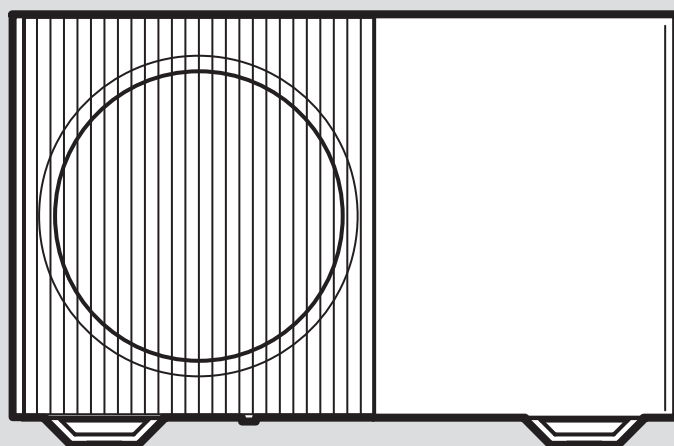




aroTHERM perform

VWL 175/8.1 A S3 Q

VWL 215/8.1 A S3 Q



Installation and maintenance instructions

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1 Safety

1.1 Intended use

There is a risk of injury or death to the user or others, or of damage to the product and other property in the event of improper use or use for which it is not intended.

The product is the outdoor unit of an air-to-water heat pump with monoblock design.

The product uses the outdoor air as a heat source and can be used to heat a residential building and for domestic hot water generation.

The intended use allows for these product combinations:

Outdoor unit	Indoor unit
VWL ..5/8.1 A ..	VWZ MWT 200
	VWZ AI /8 230V iQ

The air that escapes from the product must be able to flow out freely, and must not be used for any other purposes.

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

Intended use includes the following:

- observance of accompanying installation and maintenance instructions for the product and any other system components
- installing and setting up the product in accordance with the product and system approval
- compliance with all inspection and maintenance conditions listed in the instructions.

Intended use also covers installation in accordance with the IP code.

Any other use that is not specified in these instructions, or use beyond that specified in this document, shall be considered improper use. Any direct commercial or industrial use is also deemed to be improper.

Caution.

Improper use of any kind is prohibited.

1.2 Qualification

1.2.1 General qualifications

The following work must only be carried out by competent persons who are sufficiently qualified to do so:

- Set-up
 - Dismantling
 - Installation
 - Start-up
 - Inspection and maintenance
 - Repair
 - Decommissioning
- Proceed in accordance with current technology.

1.2.2 Qualification for R290 refrigerant

Any activity that requires the product to be opened must only be carried out by competent persons who have knowledge about the particular properties and risks of refrigerant.

Specific expert refrigeration knowledge in compliance with the local laws is required when carrying out work on the refrigerant circuit. This also includes specialist knowledge about handling flammable refrigerants, the corresponding tools and the required personal protective equipment.

- Comply with the corresponding local laws and regulations.

1.2.3 Qualification for electrical installation

Work on the electrical system and electrical equipment must only be carried out by qualified electricians who are sufficiently trained to do so.

1.3 General safety information

The following sections convey important safety information. It is essential to read and observe this information in order to prevent risk of death, risk of injury, material damage or environmental damage.

1.3.1 R290 refrigerant

The product contains the refrigerant R290.

In the event of a leak, escaping refrigerant may mix with air to form a flammable atmosphere. In conjunction with a source of ignition, there is a risk of fire and explosion.





In the event of a leak, escaping refrigerant may collect on the floor and a suffocating or toxic atmosphere may form. There is a risk of suffocation and poisoning.

Note that the refrigerant is odourless.

Storage

- ▶ Only store the product in rooms with no permanent ignition sources. Examples of such ignition sources include naked flames, a gas-fired boiler that is switched on, or an electric heater.
- ▶ Ensure that the refrigerant cannot deliberately get into the waste-water system.

Transport

- ▶ During transport, never tilt the product by any more than the 45°.

Installation

- ▶ Please note that a protective zone is defined around the product. (→ Section 4)

Installation and maintenance

- ▶ If you are working on the product when it is open, before starting work, use a gas sniffer to ensure that there is no leak.
- ▶ The gas sniffer itself must not be an ignition source. The gas sniffer must be calibrated to R290 refrigerant and set to $\leq 25\%$ of the lower explosive limit.
- ▶ Keep all ignition sources, be they temporary or permanent, away from the product. Ignition sources are, for example, open flames, electrical systems, plug sockets, lamps, light switches, electrical utility connections, hot surfaces with temperatures above 370 °C, electrical devices or tools that are not free of ignition sources, or static discharges.
- ▶ Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- ▶ Ensure that the escaping refrigerant does not collect in a recess.
- ▶ Ensure that the escaping refrigerant cannot get inside the building via building openings.
- ▶ Never make any changes to the product where these involve drilling into the product.

Repair

- ▶ Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ▶ Only use tools and units that are permitted for the refrigerant and are in proper working condition.
- ▶ Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the refrigerant cylinder.
- ▶ Note that the refrigerant must never be introduced into the waste-water system.

Decommissioning

- ▶ Drain the heating circuit in order to prevent damage caused by ice formation.

Recycling and disposal

- ▶ Extract the refrigerant that is contained in the product fully into a suitable vessel.
- ▶ Arrange for the refrigerant to be recycled or disposed of by certified competent persons in accordance with regulations.

1.3.2 Electricity

There is a risk of death from electric shock if you touch live components.

Before commencing work on the product:

- ▶ Disconnect the product from the power supply by switching off all power supplies at all poles (electrical partition in over-voltage category III for full partition, e.g. fuse or circuit breaker).
- ▶ Secure against being switched back on again.
- ▶ Wait at least 5 minutes until the condensers have discharged.
- ▶ Check that there is no voltage.

1.3.3 Hot or cold components

There is a risk of burns and frostbite from some components, particularly uninsulated pipelines.

- ▶ Only carry out work on the components once these have reached environmental temperature.

Due to the surface colour, the surface can heat up in direct sunlight and cause burns if touched.

- ▶ Do not touch the surface if the outdoor unit is exposed to direct sunlight for a long period of time.





- ▶ Only touch the surface if you can ensure that the surface is not hot. If necessary, wait until the outdoor unit is no longer exposed to direct sunlight and the surface has cooled down.

1.3.4 Installation site

- ▶ Ensure that the installation surface has sufficient load-bearing capacity to bear the total weight of the product.
- ▶ Ensure that the product is aligned horizontally.
- ▶ Ensure that the anti-vibration feet used are firmly attached to the installation surface.
- ▶ Ensure that the product is screwed to the anti-vibration feet.
- ▶ Ensure that you do not damage the heat insulation on the lines in order to prevent condensation.

1.3.5 Tools

To prevent material damage:

- ▶ Only use appropriate tools.

1.3.6 Weight

To prevent injuries when transporting the product

- ▶ Note the heavy empty weight of the product.
- ▶ People are not permitted to transport the product.
- ▶ Instead, use a crane or a forklift truck.

To prevent material damage:

- ▶ During transport, never tilt the product by any more than the 45°.
- ▶ Use suitable aids when transporting and setting up the product.

1.3.7 Safety devices

- ▶ Install the necessary safety devices in the installation.
- ▶ Observe the applicable national and international laws, standards and directives.
- ▶ Ensure that the heating installation is in a technically perfect condition.
- ▶ Ensure that no safety or monitoring devices have been removed, bridged or disabled.
- ▶ Immediately eliminate any faults and damage that may affect safety.

1.3.8 Hydraulics installation

The use of glycol or other substances that alter the viscosity of the water is not permitted in a direct connection where the outdoor and indoor units use the same fluid.

The use of glycol is only permitted when using a system separator.

Filling the heating circuit via the return while the product is switched off, by manually operating the isolation valve, is only permitted in exceptional circumstances, provided that it is ensured that the heating pump does not run dry.

1.4 Regulations (directives, laws, standards)

- ▶ Observe the national regulations, standards, directives, ordinances and laws.



2 Notes on the documentation

2.1 Documents

- ▶ Always observe all the operating and installation instructions included with the system components.
- ▶ Pass these instructions and all other applicable documents on to the end user.

2.2 Validity of the instructions

These instructions apply for the following products only:

Product article number

VWL 175/8.1 A S3 Q	8000010896
VWL 215/8.1 A S3 Q	8000010889

2.3 Further information

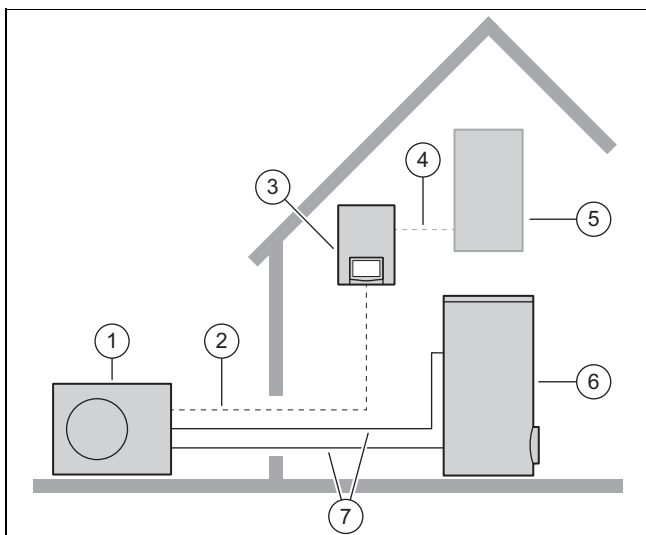


- ▶ Scan the displayed code using your smartphone in order to view further information about your product.
 - ◀ You are guided to the Internet portal.

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with monoblock technology:



- | | |
|-------------------|----------------------------|
| 1 Outdoor unit | 5 Back-up boiler, optional |
| 2 SystemLAN cable | 6 Cylinder |
| 3 Indoor unit | 7 Building circuit |
| 4 SystemLAN cable | |

3.2 Description of the product

The product is the outdoor unit of an air-to-water heat pump with monoblock technology.

3.3 Noise reduction mode

The product has a noise reduction mode function.

In noise reduction mode, the product operates more quietly than in normal operating mode. This is achieved using a limited compressor rotational speed and an adjusted fan speed.

Activating noise reduction mode reduces the heat pump's heat output.

It is activated and operated via the indoor unit.

3.4 Functions of the heat pump

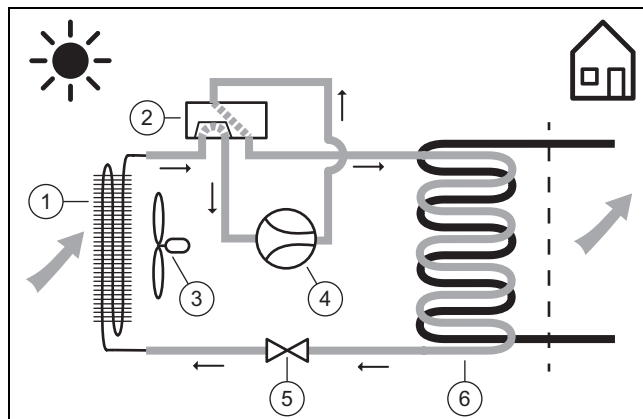
The heat pump has a closed refrigerant circuit in which refrigerant circulates.

In heating mode, cyclic evaporation, compression, condensation and expansion take in heat energy from the surroundings and transfer it to the building.

Validity: Product with cooling mode

In cooling mode, heat energy is extracted from the building and released into the environment.

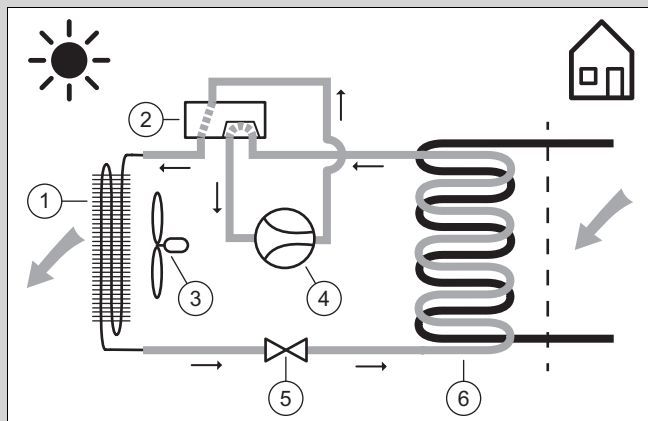
3.4.1 Operating principle in heating mode



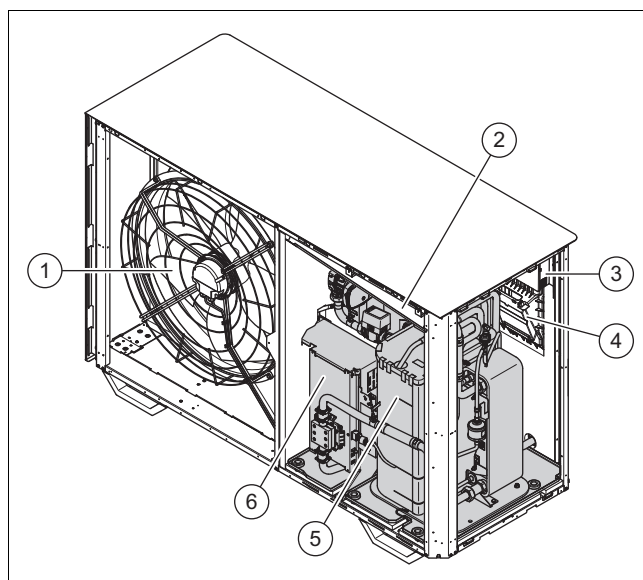
- | | |
|-------------------------|------------------------------|
| 1 Evaporator | 4 Compressor |
| 2 4-port diverter valve | 5 Electronic expansion valve |
| 3 Fan | 6 Condenser |

3.4.2 Operating principle in cooling mode

Validity: Product with cooling mode



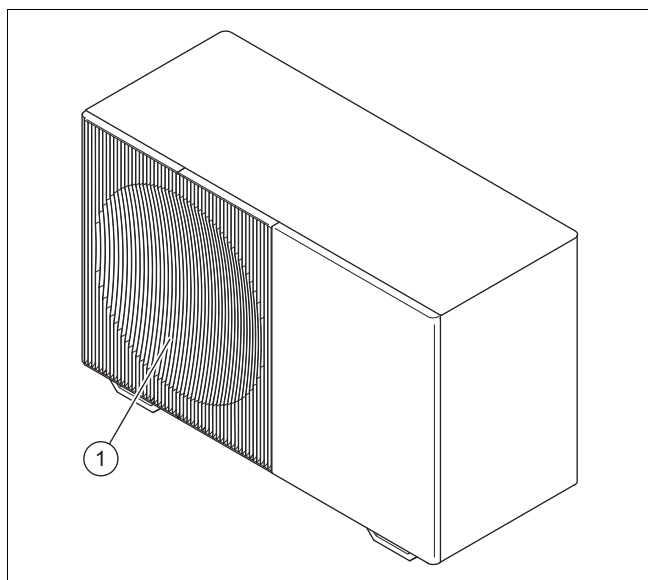
- | | | | |
|---|-----------------------|---|-----------------|
| 1 | Condenser | 4 | Compressor |
| 2 | 4-port diverter valve | 5 | Expansion valve |
| 3 | Fan | 6 | Evaporator |



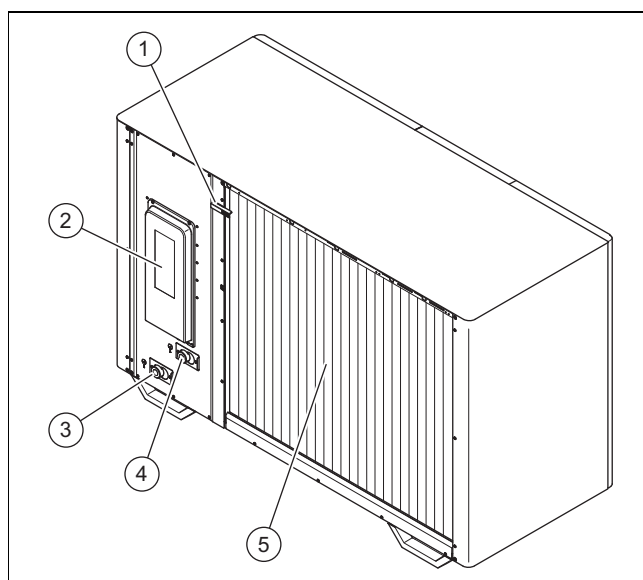
- | | | | |
|---|------------------|---|---------------------|
| 1 | Fan | 4 | Installer Board PCB |
| 2 | Drainage channel | 5 | Compressor assembly |
| 3 | HMU PCB | 6 | Inverter assembly |

3.5 Product design

3.5.1 Unit

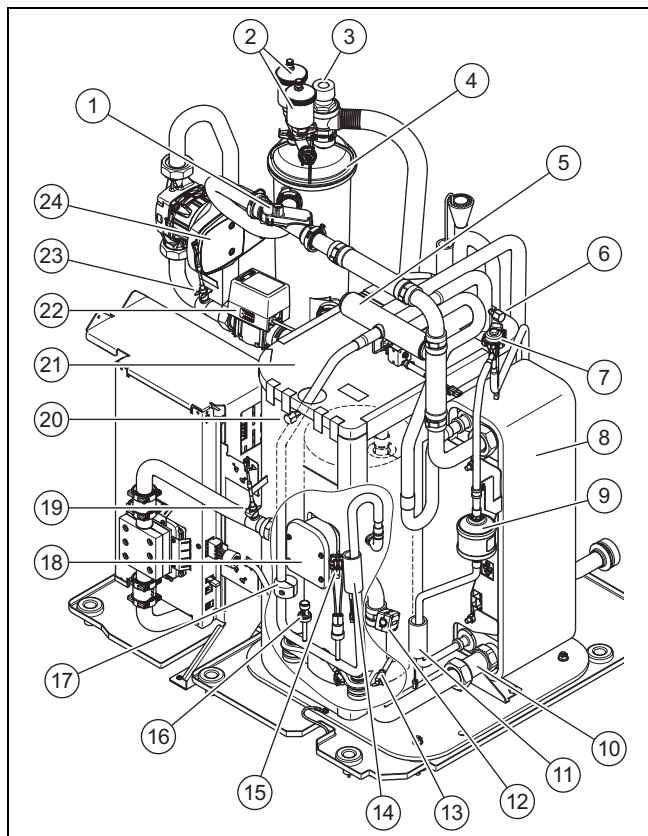


- 1 Air outlet grille



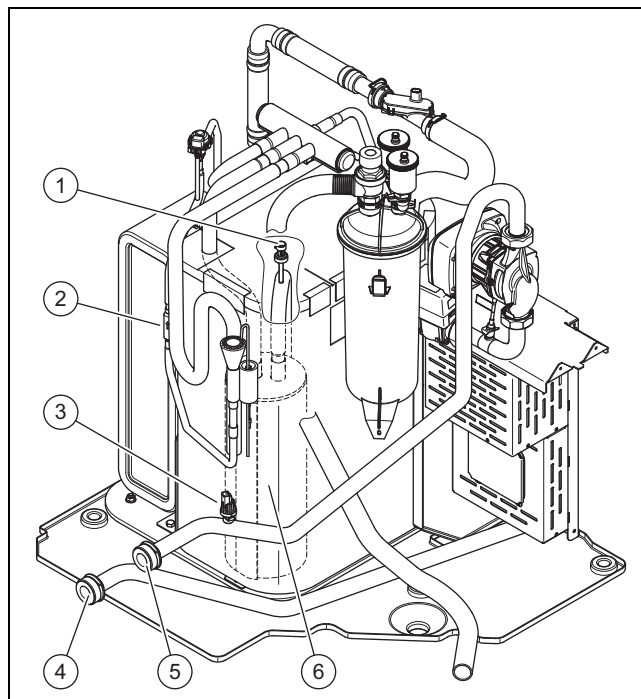
- | | | | |
|---|---|---|---------------------------------------|
| 1 | Temperature sensor (at the air inlet) | 4 | Connection for heating flow, G 1 1/2" |
| 2 | Cover for the electrical connections | 5 | Evaporator (at the air inlet) |
| 3 | Connection for heating return, G 1 1/2" | | |

3.5.2 Compressor assembly, front view



- | | |
|---|---|
| 1 Volume flow sensor | 14 Temperature sensor downstream of the compressor |
| 2 Automatic air vent | 15 Pressure switch in the high-pressure area |
| 3 Expansion relief valve | 16 Pressure sensor in the high-pressure area |
| 4 Refrigerant separator | 17 Vibration damper |
| 5 4-port diverter valve | 18 Electrical connection for the compressor |
| 6 Maintenance connection in the low-pressure area | 19 Return temperature sensor |
| 7 Electronic expansion valve | 20 Maintenance connection in the high-pressure area |
| 8 Condenser | 21 Insulation cover assembly for the compressor |
| 9 Filter | 22 Heating circuit isolation valve |
| 10 Non-return valve | 23 Flow temperature sensor |
| 11 Temperature sensor downstream of the condenser | 24 Heating pump |
| 12 Ferrite | |
| 13 Crankcase heater | |

3.5.3 Compressor assembly, rear view



- | | |
|--|---------------------------------|
| 1 Pressure sensor in the low-pressure area | 4 Connection for heating return |
| 2 Filter | 5 Connection for heating flow |
| 3 Pressure sensor in the heating circuit | 6 Refrigerant buffer vessel |

3.6 Information on the data plate

The first data plate is located on the rear of the product.

Information	Meaning
Serial no.	Unique unit identification number
VWL ...	Nomenclature
IP	Protection class
P max	Rated power, maximum

Validity: Product with cooling mode

A second data plate is located inside the product. It becomes visible when the left-hand side casing is removed.

Information	Meaning
	Compressor
	Control
I max	Rated current, maximum
I	In-rush current
MPa (bar)	Permissible operating pressure
	Refrigerant circuit
R290	Refrigerant type
GWP	Global Warming Potential
kg	Fill quantity
t CO ₂	CO ₂ equivalent
Ax/Wxx	Air inlet temperature x °C and heating flow temperature xx °C

Information	Meaning
COP / 	Coefficient of performance/heating mode
EER / 	Energy efficiency ratio/cooling mode
Appliance Revision	Unit revision

3.7 Connection symbols

Symbol	Connection
 →	Heating flow of the outdoor unit
 ←	Heating return to the outdoor unit

3.8 Warning sticker

Safety-relevant stickers are affixed to several points on the product. The warning stickers include rules of conduct for the R290 refrigerant. The warning stickers must not be removed.

Symbol	Meaning
 A3 R290	Warning against flammable materials in conjunction with R290 refrigerant.
	Read the instructions.
	Safety warning, read the instructions.
	Service information, read the instructions.

3.9 CE marking



The CE marking shows that the products comply with the basic requirements of the applicable EU laws as stated on the Declaration of Conformity.

The Declaration of Conformity can be viewed at the manufacturer's site.

