

- en Operating instructions
- en Installation and maintenance instructions



aroTHERM plus

VWL 45/6 A 230V S3 ... VWL 155/6 A S3

Operating instructions

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1 Safety

1 Safety

1.1 Action-related warnings

Classification of action-related warnings

The action-related warnings are classified in accordance with the severity of the possible danger using the following warning signs and signal words:

Warning symbols and signal words



Danger!

Imminent danger to life or risk of severe personal injury



Danger!

Risk of death from electric shock



Warning.

Risk of minor personal injury



Caution.

Risk of material or environmental damage

1.2 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 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 the operating instructions included for the product and any other installation components
- compliance with all inspection and maintenance conditions listed in the instructions.

This product can be used by children aged from 8 years and above and persons with

reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the product in a safe way and understand the hazards involved. Children must not play with the product. Cleaning and user maintenance work must not be carried out by children unless they are supervised.

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.

1.3 General safety information

1.3.1 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.

A protective zone is defined for the area close around the product. See section "Protective zone".

- ▶ Keep all ignition sources away from the protective zone. In particular, open flames, hot surfaces with temperatures above 370 °C, electrical devices or tools that are not free from electrical sources, static discharges.
- ▶ Do not use any sprays or other combustible gases in the protective zone.

1.3.2 Risk of death due to changes to the product or the product environment

- ▶ Never remove, bridge or block the safety devices.
- ▶ Do not tamper with any of the safety devices.
- ▶ Do not damage or remove any tamper-proof seals on components.
- ▶ Do not make any changes:
 - The product itself
 - To the supply lines





- On the drain pipework
- On the expansion relief valve for the heat source circuit
- to constructional conditions that may affect the operational reliability of the product

1.3.3 Risk of injury and material damage due to maintenance and repairs carried out incorrectly or not carried out at all

- ▶ Never attempt to carry out maintenance work or repairs on your product yourself.
- ▶ Faults and damage should be immediately rectified by a competent person.
- ▶ Adhere to the maintenance intervals specified.

1.3.4 Risk of material damage caused by frost

- ▶ Ensure that the heating installation always remains in operation during freezing conditions and that all rooms are sufficiently heated.
- ▶ If you cannot ensure the operation, have a competent person drain the heating installation.

1.3.5 Danger caused by improper operation

Improper operation may present a danger to you and others, and cause material damage.

- ▶ Carefully read the enclosed instructions and all other applicable documents, particularly the "Safety" section and the warnings.
- ▶ Only carry out the activities for which instructions are provided in these operating instructions.



2 Notes on the documentation

2 Notes on the documentation

2.1 Documents

- ▶ Always observe all operating instructions enclosed with the installation components.
- ▶ Store these instructions and all other applicable documents for further use.

2.2 Validity of the instructions

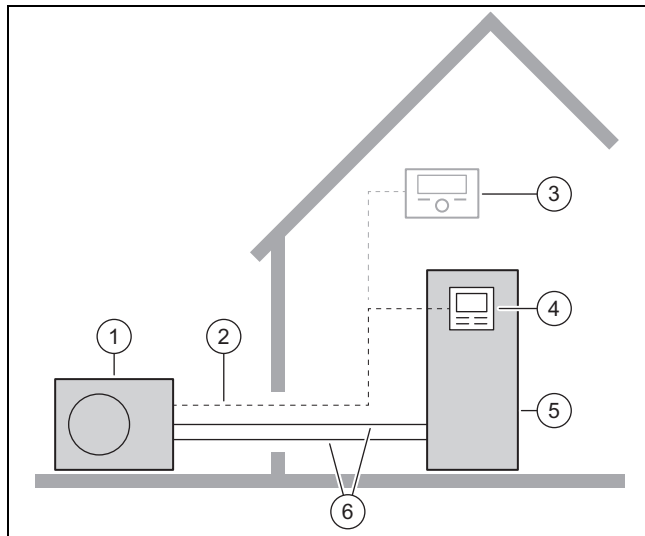
These instructions apply only to:

Product
VWL 45/6 A 230V S3
VWL 55/6 A 230V S3
VWL 65/6 A 230V S3
VWL 85/6 A 230V S3
VWL 125/6 A 230V S3
VWL 125/6 A S3
VWL 155/6 A 230V S3
VWL 155/6 A S3

3 Product description

3.1 Heat pump system

Design of a sample heat pump system with monoblock technology:



- | | |
|-----------------------------|-------------------------------|
| 1 Heat pump Outdoor unit | 4 Control for the indoor unit |
| 2 eBUS line | 5 Heat pump Indoor unit |
| 3 System control (optional) | 6 Heating circuit |

3.2 Description of the product

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

3.3 Functions of the heat pump

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

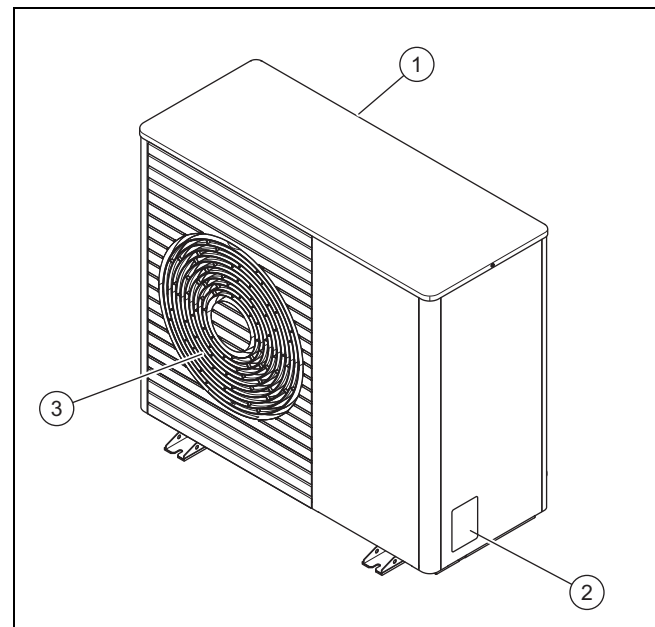
Cyclic evaporation, compression, liquefaction and expansion takes in heat energy from the surroundings and transfers it to the building. In cooling mode, heat energy is extracted from the building and released into the environment.

3.4 System separation and frost protection

With a system separation, an intermediate heat exchanger is installed in the indoor unit. This separates the heating circuit into a primary heating circuit (to the outdoor unit) and a secondary heating circuit (in the building).

If the primary heating circuit is filled with a water/frost protection mixture (brine fluid), the outdoor unit is then protected against freezing, even if this is electrically switched off or in the case of a power cut.

3.5 Product design



- | | |
|--------------------|---------------------|
| 1 Air inlet grille | 3 Air outlet grille |
| 2 Data plate | |




3.6 Data plate and serial number

The data plate is located on the right-hand side of the product's exterior.

The data plate includes the nomenclature and the serial number.

3.7 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
	Warning against flammable materials in conjunction with R290 refrigerant.
	Fire, naked flames and smoke are prohibited.
	Read the service information and technical instructions.

4 Protective zone

4.1 Protective zone

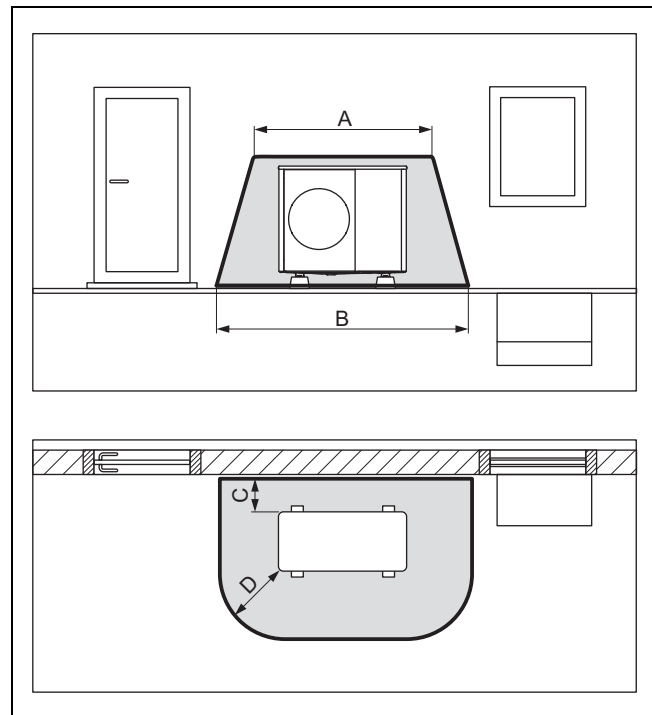
The product contains R290 refrigerant. In the event of a leak, escaping refrigerant may collect near the ground. The refrigerant must not get into building openings, grooves or into the waste-water system. The refrigerant must not collect in any way that may lead to a dangerous, explosive, suffocating or toxic atmosphere.

A protective zone is defined for the area close around the product. There must be no windows, doors, ventilation openings, light shafts, cellar entrances, escape hatches, flat-roof windows or downpipes in the protective zone. The protective zone must not extend to adjacent buildings or public traffic areas.

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

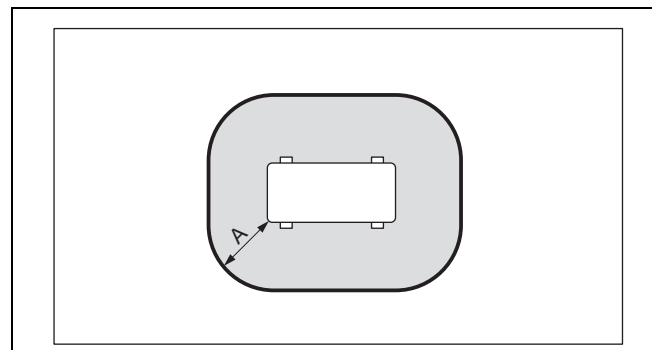
In the area close around the product, You are not permitted to make any subsequent structural alterations which infringe the stated rules for the protective zone.

4.1.1 Protective zone, for ground installation, in front of a building wall



A	2100 mm	C	200 mm/250 mm
B	3100 mm	D	1000 mm

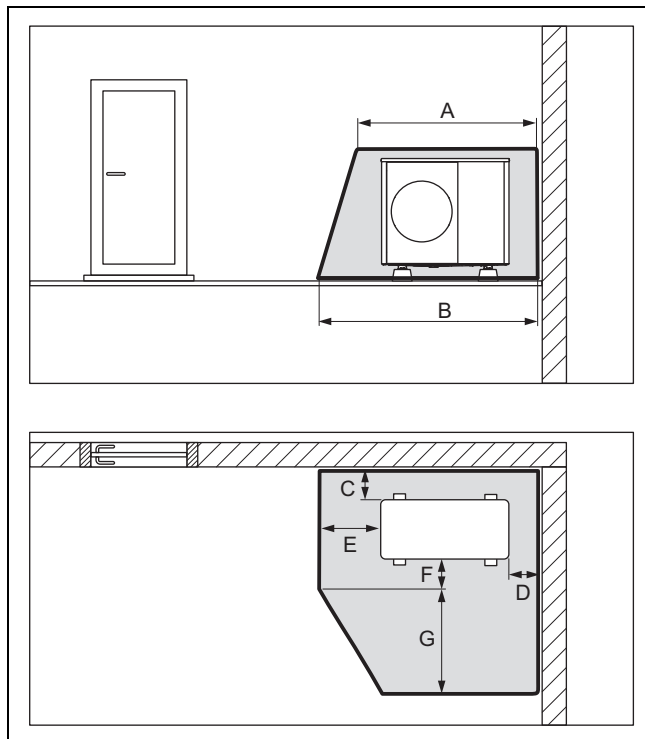
4.1.2 Protective zone, for ground installation on the premises, and for flat-roof installation



A	1000 mm
---	---------

5 Operation

4.1.3 Protective zone, for ground installation, in a building corner



A	2100 mm	E	1000 mm
B	2600 mm	F	500 mm
C	200 mm/250 mm	G	1800 mm
D	500 mm		

5 Operation

5.1 Switching on the product

- ▶ Switch on all of the disconnectors (fuses, circuit breakers) to which the product is connected in the building.

5.2 Operating the product

The control for the indoor unit provides information about the operating mode, and is used to set parameters and eliminate faults.

- ▶ Go to the indoor unit. Follow the operating instructions.

Condition: System control present

The system control controls the heating installation and domestic hot water generation of a connected domestic hot water cylinder.

- ▶ Go to the system control. Follow the operating instructions.

5.3 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.

5.4 Switching off the product

1. Switch off all of the disconnectors (fuses, circuit breakers) 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.

6 Care and maintenance

6.1 Keeping the product clear

1. Regularly remove branches and leaves that have gathered around the product.
2. Regularly remove leaves and dirt from the ventilation grille below the product.
3. Regularly remove snow from the air inlet grille and from the air outlet grille.
4. Regularly remove snow that has gathered around the product.

6.2 Caring for the product

- ▶ Clean the casing with a damp cloth and a little solvent-free soap.
- ▶ Do not use sprays, scouring agents, detergents, solvents or cleaning agents that contain chlorine.

6.3 Carrying out maintenance work

Annual inspection and maintenance of the product by a competent person is required to ensure that the product is permanently ready and safe for operation, reliable, and has a long service life. The inspection may require maintenance to be carried out earlier, depending on the results.



Danger!

Risk of injury and risk of material damage due to neglected or incorrect maintenance and repairs.

Neglected or incorrect maintenance work or repairs may lead to personal injury or damage to the product.

- ▶ Never attempt to carry out maintenance work or repairs on the product.
- ▶ Employ an authorised installation company to complete such work. We recommend making a maintenance contract.

- ▶ Employ an installation company.

7 Troubleshooting

7.1 Eliminating faults

If a fault occurs, use the "Troubleshooting" table in the appendix.

- ▶ Contact a competent person if the measure that is described is unsuccessful.

8 Decommissioning

8.1 Temporarily decommissioning the product

- ▶ Switch off the product. Protect the heating installation against frost, for example by draining the heating installation.

8.2 Permanently decommissioning the product

- ▶ Have a competent person permanently decommission the product.

9 Recycling and disposal

- ▶ The competent person who installed your product is responsible for the disposal of the packaging.



■ If the product is labelled with this mark:

- ▶ In this case, do not dispose of the product with the household waste.
- ▶ Instead, hand in the product to a collection centre for waste electrical or electronic equipment.



■ If the product contains batteries that are labelled with this mark, these batteries may contain substances that are hazardous to human health and the environment.

- ▶ In this case, dispose of the batteries at a collection point for batteries.

9.1 Arranging disposal of refrigerant

The product is filled with R290 refrigerant.

- ▶ Refrigerant must only be disposed of by an authorised competent person.
- ▶ Observe the general safety information.

Appendix

Appendix

A Troubleshooting

Fault	Possible cause	Information/measure
The product no longer works.	The power supply has been temporarily disconnected.	When the power supply is re-established, the product automatically starts up.
	The power supply has been permanently disconnected.	Inform your competent person.
Cloud of vapour at the product.	Thawing procedure at high air humidity.	This is a normal effect.

Installation and maintenance instructions

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1 Safety

1.1 Action-related warnings

Classification of action-related warnings

The action-related warnings are classified in accordance with the severity of the possible danger using the following warning signs and signal words:

Warning symbols and signal words



Danger!

Imminent danger to life or risk of severe personal injury



Danger!

Risk of death from electric shock



Warning.

Risk of minor personal injury



Caution.

Risk of material or environmental damage

1.2 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 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 operating, 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.

1.3 General safety information

1.3.1 Risk caused by inadequate 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.

1.3.2 Risk caused by inadequate qualifications for the R290 refrigerant

Any activity that requires the unit to be opened must only be carried out by competent persons who have knowledge about the particular properties and risks of R290 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 Safety

1.3.3 Risk of death from electric shock

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 with a contact gap of at least 3 mm, e.g. fuse or circuit breaker).
- ▶ Secure against being switched back on again.
- ▶ Wait for at least 3 minutes until the capacitors have discharged.
- ▶ Check that there is no voltage.

1.3.4 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.

A protective zone is defined for the area close around the product. See section "Protective zone".

- ▶ 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 away from the protective zone. In particular, open flames, hot surfaces with temperatures above $370\text{ }^{\circ}\text{C}$, electrical devices or tools that are not free from electrical sources, static discharges.

1.3.5 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.

1.3.6 Risk of death due to lack of safety devices

The basic diagrams included in this document do not show all safety devices required for correct installation.

- ▶ Install the necessary safety devices in the installation.
- ▶ Observe the applicable national and international laws, standards and directives.

1.3.7 Risk of burns, scalds and frostbite due to hot and 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.

1.4 Regulations (directives, laws, standards)

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



2 Notes on the documentation

2.1 Documents

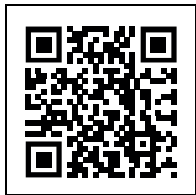
- ▶ Always observe all the operating and installation instructions included with the system components.
- ▶ Pass these instructions and all other applicable documents on to the end user.

2.2 Validity of the instructions

These instructions apply only to:

Product
VWL 45/6 A 230V S3
VWL 55/6 A 230V S3
VWL 65/6 A 230V S3
VWL 85/6 A 230V S3
VWL 125/6 A 230V S3
VWL 125/6 A S3
VWL 155/6 A 230V S3
VWL 155/6 A S3

2.3 Further information

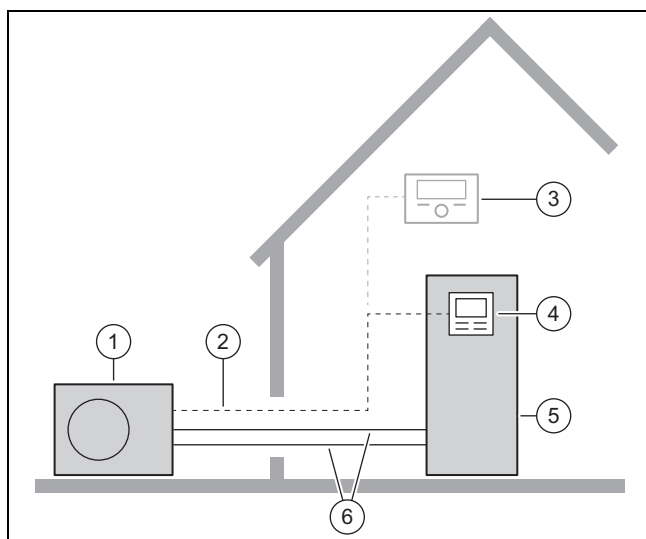


- ▶ Scan the displayed code using your smartphone in order to view further information about the installation.
 - ◀ You are guided to installation videos.

