QVANTUM



# Qvantum QA Series

## Air-to-water heat pump

## Installation and user handbook

QCH 2346-
123456

# CONTENTS

# 1 IMPORTANT INFORMATION

## General

**WARNING**

Read this manual before starting the heat pump for the first time.

It is the owner of the heat pump that is responsible for the system. If you suspect that the product is defective, contact your dealer.

## Safety

This manual contains installation and servicing procedures that must be performed by a professional.

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

**CAUTION**

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.

### 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

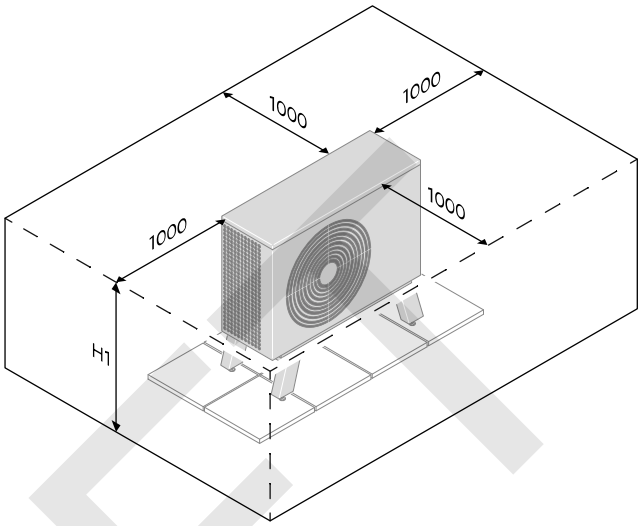
**WARNING**

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.

The safe area stretches from the top of the heat pump to ground level (H1 in the following image) and one meter in all directions from the edges of the unit.

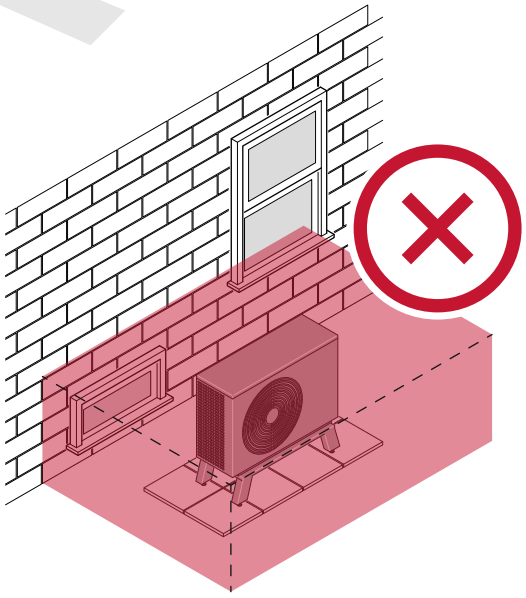
**NOTE**

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

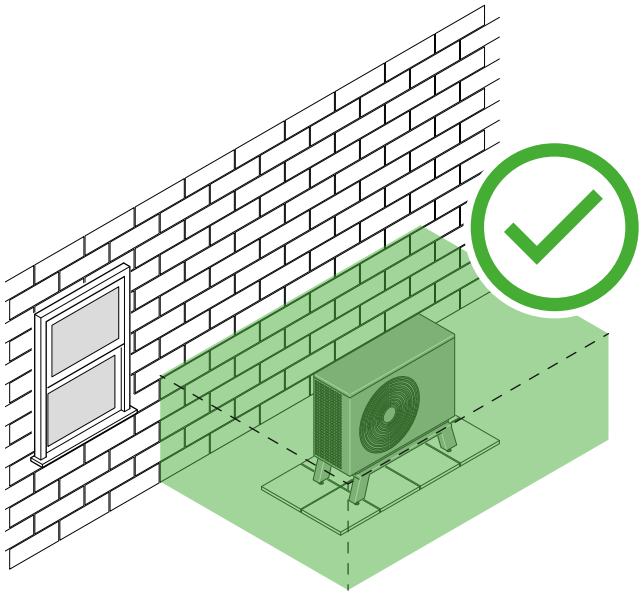



Windows, doors, ventilation openings, and potential ignition sources must not be present in the safe area. The safe area extends into neighboring structures. All wall penetrations in outer walls must be gas-tightly sealed.