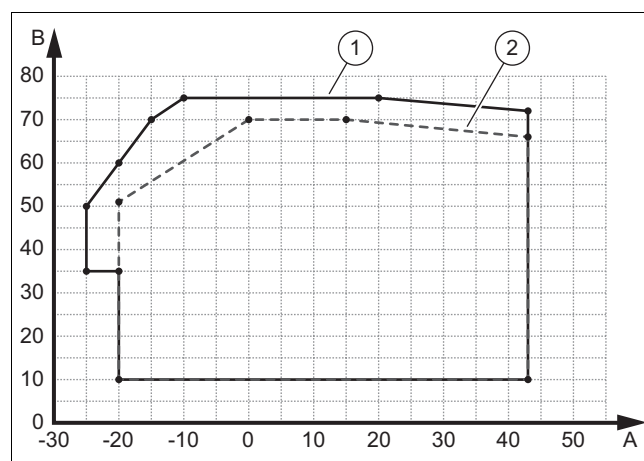
3.10 Application limits

Validity: Product with cooling mode

The product works between a minimum and maximum outdoor temperature. These outdoor temperatures define the application limits for the heating mode, domestic hot water generation and cooling mode. Operating outside of the application limits leads to the product switching off.

3.10.1 Application limits, heating mode and domestic hot water generation

In heating mode or for domestic hot water generation, the product works at outdoor temperatures of -25 °C to 43 °C.



A Outdoor temperature

B Water temperature

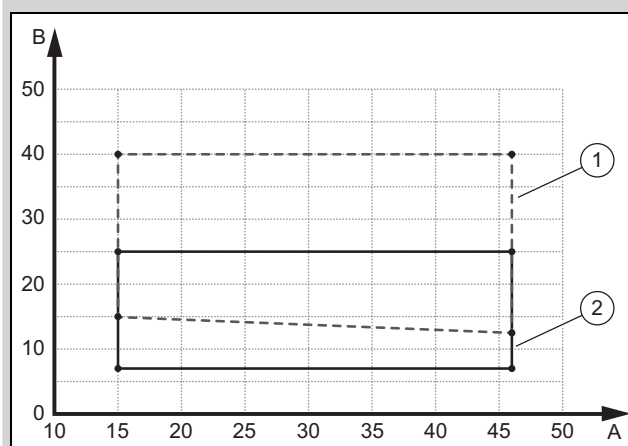
1 Application limits, normal operation for heating or domestic hot water

2 Application limit, start phase for heating or domestic hot water

3.10.2 Application limits, cooling mode

Validity: Product with cooling mode

In cooling mode, the product works at outdoor temperatures of 15 °C to 46 °C.



A Outdoor temperature

B Heating water temperature

1 Application limits, cooling start phase

2 Application limits, normal cooling operation

3.11 De-icing mode

At outdoor temperatures below 5 °C, condensation on the fins of the evaporator may freeze and frost may form in heating mode. This frost is automatically detected and is automatically de-iced at certain intervals.

The de-icing occurs by reversing the refrigeration circuit while the heat pump is operating. The heat energy that is required for this is taken from the heating installation.

Correct de-icing operation is only possible if the minimum volume of heating water is circulating in the heating installation:

Output of the electric back-up heater	15–21 kW
	Minimum volume of heating water
0.0 kW	130 litres
6.0 kW	70 litres
9.0 kW	50 litres
12.0 kW	30 litres
≥ 14.0 kW	0 litres

The values in the table refer to a heating water temperature of 20 °C (at the start of de-icing mode). These values do not include the water volume in the outdoor unit.

Do not use auxiliary equipment to speed up the de-icing process.

Fault-free operation in heating mode is possible without adding additional water. A water flow rate of 2200 l/h is required for de-icing operations. If the water flow rate is lower, the pressure loss must be reduced, e.g. by installing a bypass valve.

An electric back-up heater can be installed as an option.

When using an external back-up heater that is actuated via contacts C1/C2 of the indoor unit, a minimum volume of heating water must be taken into consideration:

External back-up heater	Minimum volume of heating water
eBUS for eloBLOCK	50 litres
Vaillant eBUS gas-fired boiler	100 litres
Other manufacturers	130 litres

The values in the table refer to a heating water temperature of 20 °C (at the start of de-icing mode). These values do not include the water volume in the outdoor unit.

3.12 Minimum volume of heating water in cooling mode

Validity: Product with cooling mode

In cooling mode, the water temperature may drop sharply if the cold cannot be removed sufficiently due to closed valves, for example.

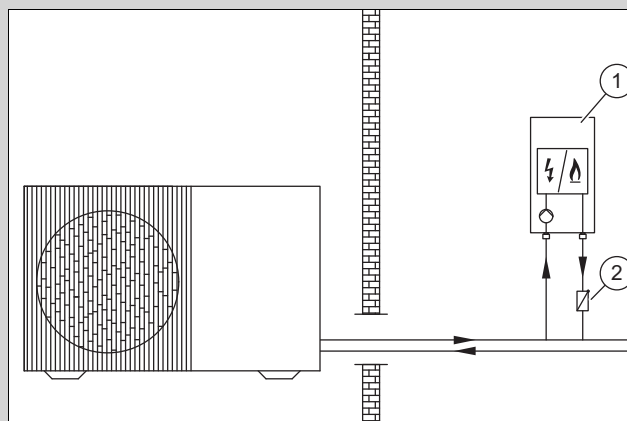
To fulfil the requirement of the minimum water temperature and the minimum running time of the compressor, a minimum volume of heating water must circulate in cooling mode:

Validity: Product with cooling mode

Type of heating system	Minimum volume of heating water
Underfloor heating	50 litres
Fan coils	80 litres

3.13 Requirement for cooling mode

Validity: Product with cooling mode



When hydraulically connecting a back-up boiler (1), a non-return valve must be integrated into the flow (2) of the back-up boiler in cooling mode. The non-return valve prevents cold flow heating water from entering the back-up boiler and prevents damage caused by condensation.

3.14 Safety devices

The product is equipped with technical safety devices. See "Safety devices" graphic in the appendix.

If the refrigerant circuit pressure exceeds the maximum pressure of 3.15 MPa (31.5 bar), the pressure switch temporarily switches the product off. Following a waiting time, another attempt is made to start it. After three failed start attempts in succession, a fault message is displayed on the indoor unit's display.

When the product is switched off, the crankcase heater switches on if the compressor outlet temperature drops below 7 °C. This prevents possible damage when switching on again.

If the temperature measured at the compressor outlet is higher than the permissible temperature, the compressor is switched off. The permissible temperature depends on the evaporation and condensation temperature.

The pressure in the heating circuit is monitored using a pressure sensor. If the pressure falls below 0.5 bar, a fault shutdown occurs. If the pressure rises to above 0.7 bar, the fault is reset again.

The pressure in the heating circuit is protected by an expansion relief valve. The load relief occurs at 2.5 bar.

The product is equipped with an automatic air vent. This must not be sealed.

The heating circuit's circulation water volume is monitored using a flow rate sensor. If no flow rate can be detected when there is a heat demand when the circulation pump is running, the compressor does not start up.

If the heating water temperature falls below 4 °C, the product's frost protection function is automatically activated as the heating pump is started.

4 Protective zone

4.1 General information

The product contains R290 refrigerant. Note that this refrigerant has a higher density than air. In the event of a leak, escaping refrigerant may collect near the ground.

The refrigerant must not collect in any way that may lead to a dangerous, explosive, suffocating or toxic atmosphere. The refrigerant must not get inside the building via building openings. The refrigerant must not collect in recesses.

A protective zone is defined around the product. There must be no windows, doors, light shafts, cellar entrances, escape hatches, flat-roof windows or ventilation openings in the protective zone.

Follow the national regulations if they are stricter than the explanations listed in this section.

There must be no ignition sources, such as plug sockets, light switches, lamps, electrical switches or other permanent ignitions sources, in the protective zone.

The protective zone must not extend to adjacent buildings or public traffic areas.

In the protective zone, you are not permitted to make any subsequent structural alterations which infringe the stated rules for the protective zone.

Observe the minimum clearance between the rear of the product and the wall. (→ Section 5.4) The ground installation and flat-roof installation types must only be used if the clearance to the wall is > 1.000 mm.



Note

If the required protective zone cannot be maintained for structural reasons, the protective zone can be reduced by activating the Flexible Space function. If the outdoor unit is installed in an area with a smaller protective zone, the Flexible Space function must remain permanently activated and the outdoor unit must be permanently supplied with power (even during prolonged periods of absence). Activating the Flexible Space function slightly reduces the system efficiency and slightly increases the standby energy consumption.

The installation of a base cover applies only for the ground installation and flat-roof installation types.

Any type of additional casing or covering of the outdoor unit is not permitted.

The following sections describe the protective zone depending on the activated or deactivated Flexible Space function. This function can be selected in the installation assistant on the indoor unit's control.

4.2 Protective zone with deactivated Flexible Space Function

The configuration with deactivated Flexible Space function corresponds to the factory setting.

The following sections describe the protective zone with the Flexible Space function deactivated.

Installation method with deactivated Flexible Space function

Free-standing ground installation or flat-roof installation (→ Section 4.2.1)

Installation in front of a building wall (→ Section 4.2.2)

Installation in the right-hand corner of a building (→ Section 4.2.3)

Installation in the left-hand corner of a building (→ Section 4.2.4)

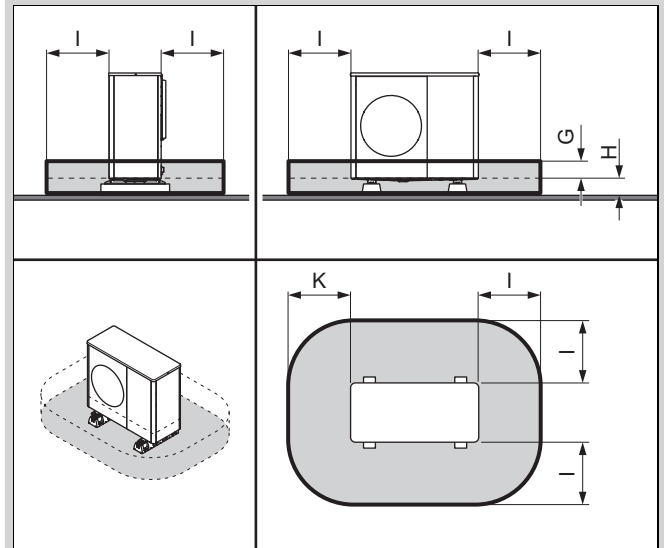
Installation with plinth wall on the right (→ Section 4.2.5)

Installation with plinth wall on the left (→ Section 4.2.6)

4.2.1 Free-standing ground installation or flat-roof installation

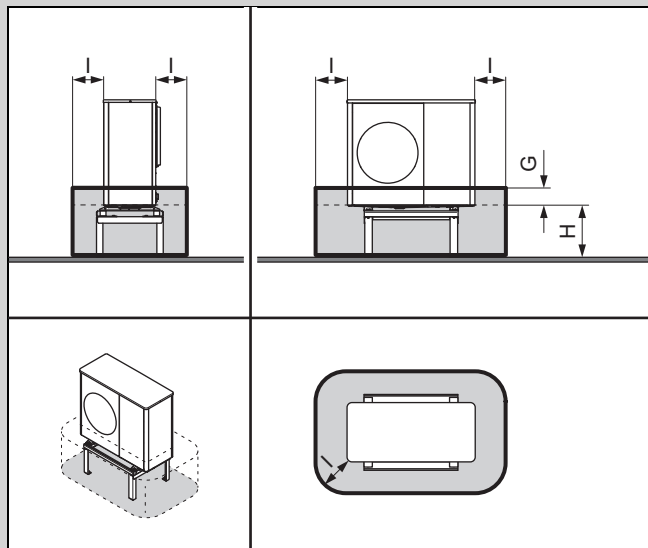
The clearance to the wall must be > 1000 mm for the unit to be considered free-standing.

Validity: Installation height < 400 mm



	Without base cover	With base cover
G	100 mm	100 mm
H	< 400 mm	< 400 mm
I	1000 mm	1200 mm
K	500 mm	500 mm

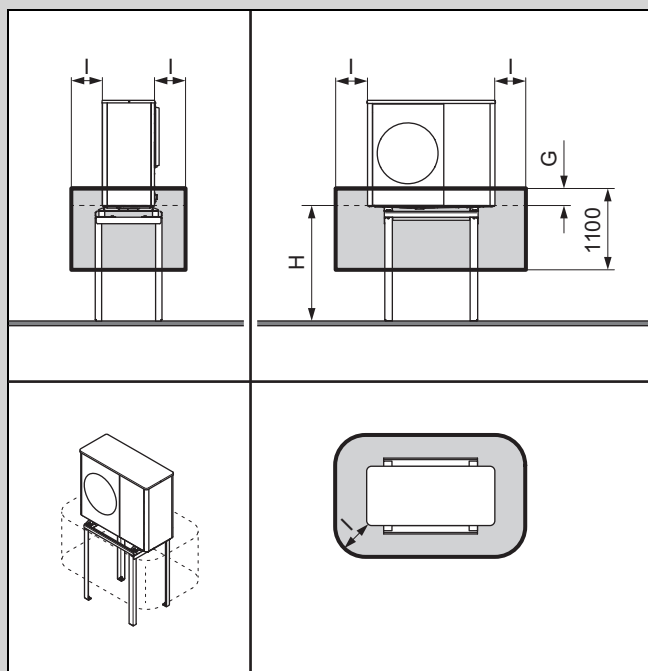
Validity: Installation height from 400 to 1000 mm



	With or without base cover
G	100 mm
H	400 to 1000 mm
I	500 mm

Suitable for installation with a raised base.

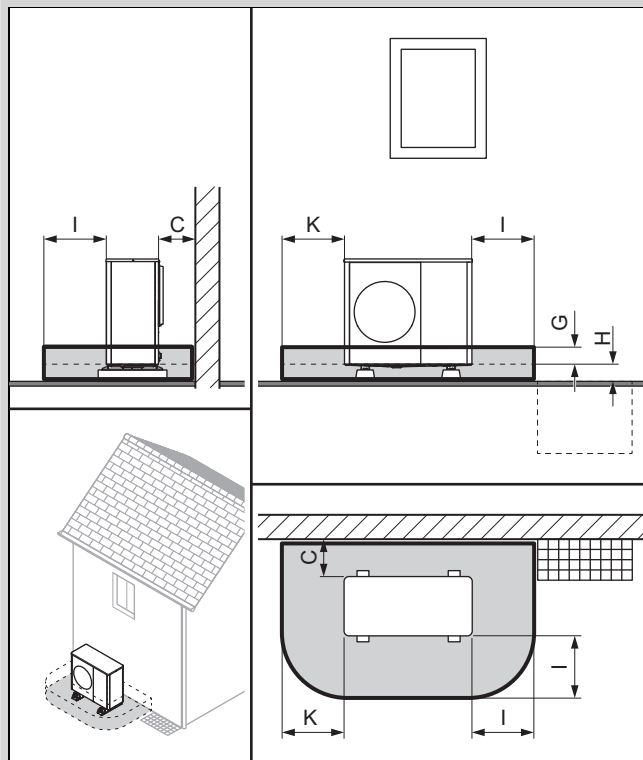
Validity: Installation height > 1000 mm



	Without base cover
G	100 mm
H	> 1000 mm
I	500 mm

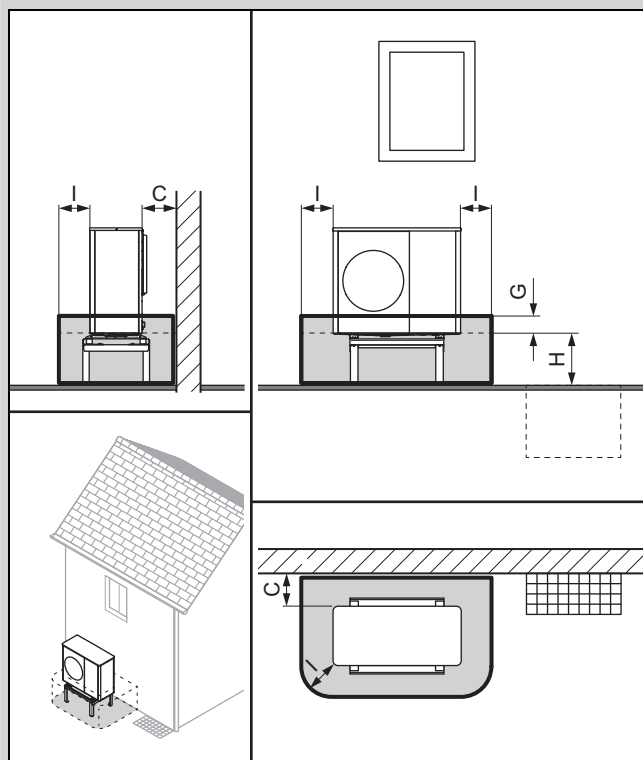
4.2.2 Installation in front of a building wall

Validity: Installation height < 400 mm



	Without base cover	With base cover
C	Minimum clearance (→ Section 5.4)	Minimum clearance (→ Section 5.4)
G	100 mm	100 mm
H	< 400 mm	< 400 mm
I	1000 mm	1200 mm
K	500 mm	1200 mm

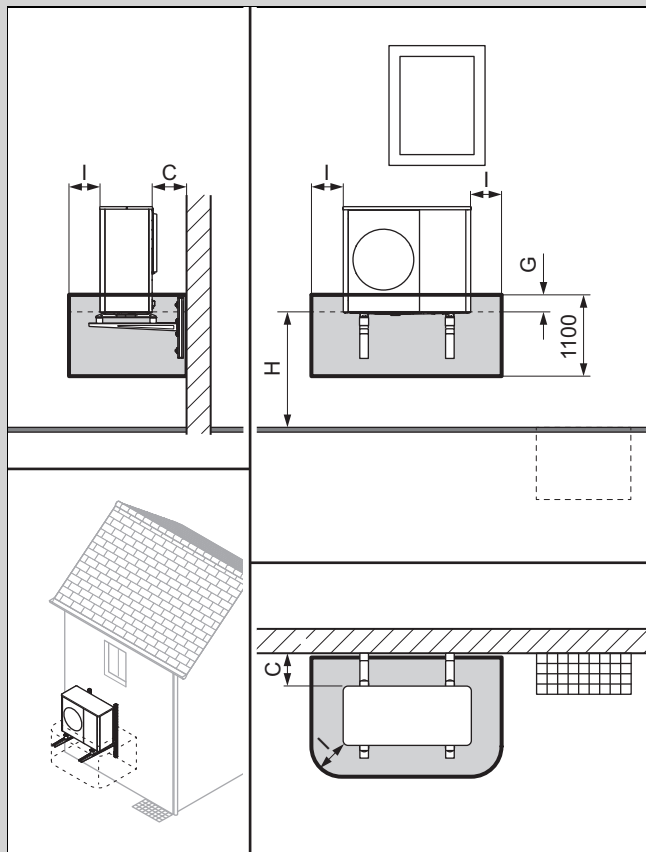
Validity: Installation height from 400 to 1000 mm



	Without base cover
C	Minimum clearance (→ Section 5.4)
G	100 mm
H	400 to 1000 mm
I	500 mm

Suitable for installation with a raised base.

Validity: Installation height > 1000 mm



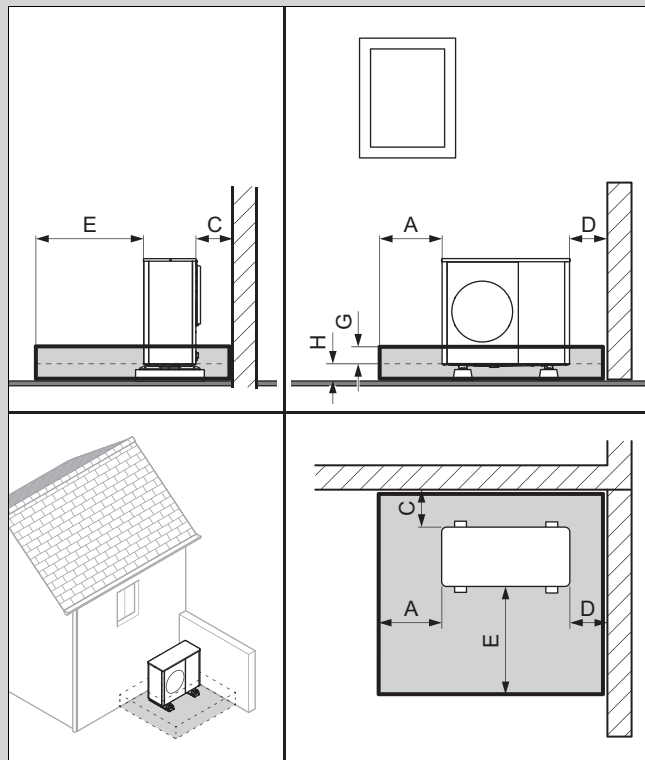
	Without base cover
C	Minimum clearance (→ Section 5.4)
G	100 mm
H	> 1000 mm
I	500 mm

4.2.3 Installation in the right-hand corner of a building

If the clearance to the rear or side panel is ≤ 1000 mm, the protective zone applies up to the side panel. Observe the minimum clearances. (→ Section 5.4)

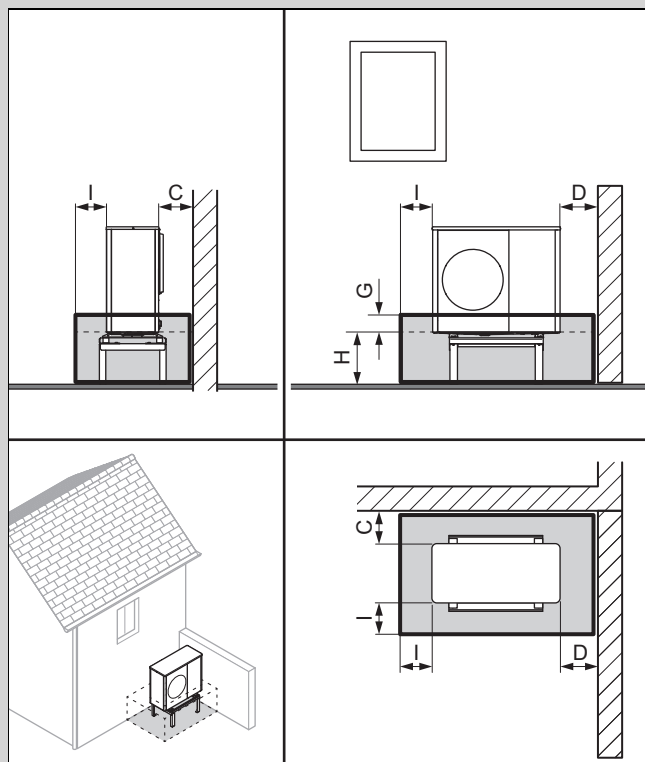
If the clearance to the rear or side panel is > 1000 mm, the configuration as a free-standing installation must be taken into account.