3 Product description

3.1 Heat pump system

Design of a sample heat pump system with monoblock technology:



1 Heat pump, outdoor unit 2 eBUS line

- | | |
|-------------------------------|--------------------------|
| 3 System control (optional) | 5 Heat pump, indoor unit |
| 4 Control for the indoor unit | 6 Heating circuit |

3.2 Description of the product

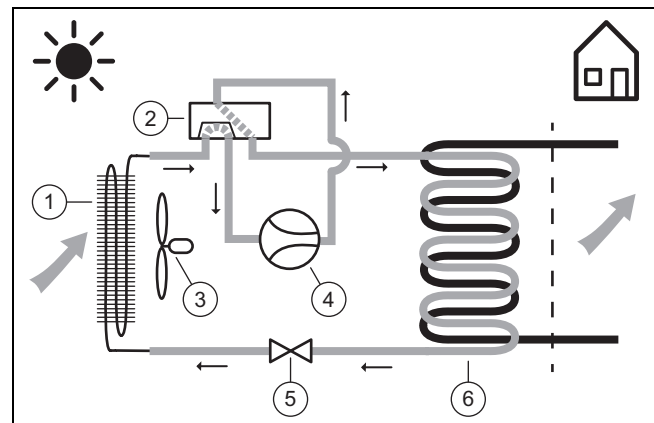
The product is the outdoor unit of an air-to-water heat pump with monoblock technology.

3.3 Functions of the heat pump

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

In heating mode, cyclic evaporation, compression, liquefaction and expansion take in heat energy from the surroundings and transfer it to the building. In cooling mode, heat energy is extracted from the building and released into the environment.

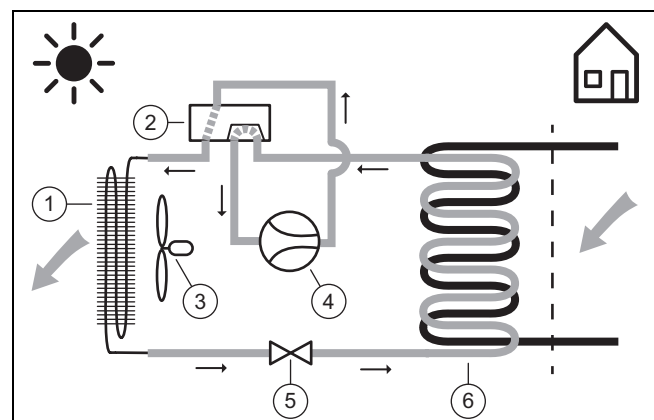
3.3.1 Operating principle, heating mode



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

3.3.2 Operating principle, cooling mode

Validity: Product with cooling mode



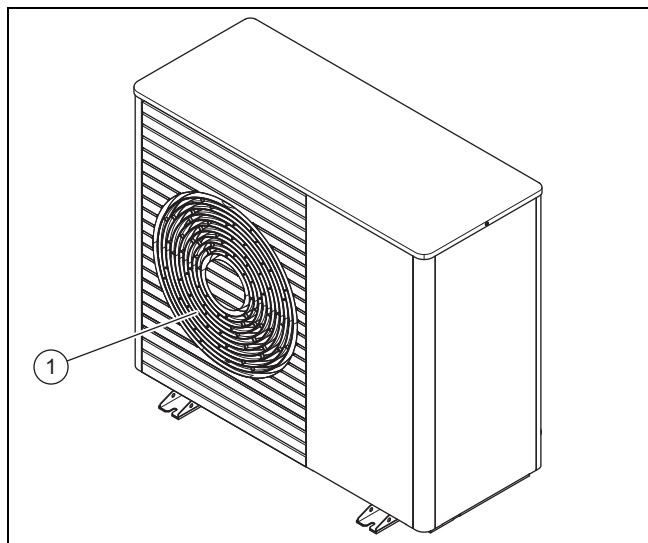
- | | |
|------------------------------|-------------------------------|
| 1 Condenser (heat exchanger) | 4 Compressor |
| 2 4-port diverter valve | 5 Expansion valve |
| 3 Fan | 6 Evaporator (heat exchanger) |

3 Product description

3.3.3 Noise reduction mode

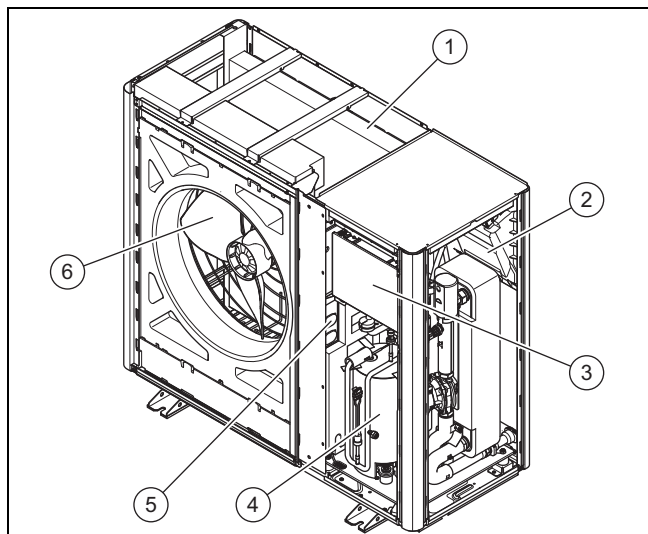
A noise reduction mode can be activated for the product. In noise reduction mode, the product is quieter than in normal operating mode, which is achieved by a limited compressor speed and an adjusted fan speed.

3.4 Product design



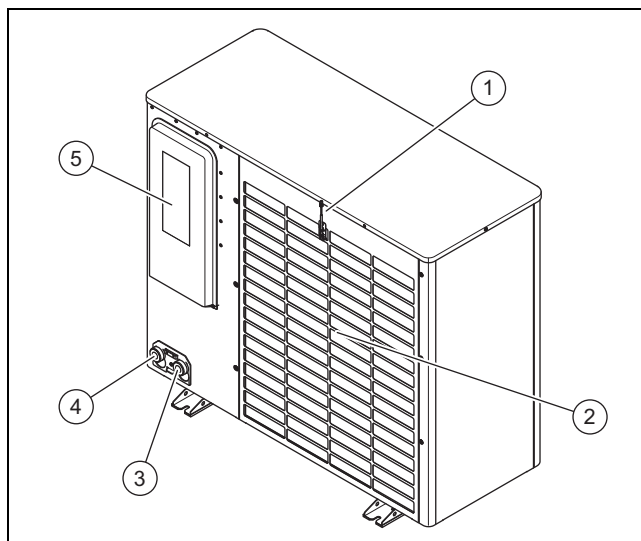
1 Air outlet grille

3.4.1 Components, unit, front



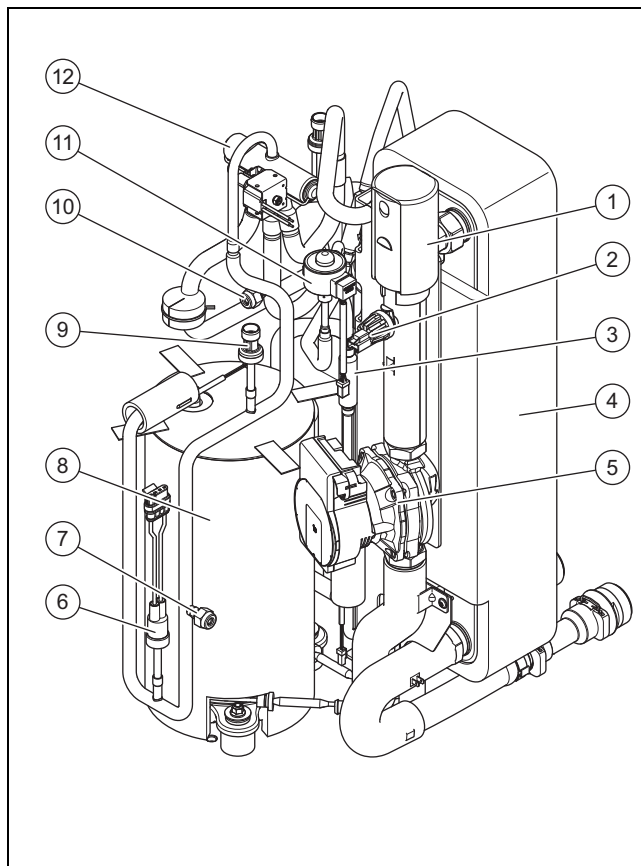
1 Evaporator (heat exchanger)	4 Compressor
2 INSTALLER BOARD PCB	5 INVERTER assembly
3 HMU PCB	6 Fan

3.4.2 Components, unit, rear



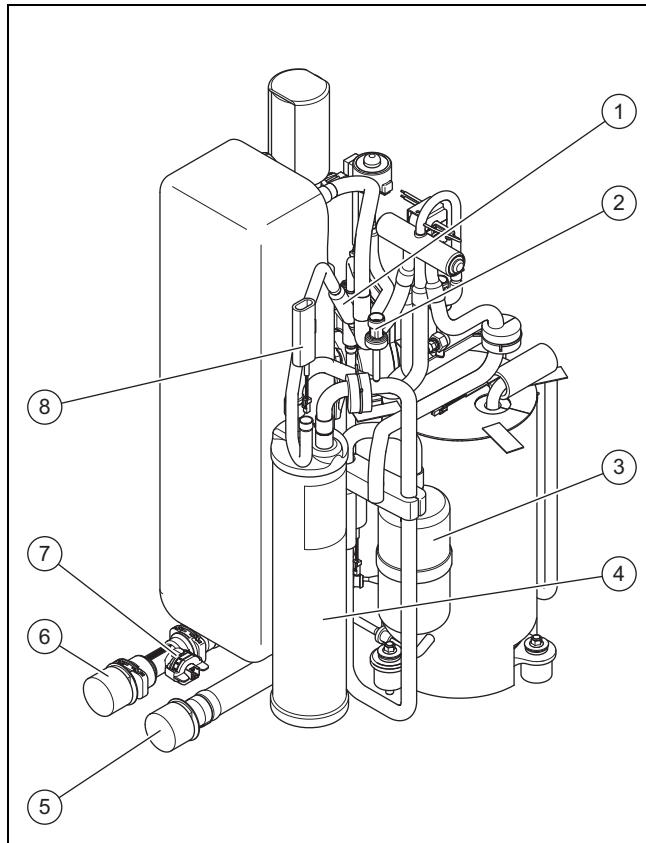
1 Temperature sensor, at the air inlet	4 Connection for heating return
2 Air inlet grille	5 Cover, electrical connections
3 Connection for heating flow	

3.4.3 Components, compressor



1 Automatic air vent	6 Pressure switch, in the high-pressure area
2 Pressure sensor, in the heating circuit	7 Maintenance connection, in the high-pressure area
3 Filter	8 Compressor, encapsulated
4 Condenser (heat exchanger)	
5 Heating pump	

- 9 Pressure sensor, in the high-pressure area
- 10 Maintenance connection, in the low-pressure area
- 11 Electronic expansion valve
- 12 4-port diverter valve



- 1 Filter
- 2 Pressure sensor, in the low-pressure area
- 3 Refrigerant separator
- 4 Refrigerant buffer
- 5 Connection for heating flow
- 6 Connection for heating return
- 7 Flow rate sensor
- 8 Temperature sensor, at the evaporator

3.5 Information on the data plate

The data plate is located on the right-hand side of the product's exterior.

A second data plate is located inside the product. It becomes visible when the top casing is removed.

	Information	Meaning
	Serial no.	Unique unit identification number
Nomenclature	VWL	Vaillant, heat pump, air
	4, 5, 6, 8, 12, 15	Heating output in kW
	5	Heating mode or cooling mode
	/6	Unit generation
	A	Outdoor unit
	230V	Electrical connection: 230 V: 1~/N/PE 230 V No information: 3~/N/PE 400 V
	S3	
	IP	Protection class

	Information	Meaning
Symbols		Compressor
		Control
		Refrigerant circuit
	P max	Rated power, maximum
	I max	Rated current, maximum
	I	In-rush current
Refrigerant circuit	MPa (bar)	Permissible operating pressure (relative)
	R290	Refrigerant, type
	GWP	Refrigerant, Global Warming Potential
	kg	Refrigerant, fill quantity
	t CO ₂	Refrigerant, CO ₂ equivalent
Heat output, cooling output	Ax/Wxx	Air inlet temperature of xx °C and heating flow temperature of xx °C
	COP /	Coefficient of Performance and heat output
	EER /	Energy efficiency ratio (Energy Efficiency Ratio) and cooling output

3.6 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
	Warning against flammable materials in conjunction with R290 refrigerant.
	Fire, naked flames and smoke are prohibited.
	Read the service information and technical instructions.

3.7 CE marking



The CE marking shows that the products comply with the basic requirements of the applicable directives as stated on the declaration of conformity.

The declaration of conformity can be viewed at the manufacturer's site.

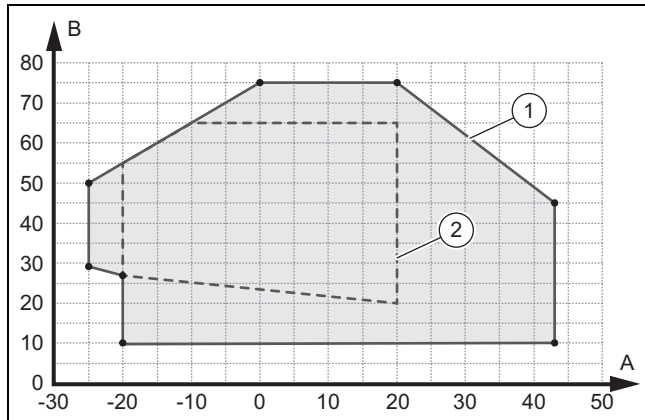
3 Product description

3.8 Application limits

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.

3.8.1 Application limits, heating mode

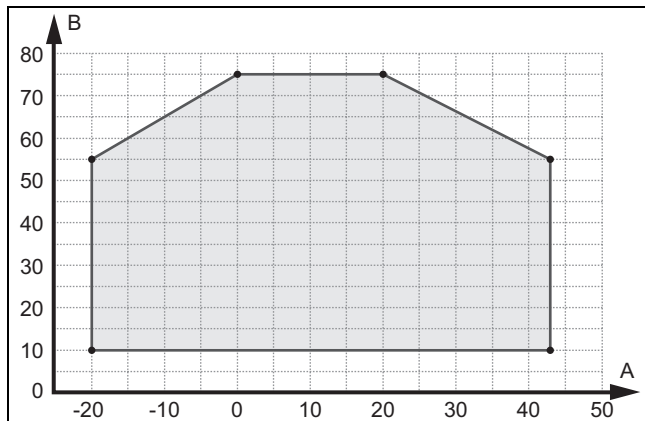
In heating mode, the product works at outdoor temperatures of -25 °C to 43 °C.



- | | | | |
|---|---------------------------|---|--------------------------------------------------|
| A | Outdoor temperature | 1 | Application limits, heating mode |
| B | Heating water temperature | 2 | Area of application, in accordance with EN 14511 |

3.8.2 Application limits, domestic hot water generation

For domestic hot water generation, the product works at outdoor temperatures of -20 °C to 43 °C.

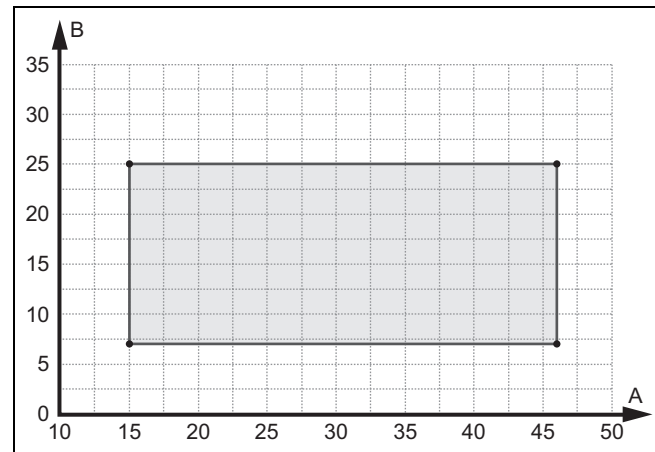


- | | | | |
|---|---------------------|---|---------------------------|
| A | Outdoor temperature | B | Heating water temperature |
|---|---------------------|---|---------------------------|

3.8.3 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 |
|---|---------------------|---|---------------------------|

3.9 Thawing mode

At outdoor temperatures below 5 °C, condensation on the fins of the evaporator may freeze and frost may form. This frost is automatically detected and is automatically thawed at certain intervals.

The thawing 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 thawing operation is only possible if the minimum volume of heating water is circulating in the heating installation:

Product	Activated back-up heater, heating water temperature > 25 °C	Deactivated back-up heater, heating water temperature > 15 °C
VWL 45/6 and VWL 55/6	15 litres	40 litres
VWL 65/6 and VWL 85/6	20 litres	55 litres
VWL 125/6 and VWL 155/6	45 litres	150 litres

3.10 Safety devices

The product is equipped with technical safety devices. See "Safety devices" graphic (→ Page 135).

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 period, another attempt is made to start it. After three failed start attempts in succession, a fault message is displayed.

If the product is switched off, the crankcase heating is switched on when the compressor outlet temperature reaches 7 °C. This prevents possible damage caused by switching the product back on.