The installation depicted in the following image is incorrect with relation to the safe area.



The installation depicted in the following image is allowed with relation to the safe area.



## 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 heat pump.

**TIP**

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

## 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.

IP21 Protection classification against water and dust in the electrical enclosure.

## Serial number and QR code

## Environmental information

### F-gas regulation (EU) No. 517/2014

This product contains a fluorinated greenhouse gas that is covered by the Kyoto protocol.

The equipment contains R290, a fluorinated greenhouse gas with a global warming potential (GWP) of 1. Do not release R290 into the atmosphere.

### Recycling

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

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

## Glossary

The following terms are used throughout the manual to describe various functions of Qvantum QA.

**Distribution system**

The distribution system is the system that is used to provide the house with heating through radiators, floor heating and/or fan convectors.

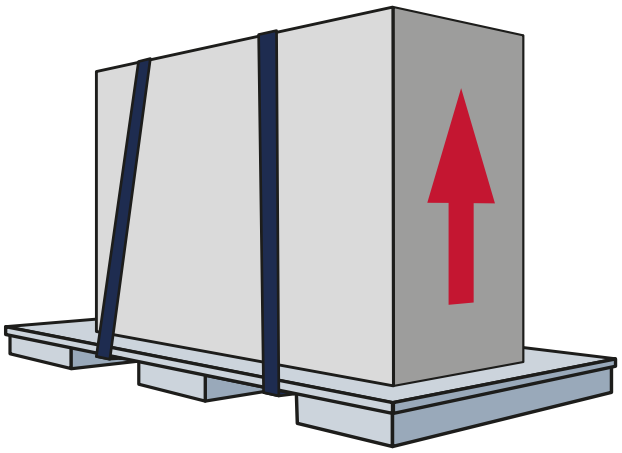
**Hydronic unit**

The hydronic unit consists of an accumulator tank, pipe connections, electrical connections and the graphical user interface. It provides the house with domestic hot water as well as heating through the distribution system.

# 2 BEFORE INSTALLING

## Transport

Transport Qvantum QA in an upright position. Ensure that the unit is adequately secured so it does not fall during transit.



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

## Installation area

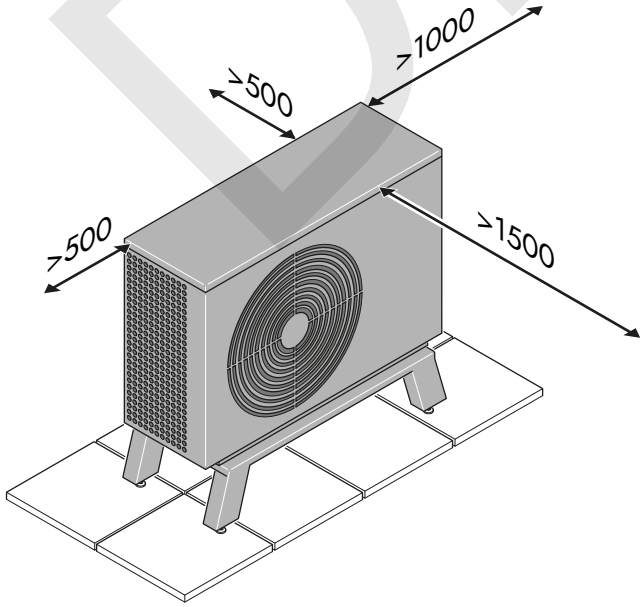
### Measurements

When installing QA, ensure that there is enough room for the inlet and outlet air. There must be at least 500 mm of free space behind and 1500 mm in front of the heat pump.

For servicing purposes, there must be at least 1000 mm of free space to the right and 500 mm to the left of the heat pump.

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.




### Prerequisites

Install the heat pump in accordance with the following requirements.

