

Q V A N T U M

QA-50

Air-to-water heat pump



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1 IMPORTANT INFORMATION

General

WARNING

Read this manual before starting the unit for the first time.

The installer is responsible for the installation and commissioning of the heat pump system. If you suspect the product is defective, contact your dealer.

Safety

This appliance can be used by children from 8 years and above and people with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning the use of the appliance in a safe way and understand the hazards involved. Children must not play with the appliance. Cleaning and maintenance must not be performed by children unless they are older than 8 and supervised.

The manual must be available for people who install, support or use the product.

Work must follow the instructions described in this manual. Companies and persons installing and maintaining the product must have the required certificates, licenses and qualifications.

The work must comply with current regulations and practices and be carried out professionally.

When powering up the product, there must be no frozen water in the system.

Wiring and electrical installation must be performed in compliance with national regulations.

It must be possible to safely disconnect the electrical power supply to the unit. Install the power supply with an isolator switch and size the cable area based on the fuse rating that is being used.

R290 refrigerant

R290, a flammable refrigerant, is present in the product. In the event of a leak, leaking refrigerant might combine with air and create an environment that could catch fire.

WARNING

It is prohibited to expose the product to flammable gases or liquids as it may cause fire.

WARNING

The unit must not be placed close to flammable gas. Fire may start if there is a gas leak of any kind.

WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

Safe area

WARNING

The heat pump must be installed outdoors. The unit must be installed so that, in the event of a leak, refrigerant cannot enter the building.

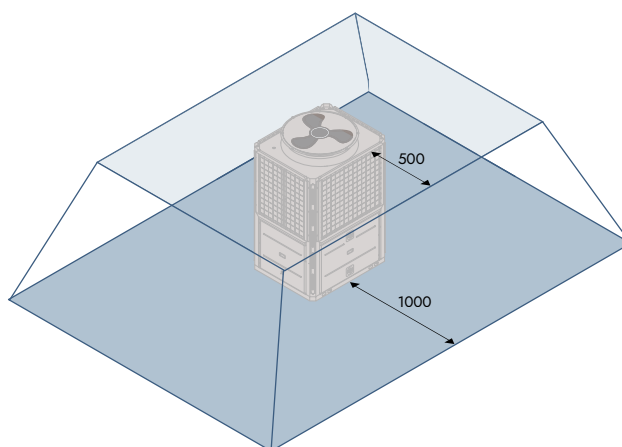
Vertically, the safe area stretches from the top of the product to ground level.

From the top of the product, the safety zone extends 0.5 m from the product's outer edges.

At ground level, the safety zone extends one meter from the product's outer edges.

NOTE

The safe area is not to be mistaken for the allowed installation area.



Windows, doors, ventilation openings, and potential ignition sources must not be present in the safe area. The safe area extends into neighboring structures. All wall penetrations in outer walls must be gas-tightly sealed.

Symbols

The manual contains the following symbols

WARNING

This symbol describes information that is of great danger to people or equipment.

CAUTION

This symbol describes information that could cause danger to people or equipment.

NOTE

This symbol describes information that is crucial when installing or servicing the product.

TIP

This symbol describes information that can be helpful when installing or servicing the product.

Product labels

These labels are found on the product.



CE marking indicates that a product has been assessed by the manufacturer and deemed to meet EU safety, health and environmental protection requirements.

IPX4

Protection classification against water and dust in the electrical enclosure.



Warning label that indicates that the product contains flammable material.



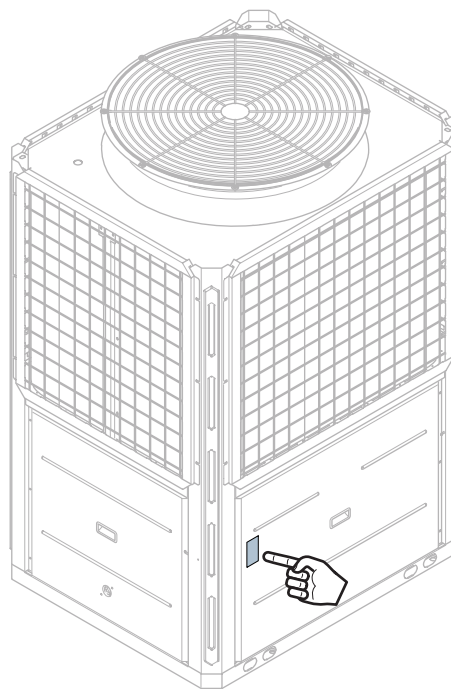
Warning label that indicates that open flames or other ignition sources are prohibited.



Read the supplied documentation.

Product identification

The product identification label is on the rear of the product.



Environmental information

Recycling



At the end of the electrical products useful life, it must not be disposed of with household waste.

Recycle at waste facility. Check with your local authority or retailer for local recycling regulations.

Packaging content

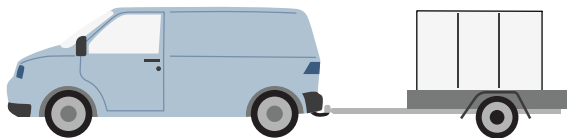
The product packaging contains the following materials.

MATERIAL	WEIGHT
Plastic	1.8 kg
Wood (pallet)	17 kg
Steel (reinforcement on pallet)	2 kg

2 BEFORE INSTALLING

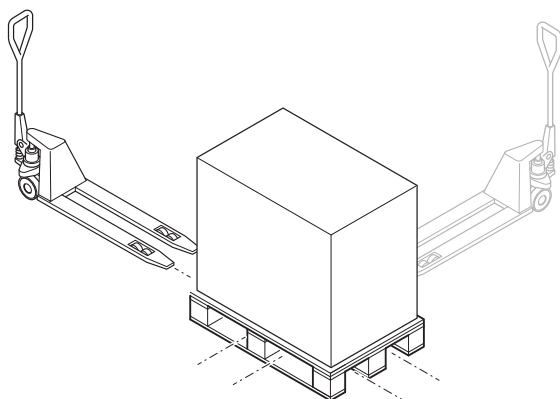
Transport

Transport the product in an upright position. Ensure that the product is adequately secured so it does not fall down during transit.

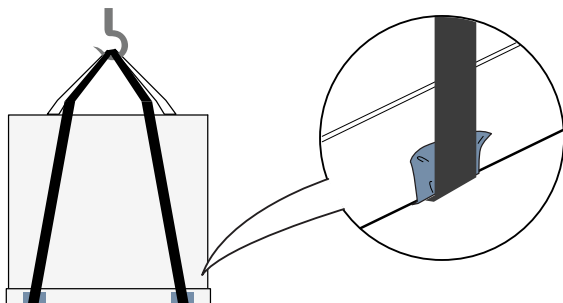


At arrival, ensure that the product was not damaged during transport.

If using a trolley or hand truck when moving the product, always have the product standing on the pallet.



The product can be lifted if needed. Put soft material between the lifting strap and the product to prevent damage to the product cabinet.



Installation area

Measurements

When installing the unit, ensure that there is enough room for the inlet and outlet air.



