DemirDöküm

DemirDöküm MaxiAir R32

HA 8-7.2 OS 230V B3
HA 10-7.2 OS 230V B3
HA 12-7.2 OS 230V B3
HA 16-7.2 OS 230V B3

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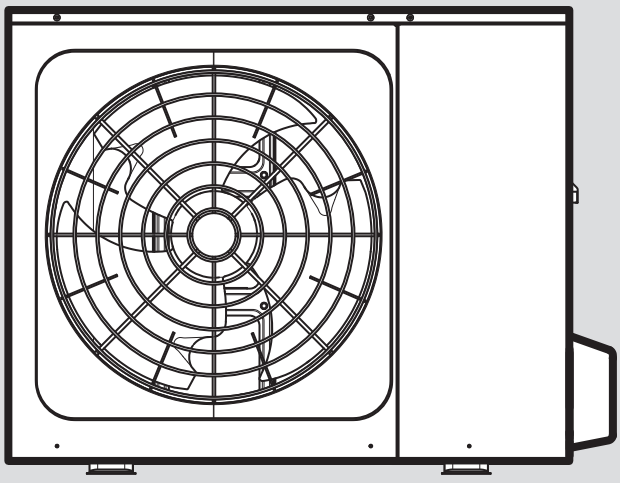

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Operating instructions

Contents

1 Safety

1.1 Intended use

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

The product is the outdoor unit for a air-to-water heat pump in a split design.

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

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit Without a back-up heater	Indoor unit With a back-up heater
HA 8-7.2 OS 230V B3	HA 10-7.2 WS 230V B1	HA 10-7.2 WS 230 V
HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ▸ Keep all ignition sources away from the product. Ignition sources include, for example:
  – Open flames,
  – Hot surfaces over 550 °C,
  – Electrical devices or tools that are not free from electrical sources,
  – Static discharges.
- ▸ Do not use any sprays or other flammable gases close to the product.

1.2.3 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Do not make any changes in the product's environment as this would cause escaping refrigerant to collect in a recess or to get inside the building via building openings.

1.2.4 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:
  - to the product itself
  - to the supply lines
  - to the drain pipework
  - to the expansion relief valve for the heat source circuit
  - to constructional conditions that may affect the operational reliability of the product
- Never make any changes to the product where these involve drilling into the product.

1.2.5 Risk of injury from burns caused by touching refrigerant pipes

The refrigerant pipes between the outdoor unit and the indoor unit may become extremely hot during operation. There is a risk of burns.

- Do not touch any uninsulated refrigerant pipes.

1.2.6 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 eliminated by a competent person.
- Adhere to the maintenance intervals specified.

1.2.7 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.

1.2.8 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

2 Notes on the documentation

- ► 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.

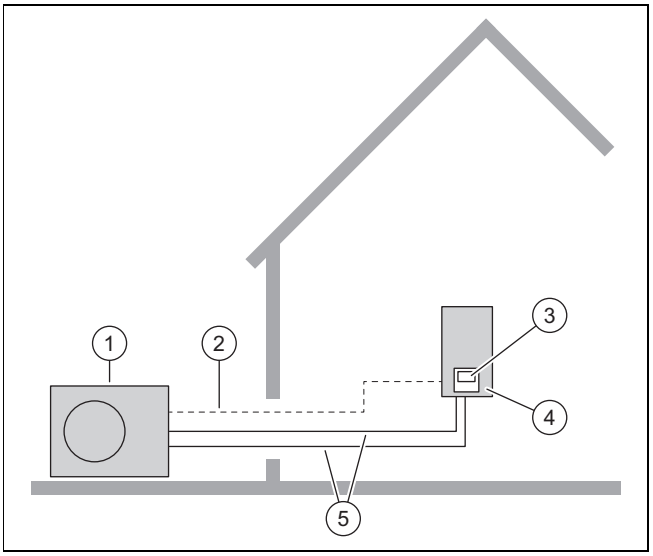
These instructions apply only to Azerbaijan:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 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.

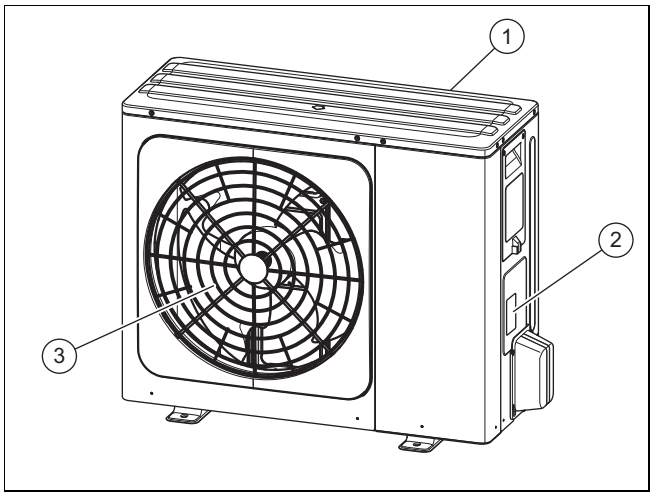
3.3 Noise reduction mode

A noise reduction mode can be activated for the product.

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

You can find additional information about noise reduction mode in the operating instructions for the indoor unit.

3.4 Product design



1	Air inlet grille	3	Air outlet grille
2	Data plate		

3.5 Data plate and serial number

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

The type designation is located on the data plate.

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 CE marking

CE

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.

3.7 Fluorinated greenhouse gases

The product contains fluorinated greenhouse gases.

3.8 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

4 Operation

4.1 Switching on the product

► Switch on the disconnector to which the product is connected in the building.

4.2 Operating the product

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

4.3 Guaranteeing frost protection

1. Ensure that the product is switched on and remains switched on.
2. Ensure that no snow accumulates around the air inlet grille and air outlet grille.

4.4 Switching off the product

1. Switch off the disconnector to which the product is connected in the building.
2. Guarantee the frost protection.

5 Care and maintenance

5.1 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.

5.2 Cleaning the product

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

5.3 Maintenance

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.

6 Troubleshooting

6.1 Eliminating faults

► If you observe a cloud of vapour on the product, you do not have to do anything. This effect may arise during the thawing process.

► If the product will no longer start up, check whether the power supply is interrupted. If required, switch on the disconnector in the building.

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

7 Decommissioning

7.1 Temporarily decommissioning the product

1. Switch off all of the disconnectors to which the product is connected in the building.
2. Protect the heating installation against frost.

7.2 Permanently decommissioning the product

► Have a competent person permanently decommission the product.

8 Recycling and disposal

This product is an electrical or electronic unit within the context of EU Directive 2012/19/EU. The unit was developed and manufactured using high-quality materials and components. These can be recycled and reused.

Find out about the regulations that apply in your country regarding the separate collection of waste electrical or electronic equipment. Correctly disposing of old units protects the environment and people against potential negative effects.

Disposing of the packaging

► Dispose of the packaging correctly.

► Observe all relevant regulations.

Disposing of the product

► Dispose of the product and its accessories correctly.
► Observe all relevant regulations.

If the product is labelled with this symbol:

► 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.

Deleting personal data

Personal data (e.g. online login details) may be misused by unauthorised third parties.

If the product contains personal data:

► Ensure that there is no personal data on or in the product before you dispose of the product.

8.1 Arranging disposal of refrigerant

The product is filled with R32 refrigerant.

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

9 Guarantee and customer service

9.1 Guarantee

İstehsalçının zəmanəti ilə bağlı məlumatı arxa tərəfdəki ünvandan əldə edə bilərsiniz.

9.2 Customer service

Müştəri xidməti ilə bağlı məlumatı arxa tərəfdəki ünvandan və ya www.demirdokum.com.tr saytından əldə edə bilərsiniz.

Installation and maintenance instructions

Contents

1 Safety

1.1 Intended use

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The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

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HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

1.2.2 Risk caused by inadequate qualifications for the R32 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 R32 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.
▸ Note that the refrigerant is odourless.

1.2.3 Risk of death caused by fire or explosion if stored incorrectly

The product contains the flammable refrigerant R32. In the event of a leak in combination with an ignition source, there is a risk of fire and explosion.

▸ Only store the unit in rooms with no permanent ignition sources. Examples of such ignition sources include naked flames, a gas-fired boiler that is switched on, or an electric heater.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- 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 R32 refrigerant and set to ≤ 25% of the lower explosive limit.
- If you suspect that there may be a leak, extinguish all naked flames in the vicinity.
- If there is a leak that requires repairs to be carried out with a soldering process, follow the procedure described in the section "11 Repair and service".
- Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.

1.2.5 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Ensure that the refrigerant does not collect in a recess.
- Ensure that the refrigerant cannot get inside the building via building openings.

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- Only carry out the work if you are competent at handling R32 refrigerant.
- Wear suitable personal protective equipment and bring a fire extinguisher with you.
- Only use tools and units that are permitted for R32 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.
- The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

1.2.7 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 in overvoltage category III for full partition, e.g. fuse or circuit breaker).
- Secure against being switched back on again.
- Wait for at least 60 minutes until the capacitors have discharged.
- Check that there is no voltage.

1.2.8 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.

1.2.9 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.

1.2.10 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

1.2.11 Risk of material damage caused by using an unsuitable tool

- Use the correct tool.

1.2.12 Risk of material damage caused by using an unsuitable material

Unsuitable refrigerant pipes may cause material damage.

- Only use special copper pipes designed for refrigeration technology.

1.3 Regulations (directives, laws, standards)

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

2 Notes on the documentation

- ► 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.

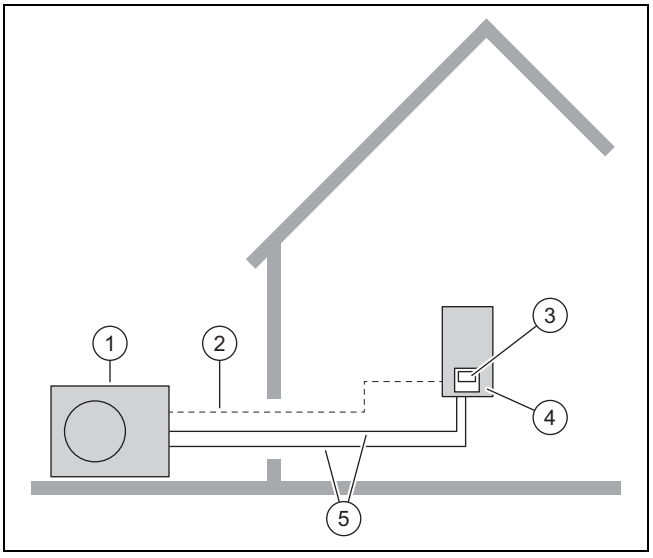
These instructions apply only to Azerbaijan:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



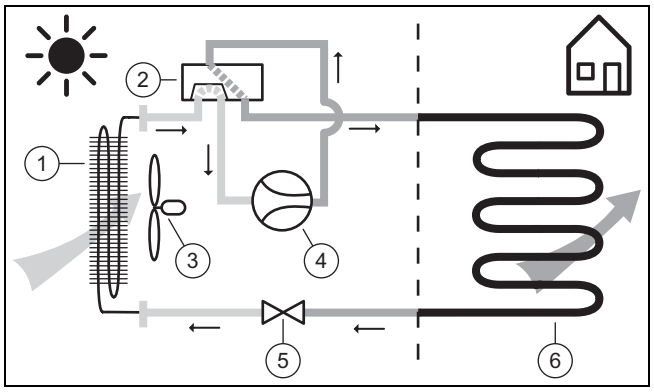
1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 Functions of the heat pump

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

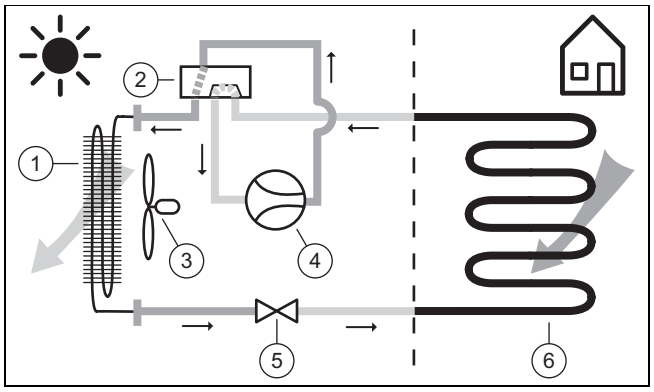
In heating mode, cyclic evaporation, compression, liquefaction and expansion take in heat energy from the surroundings and transfer it to the building. In cooling mode, heat energy is extracted from the building and released into the environment.

3.2.1 Operating principle in heating mode



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

3.2.2 Operating principle in cooling mode



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

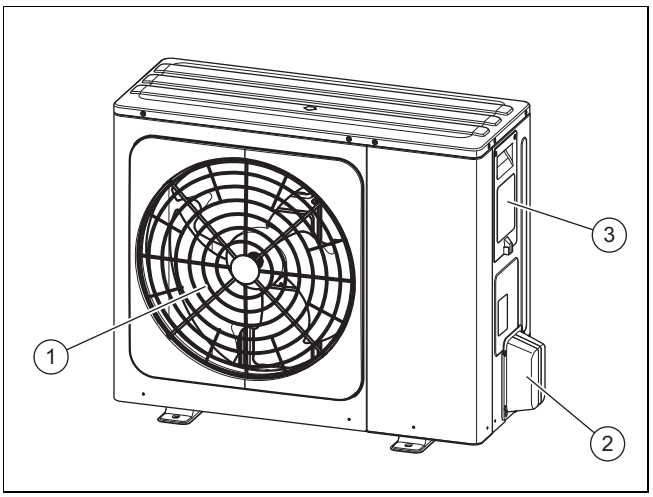
3.3 Description of the product

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

The outdoor unit is connected to the indoor unit via the refrigerant circuit.

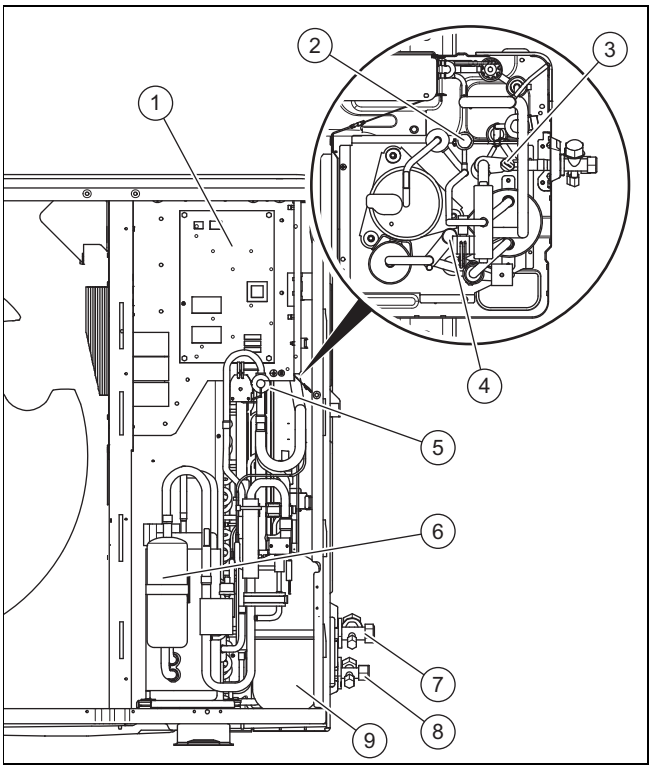
3.4 Product design

3.4.1 Unit



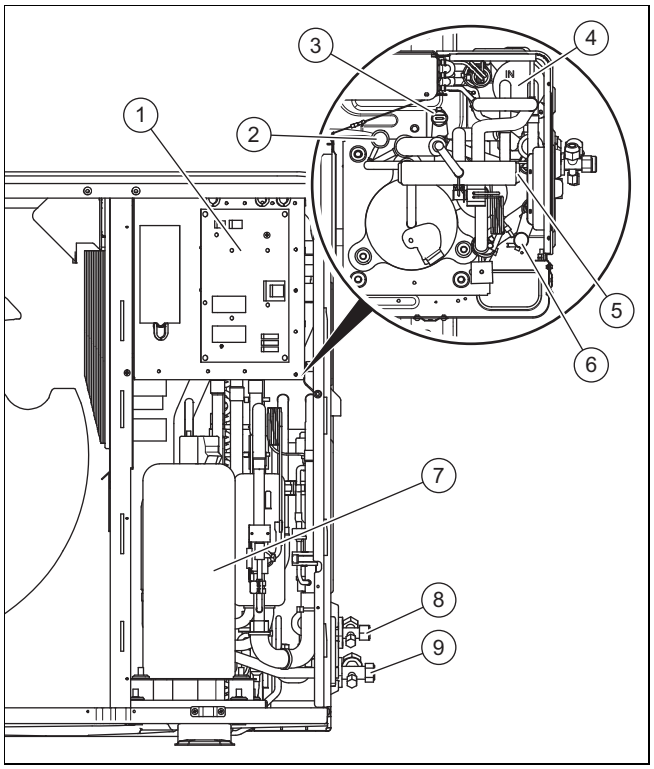
1	Air outlet grille	3	Cover for the electrical connections
2	Covering the connections for the refrigerant pipes		

3.4.2 8/10 kW functional elements



1	Control PCB	6	Compressor
2	High-pressure switch	7	Hot gas pipe isolation valve
3	Pressure sensor	8	Liquid pipe isolation valve
4	Low-pressure switch	9	Gas-liquid separator
5	4-port valve		

3.4.3 12/16 kW functional elements



1	Control PCB	6	Low-pressure switch
2	High-pressure switch	7	Compressor
3	High-pressure sensor	8	Liquid pipe isolation valve
4	Gas-liquid separator	9	Hot gas pipe isolation valve
5	4-port valve		

3.5 Serial number

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 Information on the data plate

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

Information	Meaning
HA ...	Nomenclature
DemirDöküm MaxiAir R32	Product name
xx Kw	Cooling output@35/W18
EER	Energy Efficiency Ratio@A35/W18 (energy efficiency ratio)
xx Kw	Heat output@35/W18
COP	Coefficient Of Performance@A7/W35 (coefficient of performance)
220–240 V ~ 50 Hz	Power supply
xx kW	Power consumption
xx kg	Net weight
R32	Refrigerant type
xx g	Refrigerant filling volume
GWP	Global Warming Potential (Global Warming Potential)
t CO_2	CO_2 equivalent
xx Pa	Maximum permissible pressure

Information	Meaning
COP /	Coefficient of performance/heating mode
IP	Protection class
	Reading the instructions

3.7 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

3.8 CE marking

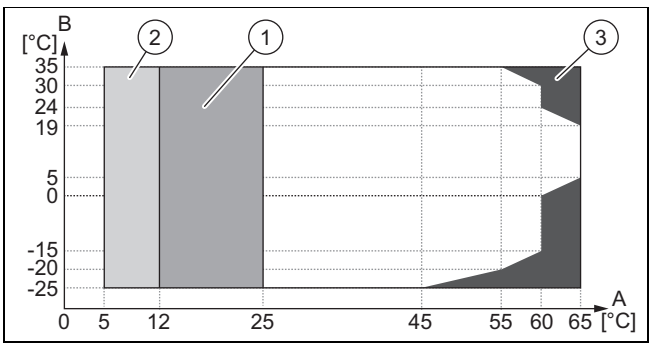
The CE marking shows that the products comply with the basic requirements of the applicable directives as stated on the declaration of conformity.

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

3.9 Application limits

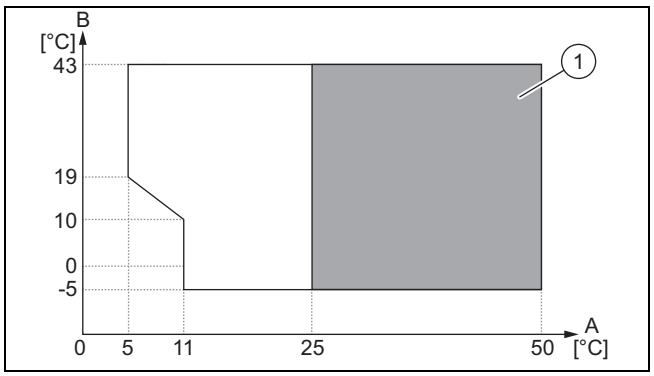
The product works between a minimum and maximum outdoor temperature. These outdoor temperatures define the application limits for the heating mode, domestic hot water mode and cooling mode. Operating outside of the application limits leads to the product switching off.

3.9.1 Heating mode



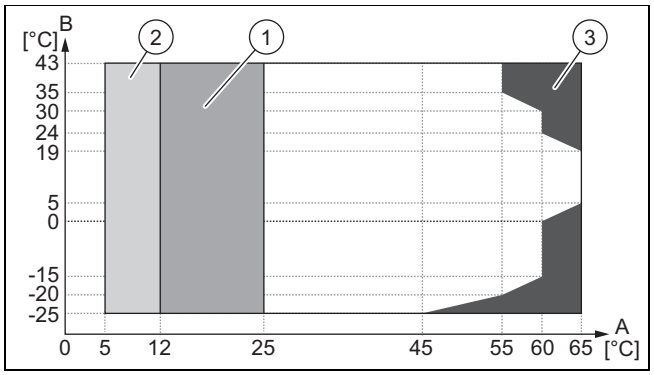
A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.9.2 Cooling mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature

3.9.3 DHW mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.10 Thawing mode

If the heat pump is running in heating mode, the condensate may freeze on the fins of the evaporator at low outdoor temperatures and frost may form. To increase efficiency, this frost is automatically detected and automatically defrosted at certain intervals by activating thawing mode.

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. Thawing mode takes 2–10 minutes, then the water is drained via the outdoor unit's drain.

The outdoor unit's fans do not run during thawing mode.

3.11 Safety devices

The product is equipped with technical safety devices.

High- and low-pressure switches regulate the pressure in the refrigerant circuit. If the pressure in the refrigerant circuit increases above the upper limit value (4.3 MPa (43 bar)) or falls below the lower limit value (0.14 MPa (1.4 bar)), the high- and/or low-pressure switch switches off and the compressor is stopped.

The compressor crankcase heating prevents refrigerant from mixing with compressor oil when the compressor is switched off.

The crankcase heating is regulated according to the outdoor temperature and the on/off condition of the compressor.

If the outdoor temperature is above 8 °C or the compressor is running, the crankcase heating is switched off.

The crankcase heating is switched on when the outdoor temperature is 8 °C or less and either

– The compressor has been switched off for more than three hours or
– The product has just been switched on (either manually or after a power cut).

If the temperature measured at the compressor outlet is higher than the permissible temperature (> 115 °C) , the compressor is switched off. The permissible temperature depends on the evaporation and condensation temperature.

In the indoor unit, the heating circuit's circulation water volume is regulated. The water flow rate switch detects the water flow rate in order to protect the compressor and the water pump in the event of an insufficient water flow rate. 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.

The Anti-Freeze Protection Control function protects the water-side heat exchanger against ice formation.

If the environmental temperature is below 3 °C in standby mode of heating/domestic hot water mode and the heating return or heating flow temperature or the water flow temperature of the additional heat source is below 5 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the environmental temperature is still below 3 °C and the water temperature is still below 5 °C, the heat pump switches to heating mode.

If, in cooling mode,

– the heating return temperature or
– the heating flow temperature or
– the heating flow temperature of the auxiliary heat source

is below 4 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the water temperature is still below 4 °C, the heat pump switches to heating mode.

If the heating flow temperature is below 2 °C in standby mode for the heating/domestic hot water mode, the heat pump stops and the water pump continues to run for 30 minutes. If the heating flow temperature is still below 2 °C, the heat pump switches to frost protection in heating mode.

4 Set-up

4.1 Unpacking the product

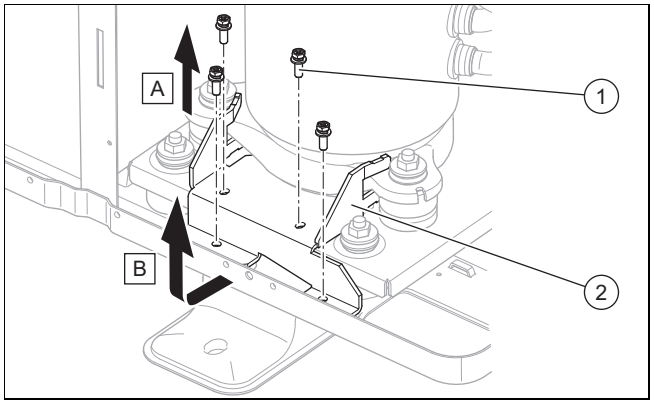
1. Remove the outer packaging parts.
2. Remove the accessory.
3. Remove the documentation.
4. Remove the screws from the pallet.
5. Remove the protective cardboard from the evaporator.

4.1.1 Remove the transport protection from the compressor (12/16 kW outdoor units only)

Note

If the compressor runs with the transport protection installed, this leads to abnormal vibrations and noises from the heat pump.

1. Remove the top casing and the right-hand front casing. (→ Section 4.10).
2. Remove the noise control cover from the compressor.



3. Remove the four screws **(1)**.
4. Remove the transport protection **(2)**.
5. Reattach the noise control cover for the compressor.

4.2 Checking the scope of delivery

► Check the contents of the packaging units.

Quantity	Designation
1	Product
1	Connection pipe for condensate discharge
1	Enclosed documentation

4.3 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.

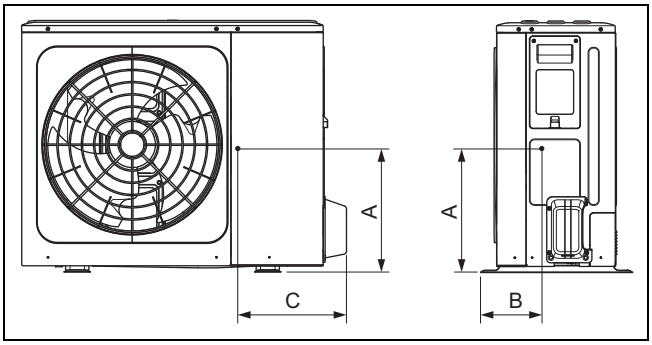
- ► Note the weight of the product.
- ► Lift the product with three people.

Caution.
Risk of material damage caused by incorrect transport.

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.

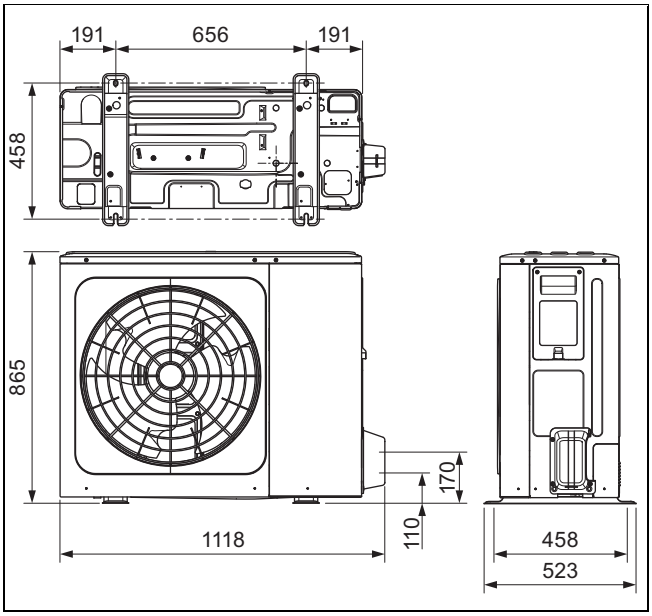
- ► During transport, do not tilt the product by any more than the maximum angle of 45°.

- ► Protect the casing sections against damage.
- ► Use carrying straps or a hand truck. In doing so, note the product's centre of gravity:



Type	A	B	C
8–10 kW	350	220	560
12–16 kW	355	275	520

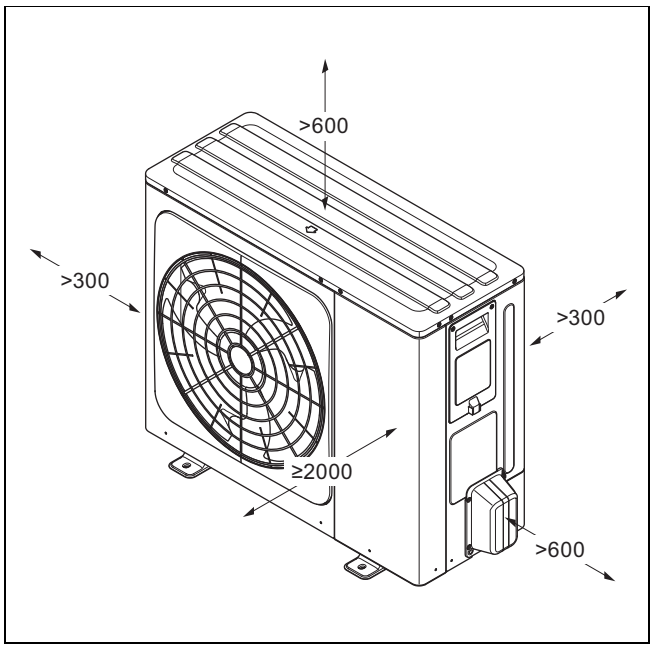
4.4 Dimensions



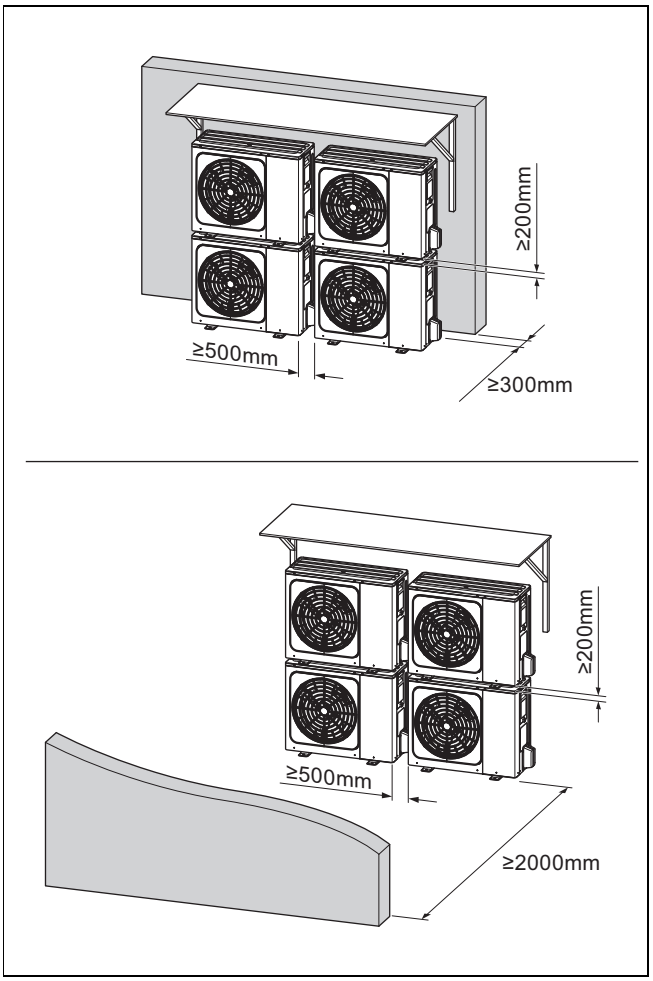
4.5 Complying with minimum clearances

- ► 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.

4.5.1 Individual installation



4.5.2 Installation on top of each other

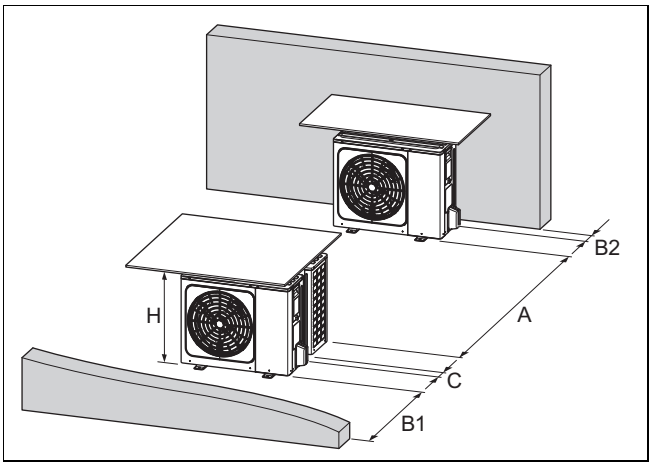


Note

If you install the products on top of each other, you must install the condensate discharge pipe to prevent condensate from discharging into the heat exchanger.

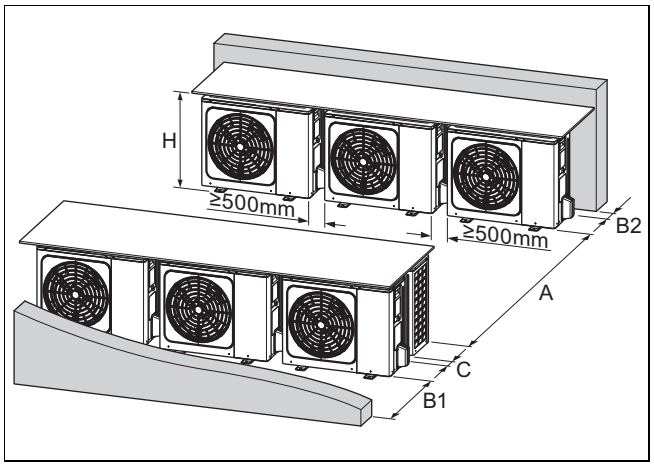
4.5.3 Multi-row installation

One product



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 150	≥ 600

Multiple products



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 300	≥ 600

4.6 Requirements for the installation site

Danger!

Risk of injury due to ice formation.

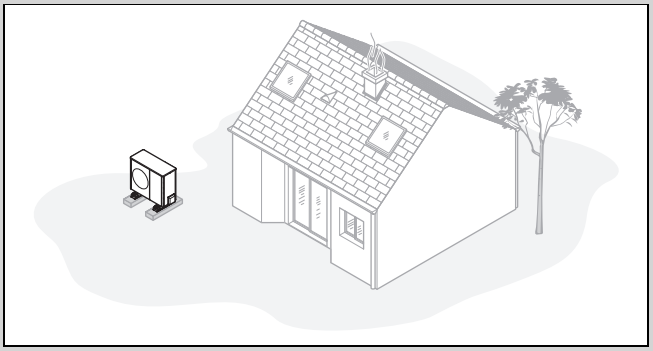
The air temperature at the air outlet is below the outdoor temperature. This can lead to ice formation.

- ► 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.
- ► The product can be set up in a coastal region or at protected areas close to the coastline. We recommend maintaining a minimum distance of 1.5 km from the coastline. In the immediate vicinity of the coastline, a protection device that sufficiently protects the product against spraying water and sea wind must also be installed. In doing so, the minimum clearances must be complied with.
- ► Observe the permissible height difference between the outdoor unit and indoor unit.
- ► Keep away from flammable substances or flammable gases.
- ► Keep away from heat sources.
- ► Avoid using preloaded extract air.
- ► Keep away from ventilation openings and extract-air shafts.
- ► Keep away from deciduous trees and shrubs.
- ► Do not expose the outdoor unit to dusty air.
- ► Do not expose the outdoor unit to corrosive air. Keep away from animal stalls or stables.
- ► Please note that the installation site must be below 2000 m above sea level.
- ► Please note the noise emissions. Select an installation site that is as far away from your own bedroom as possible.
- ► Please note the noise emissions. Select an installation site that is as far away from the windows of adjacent building as possible.
- ► Select an installation site that is easily accessible so that maintenance and service work can be carried out.

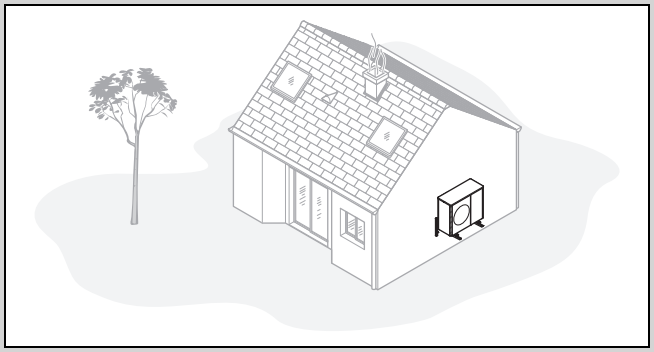
- If the installation site is adjacent to a vehicle shunting area, protect the product using ram protection.
- If the installation site is located in a region that is prone to snow, select a weather-protected installation site. If required, plan additional weather protection. In doing so, note the potential effects on the noise emissions.
- If you set up the unit in a location where it is exposed to strong winds, pay particular attention to the fact that strong winds of 5 m/s or more blowing against the unit's air outlet may cause a short circuit (extraction of the extract air). This may have the following effects:
  - Deterioration in operating performance.
  - Frequent switching on of the heating mode for frost protection.
  - Interruption to operation due to high pressure.
  - Motor burnout.
- If a strong wind is constantly blowing on the front of the unit, the fan can rotate very quickly until it breaks.
- The outdoor temperature is measured by the outdoor unit's temperature sensor and may be influenced by direct sunlight. Therefore, place the outdoor unit in the shade or erect a canopy.

Validity: Ground installation



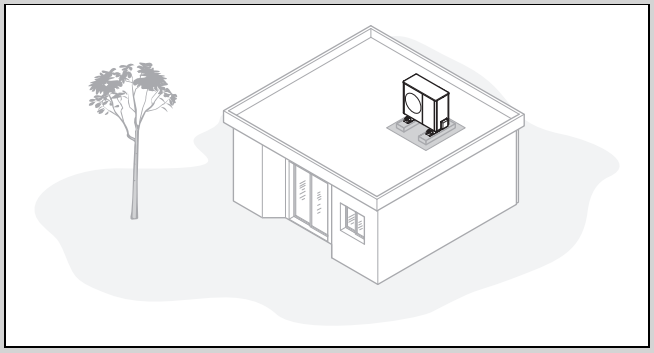
- Avoid choosing an installation site that is in the corner of a room, between walls or between fences.
- Prevent the return intake of air from the air outlet.
- Ensure that water cannot collect on the subsoil.
- Ensure that the subsoil can absorb water well.
- Plan a bed of gravel and rubble for the 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 sites between walls.
- Select an installation site with excellent sound absorption thanks to grass, hedges or 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.

Validity: Wall installation



- Ensure that the wall fulfils the static requirements. Note the weight of 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.
- If the work on the product takes place at a height above 3 m, install technical fall protection.

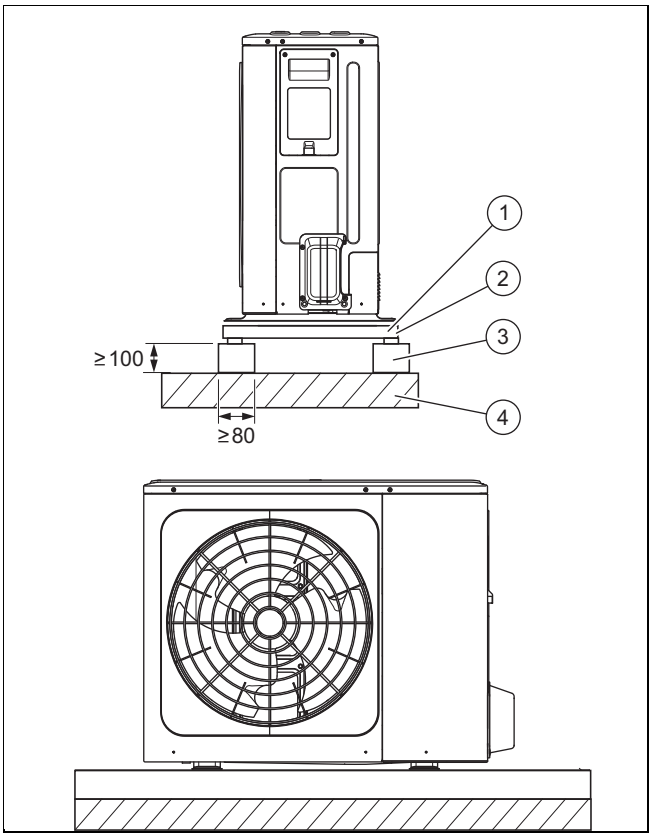
Validity: Flat-roof installation



- 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.

4.7 Planning the foundation

► Check the stability and evenness of the installation floor so that the product cannot cause any vibrations or noises during operation.

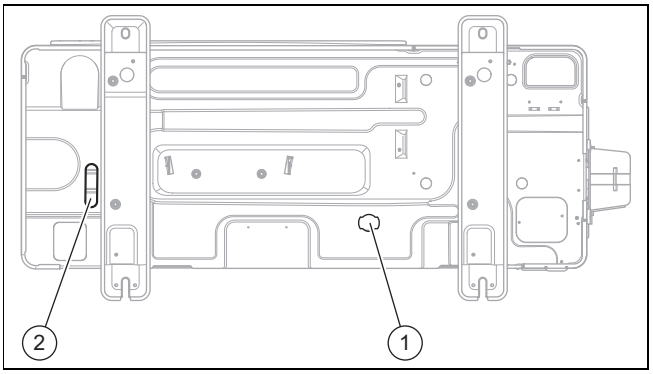


1	10 mm diameter expansion bolt	3	Concrete foundation
2	Shock-absorbing rubber mat	4	Fixed floor or canopy

► Tightly secure the product using four 10 mm diameter expansion bolts, nuts and washers.

► Screw in the expansion bolts until they have a clearance of 20 mm from the foundation surface.

Condensate discharge



1	Main drain opening	2	Large drain opening

All condensate from the outdoor unit is collected at the unit base and drains away via the main drain opening.

The larger drain opening is sealed with a rubber stopper. If the main drain opening is not sufficient for the condensate that is produced, also use the larger drain opening.

► If the water cannot drain at low temperatures, even when the large drain opening is open, install an electric heating belt. The electric heating belt acts as trace heating to prevent the formation of ice or to melt the ice that has formed.

4.8 Guaranteeing occupational safety

Validity: Wall installation

► Ensure that the installation position on the wall can be safely accessed.

► If the work on the product takes place at a height above 3 m, install technical fall protection.

► Observe the local laws and regulations.

Validity: Flat-roof installation

► Ensure that the flat roof can be safely accessed.

► Maintain a safety area of 2 m to the fall edge, plus the clearance that is required for working on the product. The safety area must not be entered.

► Alternatively, 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.

4.9 Installing the product

Danger!

Risk of injury due to frozen condensate.

Frozen condensate on paths may cause falls.

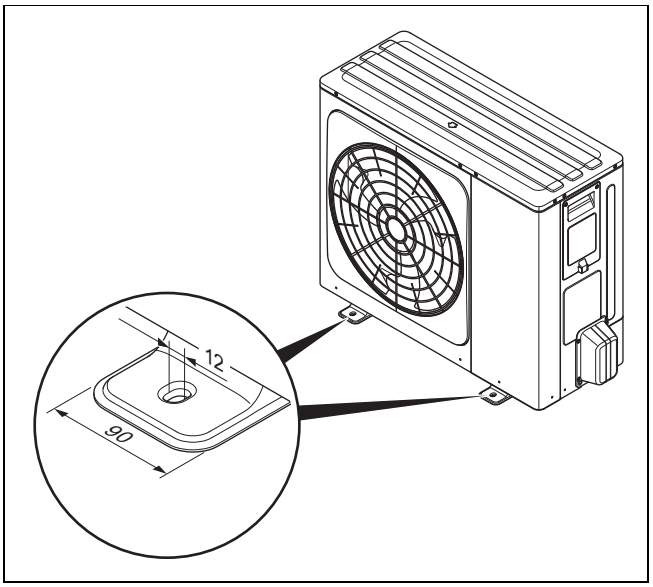
► Ensure that condensate does not discharge onto paths and that ice cannot build up there.