- NOTE

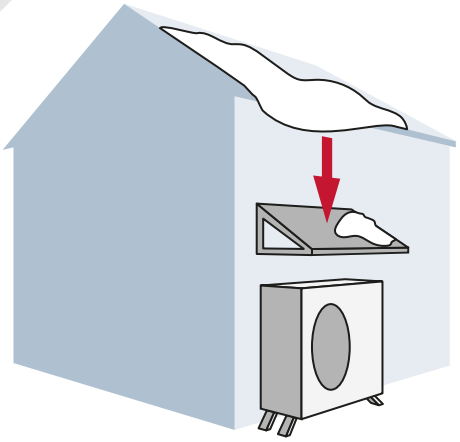
  If the heat pump is placed on concrete slabs, the slabs must rest on shingles or asphalt.

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

  a) Do not place the heat pump directly on a lawn or a similar non-solid surface.
  b) Place the heat pump on a concrete base, conrete slabs or equivalent.
- 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.
- Ensure that the installatian 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 the bottom of the evaporator is positioned higher up than the average level of snow depth.
- Ensure that condensing water is led away from the heat pump.
- If there is a risk of snow falling onto the heat pump, protect the heat pump by installing adequate snow protection.



## Supplied components

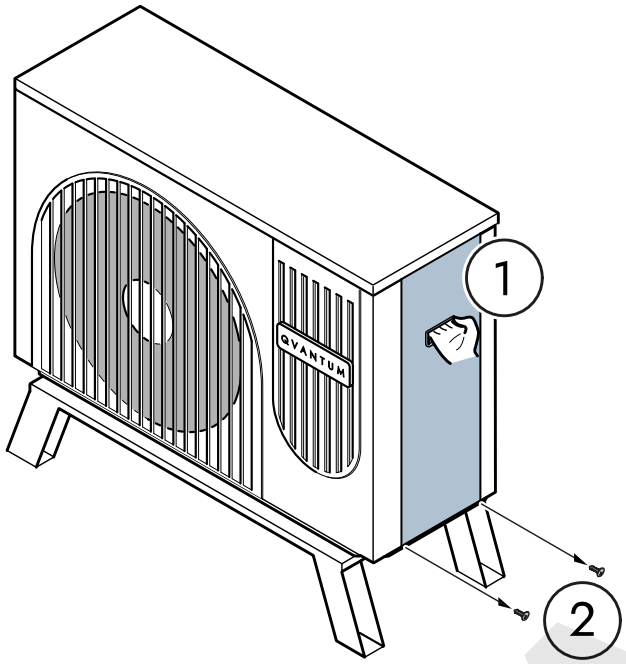
The supplied components package contains the following items.

- Vibration dampers (4 pcs)
- Temperature sensor
- Screws (4 pcs)
- 4-core signal cable
- Condensing water collector (2 pcs)
- Wire controller