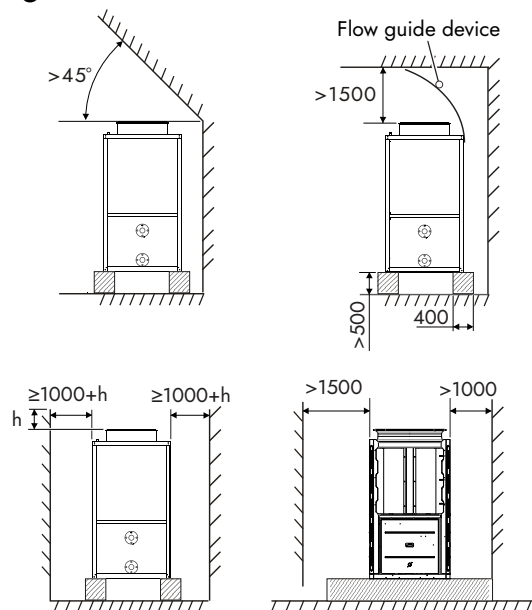
NOTE

Consider the height of obstacles surrounding the heat pump. High walls or other barriers can cause resonant sounds and unwanted recirculation of cold air.

If there is a barrier above the unit, its clearance should be a minimum of 3000 mm above the top of the unit.

If objects are stacked or placed around the unit, their height must be at least 400 mm lower than the top of the unit.

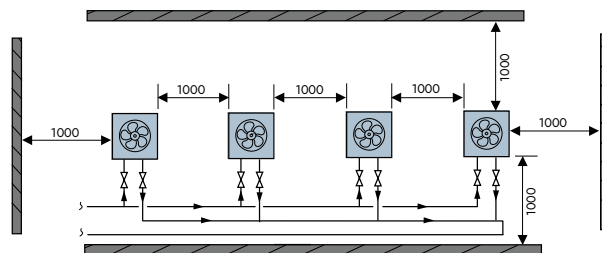
Single unit



- If a snow protective cover is installed above the heat pump, it is recommended that the angle between the protective cover and the upper surface of the unit shall not be less than 45°.
- If there is a flow guide device, a minimum vertical clearance of 1500 mm shall be maintained between the top of the unit and the highest edge of the flow guide device.
- For service, keep at least 1000 mm of free space in front of the electrical cabinet cover.
- It is recommended to maintain a minimum clearance of 1500 mm at the water inlet and outlet connections.

Multiple units

Refer to the following diagram to ensure adequate clearance between the units and the wall.



Prerequisites

Install the heat pump in accordance with the following requirements.



NOTE

If the heat pump is placed on concrete slabs, the slabs must rest on shingles or asphalt.

Place the heat pump on a solid surface that can withstand the weight of the heat pump.

- Do not place the heat pump directly on a lawn or a similar non-solid surface.
- Place the heat pump on a concrete base, concrete slabs or equivalent.

- Ensure that the heat pump is level.

NOTE

If the heat pump cannot be installed level, the lowest point must be at the condensation water outlet.

- Ensure that the installation area is adequately ventilated.

NOTE

In case of leakage, the refrigerant must not enter the house through ventilation openings, doors or windows.

- Direct wind can reduce the performance and defrosting of the product. Install the product in a place protected from direct wind.
- Ensure that the installation area is free from heat radiation, fire hazards and ignition sources.
- Do not position the heat pump next to a noise sensitive wall.
- Ensure that condensing water is drained away from the heat pump.
- Ensure that the heat pump is protected from snowfall and kept free from snow.
 - a) Ensure that the heat pump is positioned at least 100 mm above the expected snow level.
 - b) In areas with heavy snowfall, install the unit where snow will not accumulate.
 - c) If there is a risk of snow falling onto the heat pump, protect the heat pump by installing adequate snow protection.

Additional components

Supplied components

The supplied components package contains the following items:

#	COMPONENT
1	Gas separator kit
1	Filterball valve
1	Check valve
2	Straight coupling (DN40/External thread)
1	Pipe fitting (DN50/External thread)
2	T-coupling
2	Drain connector

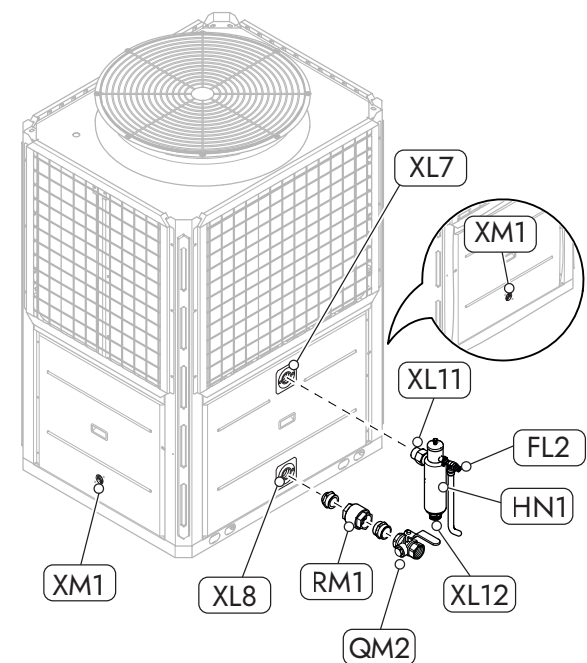
Pump specification (GP1)

Use a Lowara Ecocirc XL 32-120F circulation pump or an equivalent circulation pump to maintain the flow in the primary circuit.

3 COMPONENTS

Overview

The piping system is connected through connections that are on the back of the unit. The electrical system is connected to terminal blocks that are on the front of the unit.



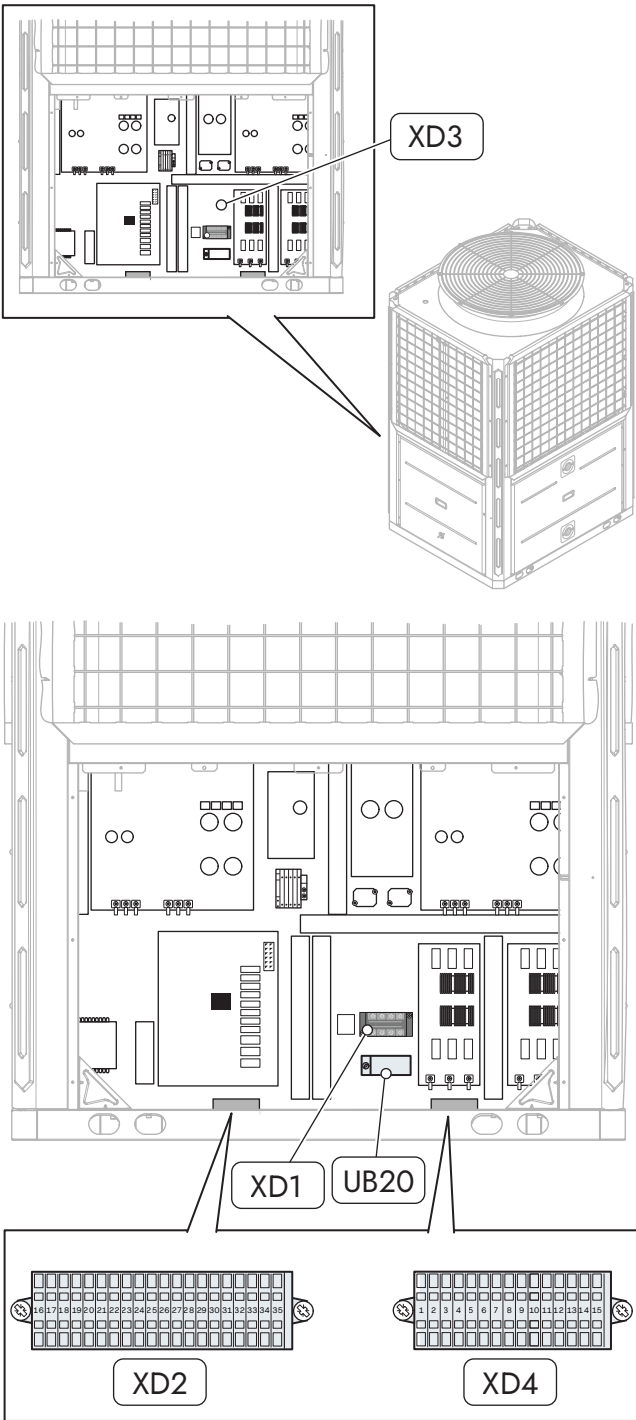
ID ¹	COMPONENT
FL2	Safety valve, distribution system
HN1	Gas separator
XL7	Docking connection, outlet
XL8	Docking connection, inlet
XL11	Gas separator, inlet
XL12	Gas separator, outlet
XM1	Drain outlet, condensation
QM2	Filterball valve
RM1	Check valve

¹ Component designations in accordance with IEC 81346.