If the compressor inlet temperature and the compressor outlet temperature are below -15 °C, the compressor does not start up.

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.

Protective zone 4

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

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

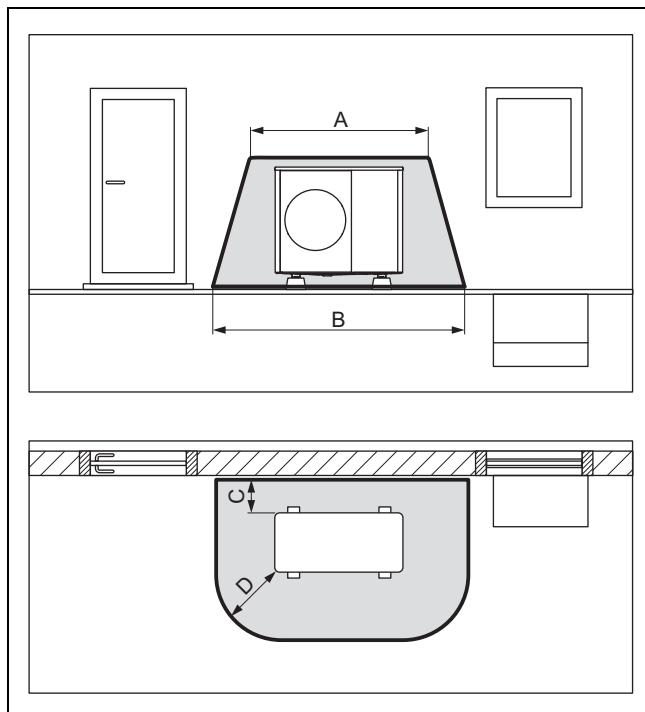
4.1 Protective zone

The product contains R290 refrigerant. In the event of a leak, escaping refrigerant may collect near the ground. The refrigerant must not get into building openings, grooves or into the waste-water system. The refrigerant must not collect in any way that may lead to a dangerous, explosive, suffocating or toxic atmosphere

A protective zone is defined for the area close around the product. There must be no windows, doors, ventilation openings, light shafts, cellar entrances, escape hatches, flat-roof windows or downpipes in the protective zone. The protective zone must not extend to adjacent buildings or public traffic areas.

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

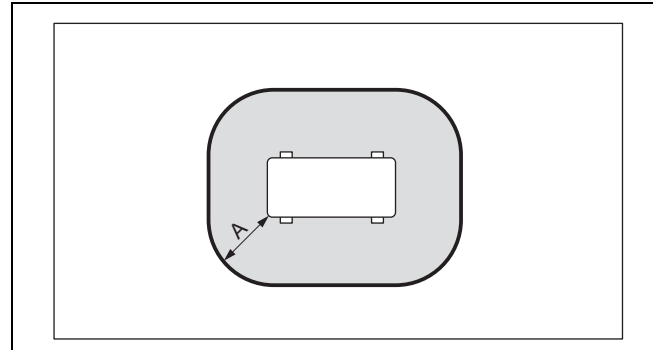
4.1.1 Protective zone, for ground installation, in front of a building wall



A	2100 mm	C	200 mm/250 mm
B	3100 mm	D	1000 mm

Dimension C is the minimum clearance that must be maintained to the wall (→ Maintaining minimum clearances).

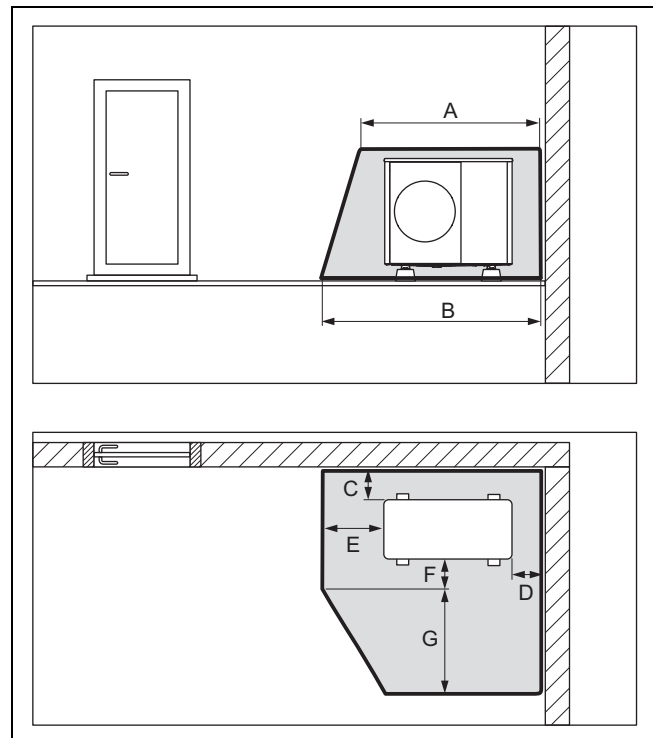
4.1.2 Protective zone, for ground installation on the premises, and for flat-roof installation



A 1000 mm

Dimension A is a clearance around the product.

4.1.3 Protective zone, for ground installation, in a building corner



A	2100 mm	E	1000 mm
B	2600 mm	F	500 mm
C	200 mm/250 mm	G	1800 mm
D	500 mm		

The right-hand corner of the building is shown here. Dimensions C and D are the minimum clearance that must be maintained to the wall (→ Maintaining minimum clearances). Dimension D varies for the left-hand corner of the building.

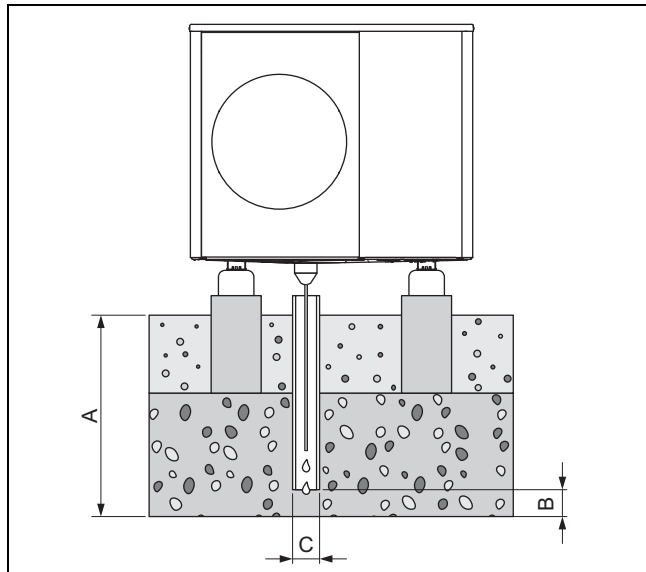
5 Set-up

4.2 Safer design of the condensate discharge

The product contains R290 refrigerant. In the event of a leak, escaping refrigerant may get into the ground via the condensate discharge. The refrigerant must not get into the waste-water system.

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

4.2.1 Safe execution of the condensate discharge, for ground installation, on the premises



A	≥ 900 mm for a region with ground frost, ≥ 600 mm for a region without ground frost	B	100 mm
		C	100 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 must be threaded into the downpipe via the condensate discharge tundish.

The downpipe must not be connected to an existing underground drain pipe that is connected to the waste-water system

5 Set-up

5.1 Checking the scope of delivery

- ▶ Check the contents of the packaging units.

Quantity	Designation
1	Heat pump, outdoor unit
1	Condensate discharge tundish
1	Bag with small parts
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 injury to the spine, for example.

- ▶ Note the weight of the product.
- ▶ Have four people lift the product VWL 45/6 to VWL 85/6.
- ▶ Have six people lift the product VWL 125/6 and VWL 155/6.



Caution.

Risk of material damage due to incorrect transportation.

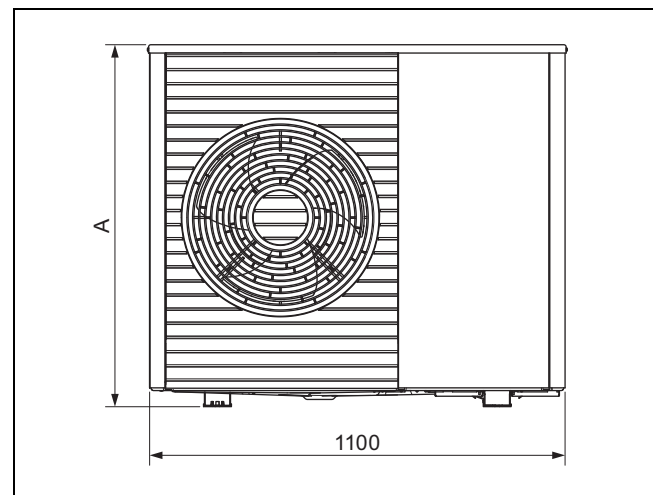
The product must never be tilted at an angle of more than 45°. Otherwise, this may lead to faults in the refrigerant circuit during subsequent operation.

- ▶ During transport, do not tilt the product by any more than the maximum angle of 45°.

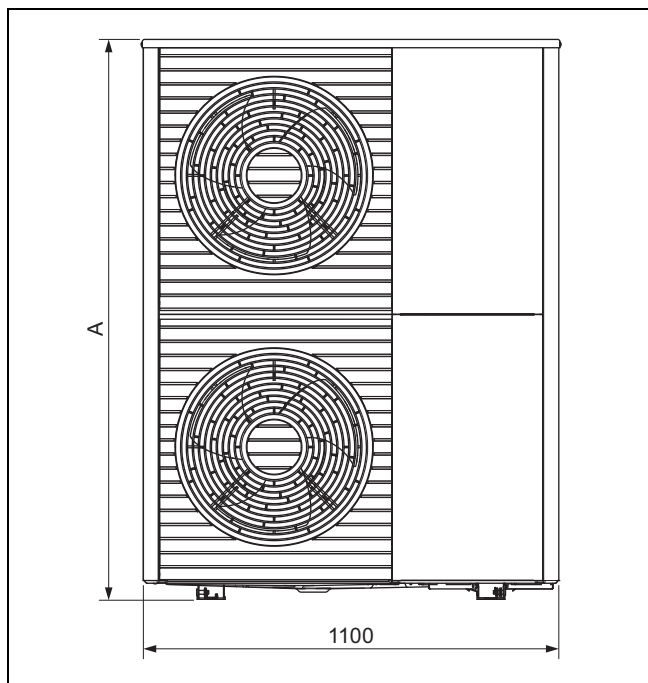
1. Take into consideration the weight distribution during transport. The product is significantly heavier on the right-hand side than on the left-hand side.
2. Use the transport straps or a suitable hand truck.
3. Protect the casing sections against damage.
4. After transport, remove the transport straps.

5.3 Dimensions

5.3.1 Front view

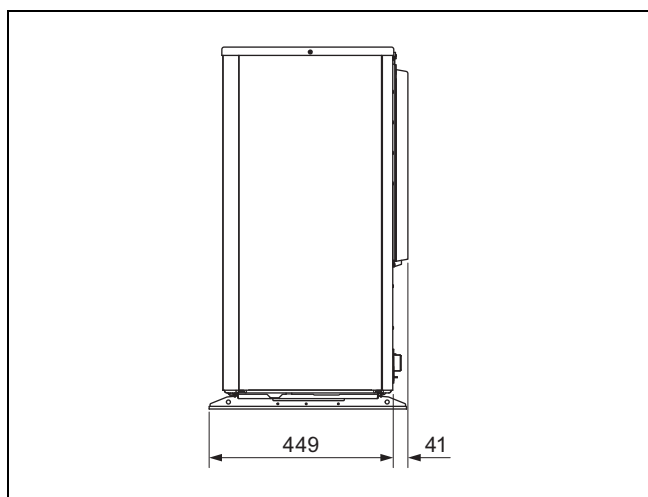


Product	A
VWL 45/6 ...	765
VWL 55/6 ...	765
VWL 65/6 ...	965
VWL 85/6 ...	965

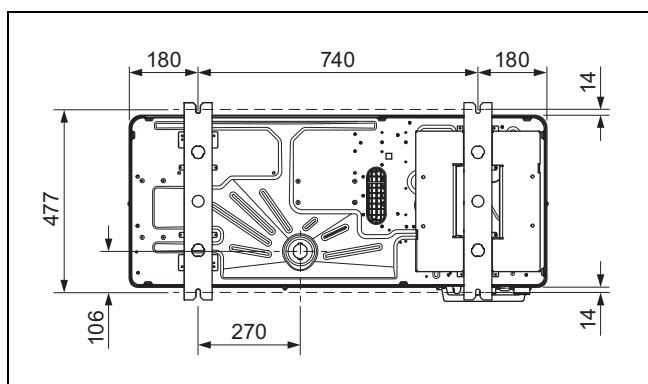


Product	A
VWL 125/6 ...	1565
VWL 155/6 ...	1565

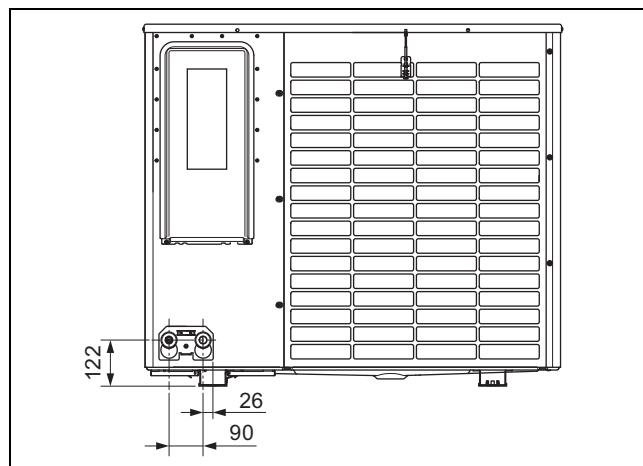
5.3.2 Side view, right



5.3.3 Bottom view



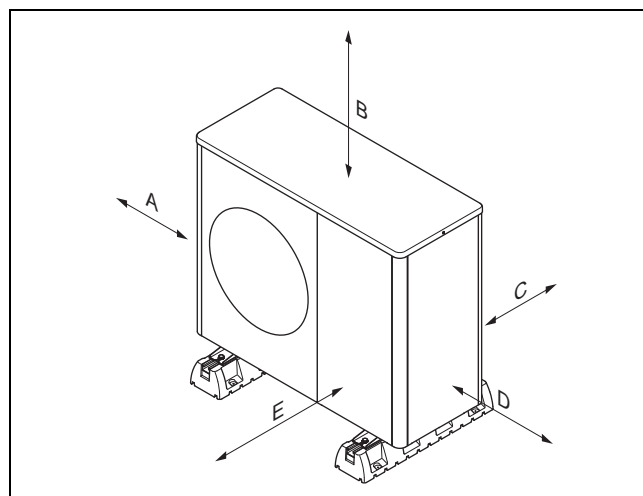
5.3.4 Rear view



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 lines.

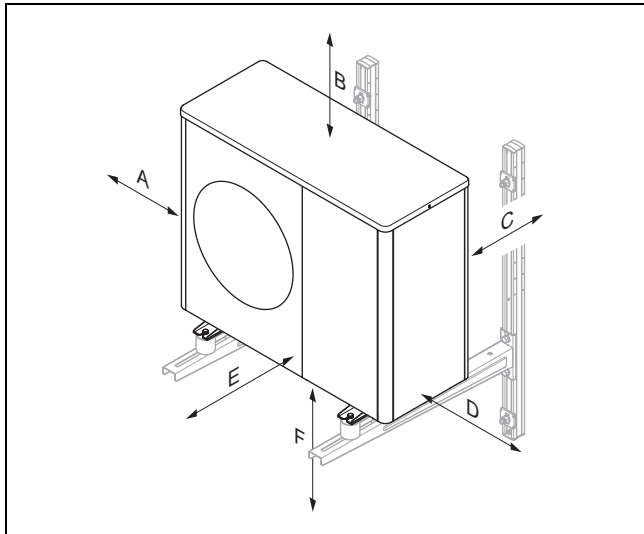
5.4.1 Minimum clearances, ground installation and flat-roof installation



Minimum clearance	Heating mode	Heating and cooling mode
A	100 mm	100 mm
B	1000 mm	1000 mm
C	200 mm	250 mm
D	500 mm	500 mm
E	600 mm	600 mm

5 Set-up

5.4.2 Minimum clearances, wall installation



Minimum clearance	Heating mode	Heating and cooling mode
A	100 mm	100 mm
B	1000 mm	1000 mm
C	200 mm	250 mm
D	500 mm	500 mm
E	600 mm	600 mm
F	300 mm	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 installation with the unit mounting bracket from the accessories is not permitted for products VWL 125/6 and VWL 155/6.

5.6 Selecting the installation site



Danger! **Risk of injury due to ice formation.**

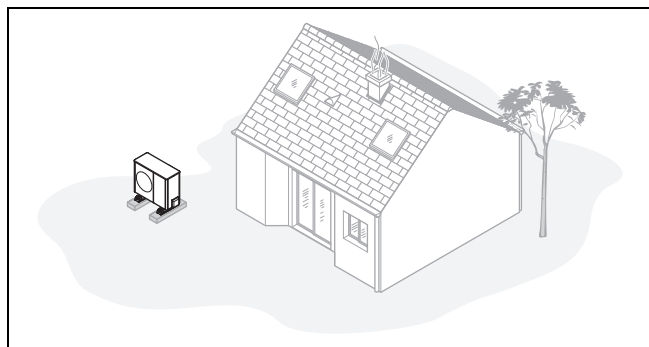
The air temperature at the air outlet is below the outdoor temperature. This can lead to ice formation.

- ▶ Select a site and an orientation at which the air outlet is at least 3 m away from walkways, plastered surfaces and down-pipes.

- ▶ Note that installation in sinks or areas that do not allow free outflow of air is not permitted.
- ▶ If the installation site is in the immediate vicinity of the coastline, ensure that the product is protected against spraying water by an additional protection device.
- ▶ Keep away from flammable substances or flammable gases.
- ▶ Keep away from heat sources.
- ▶ Do not expose the outdoor unit to dirty, dusty or corrosive air.