Validity: Installation height < 400 mm



	Without base cover	With base cover
A	1000 mm	2000 mm
C	Minimum clearance (→ Section 5.4)	Minimum clearance (→ Section 5.4)
D	Minimum clearance (→ Section 5.4)	Minimum clearance (→ Section 5.4)
E	1200 mm	1600 mm
G	100 mm	100 mm
H	< 400 mm	< 400 mm

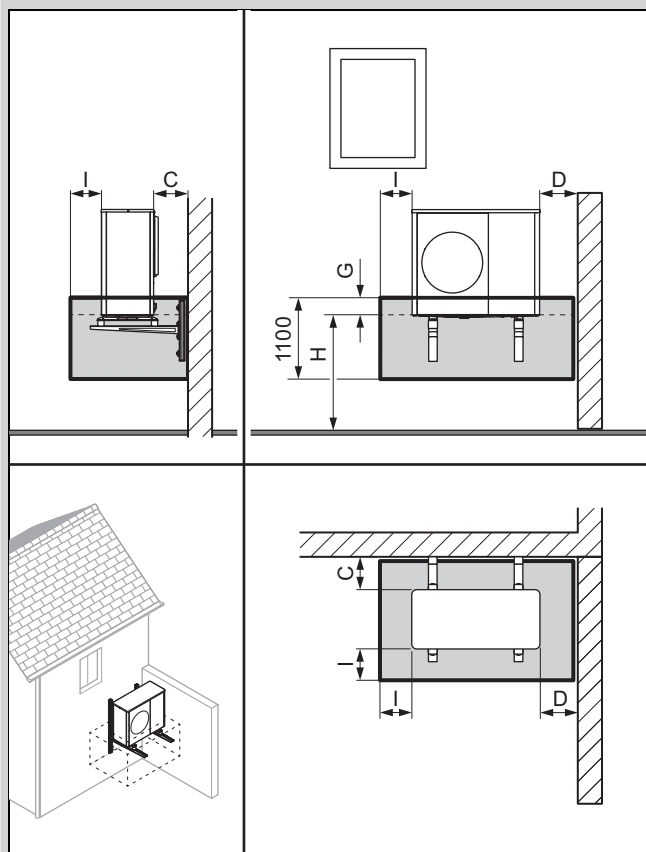
Validity: Installation height from 400 to 1000 mm



	Without base cover
C	Minimum clearance (→ Section 5.4)
D	Minimum clearance (→ Section 5.4)
I	500 mm
G	100 mm
H	400 to 1000 mm

Suitable for wall-mounting or installation with a raised base.

Validity: Installation height > 1000 mm



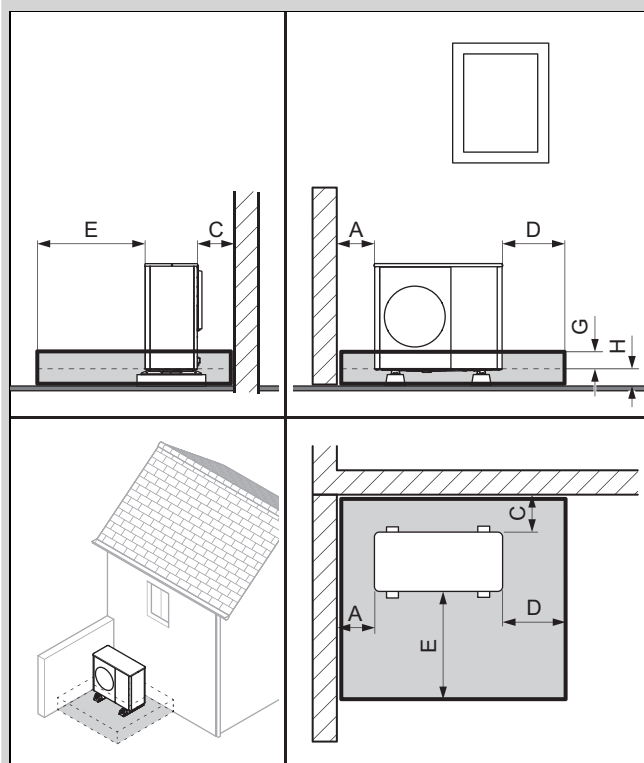
	Without base cover
C	Minimum clearance (→ Section 5.4)
D	Minimum clearance (→ Section 5.4)
I	500 mm
G	100 mm
H	> 1000 mm

4.2.4 Installation in the left-hand corner of a building

If the clearance to the rear or side panel is ≤ 1000 mm, the protective zone applies up to the side panel. Observe the minimum clearances. (→ Section 5.4)

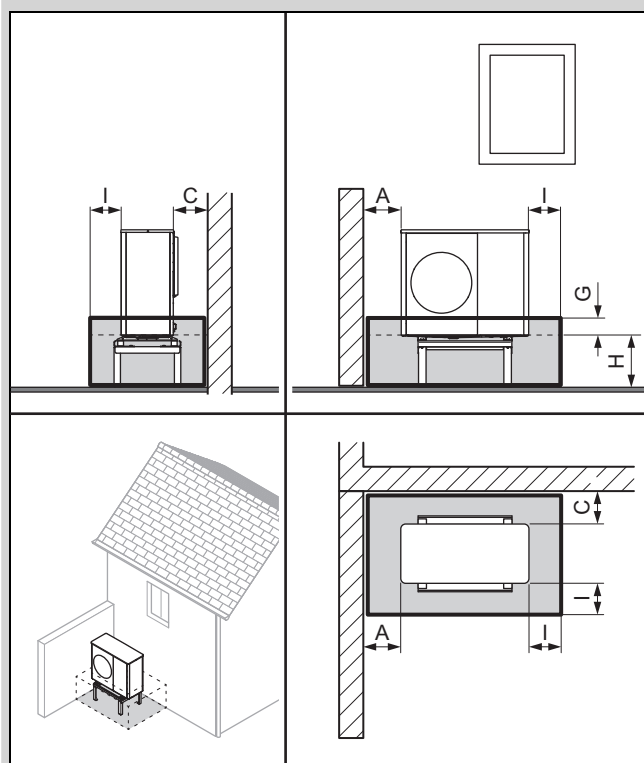
If the clearance to the rear or side panel is > 1000 mm, the configuration as a free-standing installation must be taken into account.

Validity: Installation height < 400 mm



	Without base cover	With base cover
A	Minimum clearance (→ Section 5.4)	Minimum clearance (→ Section 5.4)
C	Minimum clearance (→ Section 5.4)	Minimum clearance (→ Section 5.4)
D	1000 mm	2000 mm
E	1200 mm	1600 mm
G	100 mm	100 mm
H	< 400 mm	< 400 mm

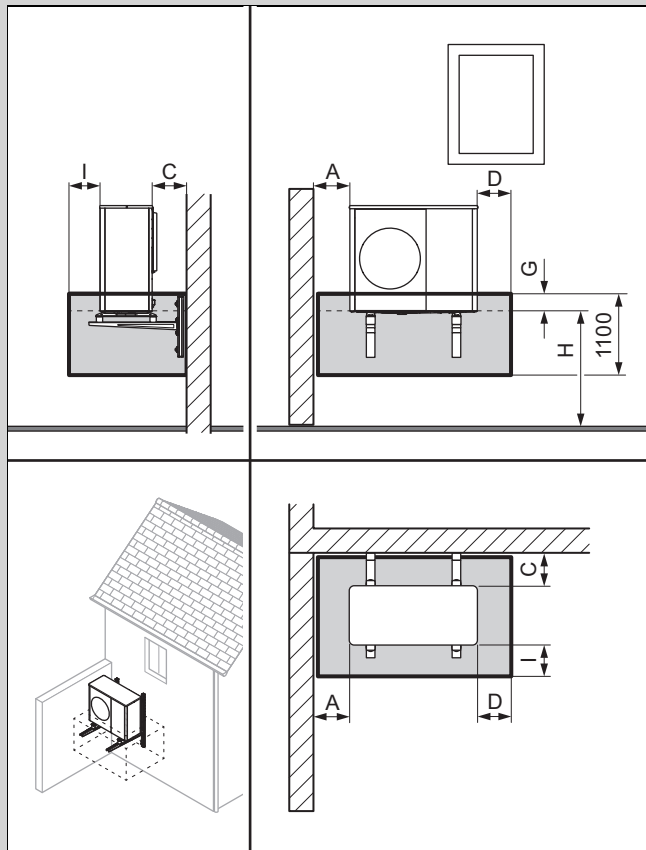
Validity: Installation height from 400 to 1000 mm



	Without base cover
A	Minimum clearance (→ Section 5.4)
C	Minimum clearance (→ Section 5.4)
G	100 mm
H	400 to 1000 mm
I	500 mm

Suitable for wall-mounting or installation with a raised base.

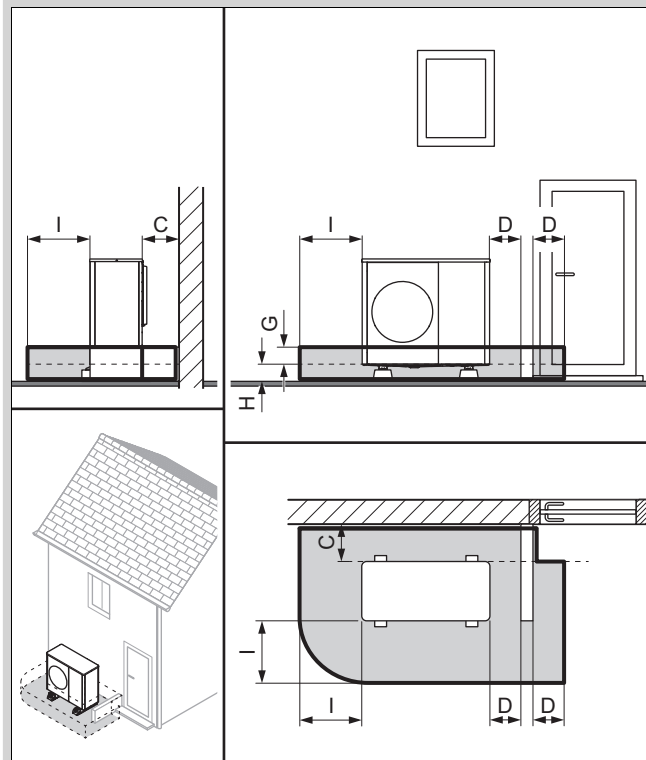
Validity: Installation height > 1000 mm



	Without base cover
A	Minimum clearance (→ Section 5.4)
C	Minimum clearance (→ Section 5.4)
D	1000 mm
G	100 mm
H	> 1000 mm
I	500 mm

4.2.5 Installation with plinth wall on the right

Validity: Installation height < 400 mm

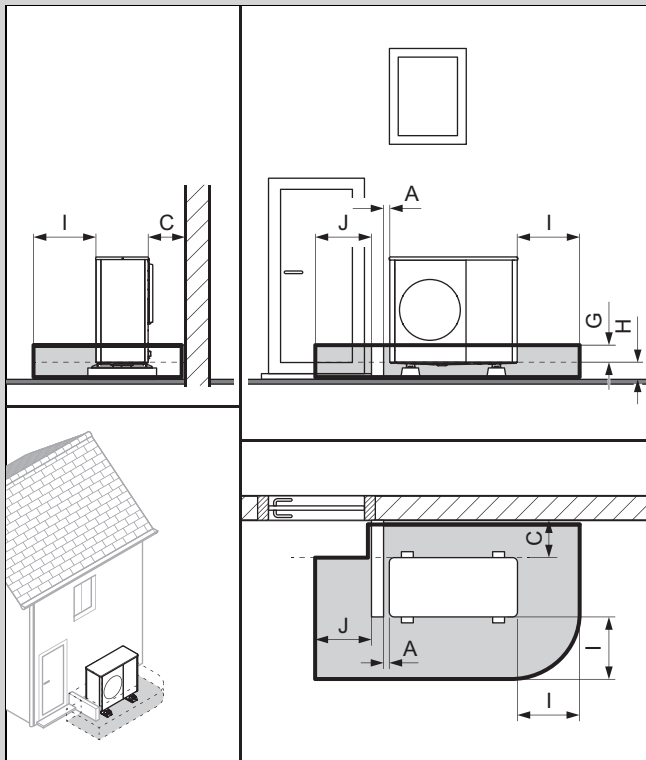


	Without base cover	With base cover
C	Minimum clearance (→ Section 5.4)	Minimum clearance (→ Section 5.4)
D	500 mm	500 mm
G	100 mm	100 mm
H	< 400 mm	< 400 mm
I	1000 mm	1200 mm

The minimum height of the plinth wall must be $\geq (G + H)$.

4.2.6 Installation with plinth wall on the left

Validity: Installation height < 400 mm



	Without base cover	With base cover
A	100 mm	100 mm
C	Minimum clearance (→ Section 5.4)	Minimum clearance (→ Section 5.4)
G	100 mm	100 mm
H	< 400 mm	< 400 mm
I	1000 mm	1200 mm
J	900 mm	900 mm

The minimum height of the plinth wall must be $\geq (G + H)$.

4.3 Protective zone with activated Flexible Space Function

The following sections describe the protective zone with the Flexible Space function activated.

Activating the Flexible Space function slightly reduces the system efficiency and slightly increases the standby energy consumption.

Inform the end user that the product must not be disconnected from the power supply when the Flexible Space Function is activated.

Installation method with activated Flexible Space function

Free-standing ground installation or flat-roof installation
(→ Section 4.3.1)

Installation in front of a building wall (→ Section 4.3.2)

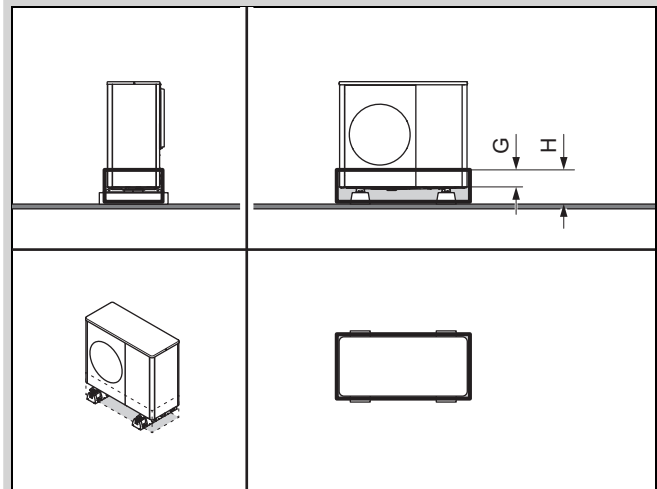
Installation in the right-hand corner of a building
(→ Section 4.3.3)

Installation in the left-hand corner of a building (→ Section 4.3.4)

4.3.1 Free-standing ground installation or flat-roof installation

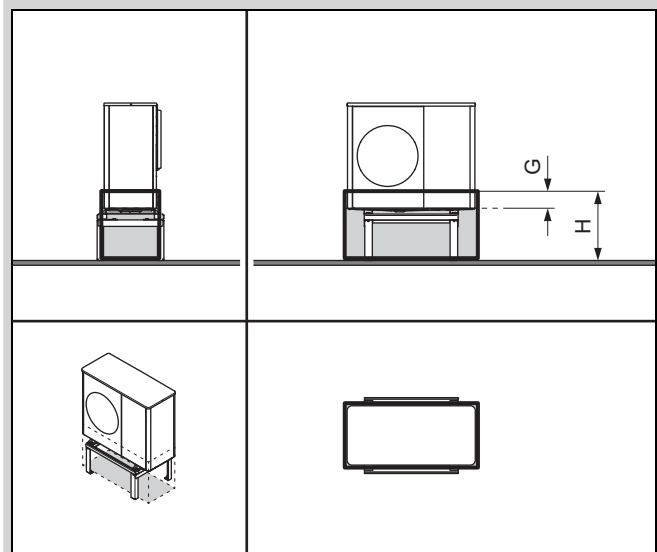
The clearance to the wall must be > 1000 mm for the unit to be considered free-standing.

Validity: Installation height < 400 mm



	With or without base cover
G	100 mm
H	< 400 mm

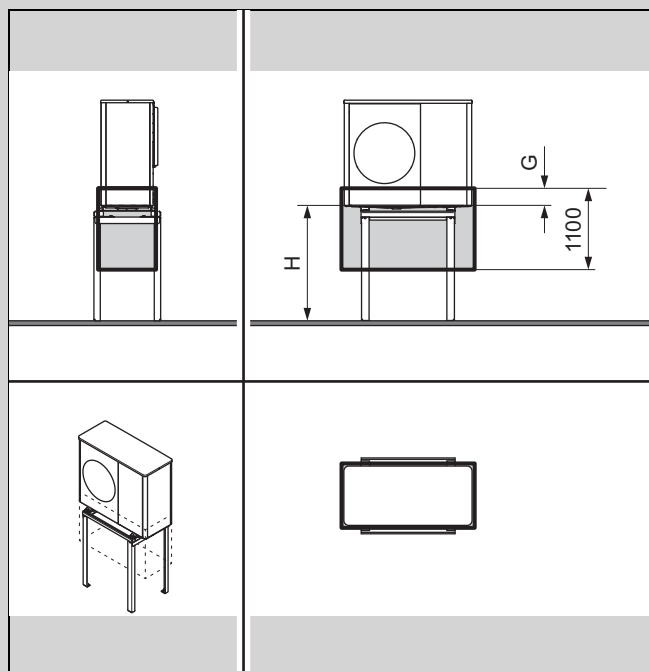
Validity: Installation height from 400 to 1000 mm



	With or without base cover
G	100 mm
H	400 to 1000 mm

Suitable for installation with a raised base.

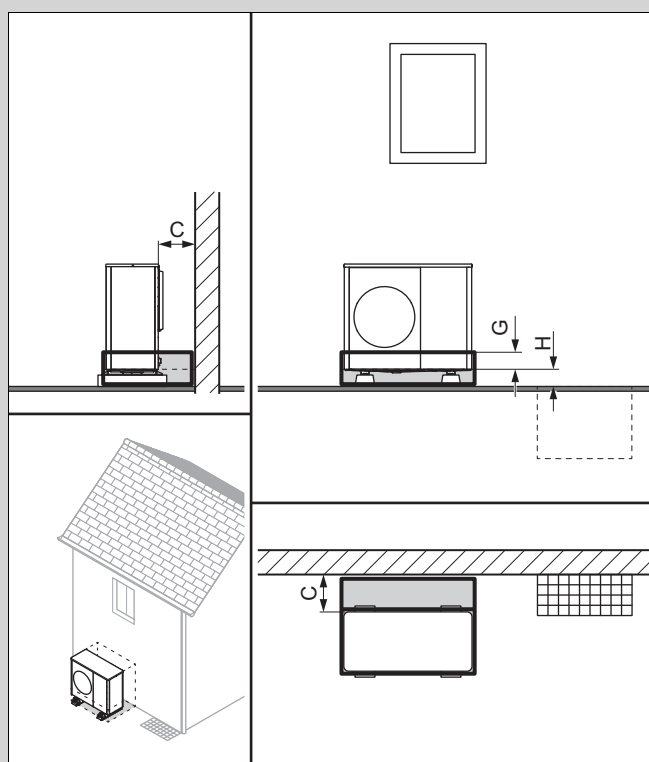
Validity: Installation height > 1000 mm



	With or without base cover
G	100 mm
H	> 1000 mm

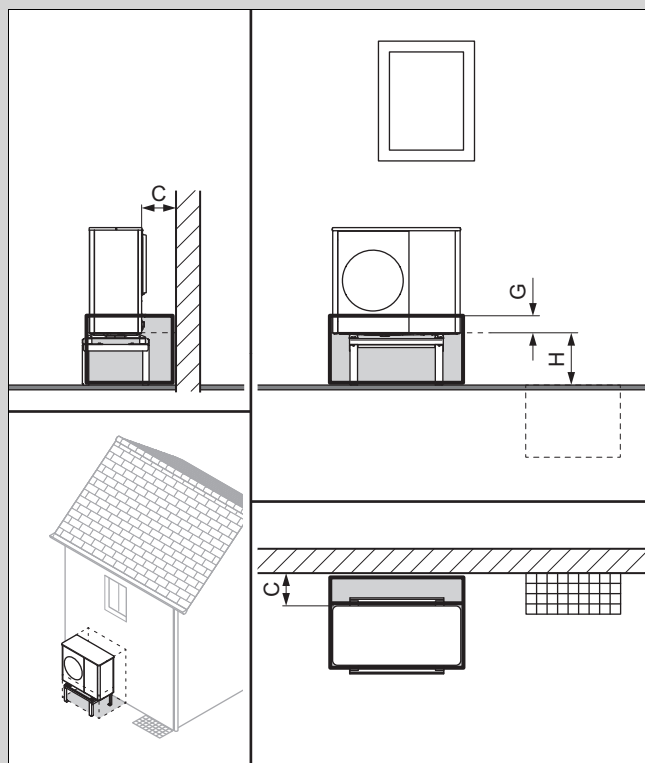
4.3.2 Installation in front of a building wall

Validity: Installation height < 400 mm



	With or without base cover
C	Minimum clearance (→ Section 5.4)
G	100 mm
H	< 400 mm

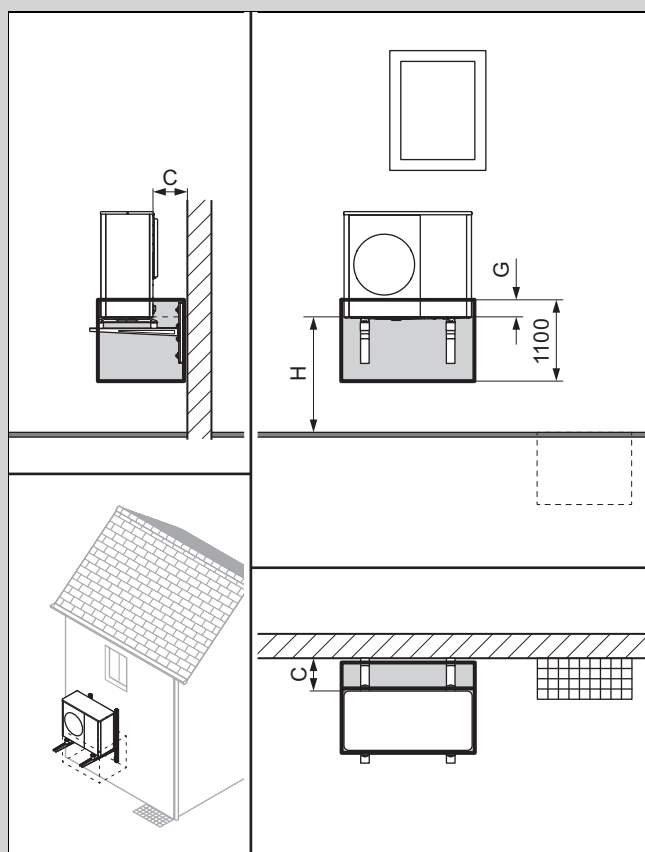
Validity: Installation height from 400 to 1000 mm



	With or without base cover
C	Minimum clearance (→ Section 5.4)
G	100 mm
H	400 to 1000 mm

Suitable for wall-mounting or installation with a raised base.