Note

Install rubber feet under the outdoor unit to prevent vibrations and noise. Recommendations for the rubber feet:

- Thickness: 50 mm to 100 mm

- Material: CR



Condition: Region prone to snow

- If required, set up additional weather protection. In doing so, note the potential effects on the noise emissions.

Validity: Ground installation

- Use the appropriate products, depending on the required installation type.
  - Damping feet
  - Raised base and damping feet
- Align the product horizontally.

Condition: Region without ground frost

- Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate.

Condition: Region with ground frost

- Do not install a condensate discharge pipe or any plugs in the floor plate.
- If required, protect the product's air inlet and air outlet against driving rain or direct snowfall. In doing so, note the potential effects on the noise emissions.

Validity: Wall installation

- Check the design and load-bearing capacity of the wall. Note the weight of the product.
- Use a unit mounting bracket that is suitable for the wall installation.
- Use the damping feet.
- Align the product horizontally.

Condition: Region without ground frost

- Below the product, create a gravel bed into which any condensate can drain.

Condition: Region with ground frost

- Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate.

Validity: Flat-roof installation

Warning.
Risk of injury due to toppling over in the wind.

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

- Use two concrete bases and an anti-slip protective mat.
- Screw the product to the concrete base.

- Use the damping feet.
- Align the product horizontally.

Condition: Region without ground frost

- Leave the condensate discharge open. In this case, the condensate drains onto the flat roof.
- Alternatively, connect drain pipework.
- To do this, install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate for this.

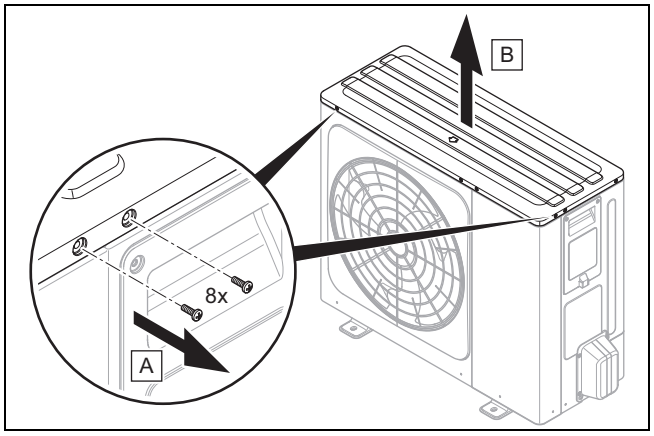
Condition: Region with ground frost

- Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate.
- Connect the condensate discharge pipe to a downpipe over a short distance.

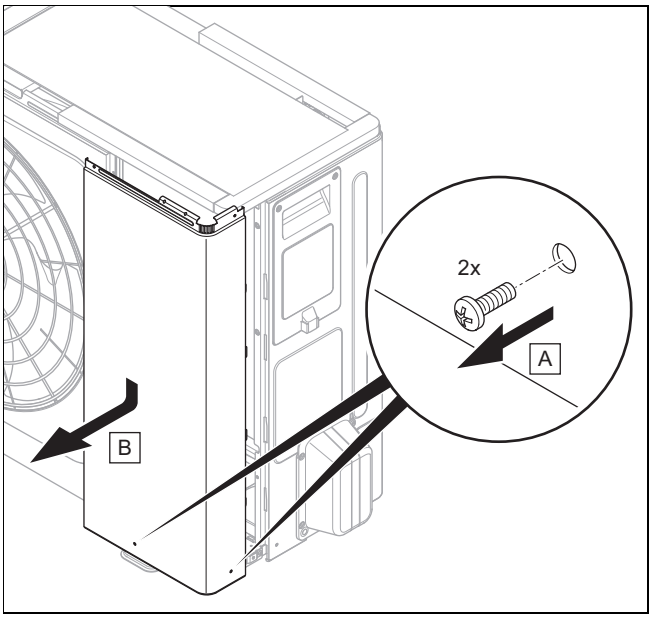
4.10 Removing/installing the casing sections

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

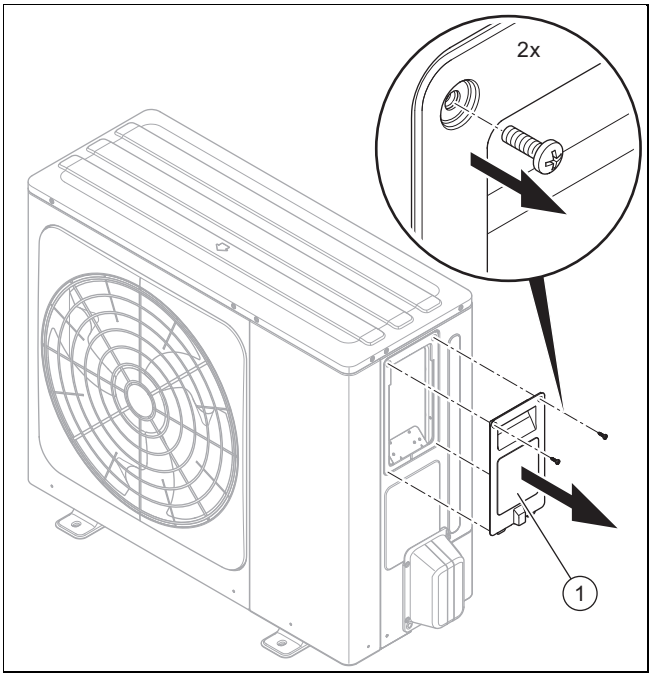
4.10.1 Removing the top casing



4.10.2 Removing the right-hand front casing



4.10.3 Removing the top casing for the electrical connections



5 Hydraulics installation

5.1 Preparing work on the refrigerant circuit

1. Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of injury and risk of environmental damage due to escaping refrigerant.

Touching any escaping refrigerant may cause injury. Escaping refrigerant leads to environmental damage if it reaches the atmosphere.

- ► Only carry out work on the refrigerant circuit if you have been trained to do so.

Caution.

Risk of material damage when extracting refrigerant.

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

- ► Ensure that heating water flows through the indoor unit's condenser or it is completely drained when extracting refrigerant on the secondary side.

2. The outdoor unit is pre-filled with R32 refrigerant. Determine whether additional refrigerant is required.
3. Ensure that the two isolation valves are closed.
4. Purchase suitable refrigerant pipes in accordance with the technical data.
5. Ensure that the refrigerant pipes that are used comply with these requirements:

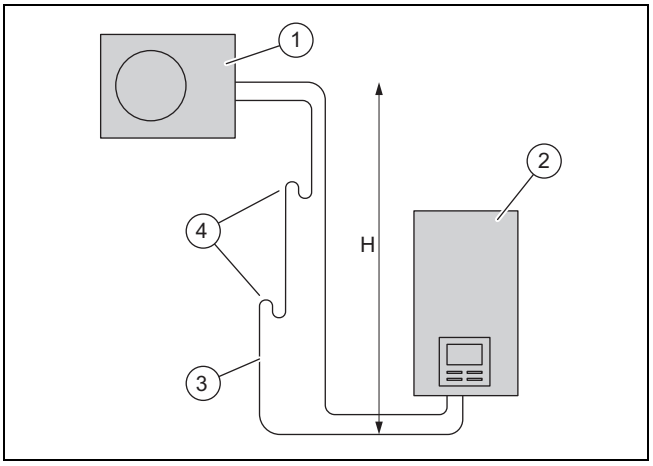
- Special copper pipes for the refrigeration technology
- Thermal insulation
- Weather resistance and UV resistance.
- Protection against rodent bites.
- Flaring with 90° flare in accordance with the SAE standard

6. Keep the refrigerant pipes blocked until they are installed.
7. Ensure that there is no dirt or water in the refrigerant pipes before you connect the refrigerant pipes to the outdoor unit and indoor unit.
8. Prevent the ingress of metal chips, dirt or moisture into the refrigerant pipes.
9. Purchase the necessary tools and equipment:

Always required	May be required
– Flaring tool for 90° flare – Torque spanner – Refrigerant fitting – Nitrogen cylinder – Vacuum pump – Vacuum gauge	– Refrigerant cylinder with R32 – Refrigerant scales

5.2 Requirements for routing the refrigerant pipes

5.2.1 Case 1: Outdoor unit raised

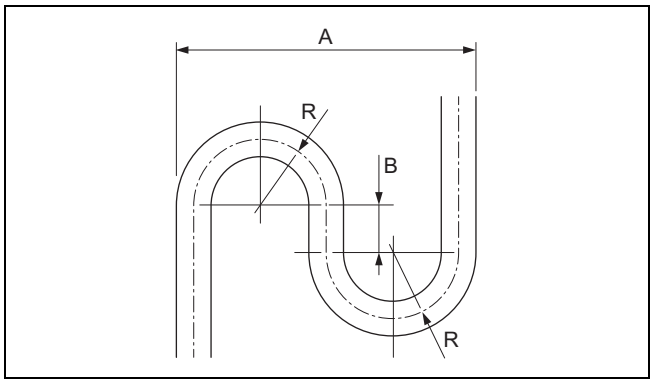


1 Outdoor unit
2 Indoor unit
3 Hot gas pipe
4 Oil elevation elbow

The outdoor unit can be installed up to a maximum height difference H of 20 m above the indoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. Depending on the height difference, oil elevation elbows must be installed in the hot gas pipe. The height difference between the oil elevation elbows must not exceed 7 m.

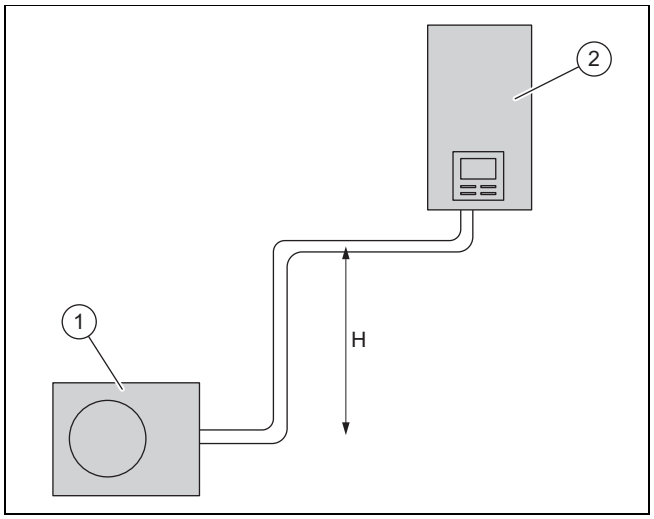
Height H	Oil elevation elbow
Up to 7 m	No oil elevation elbow required
Up to 14 m	One oil elevation elbow at 7 m high
Up to 20 m	Two oil elevation elbows, one 7 m and one 14 m in height

The oil elevation elbow must comply with these geometric requirements:



A 173 mm
B 40 mm
R 40 mm

5.2.2 Case 2: Indoor unit raised



1 Outdoor unit
2 Indoor unit

The indoor unit can be installed up to a maximum height difference H of 20 m above the outdoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. No oil elevation elbow is required.

5.3 Flare connection

The flare connection guarantees the tightness of the refrigerant pipe for the R32 refrigerant.

If a flare connection comes loose again, the old flare must then be disconnected, and a new flare must be established. The refrigerant pipe is therefore shortened slightly. This must be taken into consideration when routing the refrigerant pipes.

5.4 Routing refrigerant pipes to the product

Validity: Ground installation

► Route the refrigerant pipe through the safety pipe in the ground.

1. Route the refrigerant pipes in the wall duct with a slight downward gradient to the outside.
2. Route the refrigerant pipe centrally through the wall duct without the lines touching the wall.
3. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.

Validity: Wall installation

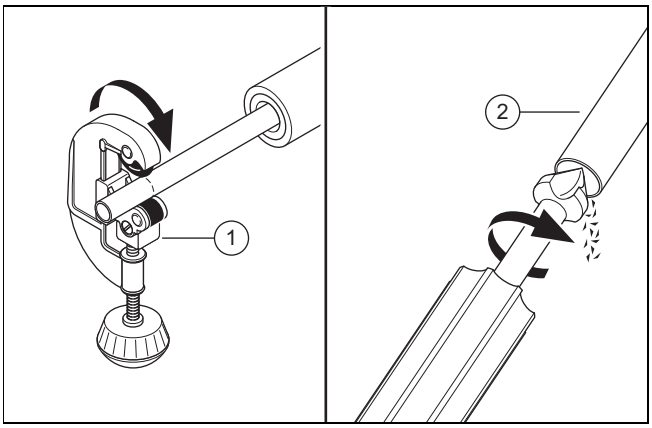
- ► Ensure that the refrigerant pipes do not come into contact with the wall and the product's casing sections.

5.5 Routing refrigerant pipes in the building

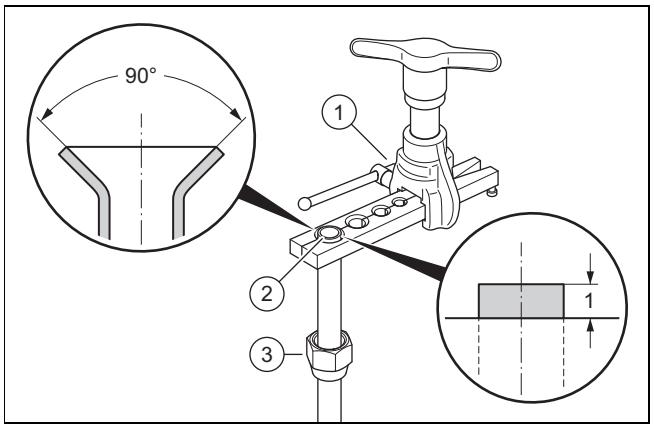
1. Do not route the refrigerant pipes in screed or masonry in the building. If this is unavoidable, install a silencer in the refrigerant pipe.
2. Do not route the refrigerant pipes through living rooms in the building.
3. Limit the routing of refrigerant pipes to a minimum. Avoid unnecessary piping and elbows.
4. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.
5. Bend the refrigerant pipes at the right angle to the wall and avoid mechanical tension during the routing.
6. Ensure that the refrigerant pipes do not come into contact with the wall.
7. Use wall brackets with rubber insert to secure these. Place the wall brackets around the thermal insulation of the refrigerant pipe.
8. Check whether oil elevation elbows are required. (→ Section 5.2.1)
9. If required, install oil elevation elbows in the hot gas pipe.
10. Ensure that the routed refrigerant pipes are protected against damage.

5.6 Cutting the pipes to length and flaring the pipe ends

1. Keep the pipe ends downwards when working on them.
2. Prevent the ingress of metal chips, dirt or moisture.

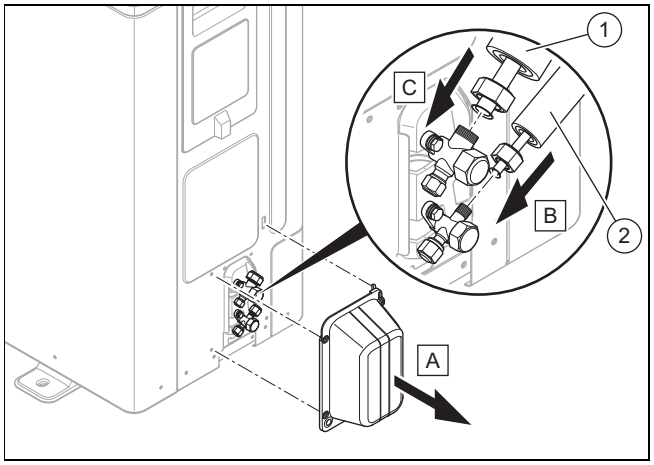


3. Cut the copper pipe to length at a right angle using a pipe cutter **(1)**.
4. Deburr the inside and outside of the pipe end **(2)**. Remove all chips carefully.
5. Unscrew the flare nut on the associated isolation valve.



6. Slide the flare nut **(3)** onto the pipe end.
7. Use a flaring tool for the 90° flare in accordance with the SAE standard.
8. Insert the pipe end into the appropriate die matrix in the flaring tool **(1)**. Allow the pipe end to protrude by 1 mm. Clamp the pipe end.
9. Widen the pipe end **(2)** using the flaring tool.

5.7 Connecting the refrigerant pipes



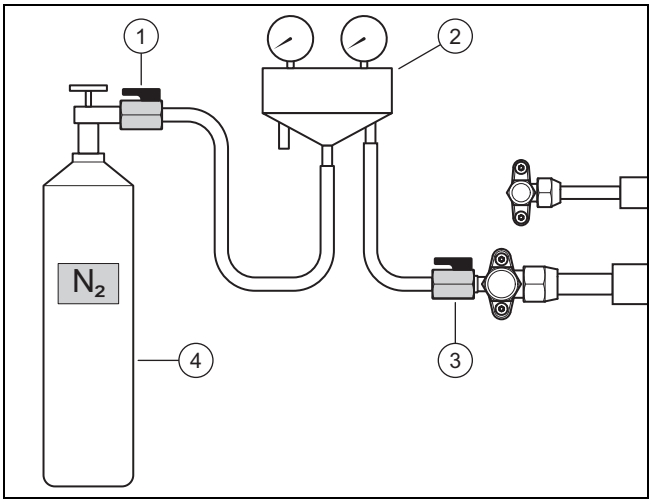
1. Remove the cover for the refrigerant pipe connections.
2. Remove the flare nut from the connections for the refrigerant pipes.
3. Cut the pipes to the correct length and flare the pipe ends. (→ Section 5.6).
4. Connect the liquid pipe **(2)** and the hot gas pipe **(1)**.
5. Tighten the flare nut. Use pliers to hold the isolation valve in place while doing so.

Pipeline	Pipe diameter	Tightening torque
Liquid pipe	3/8"	25 to 26 Nm
Hot gas pipe	5/8"	45 to 47 Nm

6. Ensure that the flare connections remain accessible for maintenance purposes.

5.8 Checking the refrigerant circuit for tightness

1. Ensure that the two isolation valves on the outdoor unit are still closed.
2. Observe the maximum operating pressure in the refrigerant circuit.



3. Connect a refrigerant fitting **(2)** with a ball valve **(3)** to the maintenance connection for the hot gas pipe.
4. Connect the refrigerant fitting with a ball valve **(1)** to a nitrogen cylinder **(4)**. Use dry nitrogen.
5. Open both of the ball valves.
6. Open the nitrogen cylinder.
   – Test pressure: 4.3 MPa (43 bar)
7. Close the nitrogen cylinder and the ball valve **(1)**.
   – Waiting time: 10 minutes
8. Check all of the connections in the refrigerant circuit for tightness. Use leak detection spray for this.
9. Observe whether the pressure is stable.

   Result 1:

   The pressure is stable and no leaks were found:
   ► Completely drain the nitrogen gas via the refrigerant fitting.
   ► Close the ball valve **(3)**.

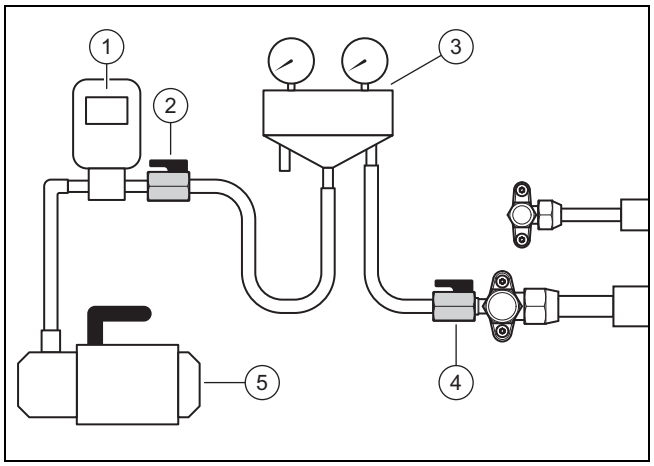
   Result 2:

   The pressure drops or a leak is found:
   ► Eliminate the leakage.
   ► Repeat the test.

5.9 Evacuating the refrigerant circuit

Note
During evacuation, residual moisture is removed from the refrigerant circuit at the same time. The length of the process depends on the residual moisture and the outdoor temperature.

1. Ensure that the two isolation valves on the outdoor unit are still closed.



2. Connect a refrigerant fitting **(3)** with a ball valve **(4)** to the maintenance connection for the hot gas pipe.
3. Connect the refrigerant fitting with a ball valve **(2)** to a vacuum gauge **(1)** and a vacuum pump **(5)**.
4. Open both of the ball valves.
5. **First test**: Switch on the vacuum pump.
6. Drain the refrigerant pipes and the condenser on the indoor unit.
   – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
   – Running time of the vacuum pump: At least 30 minutes
7. Switch off the vacuum pump.
   – Waiting period: 3 minutes
8. Check the pressure.

   Result 1:

   Pressure is stable:
   ► The first test is complete. Start with the second test.

   Result 2:

   The pressure increases and there is a leak:
   ► Check the flare connections on the outdoor unit and indoor unit. Eliminate the leakage.
   ► Start with the second test.

   Result 3:

   The pressure increases and there is residual moisture:
   ► Carry out the drying process.
   ► Start with the second test.
9. **Second test**: Switch on the vacuum pump.
10. Drain the refrigerant pipes and the condenser on the indoor unit.
    – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
    – Running time of the vacuum pump: At least 30 minutes
11. Switch off the vacuum pump.
    – Waiting period: 3 minutes
12. Check the pressure.

    Result 1:

    Pressure is stable:
    ► The second test is complete. Close the ball valves **(2)** and **(4)**.

    Result 2:

    The pressure increases.
    ► Repeat the second test.

5.10 Permissible total refrigerant volume

The outdoor unit is filled with refrigerant at the factory:

Product	Factory-set refrigerant volume	Refrigerant
8 kW, 10 kW	1.65 kg	R32
12 kW, 16 kW	1.84 kg	R32

Depending on the length of the refrigerant pipes, an additional refrigerant volume must be filled during the installation (→ Section 5.11).

The total permissible refrigerant volume is limited and depends on the minimum room size at the installation site for the indoor unit.

The requirements for the minimum room size at the indoor unit's installation site are described in the installation instructions for the indoor unit. For a total fill quantity of over 1.84 kg, the required installation room must be considerably larger.

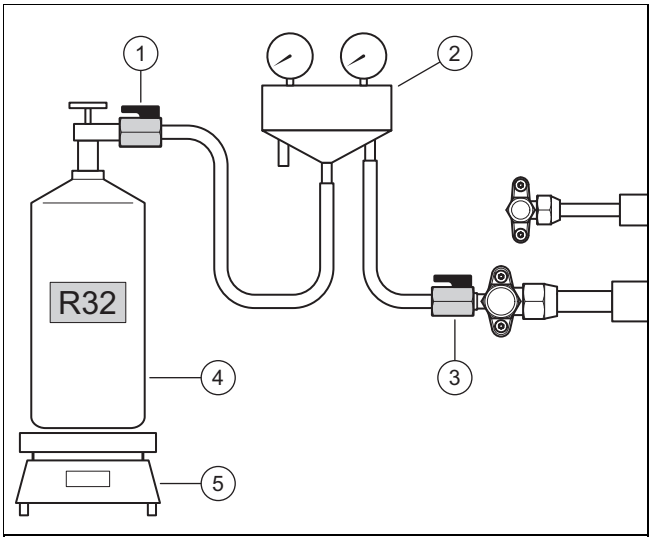
5.11 Adding additional refrigerant

Danger!
Risk of injury due to escaping refrigerant.
Touching any escaping refrigerant may cause injury.
► Wear personal protective equipment.

1. Determine the single length of the refrigerant pipe.
2. Calculate the required volume of additional refrigerant:

Single length	Refrigerant volume to be topped up
≤ 15 m	None
> 15 m	38 g for every additional metre above 15 m

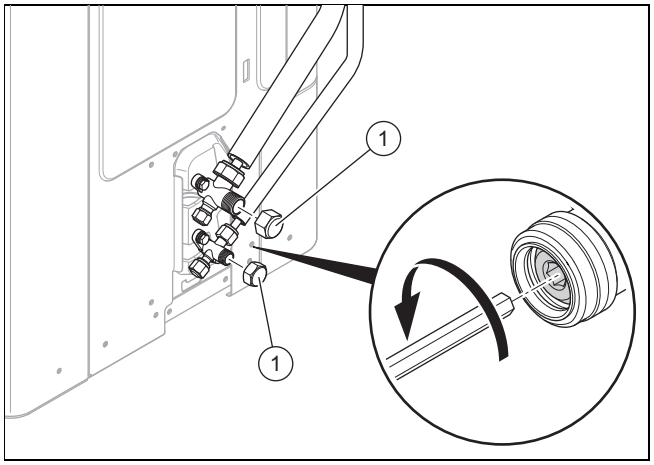
3. Ensure that the two isolation valves on the outdoor unit are still closed.



4. Connect the refrigerant fitting **(2)** with the ball valve **(1)** to a refrigerant cylinder **(4)**.
   – Refrigerant to be used: R32
5. Put the refrigerant cylinder on the scales **(5)**. If the refrigerant cylinder does not have an immersion sleeve, put it on the scales upside down.
6. Leave the ball valve **(3)** closed. Open the refrigerant cylinder and the ball valve **(1)**.
7. If the hoses have been filled with refrigerant, set the scales to zero.
8. Open the ball valve **(3)**. Fill the outdoor unit with the calculated refrigerant volume.
9. Close both of the ball valves.
10. Close the refrigerant cylinder.

5.12 Releasing the refrigerant

Danger!
Risk of injury due to escaping refrigerant.
Touching any escaping refrigerant may cause injury.
► Wear personal protective equipment.



1. Remove both covering caps **(1)**.
2. Unscrew both hexagon socket screws as far as they will go.
   ◁ The refrigerant flows into the refrigerant pipes and the indoor unit's condenser.
3. Check that no refrigerant is escaping. Check in particular all of the screwed connections and valves.
4. Screw on both covering caps. Tighten the covering caps.

5.13 Completing work on the refrigerant circuit

1. Note down the refrigerant volume added at the factory, the additional refrigerant volume added and the total refrigerant volume on the sticker on the product.
2. Enter the data in the service book.
3. Insulate and secure the refrigerant pipes after you have connected the connection cable (→ Section 6.8).
4. Install the cover for the refrigerant pipe connections.

6 Electrical installation

6.1 Precautionary measures when working on electrical wires

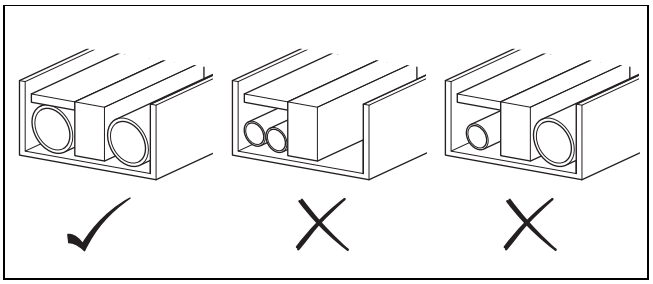
Danger!

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.

- ► Carry out the on-site wiring in accordance with the wiring diagram supplied and the instructions below.
- ► Install a main switch or other partition with all-pole contact separation in the fixed wiring. In doing so, observe the applicable local laws and regulations.
- ► Switch off the power supply before implementing any connections.
- ► Use a 3-core, shielded copper cable.
- ► Never crush bundled cables.
- ► Secure the cables in such a way that they do not come into contact with the pipelines or sharp edges.
- ► Ensure that no pressure is exerted on the terminal connections.
- ► Use a separate power supply for the product. Never use a power supply that is shared by another product.
- ► Ensure that it is earthed. Do not earth the unit via a supply pipe, overvoltage protection or the telephone earth.
- ► Install a type B residual-current circuit breaker with 30 mA (<0.1 s).
- ► Do not install a phase advance capacitor as this can impair the function of the capacitor.



- ► Route the wires in accordance with the figure.
- ► Do not connect any wires with different cross-sections to the same power supply terminal.
- ► Secure the electrical wires using cable ties so that they do not come into contact with the pipelines, especially on the high-pressure side.

6.2 Precautionary measures when connecting the power supply

- ► Use round conductor end sleeves for the connection to the terminal block for the power supply. If, for unavoidable reasons, these cannot be used, observe the following instructions.
- ► Use the specified wires for the wiring.
- ► Do not connect any wires with different cross-sections to the same power supply terminal (loose connections may lead to overheating).
- ► Use the correct screwdriver to tighten the terminal screws.
- ► Connect a residual-current circuit breaker and a fuse to the power supply cable.
- ► Establish complete connections and secure the wires in such a way that no external forces can act on the terminals.
- ► Ensure that a tolerance of +10% to -15% is maintained for the mains voltage of the single-phase 230 V mains.

6.3 Requirement for the safety device

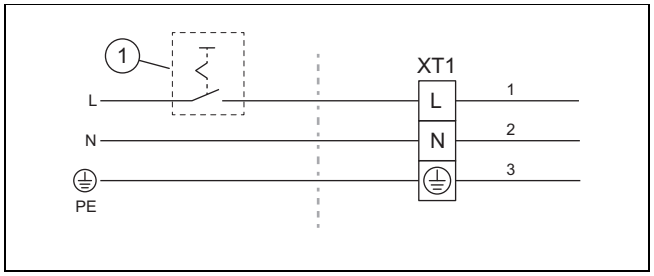
- ► Select the minimum required cable cross-section for each product individually using the tables (→ Appendix D).
- ► Select a residual-current circuit breaker that has a contact gap of at least 3 mm and which enables complete shutdown. Use the value for the maximum amperage to select current and residual-current circuit breakers (→ Appendix D).

6.4 Preparing the electrical connection

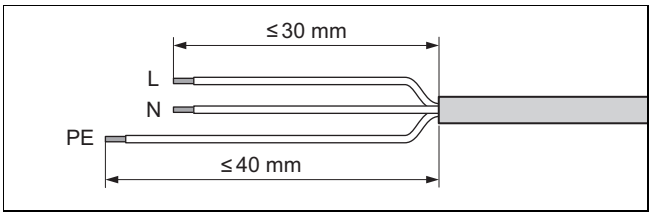
- ► Remove the top casing for the electrical connections. (→ Section 4.10.3)

6.5 Establishing the power supply

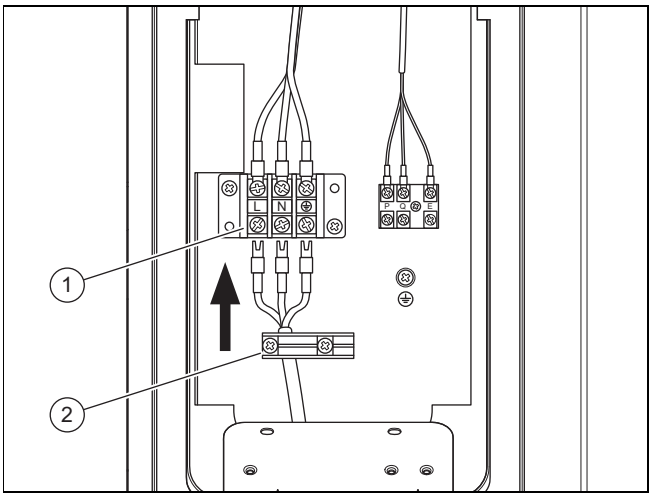
1. If it is stipulated for the installation site, install one residual-current circuit breaker for the product.



2. Install a disconnector **(1)** for the product in the building.
3. Use one 3-pole power supply cable.
4. Route the power supply cable from the building and through the wall duct to the product.
5. Route the power supply cable within the product in such a way that no contact is made with hot components.



6. Strip the power supply cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
7. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.



8. Connect the power supply cable to the power supply terminal **(1)**.
9. Secure the power supply cable using the strain relief clamp **(2)**.

6.6 Connecting the connection cable

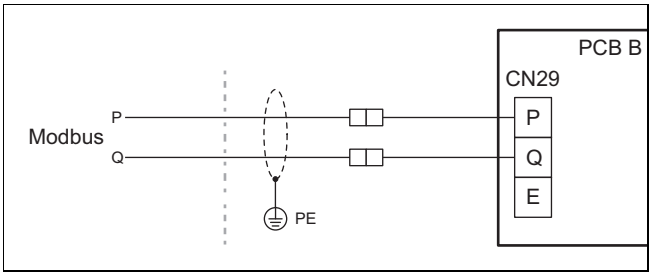
Note

The connection between the outdoor unit and the indoor unit is established via Modbus communication (RS-485 protocol).

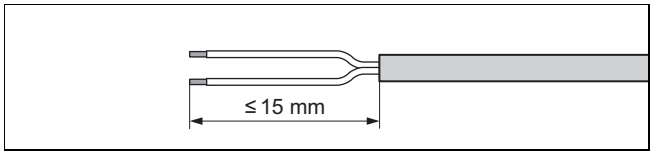
Preliminary work

1. Determine the line length between the indoor unit and outdoor unit.
2. Use a communication cable with the following properties:

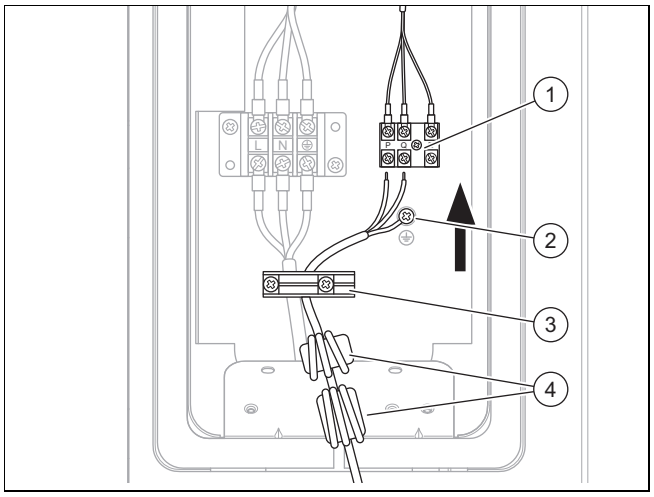
	Feature
Type	2 x shielded cable (AWG18)
Min. cross-section	0.75 mm²
Max. length	50 m



1. Ensure that connections P and Q on the indoor unit are connected to connections P and Q on the outdoor unit using the Modbus cable.
   - To do this, use a Modbus cable with different conductor colours for signals P and Q.
   - The shield braid for the communication cable must be earthed.
2. Route the Modbus cable from the building and through the wall duct to the product.
3. Route the Modbus cable within the product in such a way that no contact is made with hot components.



4. Strip the Modbus cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
5. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.

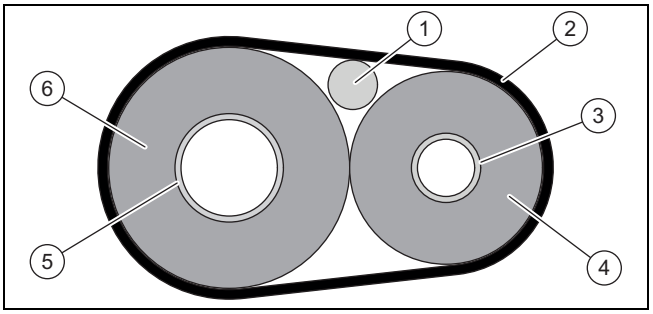


6. Position two ferrite rings **(4)** as shown in the figure.
7. Connect the two conductors on the Modbus cable to the screw terminal **(1)**. In doing so, check the assignment of the conductor colours to connections P and Q.
8. Connect the shield connection to the earthing terminal **(2)**.
9. Use the strain relief clamp **(3)** to secure the Modbus cable in place.

6.7 Completing the electrical connection

1. Check that the power supply cable and the Modbus cable are routed in such a way that they are not exposed to any wear, corrosion, tension, vibrations, sharp edges or any other unfavourable environmental influences.
2. Install the top casing.

6.8 Completing the installation of the outdoor unit



1	Connection cable	4	Liquid pipe insulation
2	Edging tape	5	Hot gas pipe
3	Liquid pipe	6	Hot gas pipe insulation

1. Insulate and secure the refrigerant pipes and the connection cable in accordance with the figure.
2. Install the protective cover for the refrigerant connection.

7 Start-up

7.1 Checking before switching on

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

7.2 Switching on the product

- ► Switch on the disconnector to which the product is connected in the building.

8 Handing over to the end user

8.1 Instructing the end user

- ► Explain to the end user how the product operates.
- ► 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 R32 refrigerant.
- ► Make the end user aware of the need for regular maintenance.

9 Troubleshooting

9.1 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).

10 Inspection and maintenance

10.1 Preparing for inspection and maintenance

- ► Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

- ► Only open the electronics box after a waiting period of 60 minutes.

- ► Observe the basic safety rules before carrying out inspection and maintenance work or installing spare parts.

- ► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
- ► Switch off the disconnector to which the product is connected in the building.
- ► Disconnect the product from the power supply but ensure that the product is still earthed.
- ► Before working in the electronics box, comply with a waiting time of 60 minutes after switching off the power supply.
  - – An LED on the PCB and the module PCB displays whether the PCBs are still supplied with power. If the LEDs no longer light up, the power supply is interrupted.
- ► When working on the product, protect all electric components from spraying water.

10.2 Observing the work plan and intervals

- ► Comply with the specified intervals. Carry out all of the work that is mentioned (Appendix D).

10.3 Procuring spare parts

The original components of the product were also certified by the manufacturer as part of the declaration of conformity. If you use other, non-certified or unauthorised parts during maintenance or repair work, this may result in the product no longer meeting the applicable standards, thereby voiding the conformity of the product.

We strongly recommend that you use original spare parts from the manufacturer as this guarantees fault-free and safe operation of the product. To receive information about the available original spare parts, contact the contact address provided on the back page of these instructions.

- ► If you require spare parts for maintenance or repair work, use only the spare parts that are permitted for the product.

10.4 Carrying out maintenance work

10.4.1 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.

10.4.2 Removing the casing sections

- ► Remove the casing sections to the extent required for the subsequent maintenance work (→ Section 4.10).

10.4.3 Cleaning the evaporator

1. Clean the gaps between the evaporator fins using a soft brush. In doing so, avoid bending the fins.
2. Remove any dirt and depositions.
3. If required, straighten out any bent fins using a fin comb.

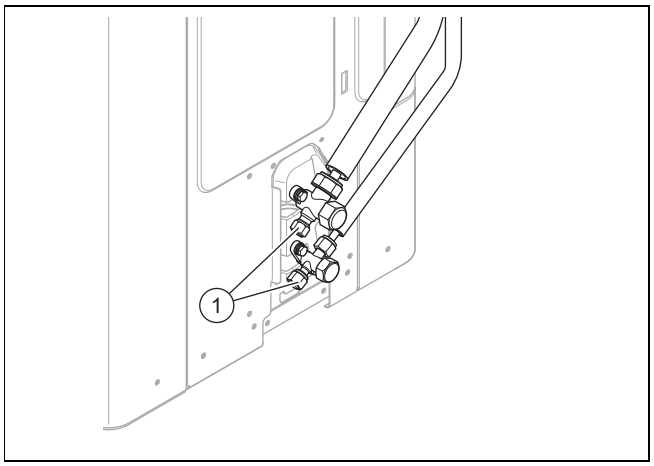
10.4.4 Checking the fan

1. Turn the fan by hand.
2. Check that the fan runs freely.

10.4.5 Cleaning the condensate discharge

1. Remove the dirt that has accumulated on the condensate tray or in the condensate discharge pipe.
2. Check that the water can drain freely. Poor approx. 1 l water into the condensate tray.

10.4.6 Checking the refrigerant circuit



1. Check whether the components and pipelines are free from dirt and corrosion.
2. Check that the covering caps **(1)** on the maintenance connections are positioned securely.
3. Check whether the thermal insulation for the refrigerant pipes is undamaged.
4. Check whether the refrigerant pipes have been routed without any kinks.

10.4.7 Checking the refrigerant circuit for tightness

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

10.4.8 Checking the electrical connections

1. In the connection box, check that the electrical wire are seated firmly in the plugs or terminals.
2. Check the earthing in the connection box.
3. Check whether the power supply cable is damaged. If it needs to be replaced, ensure that it is only replaced by customer service or a similarly qualified person in order to prevent hazards.
4. In the unit, check that the electrical wire are seated firmly in the plugs or terminals.
5. In the unit, check whether the electrical wires are free from damage.
6. If there is a fault that affects safety, do not switch the power supply back on until the fault has been eliminated.

7. If it is not possible to immediately eliminate this fault but it is still necessary to operate the installation, create a suitable interim solution. Inform the end user about this.

10.4.9 Checking the damping feet for wear

1. Check whether the damping feet are significantly compressed.
2. Check whether the damping feet have significant cracks.
3. Check whether there is substantial corrosion on the screwed connection for the damping feet.
4. If required, procure and install new damping feet.

10.5 Completing inspection and maintenance

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

11 Repair and service

11.1 Preparing repair and service work

- ► Observe the basic safety rules before carrying out any repair and service work.
- ► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
- ► Only carry out work on the refrigerant circuit if you have specific expert refrigeration knowledge and are competent at handling R32 refrigerant.
- ► When working on the refrigerant circuit, inform everybody who is working in the close vicinity or who is in the area, about the type of work that is to be carried out.
- ► Only carry out work on electrical components if you have specific electrical expertise.

Danger!

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

- ► Only open the electronics box after a waiting period of 60 minutes.

- ► Switch off the disconnector to which the product is connected in the building.
- ► Disconnect the product from the power supply but ensure that the product is still earthed.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Use only safe units and tools that are permitted for R32 refrigerant.
- ► Monitor the atmosphere in the working area using a 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 casing sections.

11.2 Replacing components of the refrigerant circuit

- ► Ensure that the work follows the defined procedure, as described in the sections below.

11.2.1 Removing refrigerant from the product

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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.
- ► Ensure that the expansion valves are open in order to guarantee that the refrigerant circuit is drained completely.
- ► The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

Caution.

Risk of material damage when removing the refrigerant.

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

- ► Remove the heating water from the indoor unit's condenser (heat exchanger) before the refrigerant is removed from the product.

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 R32 refrigerant.
3. Use only recycling cylinders that are approved for R32 refrigerant, have been labelled appropriately, and are equipped with a pressure relief and isolation valve.
4. Only use hoses, couplings and valves that are as short as possible, leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Ensure that the work area is sufficiently aerated.
6. Ensure that the outlet of the vacuum pump is not located close to potential sources of ignition.
7. Drain the recycling cylinder. In doing so, ensure that the recycling cylinder is correctly positioned.
8. Extract the refrigerant. In doing so, take into account the maximum fill quantity of the recycling cylinder, and monitor the fill quantity using calibrated scales. In doing so, never exceed the permissible operating pressure for the recycling cylinder.
9. Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the recycling cylinder.
10. If there are leaks, do not use the extraction station under negative pressure.
11. Never leave the extraction station unattended.
12. Connect the manometer bridge to the isolation valve's maintenance connection.
13. Open both expansion valves in order to guarantee that the refrigerant circuit is drained completely.
14. Once the refrigerant circuit is completely empty, immediately remove the recycling cylinders and units from the installation.
15. Close all of the isolation valves.