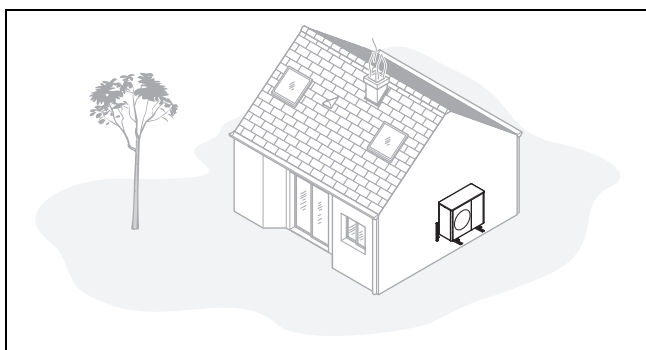
- ▶ Keep away from ventilation openings or ventilation ducts.
- ▶ Keep away from deciduous trees and shrubs.
- ▶ Please note that the installation site must be below 2000 m above sea level.
- ▶ Please note the noise emissions. Maintain sufficient clearance from noise-sensitive areas of the adjacent building. Select an installation site that is as far away from the windows of adjacent building as possible. Select a location that is as far away from your own bedroom 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.

Condition: Especially for ground installation



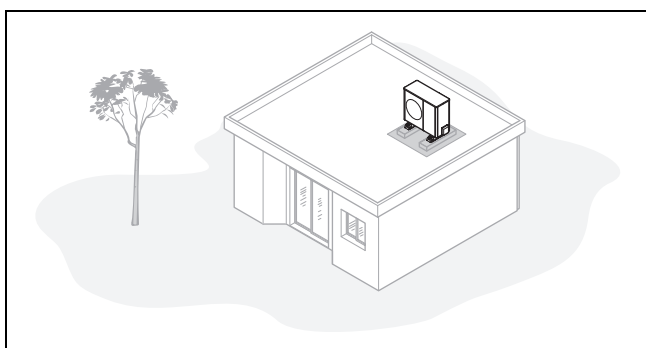
- ▶ Avoid choosing an installation site that is in the corner of a room, between walls or between fences.
- ▶ Prevent the return intake of air from the air outlet.
- ▶ Ensure that water cannot collect on the subsoil. Ensure that the subsoil can absorb water well.
- ▶ Plan a bed of gravel and rubble for 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.
- ▶ Please note the noise emissions. Avoid corners of rooms, recesses or an installation site between walls. Select an installation site with excellent sound absorption (e.g. thanks to grass, hedges, fencing).
- ▶ Route the hydraulic lines and electrical wires underground. Provide a safety pipe that leads from the outdoor unit through the wall of the building.

Condition: Especially for wall installation



- ▶ Ensure that the wall fulfils the static requirements. Please note the weight of the unit mounting bracket (accessory) and the outdoor unit.
- ▶ Avoid choosing an installation position which is near to a window.
- ▶ Please note the noise emissions. Maintain sufficient clearance from reflective building walls.
- ▶ Route the hydraulic lines and electrical wires. Provide a wall duct.

Condition: Especially for flat-roof installation



- ▶ Only install the product in buildings with a solid construction and that have cast concrete ceilings throughout.
- ▶ 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.
- ▶ Please note the noise emissions. Maintain sufficient clearance from adjacent buildings.
- ▶ Route the hydraulic lines and electrical wires. Provide a wall duct.

5.7 Preparing for fitting and installation



Danger!

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

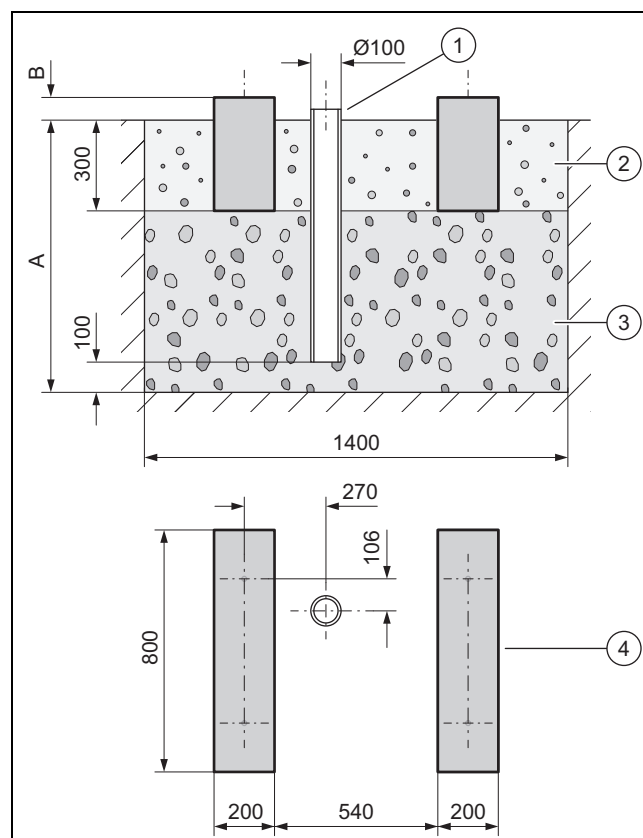
The product contains the combustible refrigerant R290. In the event of a leak, escaping refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion.

- ▶ 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 from electrical sources, static discharges.

- ▶ Observe the basic safety regulations before starting work.
- ▶ Ensure that all of the electric tools that are used when working in the protective zone are free of ignition sources.

5.8 Ground installation

5.8.1 Creating a foundation



- ▶ Dig a hole in the ground. The recommended dimensions can be found in the figure.
- ▶ Insert a downpipe (1) to divert the condensate.
- ▶ Add a layer of water-permeable coarse rubble (3).
- ▶ Calculate the depth (A) in accordance with local conditions.

5 Set-up

- Region with ground frost: Minimum depth: 900 mm
- Region without ground frost: Minimum depth: 600 mm
- ▶ Calculate the height (**B**) in accordance with local conditions.
- ▶ Create two concrete strip foundations (**4**). The recommended dimensions can be found in the figure.
- ▶ Add a gravel bed between and beside the strip foundations (**2**) to divert the condensate.

5.8.2 Installing the product

1. Use the appropriate products from the accessories, depending on the required installation type.
 - Small damping feet
 - Large damping feet
 - Raised base and small damping feet
2. Align the product exactly horizontally.

5.8.3 Installing the condensate discharge pipe



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.

Condition: Region with ground frost

- ▶ Connect the condensate discharge tundish to the product's floor plate, and secure this in place by turning it by a 1/4 rotation.
- ▶ Slide the heating wire through the condensate discharge tundish.
- ▶ Ensure that the condensate discharge tundish is positioned in the centre above the downpipe. See dimension drawing (→ Page 119).

Condition: Region without ground frost

- ▶ Connect the condensate discharge tundish to the product's floor plate, and secure this in place by turning it by a 1/4 rotation.
- ▶ Connect the condensate discharge tundish to an elbow and a condensate discharge hose.
- ▶ Slide the heating wire through the condensate discharge tundish and the elbow into the condensate discharge hose.

5.9 Wall installation

5.9.1 Guaranteeing occupational safety

- ▶ 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.
- ▶ Observe the local laws and regulations.

5.9.2 Installing the product

1. Check the design and load-bearing capacity of the wall. Note the weight of the product.
2. Use the unit mounting bracket that is suitable for wall mounting from the accessories.
3. Use the small damping feet from the accessories.
4. Align the product exactly horizontally.

5.9.3 Installing the condensate discharge pipe



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. Connect the condensate discharge tundish to the product's floor plate, and secure this in place by turning it by a 1/4 rotation.
2. Below the product, create a gravel bed into which any condensate can drain.

5.10 Flat-roof installation

5.10.1 Guaranteeing occupational safety

- ▶ 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, for example scaffolding or safety nets.
- ▶ Maintain sufficient clearance to any roof escape hatches and flat-roof windows. When carrying out the work, use suitable protective equipment (e.g. barriers) to prevent you from stepping on or falling through any escape hatches and flat-roof windows.

5.10.2 Installing the product



Warning.

Risk of injury due to toppling over in the wind.

The product may topple over if there is a wind load.

- ▶ Use a concrete base and an anti-slip protective mat. Screw the product to the concrete base.

1. Use the large damping feet from the accessories.
2. Align the product exactly horizontally.

5.10.3 Installing the condensate discharge pipe

1. Connect the condensate discharge pipe to a downpipe over a short distance.
2. Depending on the local condition, install electrical trace heating in order to keep the condensate discharge pipe frost-free.

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 indoor unit and the heating installation. In this case, if there is frost, there is a risk that the outdoor unit will freeze.

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 indoor unit or 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.

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.

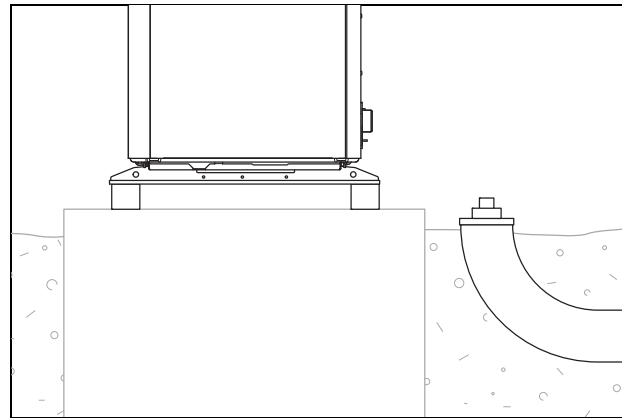
6.4 Preparing the hydraulics installation

1. Flush the heating installation thoroughly before connecting the product in order to remove any possible residue from the pipelines.
2. If you carry out soldering work on connectors, carry this out while the associated pipelines have not yet been installed on the product.
3. Install a dirt filter in the pipeline for the heating return.

6.5 Routing pipelines to the product

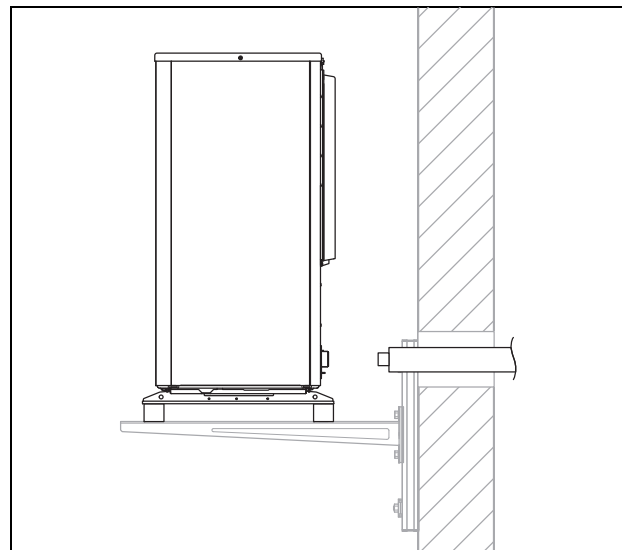
1. Route the pipelines for the heating circuit from the building, through the wall duct and to the product.

Validity: Floor 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 set-up instructions for the accessories (pre-installation jig, installation set).

Validity: Wall-mounting



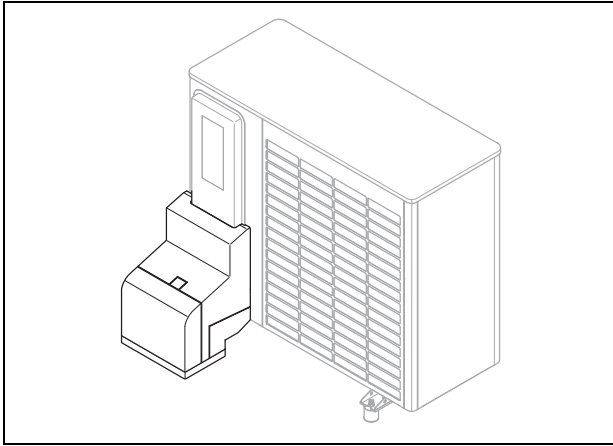
- ▶ Route the pipelines through the wall duct to the product, as shown in the figure.
- ▶ Route the pipelines from the inside outwards with a downward gradient of approx. 2°.
- ▶ You can find the dimensions and clearances in the set-up instructions for the accessories (pre-installation jig, installation set).

6.6 Connecting the pipelines to the product

1. Remove the covering caps from the hydraulic connections.

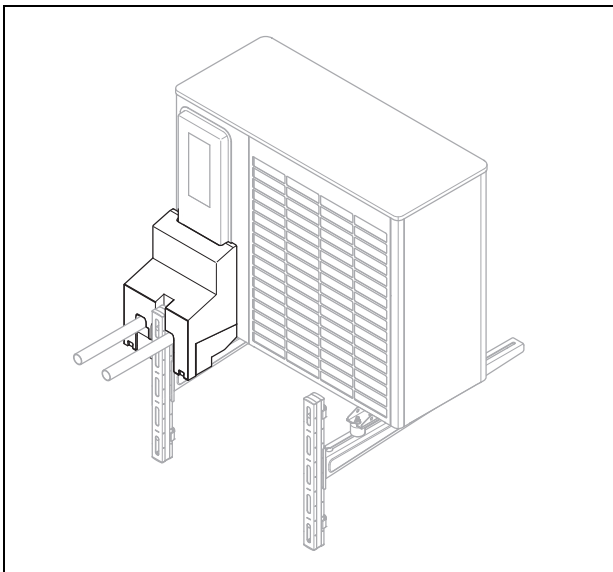
7 Electrical installation

Validity: Floor installation



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

Validity: Wall-mounting



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

6.7 Completing the hydraulics installation

1. Depending on the installation configuration, install additional required safety-relevant components.
2. 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.
3. Check all connections for tightness.

6.8 Option: 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

This unit complies with IEC 61000-3-12 under the prerequisite that the short circuit line Ssc at the connection point for the customer's installation to the public grid is greater than or equal to 33. It is the responsibility of the installer or end user of the unit to ensure, if necessary after consultation with the network operator, that this unit is only connected to one connection point with an Ssc value that is greater than or equal to 33.

7.1 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. Determine whether the energy supply company lockout function has been provided for the product, and how the power supply for the product should be designed, depending on the type of shutdown.
3. Use the data plate to determine whether the product requires a 1~/230V or a 3~/400V electrical connection.
4. Use the data plate to determine the product's rated current. Derive the suitable cable cross-sections for the electrical wires from this.
5. Prepare the routing of the electrical wires from the building and through the wall duct to the product. If the line length exceeds 10 m, prepare the separated routing of the power supply cable and sensor/bus line.

7.2 Requirements for the quality of the mains voltage

For the mains voltage of the single-phase 230 V network, a tolerance of +10% to -15% must be provided.

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 H05RN-F as a minimum.

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

For the electrical fuse protection, slow-blow fuses with C 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.

For the eBUS line, no lines with twisted wire pairs must be used.

7.4 Electrical partition

The electrical partition is also referred to as a "disconnector" in these instructions. The fuse or the circuit breaker that is installed in the building's meter/fuse box is usually used as the disconnecter.

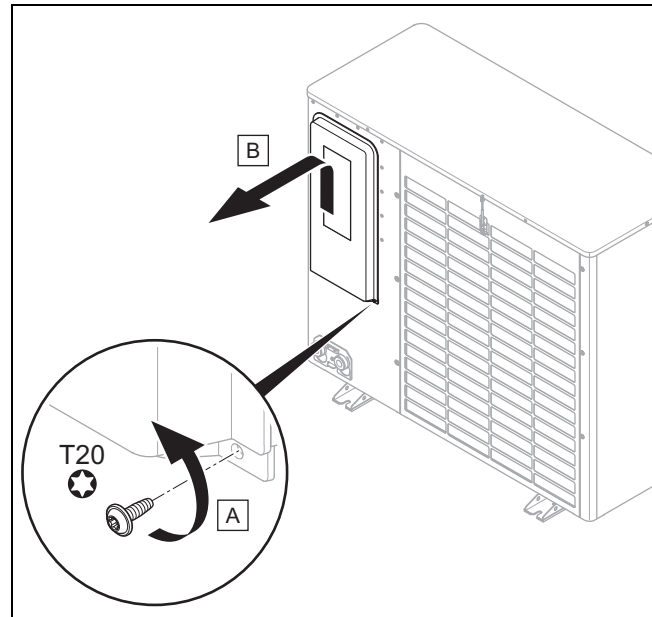
7.5 Installing components for the energy supply company lockout function

Condition: Energy supply company lockout function provided

The heat generation from the heat pump can be switched off temporarily by the energy supply company. The unit can be shut down in two ways:

- The signal for the shutdown is fed to connection S21 for the indoor unit.
- The signal for the shutdown is fed to a partition that is installed on-site in the meter/fuse box.
- ▶ Install and wire additional components in the building's meter/fuse box. To do this, follow the wiring diagram in the appendix of the installation instructions for the indoor unit.