Validity: Installation height > 1000 mm



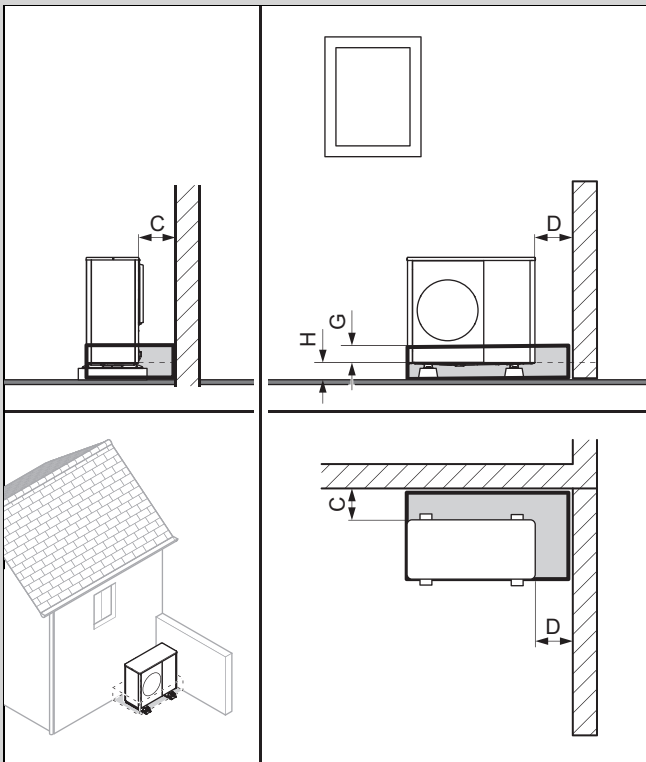
	With or without base cover
C	Minimum clearance (→ Section 5.4)
G	100 mm
H	> 1000 mm

4.3.3 Installation in the right-hand corner of a building

If the clearance to the rear or side panel is ≤ 1000 mm, the protective zone applies up to the side panel. Observe the minimum clearances. (→ Section 5.4)

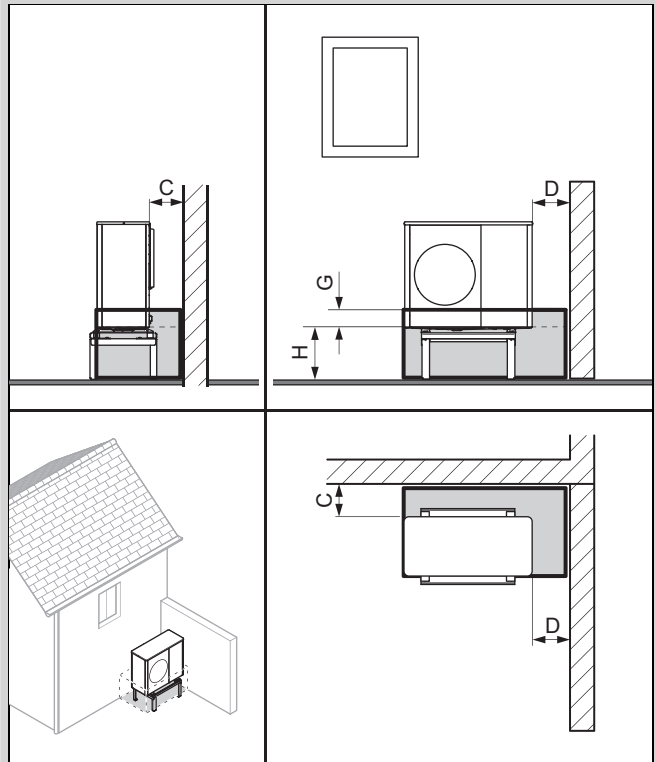
If the clearance to the rear or side panel is > 1000 mm, the configuration as a free-standing installation must be taken into account.

Validity: Installation height < 400 mm



	With or without base cover
C	Minimum clearance (→ Section 5.4)
D	Minimum clearance (→ Section 5.4)
G	100 mm
H	< 400 mm

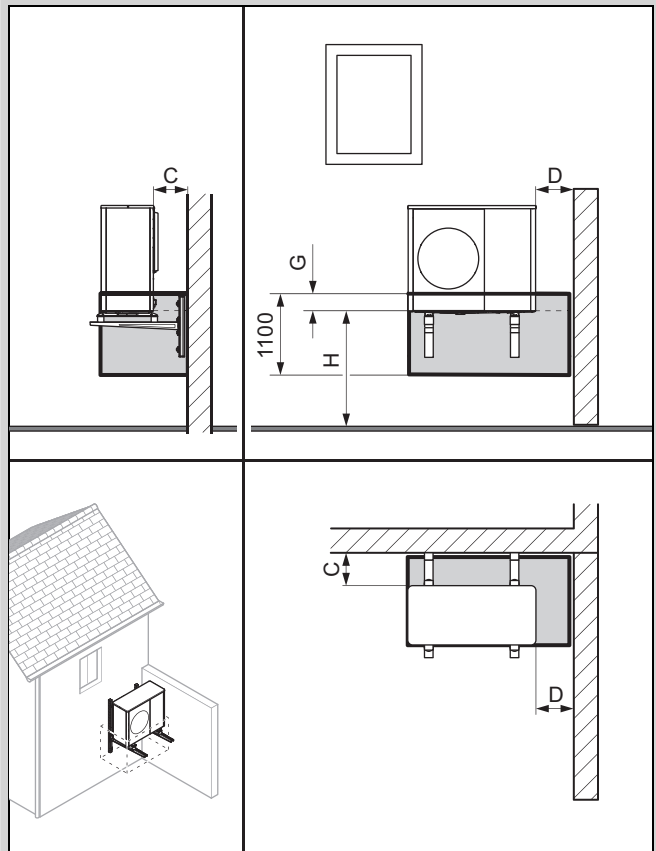
Validity: Installation height from 400 to 1000 mm



	With or without base cover
C	Minimum clearance (→ Section 5.4)
D	Minimum clearance (→ Section 5.4)
G	100 mm
H	400 to 1000 mm

Suitable for wall-mounting or installation with a raised base.

Validity: Installation height > 1000 mm



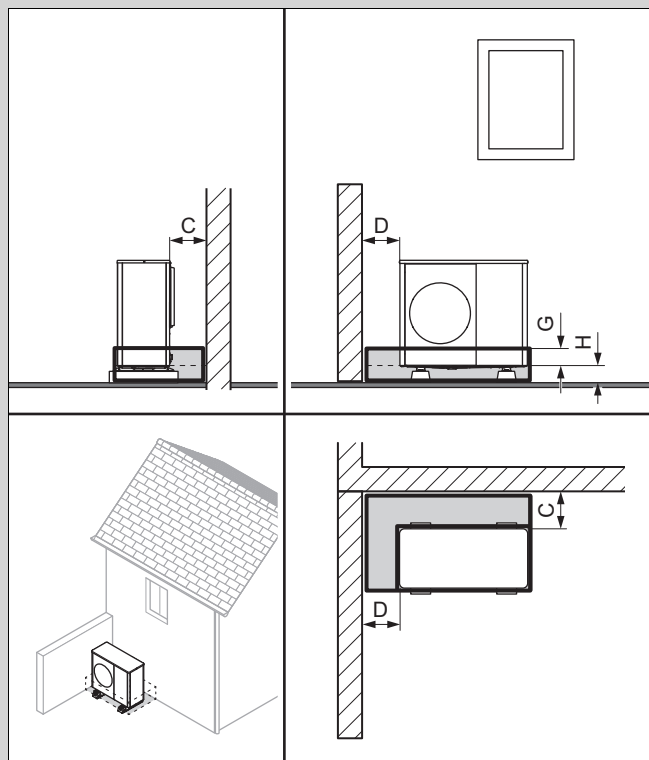
	With or without base cover
C	Minimum clearance (→ Section 5.4)
D	
G	100 mm
H	> 1000 mm

4.3.4 Installation in the left-hand corner of a building

If the clearance to the rear or side panel is ≤ 1000 mm, the protective zone applies up to the side panel. Observe the minimum clearances. (→ Section 5.4)

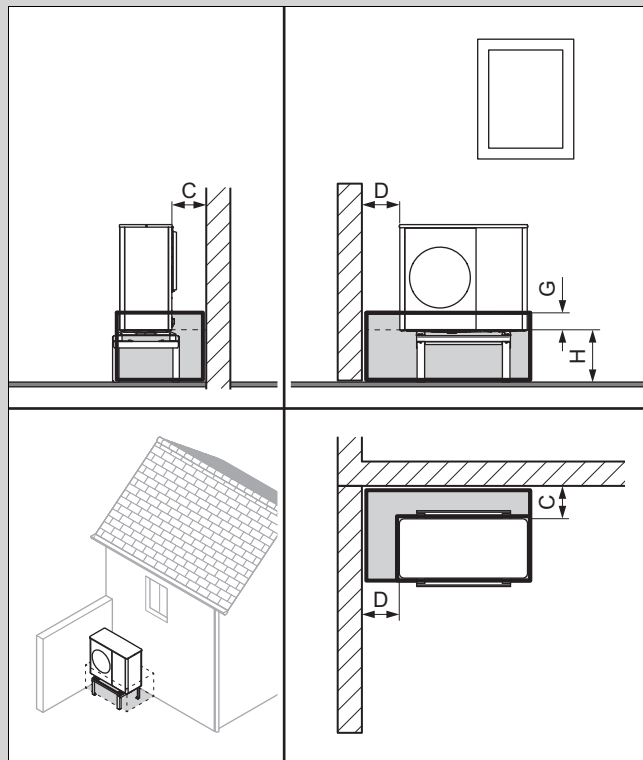
If the clearance to the rear or side panel is > 1000 mm, the configuration as a free-standing installation must be taken into account.

Validity: Installation height < 400 mm



	With or without base cover
C	Minimum clearance (→ Section 5.4)
D	
G	100 mm
H	< 400 mm

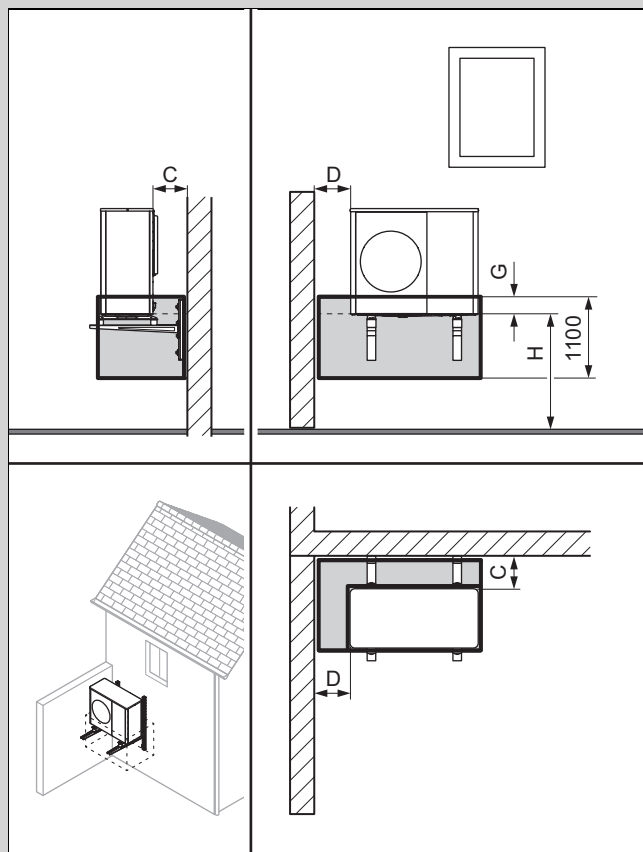
Validity: Installation height from 400 to 1000 mm



	With or without base cover
C	Minimum clearance (→ Section 5.4)
D	
G	100 mm
H	400 to 1000 mm

Suitable for wall-mounting or installation with a raised base.

Validity: Installation height > 1000 mm



	With or without base cover
C	Minimum clearance (→ Section 5.4)
D	
G	100 mm
H	> 1000 mm

5 Set-up

5.1 Checking the scope of delivery

- Check the contents of the packaging units.

Quantity	Designation
1	Product
1	Enclosed documentation

5.2 Transporting the product



Warning.

Risk of injury from lifting a heavy weight.

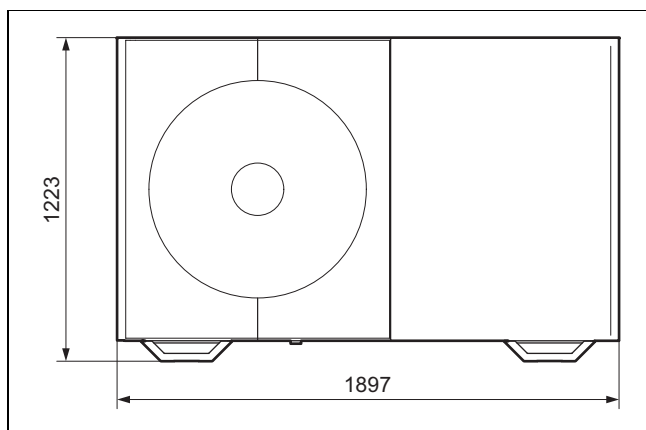
Lifting weights that are too heavy may cause serious injury to the spine, for example.

- Note the weight of the product.
- Lift the product using a crane or a suitable forklift truck.

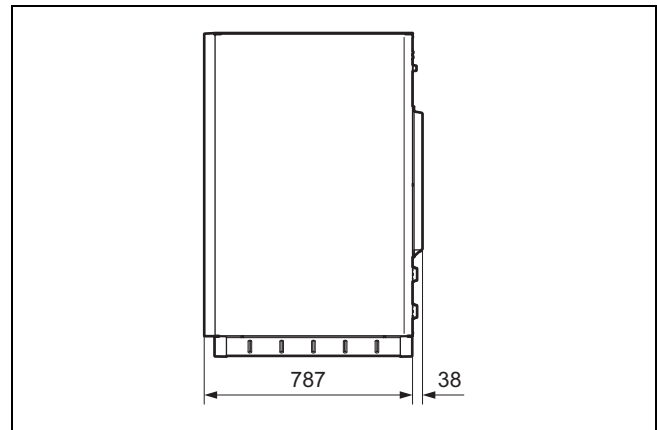
1. Take into consideration the weight distribution during transport. The product is significantly heavier on the right-hand side than on the left-hand side.
2. During transport, do not tilt the product by any more than the maximum angle of 45°.
3. Undo the screwed connection between the product and the pallet.
4. Use a suitable forklift truck for transport.
 - Fork span: 1.2 to 1.5 m
 - Fork thickness: Max. 40 mm
5. Protect the casing sections against damage.

5.3 Views and dimensions

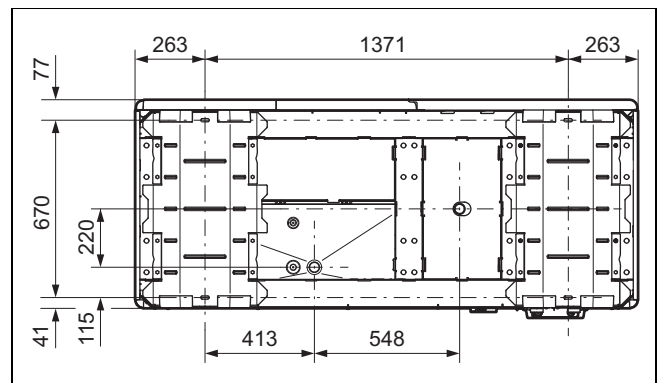
5.3.1 Front view



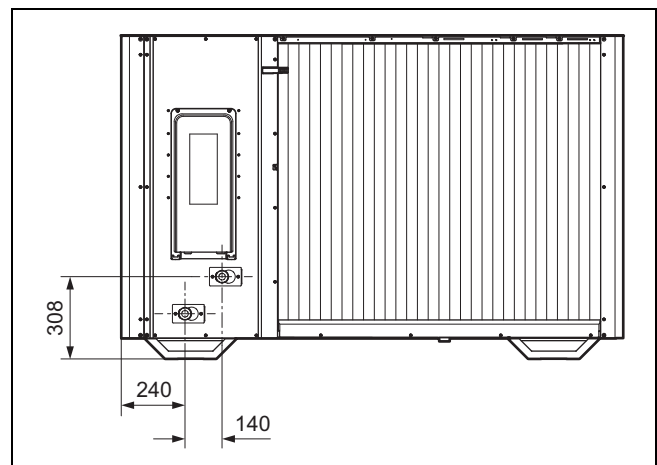
5.3.2 Side view, right



5.3.3 Bottom view



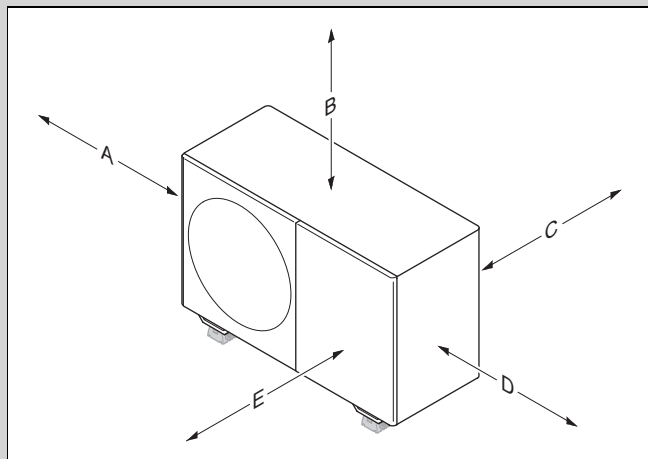
5.3.4 Rear view



5.4 Complying with minimum clearances

- To guarantee sufficient air flow and to facilitate maintenance work, observe the minimum clearances that are specified.
- Ensure that there is sufficient room to install the hydraulic pipelines.

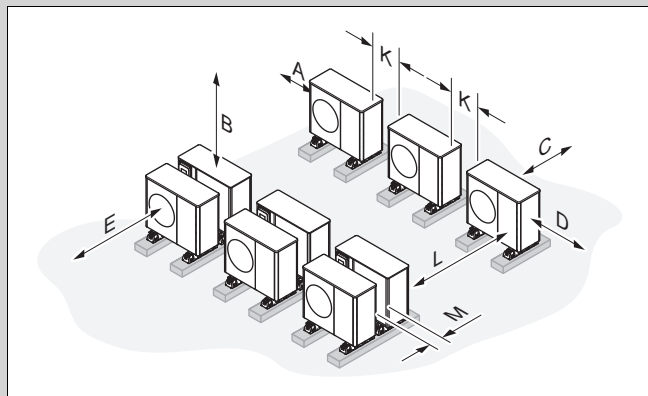
Validity: Floor installation OR Flat roof installation



Minimum clearance	Heating mode
A	500 mm
B	300 mm
C without pre-installation jig	350 mm
C with pre-installation jig	400 mm
D	500 mm
E	600 mm

Validity: Ground installation, more than one product

The table below only takes into account the minimum clearances required for efficient heat pump mode. In addition, the protection zone for each individual outdoor unit must be observed. (→ Section 4.2) (→ Section 4.3). The outdoor units are free of ignition sources, which means that one outdoor unit can be located in the protection zone of the other.

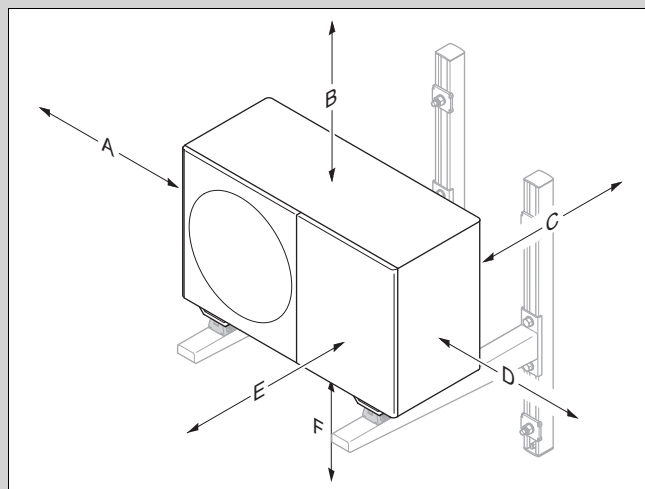


Minimum clearance	Heating mode
A	500 mm
B ¹⁾	1000 mm
C without pre-installation jig	350 mm
C with pre-installation jig	400 mm
D	500 mm
E	600 mm
K	500 mm
L	3000 mm
M	700 mm

¹⁾ Minimum clearance B can be reduced to 300 mm if the following conditions are met:

- accessibility for installation and maintenance work is guaranteed by other means
- sufficient air flow is guaranteed during operation
- the outflow of the rising vapour is guaranteed during de-icing

Validity: Wall-mounting



Minimum clearance	Heating mode
A	500 mm
B	300 mm
C without pre-installation jig	350 mm
C with pre-installation jig	400 mm
D	500 mm
E	600 mm
F	300 mm

5.5 Conditions for the installation type

The product is suitable for the following installation types: Ground installation, wall installation and flat-roof installation.

The pitched-roof installation is not permitted.

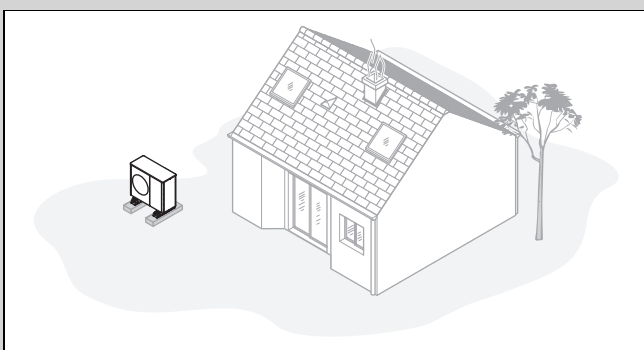
Wall-mounting with the unit mounting bracket from the accessories is not permitted. The unit can be wall-mounted using an alternative unit mounting bracket, provided that the requirements for the structural design and load-bearing capacity of the wall are met, and the weight of the unit mounting bracket and product is noted.

5.6 Selecting the installation site

- ▶ Do not place the product in sinks or areas that do not allow air to flow freely.
- ▶ Note that the cold air emitted by the outdoor unit may significantly cool the ground in front of the outlet opening up to a distance of approx. 3 m. On damp surfaces and at temperatures around freezing point, this may accelerate the formation of black ice and lead to an increased risk of slipping and falling.
- ▶ If the installation site is in the immediate vicinity of the coastline, protect the product against spraying water using an additional protection device.
- ▶ Keep away from flammable substances or flammable gases.
- ▶ Keep away from heat sources.

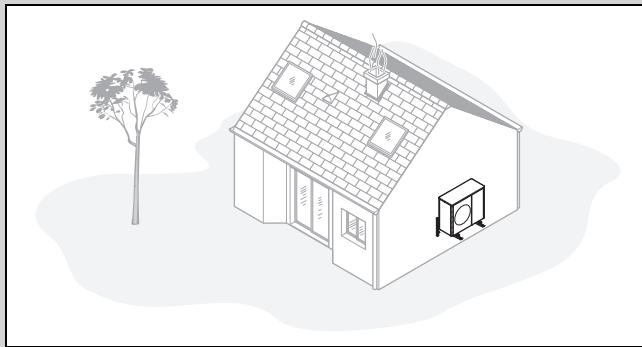
- ▶ Note that the surface texture of the outdoor unit makes it highly susceptible to damage (e.g. scratches) due to impact from branches or stones.
- ▶ Do not expose the outdoor unit to dirty, dusty or corrosive air.
- ▶ Keep away from ventilation openings or ventilation ducts.
- ▶ Keep away from deciduous trees and shrubs.
- ▶ Please note that the installation site must be below 2000 m above sea level.
- ▶ Select an installation site that is as far away from rooms that you use yourself, e.g. bedrooms.
- ▶ Please note the sound emissions. Select an installation site that is as far away from the windows of adjacent building as possible.
- ▶ Select an installation site that is easily accessible so that maintenance and service work can be carried out.
- ▶ If the installation site is adjacent to a vehicle shunting area, protect the product using ram protection.

