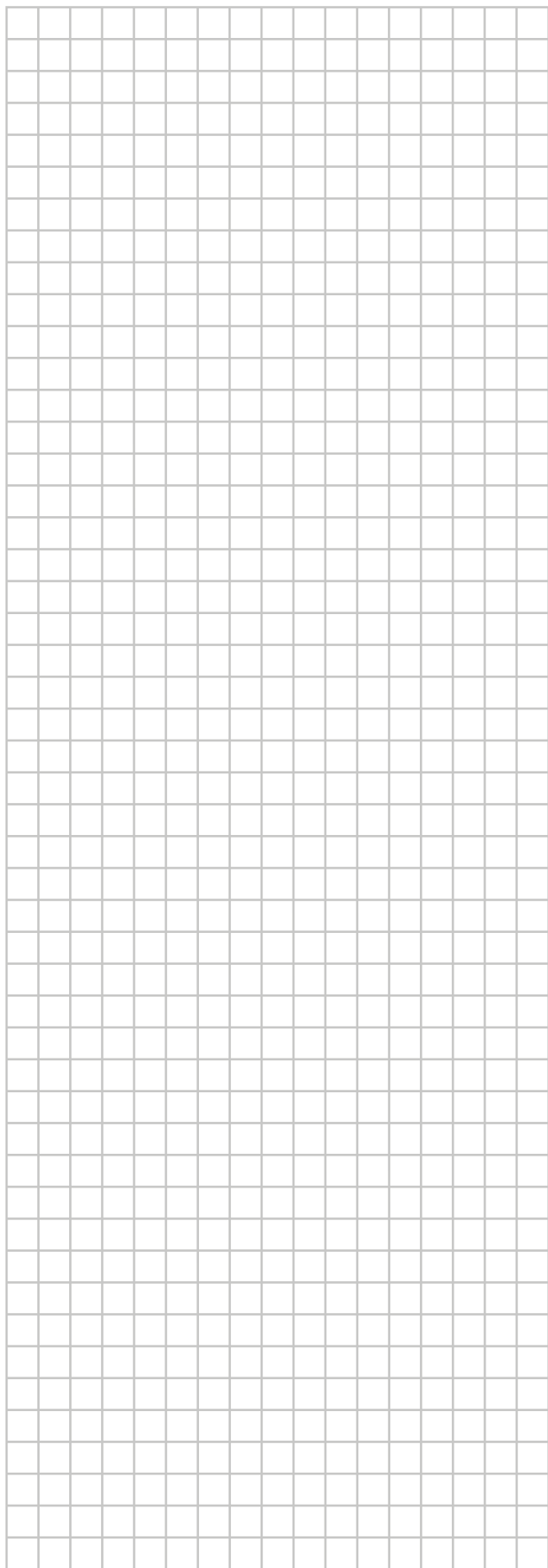
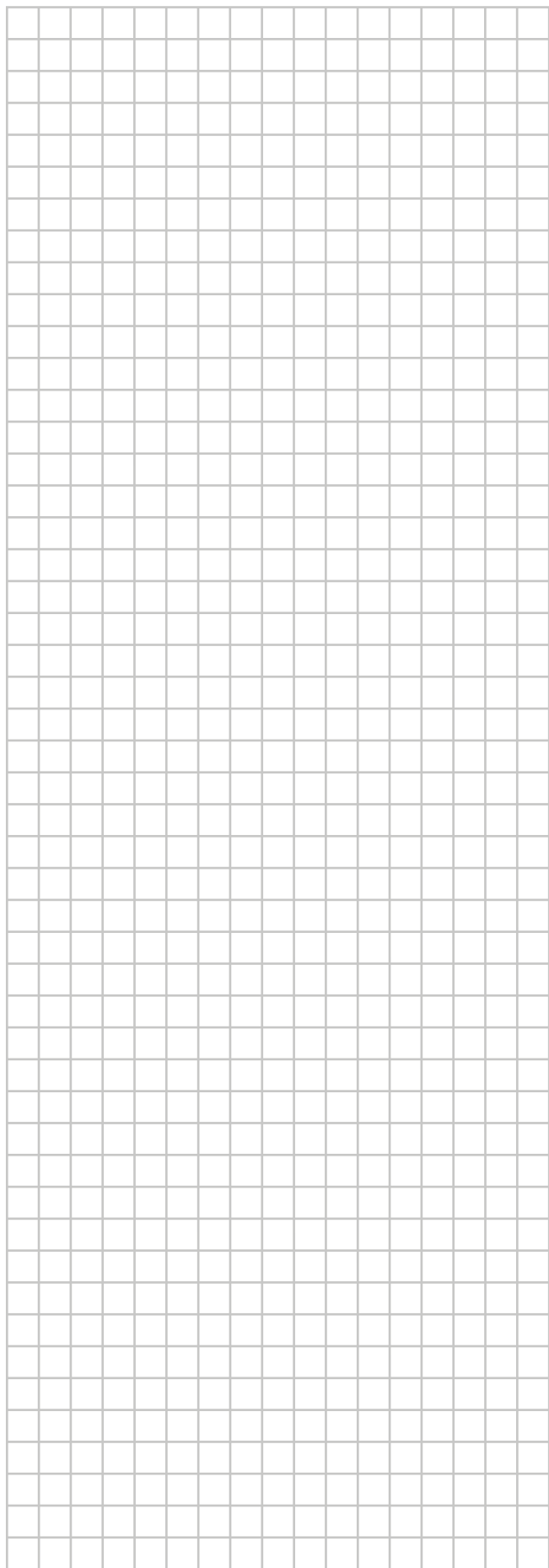
English	Translation
Legend	Legend
Field supply	Field supply