11.2.2 Removing components of the refrigerant circuit

- ► Flush the refrigerant circuit with oxygen-free nitrogen. Never use compressed air or oxygen instead of this.
- ► 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, there must no longer be any flammable refrigerant in the compressor oil. You should therefore drain it for a sufficient time using sufficient negative pressure.
- ► 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.
- ► If compressor oil is drained, this must be carried out safely and securely.
- ► Note that removed components may release refrigerant for an extended period. Only store and transport these components in well-aerated locations.

11.2.3 Installing components of the refrigerant circuit

- ► Only use original spare parts from the manufacturer.
- ► Install the component correctly. To do this, use only soldering processes.
- ► Install a filter dryer outdoors in the liquid pipe to the outdoor unit.
- ► Carry out a pressure test of the refrigerant circuit using nitrogen.
- ► Check whether all main components are correctly earthed after maintenance (compressor, etc.).

11.2.4 Filling the product with refrigerant

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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 R32 refrigerant that has not been used before and is specified as such, and the purity of which is at least 99.5%.

1. Make sure that the product is earthed.
2. Procure the tools and units that are required for filling with refrigerant:
   - Vacuum pump
   - Refrigerant cylinder
   - Scales
3. Only use tools and units that are permitted for R32 refrigerant. Only use refrigerant cylinders that are labelled accordingly.
4. Only use hoses, couplings and valves that are leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Only use hoses that are as short as possible in order to minimise the refrigerant volume that they can hold.
6. Flush the refrigerant circuit with nitrogen.
7. Drain the refrigerant circuit.
8. Fill the refrigerant circuit with R32 refrigerant. The required fill quantity is specified on the product's data plate. Ensure in particular that the refrigerant circuit is not overfilled.
9. Check the refrigerant circuit for leak-tightness using a gas sniffer. In doing so, check all of the components and pipelines.

11.3 Replacing electrical components

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

11.4 Completing repair and service work

- ► Installing the casing sections.
- ► Switch on the disconnector to which the product is connected in the building.
- ► Start up the product. Temporarily activate the heating mode.
- ► Check the product for leak-tightness using a gas sniffer.

12 Decommissioning

12.1 Temporarily decommissioning the product

1. Switch off the disconnector to which the product is connected in the building.
2. Disconnect the product from the power supply.

12.2 Permanently decommissioning the product

Caution.

Risk of damage caused by defrosting.

Draining off the refrigerant generates intense cooling of the indoor unit's plate heat exchanger, which may lead to the de-icing of the plate heat exchanger on the heating water side.

- ► Drain the indoor unit on the heating water side in order to prevent damage.
- ► Ensure that, during the refrigerant draining of the plate heat exchanger on the heating water side, there is sufficient flow-through.

1. Switch off the disconnector 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 indoor unit.
4. Remove the casing sections.
5. Remove the refrigerant from the product. (→ Section 11.2.1)
6. Note that refrigerant will continue to escape even after the refrigerant circuit is completely drained due to outgassing from the compressor oil.
7. Installing the casing sections.
8. Label the product using a sticker that is visible from the outside.
9. Note down on the sticker that the product has been decommissioned and that the refrigerant has been completely removed. Sign the sticker and specify the date.
10. Recycle the removed refrigerant in accordance with the regulations. Note that the refrigerant must be cleaned and checked before it is used again.
11. Dispose of or recycle the product and its components in accordance with the regulations.

13 Recycling and disposal

13.1 Disposing of the packaging

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

13.2 Recycling or disposing of refrigerant

Danger!

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

If R32 refrigerant is released during transport, a flammable atmosphere may form when it mixes with air. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Ensure that the refrigerant is transported correctly.

Warning.

Risk of damage to the environment.

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential).

- ► Have the refrigerant that is contained in the product completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with the regulations.
- ► When doing so, ensure that the vessel does not contain multiple different types of refrigerant.

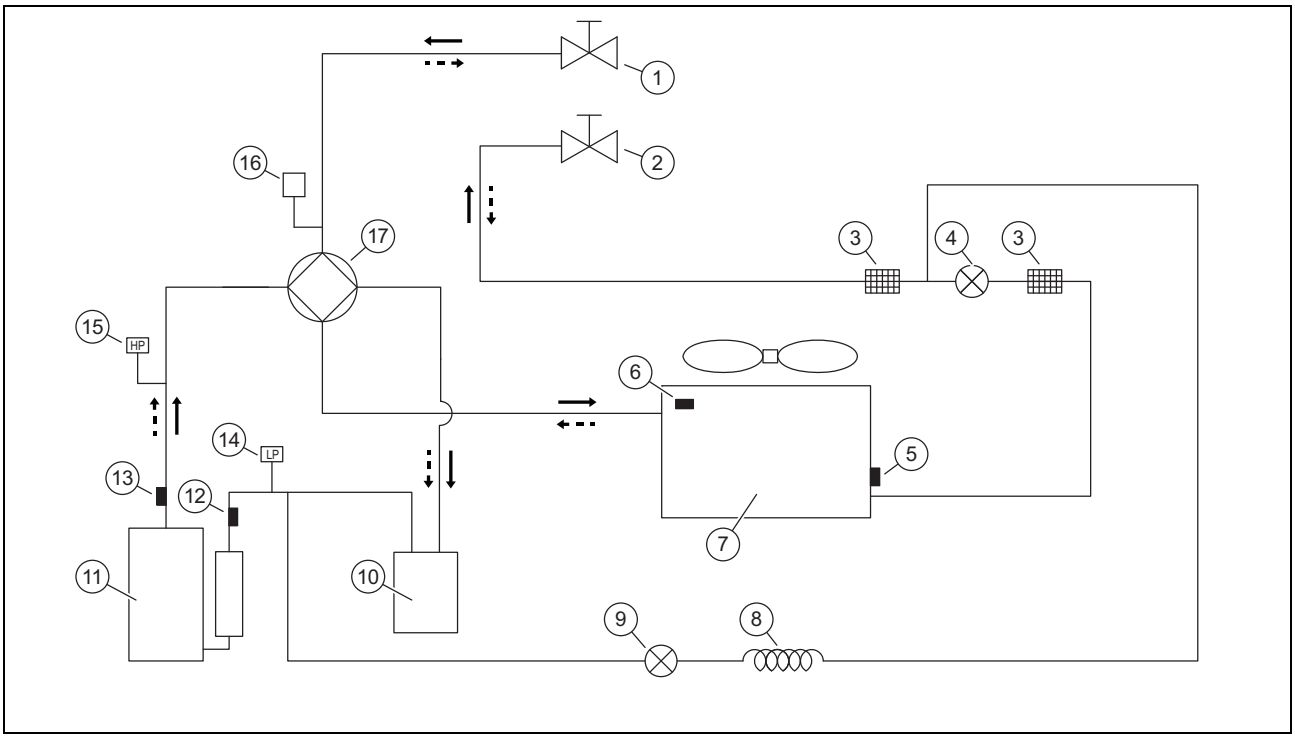
- ► Ensure that the refrigerant is recycled or disposed of by a qualified competent person.

14 Customer service

Müştəri xidməti ilə bağlı məlumatı arxa tərəfdəki ünvandan və ya www.demirdokum.com.tr saytından əldə edə bilərsiniz.

Appendix

A Refrigerant circuit



Cooling

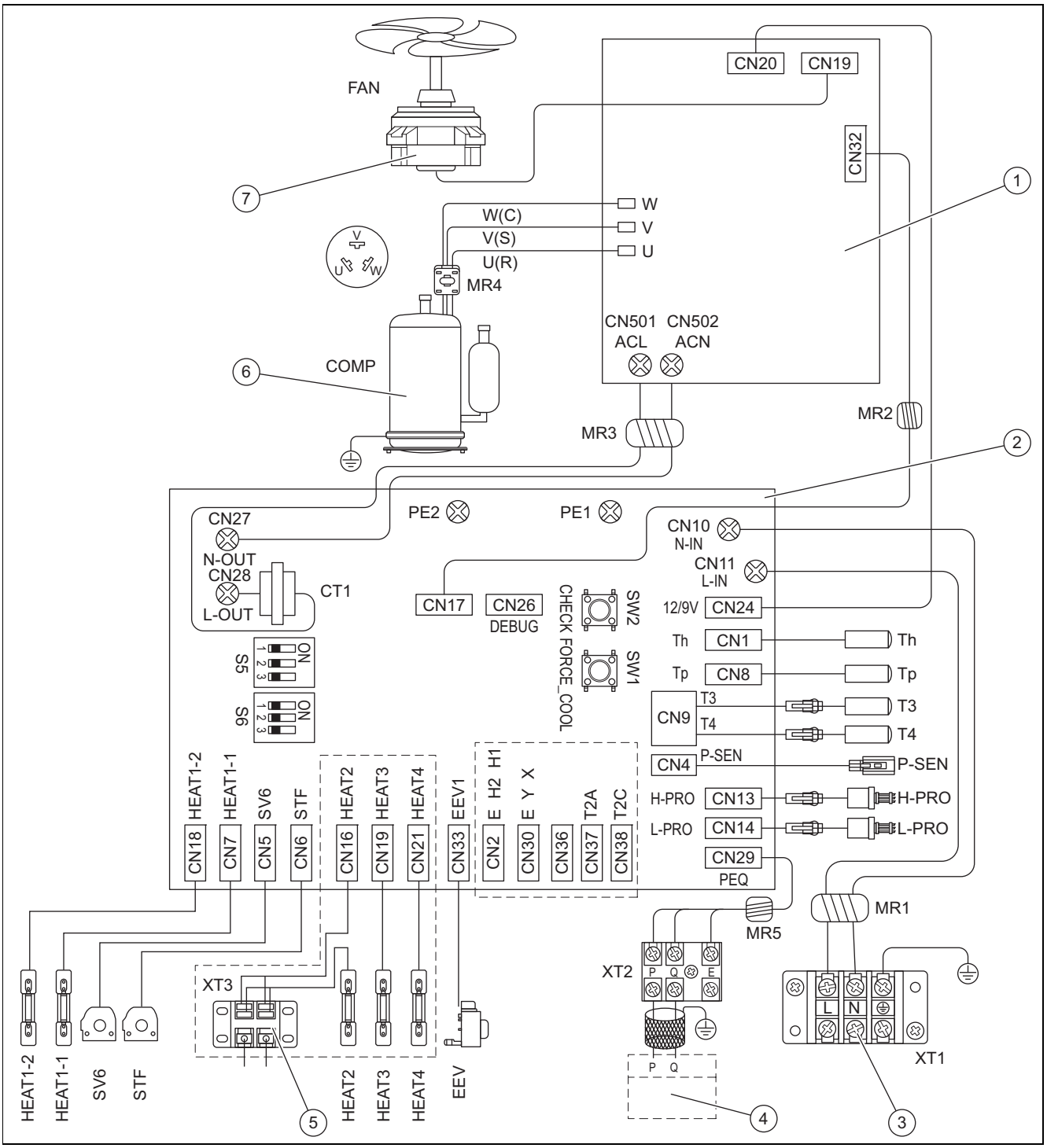
Heating

1	Hot gas pipe isolation valve
2	Liquid pipe isolation valve
3	Filter
4	Electronic expansion valve
5	Temperature sensor (evaporator in heating mode, condenser in cooling mode)
6	Outdoor temperature sensor
7	Air-side heat exchanger
8	Capillary
9	Electromagnetic one-way valve
10	Gas liquid separator
11	Compressor
12	Intake temperature sensor
13	Outlet temperature sensor
14	Low-pressure switch
15	High-pressure switch
16	Pressure sensor
17	4-port valve

B Wiring diagrams

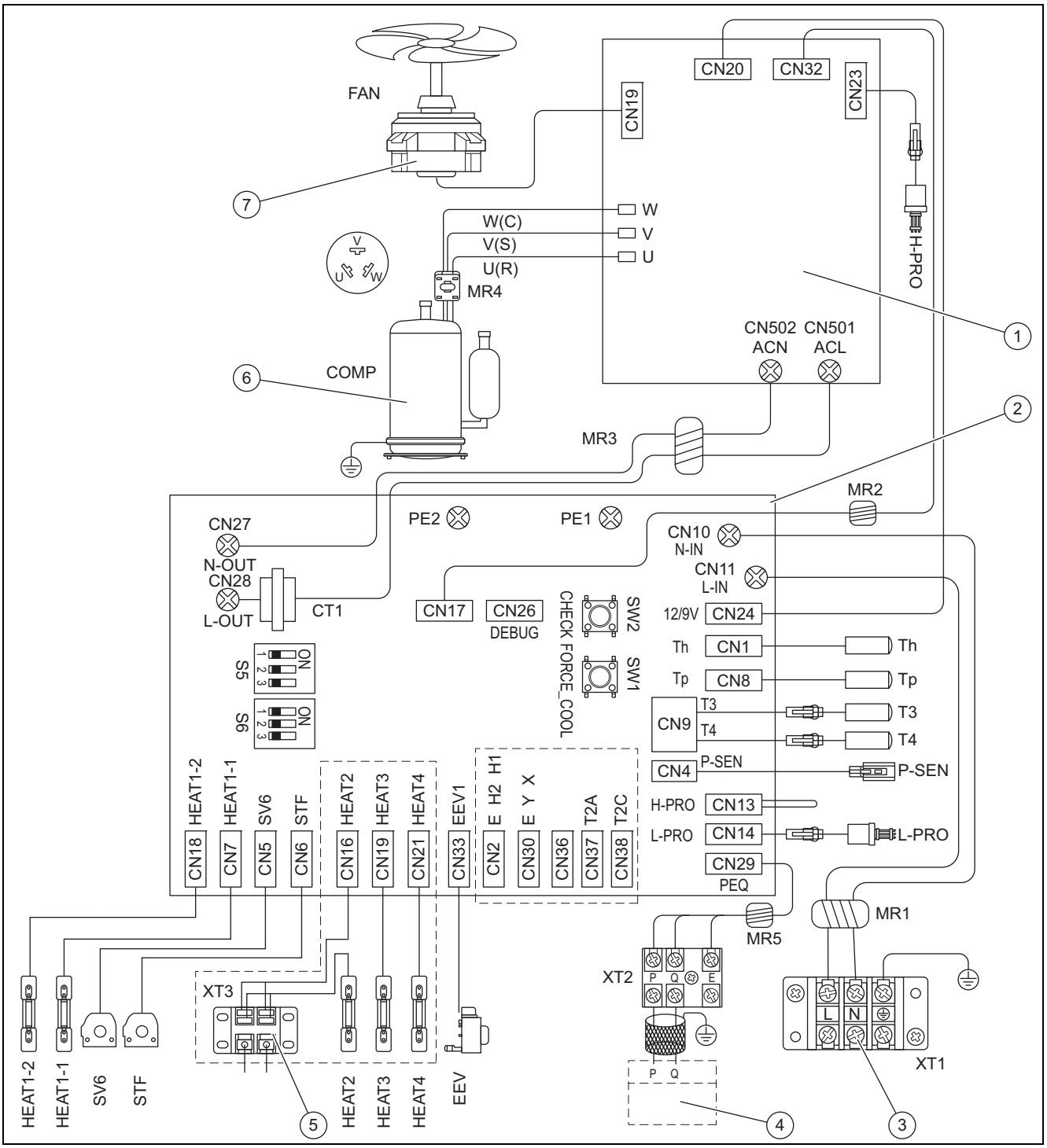
The wiring diagrams shown here are for reference only. Refer to the wiring diagram on the inside of the electronics box for the connection.

B.1 8–10 kW products



1	PCB A, inverter, single-phase
2	Main PCB B, control process, single-phase
3	Power supply connection
4	Indoor unit connection
5	Connection for heating belt at the condensate discharge
6	Compressor
7	Fan
CT1	Alternating current detector
EEV	Electronic expansion valve
Heat1-1	Compressor, electric heating belt 1
Heat1-2	Compressor, electric heating belt 2
Heat2	Connection for electric heating belt at the housing
H-PRO	High-pressure switch
L-PRO	Low-pressure switch
MR1 - MR5	Ring magnets
P-SEN.	Pressure sensor
T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
TF	Radiator temperature sensor
Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
XT1 - XT3	Terminal blocks

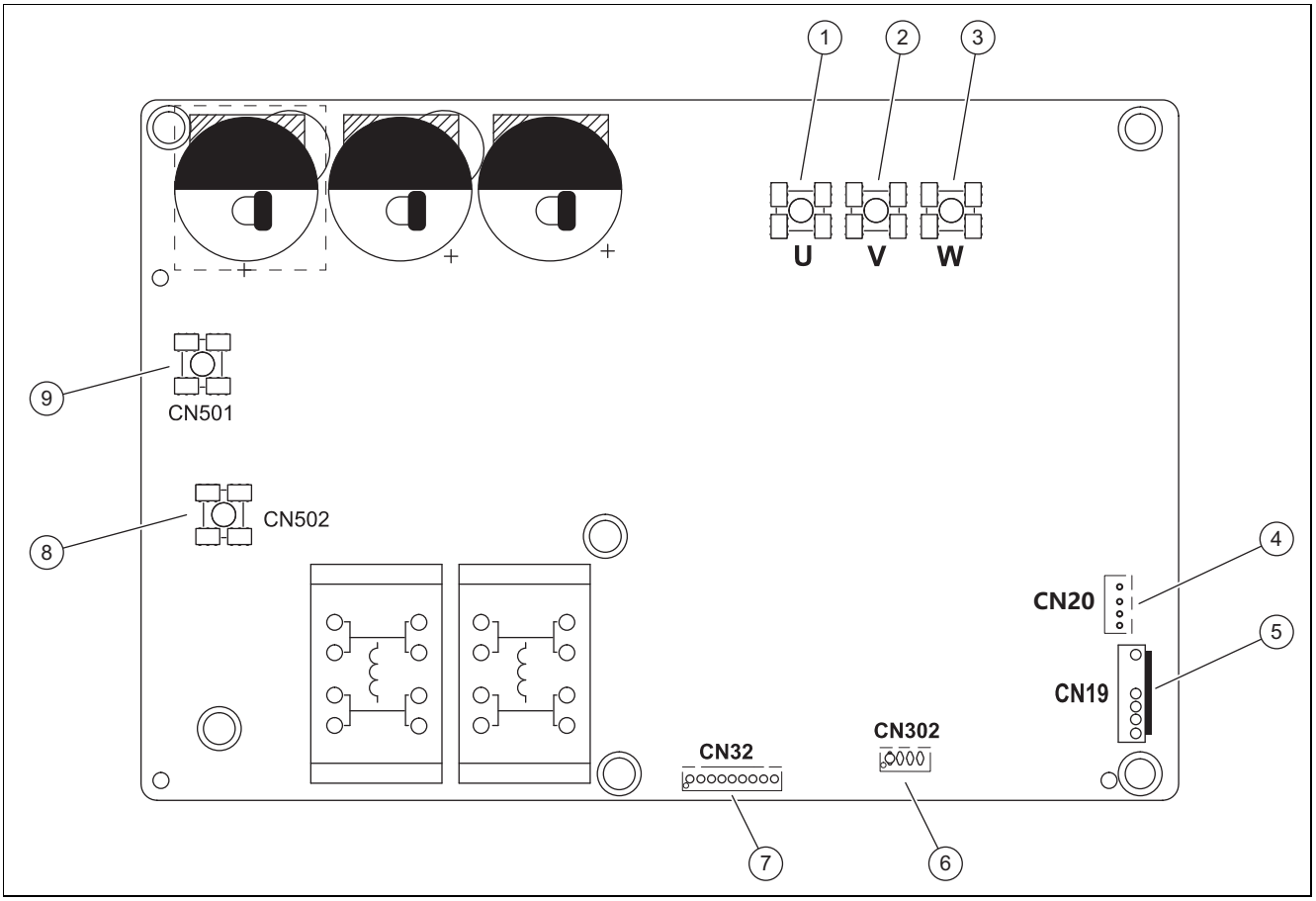
B.2 12–16 kW products



1	PCB A, inverter, single-phase
2	Main PCB B, control process, single-phase
3	Power supply connection
4	Indoor unit connection
5	Connection for heating belt at the condensate discharge
6	Compressor
7	Fan
CT1	Alternating current detector
EEV	Electronic expansion valve
Heat1-1	Compressor, electric heating belt 1
Heat1-2	Compressor, electric heating belt 2
Heat2	Connection for electric heating belt at the housing
H-PRO	High-pressure switch
L-PRO	Low-pressure switch
MR1 - MR5	Ring magnets
P-SEN.	Pressure sensor
T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
TF	Radiator temperature sensor
Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
XT1 - XT3	Terminal blocks

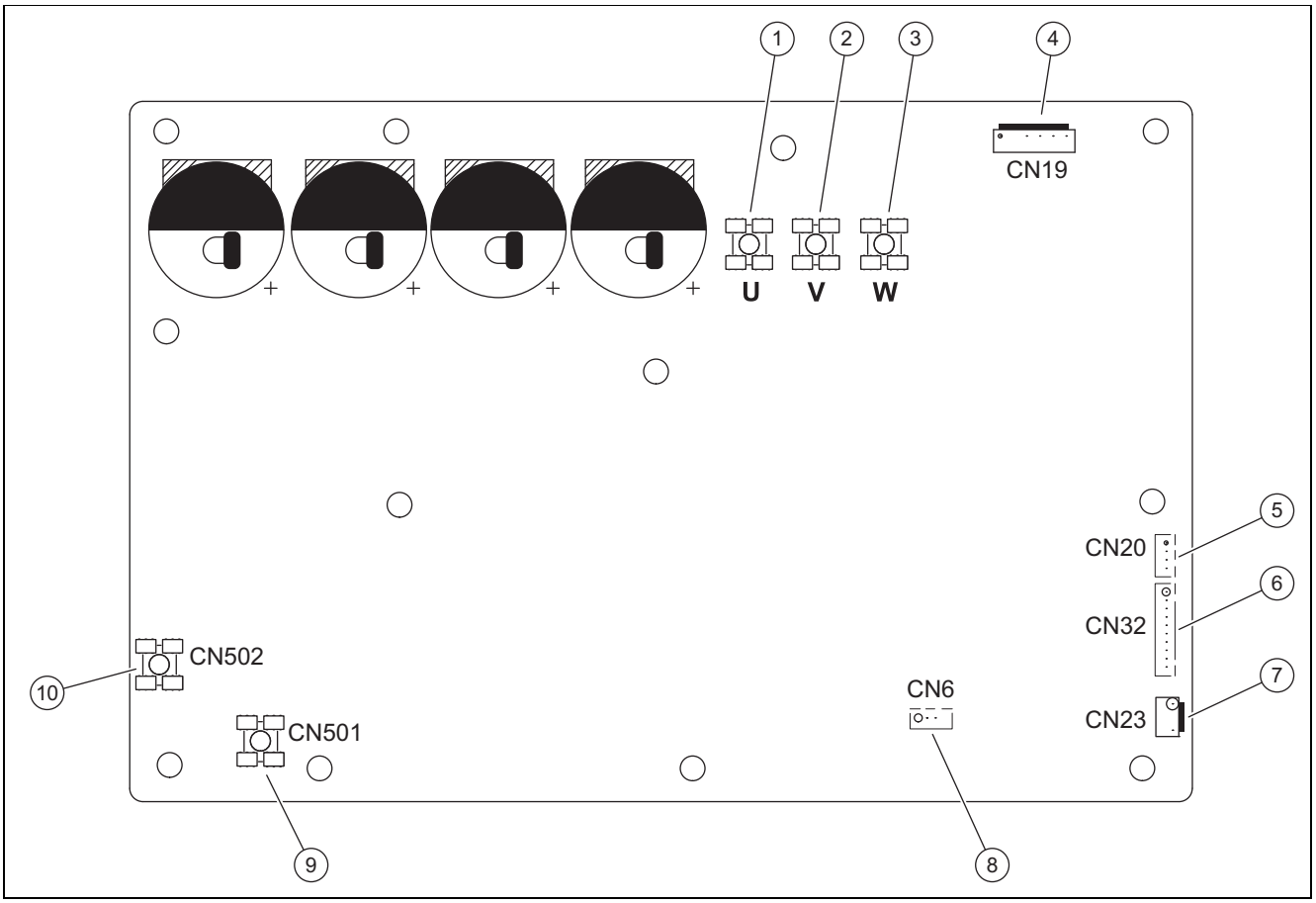
C PCBs for the electronic control unit

C.1 PCB A – inverter module – 8–10 kW products



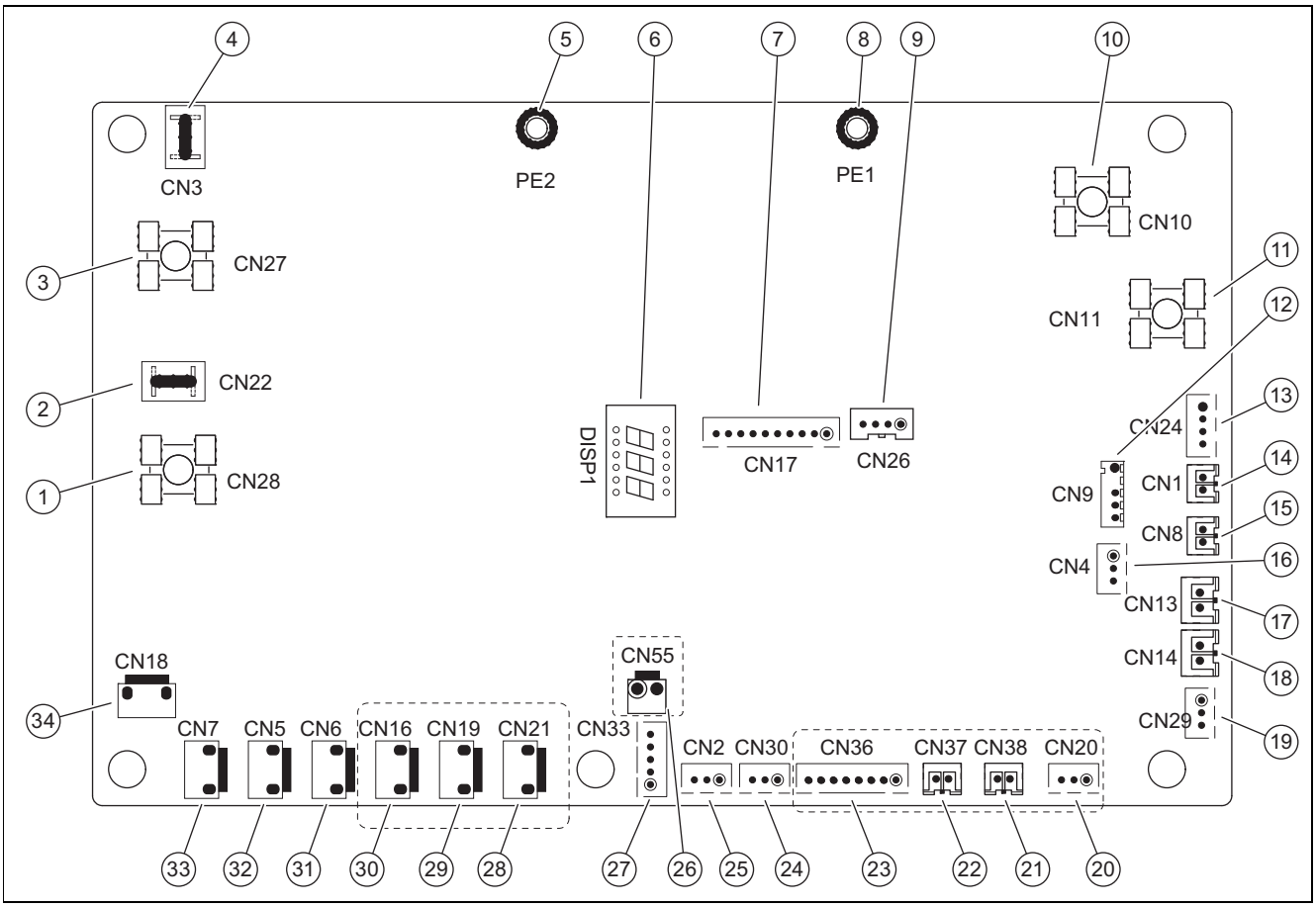
1	Compressor connection U	6	Reserved (CN302)
2	Compressor connection V	7	Connection for communication with PCB B (CN32)
3	Compressor connection W	8	Connection for input N for rectifier bridge (CN502)
4	Connection for output +12 V/9 V (CN20)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for fan (CN19)		

C.2 PCB A – inverter module – 12–16 kW products



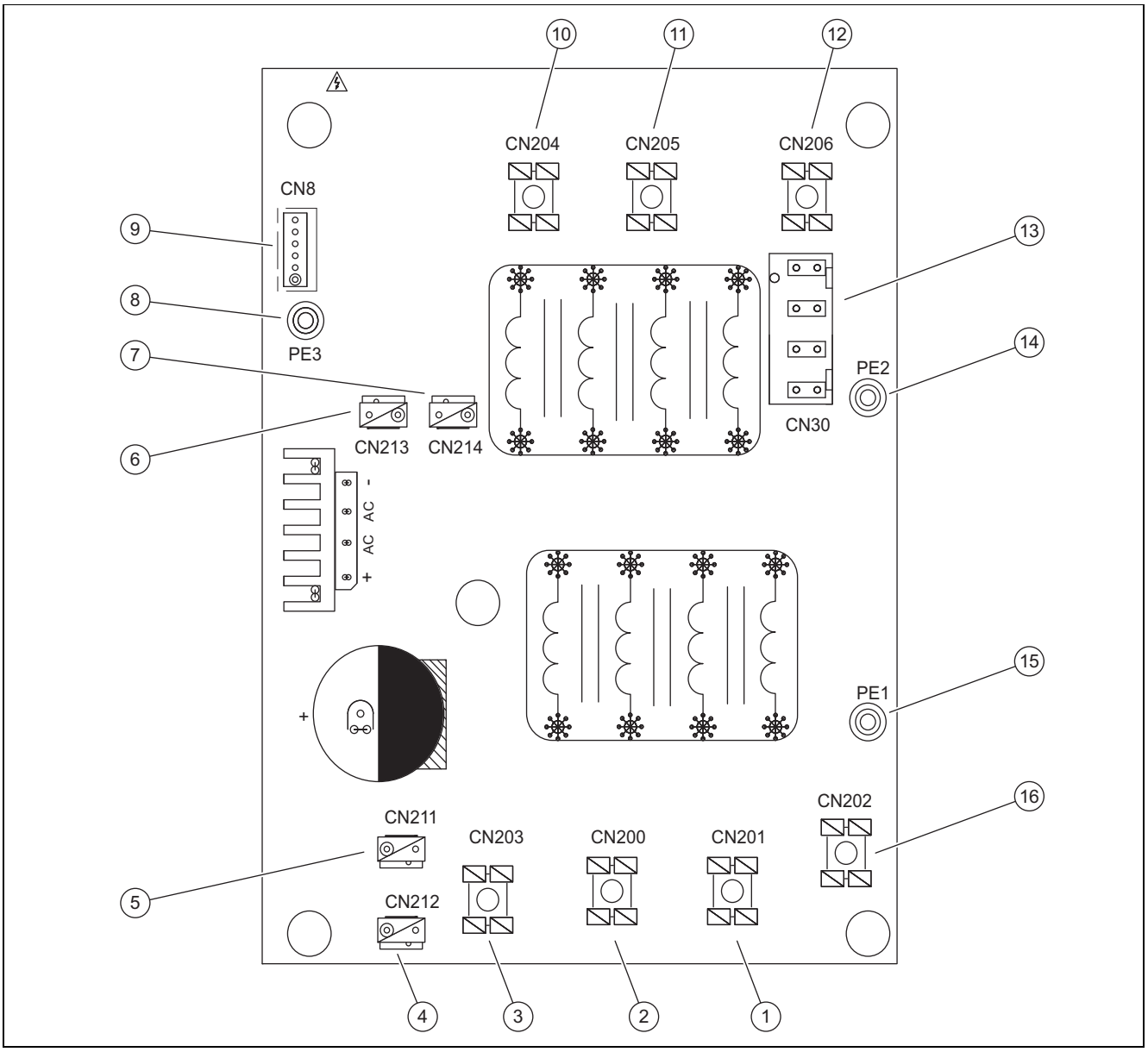
1	Compressor connection U	6	Connection for communication with PCB B (CN32)
2	Compressor connection V	7	Connection for high-pressure switch (CN23)
3	Compressor connection W	8	Reserved (CN6)
4	Connection for fan (CN19)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for output +12 V/9 V (CN20)	10	Connection for input N for rectifier bridge (CN502)

C.3 Main PCB B



1	Connection: Output L to PCB A (CN28)
2	Reserved (CN22)
3	Connection: Output N to PCB A (CN27)
4	Reserved (CN3)
5	Connection for earthing cable (PE2)
6	Display (DSP1)
7	Connection for communication with PCB A (CN17)
8	Connection for earthing cable (PE1)
9	Reserved (CN26)
10	Connection: Input for neutral conductor (CN10)
11	Connection: Input for conductor (CN11)
12	Connection for outdoor temperature sensor and condenser temperature sensor (CN9)
13	Connection for input +12 V/9 V (CN24)
14	Connection for intake temperature sensor (CN1)
15	Connection for compressor outlet temperature sensor (CN8)
16	Connection for pressure sensor (CN4)
17	Connection for high-pressure switch (CN13)
18	Connection for low-pressure switch (CN14)
19	Connection for communication with the hydrobox control card (CN29)
20	Reserved (CN20)
21	Reserved (CN38)
22	Reserved (CN37)
23	Reserved (CN36)
24	Connection for communication (reserved, CN30)
25	Connection for communication (reserved, CN2)
26	Reserved (CN55)
27	Connection for electronic expansion valve (CN33)
28	Reserved (CN21)
29	Reserved (CN19)
30	Connection for the electrical heating belt of the housing (CN16)
31	Connection for 4-port valve (CN6)
32	Connection for SV6 valve (CN5)
33	Connection for electrical heating belt 1 of the compressor (CN7)
34	Connection for electrical heating belt 2 of the compressor (CN18)

C.4 PCB C – filter



1	Power supply L2 (CN201)
2	Power supply L3 (CN200)
3	Power supply N (CN203)
4	Power supply connection for +310 V DC (CN212)
5	Reserved (CN211)
6	Connection for fan (CN213)
7	Power supply connection for inverter module (CN214)
8	Earth cable (PE3)
9	Connection for communication with main PCB B (CN8)
10	Power filtering L3 (L3')
11	Power filtering L2 (L2')
12	Power filtering L1 (L1')
13	Power supply connection for main PCB (CN30)
14	Connection for earthing cable (PE2)
15	Connection for earthing cable (PE1)
16	Power supply L1 (L1)

D Selecting electrical components

Rated current of the product [A]	Nominal cross-sectional area [mm²]	
	Flexible cables	Cable for fixed wiring
≤ 3	0.5 and 0.75	1 and 2.5
> 3 and ≤ 6	0.75 and 1	1 and 2.5
> 6 and ≤ 10	1 and 1.5	1 and 2.5
> 10 and ≤ 16	1.5 and 2.5	1.5 and 4
> 16 and ≤ 25	2.5 and 4	2.5 and 6
> 25 and ≤ 32	4 and 6	4 and 10
> 32 and ≤ 50	6 and 10	6 and 16
> 50 and ≤ 63	10 and 16	10 and 25

Note
The rated current in the upper table corresponds to the MCA in the lower table. If the MCA exceeds 63 A, the cable diameter should be selected in accordance with the national regulations.

Product	Outdoor unit				Current output			Compressor		OFM (external fan motor)	
	Voltage (V)	Frequency (Hz)	Min. (V)	Max. (V)	MCA (A)	TOCA (A)	MFA (A)	MSC (A)	RLA (A)	CW	FLA (A)
8 kW	220 - 240	50	198	264	16	19	25	–	14.50	0.17	1.50
10 kW	220 - 240	50	198	264	17	19	25	–	15.50	0.17	1.50
12 kW	220 - 240	50	198	264	25	30	35	–	23.50	0.17	1.50
16 kW	220 - 240	50	198	264	27	30	35	–	25.50	0.17	1.50

MCA (Min. Circuit Amps.): Minimum amperage in the electrical circuit (A)
TOCA (Total Over-current Amps.): Total overcurrent (A)
MFA (Max. Fuse Amps.): Max. fuse protection (A)
MSC (Max. Starting Amps.): Max. in-rush current (A)
RLA (Rated Load Amps.): Nominal operating current (A) of the compressor, under nominal test conditions in cooling or heating mode
CW (Rated Motor Output): Nominal motor output
FLA (Full Load Amps.): Full load current (A)

Maximum values for the wiring (for exact values, see Technical data):

	Product			
	8 kW	10 kW	12 kW	16 kW
Maximum fuse protection [A]	19	19	30	30
Cable diameter [mm²]	4.0	4.0	6.0	6.0

E Inspection and maintenance work

#	Maintenance work	Interval	
1	Cleaning the product	Annually	30
2	Cleaning the evaporator	Annually	30
3	Checking the fan	Annually	30
4	Cleaning the condensate discharge	Annually	30
5	Checking the refrigerant circuit	Annually	30
6	Checking the refrigerant circuit for tightness	Annually	30
7	Checking the electrical connections	Annually	30
8	Checking the damping feet for wear	Annually after the first 3 years	31

F Technical data

Note

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

The performance data is determined using a special test method. You can find information about this from the manufacturer of the product by stating "Performance data test method".

Technical data – General

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Width	1,118 mm	1,118 mm	1,118 mm	1,118 mm
Height	865 mm	865 mm	865 mm	865 mm
Depth	523 mm	523 mm	523 mm	523 mm
Net weight	75 kg	75 kg	97 kg	97 kg
Width with packaging	1,190 mm	1,190 mm	1,190 mm	1,190 mm
Height with packaging	970 mm	970 mm	970 mm	970 mm
Depth with packaging	560 mm	560 mm	560 mm	560 mm
Weight with packaging	89 kg	89 kg	110.5 kg	110.5 kg
Rated voltage	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz
Rated power	3,300 W	3,600 W	5,400 W	6,100 W
Rated current	14.5 A	16 A	24.5 A	26 A
IP rating	IP24	IP24	IP24	IP24
Maximum rotational speed of the fan	600 rpm	600 rpm	650 rpm	650 rpm
Fan, motor type	Brushless DC motor	Brushless DC motor	Brushless DC motor	Brushless DC motor
Fan, quantity	1	1	1	1
Connection for condensate discharge	DN 32	DN 32	DN 32	DN 32

Technical data – Refrigerant circuit

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Material of the refrigerant pipe	Copper	Copper	Copper	Copper
Minimum single length of the refrigerant pipe	2 m	2 m	2 m	2 m
Maximum single length of the refrigerant pipe	30 m	30 m	30 m	30 m
Permissible height difference when the outdoor unit is raised	20 m	20 m	20 m	20 m
Permissible height difference when the indoor unit is raised	20 m	20 m	20 m	20 m
Additional refrigerant volume	38 g/m	38 g/m	38 g/m	38 g/m
Connection technology	Flare connection	Flare connection	Flare connection	Flare connection
Outer diameter of the hot gas pipe	5/8″	5/8″	5/8″	5/8″
Outer diameter of the liquid pipe	3/8″	3/8″	3/8″	3/8″
Minimum wall thickness of the hot gas pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Minimum wall thickness of the liquid pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Refrigerant	R32	R32	R32	R32
Fill quantity	1.65 kg	1.65 kg	1.84 kg	1.84 kg
Global Warming Potential (GWP)	675	675	675	675
CO_2 equivalent	1.11 t	1.11 t	1.24 t	1.24 t
Maximum switch-off pressure	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)
Compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Air-side heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger
Throttle valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve

Technical data – Application limits, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	35 ℃	35 ℃	35 ℃	35 ℃
Minimum air temperature for domestic hot water generation	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature for domestic hot water generation	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Application limits, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Power, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Heat output, A7/W35	8.3 kW	10.0 kW	12.1 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W35	5.20	5.00	4.95	4.50
Power consumption, effective, A7/W35	1.60 kW	2.00 kW	2.44 kW	3.56 kW
Heat output, A7/W45	8.2 kW	10.0 kW	12.3 kW	16 kW
Coefficient of performance, COP, EN 14511, A7/W45	3.95	3.80	3.80	3.60
Power consumption, effective, A7/W45	2.08 kW	2.63 kW	3.24 kW	4.44 kW
Heat output, A7/W55	7.5 kW	9.5 kW	12.0 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W55	3.18	3.10	3.10	2.90
Power consumption, effective, A7/W55	2.36 kW	3.06 kW	3.87 kW	5.52 kW
Heat output, A-7/W35	7.10 kW	8.25 kW	10.0 kW	13.3 kW
Coefficient of performance, COP, EN 14511, A-7/W35	3.18	3.10	3.0	2.7
Power consumption, effective, A-7/W35	2.18 kW	2.62 kW	3.33 kW	4.93 kW
Heat output, A-7/W55	6.15 kW	6.85 kW	10.0 kW	12.5 kW
Coefficient of performance, COP, EN 14511, A-7/W55	2.05	2.0	2.05	2.02
Power consumption, effective, A-7/W55	3.00 kW	3.43 kW	4.88 kW	6.19 kW
Seasonal space heating energy efficiency class, flow temperature at 35 ºC	A+++	A+++	A+++	A+++
Seasonal space heating energy efficiency class, flow temperature at 55 ºC	A++	A++	A++	A++
SCOP, warmer climate, 35 ºC	6.99	7.09	6.48	6.29
SCOP, warmer climate, 55 ºC	4.51	4.62	4.43	4.48
SCOP, average climate, 35 ºC	5.22	5.20	4.81	4.62
SCOP, average climate, 55 ºC	3.37	3.47	3.45	3.41

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
SCOP, colder climate, 35 ºC	4.33	4.32	4.08	4.02
SCOP, colder climate, 55 ºC	2.88	2.99	3.02	3.12

Technical data – Power, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Cooling output, A35/W18	8.4 kW	10.0 kW	12.0 kW	14.2 kW
Energy efficiency ratio, EER, EN 14511, A35/W18	5.05	4.80	4.00	3.61
Power consumption, effective, A35/W18	1.66 kW	2.08 kW	3.00 kW	3.94 kW
Cooling output, A35/W7	7.40 kW	8.20 kW	11.60 kW	14.00 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	3.38	3.30	2.75	2.45
Power consumption, effective, A35/W7	2.19 kW	2.48 kW	4.22 kW	5.71 kW
SEER, flow temperature at 7 ºC	5.83	5.98	4.89	4.69
SEER, flow temperature at 18 ºC	8.95	8.78	7.10	6.75

Technical data – noise emissions

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Sound power (EN 12102 1)	59 dB(A)	60 dB(A)	64 dB(A)	68 dB(A)
Max. sound pressure level (heat: A7W35/cooling: A35W18)	46 dB(A)	49 dB(A)	50 dB(A)	54 dB(A)

Index

Operating instructions

Contents

1 Safety

1.1 Intended use

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

The product is the outdoor unit for a air-to-water heat pump in a split design.

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

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit Without a back-up heater	Indoor unit With a back-up heater
HA 8-7.2 OS 230V B3	HA 10-7.2 WS 230V B1	HA 10-7.2 WS 230 V
HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ▸ Keep all ignition sources away from the product. Ignition sources include, for example:
  – Open flames,
  – Hot surfaces over 550 °C,
  – Electrical devices or tools that are not free from electrical sources,
  – Static discharges.
- ▸ Do not use any sprays or other flammable gases close to the product.