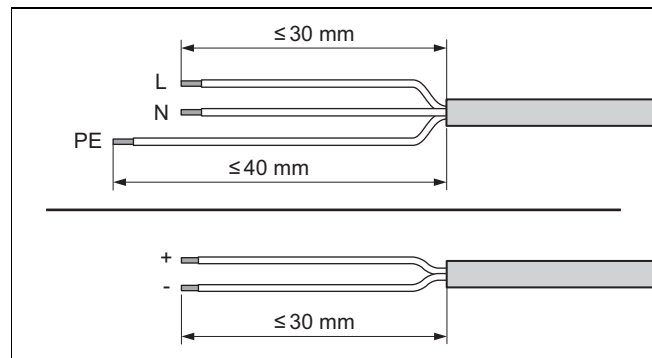
7.6 Removing the cover for the electrical connections



1. Note that the cover contains a safety-relevant seal which must be effective in the case of a leak in the refrigerant circuit.
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 Electrical installation

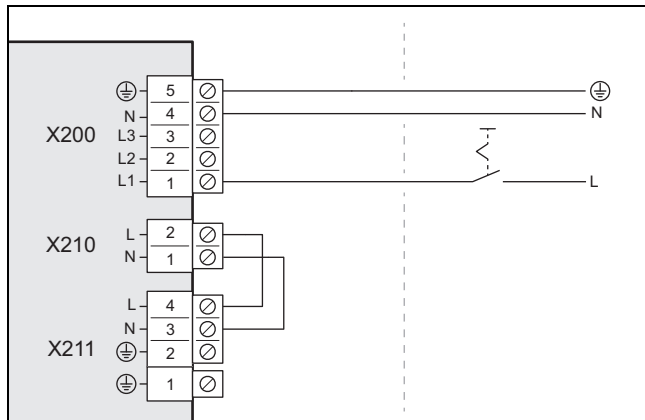
7.8 Establishing the power supply, 1~/230V

- Determine the type of connection:

Case	Connection type
Energy supply company lockout not provided	Single power supply
Energy supply company lockout provided, shutdown via connection S21	
Energy supply company lockout provided, shutdown via partition	Dual power supply

7.8.1 1~/230V, single power supply

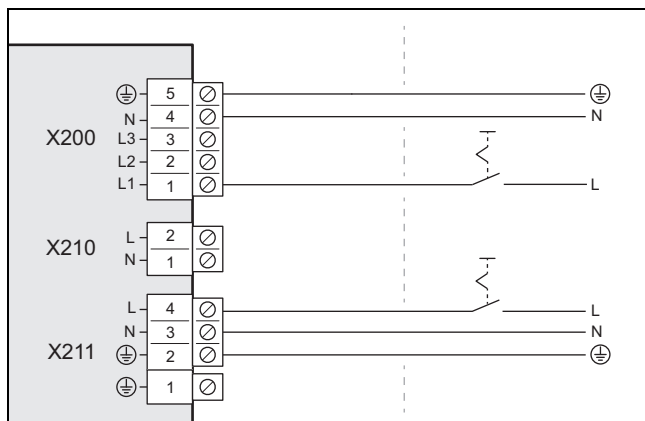
1. If it is stipulated for the installation site, install one residual-current circuit breaker for the product.



2. Install a disconnector for the product in the building, as shown in the figure.
3. Use one 3-pole power supply cable. Route this from the building and through the wall duct to the product.
4. Connect the power supply cable to connection X200 in the electronics box.
5. Use the strain relief clamp to secure the power supply cable in place.

7.8.2 1~/230V, dual power supply

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



2. Install two disconnectors for the product in the building, as shown in the figure.
3. Use two 3-pole power supply cables. Route this from the building and through the wall duct to the product.

4. Connect the power supply cable (from the heat pump electricity meter) to connection X200 in the electronics box.
5. Remove the 2-pole bridge from the X210 connection.
6. Connect the power supply cable (from the household electricity meter) to connection X211.
7. Use the strain relief clamps to secure the power supply cables in place.

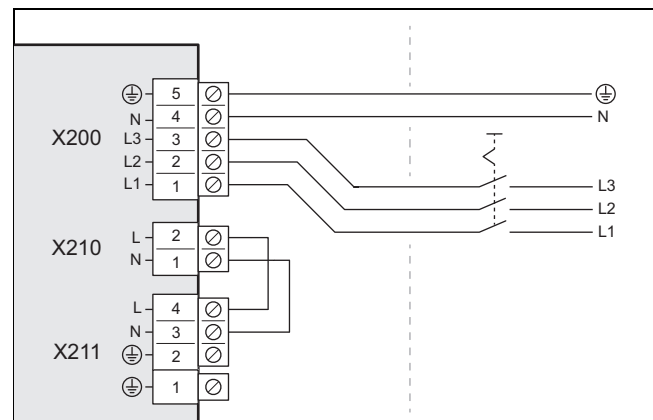
7.9 Establishing the power supply, 3~/400V

- Determine the type of connection:

Case	Connection type
Energy supply company lockout not provided	Single power supply
Energy supply company lockout provided, shutdown via connection S21	
Energy supply company lockout provided, shutdown via partition	Dual power supply

7.9.1 3~/400V, single power supply

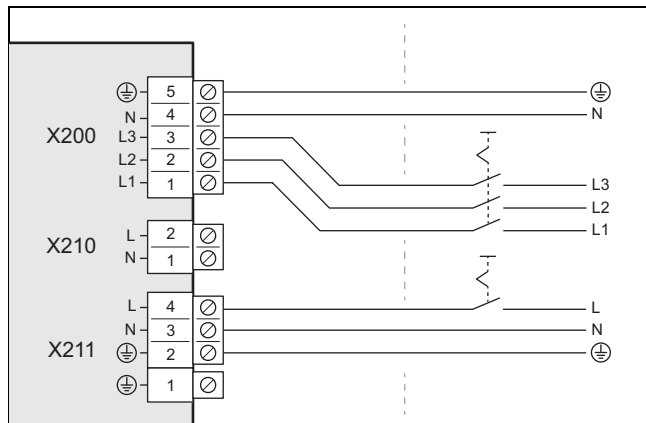
1. If it is stipulated for the installation site, install one residual-current circuit breaker for the product.



2. Install a disconnector for the product in the building, as shown in the figure.
3. Use one 5-pole power supply cable. Route this from the building and through the wall duct to the product.
4. Connect the power supply cable to connection X200 in the electronics box.
5. Use the strain relief clamp to secure the power supply cable in place.

7.9.2 3~/400V, dual power supply

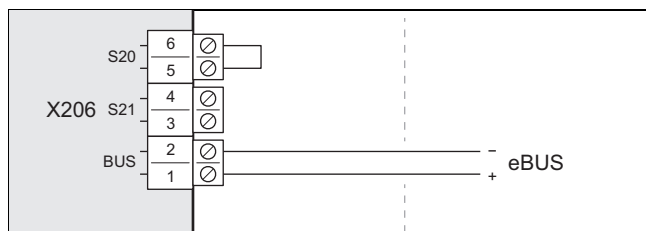
1. If it is stipulated for the installation site, install two residual-current circuit breakers for the product.



2. Install two disconnectors for the product, as shown in the figure.
3. Use a 5-pole power supply cable (from the heat pump electricity meter) and a 3-pole power supply cable (from the household electricity meter). Route this from the building and through the wall duct to the product.
4. Connect the 5-pole power supply cable to connection X200 in the electronics box.
5. Remove the 2-pole bridge from the X210 connection.
6. Connect the 3-pole power supply cable to connection X211.
7. Use the strain relief clamps to secure the power supply cables in place.

7.10 Connecting the eBUS line

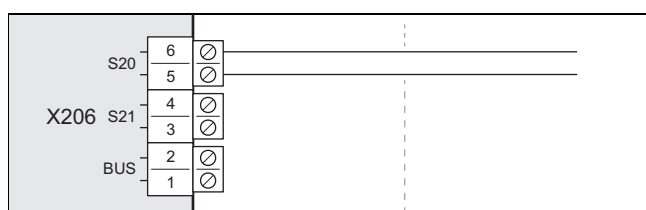
1. Use a 2-pole eBUS line with a conductor cross-section of at least 0.75 mm². Route this from the building and through the wall duct to the product.



2. Connect the eBUS line to connection X206, BUS.
3. Use the strain relief clamp to secure the eBUS line in place.

7.11 Connecting a limit thermostat

1. Use a 2-pole line with a conductor cross-section of at least 0.75 mm². Route this from the building and through the wall duct to the product.



2. Remove the bridge from the X206, S20 connection. Connect the line here.
3. Use the strain relief clamp to secure the line in place.

7.12 Connecting accessories

- Observe the wiring diagram in the appendix.

7.13 Installing the cover for the electrical connections

1. Note that the cover contains a safety-relevant seal which must be effective in the case of a leak in the refrigerant circuit.
2. Secure the cover by lowering it into the locking mechanism without damaging the circumferential seal.
3. Use two screws to secure the cover to the lower 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, depending on the type of connection, whether one or two disconnectors are 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, or fit a magnetic filter.
- 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.

8 Start-up

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 heating 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 guideline values listed in the following table are not met, or
- If the pH value of the heating water is less than 8.2 or more than 10.0.

Total heating output	Water hardness at specific system volume ¹⁾					
	≤ 20 l/kW		> 20 l/kW ≤ 50 l/kW		> 50 l/kW	
kW	°dH	mol/m ³	°dH	mol/m ³	°dH	mol/m ³
< 50	< 16.8	< 3	11.2	2	0.11	0.02
> 50 to ≤ 200	11.2	2	8.4	1.5	0.11	0.02
> 200 to ≤ 600	8.4	1.5	0.11	0.02	0.11	0.02
> 600	0.11	0.02	0.11	0.02	0.11	0.02

1) Nominal capacity in litres/heating output; in the case of multi-boiler systems, the smallest single heating output is to be used.



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

Validity: Direct connection

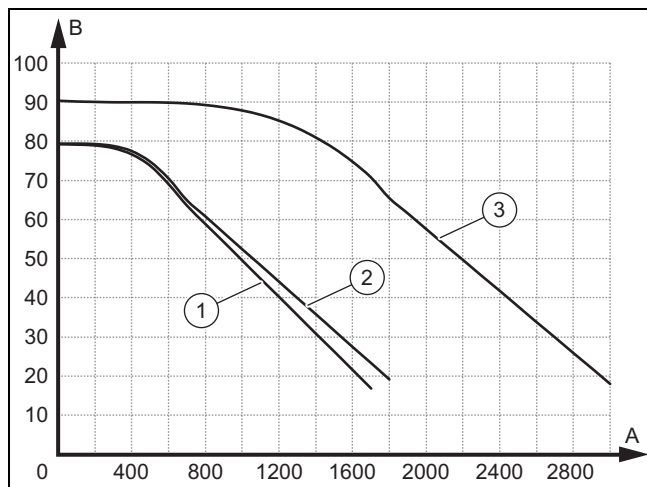
- ▶ Fill the product with heating water via the return. Slowly increase the filling pressure until the required operating pressure is reached.
 - Operating pressure: 0.15 to 0.2 MPa (1.5 to 2.0 bar)
- ▶ Activate the purge programme on the indoor unit's control.
- ▶ Check the system pressure during the purging process. If the pressure falls, top up the heating water until the required operating pressure is reached again.

Validity: System separation

- ▶ Fill the product and the primary heating circuit with a frost protection/water mixture (44% vol. propylene glycol and 56% vol. water) via the return. Slowly increase the filling pressure until the required operating pressure is reached.
 - Operating pressure: 0.15 to 0.2 MPa (1.5 to 2.0 bar)
- ▶ Activate the purge programme on the indoor unit's control.
- ▶ 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.
 - Operating pressure: 0.15 to 0.2 MPa (1.5 to 2.0 bar)
- ▶ Activate the heating pump on the indoor unit's control.
- ▶ 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 Available remaining feed pressure

The following characteristics apply to the heating circuit for the outdoor unit and relate to a heating water temperature of 20 °C.



A	Volume flow, in l/h	2	VWL 65/6 and VWL 85/6
B	Remaining feed pressure, in kPa	3	VWL 125/6 and VWL 155/6
1	VWL 45/6 and VWL 55/6		

9 Adapting the unit to the installation

9.1 Adapting the settings on the indoor unit's control

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

10 Handing over to the end user

10.1 Instructing the end user

- ▶ Explain to the end user how the product operates. Inform them 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.

11 Troubleshooting

11.1 Fault messages

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

- ▶ 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 Inspection and maintenance

12.1 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 from 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.

- ▶ Observe the basic safety rules before carrying out inspection and maintenance work or installing spare parts.
- ▶ When working on a flat roof, observe the occupational safety (→ Page 120) rules.
- ▶ 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.
- ▶ When working on the product, protect all electric components from spraying water.

12 Inspection and maintenance

12.2 Observing the work plan and intervals

- ▶ Comply with the specified intervals. Carry out all of the work that is mentioned (→ "Inspection and maintenance work" table, appendix).

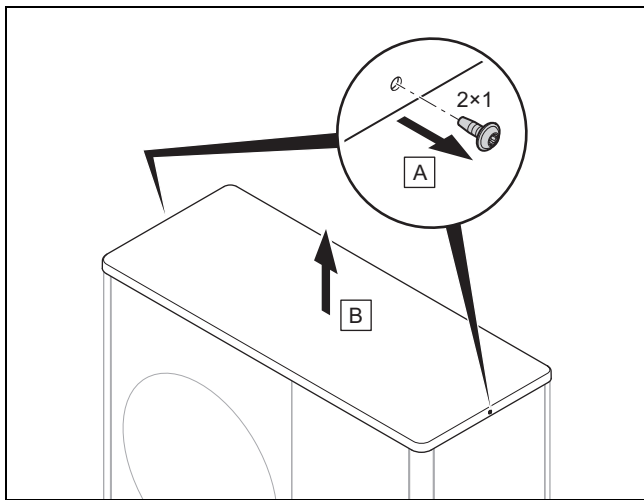
12.3 Procuring spare parts

The original components of the unit were also certified as part of the CE declaration of conformity. Information about available Vaillant genuine spare parts is available by contacting the contact address provided on the reverse of this document.

- ▶ If you require spare parts for maintenance or repair work, use only Vaillant genuine spare parts.

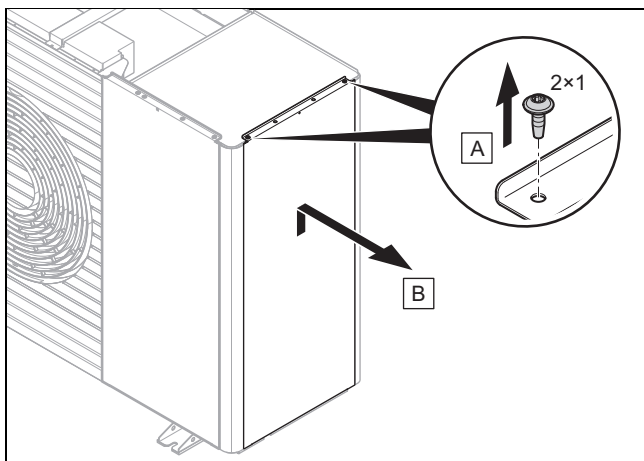
12.4 Removing the casing sections

12.4.1 Removing the top casing



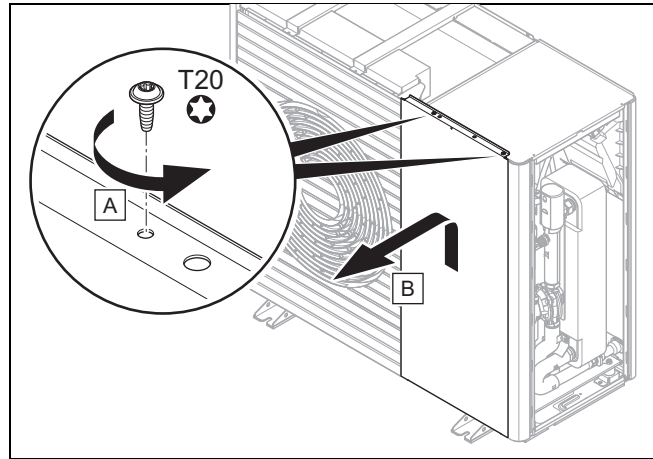
- ▶ Remove the top casing as shown in the figure.

12.4.2 Removing the right-hand side casing



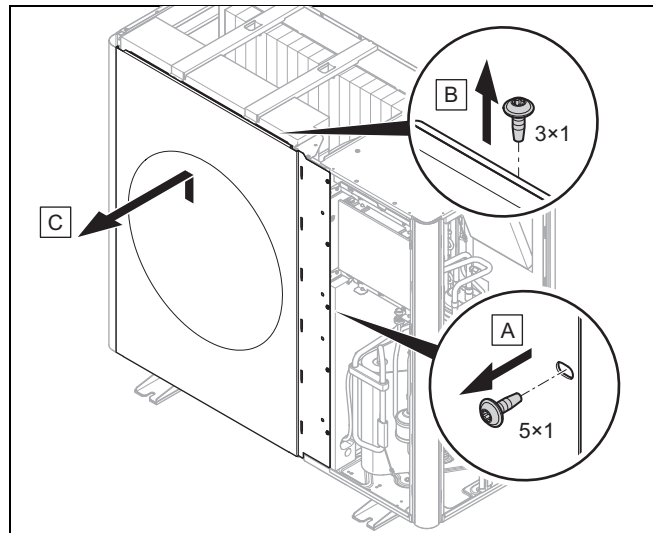
- ▶ Remove the right-hand side casing as shown in the figure.

12.4.3 Removing the front casing



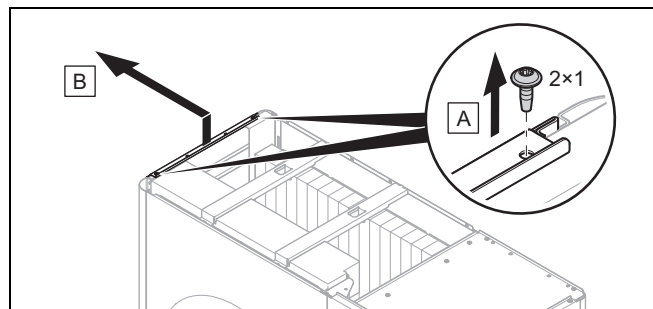
- ▶ Remove the front casing as shown in the illustration.

