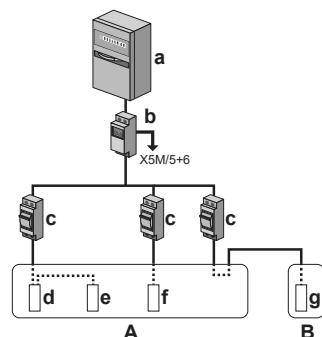


Examples in case of normal kWh rate power supply

1 power meter is sufficient.

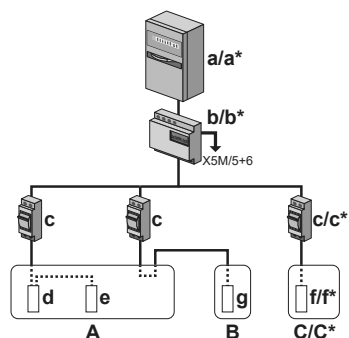
Outdoor unit (1N~) with integrated backup heater (1N~)

=> **b**: Single-phase power meter



Outdoor unit (1N~) + external backup heater kit (1N~ or 3N~)

=> **b/b***: Single- or three-phase power meter (depending on external backup heater kit)



* 3N~

A Outdoor unit

B DHW tank

C External backup heater kit

a Electrical cabinet: **Normal kWh rate power supply**

b Power meter

c Overcurrent fuse

d Compressor module

e Hydro module

f Backup heater

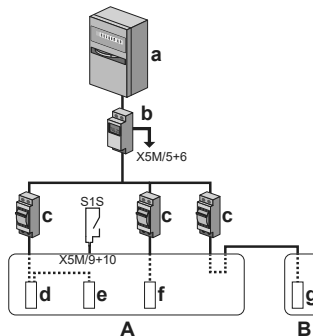
g Booster heater

Examples in case of preferential kWh rate power supply WITHOUT separate normal kWh rate power supply

1 power meter is sufficient.

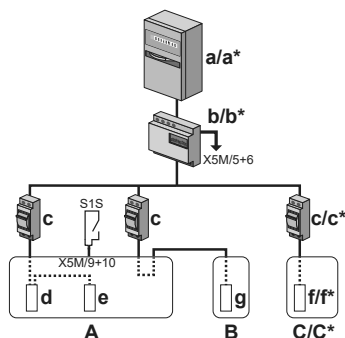
Outdoor unit (1N~) with integrated backup heater (1N~)

=> **b**: Single-phase power meter



Outdoor unit (1N~) + external backup heater kit (1N~ or 3N~)

=> **b/b***: Single- or three-phase power meter (depending on external backup heater kit)



- * 3N~
- A** Outdoor unit
- B** DHW tank
- C** External backup heater kit
- a** Electrical cabinet: **Preferential kWh rate power supply**
- b** Power meter
- c** Overcurrent fuse
- d** Compressor module
- e** Hydro module
- f** Backup heater
- g** Booster heater
- S1S** Preferential kWh rate power supply contact

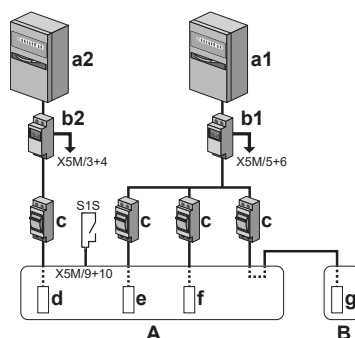
Examples in case of preferential kWh rate power supply WITH separate normal kWh rate power supply

2 power meters needed.

Outdoor unit (1N~) with integrated backup heater (1N~)

=> **b1**: Single-phase power meter

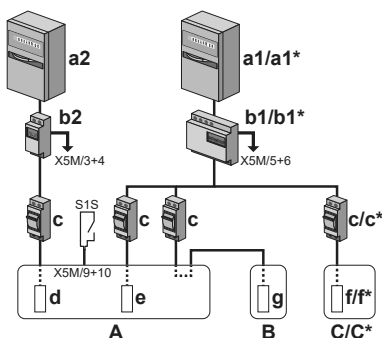
=> **b2**: Single-phase power meter



Outdoor unit (1N~) + external backup heater kit (1N~ or 3N~)

=> **b1/b1***: Single- or three-phase power meter (depending on external backup heater kit)

=> **b2**: Single-phase power meter



* 3N~

A Outdoor unit

B DHW tank

C External backup heater kit

a1 Electrical cabinet: **Normal kWh rate power supply**

a2 Electrical cabinet: **Preferential kWh rate power supply**

b1 Power meter 1

b2 Power meter 2

c Overcurrent fuse

d Compressor module

e Hydro module

f Backup heater

g Booster heater

S1S Preferential kWh rate power supply contact

6.6 Setting up the power consumption control

You can use the following power consumption controls. For more information about the corresponding settings, see "Power consumption control" [► 206].

#	Power consumption control
1	"6.6.1 Permanent power limitation" [► 54] - Allows you to limit the power consumption of the entire heat pump system (sum of outdoor unit and backup heater (if applicable)) with one permanent setting. - Limitation of power in kW or current in A.
2	"6.6.2 Power limitation activated by digital inputs" [► 55] - Allows you to limit the power consumption of the entire heat pump system (sum of outdoor unit and backup heater (if applicable)) via 4 digital inputs. - Limitation of power in kW or current in A.
3	"6.6.4 BBR16 power limitation" [► 57] Restriction: Only available in Swedish language. - Allows you to comply with BBR16 regulations (Swedish energy regulations). - Limitation of power in kW. - Can be combined with the other kW power consumption controls. If you do so, the unit uses the most restrictive control.



NOTICE

It is possible to install a field fuse with lower than recommended rating over the heat pump. For this you must modify field setting [2-0E] according to the maximum allowed current over the heat pump.

Note that field setting [2-0E] overrules all power consumption control settings. Power limiting the heat pump will reduce performance.



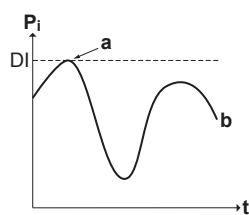
NOTICE

Set a minimum power consumption of ± 3.6 kW to guarantee:

- Defrost operation. Otherwise, if defrosting is interrupted several times, the heat exchanger will freeze up.
- Space heating and DHW production by allowing at least one electrical heater (backup heater step 1 or booster heater).

6.6.1 Permanent power limitation

Permanent power limitation is useful to assure a maximum power or current input of the system. In some countries, legislation limits the maximum power consumption for space heating and DHW production.



- P_i Power input
- t Time
- DI Digital input (power limitation level)
- a** Power limitation active
- b** Actual power input

Setup and configuration

- No additional equipment needed.
- Set the power consumption control settings in [9.9] via the user interface (see "Power consumption control" [► 206]):
 - Select continuous limitation mode
 - Select the type of limitation (power in kW or current in A)
 - Set the desired power limitation level

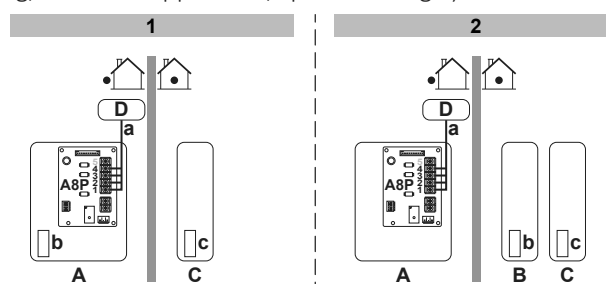
6.6.2 Power limitation activated by digital inputs

Power limitation is also useful in combination with an energy management system.

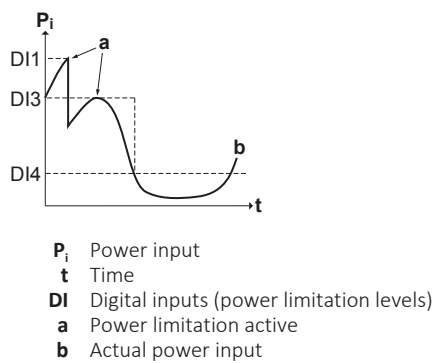
The power or current of the entire Daikin system is limited dynamically by digital inputs (maximum four steps). Each power limitation level is set via the user interface by limiting one of the following:

- Current (in A)
- Power input (in kW)

The energy management system (field supply) decides the activation of a certain power limitation level. **Example:** To limit the maximum power of the entire house (lighting, domestic appliances, space heating...).



- 1** Models with integrated backup heater
- 2** With external backup heater kit
- A** Outdoor unit
- B** External backup heater kit
- C** DHW tank
- D** Energy management system
- a** Power limitation activation (4 digital inputs)
- b** Backup heater
- c** Booster heater



Setup

- Demand PCB (option EKR1AHTA) needed.
- Maximum four digital inputs are used to activate the corresponding power limitation level:
 - DI1 = strongest limitation (lowest energy consumption)
 - DI4 = weakest limitation (highest energy consumption)
- Specification of the digital inputs:
 - DI1: S9S (limit 1)
 - DI2: S8S (limit 2)
 - DI3: S7S (limit 3)
 - DI4: S6S (limit 4)
- Refer to the wiring diagram for more information.

Configuration

- Set the power consumption control settings in [9.9] via the user interface (for the description of all settings, see "Power consumption control" [► 206]):
 - Select limitation by digital inputs.
 - Select the type of limitation (power in kW or current in A).
 - Set the desired power limitation level corresponding to each digital input.



INFORMATION

In case more than 1 digital input is closed (at the same time), the digital input priority is fixed: DI4 priority>...>DI1.

6.6.3 Power limitation process

The outdoor unit has better efficiency than the electrical heaters. Therefore, the electrical heaters are limited and turned OFF first. The system limits power consumption in the following order:

- 1 Limits certain electrical heaters.

If... has priority	Then set the priority heater via the user interface to...
Domestic hot water production	Booster heater (if applicable) Result: The backup heater will be turned OFF first.

If... has priority	Then set the priority heater via the user interface to...
Space heating	Backup heater Result: The booster heater (if applicable) will be turned OFF first.