1.2.3 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Do not make any changes in the product's environment as this would cause escaping refrigerant to collect in a recess or to get inside the building via building openings.

1.2.4 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:
  - to the product itself
  - to the supply lines
  - to the drain pipework
  - to the expansion relief valve for the heat source circuit
  - to constructional conditions that may affect the operational reliability of the product
- Never make any changes to the product where these involve drilling into the product.

1.2.5 Risk of injury from burns caused by touching refrigerant pipes

The refrigerant pipes between the outdoor unit and the indoor unit may become extremely hot during operation. There is a risk of burns.

- Do not touch any uninsulated refrigerant pipes.

1.2.6 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 eliminated by a competent person.
- Adhere to the maintenance intervals specified.

1.2.7 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.

1.2.8 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

2 Notes on the documentation

- ► 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.

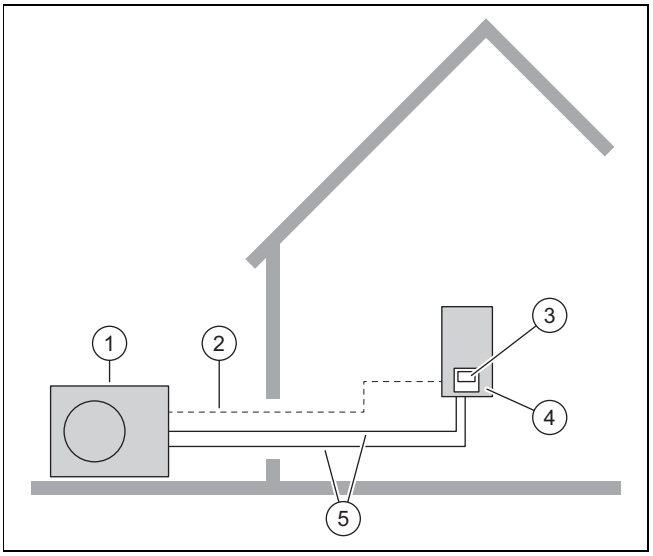
These instructions apply only to Greece:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 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.

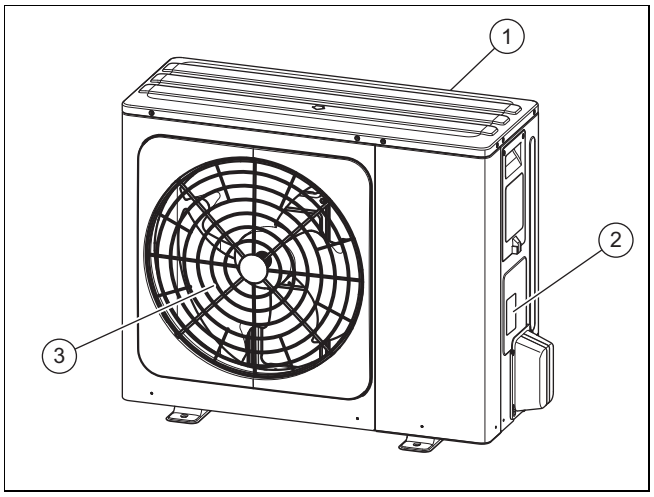
3.3 Noise reduction mode

A noise reduction mode can be activated for the product.

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

You can find additional information about noise reduction mode in the operating instructions for the indoor unit.

3.4 Product design



1	Air inlet grille	3	Air outlet grille
2	Data plate		

3.5 Data plate and serial number

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

The type designation is located on the data plate.

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 CE marking

CE

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.

3.7 Fluorinated greenhouse gases

The product contains fluorinated greenhouse gases.

3.8 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

4 Operation

4.1 Switching on the product

► Switch on the disconnector to which the product is connected in the building.

4.2 Operating the product

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

4.3 Guaranteeing frost protection

1. Ensure that the product is switched on and remains switched on.
2. Ensure that no snow accumulates around the air inlet grille and air outlet grille.

4.4 Switching off the product

1. Switch off the disconnector to which the product is connected in the building.
2. Guarantee the frost protection.

5 Care and maintenance

5.1 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.

5.2 Cleaning the product

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

5.3 Maintenance

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.

6 Troubleshooting

6.1 Eliminating faults

► If you observe a cloud of vapour on the product, you do not have to do anything. This effect may arise during the thawing process.

► If the product will no longer start up, check whether the power supply is interrupted. If required, switch on the disconnector in the building.

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

7 Decommissioning

7.1 Temporarily decommissioning the product

1. Switch off all of the disconnectors to which the product is connected in the building.
2. Protect the heating installation against frost.

7.2 Permanently decommissioning the product

► Have a competent person permanently decommission the product.

8 Recycling and disposal

This product is an electrical or electronic unit within the context of EU Directive 2012/19/EU. The unit was developed and manufactured using high-quality materials and components. These can be recycled and reused.

Find out about the regulations that apply in your country regarding the separate collection of waste electrical or electronic equipment. Correctly disposing of old units protects the environment and people against potential negative effects.

Disposing of the packaging

► Dispose of the packaging correctly.

► Observe all relevant regulations.

Disposing of the product

► Dispose of the product and its accessories correctly.
► Observe all relevant regulations.

If the product is labelled with this symbol:

► 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.

Deleting personal data

Personal data (e.g. online login details) may be misused by unauthorised third parties.

If the product contains personal data:

► Ensure that there is no personal data on or in the product before you dispose of the product.

8.1 Arranging disposal of refrigerant

The product is filled with R32 refrigerant.

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

9 Guarantee and customer service

9.1 Guarantee

Πληροφορίες για την εγγύηση κατασκευαστή μπορείτε να λάβετε από την αναφερόμενη διεύθυνση επικοινωνίας στην πίσω πλευρά.

9.2 Customer service

Στοιχεία επικοινωνίας για το τμήμα εξυπηρέτησης πελατών θα βρείτε στην αναφερόμενη διεύθυνση στην πίσω πλευρά ή στην ιστοσελίδα www.demirdokum.com.tr.

Installation and maintenance instructions

Contents

1 Safety

1.1 Intended use

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

The product is the outdoor unit for a air-to-water heat pump in a split design.

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

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit Without a back-up heater	Indoor unit With a back-up heater
HA 8-7.2 OS 230V B3	HA 10-7.2 WS 230V B1	HA 10-7.2 WS 230 V
HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

1.2.2 Risk caused by inadequate qualifications for the R32 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 R32 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.
▸ Note that the refrigerant is odourless.

1.2.3 Risk of death caused by fire or explosion if stored incorrectly

The product contains the flammable refrigerant R32. In the event of a leak in combination with an ignition source, there is a risk of fire and explosion.

▸ Only store the unit in rooms with no permanent ignition sources. Examples of such ignition sources include naked flames, a gas-fired boiler that is switched on, or an electric heater.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- 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 R32 refrigerant and set to ≤ 25% of the lower explosive limit.
- If you suspect that there may be a leak, extinguish all naked flames in the vicinity.
- If there is a leak that requires repairs to be carried out with a soldering process, follow the procedure described in the section "11 Repair and service".
- Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.

1.2.5 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Ensure that the refrigerant does not collect in a recess.
- Ensure that the refrigerant cannot get inside the building via building openings.

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- Only carry out the work if you are competent at handling R32 refrigerant.
- Wear suitable personal protective equipment and bring a fire extinguisher with you.
- Only use tools and units that are permitted for R32 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.
- The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

1.2.7 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 in overvoltage category III for full partition, e.g. fuse or circuit breaker).
- Secure against being switched back on again.
- Wait for at least 60 minutes until the capacitors have discharged.
- Check that there is no voltage.

1.2.8 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.

1.2.9 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.

1.2.10 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

1.2.11 Risk of material damage caused by using an unsuitable tool

- Use the correct tool.

1.2.12 Risk of material damage caused by using an unsuitable material

Unsuitable refrigerant pipes may cause material damage.

- Only use special copper pipes designed for refrigeration technology.

1.3 Regulations (directives, laws, standards)

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

2 Notes on the documentation

- ► 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.

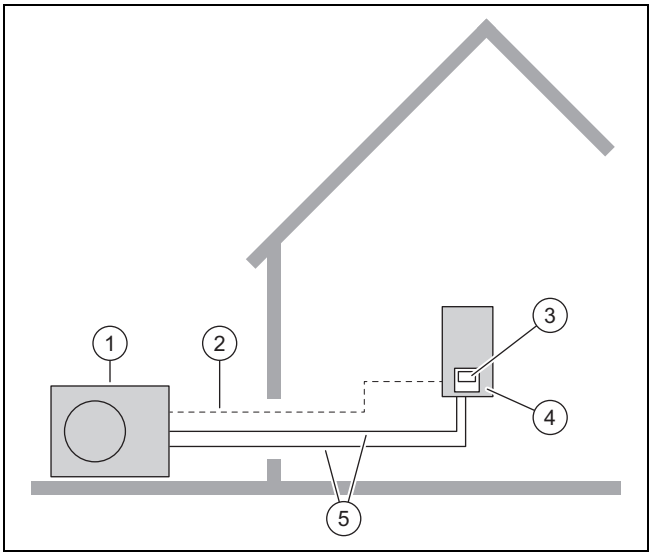
These instructions apply only to Greece:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



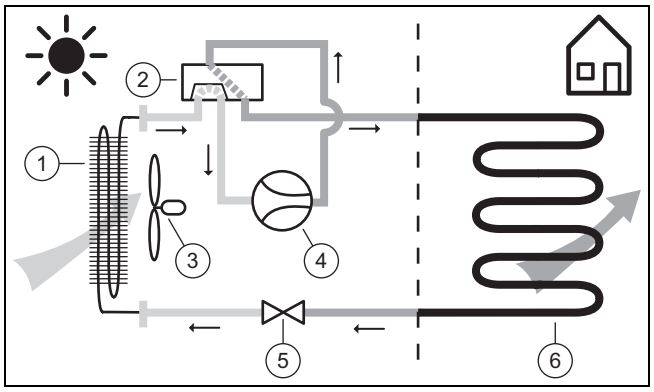
1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 Functions of the heat pump

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

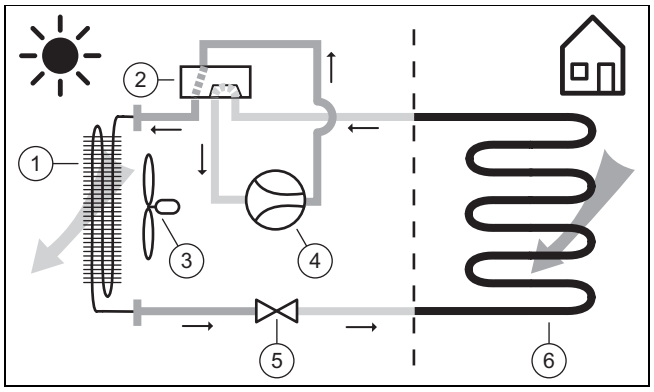
In heating mode, cyclic evaporation, compression, liquefaction and expansion take in heat energy from the surroundings and transfer it to the building. In cooling mode, heat energy is extracted from the building and released into the environment.

3.2.1 Operating principle in heating mode



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

3.2.2 Operating principle in cooling mode



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

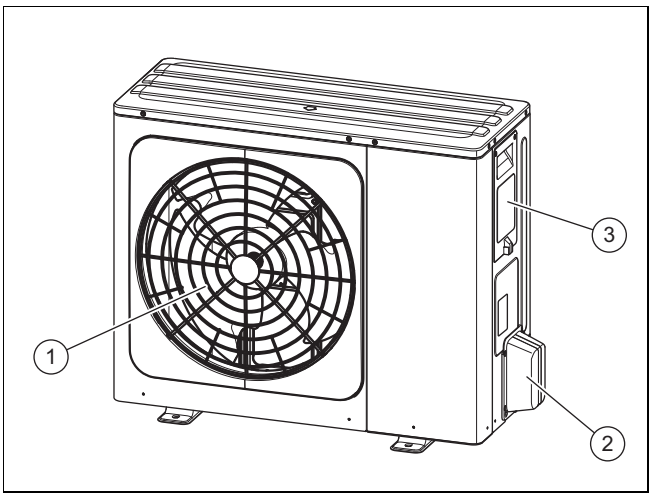
3.3 Description of the product

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

The outdoor unit is connected to the indoor unit via the refrigerant circuit.

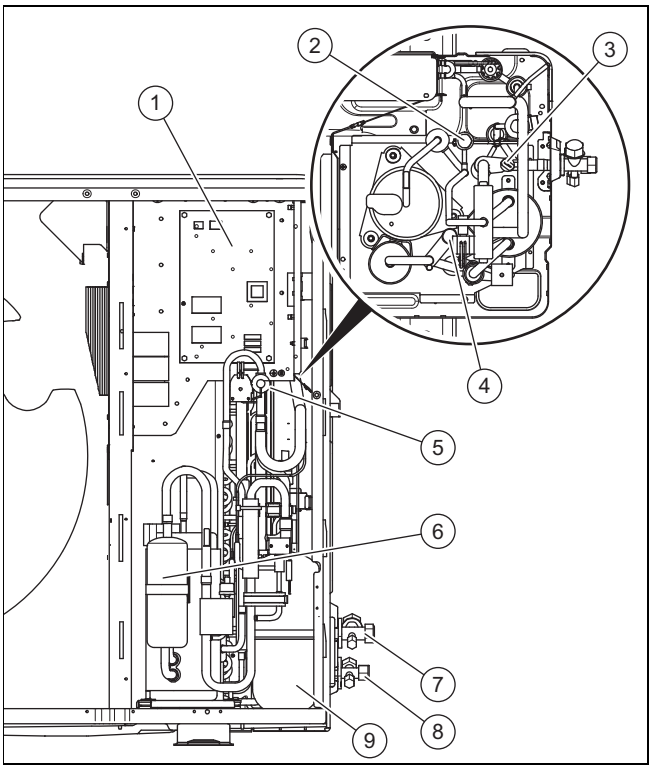
3.4 Product design

3.4.1 Unit



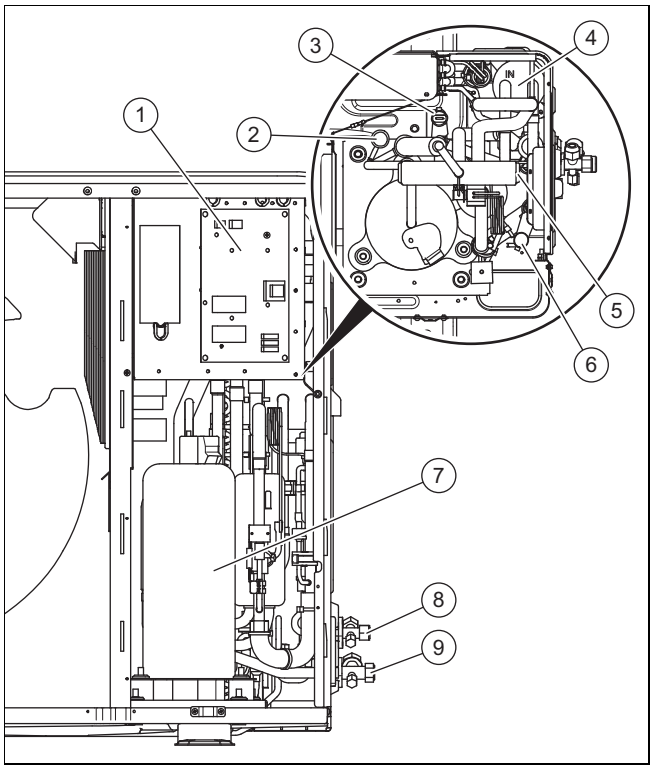
1	Air outlet grille	3	Cover for the electrical connections
2	Covering the connections for the refrigerant pipes		

3.4.2 8/10 kW functional elements



1	Control PCB	6	Compressor
2	High-pressure switch	7	Hot gas pipe isolation valve
3	Pressure sensor	8	Liquid pipe isolation valve
4	Low-pressure switch	9	Gas-liquid separator
5	4-port valve		

3.4.3 12/16 kW functional elements



1	Control PCB	6	Low-pressure switch
2	High-pressure switch	7	Compressor
3	High-pressure sensor	8	Liquid pipe isolation valve
4	Gas-liquid separator	9	Hot gas pipe isolation valve
5	4-port valve		

3.5 Serial number

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 Information on the data plate

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

Information	Meaning
HA ...	Nomenclature
DemirDöküm MaxiAir R32	Product name
xx Kw	Cooling output@35/W18
EER	Energy Efficiency Ratio@A35/W18 (energy efficiency ratio)
xx Kw	Heat output@35/W18
COP	Coefficient Of Performance@A7/W35 (coefficient of performance)
220–240 V ~ 50 Hz	Power supply
xx kW	Power consumption
xx kg	Net weight
R32	Refrigerant type
xx g	Refrigerant filling volume
GWP	Global Warming Potential (Global Warming Potential)
t CO_2	CO_2 equivalent
xx Pa	Maximum permissible pressure

Information	Meaning
COP /	Coefficient of performance/heating mode
IP	Protection class
	Reading the instructions

3.7 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

3.8 CE marking

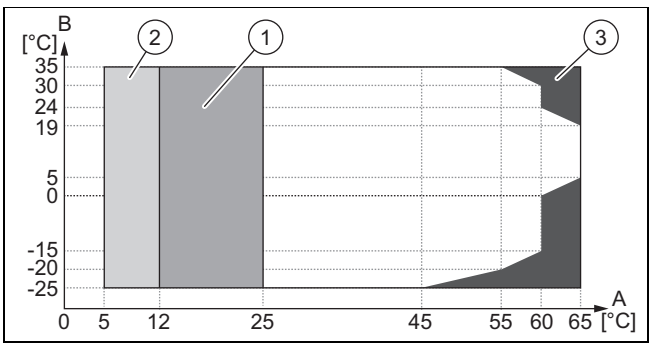
The CE marking shows that the products comply with the basic requirements of the applicable directives as stated on the declaration of conformity.

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

3.9 Application limits

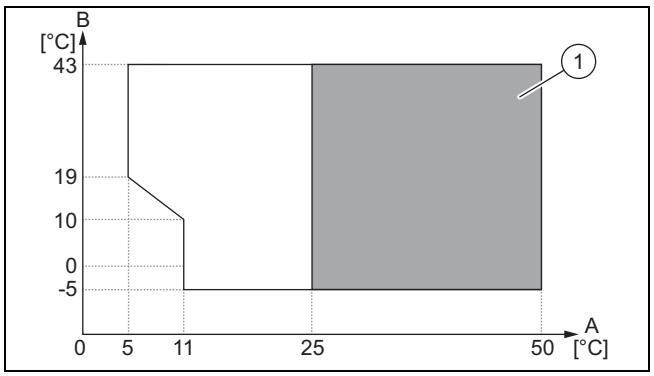
The product works between a minimum and maximum outdoor temperature. These outdoor temperatures define the application limits for the heating mode, domestic hot water mode and cooling mode. Operating outside of the application limits leads to the product switching off.

3.9.1 Heating mode



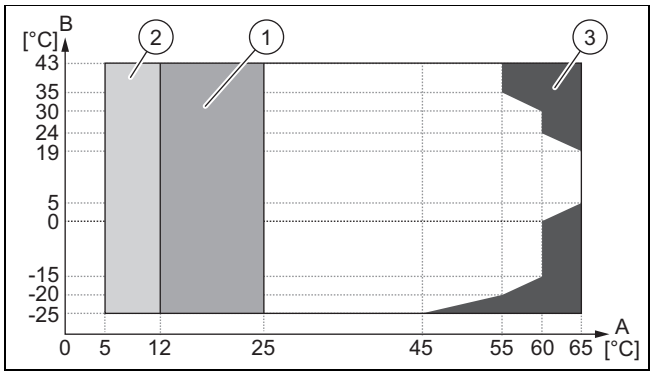
A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.9.2 Cooling mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature

3.9.3 DHW mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.10 Thawing mode

If the heat pump is running in heating mode, the condensate may freeze on the fins of the evaporator at low outdoor temperatures and frost may form. To increase efficiency, this frost is automatically detected and automatically defrosted at certain intervals by activating thawing mode.

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. Thawing mode takes 2–10 minutes, then the water is drained via the outdoor unit's drain.

The outdoor unit's fans do not run during thawing mode.

3.11 Safety devices

The product is equipped with technical safety devices.

High- and low-pressure switches regulate the pressure in the refrigerant circuit. If the pressure in the refrigerant circuit increases above the upper limit value (4.3 MPa (43 bar)) or falls below the lower limit value (0.14 MPa (1.4 bar)), the high- and/or low-pressure switch switches off and the compressor is stopped.

The compressor crankcase heating prevents refrigerant from mixing with compressor oil when the compressor is switched off.

The crankcase heating is regulated according to the outdoor temperature and the on/off condition of the compressor.

If the outdoor temperature is above 8 °C or the compressor is running, the crankcase heating is switched off.

The crankcase heating is switched on when the outdoor temperature is 8 °C or less and either

– The compressor has been switched off for more than three hours or
– The product has just been switched on (either manually or after a power cut).

If the temperature measured at the compressor outlet is higher than the permissible temperature (> 115 °C) , the compressor is switched off. The permissible temperature depends on the evaporation and condensation temperature.

In the indoor unit, the heating circuit's circulation water volume is regulated. The water flow rate switch detects the water flow rate in order to protect the compressor and the water pump in the event of an insufficient water flow rate. 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.

The Anti-Freeze Protection Control function protects the water-side heat exchanger against ice formation.

If the environmental temperature is below 3 °C in standby mode of heating/domestic hot water mode and the heating return or heating flow temperature or the water flow temperature of the additional heat source is below 5 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the environmental temperature is still below 3 °C and the water temperature is still below 5 °C, the heat pump switches to heating mode.

If, in cooling mode,

– the heating return temperature or
– the heating flow temperature or
– the heating flow temperature of the auxiliary heat source

is below 4 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the water temperature is still below 4 °C, the heat pump switches to heating mode.

If the heating flow temperature is below 2 °C in standby mode for the heating/domestic hot water mode, the heat pump stops and the water pump continues to run for 30 minutes. If the heating flow temperature is still below 2 °C, the heat pump switches to frost protection in heating mode.

4 Set-up

4.1 Unpacking the product

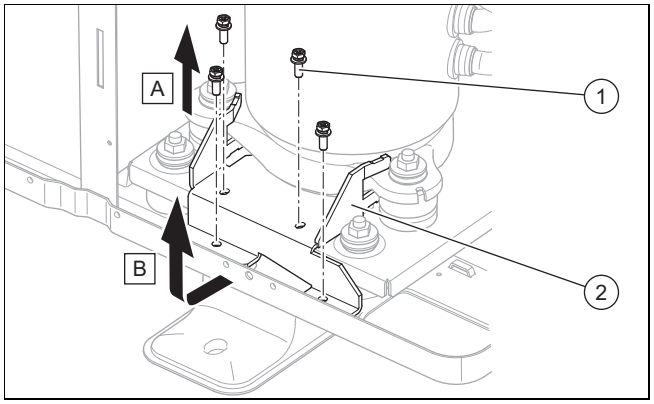
1. Remove the outer packaging parts.
2. Remove the accessory.
3. Remove the documentation.
4. Remove the screws from the pallet.
5. Remove the protective cardboard from the evaporator.

4.1.1 Remove the transport protection from the compressor (12/16 kW outdoor units only)

Note

If the compressor runs with the transport protection installed, this leads to abnormal vibrations and noises from the heat pump.

1. Remove the top casing and the right-hand front casing. (→ Section 4.10).
2. Remove the noise control cover from the compressor.



3. Remove the four screws **(1)**.
4. Remove the transport protection **(2)**.
5. Reattach the noise control cover for the compressor.

4.2 Checking the scope of delivery

► Check the contents of the packaging units.

Quantity	Designation
1	Product
1	Connection pipe for condensate discharge
1	Enclosed documentation

4.3 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.

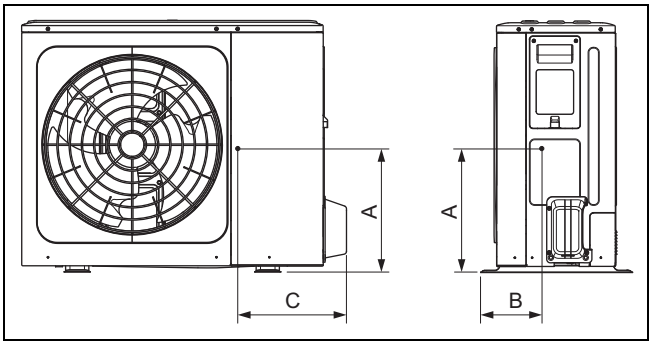
- ► Note the weight of the product.
- ► Lift the product with three people.

Caution.
Risk of material damage caused by incorrect transport.

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.

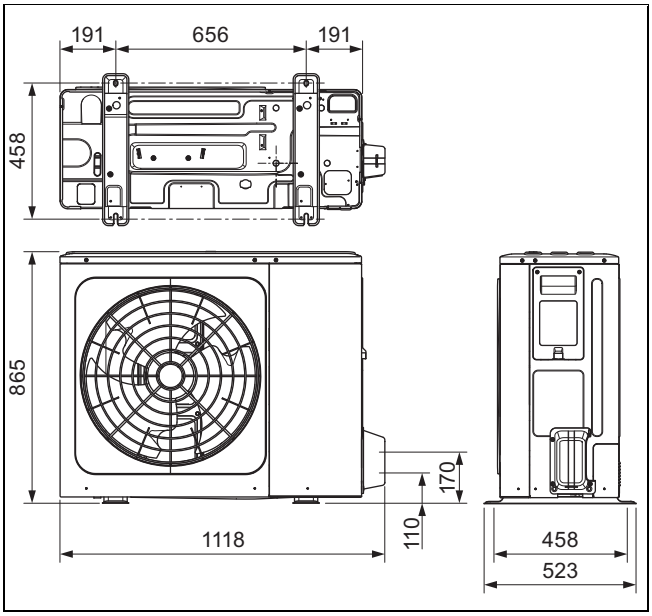
- ► During transport, do not tilt the product by any more than the maximum angle of 45°.

- ► Protect the casing sections against damage.
- ► Use carrying straps or a hand truck. In doing so, note the product's centre of gravity:



Type	A	B	C
8–10 kW	350	220	560
12–16 kW	355	275	520

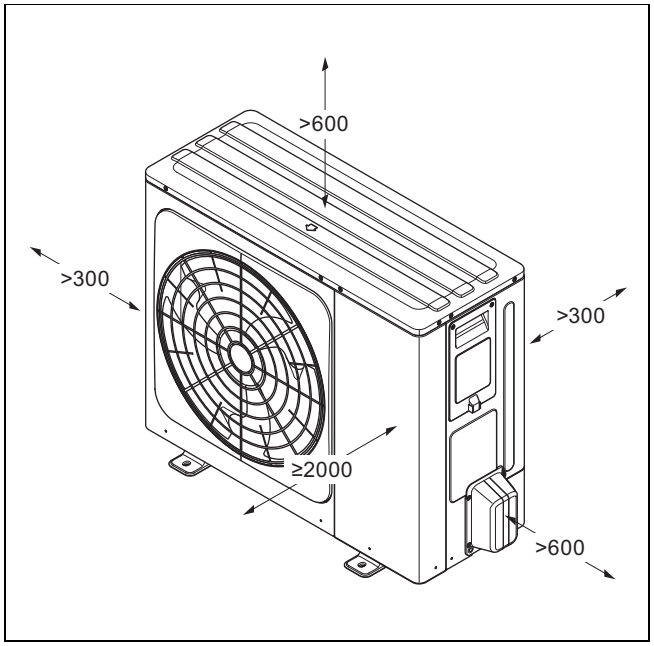
4.4 Dimensions



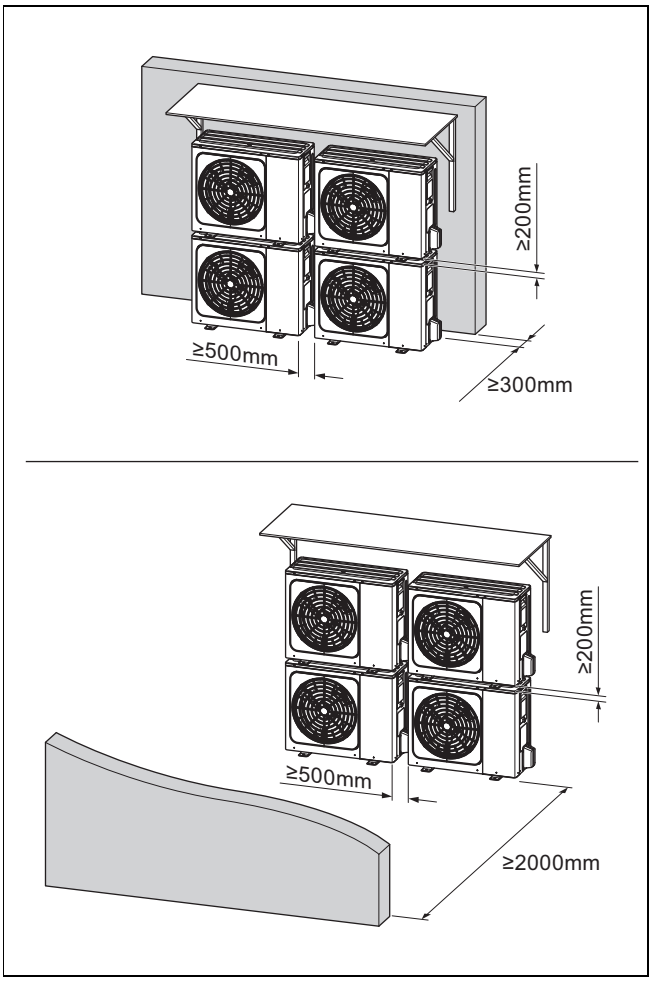
4.5 Complying with minimum clearances

- ► 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.

4.5.1 Individual installation



4.5.2 Installation on top of each other

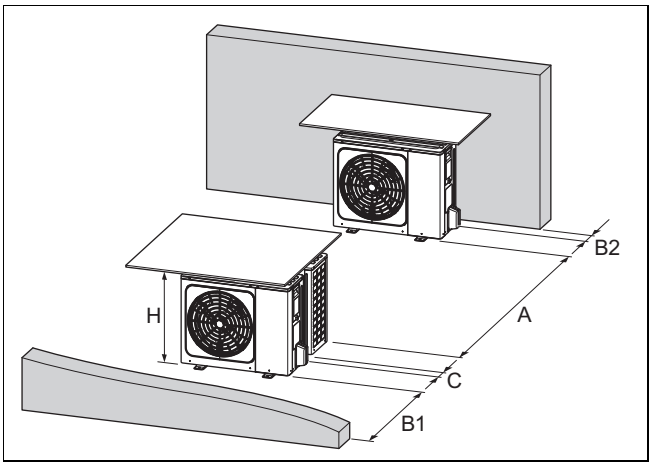


Note

If you install the products on top of each other, you must install the condensate discharge pipe to prevent condensate from discharging into the heat exchanger.

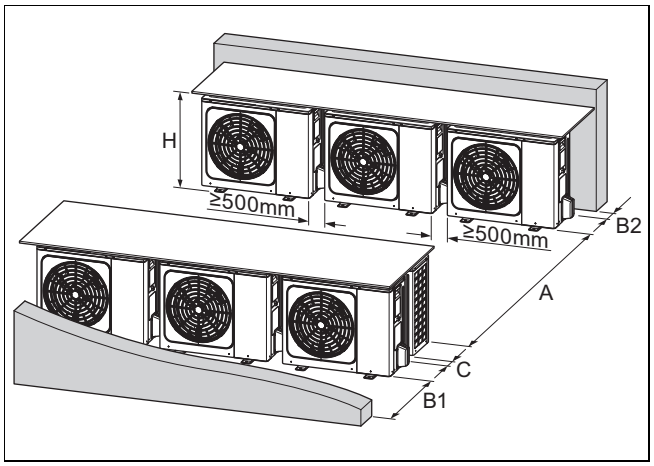
4.5.3 Multi-row installation

One product



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 150	≥ 600

Multiple products



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 300	≥ 600

4.6 Requirements for the installation site

Danger!

Risk of injury due to ice formation.

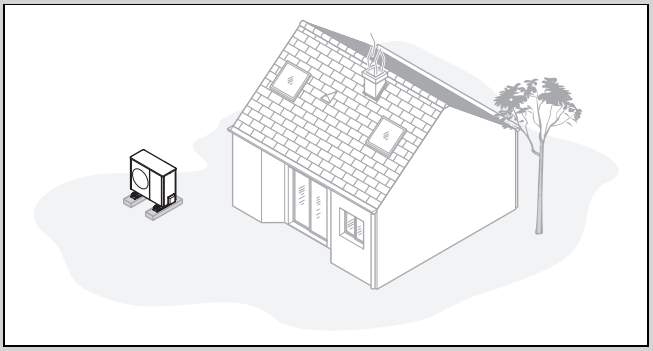
The air temperature at the air outlet is below the outdoor temperature. This can lead to ice formation.

- ► 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.
- ► The product can be set up in a coastal region or at protected areas close to the coastline. We recommend maintaining a minimum distance of 1.5 km from the coastline. In the immediate vicinity of the coastline, a protection device that sufficiently protects the product against spraying water and sea wind must also be installed. In doing so, the minimum clearances must be complied with.
- ► Observe the permissible height difference between the outdoor unit and indoor unit.
- ► Keep away from flammable substances or flammable gases.
- ► Keep away from heat sources.
- ► Avoid using preloaded extract air.
- ► Keep away from ventilation openings and extract-air shafts.
- ► Keep away from deciduous trees and shrubs.
- ► Do not expose the outdoor unit to dusty air.
- ► Do not expose the outdoor unit to corrosive air. Keep away from animal stalls or stables.
- ► Please note that the installation site must be below 2000 m above sea level.
- ► Please note the noise emissions. Select an installation site that is as far away from your own bedroom as possible.
- ► Please note the noise emissions. Select an installation site that is as far away from the windows of adjacent building as possible.
- ► Select an installation site that is easily accessible so that maintenance and service work can be carried out.

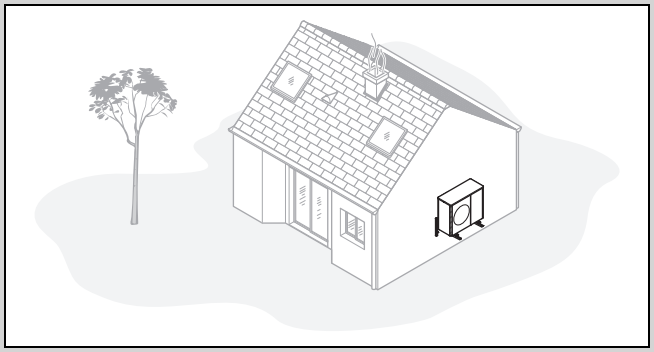
- If the installation site is adjacent to a vehicle shunting area, protect the product using ram protection.
- If the installation site is located in a region that is prone to snow, select a weather-protected installation site. If required, plan additional weather protection. In doing so, note the potential effects on the noise emissions.
- If you set up the unit in a location where it is exposed to strong winds, pay particular attention to the fact that strong winds of 5 m/s or more blowing against the unit's air outlet may cause a short circuit (extraction of the extract air). This may have the following effects:
  - Deterioration in operating performance.
  - Frequent switching on of the heating mode for frost protection.
  - Interruption to operation due to high pressure.
  - Motor burnout.
- If a strong wind is constantly blowing on the front of the unit, the fan can rotate very quickly until it breaks.
- The outdoor temperature is measured by the outdoor unit's temperature sensor and may be influenced by direct sunlight. Therefore, place the outdoor unit in the shade or erect a canopy.

Validity: Ground installation



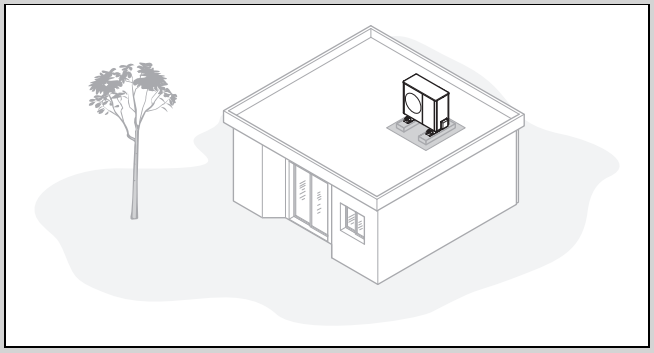
- Avoid choosing an installation site that is in the corner of a room, between walls or between fences.
- Prevent the return intake of air from the air outlet.
- Ensure that water cannot collect on the subsoil.
- Ensure that the subsoil can absorb water well.
- Plan a bed of gravel and rubble for the 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 sites between walls.
- Select an installation site with excellent sound absorption thanks to grass, hedges or 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.

Validity: Wall installation



- Ensure that the wall fulfils the static requirements. Note the weight of 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.
- If the work on the product takes place at a height above 3 m, install technical fall protection.

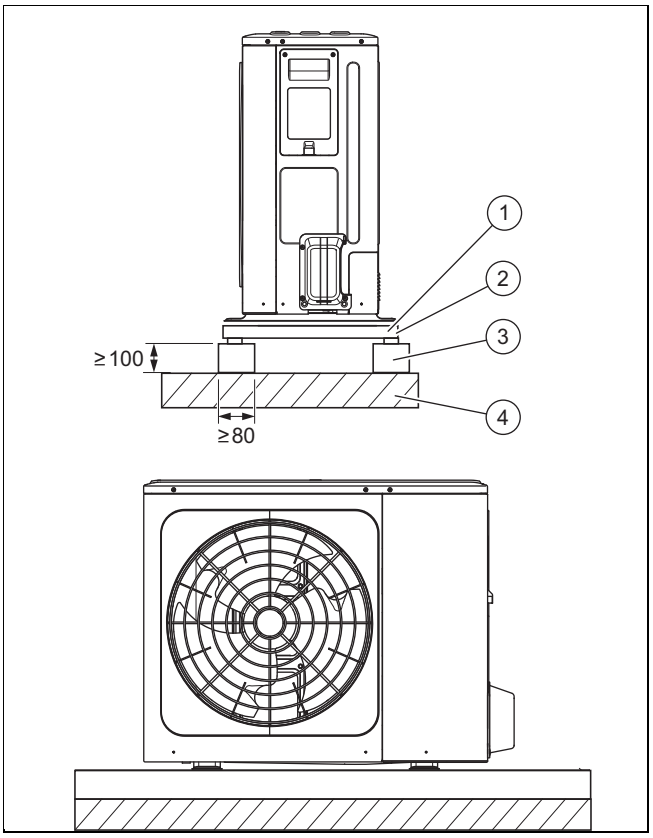
Validity: Flat-roof installation



- 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.

4.7 Planning the foundation

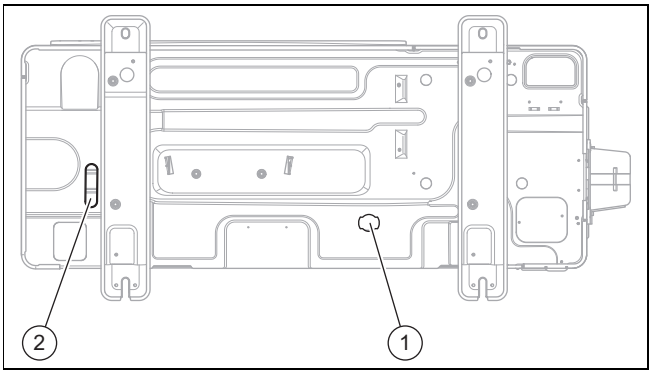
► Check the stability and evenness of the installation floor so that the product cannot cause any vibrations or noises during operation.



1	10 mm diameter expansion bolt	3	Concrete foundation
2	Shock-absorbing rubber mat	4	Fixed floor or canopy

► Tightly secure the product using four 10 mm diameter expansion bolts, nuts and washers.
► Screw in the expansion bolts until they have a clearance of 20 mm from the foundation surface.

Condensate discharge



1	Main drain opening	2	Large drain opening

All condensate from the outdoor unit is collected at the unit base and drains away via the main drain opening.

The larger drain opening is sealed with a rubber stopper. If the main drain opening is not sufficient for the condensate that is produced, also use the larger drain opening.

► If the water cannot drain at low temperatures, even when the large drain opening is open, install an electric heating belt. The electric heating belt acts as trace heating to prevent the formation of ice or to melt the ice that has formed.

4.8 Guaranteeing occupational safety

Validity: Wall installation

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

Validity: Flat-roof installation

► Ensure that the flat roof can be safely accessed.
► Maintain a safety area of 2 m to the fall edge, plus the clearance that is required for working on the product. The safety area must not be entered.
► Alternatively, 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.

4.9 Installing the product

Danger!
Risk of injury due to frozen condensate.

Frozen condensate on paths may cause falls.

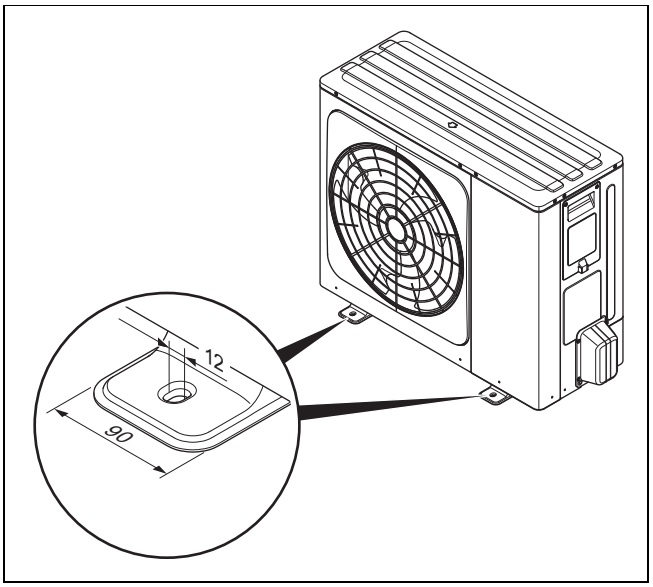
► Ensure that condensate does not discharge onto paths and that ice cannot build up there.

Note

Install rubber feet under the outdoor unit to prevent vibrations and noise. Recommendations for the rubber feet:

- Thickness: 50 mm to 100 mm

- Material: CR



Condition: Region prone to snow

- If required, set up additional weather protection. In doing so, note the potential effects on the noise emissions.

Validity: Ground installation

- Use the appropriate products, depending on the required installation type.
  - Damping feet
  - Raised base and damping feet
- Align the product horizontally.

Condition: Region without ground frost

- Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate.

Condition: Region with ground frost

- Do not install a condensate discharge pipe or any plugs in the floor plate.
- If required, protect the product's air inlet and air outlet against driving rain or direct snowfall. In doing so, note the potential effects on the noise emissions.

Validity: Wall installation

- Check the design and load-bearing capacity of the wall. Note the weight of the product.
- Use a unit mounting bracket that is suitable for the wall installation.
- Use the damping feet.
- Align the product horizontally.

Condition: Region without ground frost

- Below the product, create a gravel bed into which any condensate can drain.

Condition: Region with ground frost

- Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate.

Validity: Flat-roof installation

Warning.
Risk of injury due to toppling over in the wind.