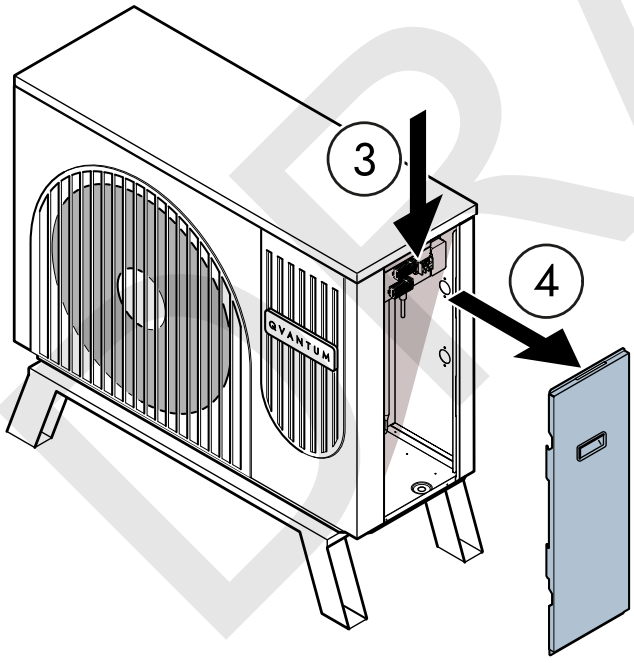
# Access

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

1. Hold the electrical cover in place.
2. Release the screws at the bottom of the electrical cover.




3. Slide the electrical cover downwards.
4. Remove the electrical cover from the heat pump.



# 3 COMPONENTS

## Overview

## Connections

## Electrical box

# 4 ELECTRICAL INSTALLATION

## General

**WARNING**

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

### Access

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

1. Hold the electrical cover in place.
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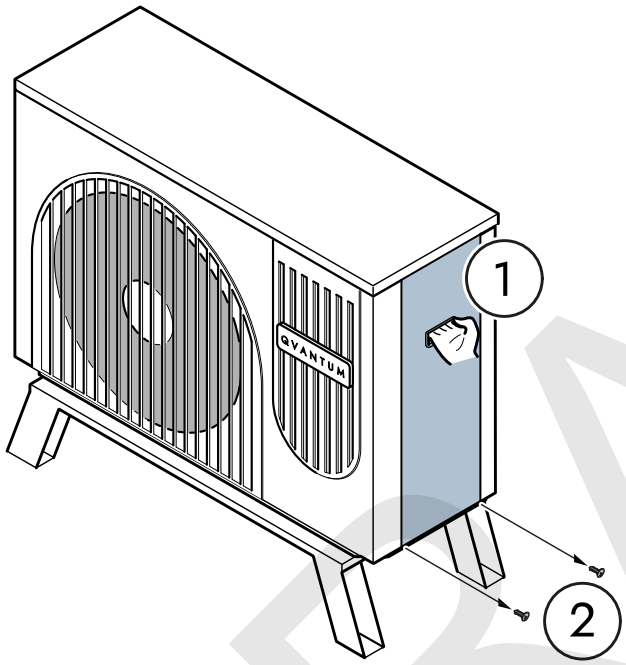


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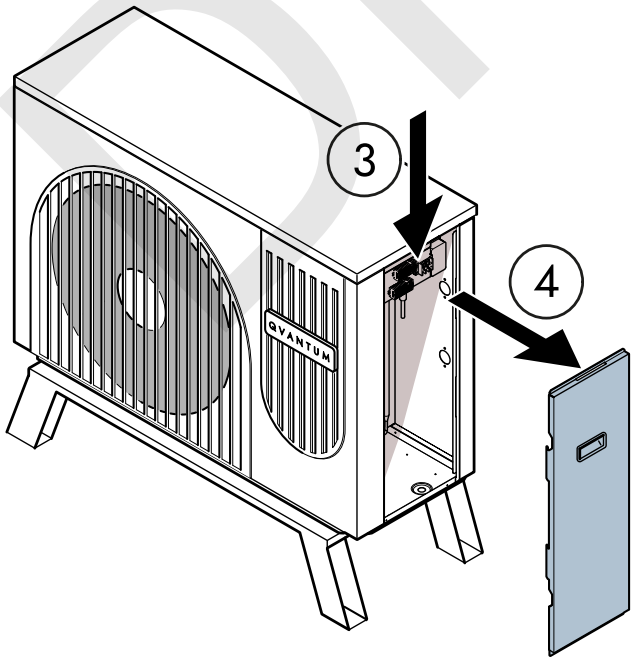


# 5 COMMISSIONING

# 6 COMFORT DISTURBANCE

## 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).
- Internal fuse in the hydronic unit.
- Internal temperature limiter in the hydronic unit.
- That the air flow to the heat pump is not obstructed.

### The heat pump does not start

**An alarm is active**

- Check the display unit of the hydronic unit for information about possible alarms.

**No demand is active**

- Heating or hot water production is not requested by the hydronic unit.

**The compressor is blocked due to temperature limitations**

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

**Not enough time has passed since the previous compressor start**

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

### No communication with hydronic unit

**Erroneous connection of communication**

- Ensure that the communication cable is correctly installed.

**Erroneous set-up in hydronic unit**

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

### Unsatisfactory hot water production

**Increased hot water production**

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

**Erroneous hot water settings**

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

**Obstructed particle filter**

- Turn off the power supply to the heat pump and clean the particle filter.