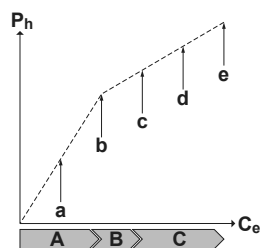
- 2 Turns OFF all electrical heaters.
- 3 Limits the outdoor unit.
- 4 Turns OFF the outdoor unit.

Example

If the configuration is as follows:

- Power limitation level does NOT allow operation of both booster heater and backup heater (step 1 and step 2).
- Priority heater = **Booster heater** (if applicable).

Then power consumption is limited as follows:



- P_h Produced heat
- C_e Consumed energy
- A** Outdoor unit
- B** Booster heater
- C** Backup heater
- a** Limited outdoor unit operation
- b** Full outdoor unit operation
- c** Booster heater turned ON
- d** Backup heater step 1 turned ON
- e** Backup heater step 2 turned ON

6.6.4 BBR16 power limitation



INFORMATION

Restriction: BBR16 settings are only visible when the language of the user interface is set to Swedish.



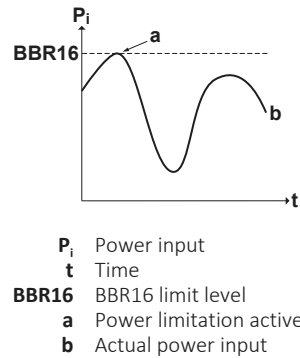
NOTICE

2 weeks to change. After you activated BBR16, you only have 2 weeks to change its settings (**BBR16 activation** and **BBR16 power limit**). After 2 weeks, the unit freezes these settings.

Note: This is different from the permanent power limitation, which is always changeable.

Use the BBR16 power limitation when you must comply with BBR16 regulations (Swedish energy regulations).

You can combine the BBR16 power limitation with the other kW power consumption controls. If you do so, the unit uses the most restrictive control.



Setup and configuration

- No additional equipment needed.
- Set the power consumption control settings in [9.9] via the user interface (see "Power consumption control" [► 206]):
 - Activate BBR16
 - Set the desired power limitation level

6.7 Setting up an external temperature sensor

You can connect one external temperature sensor. It measures the indoor or outdoor ambient temperature. We recommend to use an external temperature sensor in the following cases:

Indoor ambient temperature

- In room thermostat control, the dedicated Human Comfort Interface (BRC1HHDA used as room thermostat) measures the indoor ambient temperature. Therefore, the Human Comfort Interface must be installed on a location:
 - Where the average temperature in the room can be detected
 - That is NOT exposed to direct sunlight
 - That is NOT near a heat source
 - That is NOT affected by outside air or air draught because of, for example, door opening/closing
- If this is NOT possible, we recommend to connect a remote indoor sensor (option KRCS01-1).
- Setup: For installation instructions, see the installation manual of the remote indoor sensor, and the addendum book for optional equipment.
- Configuration: Select room sensor [9.B].

Outdoor ambient temperature

- In the outdoor unit, the outdoor ambient temperature is measured. Therefore, the outdoor unit must be installed on a location:
 - At the north side of the house or at the side of the house where the most heat emitters are located
 - That is NOT exposed to direct sunlight
- If this is NOT possible, we recommend to connect a remote outdoor sensor (option EKRSCA1).

- Setup: For installation instructions, see the installation manual of the remote outdoor sensor, and the addendum book for optional equipment.
- Configuration: Select outdoor sensor [9.B].
- When the power saving functionality of the outdoor unit is active (see "Power saving function" [► 214]), the outdoor unit is turned down to reduce standby energy losses. As a result, the outdoor ambient temperature is NOT read out.
- If the desired leaving water temperature is weather dependent, the full time outdoor temperature measurement is important. This is another reason to install the optional outdoor ambient temperature sensor.

**INFORMATION**

The external outdoor ambient sensor data (either averaged or instantaneous) is used in the weather-dependent control curves and in the automatic heating/cooling changeover logic. To protect the outdoor unit, the internal sensor of the outdoor unit is always used.

7 Unit installation

In this chapter

7.1	Preparing the installation site	60
7.1.1	Installation site requirements of the outdoor unit	60
7.1.2	Additional installation site requirements of the outdoor unit in cold climates	63
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7.1 Preparing the installation site

Choose an installation location with sufficient space to transport the unit in and out of the 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.



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).

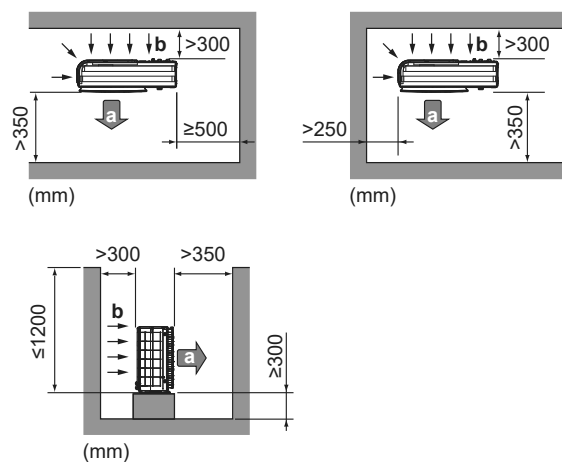
7.1.1 Installation site requirements of the outdoor unit



INFORMATION

Also read the precautions and requirements in the "2 General safety precautions" [► 9].

Mind the following spacing guidelines:



- a** Air outlet
b Air inlet

**NOTICE**

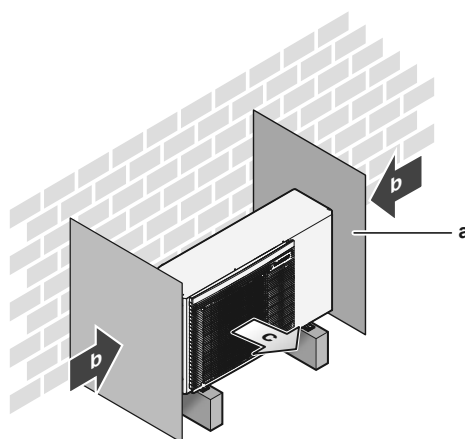
- Do NOT stack the units on each other.
- Do NOT hang the unit on a ceiling.

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

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.

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

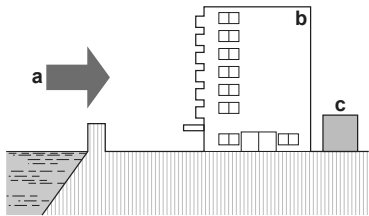
It is NOT recommended to install the unit in the following places because it may shorten the life of the unit:

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

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

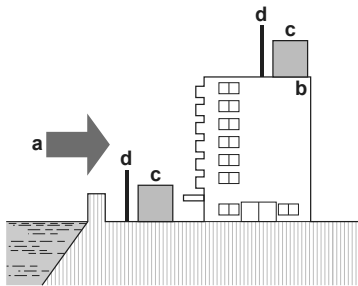
Install the outdoor unit away from direct sea winds.

Example: Behind the building.



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

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



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

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

Cooling mode	10~43°C
Heating mode	-25~25°C
DHW production	-25~35°C

Mind the measurement guidelines:

Maximum height difference between domestic hot water tank and outdoor unit		5 m
Maximum distance between outdoor unit and...		
	domestic hot water tank	10 m (25 m ^{(a), (b)})
	3-way valve	10 m (25 m ^{(a), (b)})
	external backup heater kit	10 m

^(a) If tank thermistor EKTESE1 and EKTESE2 is used.

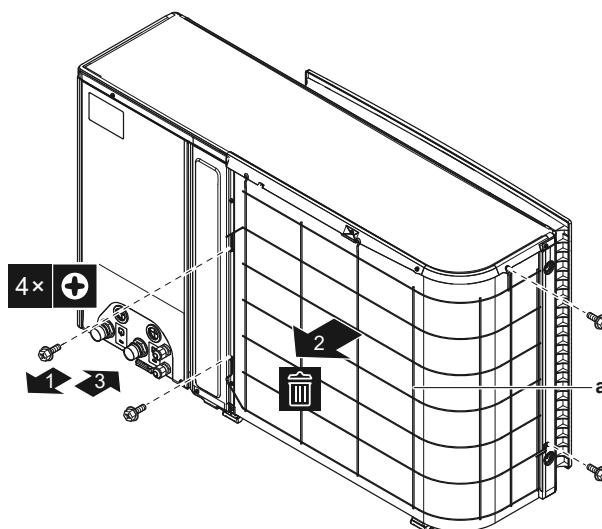
^(b) Precise water piping length can be determined using the Hydronic Piping Calculation tool. The Hydronic Piping Calculation tool is part of the Heating Solutions Navigator which can be reached via <https://professional.standbyme.daikin.eu>. Please contact your dealer if you have no access to Heating Solutions Navigator.

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

In areas with low ambient temperatures and high humidity, or in areas with heavy snowfall, remove the suction grille to ensure proper operation.

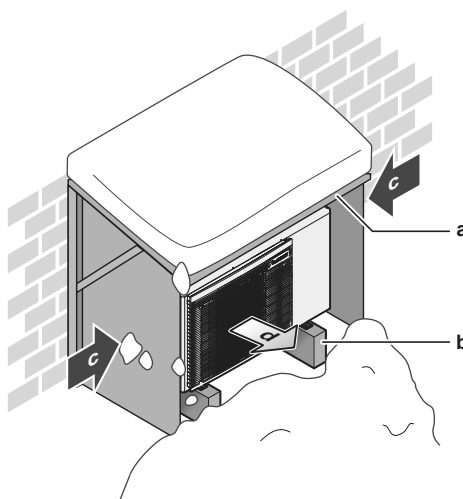
Non-exhaustive list of areas: Austria, Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Latvia, Lithuania, Norway, Poland, Romania, Serbia, Slovakia, Sweden, ...

- 1 Remove the screws holding the suction grille.
- 2 Remove the suction grille, and dispose of it.
- 3 Reattach the screws to the unit.



a Suction grille

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

In any case, provide at least 300 mm of free space below the unit. Additionally, make sure the unit is positioned at least 100 mm above the maximum expected level of snow. See "7.2 Mounting the outdoor unit" [► 64] 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.