Validity: Ground installation



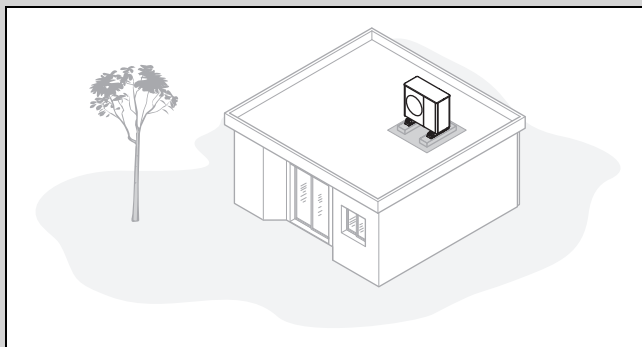
- ▶ Avoid choosing an installation site that is in the corner of a room, between walls or between fences.
- ▶ Observe the requirements of the protective zone for the installation site. (→ Section 4)
- ▶ Prevent the return intake of air from the air outlet.
- ▶ Ensure that water cannot collect on the subsoil.
- ▶ Ensure that the subsoil can absorb water well.
- ▶ Plan a bed of gravel and rubble for the condensate discharge.
- ▶ Select an installation site which is free from significant accumulations of snow in winter.
- ▶ Select an installation site at which the air inlet is not affected by strong winds. Position the unit as crosswise to the main direction of wind as possible.
- ▶ If the installation site is not protected against the wind, you should plan to set up a protective wall and observe the protective zones (→ Section 4).
- ▶ Please note the sound emissions. Avoid corners of rooms, recesses or sites between walls.
- ▶ Select an installation site with excellent sound absorption thanks to grass, hedges or fencing.
- ▶ Plan the underground frost-free routing of the hydraulic pipelines and electrical wires.
- ▶ Plan for a wall duct that leads from the outdoor unit through the building wall.

Validity: Wall installation



- ▶ Ensure that the structural design and load-bearing capacity of the wall complies with the requirements. Note the weight of the unit mounting bracket and the product.
- ▶ Avoid choosing an installation position which is near to a window.
- ▶ Please note the sound emissions. Maintain sufficient clearance from reflective building walls.
- ▶ Plan the frost-free routing of the hydraulic pipelines and electrical wires.
- ▶ Provide a wall duct.

Validity: Flat-roof installation

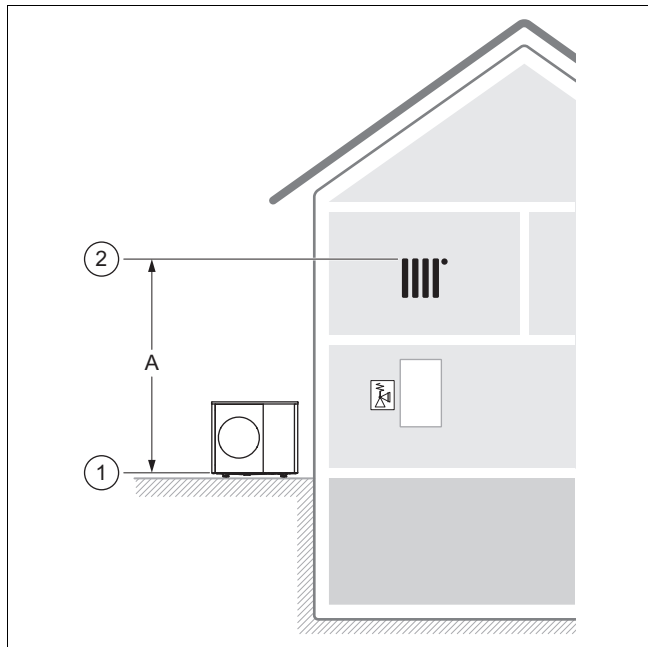


- ▶ Only install the product in buildings with a solid construction and that have cast concrete ceilings throughout.
- ▶ Note that other flat-roof constructions must undergo static analysis to determine structural stability and be checked for possible sound transmission.
- ▶ Do not install the product in buildings with a wooden structure or with a lightweight roof.
- ▶ Select an installation site that is easily accessible so that foliage or snow can be regularly removed from the product.
- ▶ Select an installation site at which the air inlet is not affected by strong winds. Position the unit as crosswise to the main direction of wind as possible.
- ▶ If the installation site is not protected against the wind, you should plan to set up a protective wall and observe the protective zones (→ Section 4).
- ▶ Please note the sound emissions. Maintain sufficient clearance from adjacent buildings.
- ▶ Plan the frost-free routing of the hydraulic pipelines and electrical wires.
- ▶ Provide a wall duct.

5.7 Permissible height difference between the outdoor unit and the expansion relief valve in the heating circuit

With regard to the outdoor unit's installation site, the position of the expansion relief valve may be higher or lower in the heating circuit. For the following installation cases, an expansion relief valve with an opening pressure of 3 bar in the building circuit is assumed.

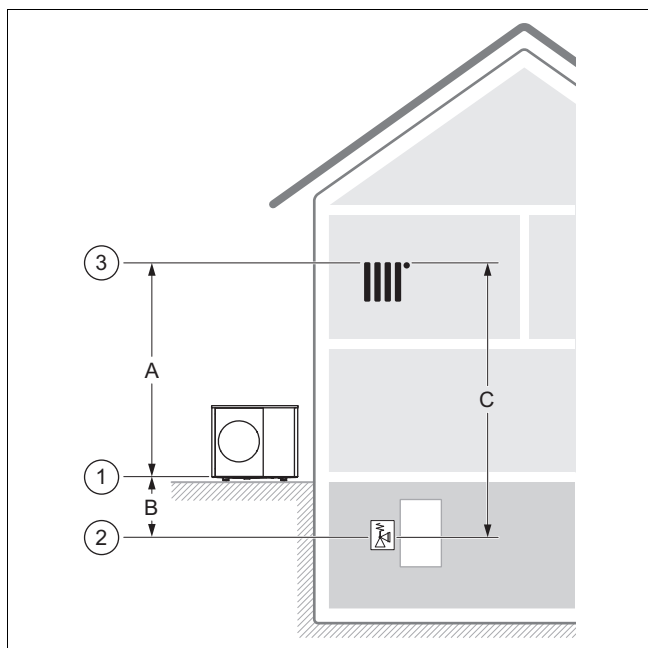
Installation case 1: Expansion relief valve in the heating circuit at the same height level as the outdoor unit



The position (1) of the expansion relief valve in the outdoor unit and the position (2) of the highest point in the heating circuit are relevant here.

The permissible height difference (A) is limited to 14 m.

Installation case 2: Expansion relief valve in the heating circuit below the outdoor unit



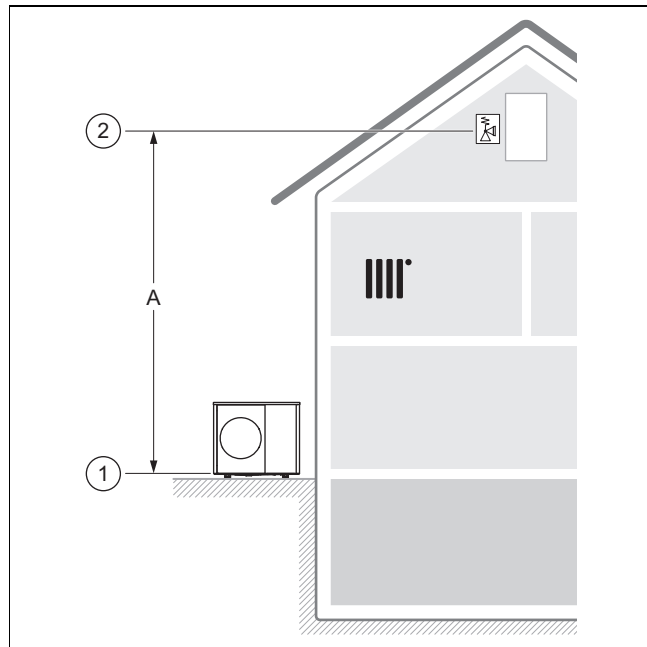
The position (1) of the expansion relief valve in the outdoor unit, the position (2) of the expansion relief valve in the heating circuit, and the position (3) of the highest point in the heating circuit are relevant here.

The permissible height difference (C) is limited to 18 m.

The permissible height difference (A) is limited to 14 m.

The permissible height difference (B) is limited to 10 m. Up to 15 m is possible if, when designing the heating installation, the operating pressure, the expansion vessel (volume and pre-charge pressure) and the water expansion are taken into consideration.

Installation case 3: Expansion relief valve in the heating circuit above the outdoor unit



The position (1) of the expansion relief valve in the outdoor unit and the position (2) of the expansion relief valve in the heating circuit are relevant here.

The permissible height difference (A) is limited to 14 m. If other heating pumps without hydraulic isolation are present in the heating installation, the height difference should be reduced in order to prevent cavitation.

5.8 Preparing for set-up and installation



Danger!

Risk of death caused by fire or explosion if there is a leak in the refrigerant circuit!

The product contains the combustible refrigerant R290. In the event of a leak, escaping refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion.

- Ensure that there are no ignition sources, such as plug sockets, light switches, lamps, electrical switches or other permanent ignition sources, in the protective zone.

- Observe the basic safety regulations before starting work.
- Note that the surface texture of the outdoor unit makes it highly susceptible to damage, particularly scratches. Use clean gloves when transporting the outdoor unit and leave the outdoor unit in its packaging for as long as possible to avoid unnecessary damage.

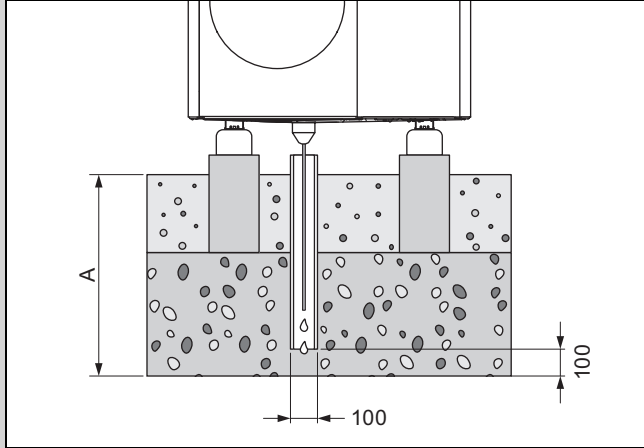
5.9 Planning the condensate discharge

The condensate that accumulates can be guided into a sewer, pump sump or soakaway via a downpipe, gully, balcony run-off or roof run-off. Open gullies or downpipes within the protective zone do not pose any safety risk.

For all installation types, you must ensure that any condensate that accumulates is discharged frost-free.

Validity: Ground installation

For the ground installation, the condensate must be discharged via a downpipe into a gravel bed which is located in the frost-free area.



For a region with ground frost, dimension A is ≥ 1000 mm and, for a region without ground frost, it is ≥ 600 mm.

The downpipe must flow into a sufficiently large gravel bed so that the condensate can trickle away freely.

To prevent the condensate from freezing, the heating wire of the pipe trace heater must be threaded into the downpipe via the condensate discharge tundish.

Validity: Wall-mounting

For wall installation, the condensate can be discharged into a gravel bed that is located below the product.

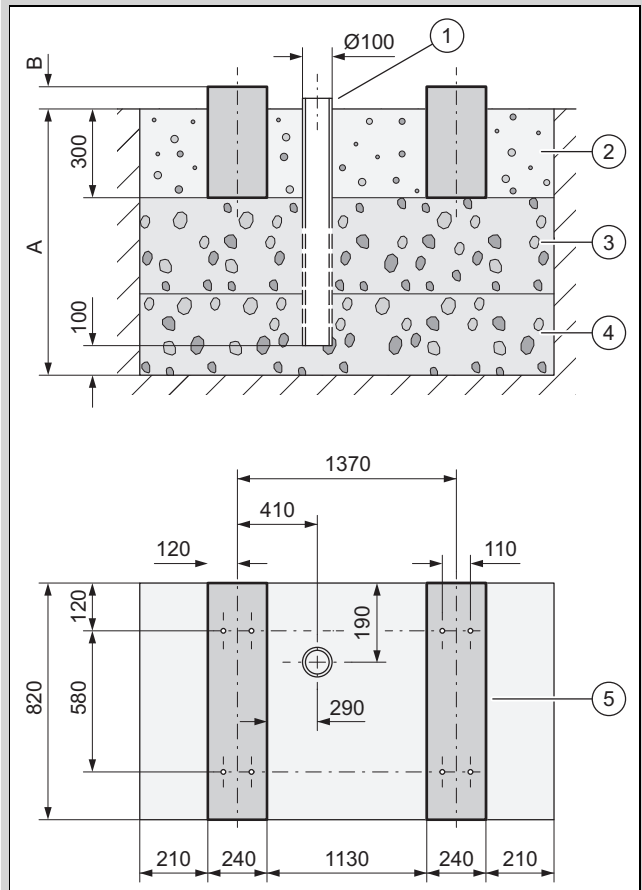
Alternatively, the condensate can be discharged by connecting the condensate discharge pipe to a downpipe. In this case, depending on the local conditions, you must use an electrical pipe trace heater (optional accessory) in order to keep the condensate discharge pipe frost-free.

Validity: Flat-roof installation

For flat-roof installation, the condensate can be discharged by connecting a condensate discharge pipe to a downpipe or a roof run-off. In this case, depending on the local conditions, you must use an electrical pipe trace heater (optional accessory) in order to keep the condensate discharge pipe frost-free.

5.10 Creating a foundation

Validity: Floor installation



- ▶ Dig a hole in the ground. The recommended dimensions can be found in the figure.
- ▶ Calculate the depth (**A**) in accordance with local conditions.
 - Region with ground frost: Minimum depth: 1000 mm
 - Region without ground frost: Minimum depth: 600 mm
- ▶ Place a first layer of gravel (**4**) in the frost-free area and cover it with drainage fleece.
- ▶ Insert a downpipe (**1**) to divert the condensate.
- ▶ Apply an additional layer of water-permeable coarse rubble (**3**).
- ▶ Calculate the height (**B**) in accordance with local conditions.
- ▶ Create two concrete strip foundations (**5**). The recommended dimensions can be found in the figure.
- ▶ Place a gravel bed (**2**) between and beside the strip foundations.

5.11 Guaranteeing occupational safety

Validity: Wall installation

- ▶ Ensure that the installation position on the wall can be safely accessed.
- ▶ If the work on the product takes place at a height above 3 m, install technical fall protection.
- ▶ Note the high weight of the product.
- ▶ Observe the local laws and regulations.

Validity: Flat-roof installation

- ▶ Ensure that the flat roof can be safely accessed.
- ▶ Maintain a safety area of 2 m to the fall edge, plus the clearance that is required for working on the product. The safety area must not be entered.
- ▶ If this is not possible, then install technical fall protection at the fall edge, for example reliable railings. Alternatively, set up technical safety catch equipment.
- ▶ Maintain sufficient clearance to any roof escape hatches and flat-roof windows. When carrying out the work, use suitable protective equipment to prevent you from stepping on or falling through any escape hatches and flat-roof windows.

5.12 Installing the product

Validity: Ground installation

- ▶ Use the anti-vibration feet from the accessories and, depending on the desired type of installation, the appropriate raised base.
- ▶ Align the product horizontally.
 - Maximum permissible deviation: 14 mm/m
- ▶ Screw the anti-vibration feet to the concrete bases.

Validity: Wall-mounting

- ▶ Check the design and load-bearing capacity of the wall. Note the weight of the product.
- ▶ Use the unit mounting bracket that is suitable for wall-mounting.
- ▶ Use the anti-vibration feet from the accessories.
- ▶ Align the product horizontally.
 - Maximum permissible deviation: 14 mm/m
- ▶ Screw the product to the unit mounting bracket.

Validity: Flat-roof installation

- ▶ Note the weight of the product.
- ▶ Use the damping feet.
- ▶ Align the product horizontally.
 - Maximum permissible deviation: 14 mm/m
- ▶ Screw the anti-vibration feet to the concrete bases.

5.13 Ensuring condensate discharge



Danger!

Risk of injury due to frozen condensate.

Frozen condensate on paths may cause falls.

- ▶ Ensure that condensate does not discharge onto paths and that ice cannot build up there.

1. For all installation types, ensure that any condensate that accumulates is discharged frost-free.
2. Install the optional accessories for the condensate discharge pipe, including the pipe trace heater (→ Assembly instructions for the accessories).

5.14 Setting up a protective wall

Validity: Ground installation OR Flat-roof installation

- ▶ If the installation site is not protected against the wind, set up a protective wall against the wall.
- ▶ Observe the requirements of the protective zone for the installation site. (→ Section 4)
- ▶ Comply with the minimum clearances. (→ Section 5.4)

5.15 Removing/installing the casing sections

The following work must only be carried out when required or during maintenance work or repair work.

The following tool is required for this:

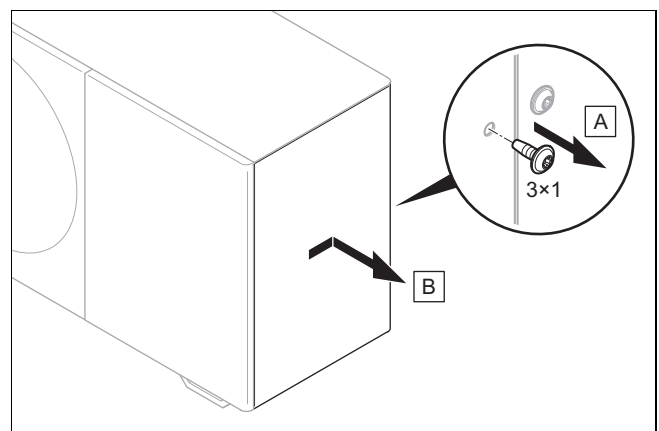
- Screwdriver for T20 tapping screw

Note that the surface texture of the outdoor unit makes it highly susceptible to damage, particularly scratches.

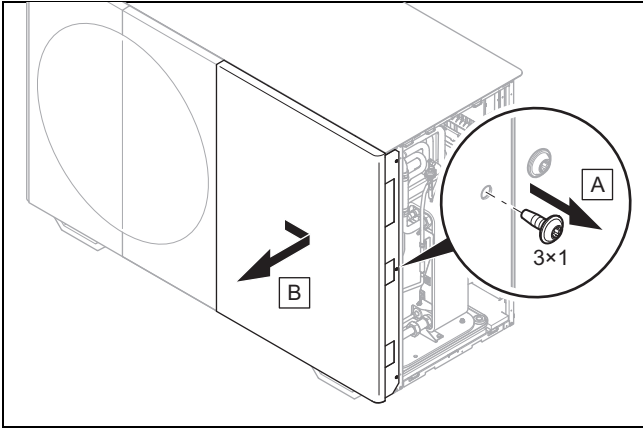
Observe the following when removing or installing casing sections:

- Set down the removed casing sections in a location where they are protected from damage. If necessary, cover the casing sections to prevent damage to the surface.
- When installing the casing sections, take steps to ensure they are not damaged in the process.

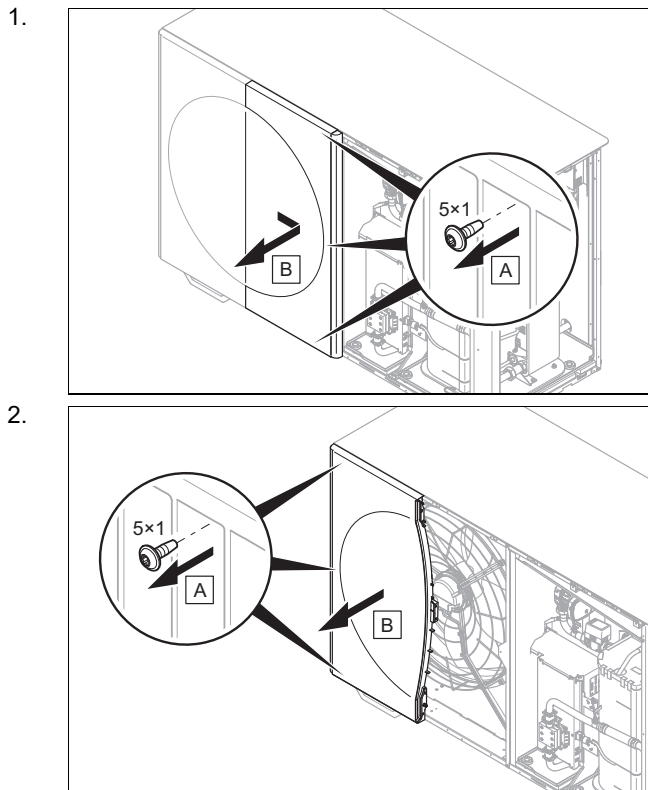
5.15.1 Removing the right-hand side casing



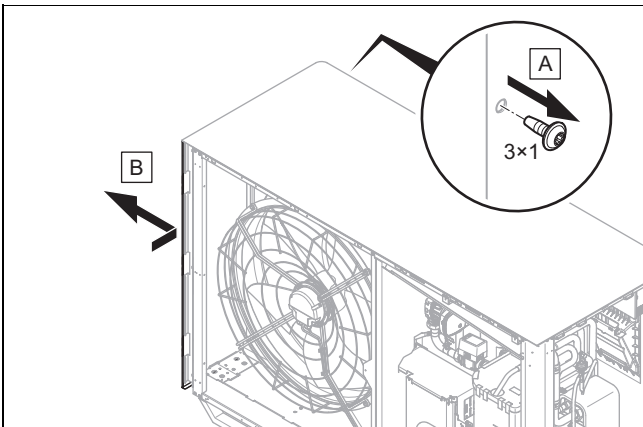
5.15.2 Removing the front casing



5.15.3 Removing the air outlet grille



5.15.4 Removing the left-hand side casing



5.16 Installing the casing sections

- When installing, carry out the steps for removal in reverse. (→ Section 5.15)

6 Hydraulics installation

6.1 Installation type: Direct connection or system separation

In the case of a direct connection, the outdoor unit is hydraulically connected directly to the heating installation. In this case, if there is frost, there is a risk that the outdoor unit will freeze. If the product is directly connected to an under-floor circuit, a thermostat must be installed on site to limit the temperature.

In the case of a system separation, the heating circuit is separated into a primary and a secondary heating circuit. In this case, the separation is implemented using an optional intermediate heat exchanger, which is positioned in the building. If the primary heating circuit is filled with a water/frost protection mixture, the outdoor unit is protected against freezing in the case of frost or a power cut. An expansion vessel must be installed in the return. A system separation increases the product's current consumption.

6.2 Guaranteeing the minimum circulation water volume

In heating installations that are equipped primarily with thermostatic or electrically controlled valves, a constant and sufficient flow through the heat pump must be ensured. When designing the heating installation, the minimum circulation water volume of heating water must be guaranteed.

6.3 Requirements for hydraulic components

Plastic pipes that are used for the heating circuit between the building and the product must be diffusion-tight.

Pipelines that are used for the heating circuit between the building and the product must have UV- and high-temperature-resistant thermal insulation.

In the case of hydraulic separation via a buffer cylinder, even when dew point monitoring is activated, both the buffer cylinder and the lines between the outdoor unit and the buffer cylinder must be designed to be vapour diffusion-tight.

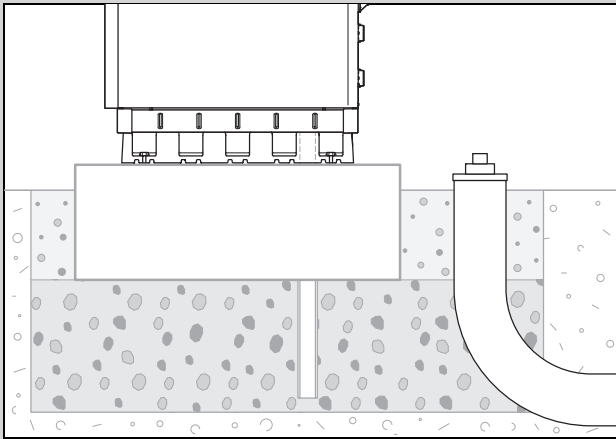
6.4 Preparing the hydraulics installation

1. Flush the heating installation thoroughly before connecting the product in order to remove any possible residue from the pipelines.
2. Install a line strainer in the pipeline for the heating return.