### Low room temperature

**Insufficient flow in distribution system**

- Fully open several or all thermostats.

**Erroneous room temperature settings**

- Check, and if necessary, change the room temperature settings in the hydronic unit.

**Air in distribution system**

- Vent the distribution system.

**Low compressor frequency**

- Check the compressor frequency and make sure that the compressor parameters are adjusted properly.
  a) If adjusting the compressor settings is not possible or insufficient, contact a service technician.

**Fan is not running or is running too slowly**

- Adjust the fan speed parameters.
  a) If adjusting the fan speed settings is not possible or insufficient, contact a service technician.

**Refrigerant leakage**

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

### High room temperature

**Erroneous room temperature settings**

- Check, and if necessary, change the room temperature settings in the hydronic unit.

### The display is not powering up

This error description is only applicable for units with an internal display unit.

**Electrical connections are not installed correctly**

- Ensure that the display cable is installed correctly.
- In three-phase installations, ensure that the phases are connected in the right phase sequence.

## Unresponsive display unit

This error description is only applicable for units with an internal display unit.

### The display is locked

- Check if a locked icon is visible in the display unit and unlock if necessary.

### The display is broken

- Ensure that the display cable is installed correctly.
- Disconnect and reconnect the power supply cable.

## Frost build-up on evaporator due to insufficient defrosting

### Erroneous defrosting settings

- Check the defrosting settings.

### Faulty EEV (electronic expansion valve)

- Ensure that the EEV works as expected.
  a) If there is a fault on the EEV, contact a service technician.

### Insufficient air flow over the evaporator

- Check the fan and the fan speed settings.

### Refrigerant amount issue

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

### Low compressor frequency

- Check the compressor frequency and make sure that the compressor parameters are adjusted properly.
  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.

### Compressor

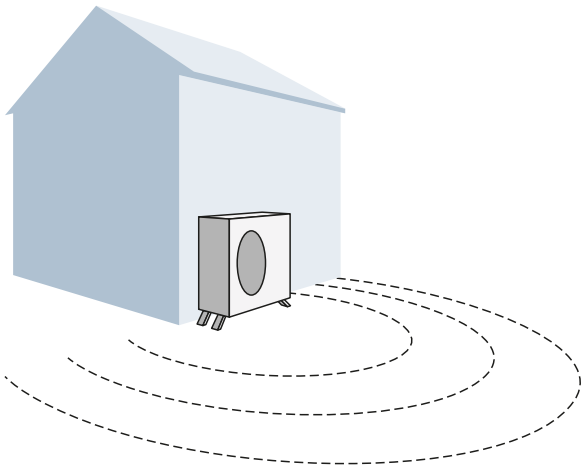
- Ensure that the compressor is functioning correctly and is firmly mounted.

### Adjoining components

- Ensure that sound does not travel because of touching components.

# 7 TECHNICAL SPECIFICATIONS

## Sound levels



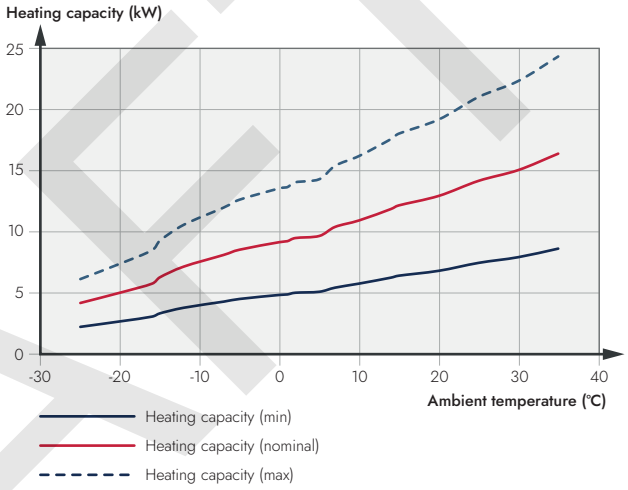
| | QA-6 | QA-9 |
|---|---|---|
| Sound power level, $L_w(A)_{EN12102}$ | 57 | 57 |
| **Sound pressure levels**[1] | | |
| At 1 m | 52 | 52 |
| At 2 m | 46 | 46 |
| At 3 m | 42 | 42 |
| At 4 m | 40 | 40 |
| At 5 m | 38 | 38 |
| At 6 m | 36 | 36 |

| | QA-6 | QA-9 |
|---|---|---|
| At 7 m | 35 | 35 |
| At 8 m | 34 | 34 |
| At 9 m | 33 | 33 |
| At 10 m | 32 | 32 |