7.2 Mounting the outdoor unit

7.2.1 About mounting the outdoor unit

When

You have to mount the outdoor unit before you can connect the water piping.

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 "7.1 Preparing the installation site" [► 60].

7.2.2 Precautions when mounting the outdoor unit



INFORMATION

Also read the precautions and requirements in the following chapters:

- "2 General safety precautions" [► 9]
- "7.1 Preparing the installation site" [► 60]

7.2.3 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.

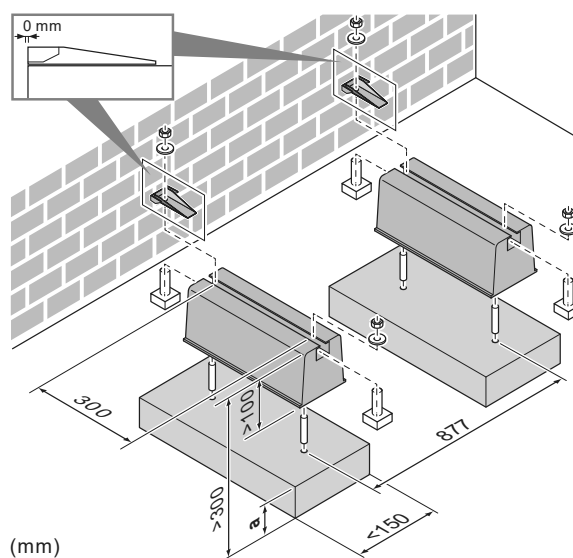
Fix the unit securely by means of foundation bolts in accordance with the foundation drawing.

This topic shows different installation structures. For all, use 4 sets of M8 or M10 anchor bolts, nuts and washers. In any case, provide at least 300 mm of free space below the unit. Additionally, make sure the unit is positioned at least 100 mm above the maximum expected level of snow.

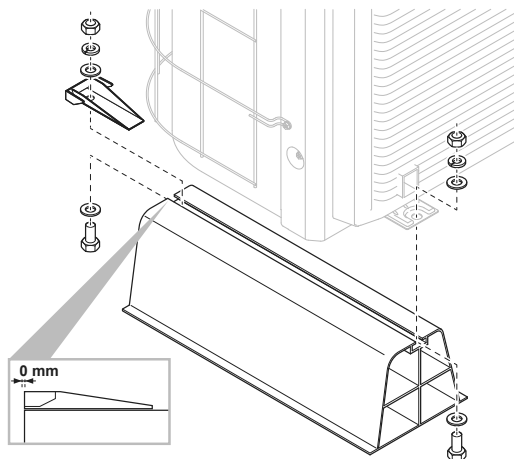


INFORMATION

The maximum height of the upper protruding part of the bolts is 15 mm.

Option 1: On mounting feet "flexi-foot with strut"**Option 2: On plastic mounting feet**

In this case, you can use the bolts, nuts, washers and spring washers delivered with the unit as accessories.

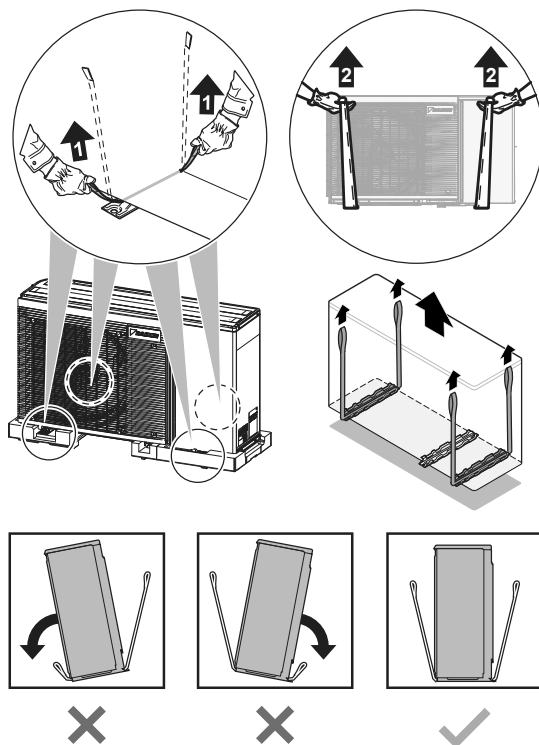
**7.2.4 To install the outdoor unit****CAUTION**

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

**CAUTION**

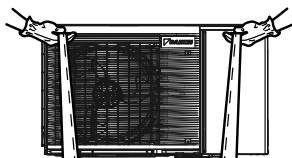
Do NOT remove the protective cardboard before the unit is installed properly.

- 1** Carry the unit using the slings attached to the unit. Pull up both sides of the sling at the same time to prevent disconnection of the sling from the unit.



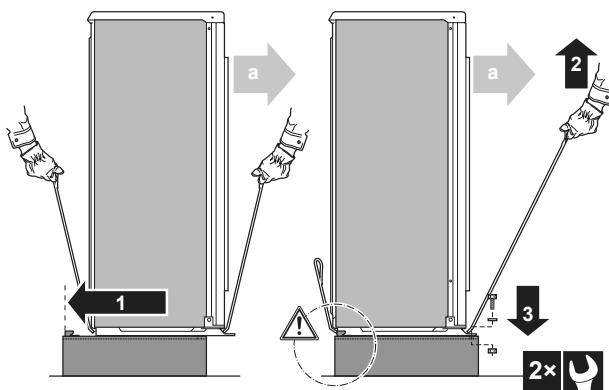
2 While handling the unit:

- Keep both sides of the sling level.
- Keep your back straight.



3 Install the outdoor unit as follows:

- (1) Put the unit into position.
- (2) Remove the slings (by pulling 1 side of the sling).
- (3) Fix the unit.

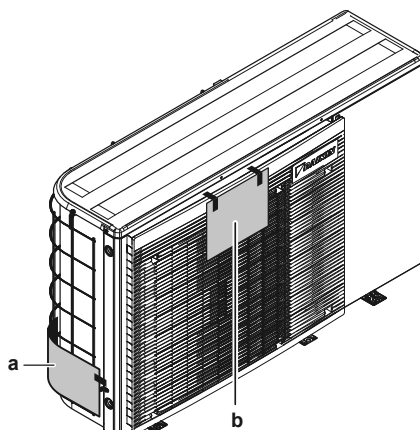


a Air outlet

**NOTICE**

Properly align the unit. Make sure the backside of the unit does NOT protrude.

- 4 Remove the protective cardboard and instruction sheet.



a Protective cardboard
b Instruction sheet

7.2.5 To provide drainage

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

**INFORMATION**

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

**NOTICE**

If the drain holes of the outdoor unit are blocked up, provide space of at least 300 mm below the outdoor unit.

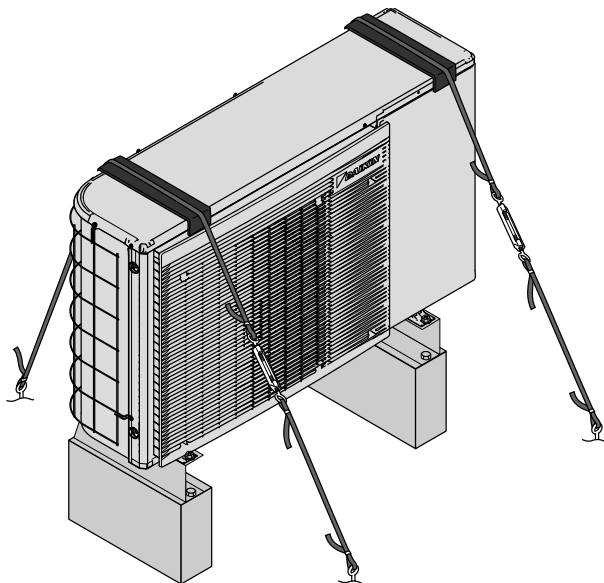
**NOTICE**

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

7.2.6 To prevent the outdoor unit from falling over

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

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



7.3 Opening and closing the unit

7.3.1 About opening the units

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

- 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.

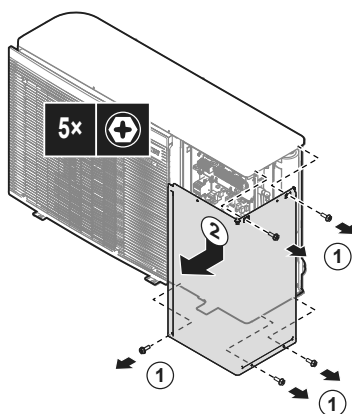
7.3.2 To open the outdoor unit



DANGER: RISK OF ELECTROCUTION



DANGER: RISK OF BURNING/SCALDING

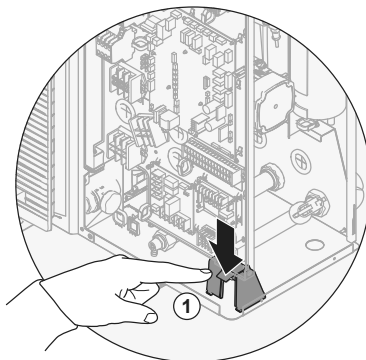


7.3.3 To rotate the switch box

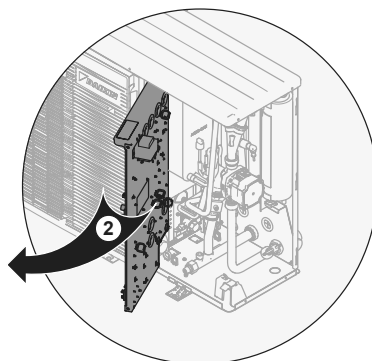
During the installation, you will need access to the inside of the outdoor unit. To have easier front access, rotate the switch box out of the unit as follows:

Prerequisite: The front plate has been removed.

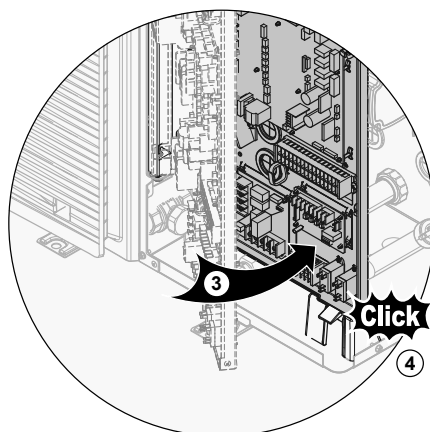
- 1 Push down the clip of the switch box holder.