6.5 Routing pipelines to the product

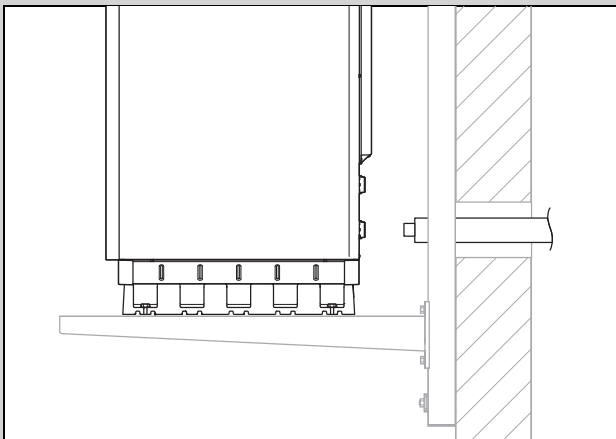
1. Route the pipelines for the heating circuit from the building, through the wall duct and to the product.

Validity: Ground installation



- Route the pipelines through a suitable safety pipe in the ground, as shown in the example in the figure.
- You can find the dimensions and clearances in the assembly instructions for the accessories.

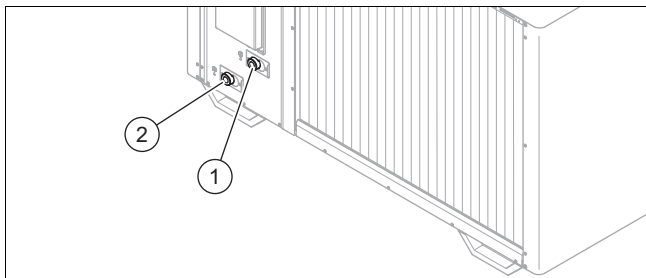
Validity: Wall installation



- Route the pipelines through the wall duct to the product, as shown in the figure.
- Route the pipelines from the inside outwards with a downward gradient of approx. 2°.
- You can find the dimensions and clearances in the assembly instructions for the accessories.

6.6 Connecting the pipelines to the product

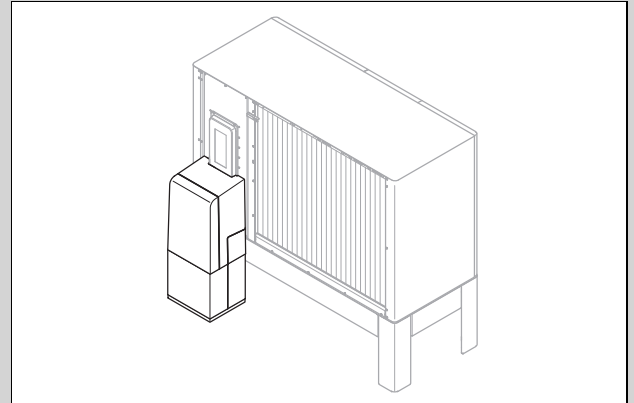
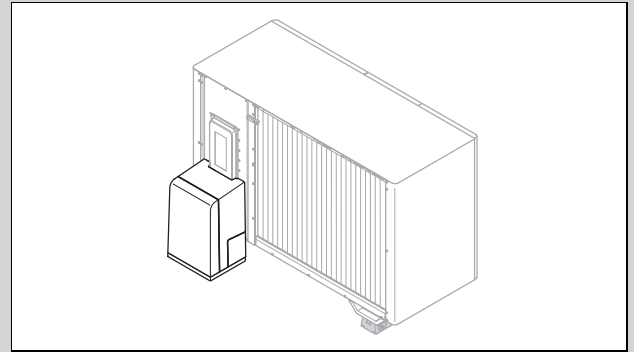
1. Remove the covering caps from the hydraulic connections.



1 Heating flow, G 1 1/2" 2 Heating return, G 1 1/2"

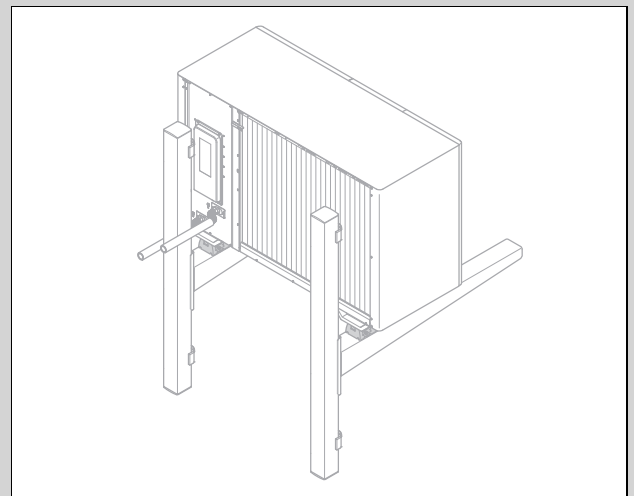
2. Connect the pipelines for the heating circuit.

Validity: Ground installation



- Use the pre-installation jig and the enclosed components from the accessories.
- Check all connections for tightness.

Validity: Wall installation



- Check all connections for tightness.

6.7 Completing the hydraulics installation

1. Depending on the installation configuration, install additional required safety-relevant components.
2. Take into account that an expansion relief valve with a triggering pressure of 2.5 bar is included in the product.
3. When the product is not installed at the highest point in the heating circuit, install additional purging valves in elevated places where air may collect.
4. Ensure that all other installed expansion relief valves in the heating circuit have a switching point of at least 3 bar while taking into consideration the maximum permissible pressure load of all of the components that

are installed in the heating circuit. This also fulfils the safety concept if there is a leak in the refrigerant circuit.

5. Check all connections for tightness.

6.8 Connecting the product to a swimming pool

1. Do not connect the product's heating circuit directly to a swimming pool.
2. Use a separation heat exchanger that is suitable and the additional components that are required for this installation.

7 Electrical installation

7.1 Conformity to standards

This product complies with IEC 61000-3-12.

7.2 Requirements for the quality of the mains voltage

For the mains voltage of the three-phase 400 V network, a tolerance of +10% to -15% must be provided. For the voltage difference between the individual phases, a tolerance of +-2% must be provided.

7.3 Requirements for electrical components

Flexible hose lines that are suitable for routing outdoors must be used for the power supply. The specification must comply with the standard 60245 IEC 57 with the abbreviation H07RN-F as a minimum.

The electrical partitions must have a contact gap of at least 3 mm.

For the electrical fuse protection, fuses with D 25 A characteristics must be used. With a three-phase power supply, the fuses must be three-pole switching.

To protect people, type B universal-current-sensitive residual-current circuit breakers must be used if these are stipulated for the installation site. Tripping must be short-time delayed and suitable for the use of inverters (tripping characteristic > 10 kHz).

7.4 Electrical partition

The electrical partition is also referred to as a "disconnect" in these instructions. The fuse or the circuit breaker that is installed in the building's meter/fuse box is usually used as the disconnect. D 25A fuses must be used as circuit breakers.

7.5 Preparing the electrical installation



Danger!

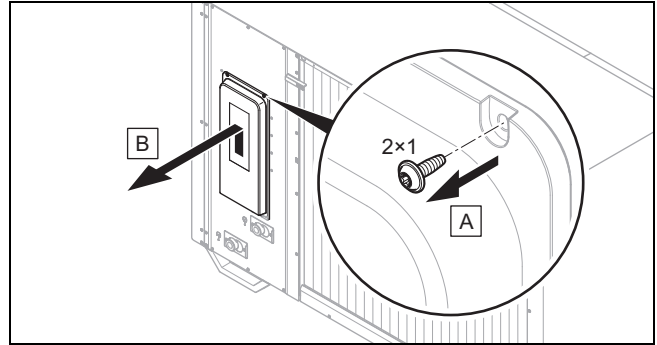
Risk of death from electric shock as a result of an improper electrical connection!

An improper electrical connection may negatively affect the operational safety of the product and result in material damage or personal injury.

- Only carry out the electrical installation if you are a trained competent person and are qualified for this work.

1. Observe the technical connection conditions for connecting to the energy supply company's low-voltage network.
2. Use the data plate to determine the product's rated current. Derive the suitable cable cross-sections for the electrical wires from this.
3. Prepare the routing of the electrical wires from the building and through the wall duct to the product.

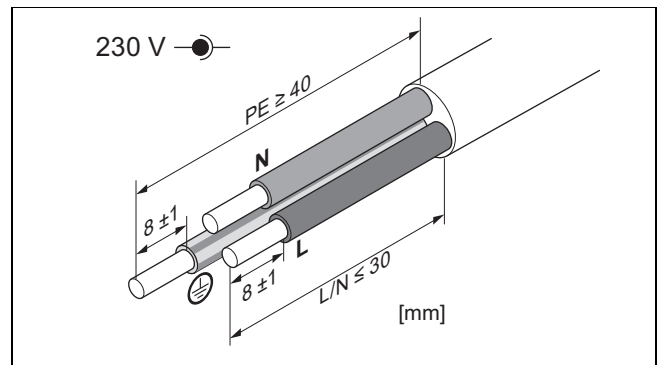
7.6 Removing the cover for the electrical connections



1. Note that the cover contains a safety-relevant seal which must be effective against the ingress of moisture.
2. Remove the cover, as shown in the figure, without damaging the circumferential seal.

7.7 Stripping the electrical wire

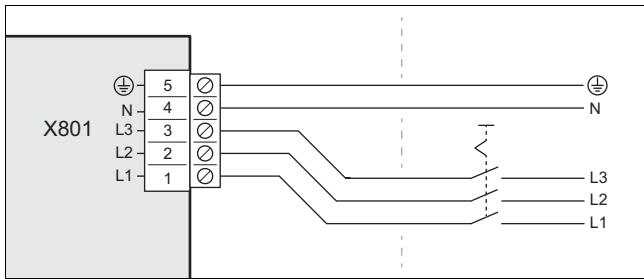
1. If required, shorten the electrical wire.



2. Strip the electrical wire as shown in the figure. In doing so, ensure that the insulation on the individual conductors is not damaged.
3. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.

7.8 Establishing the power supply, 3~ / 400V

1. If it is stipulated for the installation site, install one residual-current circuit breaker for the product.



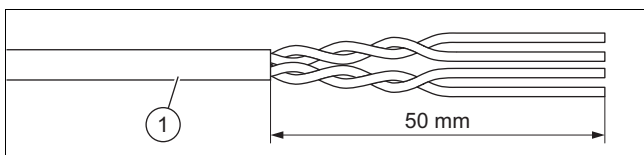
2. Install a disconnector for the product in the building.
3. Route a 5-pole power supply cable from the building and through the wall duct to the product.
4. Connect the power supply cable to connection X801 in the electronics box.
 - Tightening torque for screws: 1.2 Nm
5. Use the strain relief clamp to secure the power supply cable in place.

7.9 Requirements for the SystemLAN cable

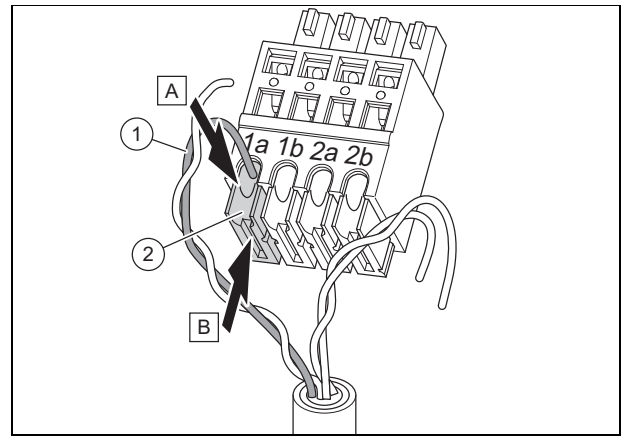
- ▶ SystemLAN cable accessories.
 - corresponds to CAT5e 2x2x24/1 SF/UTP
- ▶ Alternative cable type that can be used:
 - Conductor cross-section: AWG20 to AWG24
 - Conductor colours: Orange/white, orange, green/white, green
 - Category: At least Cat5 (e.g. Cat7 4x2x23/1 S/FTP)
 - Cable length: ≤ 100 m
- ▶ Route communication cables with a clearance of at least 40 mm from power supply cables and units with high power requirements. If the recommended minimum clearance is not reached at the unit's electrical connection box and for the wall ducts, this is not critical.
- ▶ If required, route cables in empty conduits to protect against UV radiation.

7.10 Connecting the SystemLAN cable

The SystemLAN cable is connected via a plug connector with insulation displacement technology.



- ▶ Remove 50 mm of the cable jacket. Use a suitable stripping tool for this purpose.
- ▶ Remove 50 mm of the shield braid and any plastic film, aluminium foil and filler wires.
- ▶ Leave the ends of the cable conductors unprocessed.
- ▶ Disconnect the SystemLAN plug from the connection on the printed circuit board (PCB).



Slide the first conductor **(1)** as far as it will go into the entry opening. Use the following assignment for this:

Pin	Colour
1a	Orange
1b	Orange/white
2a	Green
2b	Green/white

- ▶ Use a flat-blade screwdriver to push the gate valve **(2)** into the plug until you feel and hear it click into place.
- ▶ Repeat the process for the second to fourth conductors.
- ▶ Pull gently to check whether all conductors are firmly connected.
- ▶ Ensure that all gate valves are fully pressed in and flush with the edge of the plug.
- ▶ Connect the SystemLAN cable to the PCB using the attached plug.
- ▶ Use the strain relief to secure the SystemLAN cable.
- ▶ Tighten the screw of the strain relief by hand.

7.11 Connecting accessories

- ▶ Observe the wiring diagram in the appendix.

7.12 Installing the cover for the electrical connections

1. Secure the cover by lowering it into the stop on the lower edge.
2. Use two screws to secure the cover to the upper edge.

8 Start-up

8.1 Checking before switching on

- ▶ Check whether all the hydraulic connections are established correctly.
- ▶ Check whether all the electrical connections are established correctly.
- ▶ Check whether the disconnector is installed.
- ▶ If it is stipulated for the installation site, check whether a residual-current circuit breaker has been installed.
- ▶ Read through the operating instructions.
- ▶ After installation, ensure that at least 30 minutes have passed before switching on the product.
- ▶ Ensure that the cover for the electrical connections is installed.

8.2 Switching on the product

- Switch on all of the disconnectors to which the product is connected in the building.

8.3 Checking and treating the heating water/filling and supplementary water



Caution.

Risk of material damage due to poor-quality heating water

- Ensure that the heating water is of sufficient quality.

- Before filling or topping up the installation, check the quality of the heating water.

Checking the quality of the heating water

- Remove a little water from the heating circuit.
- Check the appearance of the heating water.
- If you ascertain that it contains sedimentary materials, you must desludge the installation.
- Use a magnetic rod to check whether it contains magnetite (iron oxide).
- If you ascertain that it contains magnetite, clean the installation and apply suitable corrosion-inhibition measures (e.g. fit a magnetite separator).
- Check the pH value of the removed water at 25 °C.
- If the value is below 8.2 or above 10.0, clean the installation and treat the heating water.
- Ensure that oxygen cannot get into the heating water.

Checking the filling and supplementary water

- Before filling the installation, measure the hardness of the filling and supplementary water.

Treating the filling and supplementary water

- Observe all applicable national regulations and technical rules when treating the filling and supplementary water.

Provided the national regulations and technical rules do not stipulate more stringent requirements, the following applies:

You must treat the filling and supplementary water in the following cases

- If the entire filling and supplementary water quantity during the operating life of the system exceeds three times the nominal volume of the heating installation, or
- If the pH value of the heating water is lower than 8.2 or higher than 10.0, or
- The guideline values listed in the following table are not met.

Total heat output	Water hardness at specific system volume ¹⁾					
	≤ 20 l/kW		> 20 l/kW ≤ 40 l/kW		> 40 l/kW	
kW	°dH	mol/m ³	°dH	mol/m ³	°dH	mol/m ³
≤ 50 ²⁾	None	None	≤ 16.8	≤ 3.0	< 0.3	< 0.05
≤ 50 ³⁾	≤ 16.8	≤ 3	≤ 8.4	≤ 1.5	< 0.3	< 0.05
> 50 to ≤ 200	≤ 11.2	≤ 2	≤ 5.6	≤ 1.0	< 0.3	< 0.05
> 200 to ≤ 600	≤ 8.4	≤ 1.5	< 0.3	< 0.05	< 0.3	< 0.05
> 600	< 0.3	< 0.05	< 0.3	< 0.05	< 0.3	< 0.05

Total heat output	Water hardness at specific system volume ¹⁾					
	≤ 20 l/kW		> 20 l/kW ≤ 40 l/kW		> 40 l/kW	
kW	°dH	mol/m ³	°dH	mol/m ³	°dH	mol/m ³
1) Nominal capacity in litres/heat output; in the case of multi-boiler systems, the smallest single heat output is to be used. 2) Specific water capacity of the heat generator ≥ 0.3 l per kW. 3) Specific water capacity of the heat generator < 0.3 l per kW (e.g. circulation water heater) and installations with electrical heating elements.						



Caution.

Risk of material damage if the heating water is treated with unsuitable additives.

Unsuitable additives may cause changes in the components, noises in heating mode and possibly subsequent damage.

- Do not use any unsuitable antifreeze and corrosion inhibitors, biocides or sealants.

No incompatibility with our products has been detected to date with proper use of the following additives.

- When using additives, follow the manufacturer's instructions without exception.

We accept no liability for the compatibility of any additive or its effectiveness in the rest of the heating system.

Additives for cleaning measures (subsequent flushing required)

- Adey MC3+
- Adey MC5
- Fernox F3
- Sentinel X 300
- Sentinel X 400

Additives intended to remain permanently in the installation

- Adey MC1+
- Fernox F1
- Fernox F2
- Sentinel X 100
- Sentinel X 200

Additives for frost protection intended to remain permanently in the installation

- Adey MC ZERO
- Fernox Antifreeze Alphi 11
- Sentinel X 500

- If you have used the above-mentioned additives, inform the end user about the measures that are required.
- Inform the end user about the measures required for frost protection.

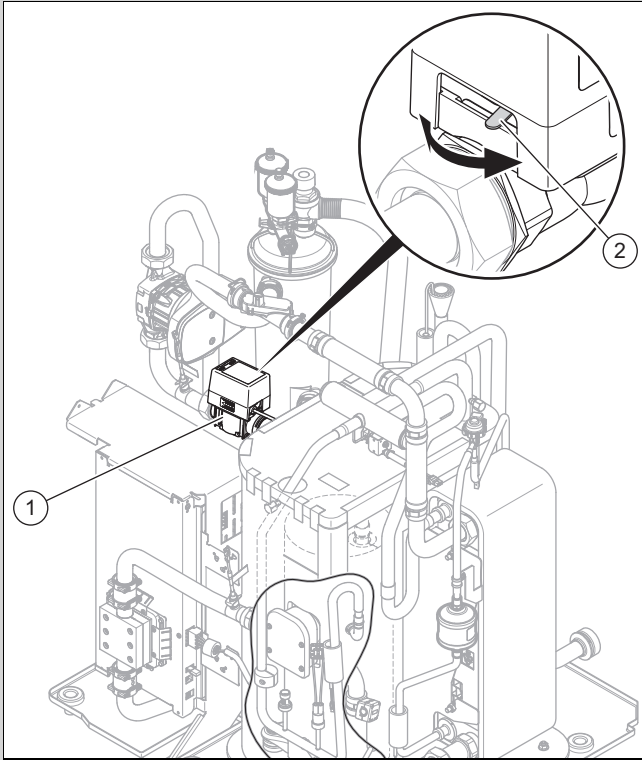
8.4 Filling and purging the heating circuit

- If you want to guarantee frost protection, do not fill the entire heating circuit with antifreeze, but rather establish a system separation.

Validity: Direct connection

- Only use antifreeze that does not change the viscosity of the water.

Filling while the unit is switched off



The isolation valve only opens the entire heating circuit if the product is switched on. If the switched-off product is filled, the heating pump may run dry during start-up and become damaged.

- If the product needs to be filled whilst it is switched off, open the isolation valve (1) manually. To do this, move the lever (2) to the right.
- Once filling is complete, close the isolation valve.
- Establish the power supply and start the installation assistant on the indoor unit. The heating circuit's isolation valve opens during initial start-up as soon as the indoor and outdoor unit are supplied with power and connected via the SystemLAN.

Filling while the unit is switched on

- Fill the product with heating water via the return. It is not possible to fill via the flow, as there is a non-return valve in the product. Slowly increase the filling pressure until the required operating pressure is reached and the pressure display on the indoor unit's display is in the green range.
- Flush the outdoor unit's heating circuit in order to prevent any build-up of air.
- Activate the purge programme on the indoor unit. In this case, the automatic air vent in the outdoor unit is open and must not be closed after the purging process.
- Check the system pressure during the purging process. If the pressure falls, top up the heating water until the required operating pressure is reached again.

Validity: System separation

Filling while the unit is switched on

- Using antifreeze that changes the viscosity of the water is only permitted if the outdoor unit's primary building circuit is separated from the secondary building circuit.
- Establish the power supply and start the installation assistant on the indoor unit. The heating circuit's isolation valve opens during initial start-up as soon as the indoor and outdoor unit are supplied with power and connected via the SystemLAN.
- Fill the product and the primary heating circuit with a brine (44% vol. propylene glycol) via the return. It is not possible to fill via the flow, as there is a non-return valve in the product. Slowly increase the filling pressure until the required operating pressure is reached and the pressure display on the indoor unit's display is in the green range.
- Flush the outdoor unit's heating circuit in order to prevent any build-up of air.
- Activate the purge programme on the indoor unit. In this case, the automatic air vent in the outdoor unit is open and must not be closed after the purging process.
- Check the system pressure during the purging process. If the pressure falls, top up the frost protection/water mixture until the required operating pressure is reached again.
- Fill the secondary heating circuit with heating water. Slowly increase the filling pressure until the required operating pressure is reached and the pressure display on the indoor unit's display is in the green range.
- Activate the heating pump on the indoor unit.
- Check the system pressure during the purging process. If the pressure falls, top up the heating water until the required operating pressure is reached again.

8.5 Operating the product

It is operated via the indoor unit (→ Operating instructions for the indoor unit).

8.6 Guaranteeing frost protection

1. If no system separation for guaranteeing the frost protection is present, ensure that the product is switched on and remains switched on.
2. Ensure that no snow accumulates around the air inlet and air outlet.

8.7 Switching off the product

1. Switch off all of the disconnectors to which the product is connected in the building.
2. Note that this means that frost protection is no longer guaranteed if no system separation for guaranteeing the frost protection is present.

8.8 Available remaining feed pressure

The characteristics apply to the heating circuit for the outdoor unit and relate to a heating water temperature of 20 °C. You can find an overview of the characteristics in the appendix. (→ Appendix A)

9 Handing over to the user

9.1 Instructing the end user

- ▶ Explain to the end user how the product operates.
- ▶ Inform the end user about whether a system separation is present and how the frost protection function is guaranteed.
- ▶ Point out, in particular, the safety warnings to the end user.
- ▶ Point out to the end user the particular risks and rules of conduct that are associated with R290 refrigerant.
- ▶ Make the end user aware of the need for regular maintenance.
- ▶ Advise the end user not to use any auxiliary equipment to accelerate the de-icing process or for cleaning other than those recommended in these instructions. Damage caused by sharp objects, hot water or naked flames must be avoided.
- ▶ Inform the end user that the operating instructions for the heat pump system are enclosed with the indoor unit.