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

A1P	Printed circuit board (main)
A2P	Printed circuit board (noise filter)
A3P	Printed circuit board (leakage current)
A4P	Printed circuit board (ACS)
BS1~BS4 (A1P)	Push button switch
C1~C4 (A1PA2P)	Capacitor
DS1 (A1P)	Dipswitch
E1H	Crankcase heater
E2H	Bottom plate heater (option)
E3H~E5H	Plate heat exchanger heaters
F1U~F4U (A2P)	Fuse (T 5.0 A / 250 V)
F6U (A1P)	Light-emitting diode (service monitor is orange)
HAP (A1P)	Light-emitting diode (service monitor is green)
K1R (A1P)	Magnetic relay (Y1S)
K1R (A4P)	Magnetic relay (E3H~E5H)
K2R (A1P)	Magnetic relay (Y2S)
K2R (A4P)	Magnetic relay (E2H)
K3R (A1P)	Magnetic relay (Y3S)
K4R (A1P)	Magnetic relay (E1H)
K10R (A1P)	Magnetic relay
K13R~K15R (A1P, A2P)	Magnetic relay
K11M (A1P)	Magnetic contactor
L1R~L3R (A1P)	Reactor
M1C	Compressor motor
M1F~M2F	Fan motor
PFC (A1P) (V1 only)	Power factor correction
PS (A1P)	Switching power supply
Q1DI	Earth leakage circuit breaker (30 mA) (field supply)
R1~R5 (A1P, A2P)	Resistor
R1T	Thermistor (outdoor air)
R2T	Thermistor (compressor discharge)
R3T	Thermistor (compressor suction)
R4T	Thermistor (air heat exchanger liquid pipe)
R5T	Thermistor (air heat exchanger middle)
R6T	Thermistor (refrigerant liquid)
R7T	Thermistor (compressor protection)
R9T	Thermistor (entering water)
R10T	Thermistor (leaving water)
R11T	Thermistor (fin)
RC (A2P)	Signal receiver circuit
S1NPH	High pressure sensor
S1PH	High pressure switch
S1PL	Low pressure switch
T1A	Current sensor

TC (A2P)	Signal transmission circuit
V1D~V4D (A1P)	Diode
V1R (A1P)	IGBT power module
V2R (A1P)	Diode module
V1T~V3T (A1P)	Insulated Gate Bipolar Transistor (IGBT)
X1M	Terminal strip
Y1E	Electronic expansion valve (main)
Y3E	Electronic expansion valve (injection)
Y1S	Solenoid valve (4-way valve)
Y2S	Solenoid valve (hot gas bypass)
Y3S	Solenoid valve (injection bypass)
Z1C~Z11C	Noise filter (ferrite core)
Z1F~Z6F (A1P, A2P)	Noise filter





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