12.4.4 Removing the air outlet grille



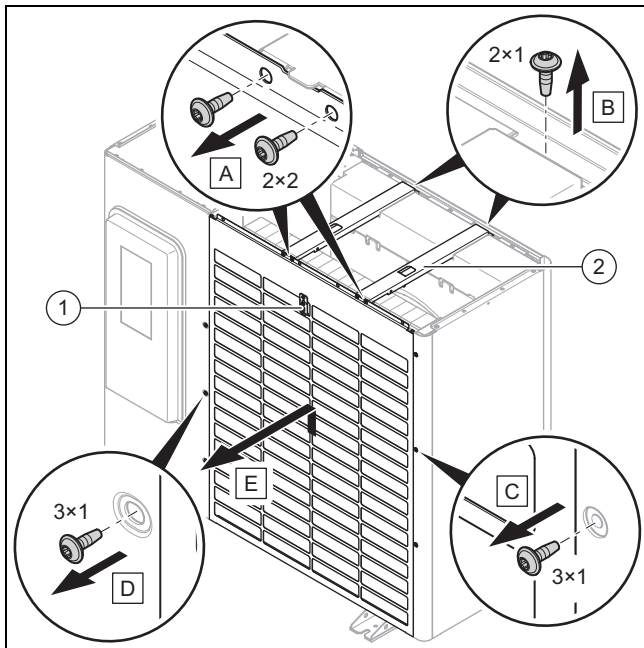
- ▶ Remove the air outlet grille as shown in the figure.

12.4.5 Removing the left-hand side casing



- ▶ Remove the left-hand side casing as shown in the figure.

12.4.6 Removing the air inlet grille



1. Disconnect the electrical connection to the temperature sensor (1).
2. Remove the two cross-members (2) as shown in the figure.
3. Remove the air inlet grille as shown in the figure.

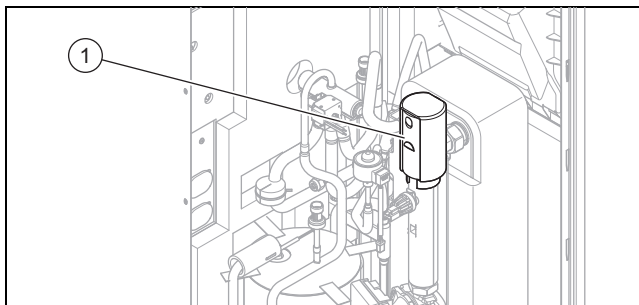
12.5 Checking the protective zone

- ▶ Check whether the defined protective zone is being maintained (→ Page 115) in the area close around the product.
- ▶ Check that no subsequent construction-related changes or installations that violate the protective zone are implemented.

12.6 Closing the purging valve

Condition: Only during the first service

- ▶ Remove the top casing. (→ Page 128)
- ▶ Remove the right-hand side casing. (→ Page 128)



- ▶ Close the purging valve (1).

12.7 Cleaning the product

- ▶ Only clean the product when all of the casing sections and covers have been installed.
- ▶ Do not clean the product with a high-pressure cleaner or a direct jet of water.
- ▶ Clean the product using a sponge and hot water with cleaning agent.
- ▶ Do not use abrasive cleaners. Do not use solvents. Do not use any cleaning agents that contain chlorine or ammonia.

12.8 Checking the evaporator, fan and condensate discharge

1. Remove the top casing. (→ Page 128)
2. Remove the left-hand side casing. (→ Page 128)
3. Remove the air outlet grille. (→ Page 128)
4. On the evaporator, check whether there is dirt between the fins or whether depositions have adhered to the fins.

Condition: Cleaning required

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

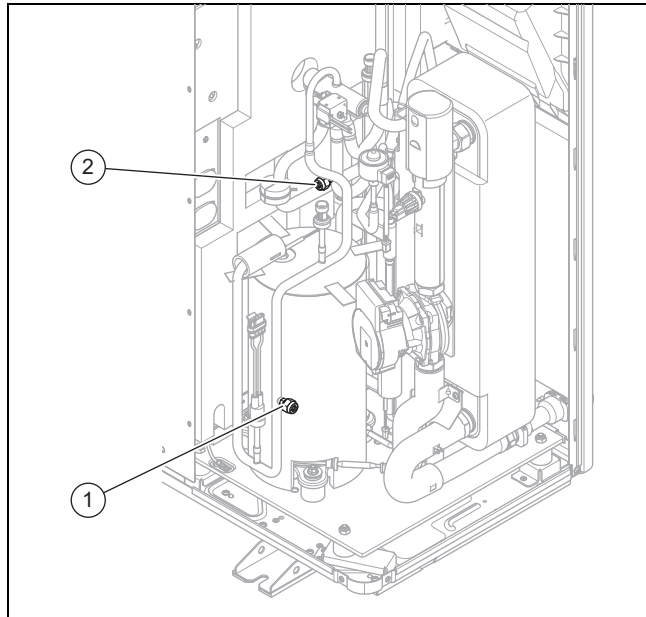
Condition: Cleaning required

- ▶ Clean the condensate tray and the condensate discharge pipe.
 - ▶ 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.

12.9 Checking the refrigerant circuit

1. Remove the top casing. (→ Page 128)
2. Remove the right-hand side casing. (→ Page 128)
3. Remove the front casing. (→ Page 128)

13 Repair and service



4. Check whether the components and pipelines are free from dirt and corrosion.
5. Check that the covering caps **(1)** and **(2)** on the maintenance connections are positioned securely.

12.10 Checking the refrigerant circuit for tightness

1. Remove the top casing. (→ Page 128)
2. Remove the right-hand side casing. (→ Page 128)
3. Remove the front casing. (→ Page 128)
4. Check the refrigerant circuit for leak-tightness using a gas sniffer. Check the individual components and pipelines.

12.11 Checking the electrical connections and electrical wires

1. Remove the cover for the electrical connections. (→ Page 123)
2. On the connection box, check whether the seal is undamaged.
3. In the connection box, check that the electrical wires are seated firmly in the plugs or terminals.
4. Check the earthing in the connection box.
5. In the connection box, check whether the power supply cable is free from damage. If the power supply cable is damaged and it needs to be replaced, a special power supply cable must be used, which is available from Vaillant or from customer service.
6. Remove the top casing. (→ Page 128)
7. Remove the left-hand side casing. (→ Page 128)
8. Remove the right-hand side casing. (→ Page 128)
9. Remove the front casing. (→ Page 128)
10. In the unit, check that the electrical wires are seated firmly in the plugs or terminals.
11. In the unit, check whether the electrical wires are free from damage.

12.12 Checking the small damping feet for wear

1. Check whether the small damping feet are significantly compressed.
2. Check whether the small damping feet have significant cracks.
3. Check whether there is substantial corrosion on the screwed connection for the small damping feet.

Condition: Replacement required

- ▶ Procure and install new damping feet.

12.13 Completing inspection and maintenance

- ▶ Installing the casing sections.
- ▶ Switch on the power supply and the product.
- ▶ Start up the product.
- ▶ Carry out an operational test and a safety test.

12.14 Installing the casing sections

12.14.1 Installing the air inlet grille

1. Secure the air inlet grille by lowering it into the stop.
2. Secure the screws at the right- and left-hand edge.
3. Install the two cross-members.
4. Establish the connection to the temperature sensor.

12.14.2 Installing the air outlet grille

1. Slide the air outlet grille vertically downwards from above.
2. Secure the screws at the right-hand edge.

12.14.3 Installing the front casing

1. Secure the front casing by lowering it into the stop.
2. Secure the screws onto the upper edge.

12.14.4 Installing the side casing

1. Secure the side casing by lowering it into the stop.
2. Secure the screws onto the upper edge.

12.14.5 Installing the top casing

1. Fit the top casing.
2. Secure the screws at the right- and left-hand edge.

13 Repair and service

13.1 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 from 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 top casing, the front casing and the right-hand side casing.

13.2 Removing/installing components of the refrigerant circuit

13.2.1 Removing the component

- ▶ Remove the refrigerant from the product. (→ Page 131)
- ▶ Rinse 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, use sufficient negative pressure to drain it for long enough to guarantee that there is no longer any combustible refrigerant 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.

13.2.2 Installing a component

- ▶ Install the component correctly.
- ▶ Carry out a pressure test of the refrigerant circuit using nitrogen.
- ▶ Fill the product with refrigerant. (→ Page 132)
- ▶ Check the refrigerant circuit for leak-tightness using a gas sniffer. Check the individual components and pipelines.

13.3 Completing repair and service work

- ▶ Installing the casing sections.
- ▶ 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.

13.4 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.



Caution.

Risk of material damage when removing the refrigerant.

When removing the refrigerant, there is a risk of material damage caused by freezing.

- ▶ If no system separation is present, remove the heating water from the condenser (heat exchanger) before the refrigerant is removed from the product.

14 Decommissioning

1. Procure the tools and units that are required for removing the refrigerant:
 - Extraction station
 - Vacuum pump
 - Recycling cylinder for refrigerant
 - Manometer bridge
 2. Only use tools and units that are permitted for R290 refrigerant.
 3. Use only recycling cylinders that are approved for R290 refrigerant, have been labelled appropriately, and are equipped with a pressure relief and isolation valve.
 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. Drain the recycling cylinder.
 6. Extract the refrigerant. Take into account the maximum fill quantity of the recycling cylinder, and monitor the fill quantity using calibrated scales.
 7. Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the recycling cylinder.
 8. 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.
1. Procure the tools and units that are required for filling with refrigerant:
 - Vacuum pump
 - Refrigerant cylinder
 - Scales
 2. Only use tools and units that are permitted for R290 refrigerant. Only use refrigerant cylinders that are labelled accordingly.
 3. Only use hoses, couplings and valves that are leak-tight and in proper working condition. Check the tightness using a suitable gas sniffer.
 4. Only use hoses that are as short as possible in order to minimise the refrigerant volume that they can hold.
 5. Flush the refrigerant circuit with nitrogen.
 6. Drain the refrigerant circuit.
 7. 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.

13.5 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.



Caution.

Risk of material damage when using the incorrect refrigerant or contaminated refrigerant.

The product may be damaged if it is filled with the incorrect refrigerant or contaminated refrigerant.

- ▶ 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%.

14 Decommissioning

14.1 Temporarily decommissioning the product

1. Switch off all of the disconnectors to which the product is connected in the building.
2. Disconnect the product from the power supply.
3. If there is a risk of frost damage, drain the heating water from the product.

14.2 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. Drain the heating water from the product.
4. Remove the top casing, the front casing and the right-hand side casing.
5. Remove the refrigerant from the product. (→ Page 131)
6. Note that refrigerant will continue to escape even after the refrigerant circuit is completely drained due to outgassing from the compressor oil.
7. Install the right-hand side casing, the front casing and the top casing.

8. 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.
9. Recycle the removed refrigerant in accordance with the regulations. Note that the refrigerant must be cleaned and checked before it is used again.
10. Dispose of or recycle the product and its components in accordance with the regulations.