- 2 Rotate the switch box out of the unit.



- 3 Rotate the switch box back until it engages properly in the switch box holder.

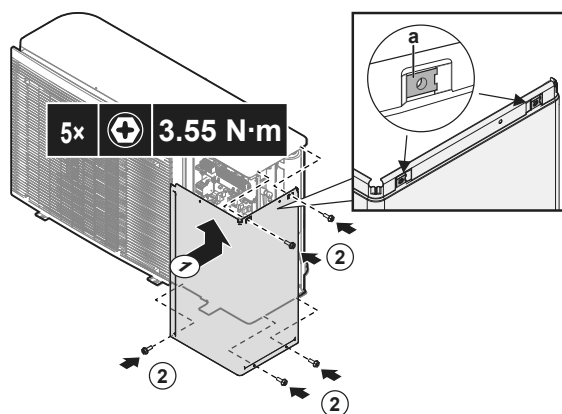


7.3.4 To close the outdoor unit



NOTICE

Speed nut. Make sure the speed nut for the top screw is correctly attached to the service cover.



a Speed nut

8 Piping installation

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8.1 Preparing water piping

8.1.1 Water circuit requirements



INFORMATION

Also read the precautions and requirements in the "2 General safety precautions" [p. 9].



NOTICE

In case of plastic pipes, make sure they are fully oxygen diffusion tight according to DIN 4726. The diffusion of oxygen into the piping can lead to excessive corrosion.

- **Connecting piping – Legislation.** Make all piping connections in accordance with the applicable legislation and the instructions in the "Installation" chapter, respecting the water inlet and outlet.
- **Connecting piping – Force.** Do NOT use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit.
- **Connecting piping – Tools.** Only use appropriate tooling to handle brass, which is a soft material. If NOT, pipes will get damaged.
- **Connecting piping – Air, moisture, dust.** If air, moisture or dust gets into the circuit, problems may occur. To prevent this:
 - ONLY use clean pipes.
 - Hold the pipe end downwards when removing burrs.
 - Cover the pipe end when inserting it through a wall, to prevent dust and/or particles from entering the pipe.
 - Use a decent thread sealant to seal connections.
 - When using non-brass metallic piping, make sure to insulate both materials from each other to prevent galvanic corrosion.
 - Because brass is a soft material, use appropriate tooling for connecting the water circuit. Inappropriate tooling will cause damage to the pipes.
- **Freeze.** Protect against freezing.

- **Closed circuit.** Use the outdoor unit ONLY in a closed water system. Using the system in an open water system will lead to excessive corrosion.
- **Piping length.** It is recommended to avoid long runs of piping between the domestic hot water tank and the hot water end point (shower, bath,...) and to avoid dead ends.
- **Piping diameter.** Select the water piping diameter in relation to the required water flow and the available external static pressure of the pump.

For the external static pressure curves of the outdoor unit, see the 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).

- **Water flow.** You can find the minimum required water flow for unit operation in the following table. In all cases, this flow needs to be guaranteed. When the flow is lower, the unit will stop operation and display error 7H.

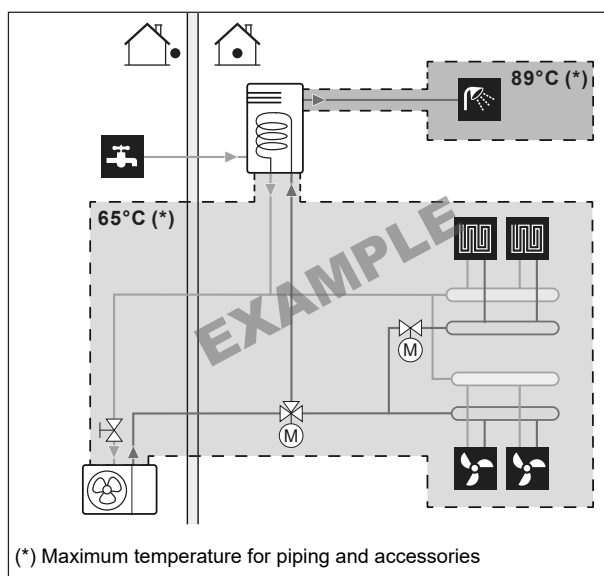
If operation is...	Then the minimum required flow rate is...
Cooling	10 l/min
Heating	6 l/min
BUH operation	12 l/min
Heating defrost	12 l/min
DHW	25 l/min

- **Field supply components – Water and glycol.** Only use materials that are compatible with the water (and, if applicable, glycol) used in the system, and with the materials used in the outdoor unit.
- **Field supply components – Water pressure and temperature.** Check that all components in the field piping can withstand the water pressure and water temperature.
- **Water pressure.** The maximum water pressure is 4 bar. Provide adequate safeguards in the water circuit to ensure that the maximum pressure is NOT exceeded.
- **Water temperature.** All installed piping and piping accessories (valve, connections,...) MUST withstand the following temperatures:



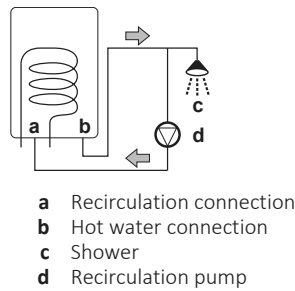
INFORMATION

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



- **Drainage – Low points.** Provide drain taps at all low points of the system in order to allow complete drainage of the water circuit.
- **Air vents.** Provide air vents at all high points of the system, which must also be easily accessible for servicing.
The outdoor unit has an automatic air purge valve.
The external backup heater kit (option) has an automatic air purge valve.
Check that the automatic air purge valves are NOT tightened too much, so that the automatic release of air from the water circuit is possible.
- **Zn-coated parts.** NEVER use zinc coated parts in the water circuit. Because the internal water circuit of the unit uses copper piping, excessive corrosion may occur.
- **Non-brass metallic piping.** When using non-brass metallic piping, insulate the brass and non-brass properly so that they do NOT make contact with each other. This to prevent galvanic corrosion.
- **Valve – Separating circuits.** When using a 3-way valve in the water circuit make sure that the domestic hot water circuit and the floor heating circuit are fully separated.
- **Valve – Change-over time.** When using a 2-way valve or a 3-way valve in the water circuit, the maximum change-over time of the valve must be 60 seconds.
- **Filter.** It is strongly recommended to install an additional filter on the heating water circuit. Especially to remove metallic particles from foul heating piping, it is recommended to use a magnetic or cyclone filter, which can remove small particles. Small particles may damage the unit and will NOT be removed by the standard filter of the heat pump system.
- **Domestic hot water tank – Capacity.** To avoid stagnation of water, it is important that the storage capacity of the domestic hot water tank meets the daily consumption of domestic hot water.
- **Domestic hot water tank – After installation.** Immediately after installation, the domestic hot water tank must be flushed with fresh water. This procedure must be repeated at least once a day the first 5 consecutive days after installation.
- **Domestic hot water tank – Standstills.** In cases where during longer periods of time there is no consumption of hot water, the equipment MUST be flushed with fresh water before usage.

- **Domestic hot water tank – Disinfection.** For the disinfection function of the domestic hot water tank, see "11.6.6 Tank" [► 178] and "6.4.5 DHW pump for disinfection" [► 46].
- **Hygienic measures.** The installation must be in compliance with the applicable legislation and may require additional hygienic installation measures.
- **Recirculation pump.** In accordance with the applicable legislation, it may be required to connect a recirculation pump in between the hot water end point and the recirculation connection of the domestic hot water tank.



8.1.2 Formula to calculate the expansion vessel pre-pressure

The pre-pressure (P_g) of the vessel depends on the installation height difference (H):

$$P_g = 0.3 + (H/10) \text{ (bar)}$$

8.1.3 To check the water volume and flow rate

The outdoor unit has an expansion vessel of 7 litre with a factory-set pre-pressure of 1 bar.

To make sure that the unit operates properly:

- You **MUST** check the minimum and maximum water volume.
- You might need to adjust the pre-pressure of the expansion vessel.

Minimum water volume

Check that the total water volume in the installation is higher than the minimum water volume, the internal water volume of the outdoor unit NOT included:

If...	Then the minimum water volume is...
Cooling operation	10 l
Heating/defrost operation and...	

If...		Then the minimum water volume is...
Preheating on the tank is possible. This is possible in the following cases:		0 l
▪ EKHWP* tank + booster heater		
▪ EKHWS*D* tank + booster heater + DHW pump		
Preheating on the tank is not possible, but a backup heater (internal or external) is present.		10 l
Preheating on the tank is not possible, there is no backup heater, and...		
The return flow temperature is $>15^{\circ}\text{C}$		20 l
The return flow temperature is $\leq 15^{\circ}\text{C}$		50 l

**INFORMATION**

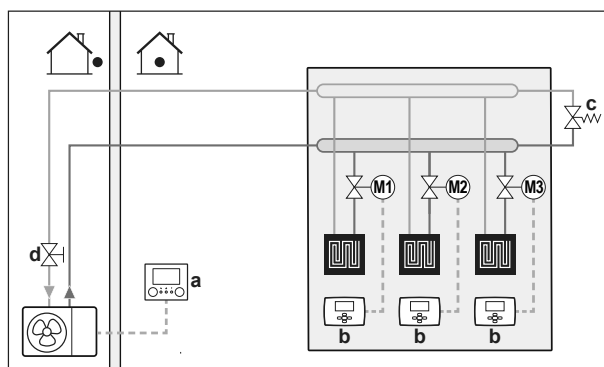
In critical processes, or in rooms with a high heat load, extra water might be required.

**NOTICE**

Never use less water than the minimum water volume. It may cause the unit to malfunction.

**NOTICE**

When circulation in each space heating/cooling loop is controlled by remotely controlled valves, it is important that the minimum water volume is guaranteed, even if all of the valves are closed or the overpressure bypass valve is installed in front of the space heating/cooling loop.