Electrical box

ID ¹	COMPONENT
XD3	Junction box
XD4	Auxiliary terminal block
UB20	Cable retention, power supply
XD1	Terminal block, power supply
XD2	Terminal block, communication and sensors

¹ Component designations in accordance with IEC 81346.



4 PIPE INSTALLATION

Pipe installation, general

NOTE

The pipe installations must be performed in accordance with applicable regulations.

NOTE

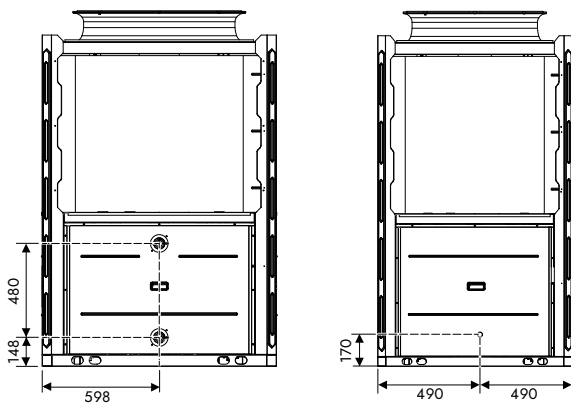
If a condensate drain is connected to the drain outlet (XM1), install it sloping downward from the heat pump along its entire length.

CAUTION

Insulate all outdoor pipework to reduce heat loss and protect the pipes from freezing.

Pipe connections

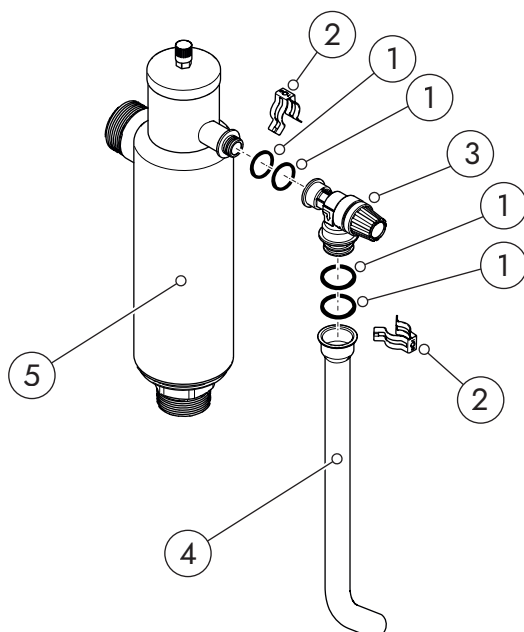
Measurements and dimensions



Preparations

Assembly of gas separator kit

Assemble the gas separator kit before the pipe installation.



ID	COMPONENT
1	O-ring
2	Clip
3	Safety valve
4	Pipe
5	Gas separator

Recommended installation

Install the following components in the heating medium circuit to make future maintenance easier.

NOTE

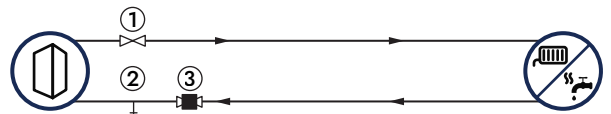
The product is not equipped with shut-off valve and drain valve for the heating medium circuit.

1. Install a shut-off valve on the heating medium supply line.
2. Install a drain valve on the heating medium return line.

NOTE

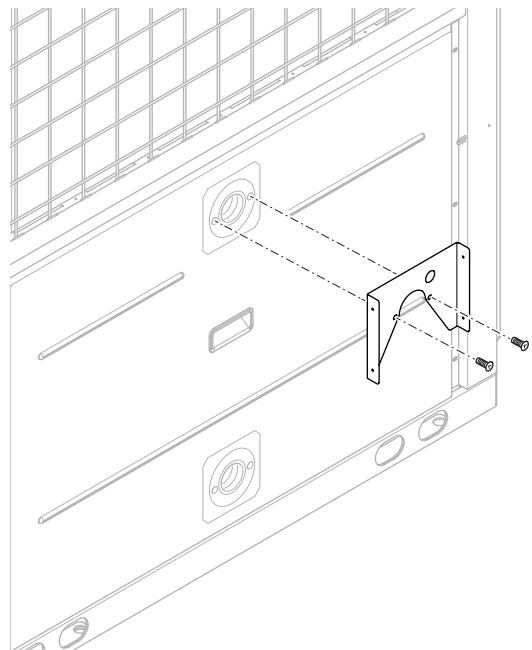
Install the drain valve at the lowest point of the system.