10 Inspection and maintenance

10.1 Preparing for inspection and maintenance

- ▶ Only carry out the work if you are competent and have knowledge about the special features and risks of R290 refrigerant.



Danger!

Risk of death caused by fire or explosion if there is a leak in the refrigerant circuit!

The product contains the combustible refrigerant R290. In the event of a leak, escaping refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion.

- ▶ If you are working on the product when it is open, before starting work, use a gas sniffer to ensure that there is no leak.
- ▶ In the case of a leak: Close the product's housing, inform the end user, and notify customer service.
- ▶ Keep all ignition sources away from the product. In particular, open flames, hot surfaces with temperatures above 370 °C, electrical devices that are not free of electrical sources, static discharges.
- ▶ Ensure that the room is sufficiently aerated around the product.
- ▶ Use a restriction to ensure that unauthorised personnel cannot enter the protective zone.

- ▶ When working in a raised position, observe the occupational safety rules (→ Section 5.11).
- ▶ Switch off all of the disconnectors to which the product is connected in the building.
- ▶ Disconnect the product from the power supply.
- ▶ Ensure that the product is still earthed.
- ▶ When working on the product, protect all electric and hydraulic components from spraying water. Cover the inverter and the wiring harnesses.

10.2 Observing the work plan and intervals



Note

The interval for carrying out inspection and maintenance work can be extended to a maximum of 2 years if a remote monitoring system that is approved by the manufacturer for the unit is used on a permanent basis.

- ▶ Comply with the specified intervals and carry out all of the work that is mentioned.

#	Maintenance work	Interval
1	Checking the protective zone (→ Section 10.4.1)	Annually
2	Cleaning the product (→ Section 10.4.2)	Annually
3	Checking the automatic air vent and expansion relief valve (→ Section 10.4.4)	Annually
4	Checking the evaporator, fan and condensate discharge (→ Section 10.4.5)	Annually
5	Checking the refrigerant circuit (→ Section 10.4.6)	Annually
6	Checking the refrigerant circuit for tightness (→ Section 10.4.7)	Annually
7	Checking the electrical connections and electrical wires (→ Section 10.4.8)	Annually

10.3 Procuring spare parts

The original components of the unit were also certified as part of the CE declaration of conformity. Information about available Vaillant original spare parts is available by contacting the contact address provided on the back page of this document or via the Internet portal.



- ▶ Scan the displayed code using your smartphone in order to view further information about your product.
 - ◁ You are guided to the Internet portal.
- ▶ If you require spare parts for maintenance or repair work, use only Vaillant original spare parts.

10.4 Carrying out maintenance work

10.4.1 Checking the protective zone

- ▶ Check whether the defined protective zone is being maintained in the area close around the product.
(→ Section 4)
- ▶ Check that no subsequent construction-related changes or installations that violate the protective zone have been implemented.

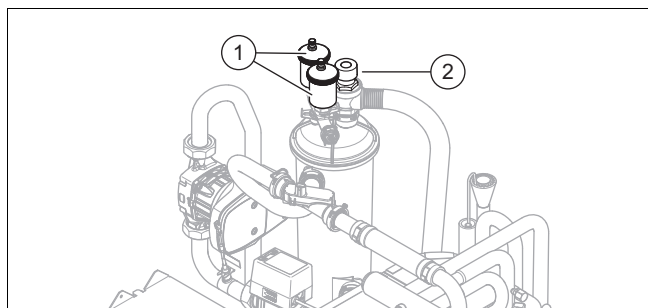
10.4.2 Cleaning the product

- ▶ Only clean the product when all of the casing sections and covers have been installed.
- ▶ Clean the product using a sponge and hot water with cleaning agent. Avoid water temperatures above 20 °C.
- ▶ Do not clean the product with a high-pressure cleaner or a direct jet of water.
- ▶ Only use cleaning agents with a neutral pH value. Do not use abrasives or solvents. Do not use any cleaning agents that contain chlorine or ammonia.
- ▶ Clean the air inlet grille and the air outlet grille.
- ▶ Clean the drainage channel.
 - To clean the drainage channel, remove the right-hand side casing (→ Section 5.15.1) and the front casing (→ Section 5.15.2).

10.4.3 Removing the casing sections

1. Before removing the casing sections, use a gas sniffer to check whether refrigerant is escaping.
2. Remove the casing sections to the extent required for the subsequent maintenance work (→ Section 5.15).

10.4.4 Checking the automatic air vent and expansion relief valve



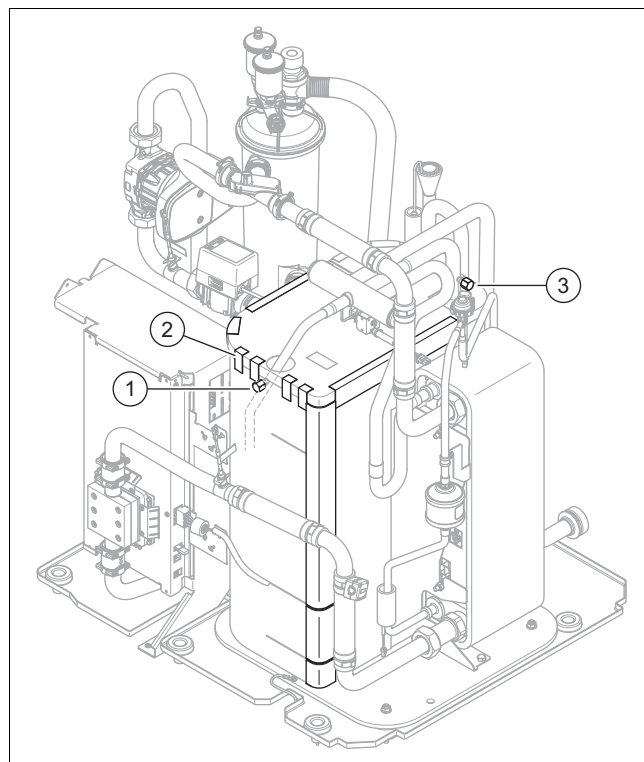
1. Check that the automatic air vent (1) is open.
2. Check the automatic air vent for leaks. If required, replace the automatic air vent.
3. Check that the expansion relief valve (2) is working correctly.

10.4.5 Checking the evaporator, fan and condensate discharge

1. Clean the gaps between the fins using a soft brush. In doing so, avoid fins being bent.
2. Remove any dirt and depositions.
3. If required, straighten out any bent fins using a fin comb.
4. Turn the fan by hand.
5. Check that the fan runs freely.
6. Remove the dirt that has accumulated on the condensate tray or in the condensate discharge pipe.

7. Check that the water can drain freely. Pour approx. 1 l water into the condensate tray.
8. Ensure that the heating wire is inserted into the condensate discharge tundish.

10.4.6 Checking the refrigerant circuit



1. Check whether the components and pipelines are free from dirt and corrosion.
2. If required, undo the hook and loop fasteners (2) of the insulation and check that the covering caps (1) and (3) the maintenance connections are positioned securely.

10.4.7 Checking the refrigerant circuit for tightness

1. Check whether the components in the refrigerant circuit and the refrigerant pipes are free from damage, corrosion and oil leaks.
2. Check the refrigerant circuit for leak-tightness using a gas sniffer. In doing so, check all of the components and pipelines.
3. Document the result of the leak-tightness test in the service book.

10.4.8 Checking the electrical connections and electrical wires

1. On the connection box, check whether the seal is undamaged.
2. In the connection box, check that the electrical wires are seated firmly in the plugs or terminals.
3. Check the earthing in the connection box.
4. Check the power supply cable.

Result:

Power supply cable defective

- ▶ Ensure that the replacement is carried out exclusively by Vaillant, by customer service or by a person qualified for electrical work.
5. In the unit, check that the electrical wires are seated firmly in the plugs or terminals.

6. In the unit, check whether the electrical wires are free from damage.
7. Check the coating on all earth connections.

Result:

Earth connections corroded

- ▶ Replace the earth connection.

10.4.9 Completing inspection and maintenance

- ▶ Installing the casing sections.
- ▶ Switch on the disconnecter to which the product is connected in the building.
- ▶ Start up the product.
- ▶ Carry out an operational test and a safety test.

11 Troubleshooting

11.1 Fault messages

In the event of a fault, a fault code is shown on the indoor unit's display.

- ▶ Use the "Fault messages" table (→ installation instructions for the indoor unit, Appendix).

11.2 Other faults

- ▶ Use the "Troubleshooting" table (→ installation instructions for the indoor unit, Appendix).

12 Repair and service

12.1 Preparing repair and service work on the refrigerant circuit

Only carry out work if you have specific expert refrigeration knowledge and are competent at handling R290 refrigerant.



Danger!

Risk of death caused by fire or explosion if there is a leak in the refrigerant circuit!

The product contains the combustible refrigerant R290. In the event of a leak, escaping refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion.

- ▶ If you are working on the product when it is open, before starting work, use a gas sniffer to ensure that there is no leak.
- ▶ In the case of a leak: Close the product's housing, inform the end user, and notify customer service.
- ▶ Keep all ignition sources away from the product. In particular, open flames, hot surfaces with temperatures above 370 °C, electrical devices that are not free of electrical sources, static discharges.
- ▶ Ensure that the room is sufficiently aerated around the product.
- ▶ Use a restriction to ensure that unauthorised personnel cannot enter the protective zone.

- ▶ Switch off all of the disconnectors to which the product is connected in the building.
- ▶ Disconnect the product from the power supply but ensure that the product is still earthed.
- ▶ Restrict the working area and put up warning signs.
- ▶ Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ▶ Use only safe units and tools that are permitted for R290 refrigerant.
- ▶ Monitor the atmosphere in the working area using a suitable gas detector that is positioned close to the floor.
- ▶ Remove all ignition sources, e.g. tools that are not spark-free. Take protective measures to prevent static discharges.
- ▶ Remove the right-hand side casing and the front casing.

12.2 Removing refrigerant from the product



Danger!

Risk of death caused by fire or explosion when removing the refrigerant!

The product contains the combustible refrigerant R290. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion.

- ▶ Only carry out the work if you are competent at handling R290 refrigerant.
- ▶ Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ▶ Only use tools and units that are permitted for R290 refrigerant and are in proper working condition.
- ▶ Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the refrigerant cylinder.
- ▶ Note that the refrigerant R290 must never be introduced into the sewage system.
- ▶ Do not use the compressor to pump the refrigerant into the outdoor unit (no pump-down).

1. If no system separation is present, remove the heating water from the condenser (heat exchanger) before the refrigerant is removed from the product.
2. Procure the tools and units that are required for removing the refrigerant:
 - Extraction station
 - Vacuum pump
 - Recycling cylinder for refrigerant
 - Manometer bridge
3. Only use tools and units that are permitted for R290 refrigerant.
4. Use only recycling cylinders that are approved for R290 refrigerant, have been labelled appropriately, and are equipped with a pressure relief and isolation valve.
5. Only use hoses, couplings and valves that are leak-tight and in proper working condition. Check the tightness using a suitable gas sniffer.
6. Drain the recycling cylinder.

7. Extract the refrigerant. Take into account the maximum fill quantity of the recycling cylinder, and monitor the fill quantity using calibrated scales.
8. Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the recycling cylinder.
9. Connect the manometer bridge to both the high-pressure side and the low-pressure sides of the refrigerant circuit and make sure that the expansion valve is open in order to ensure that the refrigerant circuit is completely drained.

12.3 Removing components of the refrigerant circuit

- ▶ Flush the refrigerant circuit with nitrogen.
- ▶ Drain the refrigerant circuit.
- ▶ Repeat the process of rinsing with nitrogen and draining until there is no longer any refrigerant in the refrigerant circuit.
- ▶ If you want to remove the compressor in which the compressor oil is located, evacuate the refrigerant circuit to ensure that no flammable refrigerant remains in the compressor oil..
- ▶ Establish the atmospheric pressure.
- ▶ Use a pipe cutter to open the refrigerant circuit. Do not use soldering equipment or sparking or chipping tools.
- ▶ Remove the component.
- ▶ Note that removed components could continue to release refrigerant for a long time due to outgassing from the compressor oil contained in the components. This applies in particular for the compressor. Only store and transport these components in well-aerated locations.

12.4 Installing components of the refrigerant circuit

- ▶ Install the component correctly. To do this, use only soldering processes.
- ▶ Carry out a pressure test of the refrigerant circuit using nitrogen.

12.5 Filling the product with refrigerant



Danger!

Risk of death caused by fire or explosion when filling with refrigerant!

The product contains the combustible refrigerant R290. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion.

- ▶ Only carry out the work if you are competent at handling R290 refrigerant.
- ▶ Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ▶ Only use tools and units that are permitted for R290 refrigerant and are in proper working condition.
- ▶ Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the refrigerant cylinder.

1. Use only R290 refrigerant that has not been used before and is specified as such, and the purity of which is at least 99.5%.
2. Procure the tools and units that are required for filling with refrigerant:
 - Vacuum pump
 - Refrigerant cylinder
 - Scales
3. Only use tools and units that are permitted for R290 refrigerant. Only use refrigerant cylinders that are labelled accordingly.
4. Only use hoses, couplings and valves that are leak-tight and in proper working condition. Check the tightness using a suitable gas sniffer.
5. Only use hoses that are as short as possible in order to minimise the refrigerant volume that they can hold.
6. Flush the refrigerant circuit with nitrogen.
7. Drain the refrigerant circuit.
8. Fill the refrigerant circuit with R290 refrigerant. The required fill quantity is specified on the product's data plate. Ensure in particular that the refrigerant circuit is not overfilled.
9. Check the refrigerant circuit for leak-tightness using a gas sniffer. In doing so, check all of the components and pipelines.

12.6 Replacing electrical components

1. Protect all of the electrical components against spraying water.
2. Only use insulated tools that allow you to work safely up to 1000 V.
3. Only use Vaillant original spare parts.
4. Replace the defective electrical component correctly.
5. Carry out an electrical test in accordance with EN 50678.

12.7 Replacing the hydraulic component

1. Protect all of the hydraulic components against spraying water.
2. Protect the inverter and the cable harnesses running above it from moisture and damp.

12.8 Completing repair and service work

- ▶ Installing the casing sections. (→ Section 5.16)
- ▶ Switch on the power supply and the product.
- ▶ Start up the product. Temporarily activate the heating mode.
- ▶ Check the product for leak-tightness using a gas sniffer.

13 Decommissioning

13.1 Temporarily decommissioning the product

1. Disconnect the product from the power supply. To do this, switch off all of the disconnectors to which the product is connected in the building.
2. Protect the heating installation against frost. If there is a risk of frost damage, drain the heating water from the product.

Condition: Activated Flexible Space Function

- Please note that the product may only be decommissioned temporarily for the time required to carry out any maintenance or repair and not for a longer period of time (e.g. holidays, the time spent waiting for spare parts to be delivered, etc.).

13.2 Permanently decommissioning the product



Danger!

Risk of death caused by fire or explosion when transporting units that contain refrigerant!

The product contains the combustible refrigerant R290. When transporting units without their original packaging, the refrigerant circuit may be damaged and refrigerant may be released. When mixing with air, a combustible atmosphere may form. There is a risk of fire and explosion.

- Ensure that the refrigerant is correctly removed from the product transport.

1. Switch off all of the disconnectors to which the product is connected in the building.
2. Disconnect the product from the power supply but ensure that the product is still earthed.
3. Use a gas sniffer to ensure that there are no leaks in the refrigerant circuit.
4. Drain the heating water from the product.
5. Remove the right-hand side casing and the front casing.
6. Remove the refrigerant from the product.
(→ Section 12.2)
7. Note that refrigerant will continue to escape even after the refrigerant circuit is completely drained due to outgassing from the compressor oil.
8. Install the right-hand side casing and the front casing.
9. Label the product using a sticker that is visible from the outside. Note down on the sticker that the product has been decommissioned and that the refrigerant has been completely removed. Sign the sticker and specify the date.
10. Recycle the removed refrigerant in accordance with the regulations. Note that the refrigerant must be cleaned and checked before it is used again.
11. Dispose of or recycle the product and its components in accordance with the regulations.

14 Recycling and disposal

14.1 Disposing of the packaging

- Dispose of the packaging correctly.
- Observe all relevant regulations.

14.2 Disposing of the refrigerant



Danger!

Risk of death caused by fire or explosion when transporting refrigerant!

If R290 refrigerant is released during transport, a flammable atmosphere may form when it mixes with air. There is a risk of fire and explosion.

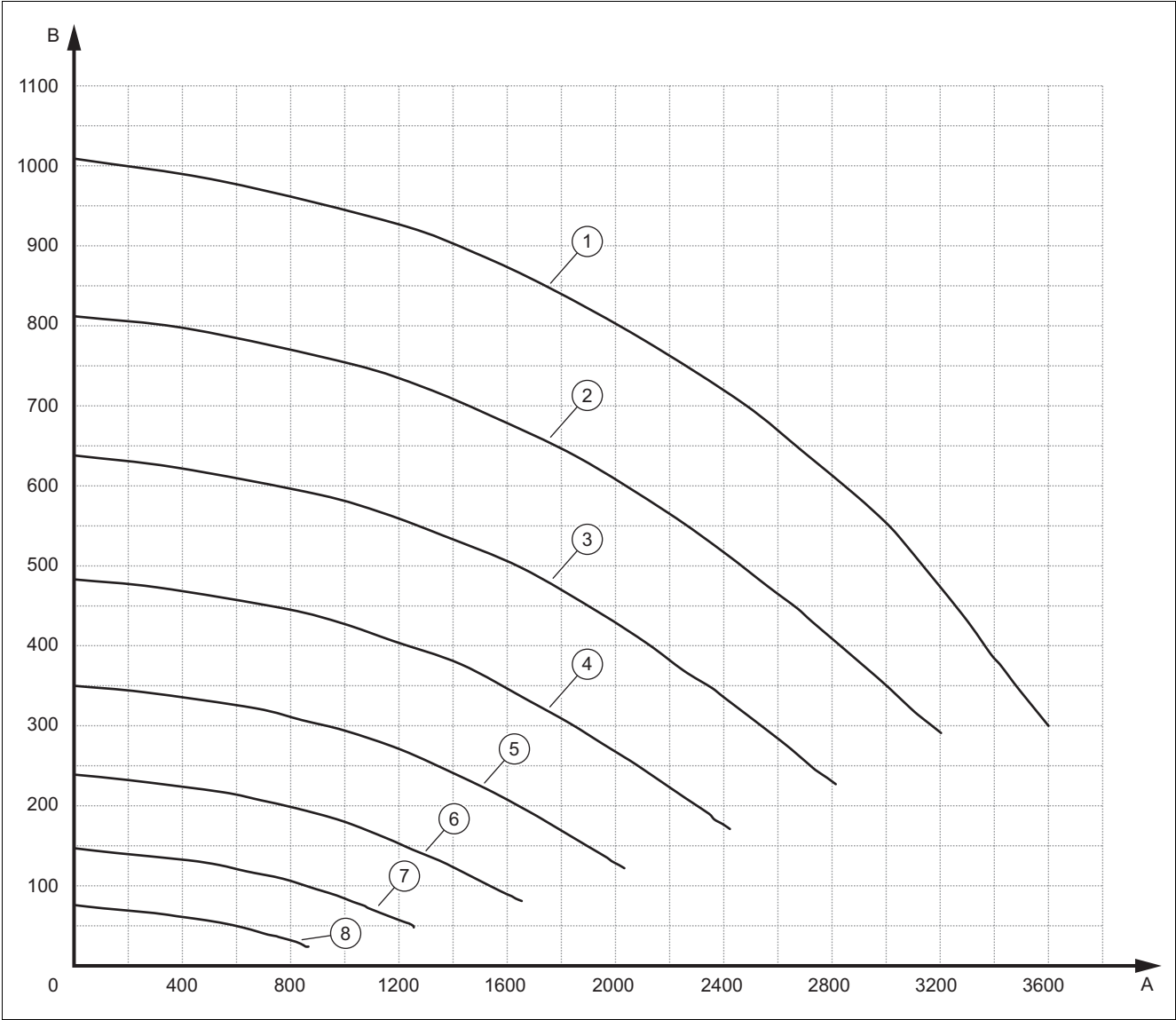
- Ensure that the refrigerant is transported correctly.
-
- Ensure that the refrigerant is disposed of by a qualified competent person.

15 Customer service

For contact details for our customer service department, you can write to the address that is provided on the back page, or you can visit www.vaillant.com.