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

- Use two concrete bases and an anti-slip protective mat.
- Screw the product to the concrete base.

- Use the damping feet.
- Align the product horizontally.

Condition: Region without ground frost

- Leave the condensate discharge open. In this case, the condensate drains onto the flat roof.
- Alternatively, connect drain pipework.
- To do this, install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate for this.

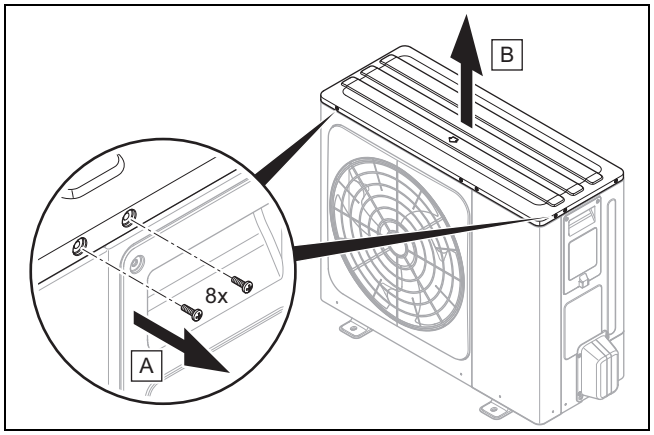
Condition: Region with ground frost

- Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate.
- Connect the condensate discharge pipe to a downpipe over a short distance.

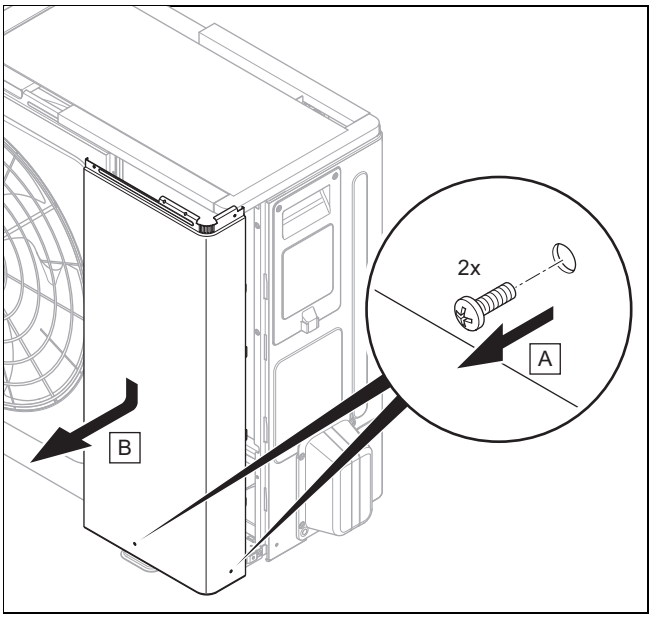
4.10 Removing/installing the casing sections

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

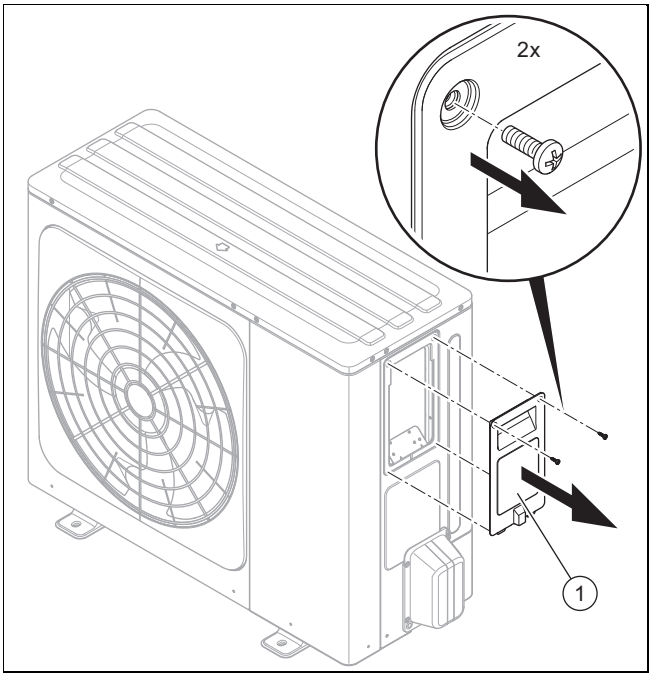
4.10.1 Removing the top casing



4.10.2 Removing the right-hand front casing



4.10.3 Removing the top casing for the electrical connections



5 Hydraulics installation

5.1 Preparing work on the refrigerant circuit

1. Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of injury and risk of environmental damage due to escaping refrigerant.

Touching any escaping refrigerant may cause injury. Escaping refrigerant leads to environmental damage if it reaches the atmosphere.

- ► Only carry out work on the refrigerant circuit if you have been trained to do so.

Caution.

Risk of material damage when extracting refrigerant.

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

- ► Ensure that heating water flows through the indoor unit's condenser or it is completely drained when extracting refrigerant on the secondary side.

2. The outdoor unit is pre-filled with R32 refrigerant. Determine whether additional refrigerant is required.
3. Ensure that the two isolation valves are closed.
4. Purchase suitable refrigerant pipes in accordance with the technical data.
5. Ensure that the refrigerant pipes that are used comply with these requirements:

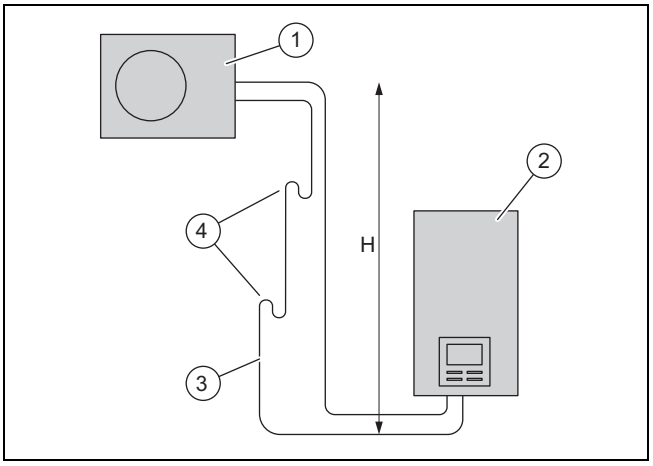
- Special copper pipes for the refrigeration technology
- Thermal insulation
- Weather resistance and UV resistance.
- Protection against rodent bites.
- Flaring with 90° flare in accordance with the SAE standard

6. Keep the refrigerant pipes blocked until they are installed.
7. Ensure that there is no dirt or water in the refrigerant pipes before you connect the refrigerant pipes to the outdoor unit and indoor unit.
8. Prevent the ingress of metal chips, dirt or moisture into the refrigerant pipes.
9. Purchase the necessary tools and equipment:

Always required	May be required
– Flaring tool for 90° flare – Torque spanner – Refrigerant fitting – Nitrogen cylinder – Vacuum pump – Vacuum gauge	– Refrigerant cylinder with R32 – Refrigerant scales

5.2 Requirements for routing the refrigerant pipes

5.2.1 Case 1: Outdoor unit raised

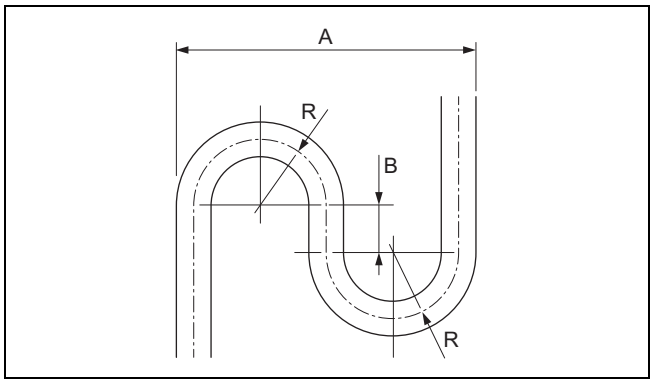


1 Outdoor unit
2 Indoor unit
3 Hot gas pipe
4 Oil elevation elbow

The outdoor unit can be installed up to a maximum height difference H of 20 m above the indoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. Depending on the height difference, oil elevation elbows must be installed in the hot gas pipe. The height difference between the oil elevation elbows must not exceed 7 m.

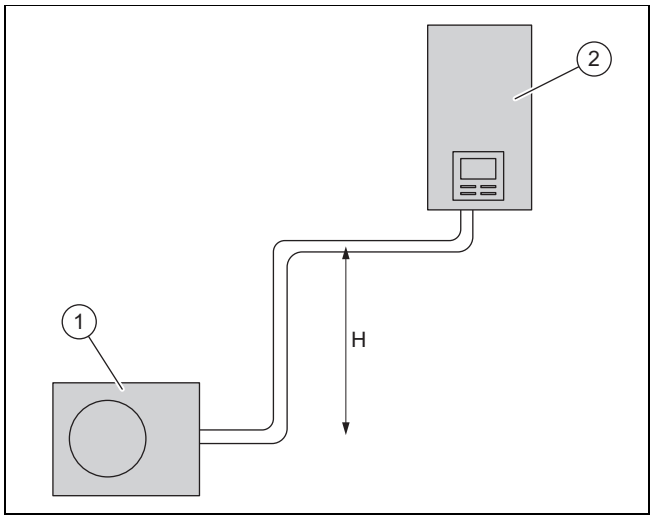
Height H	Oil elevation elbow
Up to 7 m	No oil elevation elbow required
Up to 14 m	One oil elevation elbow at 7 m high
Up to 20 m	Two oil elevation elbows, one 7 m and one 14 m in height

The oil elevation elbow must comply with these geometric requirements:



A 173 mm
B 40 mm
R 40 mm

5.2.2 Case 2: Indoor unit raised



1 Outdoor unit
2 Indoor unit

The indoor unit can be installed up to a maximum height difference H of 20 m above the outdoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. No oil elevation elbow is required.

5.3 Flare connection

The flare connection guarantees the tightness of the refrigerant pipe for the R32 refrigerant.

If a flare connection comes loose again, the old flare must then be disconnected, and a new flare must be established. The refrigerant pipe is therefore shortened slightly. This must be taken into consideration when routing the refrigerant pipes.

5.4 Routing refrigerant pipes to the product

Validity: Ground installation

► Route the refrigerant pipe through the safety pipe in the ground.

1. Route the refrigerant pipes in the wall duct with a slight downward gradient to the outside.
2. Route the refrigerant pipe centrally through the wall duct without the lines touching the wall.
3. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.

Validity: Wall installation

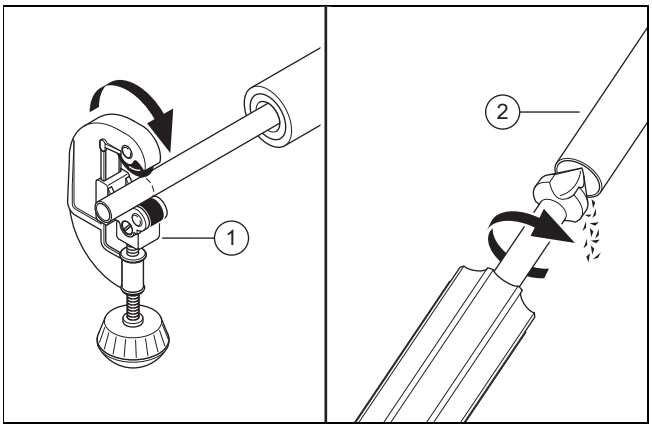
- ► Ensure that the refrigerant pipes do not come into contact with the wall and the product's casing sections.

5.5 Routing refrigerant pipes in the building

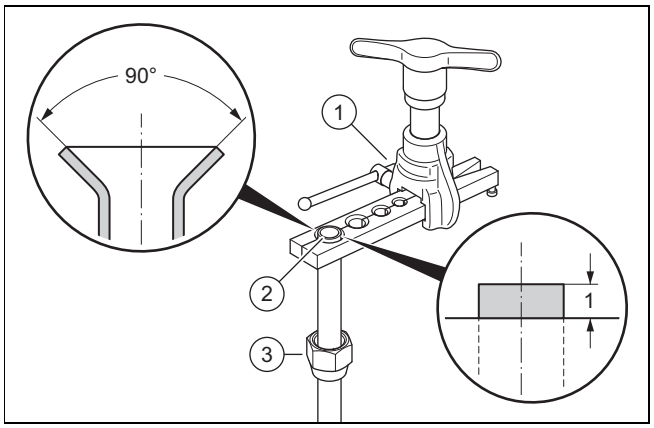
1. Do not route the refrigerant pipes in screed or masonry in the building. If this is unavoidable, install a silencer in the refrigerant pipe.
2. Do not route the refrigerant pipes through living rooms in the building.
3. Limit the routing of refrigerant pipes to a minimum. Avoid unnecessary piping and elbows.
4. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.
5. Bend the refrigerant pipes at the right angle to the wall and avoid mechanical tension during the routing.
6. Ensure that the refrigerant pipes do not come into contact with the wall.
7. Use wall brackets with rubber insert to secure these. Place the wall brackets around the thermal insulation of the refrigerant pipe.
8. Check whether oil elevation elbows are required. (→ Section 5.2.1)
9. If required, install oil elevation elbows in the hot gas pipe.
10. Ensure that the routed refrigerant pipes are protected against damage.

5.6 Cutting the pipes to length and flaring the pipe ends

1. Keep the pipe ends downwards when working on them.
2. Prevent the ingress of metal chips, dirt or moisture.

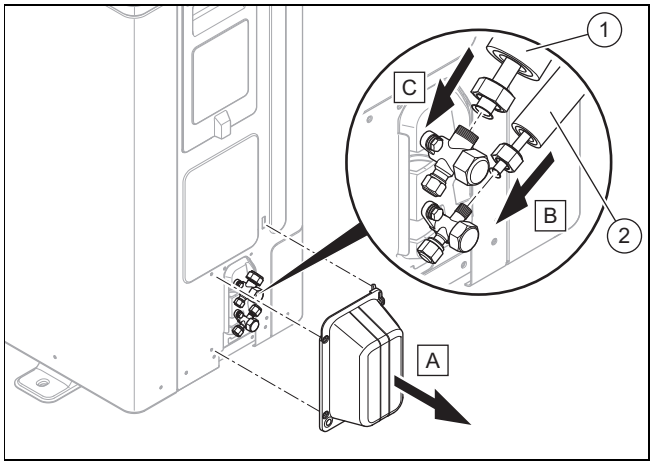


3. Cut the copper pipe to length at a right angle using a pipe cutter **(1)**.
4. Deburr the inside and outside of the pipe end **(2)**. Remove all chips carefully.
5. Unscrew the flare nut on the associated isolation valve.



6. Slide the flare nut **(3)** onto the pipe end.
7. Use a flaring tool for the 90° flare in accordance with the SAE standard.
8. Insert the pipe end into the appropriate die matrix in the flaring tool **(1)**. Allow the pipe end to protrude by 1 mm. Clamp the pipe end.
9. Widen the pipe end **(2)** using the flaring tool.

5.7 Connecting the refrigerant pipes



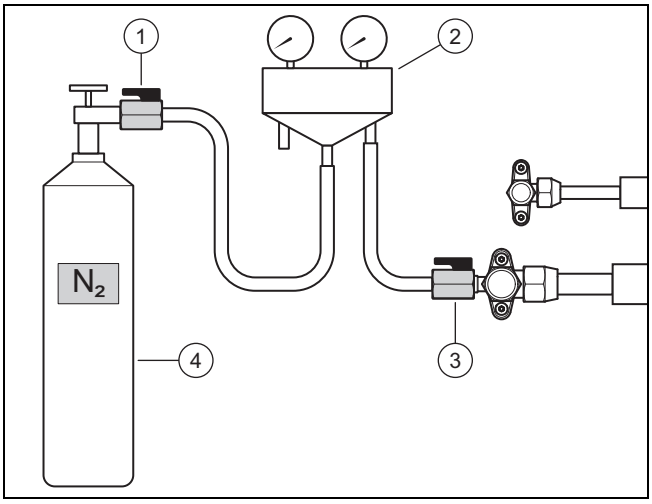
1. Remove the cover for the refrigerant pipe connections.
2. Remove the flare nut from the connections for the refrigerant pipes.
3. Cut the pipes to the correct length and flare the pipe ends. (→ Section 5.6).
4. Connect the liquid pipe **(2)** and the hot gas pipe **(1)**.
5. Tighten the flare nut. Use pliers to hold the isolation valve in place while doing so.

Pipeline	Pipe diameter	Tightening torque
Liquid pipe	3/8"	25 to 26 Nm
Hot gas pipe	5/8"	45 to 47 Nm

6. Ensure that the flare connections remain accessible for maintenance purposes.

5.8 Checking the refrigerant circuit for tightness

1. Ensure that the two isolation valves on the outdoor unit are still closed.
2. Observe the maximum operating pressure in the refrigerant circuit.



3. Connect a refrigerant fitting **(2)** with a ball valve **(3)** to the maintenance connection for the hot gas pipe.
4. Connect the refrigerant fitting with a ball valve **(1)** to a nitrogen cylinder **(4)**. Use dry nitrogen.
5. Open both of the ball valves.
6. Open the nitrogen cylinder.
   – Test pressure: 4.3 MPa (43 bar)
7. Close the nitrogen cylinder and the ball valve **(1)**.
   – Waiting time: 10 minutes
8. Check all of the connections in the refrigerant circuit for tightness. Use leak detection spray for this.
9. Observe whether the pressure is stable.

   Result 1:

   The pressure is stable and no leaks were found:
   ► Completely drain the nitrogen gas via the refrigerant fitting.
   ► Close the ball valve **(3)**.

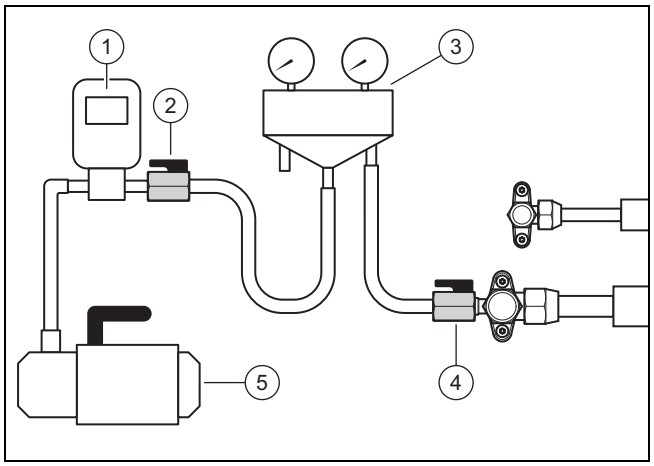
   Result 2:

   The pressure drops or a leak is found:
   ► Eliminate the leakage.
   ► Repeat the test.

5.9 Evacuating the refrigerant circuit

Note
During evacuation, residual moisture is removed from the refrigerant circuit at the same time. The length of the process depends on the residual moisture and the outdoor temperature.

1. Ensure that the two isolation valves on the outdoor unit are still closed.



2. Connect a refrigerant fitting **(3)** with a ball valve **(4)** to the maintenance connection for the hot gas pipe.
3. Connect the refrigerant fitting with a ball valve **(2)** to a vacuum gauge **(1)** and a vacuum pump **(5)**.
4. Open both of the ball valves.
5. **First test**: Switch on the vacuum pump.
6. Drain the refrigerant pipes and the condenser on the indoor unit.
   – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
   – Running time of the vacuum pump: At least 30 minutes
7. Switch off the vacuum pump.
   – Waiting period: 3 minutes
8. Check the pressure.

   Result 1:

   Pressure is stable:
   ► The first test is complete. Start with the second test.

   Result 2:

   The pressure increases and there is a leak:
   ► Check the flare connections on the outdoor unit and indoor unit. Eliminate the leakage.
   ► Start with the second test.

   Result 3:

   The pressure increases and there is residual moisture:
   ► Carry out the drying process.
   ► Start with the second test.
9. **Second test**: Switch on the vacuum pump.
10. Drain the refrigerant pipes and the condenser on the indoor unit.
    – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
    – Running time of the vacuum pump: At least 30 minutes
11. Switch off the vacuum pump.
    – Waiting period: 3 minutes
12. Check the pressure.

    Result 1:

    Pressure is stable:
    ► The second test is complete. Close the ball valves **(2)** and **(4)**.

    Result 2:

    The pressure increases.
    ► Repeat the second test.

5.10 Permissible total refrigerant volume

The outdoor unit is filled with refrigerant at the factory:

Product	Factory-set refrigerant volume	Refrigerant
8 kW, 10 kW	1.65 kg	R32
12 kW, 16 kW	1.84 kg	R32

Depending on the length of the refrigerant pipes, an additional refrigerant volume must be filled during the installation (→ Section 5.11).

The total permissible refrigerant volume is limited and depends on the minimum room size at the installation site for the indoor unit.

The requirements for the minimum room size at the indoor unit's installation site are described in the installation instructions for the indoor unit. For a total fill quantity of over 1.84 kg, the required installation room must be considerably larger.

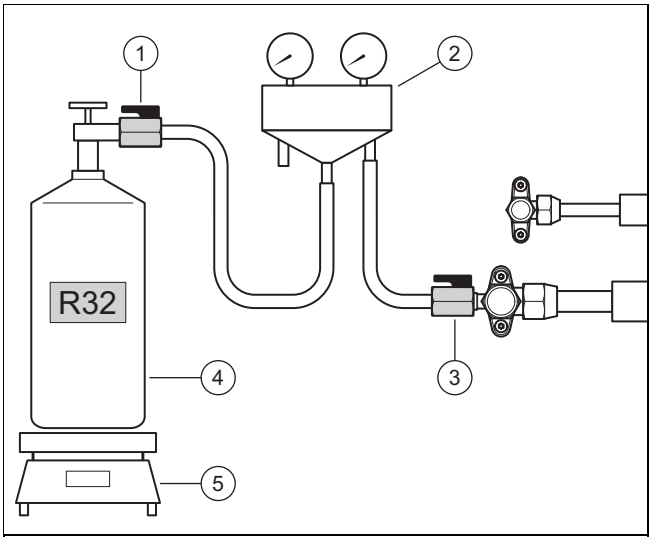
5.11 Adding additional refrigerant

Danger!
Risk of injury due to escaping refrigerant.
Touching any escaping refrigerant may cause injury.
► Wear personal protective equipment.

1. Determine the single length of the refrigerant pipe.
2. Calculate the required volume of additional refrigerant:

Single length	Refrigerant volume to be topped up
≤ 15 m	None
> 15 m	38 g for every additional metre above 15 m

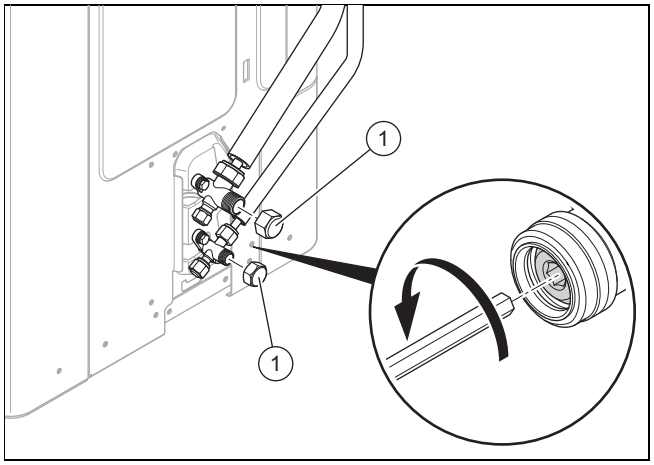
3. Ensure that the two isolation valves on the outdoor unit are still closed.



4. Connect the refrigerant fitting **(2)** with the ball valve **(1)** to a refrigerant cylinder **(4)**.
   – Refrigerant to be used: R32
5. Put the refrigerant cylinder on the scales **(5)**. If the refrigerant cylinder does not have an immersion sleeve, put it on the scales upside down.
6. Leave the ball valve **(3)** closed. Open the refrigerant cylinder and the ball valve **(1)**.
7. If the hoses have been filled with refrigerant, set the scales to zero.
8. Open the ball valve **(3)**. Fill the outdoor unit with the calculated refrigerant volume.
9. Close both of the ball valves.
10. Close the refrigerant cylinder.

5.12 Releasing the refrigerant

Danger!
Risk of injury due to escaping refrigerant.
Touching any escaping refrigerant may cause injury.
► Wear personal protective equipment.



1. Remove both covering caps **(1)**.
2. Unscrew both hexagon socket screws as far as they will go.
   ◁ The refrigerant flows into the refrigerant pipes and the indoor unit's condenser.
3. Check that no refrigerant is escaping. Check in particular all of the screwed connections and valves.
4. Screw on both covering caps. Tighten the covering caps.

5.13 Completing work on the refrigerant circuit

1. Note down the refrigerant volume added at the factory, the additional refrigerant volume added and the total refrigerant volume on the sticker on the product.
2. Enter the data in the service book.
3. Insulate and secure the refrigerant pipes after you have connected the connection cable (→ Section 6.8).
4. Install the cover for the refrigerant pipe connections.

6 Electrical installation

6.1 Precautionary measures when working on electrical wires

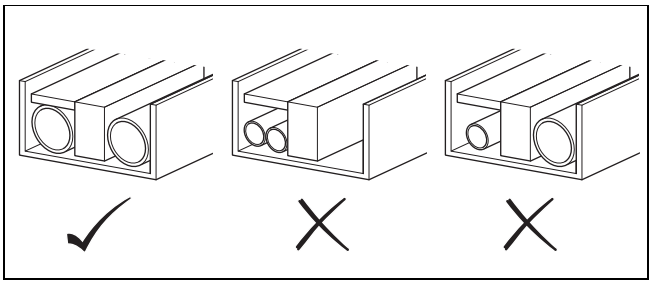
Danger!

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.

- ► Carry out the on-site wiring in accordance with the wiring diagram supplied and the instructions below.
- ► Install a main switch or other partition with all-pole contact separation in the fixed wiring. In doing so, observe the applicable local laws and regulations.
- ► Switch off the power supply before implementing any connections.
- ► Use a 3-core, shielded copper cable.
- ► Never crush bundled cables.
- ► Secure the cables in such a way that they do not come into contact with the pipelines or sharp edges.
- ► Ensure that no pressure is exerted on the terminal connections.
- ► Use a separate power supply for the product. Never use a power supply that is shared by another product.
- ► Ensure that it is earthed. Do not earth the unit via a supply pipe, overvoltage protection or the telephone earth.
- ► Install a type B residual-current circuit breaker with 30 mA (<0.1 s).
- ► Do not install a phase advance capacitor as this can impair the function of the capacitor.



- ► Route the wires in accordance with the figure.
- ► Do not connect any wires with different cross-sections to the same power supply terminal.
- ► Secure the electrical wires using cable ties so that they do not come into contact with the pipelines, especially on the high-pressure side.

6.2 Precautionary measures when connecting the power supply

- ► Use round conductor end sleeves for the connection to the terminal block for the power supply. If, for unavoidable reasons, these cannot be used, observe the following instructions.
- ► Use the specified wires for the wiring.
- ► Do not connect any wires with different cross-sections to the same power supply terminal (loose connections may lead to overheating).
- ► Use the correct screwdriver to tighten the terminal screws.
- ► Connect a residual-current circuit breaker and a fuse to the power supply cable.
- ► Establish complete connections and secure the wires in such a way that no external forces can act on the terminals.
- ► Ensure that a tolerance of +10% to -15% is maintained for the mains voltage of the single-phase 230 V mains.

6.3 Requirement for the safety device

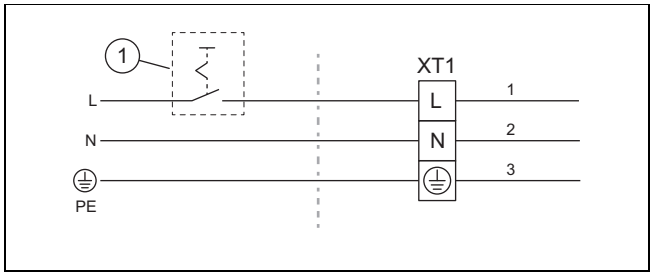
- ► Select the minimum required cable cross-section for each product individually using the tables (→ Appendix D).
- ► Select a residual-current circuit breaker that has a contact gap of at least 3 mm and which enables complete shutdown. Use the value for the maximum amperage to select current and residual-current circuit breakers (→ Appendix D).

6.4 Preparing the electrical connection

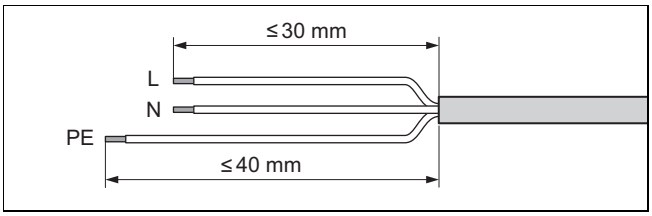
- ► Remove the top casing for the electrical connections. (→ Section 4.10.3)

6.5 Establishing the power supply

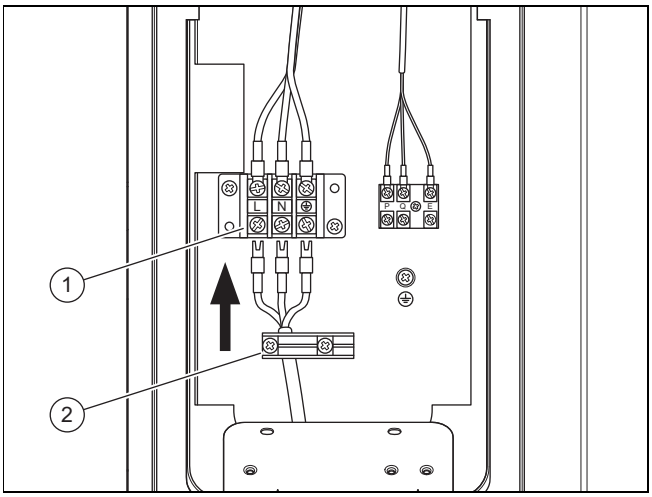
1. If it is stipulated for the installation site, install one residual-current circuit breaker for the product.



2. Install a disconnector **(1)** for the product in the building.
3. Use one 3-pole power supply cable.
4. Route the power supply cable from the building and through the wall duct to the product.
5. Route the power supply cable within the product in such a way that no contact is made with hot components.



6. Strip the power supply cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
7. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.



8. Connect the power supply cable to the power supply terminal **(1)**.
9. Secure the power supply cable using the strain relief clamp **(2)**.

6.6 Connecting the connection cable

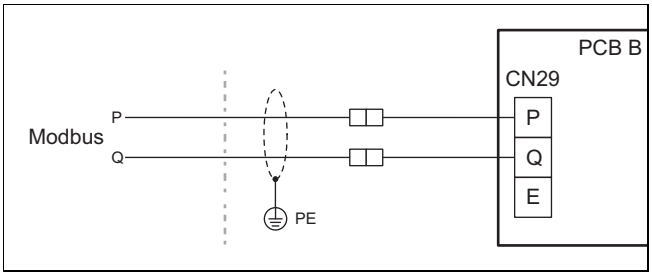
Note

The connection between the outdoor unit and the indoor unit is established via Modbus communication (RS-485 protocol).

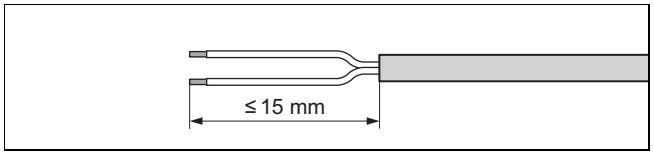
Preliminary work

1. Determine the line length between the indoor unit and outdoor unit.
2. Use a communication cable with the following properties:

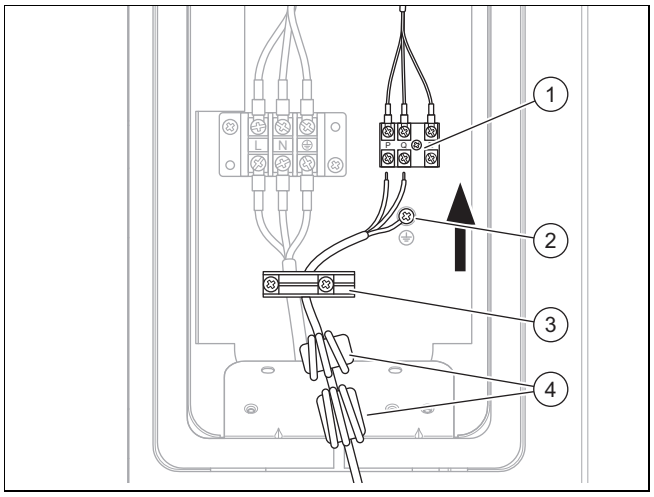
	Feature
Type	2 x shielded cable (AWG18)
Min. cross-section	0.75 mm²
Max. length	50 m



1. Ensure that connections P and Q on the indoor unit are connected to connections P and Q on the outdoor unit using the Modbus cable.
   - To do this, use a Modbus cable with different conductor colours for signals P and Q.
   - The shield braid for the communication cable must be earthed.
2. Route the Modbus cable from the building and through the wall duct to the product.
3. Route the Modbus cable within the product in such a way that no contact is made with hot components.



4. Strip the Modbus cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
5. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.

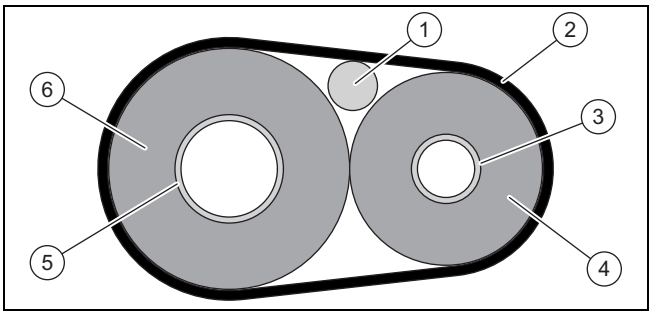


6. Position two ferrite rings **(4)** as shown in the figure.
7. Connect the two conductors on the Modbus cable to the screw terminal **(1)**. In doing so, check the assignment of the conductor colours to connections P and Q.
8. Connect the shield connection to the earthing terminal **(2)**.
9. Use the strain relief clamp **(3)** to secure the Modbus cable in place.

6.7 Completing the electrical connection

1. Check that the power supply cable and the Modbus cable are routed in such a way that they are not exposed to any wear, corrosion, tension, vibrations, sharp edges or any other unfavourable environmental influences.
2. Install the top casing.

6.8 Completing the installation of the outdoor unit



1	Connection cable	4	Liquid pipe insulation
2	Edging tape	5	Hot gas pipe
3	Liquid pipe	6	Hot gas pipe insulation

1. Insulate and secure the refrigerant pipes and the connection cable in accordance with the figure.
2. Install the protective cover for the refrigerant connection.

7 Start-up

7.1 Checking before switching on

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

7.2 Switching on the product

- ► Switch on the disconnector to which the product is connected in the building.

8 Handing over to the end user

8.1 Instructing the end user

- ► Explain to the end user how the product operates.
- ► 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 R32 refrigerant.
- ► Make the end user aware of the need for regular maintenance.

9 Troubleshooting

9.1 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).

10 Inspection and maintenance

10.1 Preparing for inspection and maintenance

- ► Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

- ► Only open the electronics box after a waiting period of 60 minutes.

- ► Observe the basic safety rules before carrying out inspection and maintenance work or installing spare parts.

- ► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
- ► Switch off the disconnector to which the product is connected in the building.
- ► Disconnect the product from the power supply but ensure that the product is still earthed.
- ► Before working in the electronics box, comply with a waiting time of 60 minutes after switching off the power supply.
  - – An LED on the PCB and the module PCB displays whether the PCBs are still supplied with power. If the LEDs no longer light up, the power supply is interrupted.
- ► When working on the product, protect all electric components from spraying water.

10.2 Observing the work plan and intervals

- ► Comply with the specified intervals. Carry out all of the work that is mentioned (Appendix D).

10.3 Procuring spare parts

The original components of the product were also certified by the manufacturer as part of the declaration of conformity. If you use other, non-certified or unauthorised parts during maintenance or repair work, this may result in the product no longer meeting the applicable standards, thereby voiding the conformity of the product.

We strongly recommend that you use original spare parts from the manufacturer as this guarantees fault-free and safe operation of the product. To receive information about the available original spare parts, contact the contact address provided on the back page of these instructions.

- ► If you require spare parts for maintenance or repair work, use only the spare parts that are permitted for the product.

10.4 Carrying out maintenance work

10.4.1 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.

10.4.2 Removing the casing sections

- ► Remove the casing sections to the extent required for the subsequent maintenance work (→ Section 4.10).

10.4.3 Cleaning the evaporator

1. Clean the gaps between the evaporator fins using a soft brush. In doing so, avoid bending the fins.
2. Remove any dirt and depositions.
3. If required, straighten out any bent fins using a fin comb.

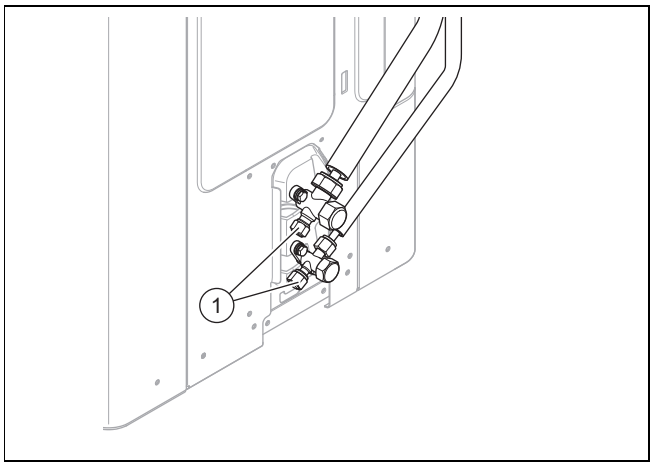
10.4.4 Checking the fan

1. Turn the fan by hand.
2. Check that the fan runs freely.

10.4.5 Cleaning the condensate discharge

1. Remove the dirt that has accumulated on the condensate tray or in the condensate discharge pipe.
2. Check that the water can drain freely. Poor approx. 1 l water into the condensate tray.

10.4.6 Checking the refrigerant circuit



1. Check whether the components and pipelines are free from dirt and corrosion.
2. Check that the covering caps **(1)** on the maintenance connections are positioned securely.
3. Check whether the thermal insulation for the refrigerant pipes is undamaged.
4. Check whether the refrigerant pipes have been routed without any kinks.

10.4.7 Checking the refrigerant circuit for tightness

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

10.4.8 Checking the electrical connections

1. In the connection box, check that the electrical wire are seated firmly in the plugs or terminals.
2. Check the earthing in the connection box.
3. Check whether the power supply cable is damaged. If it needs to be replaced, ensure that it is only replaced by customer service or a similarly qualified person in order to prevent hazards.
4. In the unit, check that the electrical wire are seated firmly in the plugs or terminals.
5. In the unit, check whether the electrical wires are free from damage.
6. If there is a fault that affects safety, do not switch the power supply back on until the fault has been eliminated.

7. If it is not possible to immediately eliminate this fault but it is still necessary to operate the installation, create a suitable interim solution. Inform the end user about this.

10.4.9 Checking the damping feet for wear

1. Check whether the damping feet are significantly compressed.
2. Check whether the damping feet have significant cracks.
3. Check whether there is substantial corrosion on the screwed connection for the damping feet.
4. If required, procure and install new damping feet.

10.5 Completing inspection and maintenance

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

11 Repair and service

11.1 Preparing repair and service work

- ► Observe the basic safety rules before carrying out any repair and service work.
- ► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
- ► Only carry out work on the refrigerant circuit if you have specific expert refrigeration knowledge and are competent at handling R32 refrigerant.
- ► When working on the refrigerant circuit, inform everybody who is working in the close vicinity or who is in the area, about the type of work that is to be carried out.
- ► Only carry out work on electrical components if you have specific electrical expertise.

Danger!

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

- ► Only open the electronics box after a waiting period of 60 minutes.

- ► Switch off the disconnector to which the product is connected in the building.
- ► Disconnect the product from the power supply but ensure that the product is still earthed.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Use only safe units and tools that are permitted for R32 refrigerant.
- ► Monitor the atmosphere in the working area using a 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 casing sections.

11.2 Replacing components of the refrigerant circuit

- ► Ensure that the work follows the defined procedure, as described in the sections below.

11.2.1 Removing refrigerant from the product

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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.
- ► Ensure that the expansion valves are open in order to guarantee that the refrigerant circuit is drained completely.
- ► The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

Caution.

Risk of material damage when removing the refrigerant.

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

- ► Remove the heating water from the indoor unit's condenser (heat exchanger) before the refrigerant is removed from the product.

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 R32 refrigerant.
3. Use only recycling cylinders that are approved for R32 refrigerant, have been labelled appropriately, and are equipped with a pressure relief and isolation valve.
4. Only use hoses, couplings and valves that are as short as possible, leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Ensure that the work area is sufficiently aerated.
6. Ensure that the outlet of the vacuum pump is not located close to potential sources of ignition.
7. Drain the recycling cylinder. In doing so, ensure that the recycling cylinder is correctly positioned.
8. Extract the refrigerant. In doing so, take into account the maximum fill quantity of the recycling cylinder, and monitor the fill quantity using calibrated scales. In doing so, never exceed the permissible operating pressure for the recycling cylinder.
9. Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the recycling cylinder.
10. If there are leaks, do not use the extraction station under negative pressure.
11. Never leave the extraction station unattended.
12. Connect the manometer bridge to the isolation valve's maintenance connection.
13. Open both expansion valves in order to guarantee that the refrigerant circuit is drained completely.
14. Once the refrigerant circuit is completely empty, immediately remove the recycling cylinders and units from the installation.
15. Close all of the isolation valves.

11.2.2 Removing components of the refrigerant circuit

- ► Flush the refrigerant circuit with oxygen-free nitrogen. Never use compressed air or oxygen instead of this.
- ► 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, there must no longer be any flammable refrigerant in the compressor oil. You should therefore drain it for a sufficient time using sufficient negative pressure.
- ► 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.
- ► If compressor oil is drained, this must be carried out safely and securely.
- ► Note that removed components may release refrigerant for an extended period. Only store and transport these components in well-aerated locations.

11.2.3 Installing components of the refrigerant circuit

- ► Only use original spare parts from the manufacturer.
- ► Install the component correctly. To do this, use only soldering processes.
- ► Install a filter dryer outdoors in the liquid pipe to the outdoor unit.
- ► Carry out a pressure test of the refrigerant circuit using nitrogen.
- ► Check whether all main components are correctly earthed after maintenance (compressor, etc.).

11.2.4 Filling the product with refrigerant

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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 R32 refrigerant that has not been used before and is specified as such, and the purity of which is at least 99.5%.

1. Make sure that the product is earthed.
2. Procure the tools and units that are required for filling with refrigerant:
   - Vacuum pump
   - Refrigerant cylinder
   - Scales
3. Only use tools and units that are permitted for R32 refrigerant. Only use refrigerant cylinders that are labelled accordingly.
4. Only use hoses, couplings and valves that are leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Only use hoses that are as short as possible in order to minimise the refrigerant volume that they can hold.
6. Flush the refrigerant circuit with nitrogen.
7. Drain the refrigerant circuit.
8. Fill the refrigerant circuit with R32 refrigerant. The required fill quantity is specified on the product's data plate. Ensure in particular that the refrigerant circuit is not overfilled.
9. Check the refrigerant circuit for leak-tightness using a gas sniffer. In doing so, check all of the components and pipelines.