3. Install a filter ball valve on the heating medium return line.



Installation

1. Fasten the support bracket for the gas separator housing to the unit.

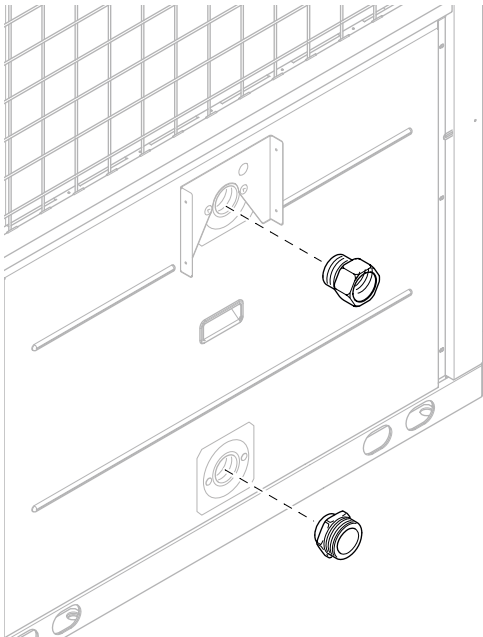


2. Install the supplied straight couplings to the pipe connections.

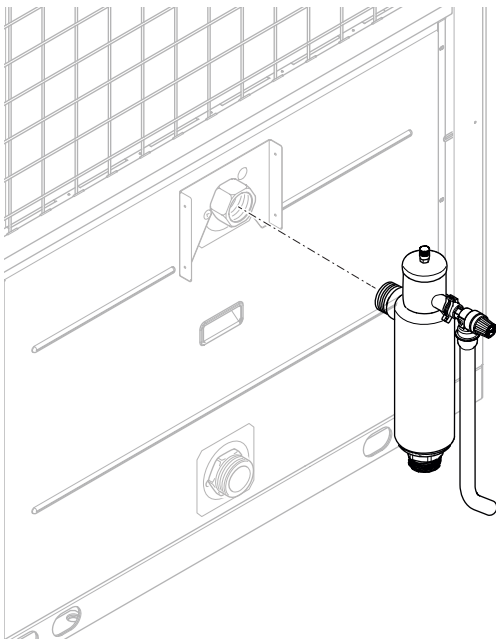


NOTE

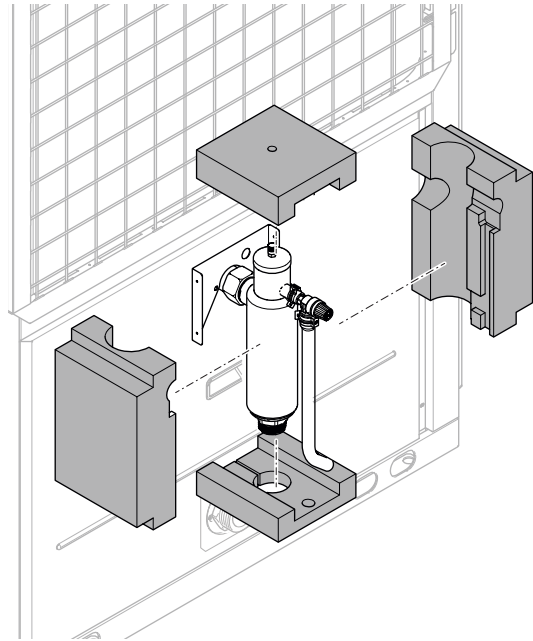
Seal the threads of the couplings before installing them.



3. Install the gas separator to the straight coupling.



4. Install the insulation blocks around the gas separator.



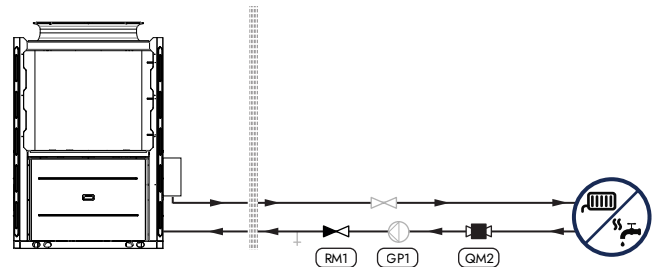
5. Install the supplied check valve (RM1), the pipe fitting, and the filterball valve (QM2) on the heating medium return line.



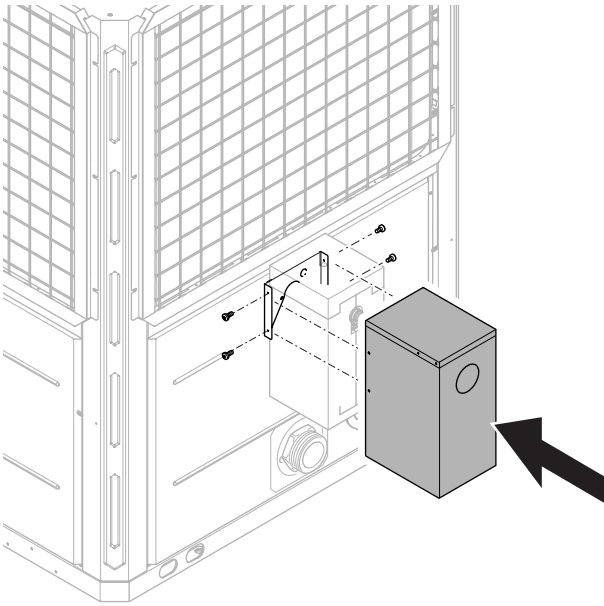
NOTE

Install the components in a frost-free area inside the building.

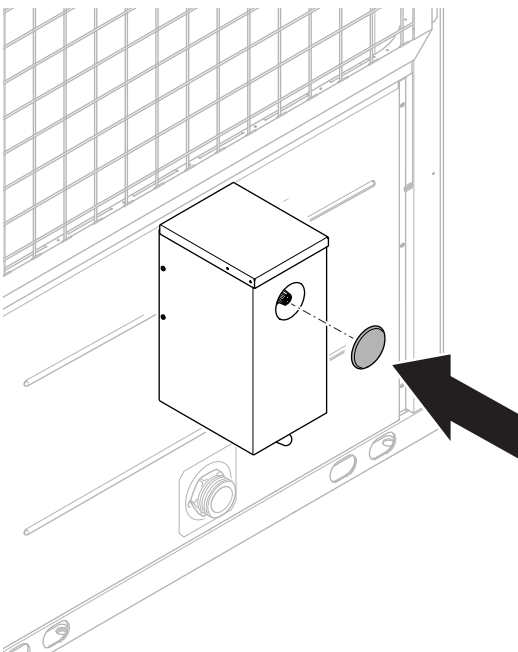
6. Install the pipes for the distribution system to the unit.
 - a) Connect the heating medium supply line to the gas separator outlet.
 - b) Connect the heating medium return line to the filterball valve connection.



7. Install the gas separator casing on the bracket with the supplied screws.



8. Attach the cover for the safety valve (FL2) to the gas separator casing.



Condensate drain connection

The QA-50 is equipped with two condensate drain outlets.

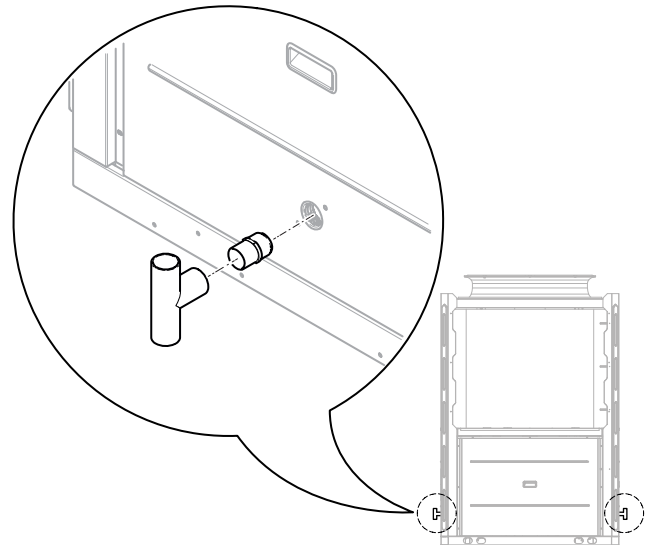


CAUTION

There must be no condensate drainage that enters the building.

Drain valve installation

1. Connect the drain connectors to the condensate outlets on both sides of the heat pump.
 - a) Connect the T-couplings to the drain connectors.



2. Connect the condensate drainage to the T-coupling.

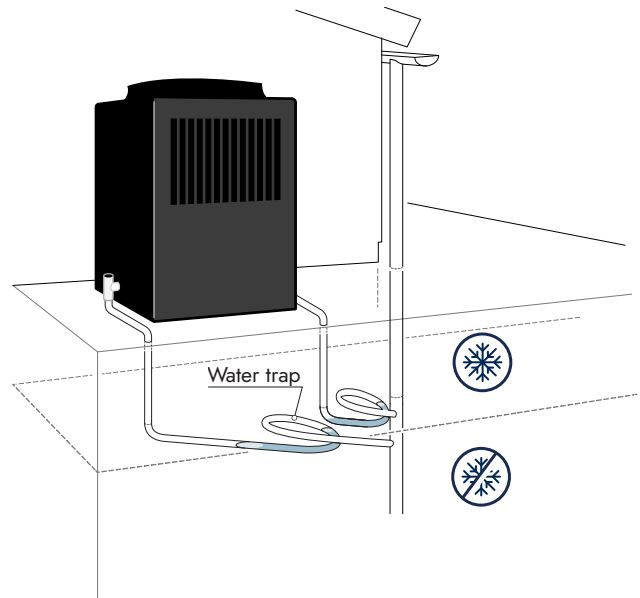
Installation options

Condensate drainage is installed in connection with a gutter drain or using a dry well.