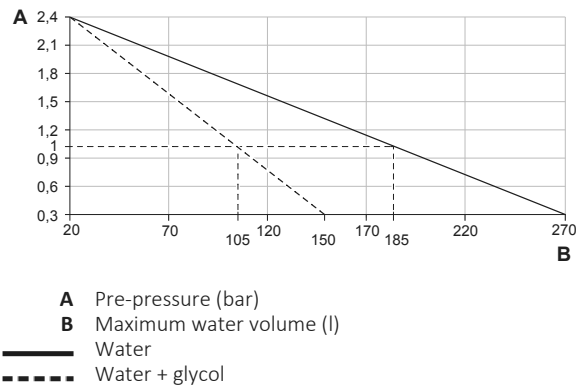
- a** User interface (delivered as accessory)
- b** Individual room thermostat (option)
- c** Overpressure bypass valve (field supply)
- d** Shut-off valve (delivered as accessory)
- M1...3** Individual motorised valve to control each loop (field supply)

Maximum water volume

**NOTICE**

The maximum water volume depends on whether glycol is added to the water circuit. For more information on the addition of glycol, refer to "8.2.4 To protect the water circuit against freezing" [p. 80].

Use the following graph to determine the maximum water volume for the calculated pre-pressure.

**Example: Maximum water volume and expansion vessel pre-pressure**

Installation height difference ^(a)	Water volume	
	≤185/105 l ^(b)	>185/105 l ^(b)
≤7 m	No pre-pressure adjustment is required.	Do the following: ▪ Decrease the pre-pressure according to the required installation height difference. The pre-pressure should decrease by 0.1 bar for each metre below 7 m. ▪ Check if the water volume does NOT exceed the maximum allowed water volume.
>7 m	Do the following: ▪ Increase the pre-pressure according to the required installation height difference. The pre-pressure should increase by 0.1 bar for each metre above 7 m. ▪ Check if the water volume does NOT exceed the maximum allowed water volume.	The expansion vessel of the outdoor unit is too small for the installation. In this case, it is recommended to install an extra vessel outside the unit.

^(a) This is the height difference (m) between the highest point of the water circuit and the outdoor unit. If the outdoor unit is at the highest point of the installation, the installation height is 0 m.

^(b) The maximum water volume is 185 l in case the circuit is only filled with water, and 105 l in case the circuit is filled with water and glycol.

Minimum flow rate

Check that the minimum flow rate (required during defrost/backup heater operation (if applicable)) in the installation is guaranteed in all conditions.

If operation is...	Then the minimum required flow rate is...
Cooling	10 l/min
Heating	6 l/min
BUH operation	12 l/min
Heating defrost	12 l/min
DHW	25 l/min

**NOTICE**

If glycol was added to the water circuit, and the temperature of the water circuit is low, the flow rate will NOT be displayed on the user interface. In this case, the minimum flow rate can be checked by way of the pump test.

**NOTICE**

When circulation in each or certain space heating loops is controlled by remotely controlled valves, it is important that the minimum flow rate is guaranteed, even if all valves are closed. In case the minimum flow rate cannot be reached, a flow error 7H will be generated (no heating or operation).

See the recommended procedure as described in "12.4 Checklist during commissioning" [► 226].

8.1.4 Changing the pre-pressure of the expansion vessel

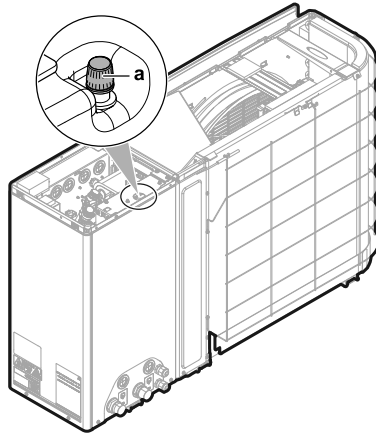
**NOTICE**

ONLY a licensed installer may adjust the pre-pressure of the expansion vessel.

The default pre-pressure of the expansion vessel is 1 bar. When it is required to change the pre-pressure, take following guidelines into account:

- Only use dry nitrogen to set the expansion vessel pre-pressure.
- Inappropriate setting of the expansion vessel pre-pressure will lead to malfunction of the system.

Changing the pre-pressure of the expansion vessel should be done by releasing or increasing nitrogen pressure through the Schrader valve of the expansion vessel.



a Schrader valve

8.1.5 To check the water volume: Examples

Example 1

The outdoor unit is installed 5 m below the highest point in the water circuit. The total water volume in the water circuit is 100 l.

No actions or adjustments are required.

Example 2

The outdoor unit is installed at the highest point in the water circuit. The total water volume in the water circuit is 250 l.

Actions:

- Because the total water volume (250 l) is more than the default water volume (185 l), the pre-pressure must be decreased.
- The required pre-pressure is:

$$P_g = (0.3 + (H/10)) \text{ bar} = (0.3 + (0/10)) \text{ bar} = 0.3 \text{ bar}$$
- The corresponding maximum water volume at 0.3 bar is 270 l. (See the graph in "Maximum water volume" [▶ 76]).
- Because 250 l is lower than 270 l, the expansion vessel is appropriate for the installation.

8.2 Connecting water piping

8.2.1 About connecting the water piping

Before connecting the water piping

Make sure the outdoor unit is mounted.

Typical workflow

Connecting the water piping typically consists of the following stages:

- 1 Connecting the water piping of the outdoor unit.
- 2 Connecting the water piping of the external backup heater kit and/or the domestic hot water tank (if applicable).
- 3 Protecting the water circuit against freezing (addition of glycol or installation of freeze protection valves).
- 4 Filling the water circuit.
- 5 Filling the domestic hot water tank (if applicable).
- 6 Insulating the water piping.

**INFORMATION**

For instructions regarding the domestic hot water tank, see the installation manual of the tank.

For instructions regarding the external backup heater kit, see:

- The installation manual of the backup heater kit.
- "To connect the backup heater kit" [▶ 100] (this topic partially supersedes the installation manual of the backup heater)

8.2.2 Precautions when connecting the water piping

**INFORMATION**

Also read the precautions and requirements in the following chapters:

- "2 General safety precautions" [▶ 9]
- "8.1 Preparing water piping" [▶ 71]

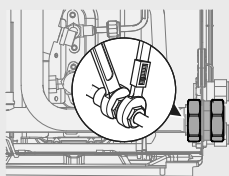
8.2.3 To connect the water piping

**NOTICE**

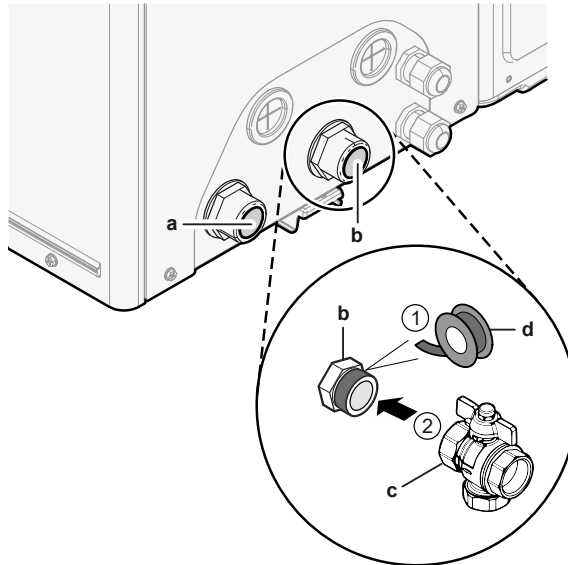
Do NOT use excessive force when connecting the field piping and make sure the piping is aligned properly. Deformation of the piping can cause malfunctioning of the unit.

**NOTICE**

When connecting the field piping, hold the nut on the inside of the unit in place using a spanner to provide extra leverage.



- 1 Connect the shut-off valve (with integrated filter) to the outdoor unit water inlet, using thread sealant.



- a** Water OUT (screw connection, male, 1")
- b** Water IN (screw connection, male, 1")
- c** Shut-off valve with integrated filter (delivered as accessory)(2× screw connection, female, 1")
- d** Thread sealant

- 2** Connect the field piping to the shut-off valve.
- 3** Connect the field piping to the outdoor unit water outlet.



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.



NOTICE

For service purposes, it is recommended to also install a shut-off valve and drain point to the water OUT connection. This shut-off valve and drain point are field supplied.



NOTICE

Install air purge valves at all local high points.



NOTICE

In case an optional domestic hot water tank is installed: A pressure relief valve (field supply) with an opening pressure of maximum 10 bar (= 1 MPa) must be installed on the domestic cold water inlet connection in accordance with the applicable legislation.

8.2.4 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, that include the activation of pump in case of low temperatures:

- Water pipe freeze prevention (see "Water pipe freeze prevention" [► 202]),

- Drain prevention. Only applicable when **Bivalent** is enabled ([C-02]=1). This function prevents the opening of freeze protection valves in the water piping to the outdoor unit when the auxiliary boiler is running at negative outdoor 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. Insulate the freeze protection valves in a similar way as the water piping, but do NOT insulate the inlet and outlet (release) of these valves.



NOTICE

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



NOTICE

If you add glycol to the water, you also need to install a flow switch (EKFLSW2).

Freeze protection by glycol

About freeze protection by glycol

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



WARNING

Ethylene glycol is toxic.



WARNING

Due to the 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.



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.

Types of glycol

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)
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.

Required concentration of glycol

The required concentration of glycol 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.

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%	—
–30°C	35%	—



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.



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.

Glycol and the maximum allowed water volume

Adding glycol to the water circuit reduces the maximum allowed water volume of the system. For more information, see "Maximum water volume" [► 76].

Glycol setting



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.