11.3 Replacing electrical components

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

11.4 Completing repair and service work

- ► Installing the casing sections.
- ► Switch on the disconnector to which the product is connected in the building.
- ► Start up the product. Temporarily activate the heating mode.
- ► Check the product for leak-tightness using a gas sniffer.

12 Decommissioning

12.1 Temporarily decommissioning the product

1. Switch off the disconnector to which the product is connected in the building.
2. Disconnect the product from the power supply.

12.2 Permanently decommissioning the product

Caution.

Risk of damage caused by defrosting.

Draining off the refrigerant generates intense cooling of the indoor unit's plate heat exchanger, which may lead to the de-icing of the plate heat exchanger on the heating water side.

- ► Drain the indoor unit on the heating water side in order to prevent damage.
- ► Ensure that, during the refrigerant draining of the plate heat exchanger on the heating water side, there is sufficient flow-through.

1. Switch off the disconnector 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 indoor unit.
4. Remove the casing sections.
5. Remove the refrigerant from the product. (→ Section 11.2.1)
6. Note that refrigerant will continue to escape even after the refrigerant circuit is completely drained due to outgassing from the compressor oil.
7. Installing the casing sections.
8. Label the product using a sticker that is visible from the outside.
9. Note down on the sticker that the product has been decommissioned and that the refrigerant has been completely removed. Sign the sticker and specify the date.
10. Recycle the removed refrigerant in accordance with the regulations. Note that the refrigerant must be cleaned and checked before it is used again.
11. Dispose of or recycle the product and its components in accordance with the regulations.

13 Recycling and disposal

13.1 Disposing of the packaging

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

13.2 Recycling or disposing of refrigerant

Danger!

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

If R32 refrigerant is released during transport, a flammable atmosphere may form when it mixes with air. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Ensure that the refrigerant is transported correctly.

Warning.

Risk of damage to the environment.

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential).

- ► Have the refrigerant that is contained in the product completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with the regulations.
- ► When doing so, ensure that the vessel does not contain multiple different types of refrigerant.

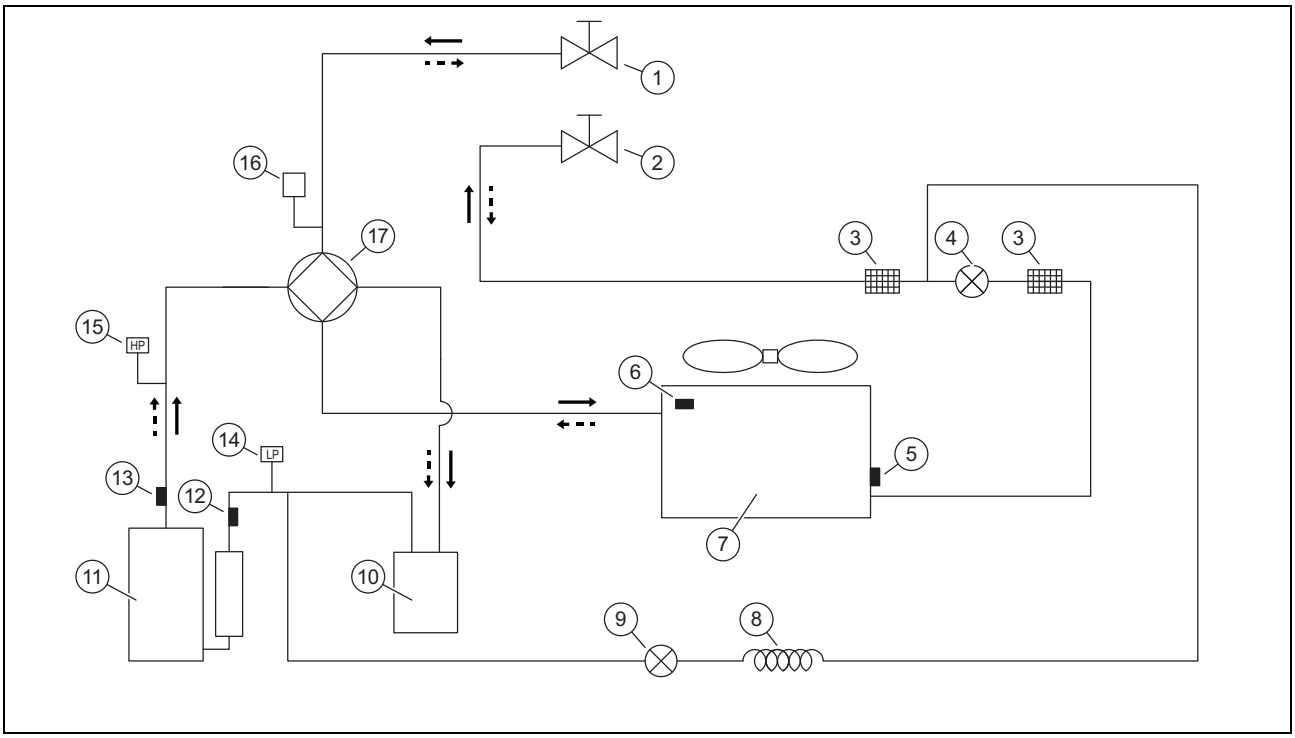
- ► Ensure that the refrigerant is recycled or disposed of by a qualified competent person.

14 Customer service

Στοιχεία επικοινωνίας για το τμήμα εξυπηρέτησης πελατών θα βρείτε στην αναφερόμενη διεύθυνση στην πίσω πλευρά ή στην ιστοσελίδα www.demirdokum.com.tr.

Appendix

A Refrigerant circuit



Cooling

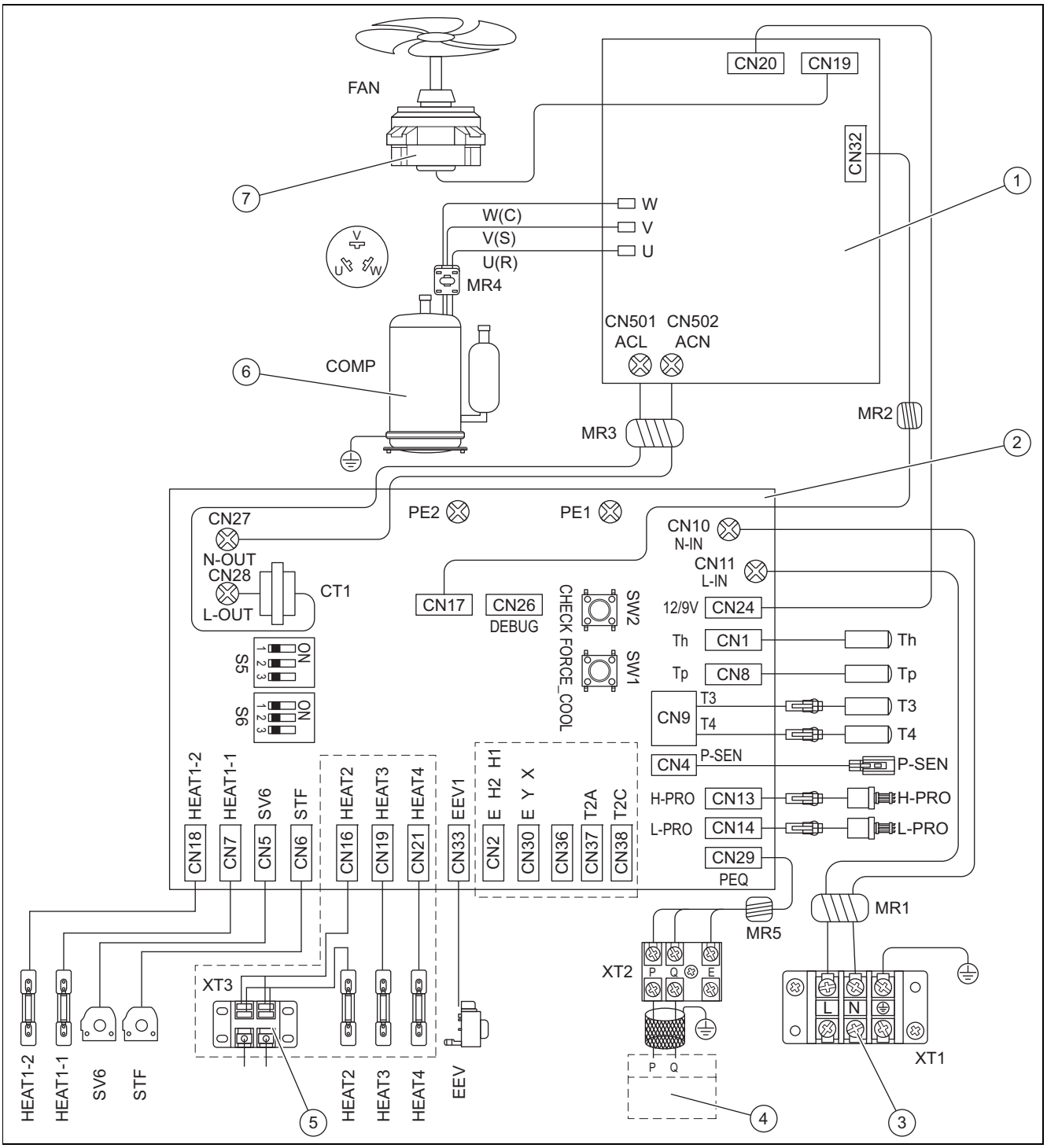
Heating

1	Hot gas pipe isolation valve
2	Liquid pipe isolation valve
3	Filter
4	Electronic expansion valve
5	Temperature sensor (evaporator in heating mode, condenser in cooling mode)
6	Outdoor temperature sensor
7	Air-side heat exchanger
8	Capillary
9	Electromagnetic one-way valve
10	Gas liquid separator
11	Compressor
12	Intake temperature sensor
13	Outlet temperature sensor
14	Low-pressure switch
15	High-pressure switch
16	Pressure sensor
17	4-port valve

B Wiring diagrams

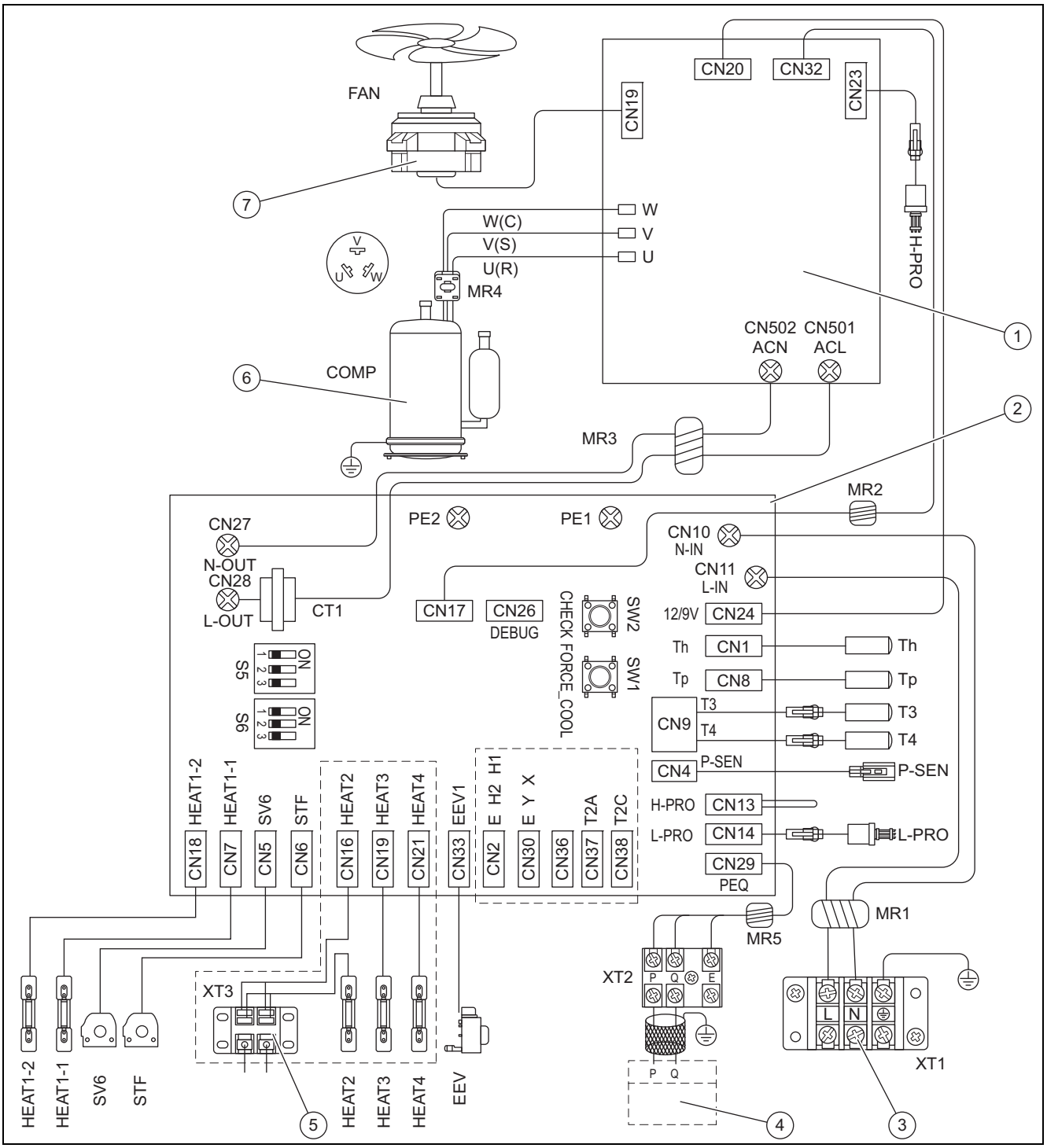
The wiring diagrams shown here are for reference only. Refer to the wiring diagram on the inside of the electronics box for the connection.

B.1 8–10 kW products



1	PCB A, inverter, single-phase
2	Main PCB B, control process, single-phase
3	Power supply connection
4	Indoor unit connection
5	Connection for heating belt at the condensate discharge
6	Compressor
7	Fan
CT1	Alternating current detector
EEV	Electronic expansion valve
Heat1-1	Compressor, electric heating belt 1
Heat1-2	Compressor, electric heating belt 2
Heat2	Connection for electric heating belt at the housing
H-PRO	High-pressure switch
L-PRO	Low-pressure switch
MR1 - MR5	Ring magnets
P-SEN.	Pressure sensor
T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
TF	Radiator temperature sensor
Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
XT1 - XT3	Terminal blocks

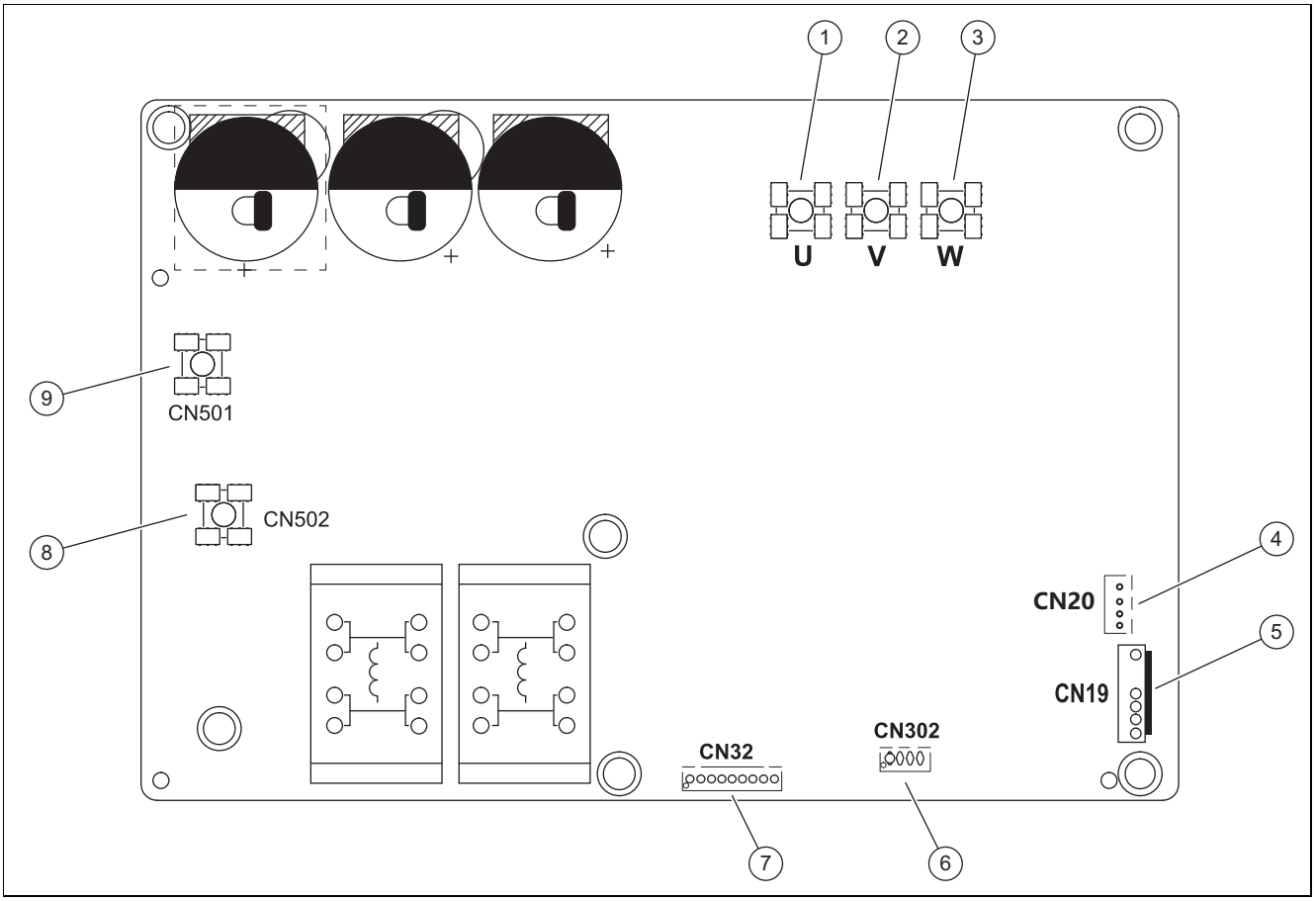
B.2 12–16 kW products



1	PCB A, inverter, single-phase	H-PRO	High-pressure switch
2	Main PCB B, control process, single-phase	L-PRO	Low-pressure switch
3	Power supply connection	MR1 - MR5	Ring magnets
4	Indoor unit connection	P-SEN.	Pressure sensor
5	Connection for heating belt at the condensate discharge	T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
6	Compressor	T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
7	Fan	TF	Radiator temperature sensor
CT1	Alternating current detector	Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
EEV	Electronic expansion valve	Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
Heat1-1	Compressor, electric heating belt 1	XT1 - XT3	Terminal blocks
Heat1-2	Compressor, electric heating belt 2		
Heat2	Connection for electric heating belt at the housing		

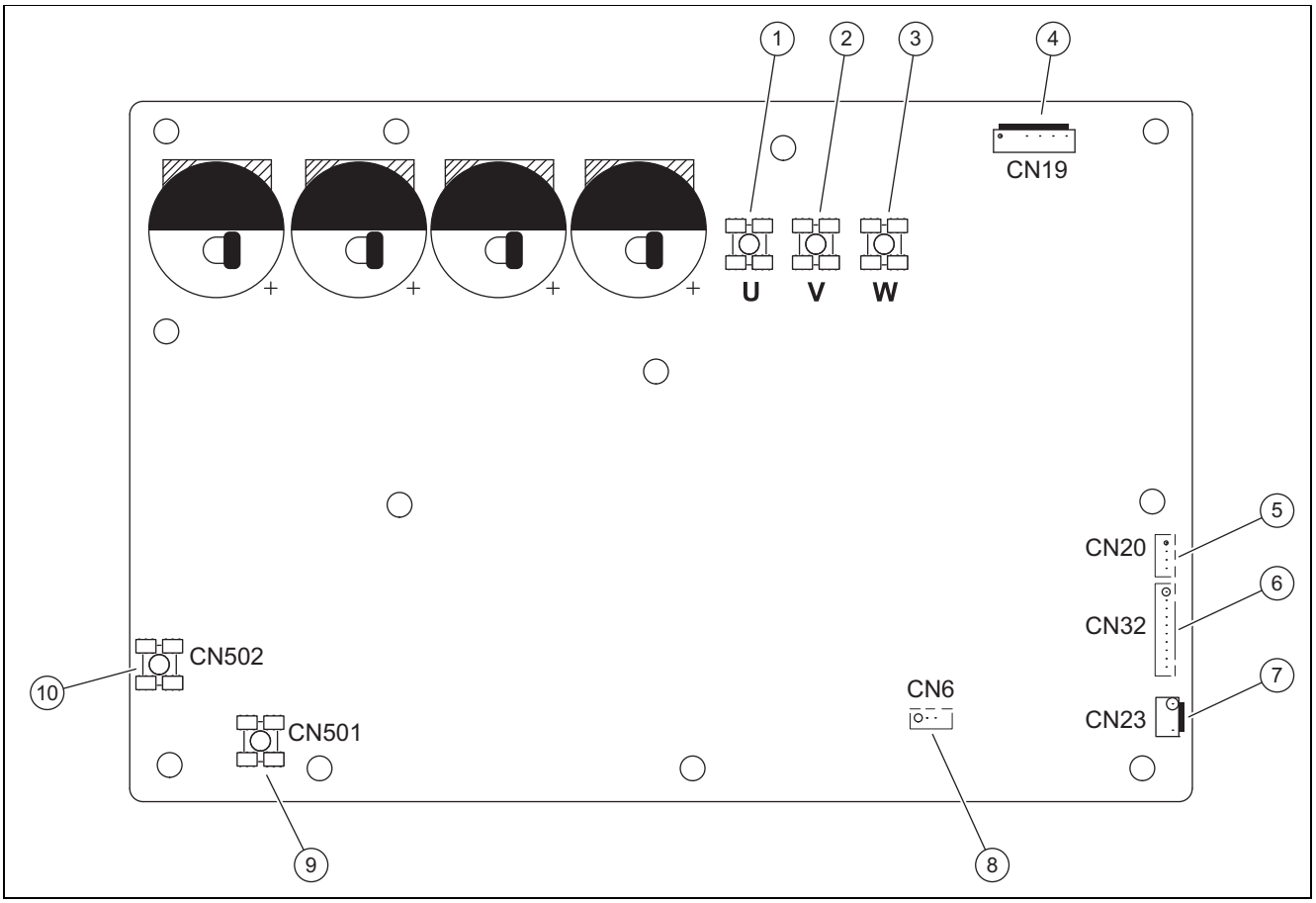
C PCBs for the electronic control unit

C.1 PCB A – inverter module – 8–10 kW products



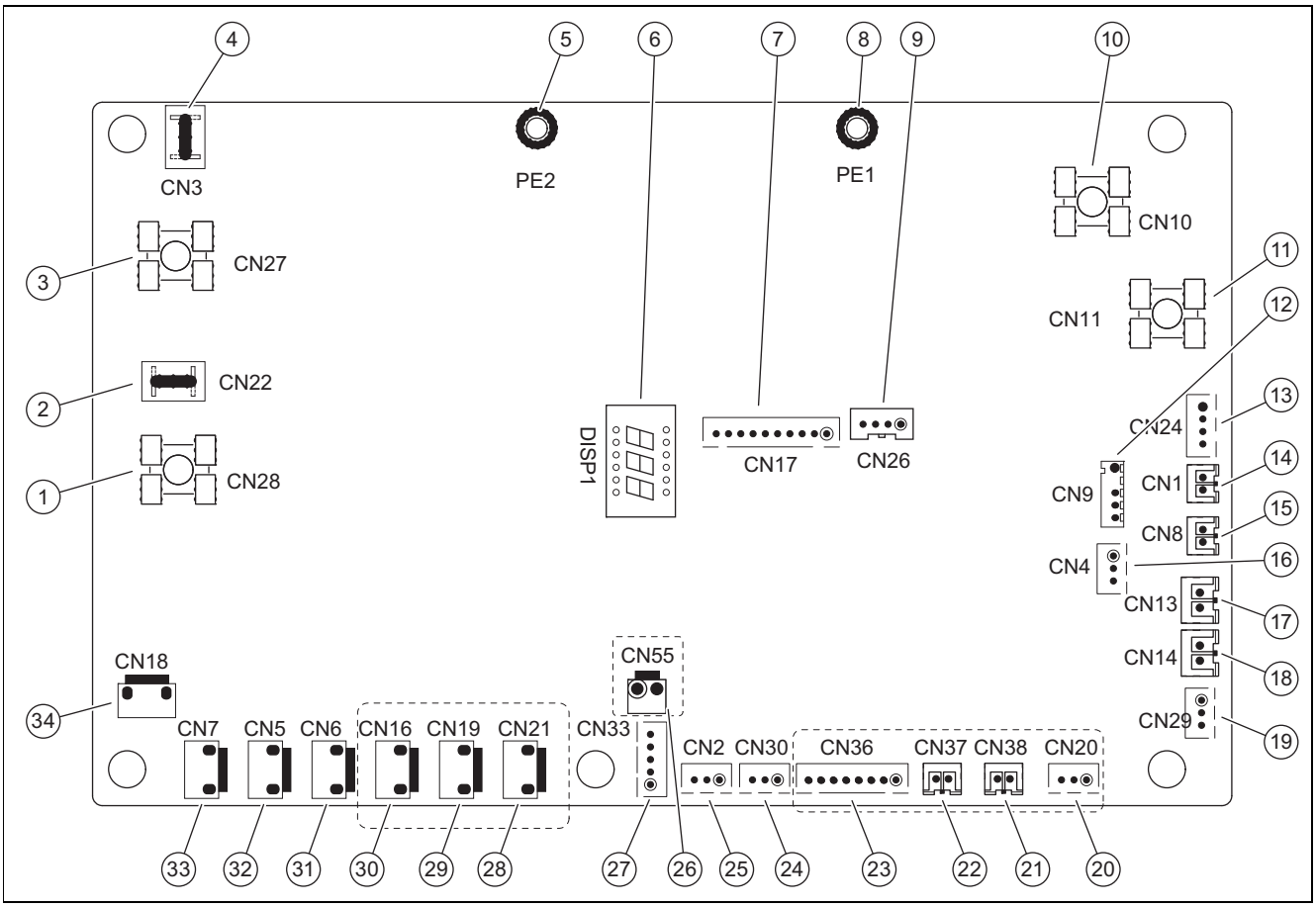
1	Compressor connection U	6	Reserved (CN302)
2	Compressor connection V	7	Connection for communication with PCB B (CN32)
3	Compressor connection W	8	Connection for input N for rectifier bridge (CN502)
4	Connection for output +12 V/9 V (CN20)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for fan (CN19)		

C.2 PCB A – inverter module – 12–16 kW products



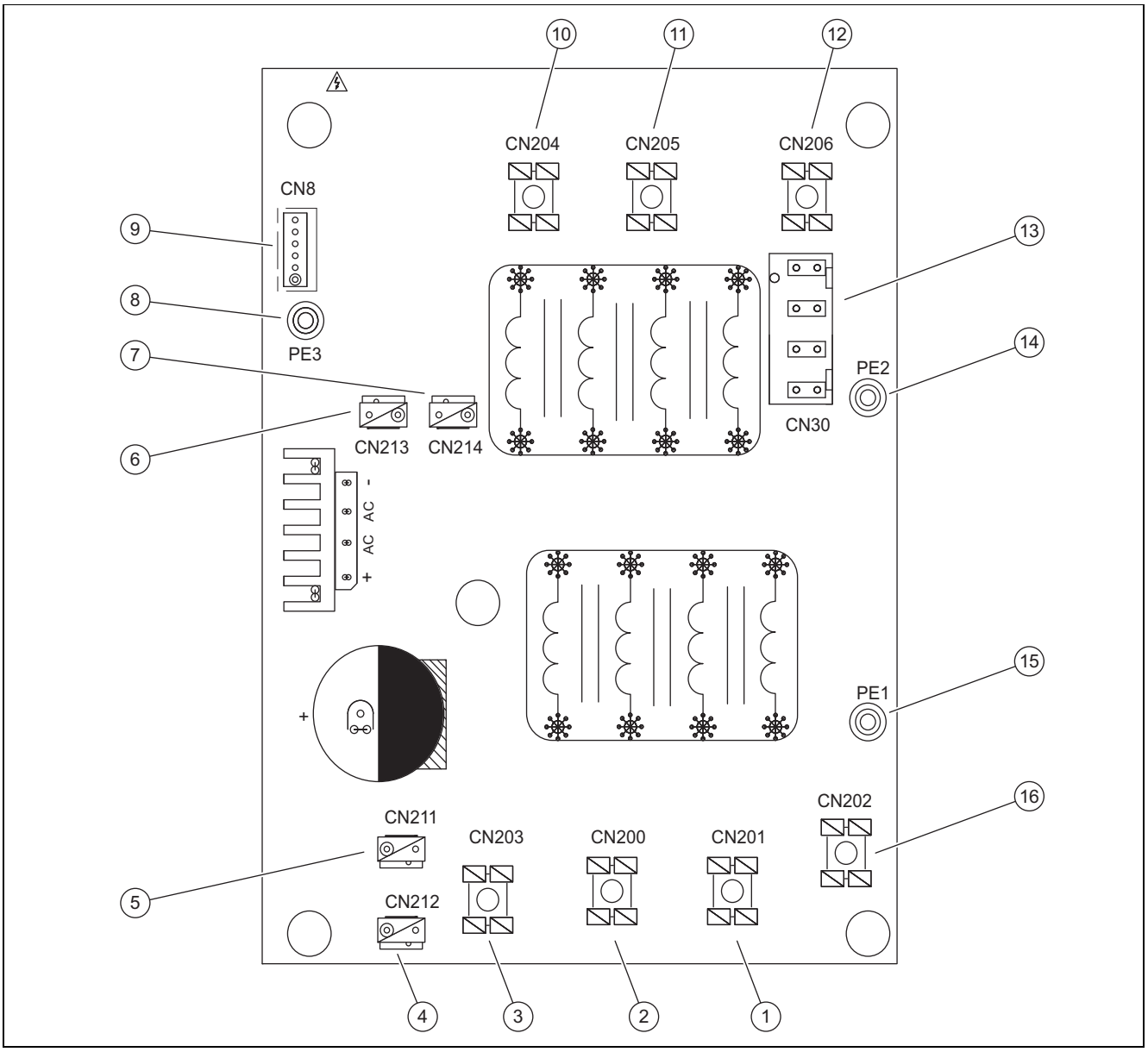
1	Compressor connection U	6	Connection for communication with PCB B (CN32)
2	Compressor connection V	7	Connection for high-pressure switch (CN23)
3	Compressor connection W	8	Reserved (CN6)
4	Connection for fan (CN19)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for output +12 V/9 V (CN20)	10	Connection for input N for rectifier bridge (CN502)

C.3 Main PCB B



1	Connection: Output L to PCB A (CN28)
2	Reserved (CN22)
3	Connection: Output N to PCB A (CN27)
4	Reserved (CN3)
5	Connection for earthing cable (PE2)
6	Display (DSP1)
7	Connection for communication with PCB A (CN17)
8	Connection for earthing cable (PE1)
9	Reserved (CN26)
10	Connection: Input for neutral conductor (CN10)
11	Connection: Input for conductor (CN11)
12	Connection for outdoor temperature sensor and condenser temperature sensor (CN9)
13	Connection for input +12 V/9 V (CN24)
14	Connection for intake temperature sensor (CN1)
15	Connection for compressor outlet temperature sensor (CN8)
16	Connection for pressure sensor (CN4)
17	Connection for high-pressure switch (CN13)
18	Connection for low-pressure switch (CN14)
19	Connection for communication with the hydrobox control card (CN29)
20	Reserved (CN20)
21	Reserved (CN38)
22	Reserved (CN37)
23	Reserved (CN36)
24	Connection for communication (reserved, CN30)
25	Connection for communication (reserved, CN2)
26	Reserved (CN55)
27	Connection for electronic expansion valve (CN33)
28	Reserved (CN21)
29	Reserved (CN19)
30	Connection for the electrical heating belt of the housing (CN16)
31	Connection for 4-port valve (CN6)
32	Connection for SV6 valve (CN5)
33	Connection for electrical heating belt 1 of the compressor (CN7)
34	Connection for electrical heating belt 2 of the compressor (CN18)

C.4 PCB C – filter



1	Power supply L2 (CN201)
2	Power supply L3 (CN200)
3	Power supply N (CN203)
4	Power supply connection for +310 V DC (CN212)
5	Reserved (CN211)
6	Connection for fan (CN213)
7	Power supply connection for inverter module (CN214)
8	Earth cable (PE3)
9	Connection for communication with main PCB B (CN8)
10	Power filtering L3 (L3')
11	Power filtering L2 (L2')
12	Power filtering L1 (L1')
13	Power supply connection for main PCB (CN30)
14	Connection for earthing cable (PE2)
15	Connection for earthing cable (PE1)
16	Power supply L1 (L1)

D Selecting electrical components

Rated current of the product [A]	Nominal cross-sectional area [mm²]	
	Flexible cables	Cable for fixed wiring
≤ 3	0.5 and 0.75	1 and 2.5
> 3 and ≤ 6	0.75 and 1	1 and 2.5
> 6 and ≤ 10	1 and 1.5	1 and 2.5
> 10 and ≤ 16	1.5 and 2.5	1.5 and 4
> 16 and ≤ 25	2.5 and 4	2.5 and 6
> 25 and ≤ 32	4 and 6	4 and 10
> 32 and ≤ 50	6 and 10	6 and 16
> 50 and ≤ 63	10 and 16	10 and 25

Note
The rated current in the upper table corresponds to the MCA in the lower table. If the MCA exceeds 63 A, the cable diameter should be selected in accordance with the national regulations.

Product	Outdoor unit				Current output			Compressor		OFM (external fan motor)	
	Voltage (V)	Frequency (Hz)	Min. (V)	Max. (V)	MCA (A)	TOCA (A)	MFA (A)	MSC (A)	RLA (A)	CW	FLA (A)
8 kW	220 - 240	50	198	264	16	19	25	–	14.50	0.17	1.50
10 kW	220 - 240	50	198	264	17	19	25	–	15.50	0.17	1.50
12 kW	220 - 240	50	198	264	25	30	35	–	23.50	0.17	1.50
16 kW	220 - 240	50	198	264	27	30	35	–	25.50	0.17	1.50

MCA (Min. Circuit Amps.): Minimum amperage in the electrical circuit (A)
TOCA (Total Over-current Amps.): Total overcurrent (A)
MFA (Max. Fuse Amps.): Max. fuse protection (A)
MSC (Max. Starting Amps.): Max. in-rush current (A)
RLA (Rated Load Amps.): Nominal operating current (A) of the compressor, under nominal test conditions in cooling or heating mode
CW (Rated Motor Output): Nominal motor output
FLA (Full Load Amps.): Full load current (A)

Maximum values for the wiring (for exact values, see Technical data):

	Product			
	8 kW	10 kW	12 kW	16 kW
Maximum fuse protection [A]	19	19	30	30
Cable diameter [mm²]	4.0	4.0	6.0	6.0

E Inspection and maintenance work

#	Maintenance work	Interval	
1	Cleaning the product	Annually	74
2	Cleaning the evaporator	Annually	74
3	Checking the fan	Annually	74
4	Cleaning the condensate discharge	Annually	74
5	Checking the refrigerant circuit	Annually	74
6	Checking the refrigerant circuit for tightness	Annually	74
7	Checking the electrical connections	Annually	74
8	Checking the damping feet for wear	Annually after the first 3 years	75

F Technical data

Note

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

The performance data is determined using a special test method. You can find information about this from the manufacturer of the product by stating "Performance data test method".

Technical data – General

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Width	1,118 mm	1,118 mm	1,118 mm	1,118 mm
Height	865 mm	865 mm	865 mm	865 mm
Depth	523 mm	523 mm	523 mm	523 mm
Net weight	75 kg	75 kg	97 kg	97 kg
Width with packaging	1,190 mm	1,190 mm	1,190 mm	1,190 mm
Height with packaging	970 mm	970 mm	970 mm	970 mm
Depth with packaging	560 mm	560 mm	560 mm	560 mm
Weight with packaging	89 kg	89 kg	110.5 kg	110.5 kg
Rated voltage	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz
Rated power	3,300 W	3,600 W	5,400 W	6,100 W
Rated current	14.5 A	16 A	24.5 A	26 A
IP rating	IP24	IP24	IP24	IP24
Maximum rotational speed of the fan	600 rpm	600 rpm	650 rpm	650 rpm
Fan, motor type	Brushless DC motor	Brushless DC motor	Brushless DC motor	Brushless DC motor
Fan, quantity	1	1	1	1
Connection for condensate discharge	DN 32	DN 32	DN 32	DN 32

Technical data – Refrigerant circuit

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Material of the refrigerant pipe	Copper	Copper	Copper	Copper
Minimum single length of the refrigerant pipe	2 m	2 m	2 m	2 m
Maximum single length of the refrigerant pipe	30 m	30 m	30 m	30 m
Permissible height difference when the outdoor unit is raised	20 m	20 m	20 m	20 m
Permissible height difference when the indoor unit is raised	20 m	20 m	20 m	20 m
Additional refrigerant volume	38 g/m	38 g/m	38 g/m	38 g/m
Connection technology	Flare connection	Flare connection	Flare connection	Flare connection
Outer diameter of the hot gas pipe	5/8″	5/8″	5/8″	5/8″
Outer diameter of the liquid pipe	3/8″	3/8″	3/8″	3/8″
Minimum wall thickness of the hot gas pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Minimum wall thickness of the liquid pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Refrigerant	R32	R32	R32	R32
Fill quantity	1.65 kg	1.65 kg	1.84 kg	1.84 kg
Global Warming Potential (GWP)	675	675	675	675
CO_2 equivalent	1.11 t	1.11 t	1.24 t	1.24 t
Maximum switch-off pressure	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)
Compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Air-side heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger
Throttle valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve

Technical data – Application limits, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	35 ℃	35 ℃	35 ℃	35 ℃
Minimum air temperature for domestic hot water generation	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature for domestic hot water generation	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Application limits, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Power, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Heat output, A7/W35	8.3 kW	10.0 kW	12.1 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W35	5.20	5.00	4.95	4.50
Power consumption, effective, A7/W35	1.60 kW	2.00 kW	2.44 kW	3.56 kW
Heat output, A7/W45	8.2 kW	10.0 kW	12.3 kW	16 kW
Coefficient of performance, COP, EN 14511, A7/W45	3.95	3.80	3.80	3.60
Power consumption, effective, A7/W45	2.08 kW	2.63 kW	3.24 kW	4.44 kW
Heat output, A7/W55	7.5 kW	9.5 kW	12.0 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W55	3.18	3.10	3.10	2.90
Power consumption, effective, A7/W55	2.36 kW	3.06 kW	3.87 kW	5.52 kW
Heat output, A-7/W35	7.10 kW	8.25 kW	10.0 kW	13.3 kW
Coefficient of performance, COP, EN 14511, A-7/W35	3.18	3.10	3.0	2.7
Power consumption, effective, A-7/W35	2.18 kW	2.62 kW	3.33 kW	4.93 kW
Heat output, A-7/W55	6.15 kW	6.85 kW	10.0 kW	12.5 kW
Coefficient of performance, COP, EN 14511, A-7/W55	2.05	2.0	2.05	2.02
Power consumption, effective, A-7/W55	3.00 kW	3.43 kW	4.88 kW	6.19 kW
Seasonal space heating energy efficiency class, flow temperature at 35 ºC	A+++	A+++	A+++	A+++
Seasonal space heating energy efficiency class, flow temperature at 55 ºC	A++	A++	A++	A++
SCOP, warmer climate, 35 ºC	6.99	7.09	6.48	6.29
SCOP, warmer climate, 55 ºC	4.51	4.62	4.43	4.48
SCOP, average climate, 35 ºC	5.22	5.20	4.81	4.62
SCOP, average climate, 55 ºC	3.37	3.47	3.45	3.41

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
SCOP, colder climate, 35 ºC	4.33	4.32	4.08	4.02
SCOP, colder climate, 55 ºC	2.88	2.99	3.02	3.12

Technical data – Power, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Cooling output, A35/W18	8.4 kW	10.0 kW	12.0 kW	14.2 kW
Energy efficiency ratio, EER, EN 14511, A35/W18	5.05	4.80	4.00	3.61
Power consumption, effective, A35/W18	1.66 kW	2.08 kW	3.00 kW	3.94 kW
Cooling output, A35/W7	7.40 kW	8.20 kW	11.60 kW	14.00 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	3.38	3.30	2.75	2.45
Power consumption, effective, A35/W7	2.19 kW	2.48 kW	4.22 kW	5.71 kW
SEER, flow temperature at 7 ºC	5.83	5.98	4.89	4.69
SEER, flow temperature at 18 ºC	8.95	8.78	7.10	6.75

Technical data – noise emissions

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Sound power (EN 12102 1)	59 dB(A)	60 dB(A)	64 dB(A)	68 dB(A)
Max. sound pressure level (heat: A7W35/cooling: A35W18)	46 dB(A)	49 dB(A)	50 dB(A)	54 dB(A)

Index

Operating instructions

Contents

1 Safety

1.1 Intended use

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

The product is the outdoor unit for a air-to-water heat pump in a split design.

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

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit Without a back-up heater	Indoor unit With a back-up heater
HA 8-7.2 OS 230V B3	HA 10-7.2 WS 230V B1	HA 10-7.2 WS 230 V
HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ▸ Keep all ignition sources away from the product. Ignition sources include, for example:
  – Open flames,
  – Hot surfaces over 550 °C,
  – Electrical devices or tools that are not free from electrical sources,
  – Static discharges.
- ▸ Do not use any sprays or other flammable gases close to the product.

1.2.3 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Do not make any changes in the product's environment as this would cause escaping refrigerant to collect in a recess or to get inside the building via building openings.

1.2.4 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:
  - to the product itself
  - to the supply lines
  - to the drain pipework
  - to the expansion relief valve for the heat source circuit
  - to constructional conditions that may affect the operational reliability of the product
- Never make any changes to the product where these involve drilling into the product.

1.2.5 Risk of injury from burns caused by touching refrigerant pipes

The refrigerant pipes between the outdoor unit and the indoor unit may become extremely hot during operation. There is a risk of burns.

- Do not touch any uninsulated refrigerant pipes.

1.2.6 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 eliminated by a competent person.
- Adhere to the maintenance intervals specified.

1.2.7 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.

1.2.8 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

2 Notes on the documentation

- ► 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.

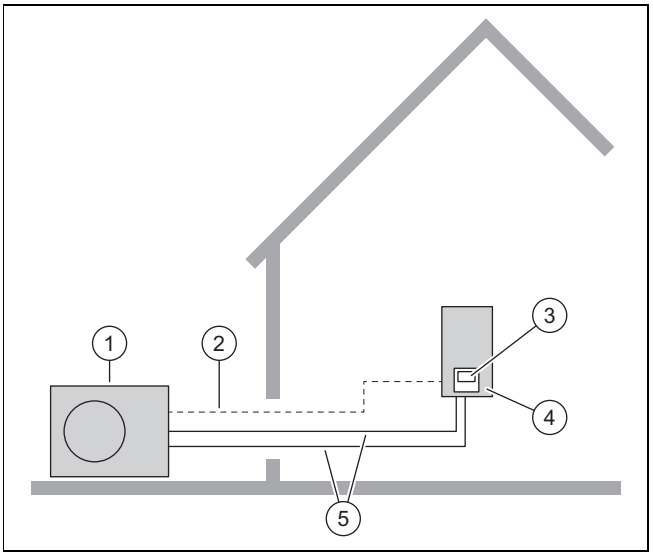
These instructions apply only to Georgia:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 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.