Gutter drain

When the condensate drain is connected to a gutter drain, a water trap must be installed between the air-to-water heat pump and the gutter drain connection point.

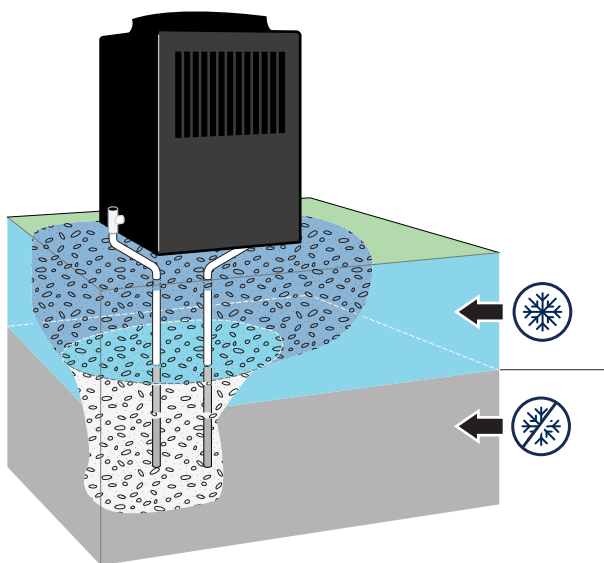
The condensate drain outlet must be at a frost-free depth.



- Customize the installation length by adjusting the size of the water trap.
- The condensate drain shall be installed sloping along its entire length, up to the connection point to the gutter drain.

Dry well

The condensate drain outlet must be at a frost-free depth.



CAUTION

Ensure that the dry well is positioned so that condensation water does not cause damage to the property. For properties with a basement, the dry well should not be placed adjacent to the building.

5 ELECTRICAL INSTALLATION

Electrical installation, general

WARNING

All electrical connections must be performed by a qualified electrician and in accordance with applicable regulations.

CAUTION

Do not start the unit until it has been filled with water and all electrical connections have been checked. Premature start-up can cause damage to internal components.

- The unit must be disconnected before the house wiring is insulation tested.
- Power cables should be placed at least 200 mm from communication and sensor cables.
- The product must be installed with a separate residual current device (RCD, type B) with a tripping current of 300 mA.

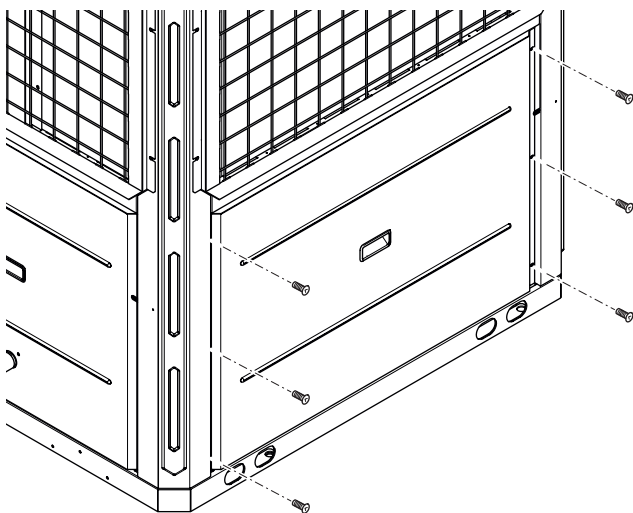
NOTE

An RCBO may be used as an alternative, provided it provides equivalent residual current protection and incorporates the required overcurrent (fuse) protection.

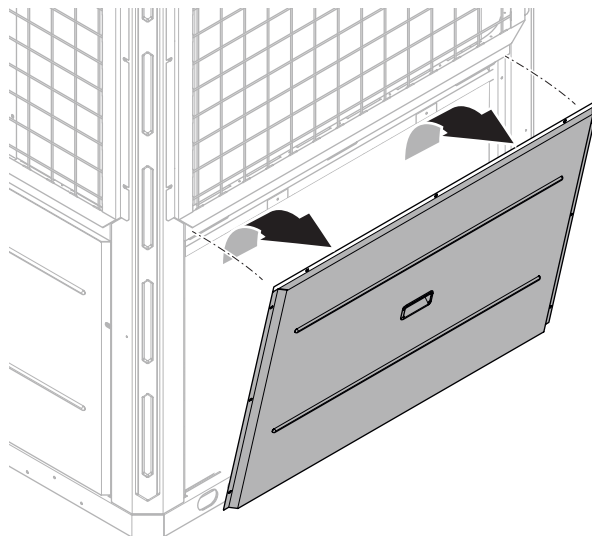
Access

This section describes how to access the electrical connections in the heat pump.

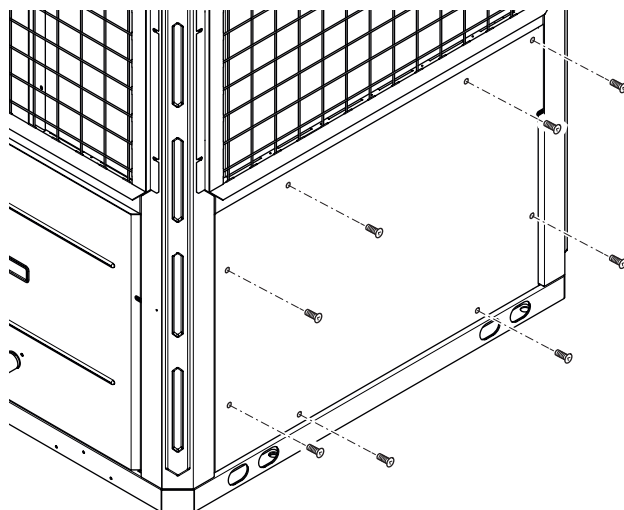
1. Remove the screws from the back cover.



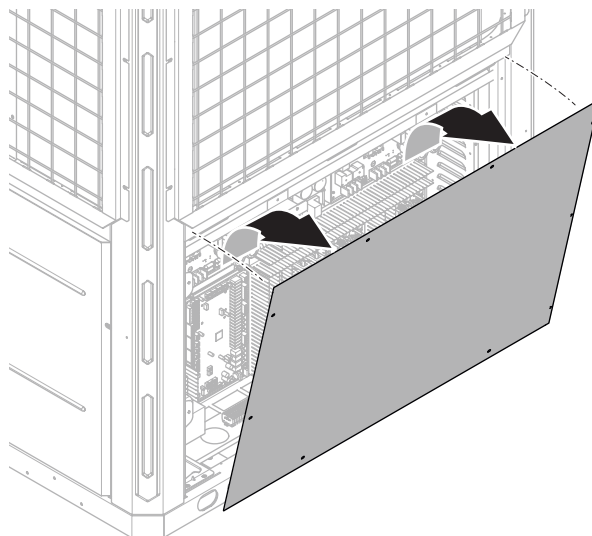
2. Tilt the top of the cover away from the unit.
a) Lift the cover to remove it from the unit.



3. Remove the screws from the protective cover.



4. Remove the protective cover from the unit.



Electrical connections

Power connection

An isolator switch with a 3mm minimum breaking distance must be used to install the unit.