15 Recycling and disposal

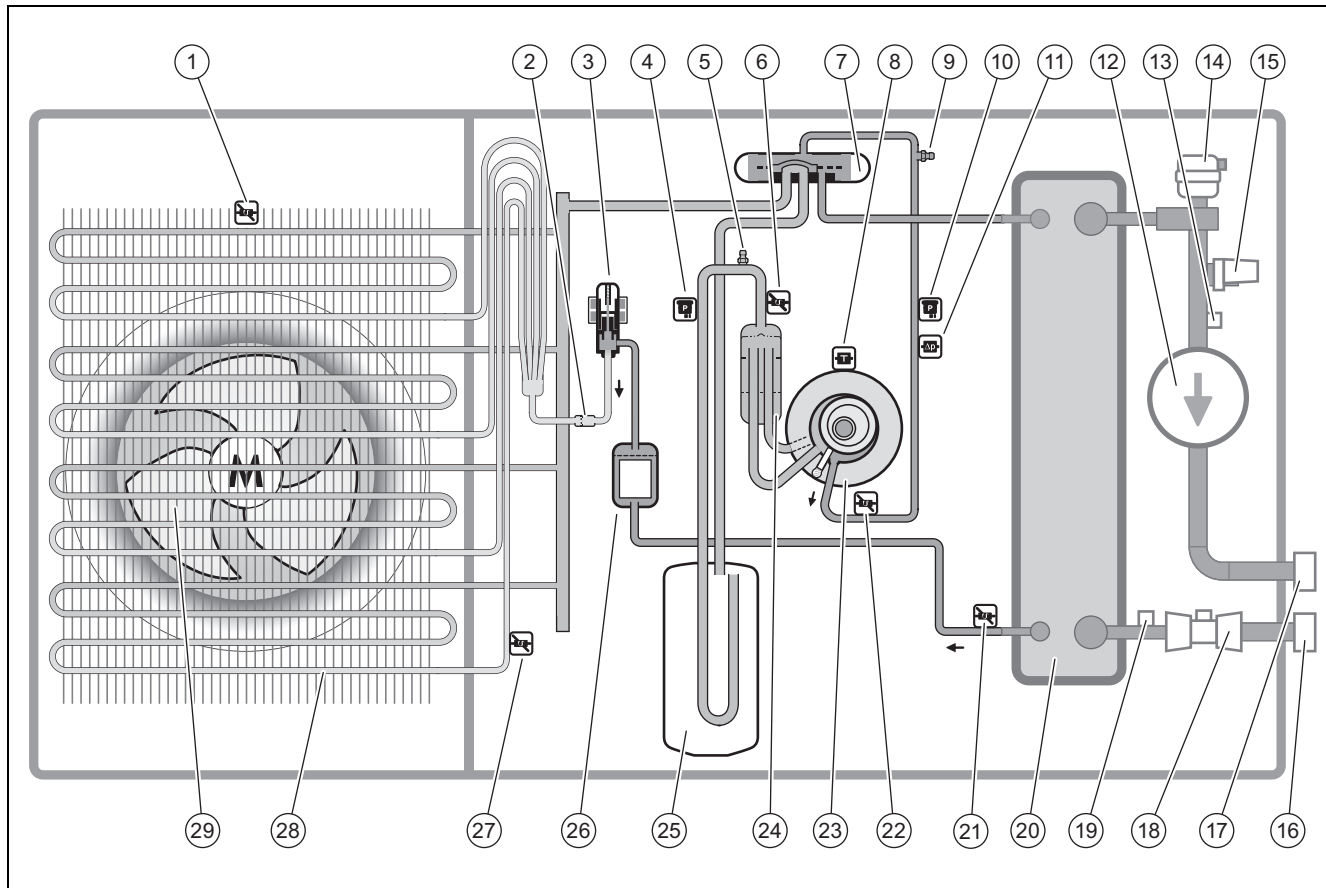
Disposing of the packaging

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

Appendix

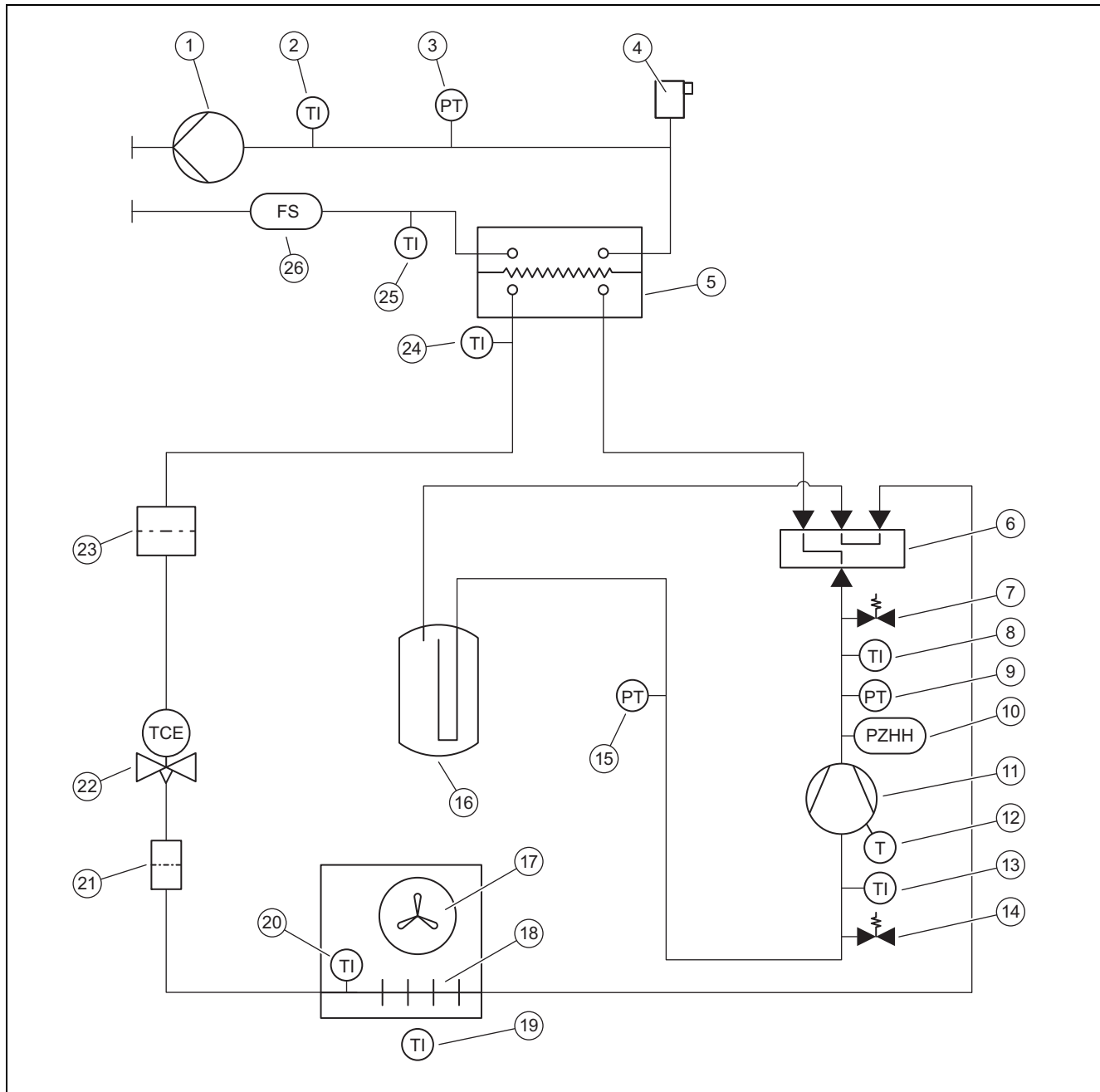
Appendix

A Functional diagram



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

B Safety devices

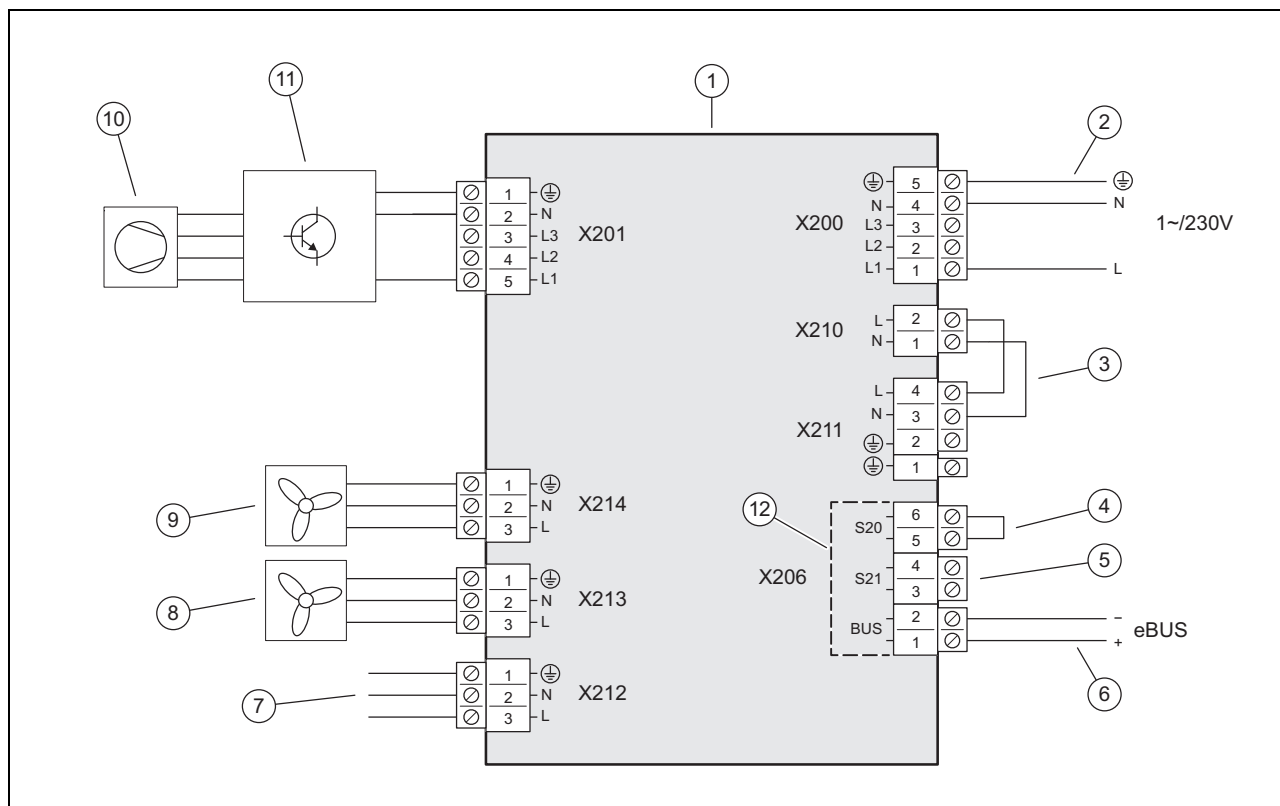


- | | | | |
|----|---------------------------------------------------|----|--------------------------------------------------|
| 1 | Heating pump | 14 | Maintenance connection, in the low-pressure area |
| 2 | Temperature sensor, heating flow | 15 | Pressure sensor, in the low-pressure area |
| 3 | Pressure sensor, in the heating circuit | 16 | Refrigerant buffer |
| 4 | Automatic air vent, in the heating circuit | 17 | Fan |
| 5 | Condenser (heat exchanger) | 18 | Evaporator (heat exchanger) |
| 6 | 4-port diverter valve | 19 | Temperature sensor, air inlet |
| 7 | Maintenance connection, in the high-pressure area | 20 | Temperature sensor, at the evaporator |
| 8 | Temperature sensor, behind the compressor | 21 | Filter |
| 9 | Pressure sensor, in the high-pressure area | 22 | Electronic expansion valve |
| 10 | Pressure switch, in the high-pressure area | 23 | Filter/dryer |
| 11 | Compressor, with refrigerant separator | 24 | Temperature sensor, behind the condenser |
| 12 | Temperature monitor, on the compressor | 25 | Temperature sensor, heating return |
| 13 | Temperature sensor, in front of the compressor | 26 | Flow rate sensor |

Appendix

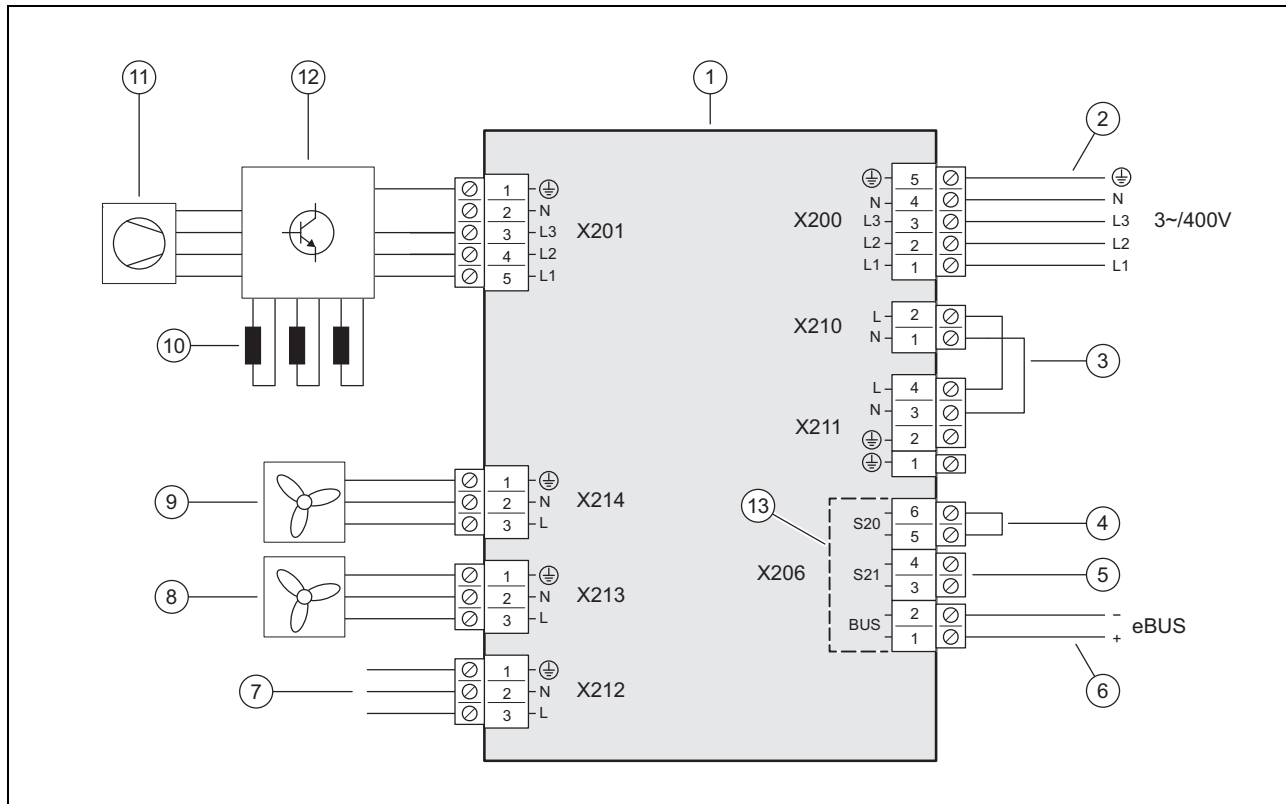
C Wiring diagram

C.1 Wiring diagram, power supply, 1~/230V



1	INSTALLER BOARD PCB	7	Connection to the HMU PCB
2	Power supply connection	8	Power supply for fan 2 (only for product VWL 125/6 and VWL 155/6)
3	Bridge, depending on the type of connection (energy supply company lockout)	9	Power supply for fan 1
4	Input for the limit thermostat	10	Compressor
5	Input S21, not used	11	INVERTER assembly
6	eBUS line connection	12	Range for the safety extra-low voltage (SELV)

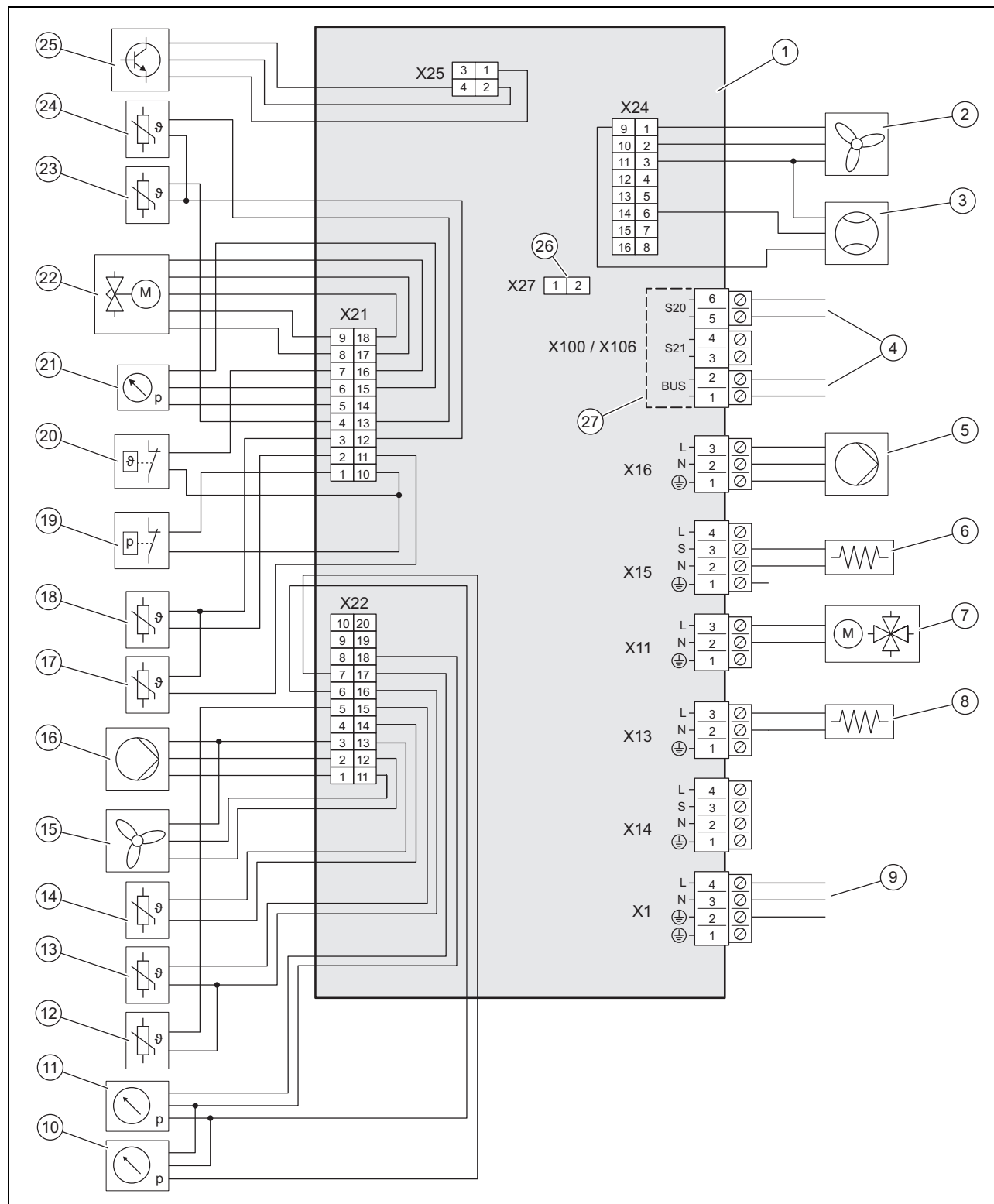
C.2 Wiring diagram, power supply, 3~/400V



- | | | | |
|---|-----------------------------------------------------------------------------|----|-------------------------------------------------------------------|
| 1 | INSTALLER BOARD PCB | 8 | Power supply for fan 2 (only for product VWL 125/6 and VWL 155/6) |
| 2 | Power supply connection | 9 | Power supply for fan 1 |
| 3 | Bridge, depending on the type of connection (energy supply company lockout) | 10 | Choking (only for product VWL 125/6 and VWL 155/6) |
| 4 | Input for the limit thermostat | 11 | Compressor |
| 5 | Input S21, not used | 12 | INVERTER assembly |
| 6 | eBUS line connection | 13 | Range for the safety extra-low voltage (SELV) |
| 7 | Connection to the HMU PCB | | |

Appendix


C.3 Wiring diagram, sensors and actuators



- | | | | |
|---|----------------------------------------------------------------|----|-------------------------------------------|
| 1 | HMU PCB | 9 | Connection to the INSTALLER BOARD PCB |
| 2 | Actuation for fan 2 (only for product VWL 125/6 and VWL 155/6) | 10 | Pressure sensor, in the low-pressure area |
| 3 | Flow rate sensor | 11 | Pressure sensor, in the heating circuit |
| 4 | Connection to the INSTALLER BOARD PCB | 12 | Temperature sensor, on the heating flow |
| 5 | Heating pump power supply | 13 | Temperature sensor, on the heating return |
| 6 | Crankcase heating | 14 | Temperature sensor, at the air inlet |
| 7 | 4-port diverter valve | 15 | Actuation for fan 1 |
| 8 | Condensate tray heater | 16 | Actuation for the heating pump |
| | | 17 | Temperature sensor, behind the compressor |

18	Temperature sensor, in front of the compressor	23	Temperature sensor, at the evaporator
19	Pressure switch	24	Temperature sensor, behind the condenser
20	Temperature monitor	25	Actuation for INVERTER assembly
21	Pressure sensor, in the high-pressure area	26	Slot for coding resistor for cooling mode
22	Electronic expansion valve	27	Range for the safety extra-low voltage (SELV)

D Inspection and maintenance work

#	Maintenance work	Interval	
1	Checking the protective zone	Annually	129
2	Closing the purging valve	During the first service	129
3	Cleaning the product	Annually	129
4	Checking the evaporator, fan and condensate discharge	Annually	129
5	Checking the refrigerant circuit	Annually	129
6	Checking the refrigerant circuit for tightness	Annually	130
7	Checking the electrical connections and electrical wires	Annually	130
8	Checking the small damping feet for wear	Annually after the first 3 years	130

E Technical data



Note

The following performance data is only applicable to new products with clean heat exchangers.

The performance data also covers the noise reduction mode (unit operates with reduced noise emissions).

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 45/6 A 230V S3	VWL 55/6 A 230V S3	VWL 65/6 A 230V S3	VWL 85/6 A 230V S3
Width	1,100 mm	1,100 mm	1,100 mm	1,100 mm
Height	765 mm	765 mm	965 mm	965 mm
Depth	450 mm	450 mm	450 mm	450 mm
Weight, with packaging	132 kg	132 kg	150 kg	150 kg
Weight, ready for operation	114 kg	114 kg	128 kg	128 kg
Weight, ready for operation, left-/right-hand side	38 kg/76 kg	38 kg/76 kg	43 kg/85 kg	43 kg/85 kg
Connection, heating circuit	G 1 1/4 "	G 1 1/4 "	G 1 1/4 "	G 1 1/4 "
Rated voltage	230 V (+10%/-15%), 50 Hz, 1~/N/PE	230 V (+10%/-15%), 50 Hz, 1~/N/PE	230 V (+10%/-15%), 50 Hz, 1~/N/PE	230 V (+10%/-15%), 50 Hz, 1~/N/PE
Rated power, maximum	3.40 kW	3.40 kW	3.50 kW	3.50 kW
Rated power factor	1.0	1.0	1.0	1.0
Rated current, maximum	14.3 A	14.3 A	15.0 A	15.0 A
In-rush current	14.3 A	14.3 A	15.0 A	15.0 A
IP rating	IP 15 B	IP 15 B	IP 15 B	IP 15 B
Overvoltage category	II	II	II	II
Fan, power consumption	40 W	40 W	80 W	80 W
Fan, quantity	1	1	1	1
Fan, rotational speed, maximum	620 rpm	620 rpm	790 rpm	790 rpm
Fan, air flow, maximum	2,300 m³/h	2,300 m³/h	3,000 m³/h	3,000 m³/h
Heating pump, power consumption	2 ... 50 W	2 ... 50 W	2 ... 50 W	2 ... 50 W

Appendix

	VWL 125/6 A 230V S3	VWL 125/6 A S3	VWL 155/6 A 230V S3	VWL 155/6 A S3
Width	1,100 mm	1,100 mm	1,100 mm	1,100 mm
Height	1,565 mm	1,565 mm	1,565 mm	1,565 mm
Depth	450 mm	450 mm	450 mm	450 mm
Weight, with packaging	223 kg	239 kg	223 kg	239 kg
Weight, ready for operation	194 kg	210 kg	194 kg	210 kg
Weight, ready for operation, left-/right-hand side	65 kg/129 kg	70 kg/140 kg	65 kg/129 kg	70 kg/140 kg
Connection, heating circuit	G 1 1/4"	G 1 1/4"	G 1 1/4"	G 1 1/4"
Rated voltage	230 V (+10%/-15%), 50 Hz, 1~/N/PE	400 V (+10%/-15%), 50 Hz, 3~/N/PE	230 V (+10%/-15%), 50 Hz, 1~/N/PE	400 V (+10%/-15%), 50 Hz, 3~/N/PE
Rated power, maximum	5.40 kW	8.00 kW	5.40 kW	8.00 kW
Rated power factor	1.0	1.0	1.0	1.0
Rated current, maximum	23.3 A	15.0 A	23.3 A	15.0 A
In-rush current	23.3 A	15.0 A	23.3 A	15.0 A
IP rating	IP 15 B	IP 15 B	IP 15 B	IP 15 B
Overvoltage category	II	II	II	II
Fan, power consumption	80 W	80 W	80 W	80 W
Fan, quantity	2	2	2	2
Fan, rotational speed, maximum	790 rpm	790 rpm	790 rpm	790 rpm
Fan, air flow, maximum	6,000 m³/h	6,000 m³/h	6,000 m³/h	6,000 m³/h
Heating pump, power consumption	3 ... 87 W	3 ... 87 W	3 ... 87 W	3 ... 87 W