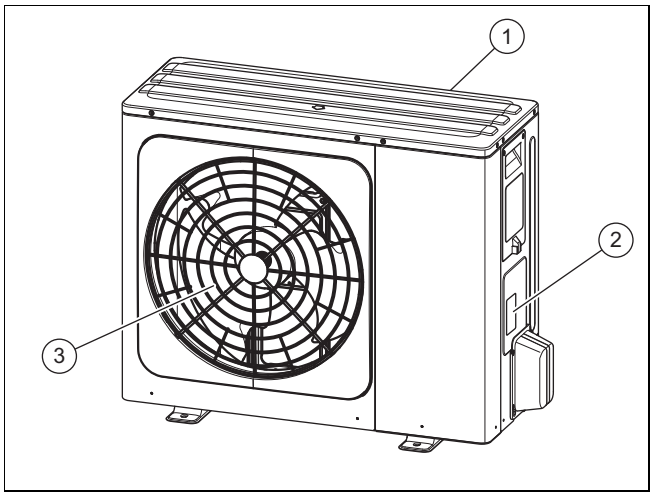
3.3 Noise reduction mode

A noise reduction mode can be activated for the product.

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

You can find additional information about noise reduction mode in the operating instructions for the indoor unit.

3.4 Product design



1	Air inlet grille	3	Air outlet grille
2	Data plate		

3.5 Data plate and serial number

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

The type designation is located on the data plate.

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 CE marking

CE

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.

3.7 Fluorinated greenhouse gases

The product contains fluorinated greenhouse gases.

3.8 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

4 Operation

4.1 Switching on the product

► Switch on the disconnector to which the product is connected in the building.

4.2 Operating the product

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

4.3 Guaranteeing frost protection

1. Ensure that the product is switched on and remains switched on.
2. Ensure that no snow accumulates around the air inlet grille and air outlet grille.

4.4 Switching off the product

1. Switch off the disconnector to which the product is connected in the building.
2. Guarantee the frost protection.

5 Care and maintenance

5.1 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.

5.2 Cleaning the product

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

5.3 Maintenance

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.

6 Troubleshooting

6.1 Eliminating faults

► If you observe a cloud of vapour on the product, you do not have to do anything. This effect may arise during the thawing process.

► If the product will no longer start up, check whether the power supply is interrupted. If required, switch on the disconnector in the building.

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

7 Decommissioning

7.1 Temporarily decommissioning the product

1. Switch off all of the disconnectors to which the product is connected in the building.
2. Protect the heating installation against frost.

7.2 Permanently decommissioning the product

► Have a competent person permanently decommission the product.

8 Recycling and disposal

This product is an electrical or electronic unit within the context of EU Directive 2012/19/EU. The unit was developed and manufactured using high-quality materials and components. These can be recycled and reused.

Find out about the regulations that apply in your country regarding the separate collection of waste electrical or electronic equipment. Correctly disposing of old units protects the environment and people against potential negative effects.

Disposing of the packaging

► Dispose of the packaging correctly.

► Observe all relevant regulations.

Disposing of the product

► Dispose of the product and its accessories correctly.
► Observe all relevant regulations.

If the product is labelled with this symbol:

► 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.

Deleting personal data

Personal data (e.g. online login details) may be misused by unauthorised third parties.

If the product contains personal data:

► Ensure that there is no personal data on or in the product before you dispose of the product.

8.1 Arranging disposal of refrigerant

The product is filled with R32 refrigerant.

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

9 Guarantee and customer service

9.1 Guarantee

დამამზადებლის გარანტიის შესახებ ინფორმაცია იხ. საკონტაქტო მისამართზე, რომელიც მითითებულია მეორე მხარეს.

9.2 Customer service

ჩვენი მომხმარებლის მხარდაჭერის სამსახურის თაობაზე საკონტაქტო ინფორმაცია იხ. მეორე მხარეს მოყვანილ მისამართზე ან მიყევით ბმულს: www.demirdokum.com.tr.

Installation and maintenance instructions

Contents

1 Safety

1.1 Intended use

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

The product is the outdoor unit for a air-to-water heat pump in a split design.

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

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit Without a back-up heater	Indoor unit With a back-up heater
HA 8-7.2 OS 230V B3	HA 10-7.2 WS 230V B1	HA 10-7.2 WS 230 V
HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

1.2.2 Risk caused by inadequate qualifications for the R32 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 R32 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.
▸ Note that the refrigerant is odourless.

1.2.3 Risk of death caused by fire or explosion if stored incorrectly

The product contains the flammable refrigerant R32. In the event of a leak in combination with an ignition source, there is a risk of fire and explosion.

▸ Only store the unit in rooms with no permanent ignition sources. Examples of such ignition sources include naked flames, a gas-fired boiler that is switched on, or an electric heater.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- 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 R32 refrigerant and set to ≤ 25% of the lower explosive limit.
- If you suspect that there may be a leak, extinguish all naked flames in the vicinity.
- If there is a leak that requires repairs to be carried out with a soldering process, follow the procedure described in the section "11 Repair and service".
- Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.

1.2.5 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Ensure that the refrigerant does not collect in a recess.
- Ensure that the refrigerant cannot get inside the building via building openings.

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- Only carry out the work if you are competent at handling R32 refrigerant.
- Wear suitable personal protective equipment and bring a fire extinguisher with you.
- Only use tools and units that are permitted for R32 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.
- The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

1.2.7 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 in overvoltage category III for full partition, e.g. fuse or circuit breaker).
- Secure against being switched back on again.
- Wait for at least 60 minutes until the capacitors have discharged.
- Check that there is no voltage.

1.2.8 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.

1.2.9 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.

1.2.10 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

1.2.11 Risk of material damage caused by using an unsuitable tool

- Use the correct tool.

1.2.12 Risk of material damage caused by using an unsuitable material

Unsuitable refrigerant pipes may cause material damage.

- Only use special copper pipes designed for refrigeration technology.

1.3 Regulations (directives, laws, standards)

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

2 Notes on the documentation

- ► 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.

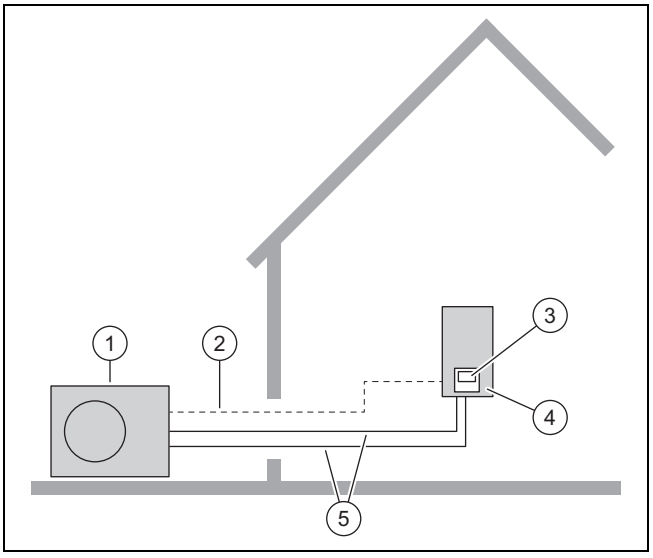
These instructions apply only to Georgia:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



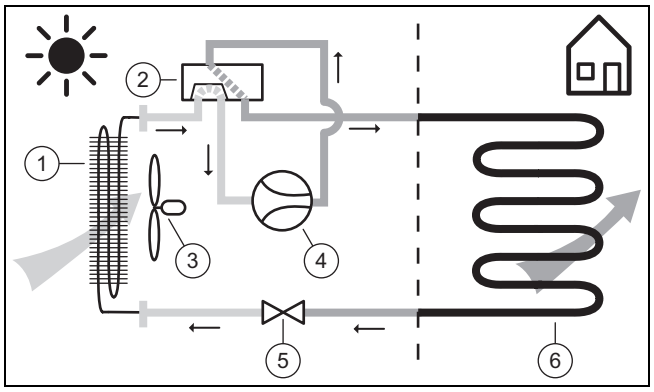
1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 Functions of the heat pump

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

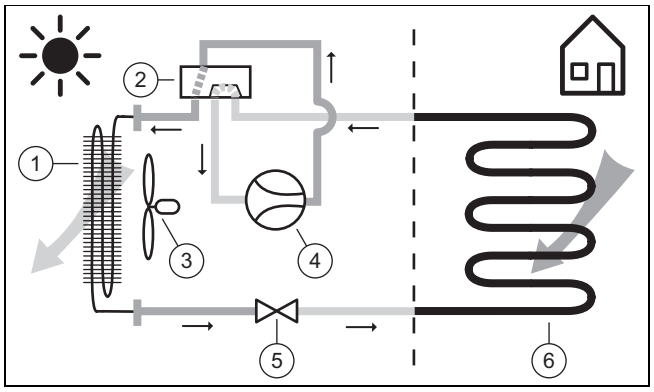
In heating mode, cyclic evaporation, compression, liquefaction and expansion take in heat energy from the surroundings and transfer it to the building. In cooling mode, heat energy is extracted from the building and released into the environment.

3.2.1 Operating principle in heating mode



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

3.2.2 Operating principle in cooling mode



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

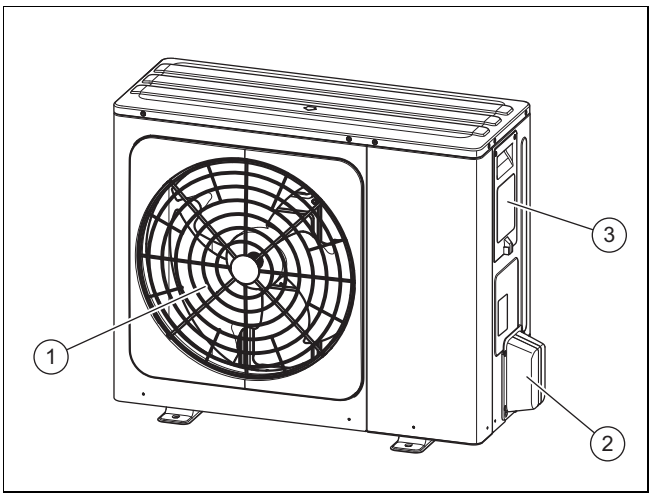
3.3 Description of the product

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

The outdoor unit is connected to the indoor unit via the refrigerant circuit.

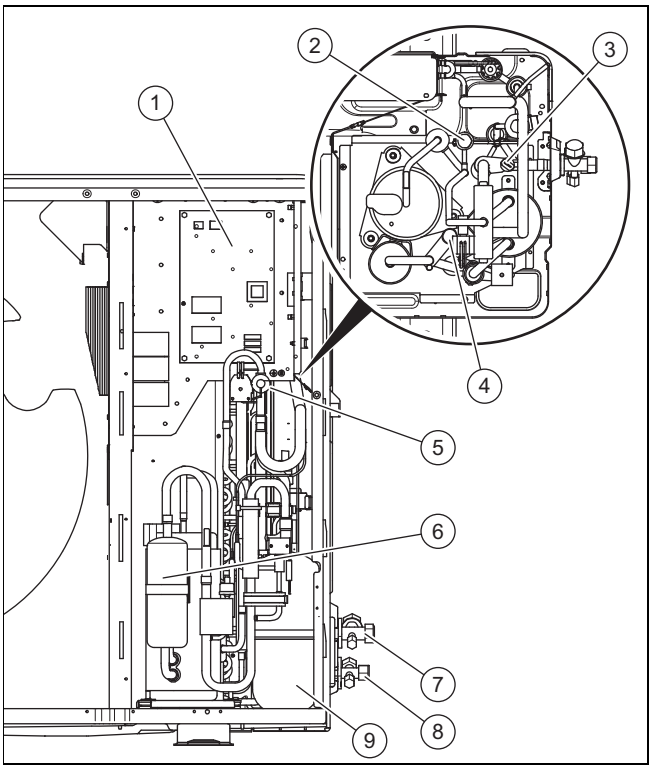
3.4 Product design

3.4.1 Unit



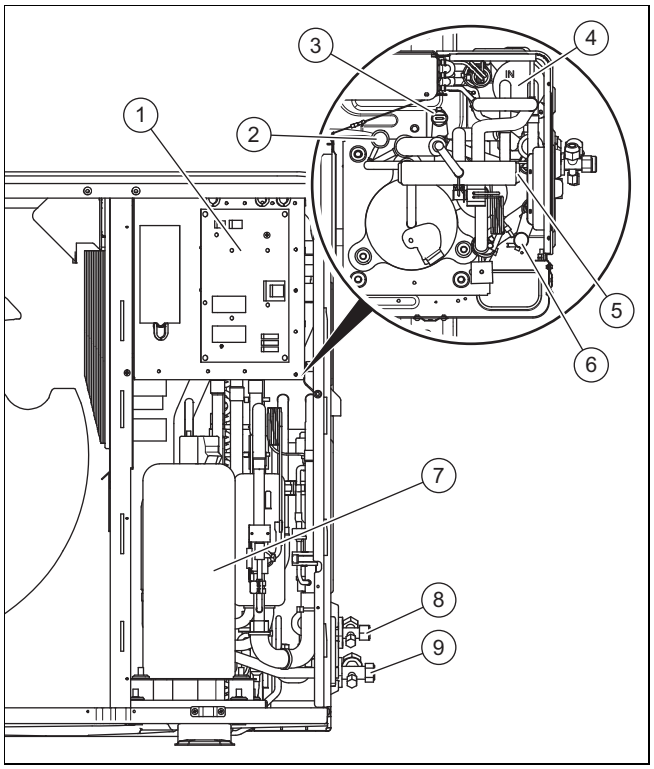
1	Air outlet grille	3	Cover for the electrical connections
2	Covering the connections for the refrigerant pipes		

3.4.2 8/10 kW functional elements



1	Control PCB	6	Compressor
2	High-pressure switch	7	Hot gas pipe isolation valve
3	Pressure sensor	8	Liquid pipe isolation valve
4	Low-pressure switch	9	Gas-liquid separator
5	4-port valve		

3.4.3 12/16 kW functional elements



1	Control PCB	6	Low-pressure switch
2	High-pressure switch	7	Compressor
3	High-pressure sensor	8	Liquid pipe isolation valve
4	Gas-liquid separator	9	Hot gas pipe isolation valve
5	4-port valve		

3.5 Serial number

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 Information on the data plate

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

Information	Meaning
HA ...	Nomenclature
DemirDöküm MaxiAir R32	Product name
xx Kw	Cooling output@35/W18
EER	Energy Efficiency Ratio@A35/W18 (energy efficiency ratio)
xx Kw	Heat output@35/W18
COP	Coefficient Of Performance@A7/W35 (coefficient of performance)
220–240 V ~ 50 Hz	Power supply
xx kW	Power consumption
xx kg	Net weight
R32	Refrigerant type
xx g	Refrigerant filling volume
GWP	Global Warming Potential (Global Warming Potential)
t CO_2	CO_2 equivalent
xx Pa	Maximum permissible pressure

Information	Meaning
COP /	Coefficient of performance/heating mode
IP	Protection class
	Reading the instructions

3.7 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

3.8 CE marking

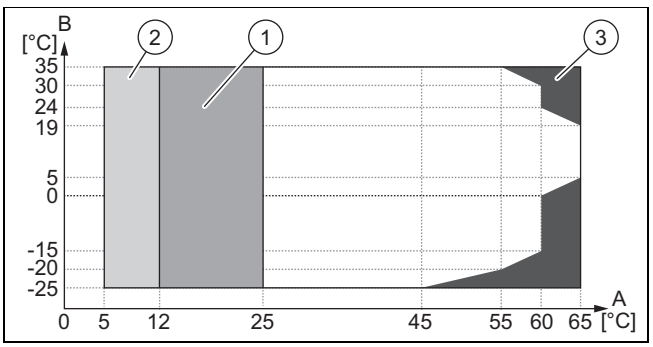
The CE marking shows that the products comply with the basic requirements of the applicable directives as stated on the declaration of conformity.

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

3.9 Application limits

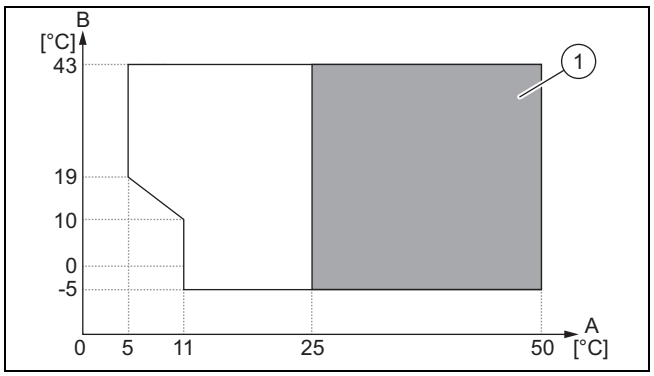
The product works between a minimum and maximum outdoor temperature. These outdoor temperatures define the application limits for the heating mode, domestic hot water mode and cooling mode. Operating outside of the application limits leads to the product switching off.

3.9.1 Heating mode



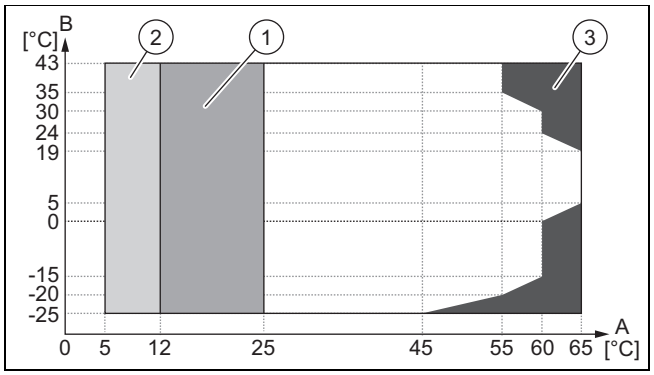
A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.9.2 Cooling mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature

3.9.3 DHW mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.10 Thawing mode

If the heat pump is running in heating mode, the condensate may freeze on the fins of the evaporator at low outdoor temperatures and frost may form. To increase efficiency, this frost is automatically detected and automatically defrosted at certain intervals by activating thawing mode.

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. Thawing mode takes 2–10 minutes, then the water is drained via the outdoor unit's drain.

The outdoor unit's fans do not run during thawing mode.

3.11 Safety devices

The product is equipped with technical safety devices.

High- and low-pressure switches regulate the pressure in the refrigerant circuit. If the pressure in the refrigerant circuit increases above the upper limit value (4.3 MPa (43 bar)) or falls below the lower limit value (0.14 MPa (1.4 bar)), the high- and/or low-pressure switch switches off and the compressor is stopped.

The compressor crankcase heating prevents refrigerant from mixing with compressor oil when the compressor is switched off.

The crankcase heating is regulated according to the outdoor temperature and the on/off condition of the compressor.

If the outdoor temperature is above 8 °C or the compressor is running, the crankcase heating is switched off.

The crankcase heating is switched on when the outdoor temperature is 8 °C or less and either

– The compressor has been switched off for more than three hours or
– The product has just been switched on (either manually or after a power cut).

If the temperature measured at the compressor outlet is higher than the permissible temperature (> 115 °C) , the compressor is switched off. The permissible temperature depends on the evaporation and condensation temperature.

In the indoor unit, the heating circuit's circulation water volume is regulated. The water flow rate switch detects the water flow rate in order to protect the compressor and the water pump in the event of an insufficient water flow rate. 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.

The Anti-Freeze Protection Control function protects the water-side heat exchanger against ice formation.

If the environmental temperature is below 3 °C in standby mode of heating/domestic hot water mode and the heating return or heating flow temperature or the water flow temperature of the additional heat source is below 5 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the environmental temperature is still below 3 °C and the water temperature is still below 5 °C, the heat pump switches to heating mode.

If, in cooling mode,

– the heating return temperature or
– the heating flow temperature or
– the heating flow temperature of the auxiliary heat source

is below 4 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the water temperature is still below 4 °C, the heat pump switches to heating mode.

If the heating flow temperature is below 2 °C in standby mode for the heating/domestic hot water mode, the heat pump stops and the water pump continues to run for 30 minutes. If the heating flow temperature is still below 2 °C, the heat pump switches to frost protection in heating mode.

4 Set-up

4.1 Unpacking the product

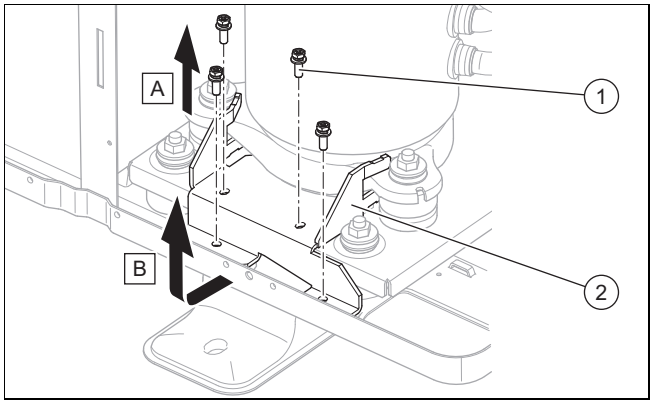
1. Remove the outer packaging parts.
2. Remove the accessory.
3. Remove the documentation.
4. Remove the screws from the pallet.
5. Remove the protective cardboard from the evaporator.

4.1.1 Remove the transport protection from the compressor (12/16 kW outdoor units only)

Note

If the compressor runs with the transport protection installed, this leads to abnormal vibrations and noises from the heat pump.

1. Remove the top casing and the right-hand front casing. (→ Section 4.10).
2. Remove the noise control cover from the compressor.



3. Remove the four screws **(1)**.
4. Remove the transport protection **(2)**.
5. Reattach the noise control cover for the compressor.

4.2 Checking the scope of delivery

► Check the contents of the packaging units.

Quantity	Designation
1	Product
1	Connection pipe for condensate discharge
1	Enclosed documentation

4.3 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.

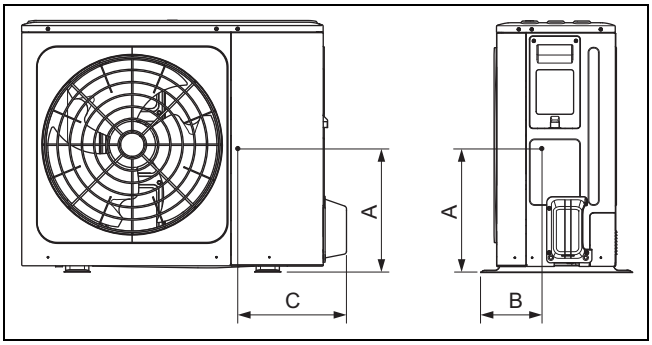
- ► Note the weight of the product.
- ► Lift the product with three people.

Caution.
Risk of material damage caused by incorrect transport.

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.

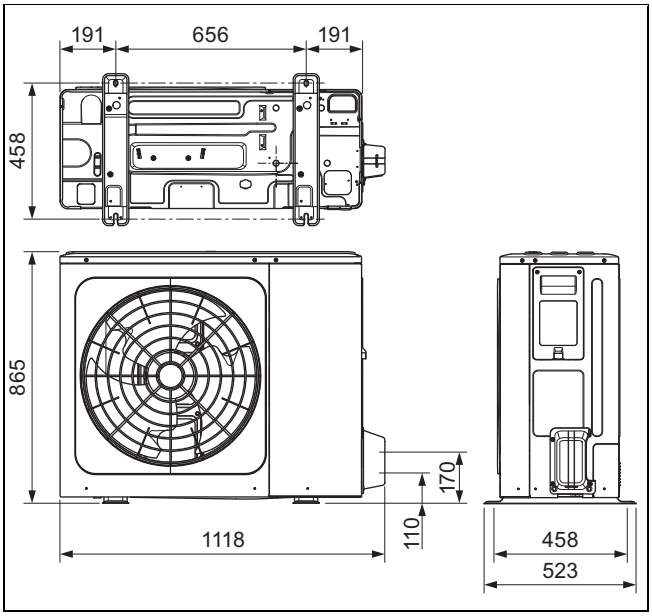
- ► During transport, do not tilt the product by any more than the maximum angle of 45°.

- ► Protect the casing sections against damage.
- ► Use carrying straps or a hand truck. In doing so, note the product's centre of gravity:



Type	A	B	C
8–10 kW	350	220	560
12–16 kW	355	275	520

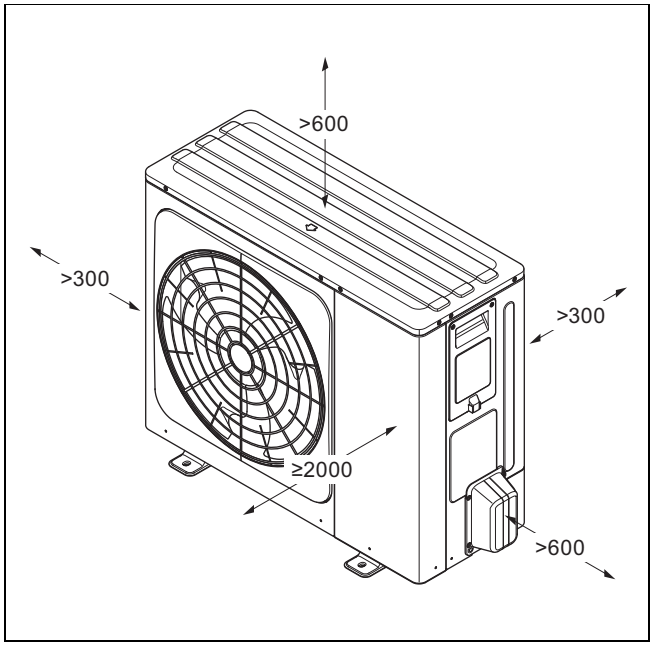
4.4 Dimensions



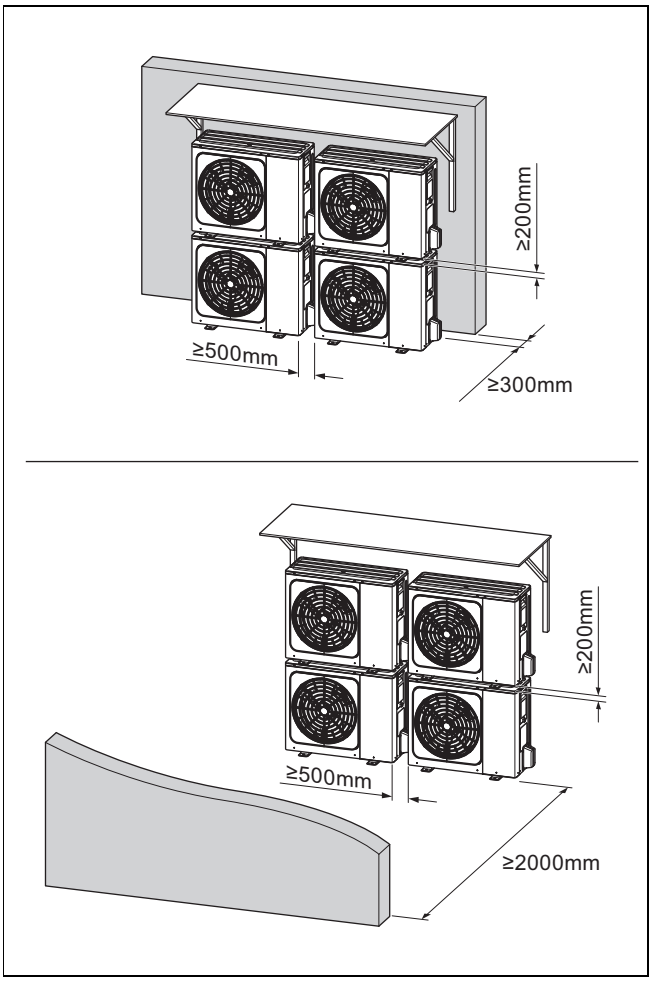
4.5 Complying with minimum clearances

- ► 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.

4.5.1 Individual installation



4.5.2 Installation on top of each other

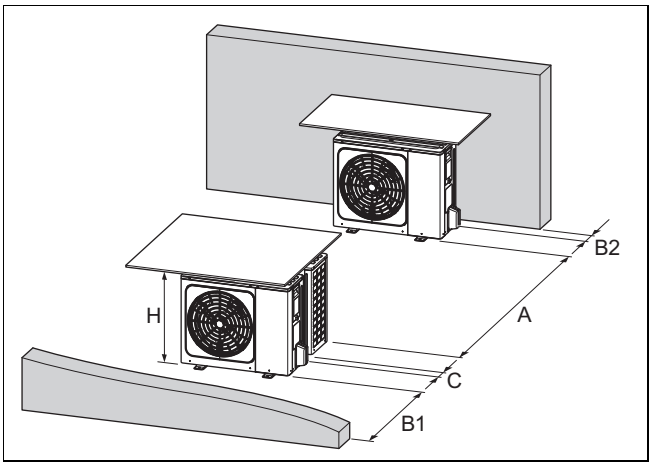


Note

If you install the products on top of each other, you must install the condensate discharge pipe to prevent condensate from discharging into the heat exchanger.

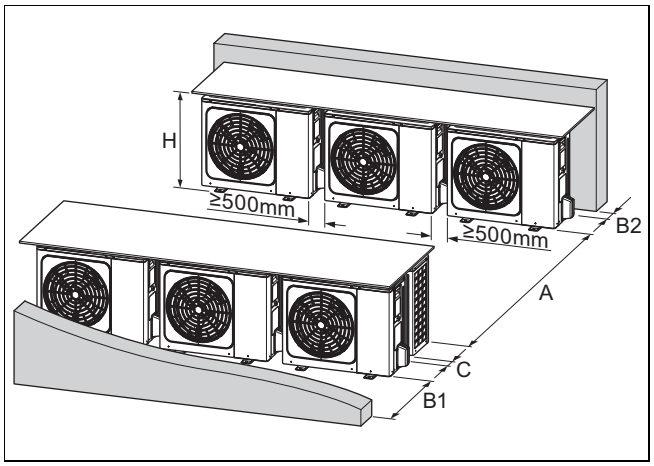
4.5.3 Multi-row installation

One product



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 150	≥ 600

Multiple products



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 300	≥ 600

4.6 Requirements for the installation site

Danger!

Risk of injury due to ice formation.

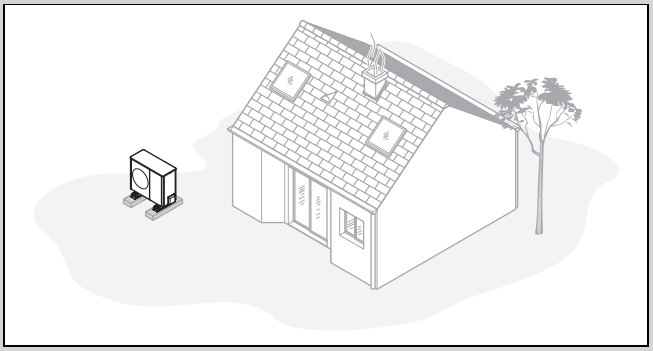
The air temperature at the air outlet is below the outdoor temperature. This can lead to ice formation.

- ► 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.
- ► The product can be set up in a coastal region or at protected areas close to the coastline. We recommend maintaining a minimum distance of 1.5 km from the coastline. In the immediate vicinity of the coastline, a protection device that sufficiently protects the product against spraying water and sea wind must also be installed. In doing so, the minimum clearances must be complied with.
- ► Observe the permissible height difference between the outdoor unit and indoor unit.
- ► Keep away from flammable substances or flammable gases.
- ► Keep away from heat sources.
- ► Avoid using preloaded extract air.
- ► Keep away from ventilation openings and extract-air shafts.
- ► Keep away from deciduous trees and shrubs.
- ► Do not expose the outdoor unit to dusty air.
- ► Do not expose the outdoor unit to corrosive air. Keep away from animal stalls or stables.
- ► Please note that the installation site must be below 2000 m above sea level.
- ► Please note the noise emissions. Select an installation site that is as far away from your own bedroom as possible.
- ► Please note the noise emissions. Select an installation site that is as far away from the windows of adjacent building as possible.
- ► Select an installation site that is easily accessible so that maintenance and service work can be carried out.

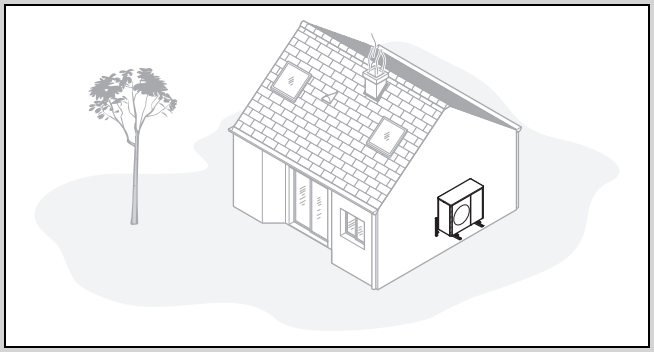
- If the installation site is adjacent to a vehicle shunting area, protect the product using ram protection.
- If the installation site is located in a region that is prone to snow, select a weather-protected installation site. If required, plan additional weather protection. In doing so, note the potential effects on the noise emissions.
- If you set up the unit in a location where it is exposed to strong winds, pay particular attention to the fact that strong winds of 5 m/s or more blowing against the unit's air outlet may cause a short circuit (extraction of the extract air). This may have the following effects:
  - Deterioration in operating performance.
  - Frequent switching on of the heating mode for frost protection.
  - Interruption to operation due to high pressure.
  - Motor burnout.
- If a strong wind is constantly blowing on the front of the unit, the fan can rotate very quickly until it breaks.
- The outdoor temperature is measured by the outdoor unit's temperature sensor and may be influenced by direct sunlight. Therefore, place the outdoor unit in the shade or erect a canopy.

Validity: Ground installation



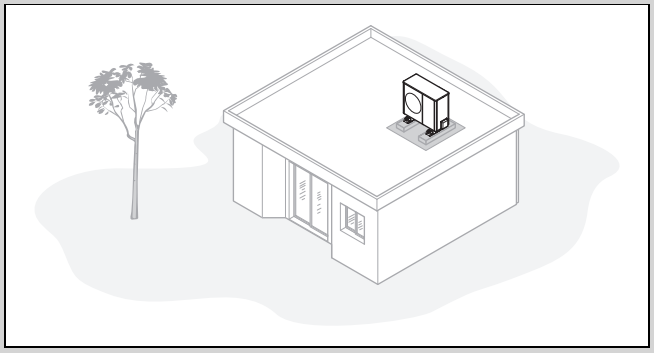
- Avoid choosing an installation site that is in the corner of a room, between walls or between fences.
- Prevent the return intake of air from the air outlet.
- Ensure that water cannot collect on the subsoil.
- Ensure that the subsoil can absorb water well.
- Plan a bed of gravel and rubble for the 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 sites between walls.
- Select an installation site with excellent sound absorption thanks to grass, hedges or 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.

Validity: Wall installation



- Ensure that the wall fulfils the static requirements. Note the weight of 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.
- If the work on the product takes place at a height above 3 m, install technical fall protection.

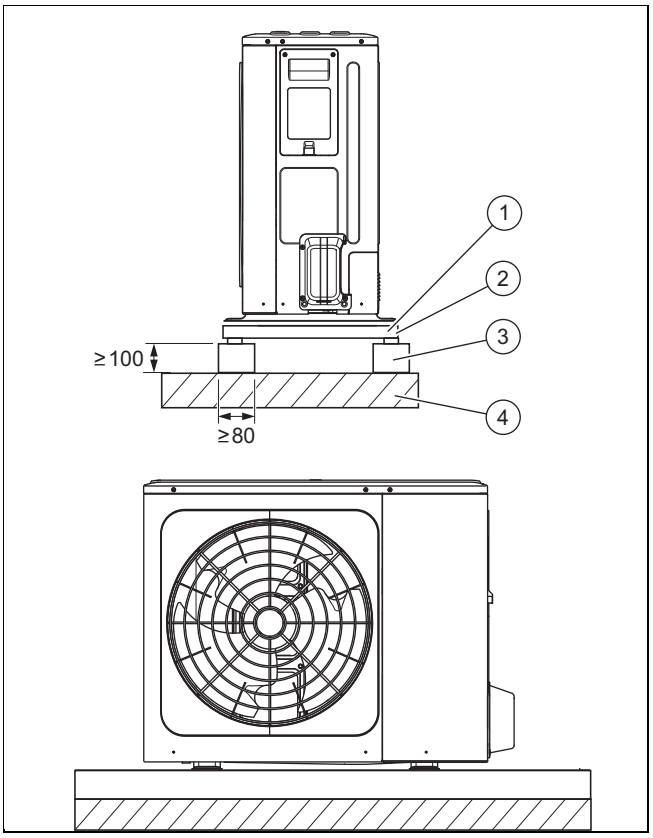
Validity: Flat-roof installation



- 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.

4.7 Planning the foundation

► Check the stability and evenness of the installation floor so that the product cannot cause any vibrations or noises during operation.

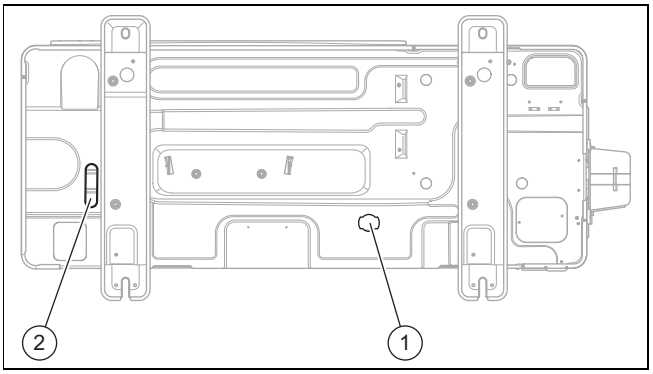


1	10 mm diameter expansion bolt	3	Concrete foundation
2	Shock-absorbing rubber mat	4	Fixed floor or canopy

► Tightly secure the product using four 10 mm diameter expansion bolts, nuts and washers.

► Screw in the expansion bolts until they have a clearance of 20 mm from the foundation surface.

Condensate discharge



1	Main drain opening	2	Large drain opening

All condensate from the outdoor unit is collected at the unit base and drains away via the main drain opening.

The larger drain opening is sealed with a rubber stopper. If the main drain opening is not sufficient for the condensate that is produced, also use the larger drain opening.

► If the water cannot drain at low temperatures, even when the large drain opening is open, install an electric heating belt. The electric heating belt acts as trace heating to prevent the formation of ice or to melt the ice that has formed.

4.8 Guaranteeing occupational safety

Validity: Wall installation

► Ensure that the installation position on the wall can be safely accessed.

► If the work on the product takes place at a height above 3 m, install technical fall protection.

► Observe the local laws and regulations.

Validity: Flat-roof installation

► Ensure that the flat roof can be safely accessed.

► Maintain a safety area of 2 m to the fall edge, plus the clearance that is required for working on the product. The safety area must not be entered.

► Alternatively, 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.

4.9 Installing the product

Danger!

Risk of injury due to frozen condensate.

Frozen condensate on paths may cause falls.

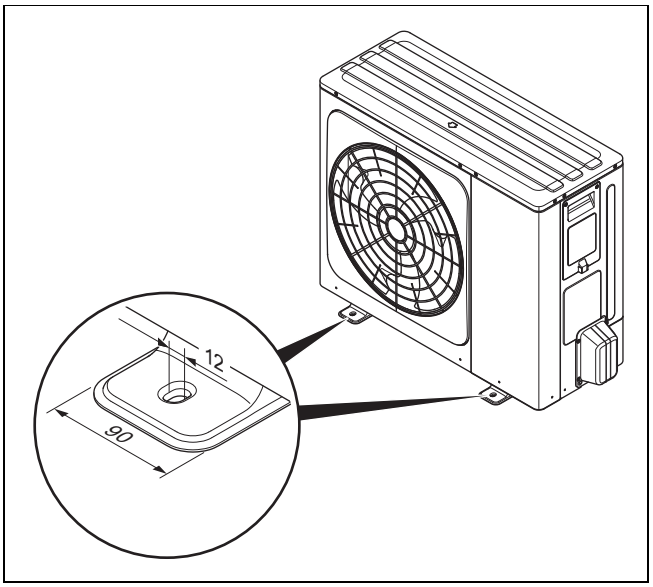
► Ensure that condensate does not discharge onto paths and that ice cannot build up there.

Note

Install rubber feet under the outdoor unit to prevent vibrations and noise. Recommendations for the rubber feet:

- Thickness: 50 mm to 100 mm

- Material: CR



Condition: Region prone to snow

- If required, set up additional weather protection. In doing so, note the potential effects on the noise emissions.

Validity: Ground installation

- Use the appropriate products, depending on the required installation type.
  - Damping feet
  - Raised base and damping feet
- Align the product horizontally.

Condition: Region without ground frost

- Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate.

Condition: Region with ground frost

- Do not install a condensate discharge pipe or any plugs in the floor plate.
- If required, protect the product's air inlet and air outlet against driving rain or direct snowfall. In doing so, note the potential effects on the noise emissions.

Validity: Wall installation

- Check the design and load-bearing capacity of the wall. Note the weight of the product.
- Use a unit mounting bracket that is suitable for the wall installation.
- Use the damping feet.
- Align the product horizontally.

Condition: Region without ground frost

- Below the product, create a gravel bed into which any condensate can drain.

Condition: Region with ground frost

- Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate.

Validity: Flat-roof installation

Warning.
Risk of injury due to toppling over in the wind.

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

- Use two concrete bases and an anti-slip protective mat.
- Screw the product to the concrete base.

- Use the damping feet.
- Align the product horizontally.

Condition: Region without ground frost

- Leave the condensate discharge open. In this case, the condensate drains onto the flat roof.
- Alternatively, connect drain pipework.
- To do this, install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate for this.

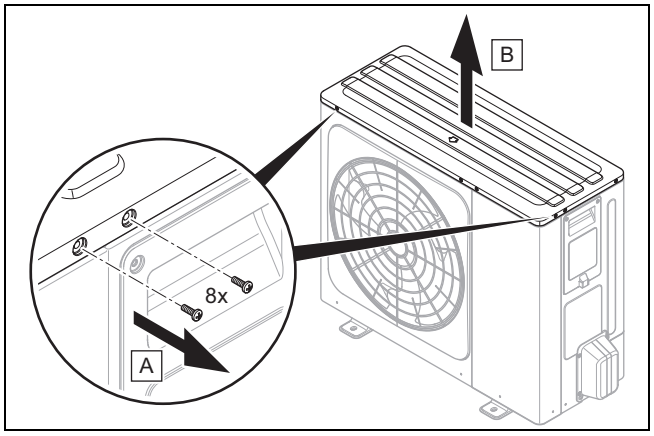
Condition: Region with ground frost

- Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- If required, seal other openings in the floor plate.
- Connect the condensate discharge pipe to a downpipe over a short distance.