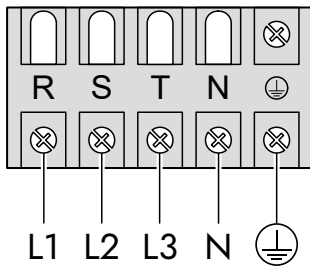
Size the minimum cable area in accordance with the fuse rating that is being used.

Power supply	3×400 V
Fuse rating	32 A (class C)

Connect the power supply to the screw terminal block XD1.

NOTE

Secure the supply cable with the cable retention (UB20) on the junction box (XD3).



External interfaces

The heat pump uses a Q-Multiplexer as a communication interface to connect to external components and other heat pumps and to route signals to the controller.

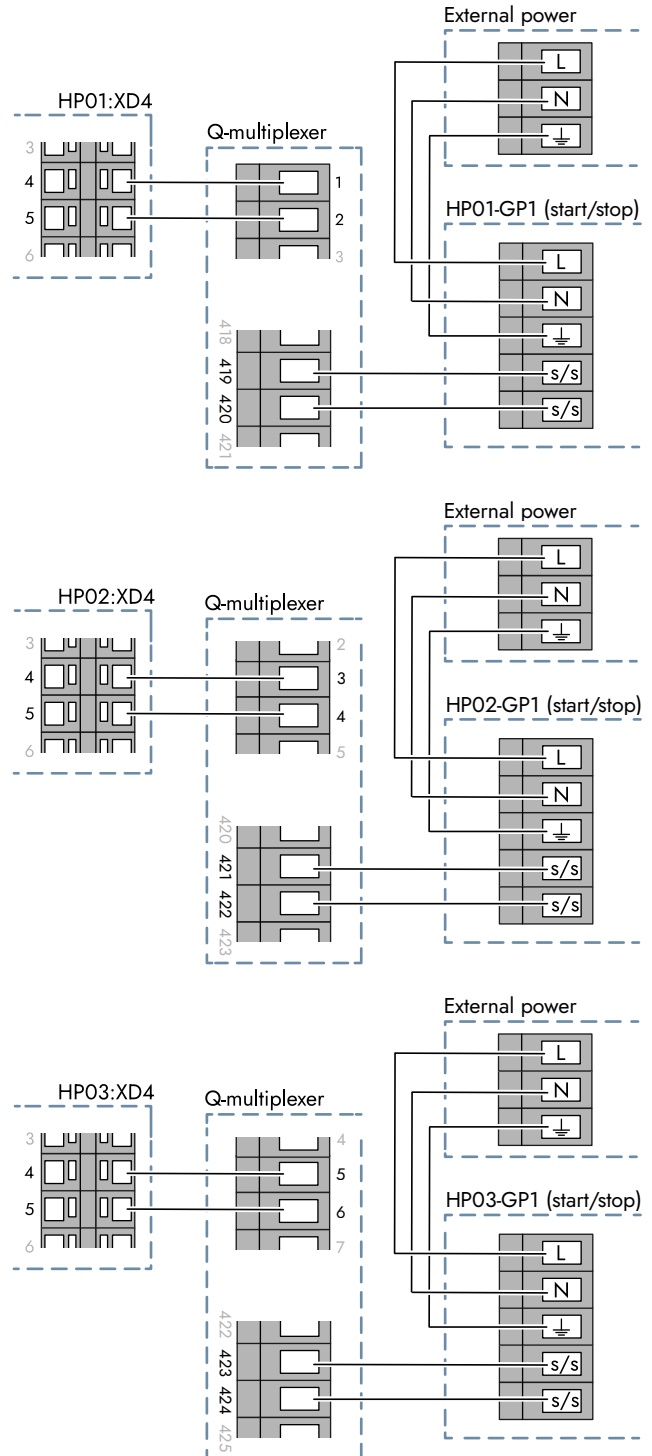
Circulation pump

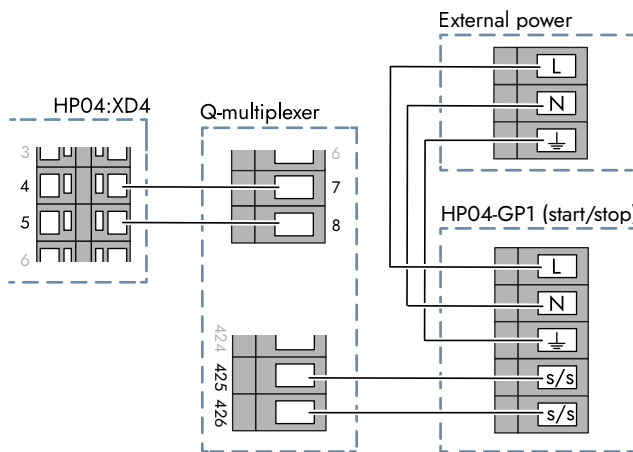
NOTE

Connections depend on the number of units in the system.

1. Connect the start/stop signal wires for the circulation pump (GP1) to the terminals on the Q-Multiplexer.

2. Connect the wires from the terminals on the Q-Multiplexer to the terminal block XD4:4-5 on the heat pump (HP0x).





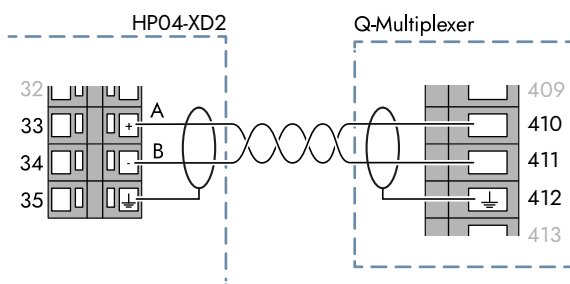
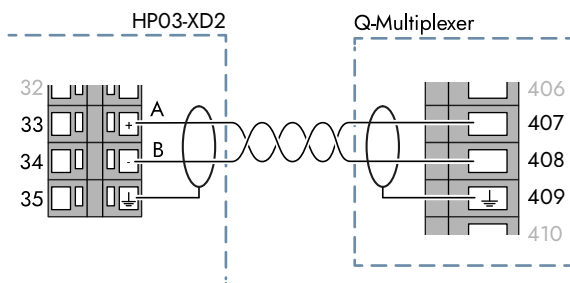
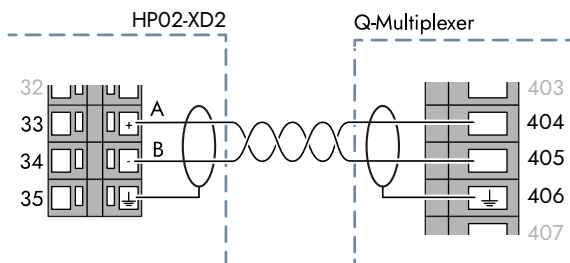
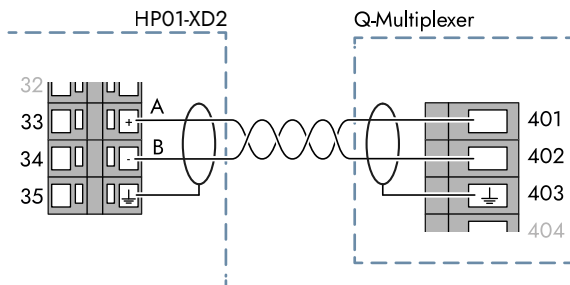
Communication



NOTE

Connections depend on the number of units in the system.

Connect the communication cable from the Q-Multiplexer to XD2:33-35 on the heat pump.