Technical data – Heating circuit

	VWL 45/6 A 230V S3	VWL 55/6 A 230V S3	VWL 65/6 A 230V S3	VWL 85/6 A 230V S3
Heating water temperature, minimum/maximum	20 ... 75 °C	20 ... 75 °C	20 ... 75 °C	20 ... 75 °C
Basic length of the heating water pipe, maximum, between the outdoor unit and indoor unit	20 m	20 m	20 m	20 m
Operating pressure, minimum	0.05 MPa (0.50 bar)	0.05 MPa (0.50 bar)	0.05 MPa (0.50 bar)	0.05 MPa (0.50 bar)
Operating pressure, maximum	0.30 MPa (3.00 bar)	0.30 MPa (3.00 bar)	0.30 MPa (3.00 bar)	0.30 MPa (3.00 bar)
Volume flow, minimum	400 l/h	400 l/h	540 l/h	540 l/h
Volume flow, maximum	860 l/h	860 l/h	1,205 l/h	1,205 l/h
Water volume, in the outdoor unit	1.5 l	1.5 l	2.0 l	2.0 l
Water volume, in the heating circuit, minimum, thawing mode, activated/deactivated back-up heater	15 l / 40 l	15 l / 40 l	20 l / 55 l	20 l / 55 l
Remaining feed pressure, hydraulic	56.0 kPa (560.0 mbar)	56.0 kPa (560.0 mbar)	44.0 kPa (440.0 mbar)	44.0 kPa (440.0 mbar)

	VWL 125/6 A 230V S3	VWL 125/6 A S3	VWL 155/6 A 230V S3	VWL 155/6 A S3
Heating water temperature, minimum/maximum	20 ... 75 °C	20 ... 75 °C	20 ... 75 °C	20 ... 75 °C
Basic length of the heating water pipe, maximum, between the outdoor unit and indoor unit	20 m	20 m	20 m	20 m
Operating pressure, minimum	0.05 MPa (0.50 bar)	0.05 MPa (0.50 bar)	0.05 MPa (0.50 bar)	0.05 MPa (0.50 bar)
Operating pressure, maximum	0.30 MPa (3.00 bar)	0.30 MPa (3.00 bar)	0.30 MPa (3.00 bar)	0.30 MPa (3.00 bar)
Volume flow, minimum	995 l/h	995 l/h	995 l/h	995 l/h
Volume flow, maximum	2,065 l/h	2,065 l/h	2,065 l/h	2,065 l/h

	VWL 125/6 A 230V S3	VWL 125/6 A S3	VWL 155/6 A 230V S3	VWL 155/6 A S3
Water volume, in the outdoor unit	2.5 l	2.5 l	2.5 l	2.5 l
Water volume, in the heating circuit, minimum, thawing mode, activated/deactivated back-up heater	45 l / 150 l	45 l / 150 l	45 l / 150 l	45 l / 150 l
Remaining feed pressure, hydraulic	55.0 kPa (550.0 mbar)	55.0 kPa (550.0 mbar)	55.0 kPa (550.0 mbar)	55.0 kPa (550.0 mbar)

Technical data – Refrigerant circuit

	VWL 45/6 A 230V S3	VWL 55/6 A 230V S3	VWL 65/6 A 230V S3	VWL 85/6 A 230V S3
Refrigerant, type	R290	R290	R290	R290
Refrigerant, fill quantity	0.60 kg	0.60 kg	0.90 kg	0.90 kg
Refrigerant, Global Warming Potential (GWP)	3	3	3	3
Refrigerant, CO ₂ equivalent	0.0018 t	0.0018 t	0.0027 t	0.0027 t
Permissible operating pressure, maximum	3.15 MPa (31.50 bar)	3.15 MPa (31.50 bar)	3.15 MPa (31.50 bar)	3.15 MPa (31.50 bar)
Compressor, type	Rotary piston	Rotary piston	Rotary piston	Rotary piston
Compressor, oil type	Specific polyalkylene glycol (PAG)	Specific polyalkylene glycol (PAG)	Specific polyalkylene glycol (PAG)	Specific polyalkylene glycol (PAG)
Compressor, control	Electronic	Electronic	Electronic	Electronic

	VWL 125/6 A 230V S3	VWL 125/6 A S3	VWL 155/6 A 230V S3	VWL 155/6 A S3
Refrigerant, type	R290	R290	R290	R290
Refrigerant, fill quantity	1.30 kg	1.30 kg	1.30 kg	1.30 kg
Refrigerant, Global Warming Potential (GWP)	3	3	3	3
Refrigerant, CO ₂ equivalent	0.0039 t	0.0039 t	0.0039 t	0.0039 t
Permissible operating pressure, maximum	3.15 MPa (31.50 bar)	3.15 MPa (31.50 bar)	3.15 MPa (31.50 bar)	3.15 MPa (31.50 bar)
Compressor, type	Scroll compressor	Scroll compressor	Scroll compressor	Scroll compressor
Compressor, oil type	Specific polyalkylene glycol (PAG)	Specific polyalkylene glycol (PAG)	Specific polyalkylene glycol (PAG)	Specific polyalkylene glycol (PAG)
Compressor, control	Electronic	Electronic	Electronic	Electronic

Technical data – Power, heating mode

	VWL 45/6 A 230V S3	VWL 55/6 A 230V S3	VWL 65/6 A 230V S3	VWL 85/6 A 230V S3
Heat output, A2/W35	1.90 kW	1.90 kW	3.10 kW	3.10 kW
Coefficient of performance, COP, EN 14511, A2/W35	3.70	3.70	4.10	4.10
Power consumption, effective, A2/W35	0.51 kW	0.51 kW	0.76 kW	0.76 kW
Power consumption, A2/W35	2.60 A	2.60 A	3.70 A	3.70 A
Heat output, minimum/maximum, A7/W35	2.10 ... 6.50 kW	2.10 ... 7.90 kW	3.00 ... 8.50 kW	3.00 ... 9.00 kW
Heat output, nominal, A7/W35	4.10 kW	4.20 kW	5.10 kW	7.80 kW
Coefficient of performance, COP, EN 14511, A7/W35	4.60	4.40	4.70	4.40
Power consumption, effective, A7/W35	0.89 kW	0.95 kW	1.09 kW	1.77 kW
Power consumption, A7/W35	4.20 A	4.50 A	5.20 A	8.00 A
Heat output, A7/W45	3.10 kW	3.10 kW	4.20 kW	4.20 kW
Coefficient of performance, COP, EN 14511, A7/W45	3.60	3.60	3.60	3.60
Power consumption, effective, A7/W45	0.86 kW	0.86 kW	1.17 kW	1.17 kW
Power consumption, A7/W45	4.00 A	4.00 A	5.40 A	5.40 A

Appendix

	VWL 45/6 A 230V S3	VWL 55/6 A 230V S3	VWL 65/6 A 230V S3	VWL 85/6 A 230V S3
Heat output, A7/W55	3.60 kW	4.80 kW	5.80 kW	7.60 kW
Coefficient of performance, COP, EN 14511, A7/W55	2.80	2.80	2.90	2.90
Power consumption, effective, A7/W55	1.29 kW	1.71 kW	2.00 kW	2.62 kW
Power consumption, A7/W55	6.30 A	7.70 A	9.40 A	11.70 A
Heat output, A7/W65	4.50 kW	4.50 kW	6.30 kW	6.30 kW
Coefficient of performance, COP, EN 14511, A7/W65	2.30	2.30	2.30	2.30
Power consumption, effective, A7/W65	1.96 kW	1.96 kW	2.74 kW	2.74 kW
Power consumption, A7/W65	9.00 A	9.00 A	12.20 A	12.20 A
Heat output, A-7/W35	4.00 kW	4.90 kW	6.00 kW	6.50 kW
Coefficient of performance, COP, EN 14511, A-7/W35	2.90	2.40	3.00	2.50
Power consumption, effective, A-7/W35	1.38 kW	2.04 kW	2.00 kW	2.60 kW
Power consumption, A-7/W35	6.80 A	9.30 A	9.40 A	11.60 A

	VWL 125/6 A 230V S3	VWL 125/6 A S3	VWL 155/6 A 230V S3	VWL 155/6 A S3
Heat output, A2/W35	5.60 kW	5.60 kW	5.70 kW	5.70 kW
Coefficient of performance, COP, EN 14511, A2/W35	4.30	4.30	4.20	4.20
Power consumption, effective, A2/W35	1.30 kW	1.30 kW	1.36 kW	1.36 kW
Power consumption, A2/W35	6.20 A	2.90 A	6.70 A	3.00 A
Heat output, minimum/maximum, A7/W35	5.40 ... 13.50 kW	5.40 ... 13.50 kW	5.40 ... 15.00 kW	5.40 ... 15.00 kW
Heat output, nominal, A7/W35	11.60 kW	11.60 kW	14.30 kW	14.30 kW
Coefficient of performance, COP, EN 14511, A7/W35	4.70	4.70	4.30	4.30
Power consumption, effective, A7/W35	2.47 kW	2.47 kW	3.33 kW	3.33 kW
Power consumption, A7/W35	11.20 A	4.40 A	15.10 A	5.60 A
Heat output, A7/W45	8.10 kW	8.10 kW	8.10 kW	8.10 kW
Coefficient of performance, COP, EN 14511, A7/W45	4.10	4.10	4.10	4.10
Power consumption, effective, A7/W45	1.98 kW	1.98 kW	1.98 kW	1.98 kW
Power consumption, A7/W45	9.40 A	3.60 A	9.40 A	3.60 A
Heat output, A7/W55	13.20 kW	13.20 kW	14.20 kW	14.20 kW
Coefficient of performance, COP, EN 14511, A7/W55	2.90	2.90	2.80	2.80
Power consumption, effective, A7/W55	4.55 kW	4.55 kW	5.07 kW	5.07 kW
Power consumption, A7/W55	20.10 A	7.30 A	22.50 A	8.10 A
Heat output, A7/W65	11.40 kW	11.40 kW	11.40 kW	11.40 kW
Coefficient of performance, COP, EN 14511, A7/W65	2.30	2.30	2.30	2.30
Power consumption, effective, A7/W65	4.96 kW	4.96 kW	4.96 kW	4.96 kW
Power consumption, A7/W65	22.20 A	7.90 A	22.20 A	7.90 A
Heat output, A-7/W35	10.20 kW	10.20 kW	11.30 kW	11.30 kW
Coefficient of performance, COP, EN 14511, A-7/W35	2.80	2.80	2.40	2.40
Power consumption, effective, A-7/W35	3.64 kW	3.64 kW	4.71 kW	4.71 kW
Power consumption, A-7/W35	16.40 A	6.10 A	20.90 A	7.60 A

Technical data – Power, cooling mode

Validity: Product with cooling mode

	VWL 45/6 A 230V S3	VWL 55/6 A 230V S3	VWL 65/6 A 230V S3	VWL 85/6 A 230V S3
Cooling output, A35/W18	4.50 kW	4.50 kW	6.40 kW	6.40 kW
Energy efficiency ratio, EER, EN 14511, A35/W18	4.30	4.30	4.20	4.20
Power consumption, effective, A35/W18	1.05 kW	1.05 kW	1.52 kW	1.52 kW
Power consumption, A35/W18	4.90 A	4.90 A	7.00 A	7.00 A
Cooling output, minimum/maximum, A35/W7	1.80 ... 5.20 kW	1.80 ... 5.20 kW	2.50 ... 7.20 kW	2.40 ... 7.20 kW
Cooling output, A35/W7	3.40 kW	5.20 kW	5.00 kW	7.20 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	3.40	2.60	3.50	2.70
Power consumption, effective, A35/W7	1.00 kW	2.00 kW	1.43 kW	2.67 kW
Power consumption, A35/W7	4.70 A	9.10 A	6.60 A	11.90 A

	VWL 125/6 A 230V S3	VWL 125/6 A S3	VWL 155/6 A 230V S3	VWL 155/6 A S3
Cooling output, A35/W18	10.90 kW	10.90 kW	10.80 kW	10.80 kW
Energy efficiency ratio, EER, EN 14511, A35/W18	4.60	4.60	4.60	4.60
Power consumption, effective, A35/W18	2.37 kW	2.37 kW	2.35 kW	2.35 kW
Power consumption, A35/W18	10.90 A	4.20 A	10.90 A	4.20 A
Cooling output, minimum/maximum, A35/W7	4.40 ... 12.10 kW	4.40 ... 12.10 kW	4.30 ... 12.00 kW	4.30 ... 12.00 kW
Cooling output, A35/W7	7.90 kW	7.90 kW	12.00 kW	12.00 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	3.50	3.50	2.80	2.80
Power consumption, effective, A35/W7	2.26 kW	2.26 kW	4.29 kW	4.29 kW
Power consumption, A35/W7	10.20 A	4.00 A	19.20 A	7.00 A

Technical data – output, cooling mode, additional information

Validity: Product with cooling mode

	VWL 45/6 A 230V S3	VWL 55/6 A 230V S3	VWL 65/6 A 230V S3	VWL 85/6 A 230V S3
Cooling output, A35/W7	5.20 kW	3.40 kW	7.20 kW	4.90 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	2.60	3.40	2.70	3.50
Power consumption, effective, A35/W7	2.00 kW	1.00 kW	2.67 kW	1.40 kW
Power consumption, A35/W7	9.10 A	4.70 A	11.90 A	6.60 A
Compressor speed, A35/W7	5,280 rpm	3,300 rpm	5,100 rpm	3,300 rpm

	VWL 125/6 A 230V S3	VWL 125/6 A S3	VWL 155/6 A 230V S3	VWL 155/6 A S3
Cooling output, A35/W7	12.10 kW	12.10 kW	7.80 kW	7.80 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	2.80	2.80	3.50	3.50
Power consumption, effective, A35/W7	4.32 kW	4.32 kW	2.23 kW	2.23 kW
Power consumption, A35/W7	19.20 A	7.00 A	10.20 A	4.00 A
Compressor speed, A35/W7	5,280 rpm	5,280 rpm	3,300 rpm	3,300 rpm

Appendix

Technical data – Noise emissions, heating mode

	VWL 45/6 A 230V S3	VWL 55/6 A 230V S3	VWL 65/6 A 230V S3	VWL 85/6 A 230V S3
Sound power, EN 12102, EN 14511 LWA, A7/W35	51 dB(A)	52 dB(A)	50 dB(A)	58 dB(A)
Sound power, EN 12102, EN 14511 LWA, A7/W45	53 dB(A)	53 dB(A)	53 dB(A)	53 dB(A)
Sound power, EN 12102, EN 14511 LWA, A7/W55	52 dB(A)	54 dB(A)	57 dB(A)	57 dB(A)
Sound power, EN 12102, EN 14511 LWA, A7/W65	54 dB(A)	54 dB(A)	55 dB(A)	55 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 40% noise reduction mode	48 dB(A)	48 dB(A)	50 dB(A)	50 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 50% noise reduction mode	47 dB(A)	47 dB(A)	48 dB(A)	48 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 60% noise reduction mode	46 dB(A)	46 dB(A)	46 dB(A)	46 dB(A)

	VWL 125/6 A 230V S3	VWL 125/6 A S3	VWL 155/6 A 230V S3	VWL 155/6 A S3
Sound power, EN 12102, EN 14511 LWA, A7/W35	58 dB(A)	58 dB(A)	61 dB(A)	61 dB(A)
Sound power, EN 12102, EN 14511 LWA, A7/W45	58 dB(A)	59 dB(A)	58 dB(A)	59 dB(A)
Sound power, EN 12102, EN 14511 LWA, A7/W55	60 dB(A)	60 dB(A)	61 dB(A)	61 dB(A)
Sound power, EN 12102, EN 14511 LWA, A7/W65	61 dB(A)	59 dB(A)	61 dB(A)	59 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 40% noise reduction mode	54 dB(A)	55 dB(A)	54 dB(A)	55 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 50% noise reduction mode	51 dB(A)	51 dB(A)	51 dB(A)	51 dB(A)
Sound power, EN 12102, EN 14511 LWA, A-7/W35, 60% noise reduction mode	51 dB(A)	51 dB(A)	51 dB(A)	51 dB(A)

Technical data – Noise emissions, cooling mode

Validity: Product with cooling mode

	VWL 45/6 A 230V S3	VWL 55/6 A 230V S3	VWL 65/6 A 230V S3	VWL 85/6 A 230V S3
Sound power, EN 12102, EN 14511 LWA, A35/W18	53 dB(A)	53 dB(A)	55 dB(A)	55 dB(A)
Sound power, EN 12102, EN 14511 LWA, A35/W7	53 dB(A)	53 dB(A)	55 dB(A)	55 dB(A)

	VWL 125/6 A 230V S3	VWL 125/6 A S3	VWL 155/6 A 230V S3	VWL 155/6 A S3
Sound power, EN 12102, EN 14511 LWA, A35/W18	58 dB(A)	59 dB(A)	58 dB(A)	59 dB(A)
Sound power, EN 12102, EN 14511 LWA, A35/W7	59 dB(A)	59 dB(A)	59 dB(A)	59 dB(A)

Country specifics

4 NZ, New Zealand

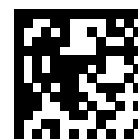
– New Zealand –

4.1 Guarantee

For information on the manufacturer's guarantee, you can write to the contact address that is provided on the back page.

4.2 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.



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