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

## Dimensions

## Operational data




## Technical data

| MODEL | | QA-9 | QA-15 (1-PHASE) | QA-15 (3-PHASE) |
|---|---|---|---|---|
| **Energy efficiency, average climate** | | | | |
| The product's efficiency class room heating, average climate 35 / 55 °C | | | A+++/A+++ | |
| The system's efficiency class room heating, average climate 35 / 55 °C | | | A+++/A+++ | |
| **Output data (EN14825)** | | | | |
| Nominal heating output ($P_{designh}$) | kW | 5 | 10 | 10 |
| SCOP average climate, 35 °C / 55 °C | | 5,16 / 3,85 | 5,05 / 3,88 | 5,05 / 3,88 |
| **Heating capacity and COP**[1] | | | | |
| Heating capacity / COP (min) | kW | | 5,34 / 5,09 | 5,34 / 5,09 |
| Heating capacity / COP (nominal) | kW | | 10,35 / 4,91 | 10,35 / 4,91 |
| Heating capacity / COP (max) | A | | 15,37 / 4,53 | 15,37 / 4,53 |
| **Refrigerant circuit** | | | | |
| Type of refrigerant (GWP) | | | R290 (3) | |
| $CO_2$ equivalent | kg | 1,5 | 2,55 | 2,55 |
| Refrigerant quantity | kg | 0,5 | 0,85 | 0,85 |
| Cut-out value pressostat LP | MPa/bar | | 0,8/80 | |
| Cut-out value pressostat HP | MPa/bar | | 3,0/300 | |
| **Heating medium circuit** | | | | |
| Operational range | °C | | -25~43 | |
| Max external available pressure | kPa | | 74 | |
| **Air flow** | | | | |
| Maximum air flow | $m^3/h$ | ?? | ?? | ?? |
| **Electrical data** | | | | |
| Rated voltage | V | 230V 1N ~ 50Hz | 230V 1N ~ 50Hz | 400V 3N ~ 50Hz |
| Maximum power input | kW | 3,0 | 5,3 | 5,3 |
| Maximum current input | A | 13,5 | 24,5 | 10,5 |

| MODEL | | QA-9 | QA-15 (1-PHASE) | QA-15 (3-PHASE) |
|---|---|---|---|---|
| Recommended fuse | A | 16 | | |
| Enclosure class | | IPX4 | | |
| **Sound data** | | | | |
| Sound power level ($L_{W(A)}$)$_{EN12102}$ | dB | 57 | 57 | 58 |
| Sound pressure level (1m) | dB(A) | 42 | 43 | 44 |
| **Fan data** | | | | |
| Fan motor type | | DC motor | | |
| Fan motor power input (min~max) | W | 55~105 | 60~120 | 60~120 |
| Fan speed | rpm | 300~600 | 220~600 | 220~600 |
| **Connection dimensions** | | | | |
| Heating medium, external thread ⌀ | inch | 1 | 1 | 1 |
| **Weight and dimensions** | | | | |
| Net weight | kg | 80 | 160 | 160 |
| Heat pump dimensions (W x D x H) | mm | 1167 x 407 x 795 | 1287 x 458 x 928 | 1287 x 458 x 928 |