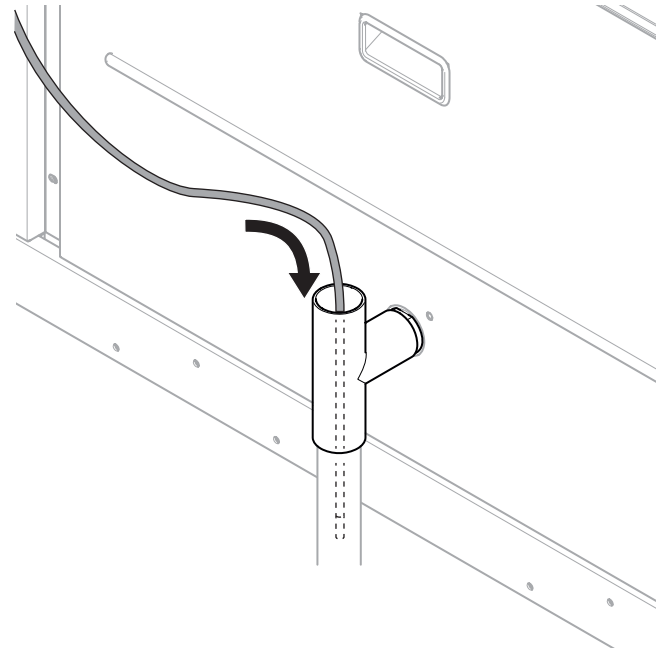


Heating cable installation

If there is a risk of freezing, install heating cables on the condensate drain outlets on both sides of the heat pump.

Heating cables with a current load that exceeds the applicable fuse rating must have an external power supply and must be installed with separate residual current device (RCD).

1. Insert the self-regulating heating cable into the top opening of the T-coupling.
 - a) Route the heating cable inside the connected drain pipes.



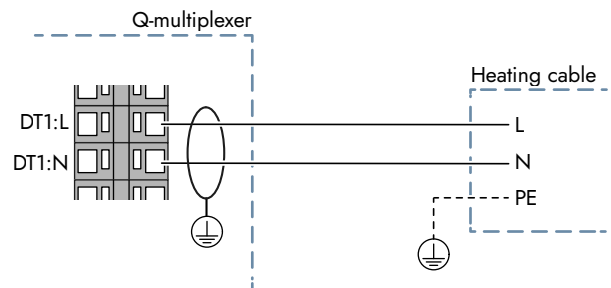
2. Connect the heating cable to the distribution terminal blocks (DT1) inside the Q-Multiplexer.



NOTE

The total current of all connected heating cables must not be more than the fuse rating (10 A) of the Q-Multiplexer terminal blocks.

- a) Connect the heating cable to a ground point.



6 COMMISSIONING

Before first start-up



CAUTION

Before the first start-up, ensure that there is no frozen water in the system.



NOTE

Before the first start-up, ensure that there is water in the distribution system.

- Ensure that all pipe connections are correct and tightened.
- Ensure that the gas separator and the gas separator housing are mounted correctly.
- Ensure that the power supply to the heat pump is installed correctly.
- Reassemble all covers.

First start-up

1. Turn on the isolator switch.
2. Verify that the heat pump is powered on.



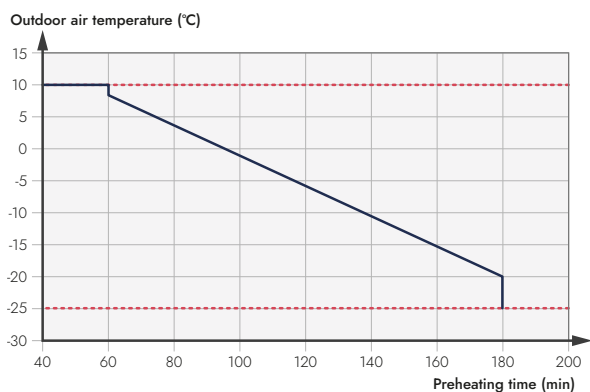
TIP

The compressor starts approximately one minute after a demand is detected by the controller.

3. If necessary, adjust affected settings through the display in the controller.

Compressor preheating

When the product is powered on, the compressor may enter a preheating mode before it can start. The preheating time depends on the outdoor air temperature. If the outdoor temperature is above +10 °C, preheating is not needed. If the outdoor temperature is below -25 °C, the compressor cannot start.



7 SERVICE

General

CAUTION

Maintenance and servicing must be performed by persons with sufficient knowledge about the task.

Maintenance

NOTE

The end user must be informed about necessary maintenance actions.

Regular checks

In order to prevent possible operational disturbances, regular checks of the heat pump must be carried out.

- Ensure that the unit is clean and free of debris.

NOTE

Clean the unit using hot water and a soft cloth. Do not use chemicals to clean the unit.

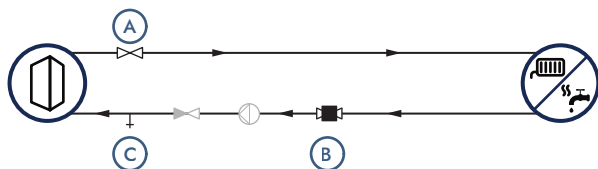
- Check that condensation water drain is not obstructed.
- Check the machine for uncontrolled ice formation.

Condenser draining

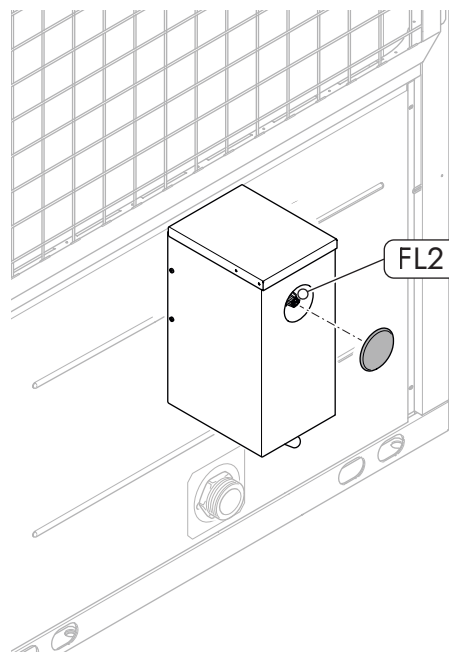
If an extended power failure occurs, it is necessary to drain water from the condenser to prevent freezing.

To safely drain the system proceed as follows:

1. Close the shut-off valve (A) on the heating medium supply line.
2. Close the filterball valve (B) on the heating medium return line.



3. Open the safety valve (FL2) on the gas separator.



4. Open the drain valve (C) on the heating medium return line.

8 TROUBLESHOOTING

Before troubleshooting

If the system does not inform about an active fault, check the following components before troubleshooting:

WARNING

The incoming supply electricity must be isolated at the safety switch by or under the supervision of a trained electrician in the event that corrective action is needed to address faults that call for work inside screwed hatches.

- Power supply.
- Group and main fuses of the property.
- Residual current device (RCD).
- That the air flow to the heat pump is not obstructed.

The heat pump does not start

An alarm is active

- Check the controller display for information about active alarms.

No demand is active

- Make sure that the external control signal is requesting heating or hot water production.

The compressor is blocked due to temperature limitations

- Ensure that the heat pump is not outside its operational range.

Compressor preheating is active

- Wait for the compressor preheating to finish.

Not enough time has passed since the previous compressor start

- Wait for approximately 30 minutes and see if the compressor starts.

Communication issues

Incorrect power supply

- Verify the condition of the power supply for the heat pump unit.