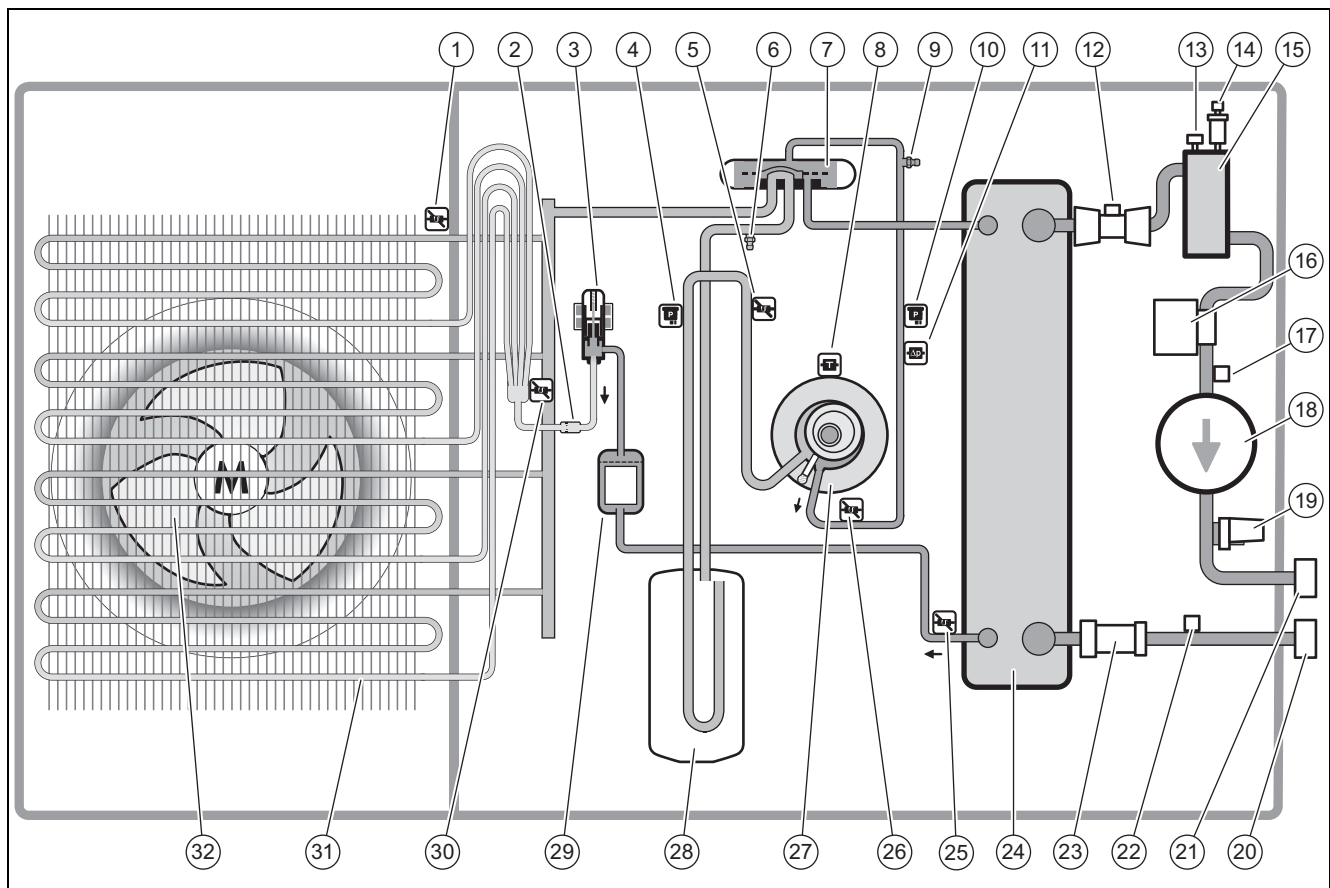
Appendix

A Available remaining feed pressure



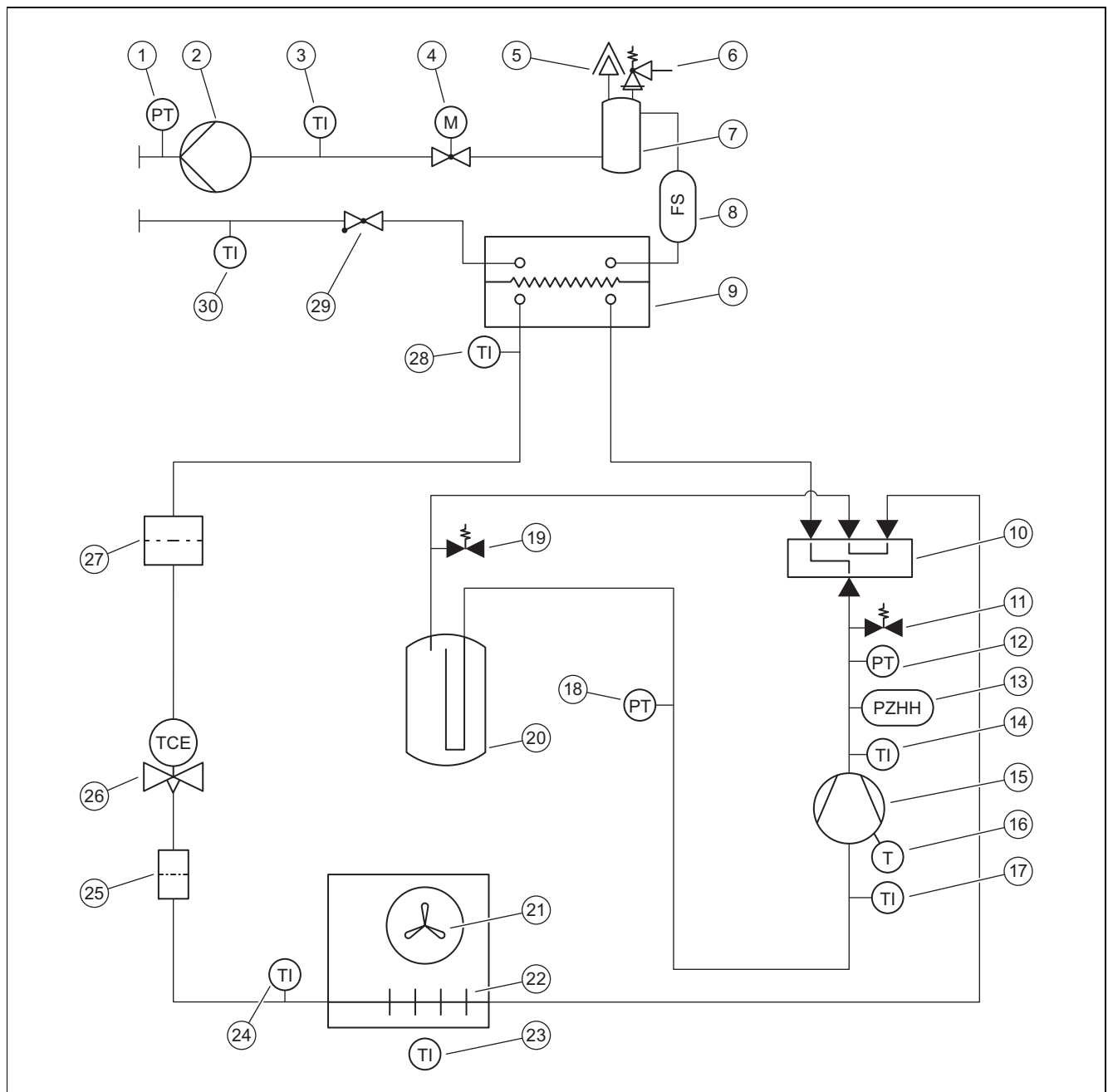
A	Volume flow, in l/h	B	Remaining feed pressure, in mbar (1000 mbar = 100 kPa)
1	100% PWM	5	60% PWM
2	90% PWM	6	50% PWM
3	80% PWM	7	40% PWM
4	70% PWM	8	30% PWM

B Functional diagram



1	Temperature sensor at the air inlet	17	Temperature sensor on the heating flow
2	Filter	18	Heating pump
3	Electronic expansion valve	19	Pressure sensor in the heating circuit
4	Pressure sensor in the low-pressure area	20	Connection for heating return
5	Temperature sensor upstream of the compressor	21	Connection for heating flow
6	Maintenance connection in the low-pressure area	22	Temperature sensor on the heating return
7	4-port diverter valve	23	Non-return valve
8	Temperature sensor on the compressor	24	Condenser
9	Maintenance connection in the high-pressure area	25	Temperature sensor downstream of the condenser
10	Pressure sensor in the high-pressure area	26	Temperature sensor downstream of the compressor
11	Pressure switch	27	Compressor
12	Flow rate sensor	28	Refrigerant buffer vessel
13	Expansion relief valve	29	Filter/dryer
14	Automatic air vent	30	Temperature sensor at the evaporator
15	Refrigerant separator	31	Evaporator
16	Heating circuit isolation valve	32	Fan

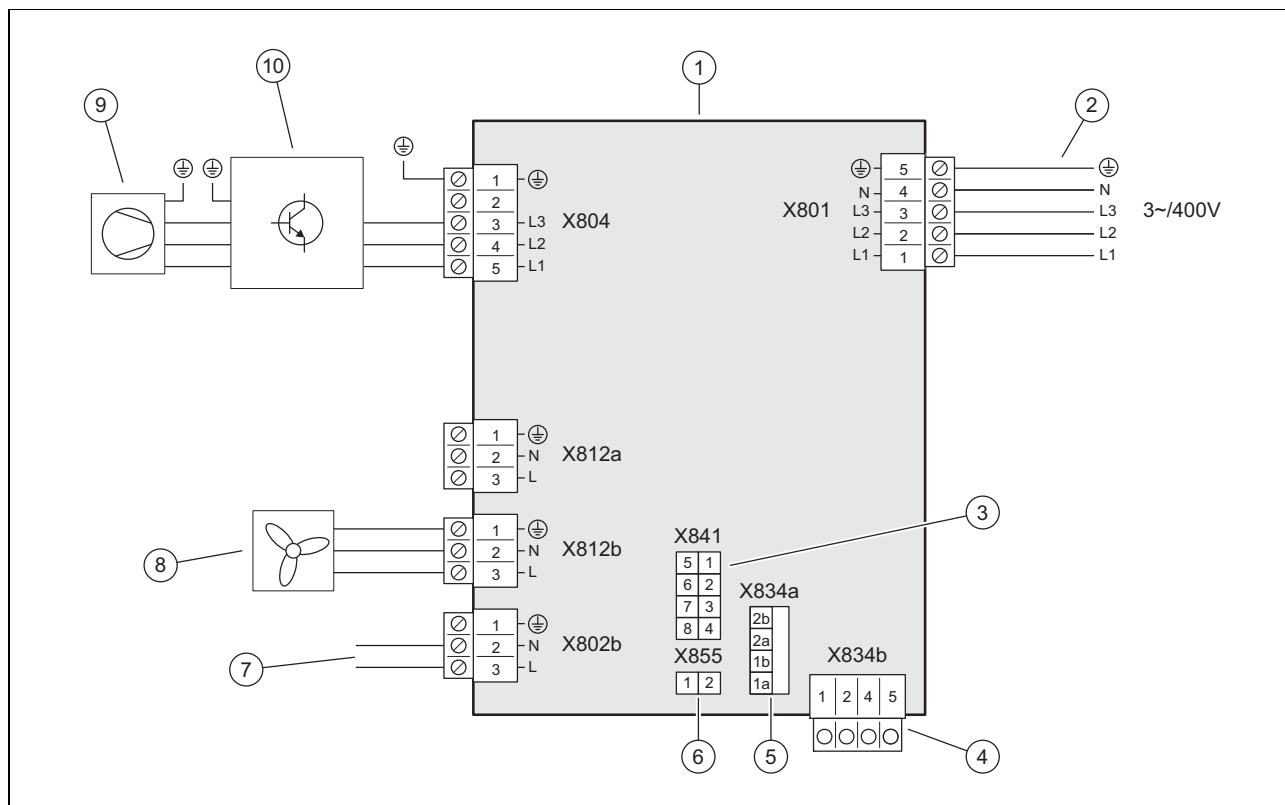
C Safety devices



1	Pressure sensor in the heating circuit	16	Temperature monitor at the compressor
2	Heating pump	17	Temperature sensor upstream of the compressor
3	Temperature sensor on the heating flow	18	Pressure sensor in the low-pressure area
4	Heating circuit isolation valve	19	Maintenance connection in the low-pressure area
5	Automatic air vent	20	Refrigerant buffer vessel
6	Expansion relief valve	21	Fan
7	Refrigerant separator	22	Evaporator
8	Flow rate sensor	23	Temperature sensor at the air inlet
9	Condenser	24	Temperature sensor at the evaporator
10	4-port diverter valve	25	Filter
11	Maintenance connection in the high-pressure area	26	Electronic expansion valve
12	Pressure sensor in the high-pressure area	27	Filter/dryer
13	Pressure switch in the high-pressure area	28	Temperature sensor downstream of the condenser
14	Temperature sensor downstream of the compressor	29	Non-return valve
15	Compressor	30	Heating return temperature sensor

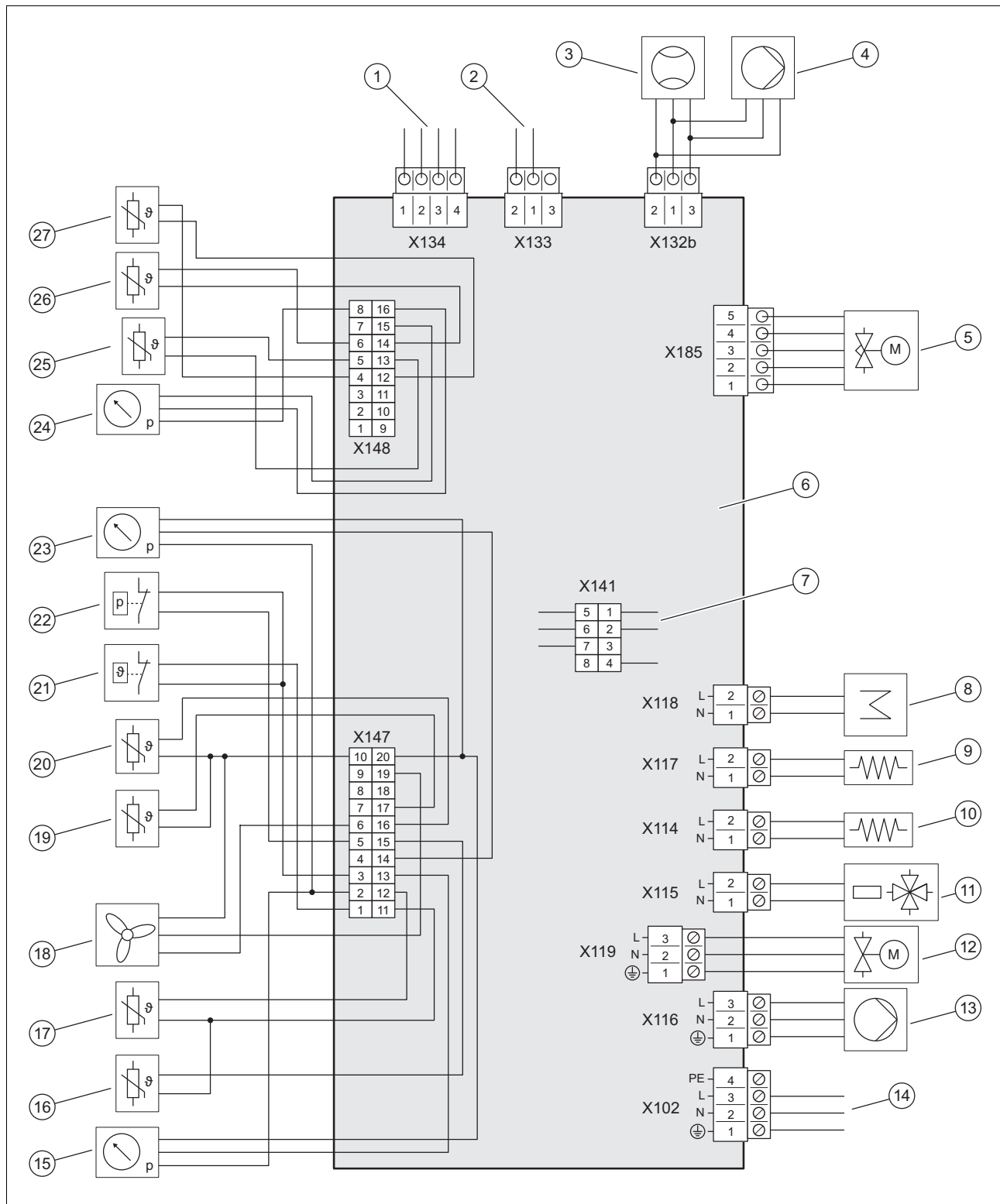
D Wiring diagram

D.1 Wiring diagram, power supply, 3~/400V



- | | | | |
|---|---|----|----------------------------------|
| 1 | Installer Board PCB | 6 | Coding resistor for cooling mode |
| 2 | Power supply connection | 7 | Power supply for the HMU PCB |
| 3 | Connection to the HMU PCB | 8 | Fan power supply |
| 4 | SystemLAN connection to the HMU | 9 | Compressor |
| 5 | SystemLAN connection to the indoor unit | 10 | Inverter assembly |

D.2 Wiring diagram, sensors and actuators



- | | | | |
|----|---|----|--|
| 1 | Installer Board SystemLAN | 11 | 4-port diverter valve |
| 2 | Modbus to the inverter | 12 | Heating circuit isolation valve |
| 3 | LIN bus flow rate sensor | 13 | Heating pump power supply |
| 4 | LIN bus heating pump | 14 | HMU PCB power supply |
| 5 | Electronic expansion valve | 15 | Pressure sensor in the low-pressure area |
| 6 | HMU PCB | 16 | Temperature sensor at the evaporator |
| 7 | Connection to the Installer Board PCB | 17 | Temperature sensor for outdoor air |
| 8 | Heating, condensate tray drain (optional) | 18 | Fan actuation |
| 9 | Condensate tray heater | 19 | Temperature sensor for compressor input |
| 10 | Crankcase heater | 20 | Temperature sensor for compressor output |

21	Temperature monitor	25	Temperature sensor on the heating return
22	Pressure switch in the high-pressure area	26	Temperature sensor downstream of the condenser
23	Pressure sensor in the high-pressure area	27	Temperature sensor on the heating flow
24	Pressure sensor in the heating circuit		

E Technical data



Note

The following performance data is only applicable to new products with clean heat exchangers and a previous minimum compressor operating time of 72 hours.

The performance data also covers noise reduction mode.

The data in accordance with EN 14825 is determined using a special test method. You can find information about this from the manufacturer of the product by stating "EN 14825 test method".

Technical data – General

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Width	1,897 mm	1,897 mm
Height	1,233 mm	1,233 mm
Depth	785 mm	785 mm
Weight, with packaging	342 kg	342 kg
Weight, ready for operation	308 kg	308 kg
Weight, ready for operation, left-/right-hand side	96 kg/212 kg	96 kg/212 kg
RAL colour	7021	7021
Connection, heating circuit	G 1 1/2 "	G 1 1/2 "
Rated voltage	400 V (+10%/-15%), 50 Hz, 3~N/PE	400 V (+10%/-15%), 50 Hz, 3~N/PE
Rated power, maximum	13.0 kW	13.0 kW
Rated power factor	1	1
Rated current, maximum	19.0 A	19.0 A
Minimum cable cross-section	2.5 mm ²	2.5 mm ²
IP rating	IPX4	IPX4
Fuse type	Characteristic D 25 A, slow-blow, three-pole switching	Characteristic D 25 A, slow-blow, three-pole switching
Fan, power consumption	275 W	275 W
Fan, quantity	1	1
Fan, rotational speed, maximum	415 rpm	415 rpm
Fan, air flow, maximum	7,800 m ³ /h	7,800 m ³ /h
Heating pump, power consumption	140 W	140 W

Technical data – Heating circuit

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Heating water temperature, minimum/maximum	20 to 75 °C	20 to 75 °C
Operating pressure, minimum	0.05 MPa (0.50 bar)	0.05 MPa (0.50 bar)
Operating pressure, maximum	0.25 MPa (2.50 bar)	0.25 MPa (2.50 bar)
Volume flow, minimum	1,140 l/h	1,140 l/h
Volume flow, maximum	3,600 l/h	3,600 l/h
De-icing volume flow, minimal	2,200 l/h	2,200 l/h
Radiator volume flow	1,800 l/h	1,800 l/h

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Underfloor heating volume flow	2,900 l/h	2,900 l/h
Water volume, in the outdoor unit	8.0 l	8.0 l

Technical data – Refrigerant circuit

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Refrigerant, type	R290	R290
Refrigerant, fill quantity	2.4 kg	2.4 kg
Refrigerant, Global Warming Potential (GWP)	0.02	0.02
Refrigerant, CO ₂ equivalent	0.000046 t	0.000046 t
Permissible operating pressure, maximum	3.15 MPa (31.50 bar)	3.15 MPa (31.50 bar)
Compressor, type	Scroll compressor	Scroll compressor
Compressor, oil type	Specific polyalkylene glycol (PAG)	Specific polyalkylene glycol (PAG)
Compressor, control	Electronic	Electronic

Technical data – Power, heating mode

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Heat output, A2/W35	8.38 kW	8.38 kW
Coefficient of performance, COP, EN 14511, A2/W35	4.54	4.54
Heat output, minimum/maximum, A2/W35	6.58 to 16.16 kW	6.58 to 23.06 kW
Heat output, A2/W45	12.78 kW	12.78 kW
Coefficient of performance, COP, EN 14511, A2/W45	3.3	3.3
Heat output, minimum/maximum, A2/W45	6.17 to 18.35 kW	6.17 to 22.60 kW
Heat output, A2/W55	11.21 kW	14.24 kW
Coefficient of performance, COP, EN 14511, A2/W55	2.69	2.81
Heat output, minimum/maximum, A2/W55	5.51 to 16.55 kW	5.51 to 23.43 kW
Heat output, nominal, A7/W35	17.66 kW	20.89 kW
Coefficient of performance, COP, EN 14511, A7/W35	5.02	4.68
Heat output, minimum/maximum, A7/W35	7.47 to 17.92 kW	7.47 to 24.27 kW
Heat output, A7/W45	14.44 kW	14.44 kW
Coefficient of performance, COP, EN 14511, A7/W45	3.73	3.73
Heat output, minimum/maximum, A7/W45	6.93 to 17.19 kW	6.93 to 21.60 kW
Heat output, A7/W55	14.19 kW	14.12 kW
Coefficient of performance, COP, EN 14511, A7/W55	3.31	3.31
Heat output, minimum/maximum, A7/W55	6.00 to 17.29 kW	6.00 to 21.50 kW
Heat output, maximum, A7/W65	17.31 kW	24.32 kW
Coefficient of performance, COP, EN 14511, maximum, A7/W65	2.62	2.34
Heat output, A-7/W35	14.82 kW	10.21 kW
Coefficient of performance, COP, EN 14511, A-7/W35	3.14	3.42
Maximum heat output, A-7/W35	14.82 kW	19.60 kW
Heat output, A-7/W45	10.5 kW	10.5 kW
Coefficient of performance, COP, EN 14511, A-7/W45	2.60	2.60
Maximum heat output, A-7/W45	18.35 kW	19.54 kW
Heat output, A-7/W55	14.76 kW	9.52 kW
Coefficient of performance, COP, EN 14511, A-7/W55	2.21	2.26
Maximum heat output, A-7/W55	14.64 kW	20.50 kW

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Maximum heat output, A-7/W65	14.1 kW	19.33 kW
Coefficient of performance, COP, EN 14511, maximum, A-7/W65	1.75	1.84

Technical data – Power, cooling mode

Validity: Product with cooling mode

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Cooling output, A35/W18	16.63 kW	16.63 kW
Energy efficiency ratio, EER, EN 14511, A35/W18	5.04	5.04
Cooling output, minimum/maximum, A35/W18	10.91 to 20.56 kW	10.91 to 20.56 kW
Cooling output, A35/W7	16.59 kW	16.59 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	3.03	3.03
Cooling output, minimum/maximum, A35/W7	7.58 to 16.96 kW	7.58 to 16.96 kW

Technical data – Power in noise reduction mode, heating mode

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Heat output, EN 14511, A-7/W35, 25% noise reduction mode	14.9 kW	14.9 kW
Coefficient of performance, COP, EN 14511, A-7/W35, noise reduction mode 25%	3.10	3.10
Power consumption, effective, EN 14511, A-7/W35, 25% noise reduction mode	4.9 kW	4.9 kW
Heat output, EN 14511, A-7/W35, 50% noise reduction mode	13.5 kW	13.5 kW
Coefficient of performance, COP, EN 14511, A-7/W35, noise reduction mode 50%	3.10	3.10
Power consumption, effective, EN 14511, A-7/W35, 50% noise reduction mode	4.4 kW	4.4 kW
Heat output, EN 14511, A-7/W35, 75% noise reduction mode	12.3 kW	12.3 kW
Coefficient of performance, COP, EN 14511, A-7/W35, noise reduction mode 75%	3.10	3.10
Power consumption, effective, EN 14511, A-7/W35, 75% noise reduction mode	4.0 kW	4.0 kW
Heat output, EN 14511, A-7/W35, 100% noise reduction mode	10.7 kW	10.7 kW
Coefficient of performance, COP, EN 14511, A-7/W35, noise reduction mode 100%	3.05	3.05
Power consumption, effective, EN 14511, A-7/W35, 100% noise reduction mode	3.5 kW	3.5 kW

Technical data – Sound emissions, heating mode

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Sound power, EN 12102-1, EN ISO 3745, ERP	49.0 dB(A)	50.0 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 25% noise reduction mode	58.4 dB(A)	56.2 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 50% noise reduction mode	55.3 dB(A)	54.5 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 75% noise reduction mode	54.5 dB(A)	53.6 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 100% noise reduction mode	52.7 dB(A)	51.7 dB(A)
Sound power, maximum, EN 12102-1, EN ISO 3745	61.7 dB(A)	–
Sound power, in operation, EN 12102-1, EN ISO 3745	–	62.7 dB(A)

Technical data – Sound emissions, cooling mode

Validity: Product with cooling mode

	VWL 175/8.1 A S3 Q	VWL 215/8.1 A S3 Q
Sound power, EN 12102, EN 14511 LWA, A35/W18	64.1 dB(A)	64.7 dB(A)
Sound power, EN 12102, EN 14511 LWA, A35/W7	64.4 dB(A)	64.8 dB(A)

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