1 Ambient temperature: 7°C, supply temperature: 35°C

# Energy labelling

## Information sheet

| SUPPLIER | | QVANTUM | QVANTUM |
|---|---|---|---|
| **MODEL** | | **QA-5** | **QA-9** |
| Temperature application | °C | 35 / 55 | 35 / 55 |
| Seasonal space heating energy efficiency class, average climate | | A+++ / A+++ | A+++ / A+++ |
| Rated heat output ($P_{designh}$), average climate | kW | 5,0 / 4,8 | 9,5 / 9,0 |
| Annual energy consumption space heating, average climate | kWh | 1970 / 2575 | 3823 / 4710 |
| Seasonal space heating energy efficiency, average climate | % | 205 / 150 | 202 / 156 |
| Sound power level $L_{WA}$ indoors | dB | - | - |
| Sound power level $L_{WA}$ outdoors | dB | 57 / 60 | 56 / 57 |

## Data for energy efficiency of the package

| MODEL | | QA-9 | QA-15 |
|---|---|---|---|
| Temperature application | °C | 35 / 55 | 35 / 55 |
| Controller, class | | IV | IV |
| Controller, contribution to efficiency | % | 4 | 4 |
| Seasonal space heating energy efficiency of the package, average climate | % | 209 / 154 | 206 / 160 |
| Seasonal space heating energy efficiency class of the package, average climate | | **A+++ / A+++** | **A+++ / A+++** |

## Technical documentation

| MODEL | | QA-9 | | | | | |
|---|---|---|---|---|---|---|---|
| Type of heat pump | | ☒ Air-water | | | | | |
| | | ☐ Exhaust-water | | | | | |
| | | ☐ Brine-water | | | | | |
| | | ☐ Water-water | | | | | |
| Low-temperature heat pump | | ☐ Yes ☒ No | | | | | |
| Integrated immersion heater for additional heat | | ☐ Yes ☒ No | | | | | |
| Heat pump combination heater | | ☐ Yes ☒ No | | | | | |
| Climate | | ☒ Average ☐ Cold ☐ Warm | | | | | |
| Temperature application | | ☒ Medium (55°C) ☐ Low (35°C) | | | | | |
| Applied standard | | EN14825, EN14511, EN12102 | | | | | |
| *Rated heat output* | Prated | 4,77 | kW | *Seasonal space heating energy efficiency* | $\eta_s$ | 150,1 | % |
| *Declared capacity for space heating at part load and at outdoor temperature Tj* | | | | *Declared coefficient of performance for space heating at part load and at outdoor temperature Tj* | | | |
| Tj = -7 °C | Pdh | 4,2 | kW | Tj = -7 °C | COPd | 2,33 | - |
| Tj = +2 °C | Pdh | 2,7 | kW | Tj = +2 °C | COPd | 3,68 | - |
| Tj = +7 °C | Pdh | 2,6 | kW | Tj = +7 °C | COPd | 5,07 | - |
| Tj = +12 °C | Pdh | 3,0 | kW | Tj = +12 °C | COPd | 7,35 | - |
| Tj = biv | Pdh | 4,2 | kW | Tj = biv | COPd | 2,33 | - |
| Tj = TOL | Pdh | 4,73 | kW | Tj = TOL | COPd | 2,08 | - |
| Tj = -15 °C (if TOL < -20 °C) | Pdh | | kW | Tj = -15 °C (if TOL < -20 °C) | COPd | | - |

| MODEL | | QA-9 | | | | | |
|---|---|---|---|---|---|---|---|
| Bivalent temperature | $T_{biv}$ | -7 | °C | Min. outdoor air temperature | TOL | -10 | °C |
| Cycling interval capacity | Pcych | | kW | Cycling interval efficiency | COPcyc | | - |
| Degradation coefficient | Cdh | 0,99 | - | Max supply temperature | WTOL | 75 | °C |
| *Power consumption in modes other than active mode* | | | | *Additional heat* | | | |
| Off mode | $P_{OFF}$ | 0.010 | kW | Rated heat output | Psup | 0,0 | kW |
| Thermostat-off mode | $P_{TO}$ | 0.010 | kW | | | | |
| Standby mode | $P_{SB}$ | 0.010 | kW | Type of energy input | Electric | | |
| Crankcase heater mode | $P_{CK}$ | 0.042 | kW | | | | |
| *Other items* | | | | | | | |
| Capacity control | Variable | | | Rated airflow (air-water) | | 2500 | $m^3/h$ |
| Sound power level, indoors/outdoors | $L_{WA}$ | - / 60 | dB | Nominal heating medium flow | | | $m^3/h$ |
| Annual energy consumption | $Q_{HE}$ | 2575 | kWh | Brine flow brine-water or water-water heat pumps | | | $m^3/h$ |
| Contact information | *Qvantum Energi AB - Ji-te gatan 7 - 265 38 Åstorp - Sweden* | | | | | | |