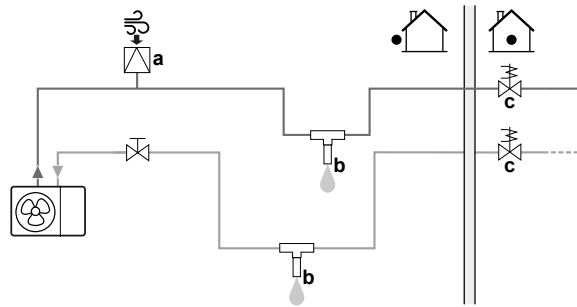
Freeze protection by freeze protection valves

About freeze protection valves

It is the responsibility of the installer to protect the field piping against freezing. When no glycol is added to the water, you can use freeze protection valves at all lowest points of the field piping to drain the water from the system before it can freeze.

To install freeze protection valves

To protect the field piping against freezing, install the following parts:



- a Automatic air intake
- b Freeze protection valve (optional – field supply)
- c Normally closed valves (recommended – field supply)

Part	Description
	An automatic air intake (for air supply) should be installed at the highest point. For example, an automatic air purge.
	Protection for the field piping. - Install the freeze protection valves: - At all lowest points of the field piping. - In the coldest part of the field piping, away from heat sources. - Vertically to allow water to flow out properly. >15 cm above the ground to prevent ice from blocking the water exit. Make sure there are no obstructions. >10 cm away from other freeze protection valves. - Prevent rain, snow and direct sunlight on the freeze protection valves. - Insulate the freeze protection valves in a similar way as the water piping, but do NOT insulate the inlet and outlet (release) of these valves. - Do NOT make traps in the field piping.

Part	Description
	Isolation of water inside the house when there is a power interruption. 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. ▪ When there is a power interruption: The normally closed valves close and isolate the water inside the house. If the freeze protection valves open, only the water outside the house is drained. ▪ In other circumstances (example: when there is a pump failure): The normally closed valves remain open. If the freeze protection valves open, the water from inside the house is also drained.

**NOTICE**

When freeze protection valves are installed, set the minimum cooling setpoint (default=7°C) at least 2°C higher than the maximum opening temperature of the freeze protection valve. If lower, freeze protection valves can open during cooling operation.

8.2.5 To fill the water circuit

To fill the water circuit, use a field supply filling kit. Make sure you comply with the applicable legislation.

**NOTICE**

The unit contains an automatic air purge valve. Make sure it is open. All automatic air purge valves in the system (in the unit, and in the field piping – if any) must remain open after commissioning.



8.2.6 To fill the domestic hot water tank

See the installation manual of the domestic hot water tank.

8.2.7 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 insulation**NOTICE**

Outside piping. Make sure the outside piping is insulated as instructed to protect against hazards.

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 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.

9 Electrical installation

In this chapter

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9.1 About connecting the electrical wiring

Before connecting the electrical wiring

Make sure the water piping is connected.

Typical workflow

Connecting the electrical wiring typically consists of the following stages:

- "9.2 Connections to the outdoor unit" [► 90]

9.1.1 Precautions when connecting the electrical wiring



DANGER: RISK OF ELECTROCUTION



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.

**INFORMATION**

Also read the precautions and requirements in the "2 General safety precautions" [▶ 9].

**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.

**CAUTION**

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

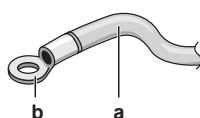
**NOTICE**

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

9.1.2 Guidelines when connecting the electrical wiring

Keep the following in mind:

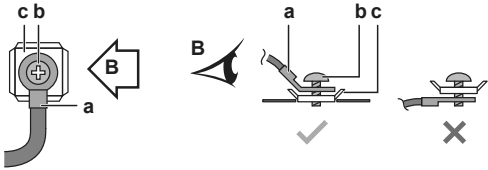
- If stranded conductor wires are used, install a round crimp-style terminal on the end of the wire. Place the round crimp-style terminal on the wire up to the covered part and fasten the terminal with the appropriate tool.



- a** Stranded conductor wire
b Round crimp-style terminal

- Use the following methods for installing wires:

Wire type	Installation method
Single-core wire	a Curled single-core wire b Screw c Flat washer

Wire type	Installation method
Stranded conductor wire with round crimp-style terminal	 a Terminal b Screw c Flat washer ✓ Allowed ✗ NOT allowed

Tightening torques

Item	Tightening torque (N•m)
X1M	2.45 ±10%
X2M	0.88 ±10%
X3M	0.88 ±10%
X4M	2.45 ±10%
X5M	0.88 ±10%
X7M	0.88 ±10%
X9M	2.45 ±10%
X10M	0.88 ±10%

9.1.3 About electrical compliance

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.).

9.1.4 About preferential kWh rate power supply

Electricity companies throughout the world work hard to provide reliable electric service at competitive prices and are often authorised to bill clients at benefit rates. E.g. time-of-use rates, seasonal rates, Wärmepumpentarif in Germany and Austria, ...

This equipment allows for connection to such preferential kWh rate power supply delivery systems.

Consult with the electricity company acting as provider at the site where this equipment is to be installed to know whether it is appropriate to connect the equipment in one of the preferential kWh rate power supply delivery systems available, if any.

When the equipment is connected to such preferential kWh rate power supply, the electricity company is allowed to:

- interrupt power supply to the equipment for certain periods of time;
- demand that the equipment ONLY consumes a limited amount of electricity during certain periods of time.

The hydro module of the outdoor unit is designed to receive an input signal by which the unit switches into forced off mode. At that moment, the outdoor unit compressor will not operate.

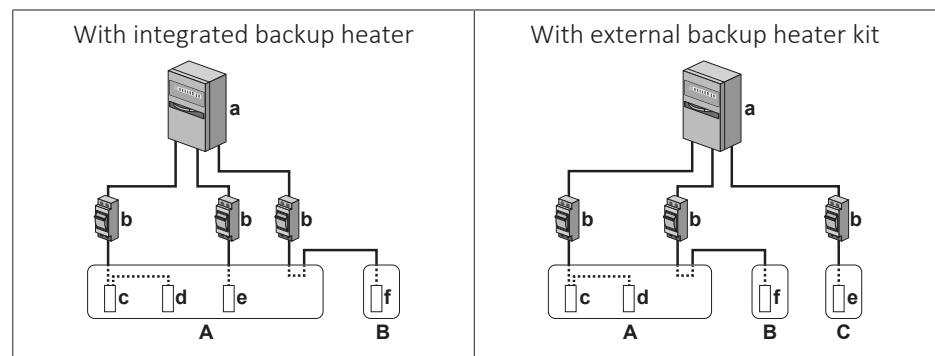
The wiring to the unit is different depending on whether the power supply is interrupted or NOT.

9.1.5 Overview of electrical connections except external actuators

This topic describes the following power supply layouts:

- Normal kWh rate power supply
- Preferential kWh rate power supply WITHOUT separate normal kWh rate power supply
- Preferential kWh rate power supply WITH separate normal kWh rate power supply

Normal kWh rate power supply

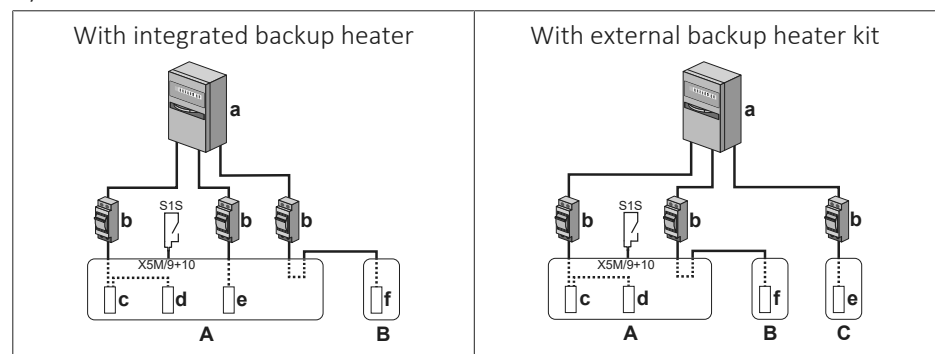


- A** Outdoor unit
- B** DHW tank
- C** External backup heater kit
- a** Electrical cabinet: **Normal kWh rate power supply**
- b** Overcurrent fuse
- c** Compressor module
- d** Hydro module
- e** Backup heater
- f** Booster heater

Preferential kWh rate power supply WITHOUT separate normal kWh rate power supply

During preferential kWh rate power supply activation, power supply is NOT interrupted. The compressor module of the outdoor unit is turned off by the control.

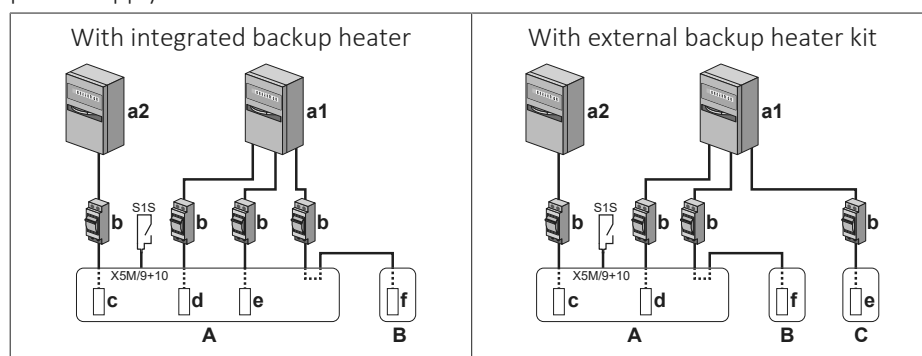
Remark: The electricity company must always allow the power consumption of the hydro module of the outdoor unit.



- A** Outdoor unit
- B** DHW tank
- C** External backup heater kit
- a** Electrical cabinet: **Preferential kWh rate power supply**
- b** Overcurrent fuse
- c** Compressor module
- d** Hydro module
- e** Backup heater
- f** Booster heater
- S1S** Preferential kWh rate power supply contact

Preferential kWh rate power supply WITH separate normal kWh rate power supply

During preferential kWh rate power supply activation, power supply is interrupted immediately or after some time by the electricity company. In this case, the hydro module of the outdoor unit must be powered by a separate normal kWh rate power supply.