Incorrect connection of communication

- Ensure that the communication cable is correctly installed.

Damaged communication cable

- Replace the communication cable.

Incorrect set-up in controller

- Ensure that the heat pump is correctly set up in the controller.

Insufficient hot water production

Increased hot water demand

- Wait until the target temperature for the hot water has been reached.

Air in the system circuit

- Purge the air from the system until only a steady stream of water comes out.

Incorrect hot water settings

- Check and, if necessary, change the hot water settings in the controller.

Obstructed filterball valve

- Turn off the power supply to the heat pump and clean the filterball valve that is connected to the heat pump inlet connection.

Frost build-up on evaporator

Insufficient air flow over the evaporator

- Check that the fan operates as intended.

Refrigerant amount issue

- Check the refrigerant pressure.
 - a) If a leakage is present, contact a service technician.

Too low compressor frequency

- Check the compressor frequency.
 - a) If adjusting the compressor settings is not possible or insufficient, contact a service technician.

Abnormal noise

Unfastened screws

- Ensure that all screws are properly fastened.

Fan blade or fan motor

- Ensure that the fan is functioning correctly and is firmly mounted.
- Ensure that the fan blades are free of ice.

Compressor

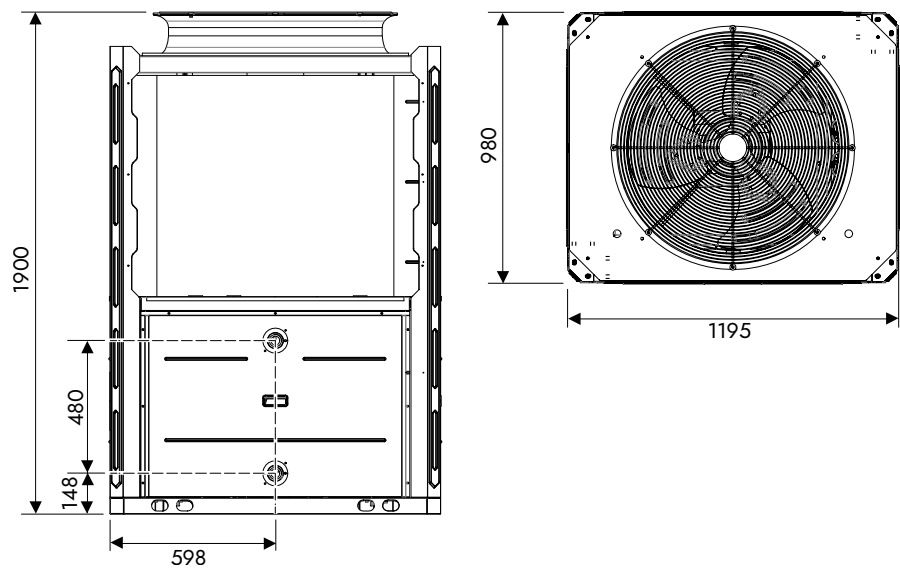
- Ensure that the compressor is functioning correctly and is firmly mounted.

Adjoining components

- Ensure that sound is not carried by components touching each other.

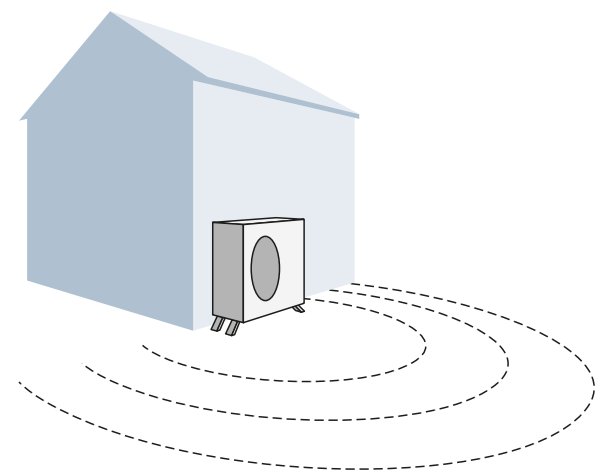
9 TECHNICAL SPECIFICATIONS

Dimensions



Operational data

Sound levels

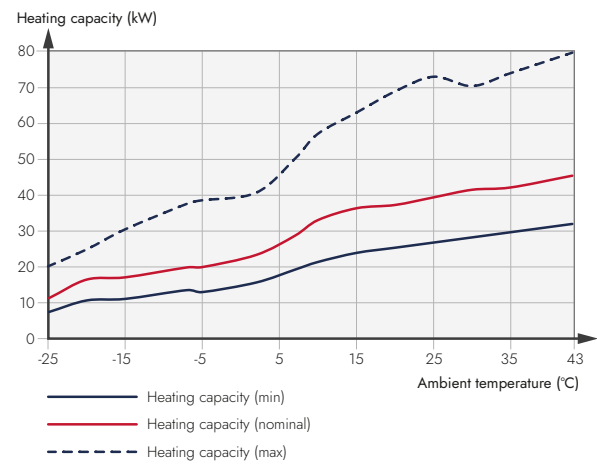


Sound power level, $L_w(A)_{EN12102}$	75
Sound pressure levels¹	
At 1 m	70
At 2 m	64
At 3 m	60
At 4 m	58
At 5 m	56
At 6 m	54
At 7 m	53
At 8 m	52
At 9 m	51
At 10 m	50

¹ Sound pressure levels are calculated using directivity factor Q=4.

Heating capacity

Heating capacity at supply line temperature 35 °C.



Technical data

MODEL		QA-50
Energy efficiency, average climate		
The product's efficiency class room heating, average climate 35 / 55 °C		A+++ / A++
Output data (EN14825)		
Nominal heating output (P_{designh}), average climate 35 / 55 °C	kW	25.56 / 25.53
SCOP average climate, 35 °C / 55 °C		4.52 / 3.26
Heating capacity and COP		
Maximum heating capacity (A7/W35)	kW	50
Maximum heating capacity (A7/W55)	kW	46
Maximum heating capacity (A-10/W55)	kW	30.30
COP (A7/W35)		3.12
COP (A7/W55)		2.47
Refrigerant circuit		
Type of refrigerant (GWP)		R290 (0.02)
CO ₂ equivalent	kg	0.06
Refrigerant quantity	kg	1.5x2
Cut-out value pressostat LP	MPa/bar	0.8 / 8
Cut-out value pressostat HP	MPa/bar	3.0 / 30
Heating medium circuit		
Max pressure drop	kPa	80
Rated water flow	m³/h	8.5
Water pressure (max)	kPa	80
Electrical data		
Rated voltage	V	380V 3N ~ 50Hz
Maximum power input	kW	24
Maximum current input	A	30
Recommended fuse	A	32
Recommended RCD type		B
Enclosure class		IPX4
Sound data		
Sound power level ($L_{W(A)}$) _{EN12102}	dB(A)	75
Sound pressure (1m)	dB(A)	70
Fan data		
Fan motor type		DC motor
Fan motor power input (min~max)	W	750
Fan speed	rpm	850
Connection dimensions		
Heating medium, internal thread Ø		DN40
Weight and dimensions		
Net weight	kg	363
W x D x H	mm	1195 x 980 x 1900
Gross weight ¹	kg	430
W x D x H with packaging	mm	1290 x 1060 x 1960
Misc		
Ambient temperature range, min~max	°C	-25~43
Part no.		1014962

1 The weight includes the packaging and the supplied components.

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Changing the way cities are heated.

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QCH EN 2623-A



1017820