| MODEL | | QA-9 | | | | | |
|---|---|---|---|---|---|---|---|
| Type of heat pump | | ☒ Air-water | | | | | |
| | | ☐ Exhaust-water | | | | | |
| | | ☐ Brine-water | | | | | |
| | | ☐ Water-water | | | | | |
| Low-temperature heat pump | | ☐ Yes ☒ No | | | | | |
| Integrated immersion heater for additional heat | | ☐ Yes ☒ No | | | | | |
| Heat pump combination heater | | ☐ Yes ☒ No | | | | | |
| Climate | | ☒ Average ☐ Cold ☐ Warm | | | | | |
| Temperature application | | ☒ Medium (55°C) ☐ Low (35°C) | | | | | |
| Applied standard | | EN14825, EN14511, EN12102 | | | | | |
| *Rated heat output* | Prated | 9,03 | kW | *Seasonal space heating energy efficiency* | $\eta_s$ | 155,5 | % |
| *Declared capacity for space heating at part load and at outdoor temperature Tj* | | | | *Declared coefficient of performance for space heating at part load and at outdoor temperature Tj* | | | |
| Tj = -7 °C | Pdh | 8,0 | kW | Tj = -7 °C | COPd | 2,41 | - |
| Tj = +2 °C | Pdh | 4,9 | kW | Tj = +2 °C | COPd | 3,77 | - |
| Tj = +7 °C | Pdh | 5,8 | kW | Tj = +7 °C | COPd | 5,38 | - |
| Tj = +12 °C | Pdh | 6,5 | kW | Tj = +12 °C | COPd | 7,07 | - |
| Tj = biv | Pdh | 8,0 | kW | Tj = biv | COPd | 2,41 | - |
| Tj = TOL | Pdh | 9,2 | kW | Tj = TOL | COPd | 2,02 | - |
| Tj = -15 °C (if TOL < -20 °C) | Pdh | | kW | Tj = -15 °C (if TOL < -20 °C) | COPd | | - |
| | | | | | | | |
| Bivalent temperature | $T_{biv}$ | -7 | °C | Min. outdoor air temperature | TOL | -10 | °C |
| Cycling interval capacity | Pcych | | kW | Cycling interval efficiency | COPcyc | | - |
| Degradation coefficient | Cdh | 0,99 | - | Max supply temperature | WTOL | 75 | °C |
| *Power consumption in modes other than active mode* | | | | *Additional heat* | | | |
| Off mode | $P_{OFF}$ | 0.009 | kW | Rated heat output | Psup | 0,0 | kW |
| Thermostat-off mode | $P_{TO}$ | 0.009 | kW | | | | |
| Standby mode | $P_{SB}$ | 0.009 | kW | Type of energy input | Electric | | |
| Crankcase heater mode | $P_{CK}$ | 0.042 | kW | | | | |
| *Other items* | | | | | | | |

| MODEL | QA-9 | | | | | | |
|---|---|---|---|---|---|---|---|
| Capacity control | Variable | | | Rated airflow (air-water) | | 4000 | $m^3/h$ |
| Sound power level, indoors/outdoors | $L_{WA}$ | - / 57 | dB | Nominal heating medium flow | | | $m^3/h$ |
| Annual energy consumption | $Q_{HE}$ | 4710 | kWh | Brine flow brine-water or water-water heat pumps | | | $m^3/h$ |
| Contact information | *Qvantum Energi AB - Ji-te gatan 7 - 265 38 Åstorp - Sweden* | | | | | | |

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**Qvantum Energi AB**
Ji-te gatan 7, 265 38 Åstorp – Sweden | qvantum.com

QVANTUM