- A** Outdoor unit
- B** DHW tank
- C** External backup heater kit
- a1** Electrical cabinet: **Normal kWh rate power supply**
- a2** Electrical cabinet: **Preferential kWh rate power supply**
- b** Overcurrent fuse
- c** Compressor module
- d** Hydro module
- e** Backup heater
- f** Booster heater
- S1S** Preferential kWh rate power supply contact

9.2 Connections to the outdoor unit

Item	Description
Power supply (main)	See "9.2.2 To connect the main power supply" [► 96].
Power supply (backup heater) (in case of outdoor unit with integrated backup heater)	See "9.2.3 To connect the backup heater power supply" [► 99].
Backup heater kit + Bypass valve kit (in case of external backup heater kit)	See "9.2.4 External backup heater kit" [► 100].
User interface	See "9.2.5 To connect the user interface" [► 107].

Item	Description
Shut-off valve	See "9.2.6 To connect the shut-off valve" [► 110].
Electricity meters	See "9.2.7 To connect the electricity meters" [► 111].
Domestic hot water pump	See "9.2.8 To connect the domestic hot water pump" [► 112].
Alarm output	See "9.2.9 To connect the alarm output" [► 112].
Space cooling/heating operation control	See "9.2.10 To connect the space cooling/heating ON/OFF output" [► 113].
Changeover to external heat source control	See "9.2.11 To connect the changeover to external heat source" [► 114].
Power consumption digital inputs	See "9.2.12 To connect the power consumption digital inputs" [► 115].
Safety thermostat	See "9.2.13 To connect the safety thermostat (normally closed contact)" [► 116].
Smart Grid	See "9.2.14 To connect a Smart Grid" [► 117].
WLAN cartridge	See "9.2.15 To connect the WLAN cartridge (delivered as accessory)" [► 120].

Item	Description
Room thermostat (wired or wireless)	 In case of wireless room thermostat, see: ▪ Installation manual of the wireless room thermostat ▪ Addendum book for optional equipment In case of wired room thermostat without multi-zoning base unit, see: ▪ Installation manual of the wired room thermostat ▪ Addendum book for optional equipment In case of wired room thermostat with multi-zoning base unit, see: ▪ Installation manual of the wired room thermostat (digital or analogue) + multi-zoning base unit ▪ Addendum book for optional equipment ▪ In this case: - You need to connect the wired room thermostat (digital or analogue) to the multi-zoning base unit - You need to connect the multi-zoning base unit to the outdoor unit - For cooling/heating operation, you also need to implement a relay (field supply, see addendum book for optional equipment)
	 Wires: 0.75 mm² Maximum running current: 100 mA
	 For the main zone: ▪ [2.9] Control ▪ [2.A] Ext thermostat type For the additional zone: ▪ [3.A] Ext thermostat type ▪ [3.9] (read-only) Control

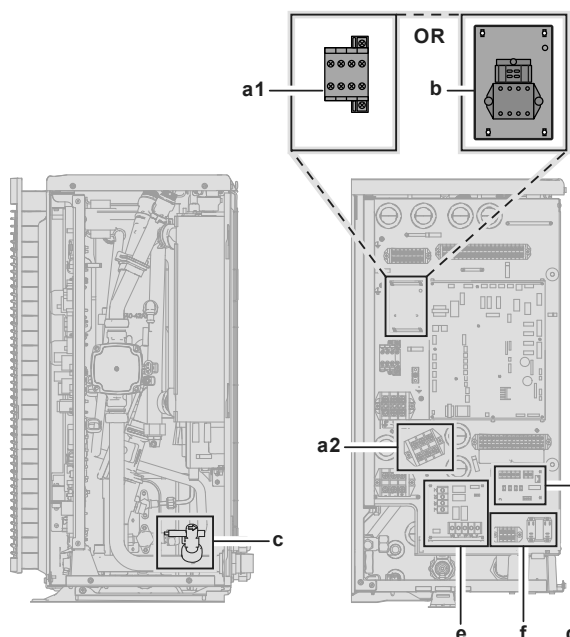
Item	Description	
Heat pump convector		There are different controllers and setups possible for the heat pump convectors. Depending on the setup, you also need to implement a relay (field supply, see addendum book for optional equipment). For more information, see: ▪ Installation manual of the heat pump convectors ▪ Installation manual of the heat pump convector options ▪ Addendum book for optional equipment
		Wires: 0.75 mm² Maximum running current: 100 mA
		For the main zone: ▪ [2.9] Control ▪ [2.A] Ext thermostat type For the additional zone: ▪ [3.A] Ext thermostat type ▪ [3.9] (read-only) Control
Remote outdoor sensor		See: ▪ Installation manual of the remote outdoor sensor ▪ Addendum book for optional equipment
		Wires: 2×0.75 mm²
		[9.B.1]=1 (External sensor = Outdoor) [9.B.2] Ext. amb. sensor offset [9.B.3] Averaging time
Remote indoor sensor		See: ▪ Installation manual of the remote indoor sensor ▪ Addendum book for optional equipment
		Wires: 2×0.75 mm²
		[9.B.1]=2 (External sensor = Room) [1.7] Room sensor offset

Item	Description	
Human Comfort Interface		See: ▪ Installation and operation manual of the Human Comfort Interface ▪ Addendum book for optional equipment
		Wires: 2×(0.75~1.25 mm ²) Maximum length: 500 m
		[2.9] Control [1.6] Room sensor offset
(in case of DHW tank) 3-way valve		See: ▪ Installation manual of the 3-way valve ▪ Addendum book for optional equipment
		Wires: 3×0.75 mm ² Maximum running current: 100 mA
		[9.2] Domestic hot water
(in case of DHW tank) Domestic hot water tank thermistor		See: ▪ Installation manual of the domestic hot water tank ▪ Addendum book for optional equipment
		Wires: 2 The thermistor and connection wire (12 m) are delivered with the domestic hot water tank. A thermistor (30 m) is optionally available.
		[9.2] Domestic hot water
(in case of DHW tank) Power supply for booster heater (from outdoor unit to thermal protector of booster heater)		See: ▪ Installation manual of the domestic hot water tank ▪ Addendum book for optional equipment
		Wires: (2+GND)×2.5 mm ²
		[9.4] Booster heater
(in case of DHW tank) Power supply for booster heater (from mains to outdoor unit)		See: ▪ Installation manual of the domestic hot water tank ▪ Addendum book for optional equipment
		Wires: 2+GND Maximum running current: 13 A
		[9.4] Booster heater

Item	Description	
Flow switch		See installation manual of the flow switch
		Wires: 2x0.5 mm ²
		—

Location extra components

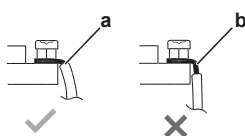
The following illustration shows the location of the extra components that you need to install on the outdoor unit when using certain option kits.



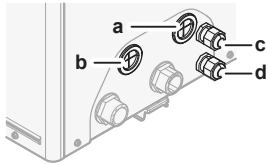
- a** Accessories in standalone domestic hot water tank (EKHWS*D* and EKHWSU*D*)
- a1:** Contactor
- a2:** Terminal block
- b** Connection kit for third-party tank with built-in thermostat (EKHY3PART2)
- c** Flow switch (EKFLSW2)
- d** Demand PCB (A8P: EKR1AHTA)
- e** Digital I/O PCB (A4P: EKR1HBAA)
- f** Smart grid relay kit (EKRELSG)

9.2.1 To connect the electrical wiring to the outdoor unit

- 1 Open the service cover. See "7.3.2 To open the outdoor unit" [▶ 68]. If necessary, rotate the switch box. See "7.3.3 To rotate the switch box" [▶ 69].
- 2 Strip insulation (20 mm) from the wires.



- a** Strip wire end to this point
 - b** An excessive strip length may cause electrical shock or leakage
- 3 Insert the cables at the back of the unit, and route them through the unit to the appropriate terminal blocks.



- a High voltage options
- b Low voltage options
- c Power supply for backup heater (in case of unit with integrated backup heater)
Wiring for backup heater kit (in case of external backup heater kit)
- d Unit power supply

4 Connect the wires to the appropriate terminals, and fix the cables with cable ties.

9.2.2 To connect the main power supply

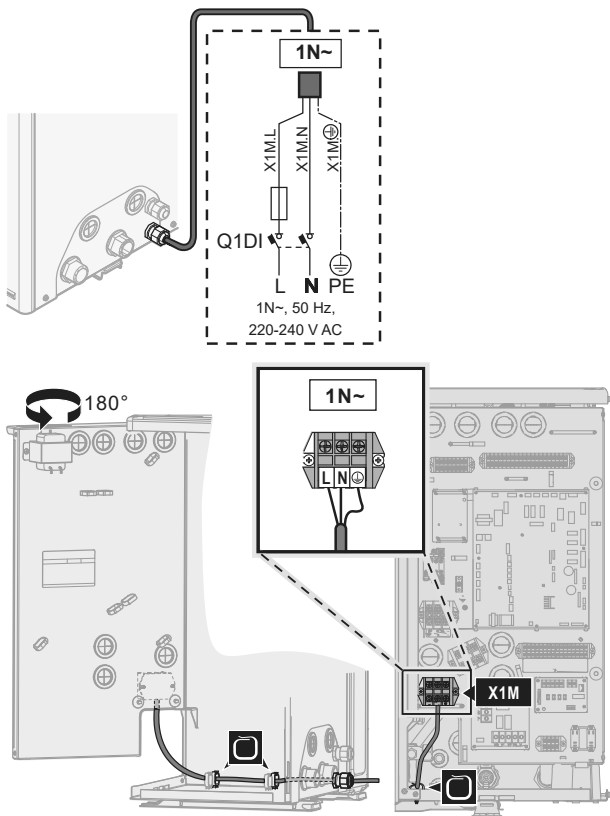
This topic describes 2 possible ways to connect the main power supply:

- In case of normal kWh rate power supply
- In case of preferential kWh rate power supply

In case of normal kWh rate power supply

	Normal kWh rate power supply	Wires: 1N+GND Maximum running current: Refer to name plate on unit.
	—	—

- 1 Access the electrical connections. See "9.2.1 To connect the electrical wiring to the outdoor unit" [► 95].
- 2 Connect as follows:

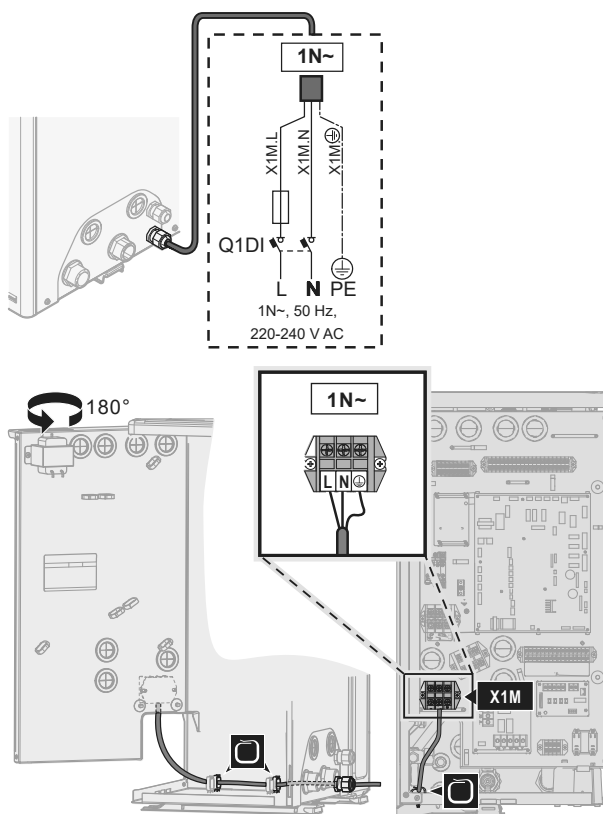


- 3 Fix the cables with cable ties to the cable tie mountings.

In case of preferential kWh rate power supply

	Preferential kWh rate power supply	Wires: 1N+GND Maximum running current: Refer to name plate on unit.
	Separate normal kWh rate power supply	Wires: 1N Maximum running current: 6.3 A
	Preferential kWh rate power supply contact	Wires: 2×(0.75~1.25 mm ²) Maximum length: 50 m. Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB). The voltage-free contact shall ensure the minimum applicable load of 15 V DC, 10 mA.
	[9.8] Benefit kWh power supply	

- 1 Access the electrical connections. See "9.2.1 To connect the electrical wiring to the outdoor unit" [► 95].
- 2 Connect the preferential kWh rate power supply.



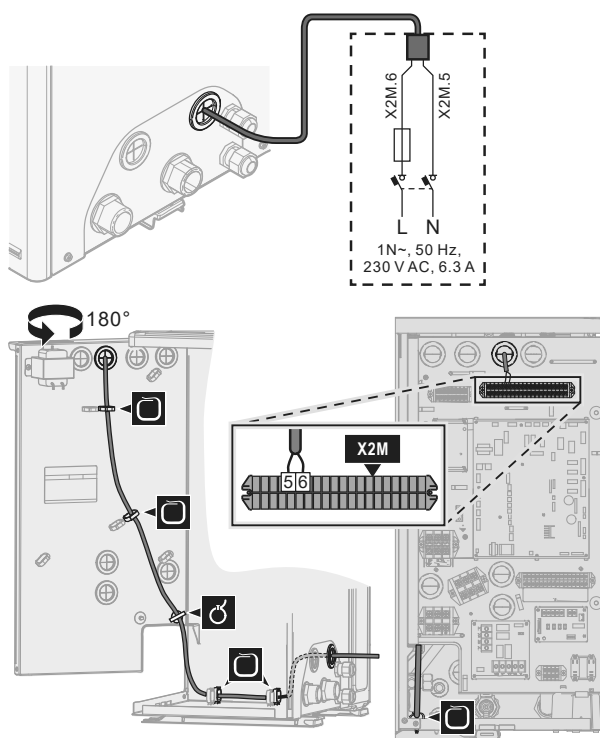
- 3 If necessary, connect the separate normal kWh rate power supply.



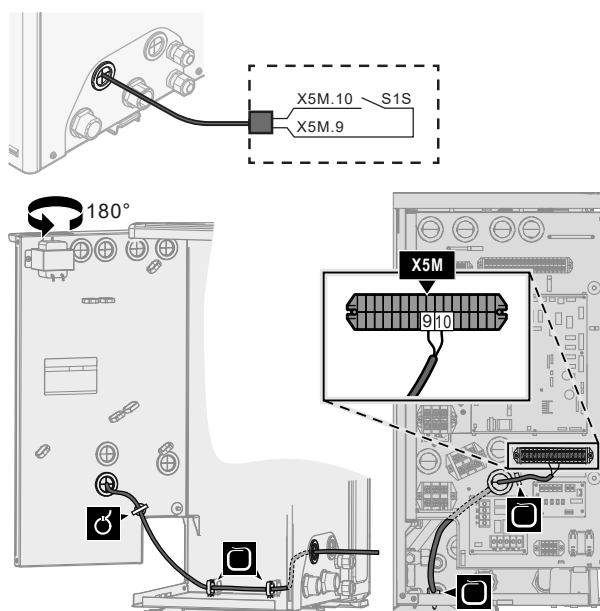
INFORMATION

Some types of preferential kWh rate power supply require a separate normal kWh rate power supply to the outdoor unit. This is required in the following cases:

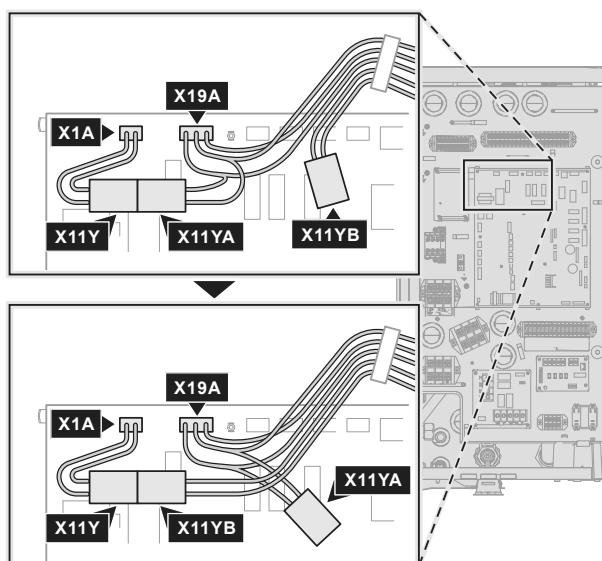
- if the preferential kWh rate power supply is interrupted when active, OR
- if no power consumption of the hydro module of the outdoor unit is allowed at the preferential kWh rate power supply when active.



4 Connect the preferential power supply contact.



5 In case of a separate normal kWh rate power supply, disconnect X11Y from X11YA, and connect X11Y to X11YB.



6 Fix the cables with cable ties to the cable tie mountings.

9.2.3 To connect the backup heater power supply

This topic is only applicable in case of models with integrated backup heater. For instructions in case of an external backup heater kit, see "9.2.4 External backup heater kit" [► 100].

	Backup heater type	Power supply	Wires
	*3V	1N~ 230 V	2+GND
	[9.3] Backup heater		



WARNING

The backup heater **MUST** have a dedicated power supply and **MUST** be protected by the safety devices required by the applicable legislation.

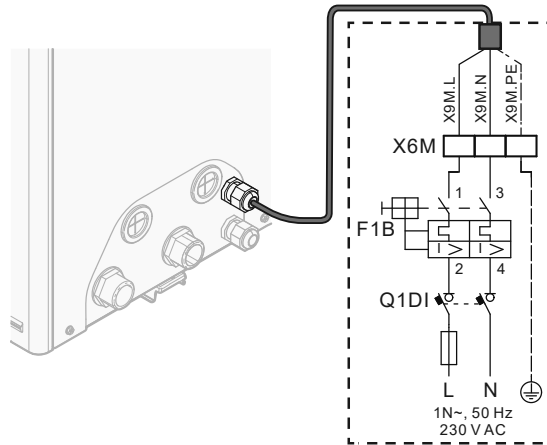


CAUTION

To guarantee the unit is completely earthed, **ALWAYS** connect the backup heater power supply and the earth cable.

Connect the power supply of the backup heater as follows:

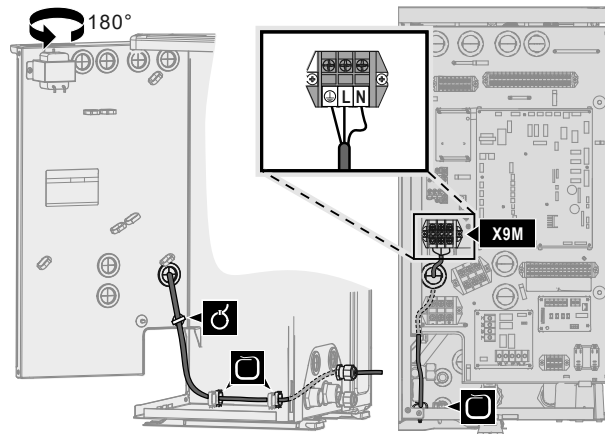
- 1 Access the electrical connections. See "9.2.1 To connect the electrical wiring to the outdoor unit" [► 95].
- 2 Connect the power supply cable (including earth) to the appropriate terminals as shown in the illustration below.



F1B Overcurrent fuse (field supply). Recommended fuse: 2-pole; 16 A; curve 400 V; tripping class C.

Q1DI Earth leakage circuit breaker (field supply)

X6M Terminal (field supply)



3 Fix the cable with cable ties to the cable tie mountings.

9.2.4 External backup heater kit

For models without integrated backup heater, you can install the external backup heater kit (EKLBUHCB6W1).

If you do so, then under certain conditions you also need to install a bypass valve kit (EKMBHBP1).

See:

- "To connect the backup heater kit" [▶ 100]
- "Bypass valve kit necessity" [▶ 105]
- "To connect the bypass valve kit" [▶ 106]

To connect the backup heater kit

The installation of the external backup heater kit is described in the installation manual of the kit. However, certain parts of it are superseded by the information described here. It concerns the following:

- To connect the backup heater kit power supply
- To connect the backup heater kit to the outdoor unit



Wires: See installation manual of the backup heater kit