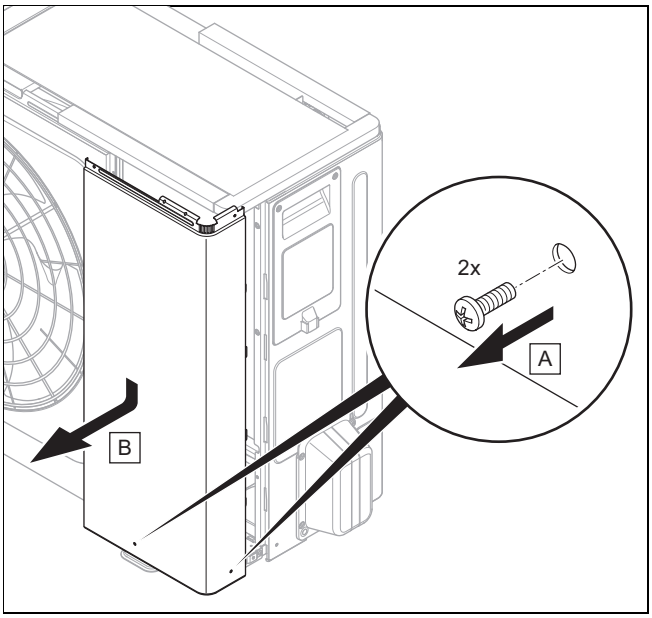
4.10 Removing/installing the casing sections

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

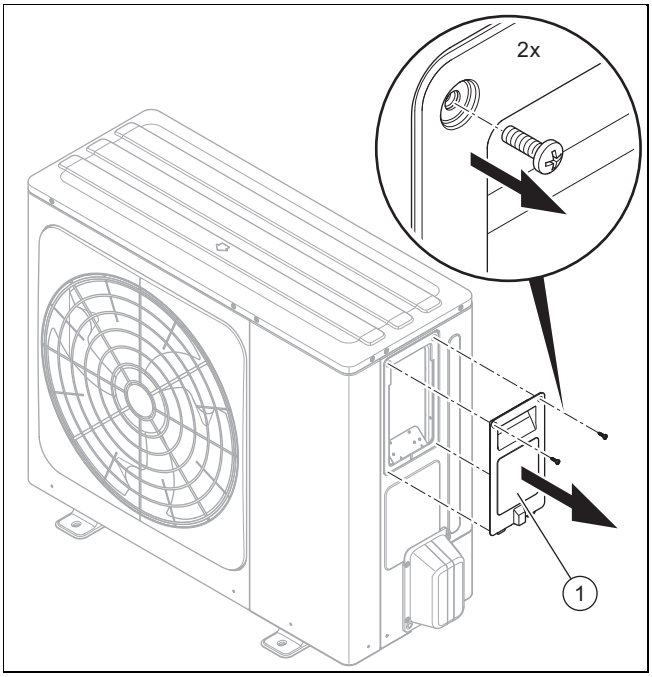
4.10.1 Removing the top casing



4.10.2 Removing the right-hand front casing



4.10.3 Removing the top casing for the electrical connections



5 Hydraulics installation

5.1 Preparing work on the refrigerant circuit

1. Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of injury and risk of environmental damage due to escaping refrigerant.

Touching any escaping refrigerant may cause injury. Escaping refrigerant leads to environmental damage if it reaches the atmosphere.

- ► Only carry out work on the refrigerant circuit if you have been trained to do so.

Caution.

Risk of material damage when extracting refrigerant.

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

- ► Ensure that heating water flows through the indoor unit's condenser or it is completely drained when extracting refrigerant on the secondary side.

2. The outdoor unit is pre-filled with R32 refrigerant. Determine whether additional refrigerant is required.
3. Ensure that the two isolation valves are closed.
4. Purchase suitable refrigerant pipes in accordance with the technical data.
5. Ensure that the refrigerant pipes that are used comply with these requirements:

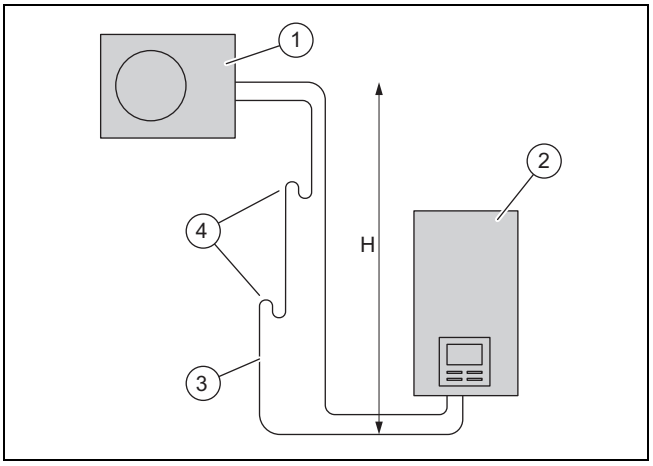
- Special copper pipes for the refrigeration technology
- Thermal insulation
- Weather resistance and UV resistance.
- Protection against rodent bites.
- Flaring with 90° flare in accordance with the SAE standard

6. Keep the refrigerant pipes blocked until they are installed.
7. Ensure that there is no dirt or water in the refrigerant pipes before you connect the refrigerant pipes to the outdoor unit and indoor unit.
8. Prevent the ingress of metal chips, dirt or moisture into the refrigerant pipes.
9. Purchase the necessary tools and equipment:

Always required	May be required
– Flaring tool for 90° flare – Torque spanner – Refrigerant fitting – Nitrogen cylinder – Vacuum pump – Vacuum gauge	– Refrigerant cylinder with R32 – Refrigerant scales

5.2 Requirements for routing the refrigerant pipes

5.2.1 Case 1: Outdoor unit raised

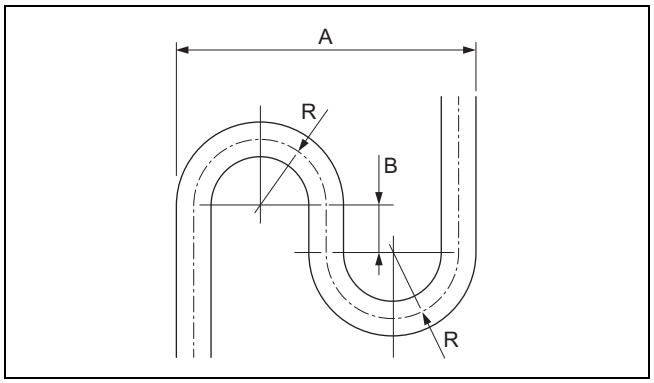


1 Outdoor unit
2 Indoor unit
3 Hot gas pipe
4 Oil elevation elbow

The outdoor unit can be installed up to a maximum height difference H of 20 m above the indoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. Depending on the height difference, oil elevation elbows must be installed in the hot gas pipe. The height difference between the oil elevation elbows must not exceed 7 m.

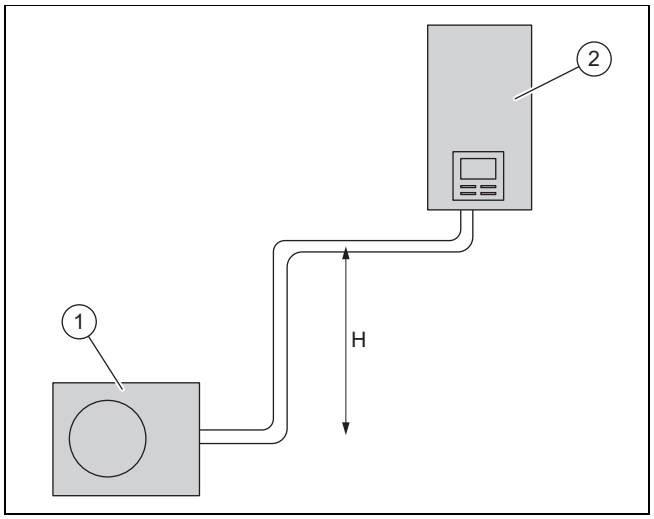
Height H	Oil elevation elbow
Up to 7 m	No oil elevation elbow required
Up to 14 m	One oil elevation elbow at 7 m high
Up to 20 m	Two oil elevation elbows, one 7 m and one 14 m in height

The oil elevation elbow must comply with these geometric requirements:



A 173 mm
B 40 mm
R 40 mm

5.2.2 Case 2: Indoor unit raised



1 Outdoor unit
2 Indoor unit

The indoor unit can be installed up to a maximum height difference H of 20 m above the outdoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. No oil elevation elbow is required.

5.3 Flare connection

The flare connection guarantees the tightness of the refrigerant pipe for the R32 refrigerant.

If a flare connection comes loose again, the old flare must then be disconnected, and a new flare must be established. The refrigerant pipe is therefore shortened slightly. This must be taken into consideration when routing the refrigerant pipes.

5.4 Routing refrigerant pipes to the product

Validity: Ground installation

► Route the refrigerant pipe through the safety pipe in the ground.

1. Route the refrigerant pipes in the wall duct with a slight downward gradient to the outside.
2. Route the refrigerant pipe centrally through the wall duct without the lines touching the wall.
3. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.

Validity: Wall installation

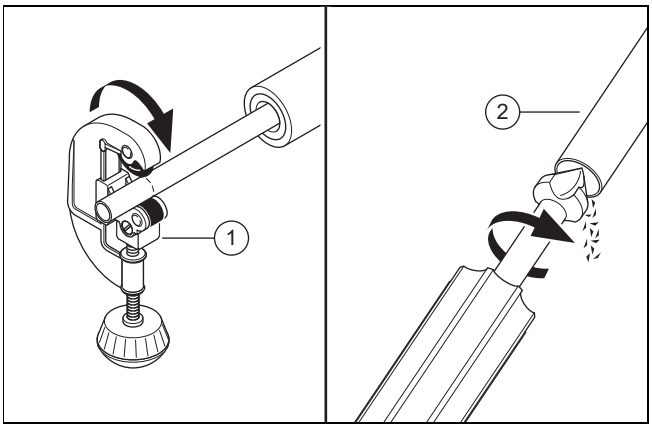
- ► Ensure that the refrigerant pipes do not come into contact with the wall and the product's casing sections.

5.5 Routing refrigerant pipes in the building

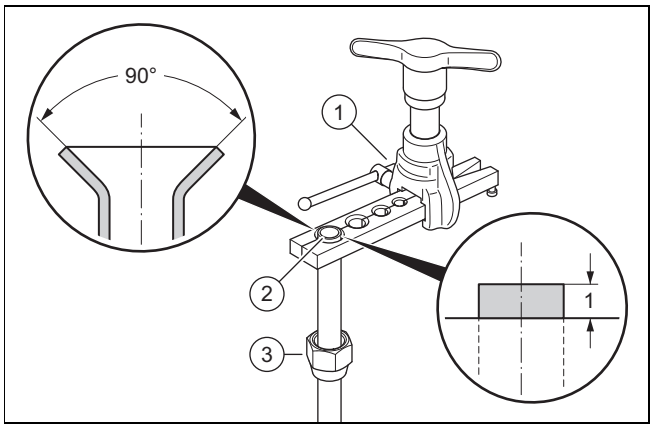
1. Do not route the refrigerant pipes in screed or masonry in the building. If this is unavoidable, install a silencer in the refrigerant pipe.
2. Do not route the refrigerant pipes through living rooms in the building.
3. Limit the routing of refrigerant pipes to a minimum. Avoid unnecessary piping and elbows.
4. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.
5. Bend the refrigerant pipes at the right angle to the wall and avoid mechanical tension during the routing.
6. Ensure that the refrigerant pipes do not come into contact with the wall.
7. Use wall brackets with rubber insert to secure these. Place the wall brackets around the thermal insulation of the refrigerant pipe.
8. Check whether oil elevation elbows are required. (→ Section 5.2.1)
9. If required, install oil elevation elbows in the hot gas pipe.
10. Ensure that the routed refrigerant pipes are protected against damage.

5.6 Cutting the pipes to length and flaring the pipe ends

1. Keep the pipe ends downwards when working on them.
2. Prevent the ingress of metal chips, dirt or moisture.

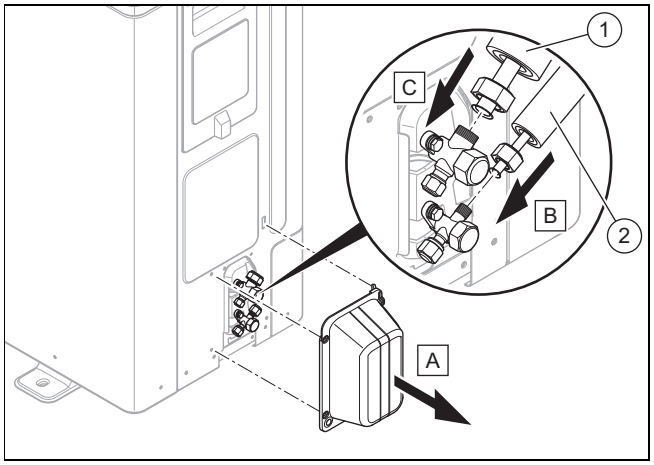


3. Cut the copper pipe to length at a right angle using a pipe cutter **(1)**.
4. Deburr the inside and outside of the pipe end **(2)**. Remove all chips carefully.
5. Unscrew the flare nut on the associated isolation valve.



6. Slide the flare nut **(3)** onto the pipe end.
7. Use a flaring tool for the 90° flare in accordance with the SAE standard.
8. Insert the pipe end into the appropriate die matrix in the flaring tool **(1)**. Allow the pipe end to protrude by 1 mm. Clamp the pipe end.
9. Widen the pipe end **(2)** using the flaring tool.

5.7 Connecting the refrigerant pipes



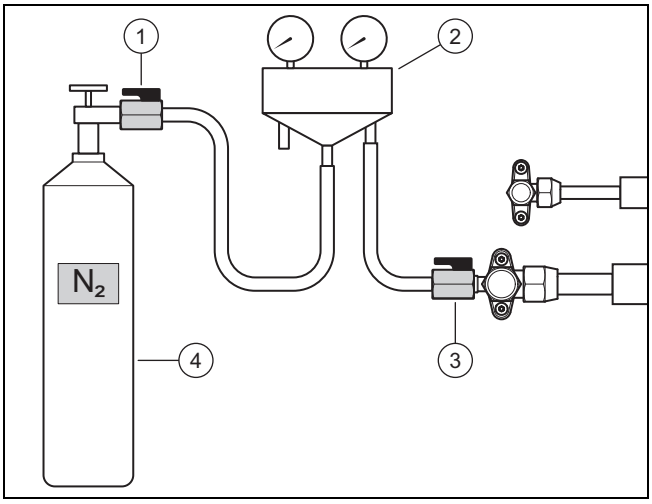
1. Remove the cover for the refrigerant pipe connections.
2. Remove the flare nut from the connections for the refrigerant pipes.
3. Cut the pipes to the correct length and flare the pipe ends. (→ Section 5.6).
4. Connect the liquid pipe **(2)** and the hot gas pipe **(1)**.
5. Tighten the flare nut. Use pliers to hold the isolation valve in place while doing so.

Pipeline	Pipe diameter	Tightening torque
Liquid pipe	3/8"	25 to 26 Nm
Hot gas pipe	5/8"	45 to 47 Nm

6. Ensure that the flare connections remain accessible for maintenance purposes.

5.8 Checking the refrigerant circuit for tightness

1. Ensure that the two isolation valves on the outdoor unit are still closed.
2. Observe the maximum operating pressure in the refrigerant circuit.



3. Connect a refrigerant fitting **(2)** with a ball valve **(3)** to the maintenance connection for the hot gas pipe.
4. Connect the refrigerant fitting with a ball valve **(1)** to a nitrogen cylinder **(4)**. Use dry nitrogen.
5. Open both of the ball valves.
6. Open the nitrogen cylinder.
   – Test pressure: 4.3 MPa (43 bar)
7. Close the nitrogen cylinder and the ball valve **(1)**.
   – Waiting time: 10 minutes
8. Check all of the connections in the refrigerant circuit for tightness. Use leak detection spray for this.
9. Observe whether the pressure is stable.

   Result 1:

   The pressure is stable and no leaks were found:
   ► Completely drain the nitrogen gas via the refrigerant fitting.
   ► Close the ball valve **(3)**.

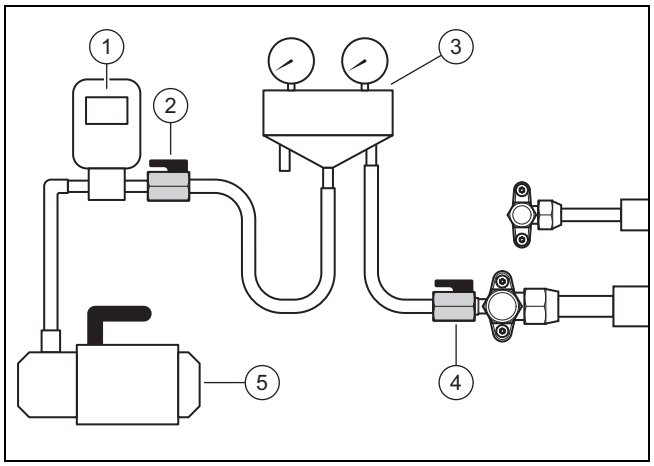
   Result 2:

   The pressure drops or a leak is found:
   ► Eliminate the leakage.
   ► Repeat the test.

5.9 Evacuating the refrigerant circuit

Note
During evacuation, residual moisture is removed from the refrigerant circuit at the same time. The length of the process depends on the residual moisture and the outdoor temperature.

1. Ensure that the two isolation valves on the outdoor unit are still closed.



2. Connect a refrigerant fitting **(3)** with a ball valve **(4)** to the maintenance connection for the hot gas pipe.
3. Connect the refrigerant fitting with a ball valve **(2)** to a vacuum gauge **(1)** and a vacuum pump **(5)**.
4. Open both of the ball valves.
5. **First test**: Switch on the vacuum pump.
6. Drain the refrigerant pipes and the condenser on the indoor unit.
   – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
   – Running time of the vacuum pump: At least 30 minutes
7. Switch off the vacuum pump.
   – Waiting period: 3 minutes
8. Check the pressure.

   Result 1:

   Pressure is stable:
   ► The first test is complete. Start with the second test.

   Result 2:

   The pressure increases and there is a leak:
   ► Check the flare connections on the outdoor unit and indoor unit. Eliminate the leakage.
   ► Start with the second test.

   Result 3:

   The pressure increases and there is residual moisture:
   ► Carry out the drying process.
   ► Start with the second test.
9. **Second test**: Switch on the vacuum pump.
10. Drain the refrigerant pipes and the condenser on the indoor unit.
    – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
    – Running time of the vacuum pump: At least 30 minutes
11. Switch off the vacuum pump.
    – Waiting period: 3 minutes
12. Check the pressure.

    Result 1:

    Pressure is stable:
    ► The second test is complete. Close the ball valves **(2)** and **(4)**.

    Result 2:

    The pressure increases.
    ► Repeat the second test.

5.10 Permissible total refrigerant volume

The outdoor unit is filled with refrigerant at the factory:

Product	Factory-set refrigerant volume	Refrigerant
8 kW, 10 kW	1.65 kg	R32
12 kW, 16 kW	1.84 kg	R32

Depending on the length of the refrigerant pipes, an additional refrigerant volume must be filled during the installation (→ Section 5.11).

The total permissible refrigerant volume is limited and depends on the minimum room size at the installation site for the indoor unit.

The requirements for the minimum room size at the indoor unit's installation site are described in the installation instructions for the indoor unit. For a total fill quantity of over 1.84 kg, the required installation room must be considerably larger.

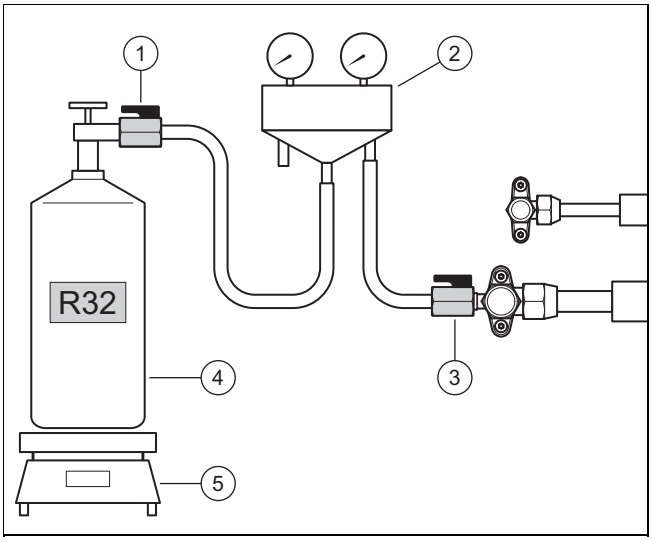
5.11 Adding additional refrigerant

Danger!
Risk of injury due to escaping refrigerant.
Touching any escaping refrigerant may cause injury.
► Wear personal protective equipment.

1. Determine the single length of the refrigerant pipe.
2. Calculate the required volume of additional refrigerant:

Single length	Refrigerant volume to be topped up
≤ 15 m	None
> 15 m	38 g for every additional metre above 15 m

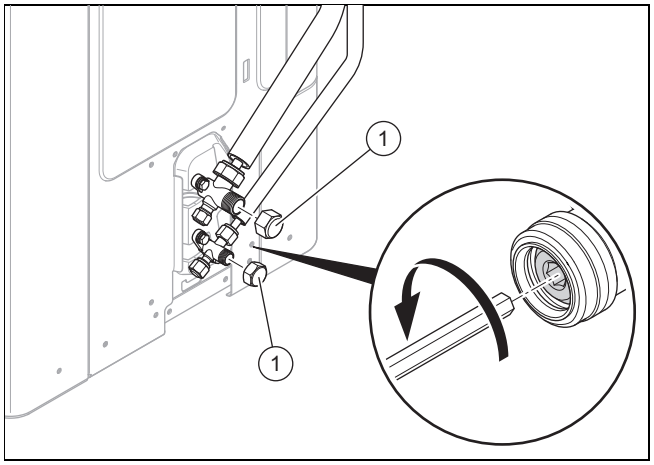
3. Ensure that the two isolation valves on the outdoor unit are still closed.



4. Connect the refrigerant fitting **(2)** with the ball valve **(1)** to a refrigerant cylinder **(4)**.
   – Refrigerant to be used: R32
5. Put the refrigerant cylinder on the scales **(5)**. If the refrigerant cylinder does not have an immersion sleeve, put it on the scales upside down.
6. Leave the ball valve **(3)** closed. Open the refrigerant cylinder and the ball valve **(1)**.
7. If the hoses have been filled with refrigerant, set the scales to zero.
8. Open the ball valve **(3)**. Fill the outdoor unit with the calculated refrigerant volume.
9. Close both of the ball valves.
10. Close the refrigerant cylinder.

5.12 Releasing the refrigerant

Danger!
Risk of injury due to escaping refrigerant.
Touching any escaping refrigerant may cause injury.
► Wear personal protective equipment.



1. Remove both covering caps **(1)**.
2. Unscrew both hexagon socket screws as far as they will go.
   ◁ The refrigerant flows into the refrigerant pipes and the indoor unit's condenser.
3. Check that no refrigerant is escaping. Check in particular all of the screwed connections and valves.
4. Screw on both covering caps. Tighten the covering caps.

5.13 Completing work on the refrigerant circuit

1. Note down the refrigerant volume added at the factory, the additional refrigerant volume added and the total refrigerant volume on the sticker on the product.
2. Enter the data in the service book.
3. Insulate and secure the refrigerant pipes after you have connected the connection cable (→ Section 6.8).
4. Install the cover for the refrigerant pipe connections.

6 Electrical installation

6.1 Precautionary measures when working on electrical wires

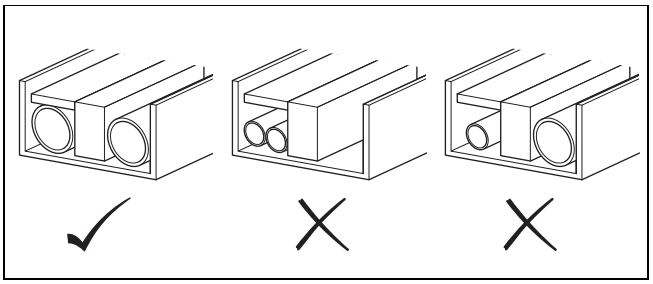
Danger!

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.

- ► Carry out the on-site wiring in accordance with the wiring diagram supplied and the instructions below.
- ► Install a main switch or other partition with all-pole contact separation in the fixed wiring. In doing so, observe the applicable local laws and regulations.
- ► Switch off the power supply before implementing any connections.
- ► Use a 3-core, shielded copper cable.
- ► Never crush bundled cables.
- ► Secure the cables in such a way that they do not come into contact with the pipelines or sharp edges.
- ► Ensure that no pressure is exerted on the terminal connections.
- ► Use a separate power supply for the product. Never use a power supply that is shared by another product.
- ► Ensure that it is earthed. Do not earth the unit via a supply pipe, overvoltage protection or the telephone earth.
- ► Install a type B residual-current circuit breaker with 30 mA (<0.1 s).
- ► Do not install a phase advance capacitor as this can impair the function of the capacitor.



- ► Route the wires in accordance with the figure.
- ► Do not connect any wires with different cross-sections to the same power supply terminal.
- ► Secure the electrical wires using cable ties so that they do not come into contact with the pipelines, especially on the high-pressure side.

6.2 Precautionary measures when connecting the power supply

- ► Use round conductor end sleeves for the connection to the terminal block for the power supply. If, for unavoidable reasons, these cannot be used, observe the following instructions.
- ► Use the specified wires for the wiring.
- ► Do not connect any wires with different cross-sections to the same power supply terminal (loose connections may lead to overheating).
- ► Use the correct screwdriver to tighten the terminal screws.
- ► Connect a residual-current circuit breaker and a fuse to the power supply cable.
- ► Establish complete connections and secure the wires in such a way that no external forces can act on the terminals.
- ► Ensure that a tolerance of +10% to -15% is maintained for the mains voltage of the single-phase 230 V mains.

6.3 Requirement for the safety device

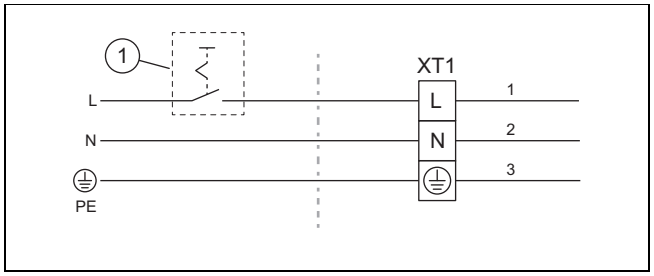
- ► Select the minimum required cable cross-section for each product individually using the tables (→ Appendix D).
- ► Select a residual-current circuit breaker that has a contact gap of at least 3 mm and which enables complete shutdown. Use the value for the maximum amperage to select current and residual-current circuit breakers (→ Appendix D).

6.4 Preparing the electrical connection

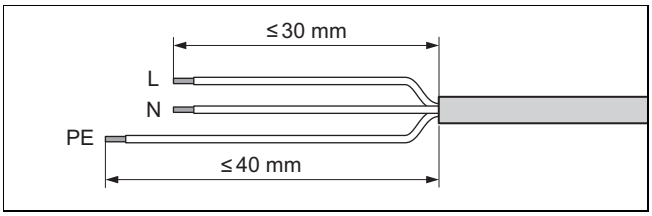
- ► Remove the top casing for the electrical connections. (→ Section 4.10.3)

6.5 Establishing the power supply

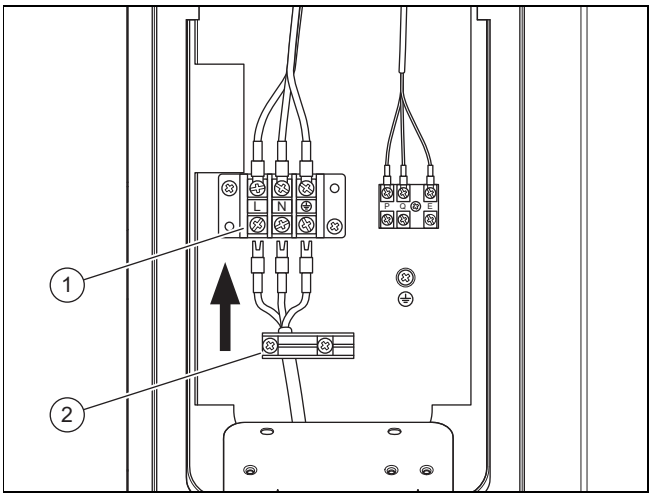
1. If it is stipulated for the installation site, install one residual-current circuit breaker for the product.



2. Install a disconnector **(1)** for the product in the building.
3. Use one 3-pole power supply cable.
4. Route the power supply cable from the building and through the wall duct to the product.
5. Route the power supply cable within the product in such a way that no contact is made with hot components.



6. Strip the power supply cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
7. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.



8. Connect the power supply cable to the power supply terminal **(1)**.
9. Secure the power supply cable using the strain relief clamp **(2)**.

6.6 Connecting the connection cable

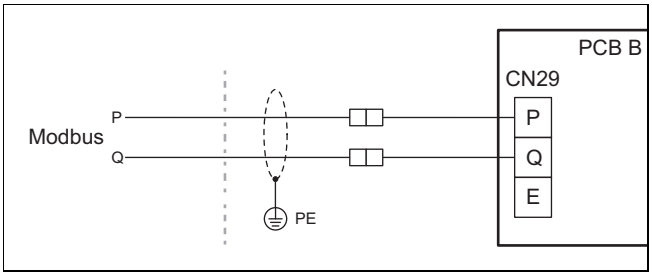
Note

The connection between the outdoor unit and the indoor unit is established via Modbus communication (RS-485 protocol).

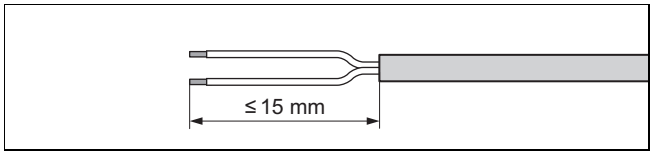
Preliminary work

1. Determine the line length between the indoor unit and outdoor unit.
2. Use a communication cable with the following properties:

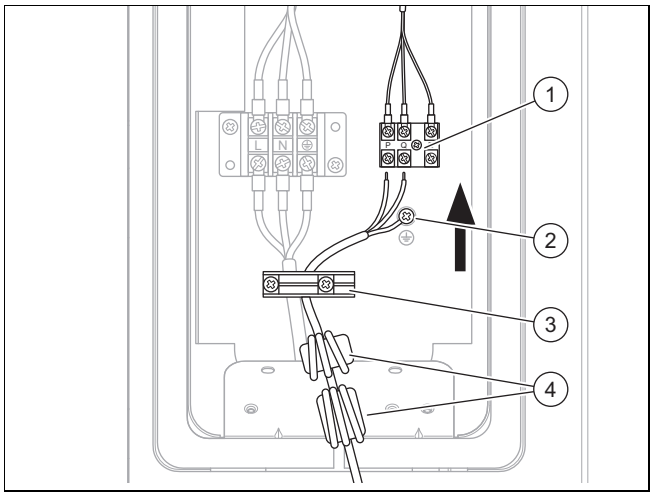
	Feature
Type	2 x shielded cable (AWG18)
Min. cross-section	0.75 mm²
Max. length	50 m



1. Ensure that connections P and Q on the indoor unit are connected to connections P and Q on the outdoor unit using the Modbus cable.
   - To do this, use a Modbus cable with different conductor colours for signals P and Q.
   - The shield braid for the communication cable must be earthed.
2. Route the Modbus cable from the building and through the wall duct to the product.
3. Route the Modbus cable within the product in such a way that no contact is made with hot components.



4. Strip the Modbus cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
5. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.

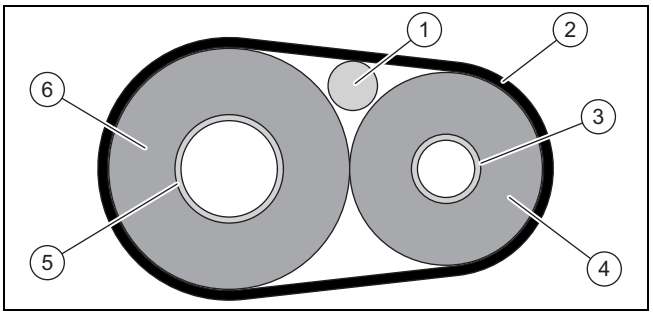


6. Position two ferrite rings **(4)** as shown in the figure.
7. Connect the two conductors on the Modbus cable to the screw terminal **(1)**. In doing so, check the assignment of the conductor colours to connections P and Q.
8. Connect the shield connection to the earthing terminal **(2)**.
9. Use the strain relief clamp **(3)** to secure the Modbus cable in place.

6.7 Completing the electrical connection

1. Check that the power supply cable and the Modbus cable are routed in such a way that they are not exposed to any wear, corrosion, tension, vibrations, sharp edges or any other unfavourable environmental influences.
2. Install the top casing.

6.8 Completing the installation of the outdoor unit



1	Connection cable	4	Liquid pipe insulation
2	Edging tape	5	Hot gas pipe
3	Liquid pipe	6	Hot gas pipe insulation

1. Insulate and secure the refrigerant pipes and the connection cable in accordance with the figure.
2. Install the protective cover for the refrigerant connection.

7 Start-up

7.1 Checking before switching on

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

7.2 Switching on the product

- ► Switch on the disconnector to which the product is connected in the building.

8 Handing over to the end user

8.1 Instructing the end user

- ► Explain to the end user how the product operates.
- ► 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 R32 refrigerant.
- ► Make the end user aware of the need for regular maintenance.

9 Troubleshooting

9.1 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).

10 Inspection and maintenance

10.1 Preparing for inspection and maintenance

- ► Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

- ► Only open the electronics box after a waiting period of 60 minutes.

- ► Observe the basic safety rules before carrying out inspection and maintenance work or installing spare parts.

- ► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
- ► Switch off the disconnector to which the product is connected in the building.
- ► Disconnect the product from the power supply but ensure that the product is still earthed.
- ► Before working in the electronics box, comply with a waiting time of 60 minutes after switching off the power supply.
  - – An LED on the PCB and the module PCB displays whether the PCBs are still supplied with power. If the LEDs no longer light up, the power supply is interrupted.
- ► When working on the product, protect all electric components from spraying water.

10.2 Observing the work plan and intervals

- ► Comply with the specified intervals. Carry out all of the work that is mentioned (Appendix D).

10.3 Procuring spare parts

The original components of the product were also certified by the manufacturer as part of the declaration of conformity. If you use other, non-certified or unauthorised parts during maintenance or repair work, this may result in the product no longer meeting the applicable standards, thereby voiding the conformity of the product.

We strongly recommend that you use original spare parts from the manufacturer as this guarantees fault-free and safe operation of the product. To receive information about the available original spare parts, contact the contact address provided on the back page of these instructions.

- ► If you require spare parts for maintenance or repair work, use only the spare parts that are permitted for the product.

10.4 Carrying out maintenance work

10.4.1 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.

10.4.2 Removing the casing sections

- ► Remove the casing sections to the extent required for the subsequent maintenance work (→ Section 4.10).

10.4.3 Cleaning the evaporator

1. Clean the gaps between the evaporator fins using a soft brush. In doing so, avoid bending the fins.
2. Remove any dirt and depositions.
3. If required, straighten out any bent fins using a fin comb.

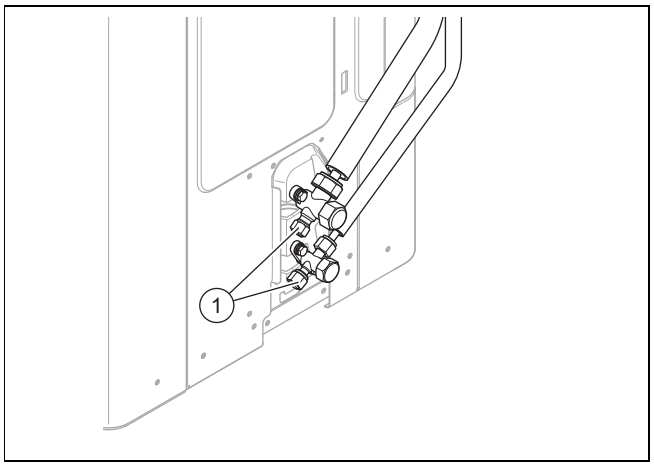
10.4.4 Checking the fan

1. Turn the fan by hand.
2. Check that the fan runs freely.

10.4.5 Cleaning the condensate discharge

1. Remove the dirt that has accumulated on the condensate tray or in the condensate discharge pipe.
2. Check that the water can drain freely. Poor approx. 1 l water into the condensate tray.

10.4.6 Checking the refrigerant circuit



1. Check whether the components and pipelines are free from dirt and corrosion.
2. Check that the covering caps **(1)** on the maintenance connections are positioned securely.
3. Check whether the thermal insulation for the refrigerant pipes is undamaged.
4. Check whether the refrigerant pipes have been routed without any kinks.

10.4.7 Checking the refrigerant circuit for tightness

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

10.4.8 Checking the electrical connections

1. In the connection box, check that the electrical wire are seated firmly in the plugs or terminals.
2. Check the earthing in the connection box.
3. Check whether the power supply cable is damaged. If it needs to be replaced, ensure that it is only replaced by customer service or a similarly qualified person in order to prevent hazards.
4. In the unit, check that the electrical wire are seated firmly in the plugs or terminals.
5. In the unit, check whether the electrical wires are free from damage.
6. If there is a fault that affects safety, do not switch the power supply back on until the fault has been eliminated.

7. If it is not possible to immediately eliminate this fault but it is still necessary to operate the installation, create a suitable interim solution. Inform the end user about this.

10.4.9 Checking the damping feet for wear

1. Check whether the damping feet are significantly compressed.
2. Check whether the damping feet have significant cracks.
3. Check whether there is substantial corrosion on the screwed connection for the damping feet.
4. If required, procure and install new damping feet.

10.5 Completing inspection and maintenance

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

11 Repair and service

11.1 Preparing repair and service work

- ► Observe the basic safety rules before carrying out any repair and service work.
- ► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
- ► Only carry out work on the refrigerant circuit if you have specific expert refrigeration knowledge and are competent at handling R32 refrigerant.
- ► When working on the refrigerant circuit, inform everybody who is working in the close vicinity or who is in the area, about the type of work that is to be carried out.
- ► Only carry out work on electrical components if you have specific electrical expertise.

Danger!

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

- ► Only open the electronics box after a waiting period of 60 minutes.

- ► Switch off the disconnector to which the product is connected in the building.
- ► Disconnect the product from the power supply but ensure that the product is still earthed.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Use only safe units and tools that are permitted for R32 refrigerant.
- ► Monitor the atmosphere in the working area using a 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 casing sections.

11.2 Replacing components of the refrigerant circuit

- ► Ensure that the work follows the defined procedure, as described in the sections below.

11.2.1 Removing refrigerant from the product

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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.
- ► Ensure that the expansion valves are open in order to guarantee that the refrigerant circuit is drained completely.
- ► The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

Caution.

Risk of material damage when removing the refrigerant.

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

- ► Remove the heating water from the indoor unit's condenser (heat exchanger) before the refrigerant is removed from the product.

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 R32 refrigerant.
3. Use only recycling cylinders that are approved for R32 refrigerant, have been labelled appropriately, and are equipped with a pressure relief and isolation valve.
4. Only use hoses, couplings and valves that are as short as possible, leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Ensure that the work area is sufficiently aerated.
6. Ensure that the outlet of the vacuum pump is not located close to potential sources of ignition.
7. Drain the recycling cylinder. In doing so, ensure that the recycling cylinder is correctly positioned.
8. Extract the refrigerant. In doing so, take into account the maximum fill quantity of the recycling cylinder, and monitor the fill quantity using calibrated scales. In doing so, never exceed the permissible operating pressure for the recycling cylinder.
9. Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the recycling cylinder.
10. If there are leaks, do not use the extraction station under negative pressure.
11. Never leave the extraction station unattended.
12. Connect the manometer bridge to the isolation valve's maintenance connection.
13. Open both expansion valves in order to guarantee that the refrigerant circuit is drained completely.
14. Once the refrigerant circuit is completely empty, immediately remove the recycling cylinders and units from the installation.
15. Close all of the isolation valves.

11.2.2 Removing components of the refrigerant circuit

- ► Flush the refrigerant circuit with oxygen-free nitrogen. Never use compressed air or oxygen instead of this.
- ► 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, there must no longer be any flammable refrigerant in the compressor oil. You should therefore drain it for a sufficient time using sufficient negative pressure.
- ► 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.
- ► If compressor oil is drained, this must be carried out safely and securely.
- ► Note that removed components may release refrigerant for an extended period. Only store and transport these components in well-aerated locations.

11.2.3 Installing components of the refrigerant circuit

- ► Only use original spare parts from the manufacturer.
- ► Install the component correctly. To do this, use only soldering processes.
- ► Install a filter dryer outdoors in the liquid pipe to the outdoor unit.
- ► Carry out a pressure test of the refrigerant circuit using nitrogen.
- ► Check whether all main components are correctly earthed after maintenance (compressor, etc.).

11.2.4 Filling the product with refrigerant

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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 R32 refrigerant that has not been used before and is specified as such, and the purity of which is at least 99.5%.

1. Make sure that the product is earthed.
2. Procure the tools and units that are required for filling with refrigerant:
   - Vacuum pump
   - Refrigerant cylinder
   - Scales
3. Only use tools and units that are permitted for R32 refrigerant. Only use refrigerant cylinders that are labelled accordingly.
4. Only use hoses, couplings and valves that are leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Only use hoses that are as short as possible in order to minimise the refrigerant volume that they can hold.
6. Flush the refrigerant circuit with nitrogen.
7. Drain the refrigerant circuit.
8. Fill the refrigerant circuit with R32 refrigerant. The required fill quantity is specified on the product's data plate. Ensure in particular that the refrigerant circuit is not overfilled.
9. Check the refrigerant circuit for leak-tightness using a gas sniffer. In doing so, check all of the components and pipelines.

11.3 Replacing electrical components

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

11.4 Completing repair and service work

- ► Installing the casing sections.
- ► Switch on the disconnector to which the product is connected in the building.
- ► Start up the product. Temporarily activate the heating mode.
- ► Check the product for leak-tightness using a gas sniffer.

12 Decommissioning

12.1 Temporarily decommissioning the product

1. Switch off the disconnector to which the product is connected in the building.
2. Disconnect the product from the power supply.

12.2 Permanently decommissioning the product

Caution.

Risk of damage caused by defrosting.

Draining off the refrigerant generates intense cooling of the indoor unit's plate heat exchanger, which may lead to the de-icing of the plate heat exchanger on the heating water side.

- ► Drain the indoor unit on the heating water side in order to prevent damage.
- ► Ensure that, during the refrigerant draining of the plate heat exchanger on the heating water side, there is sufficient flow-through.

1. Switch off the disconnector 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 indoor unit.
4. Remove the casing sections.
5. Remove the refrigerant from the product. (→ Section 11.2.1)
6. Note that refrigerant will continue to escape even after the refrigerant circuit is completely drained due to outgassing from the compressor oil.
7. Installing the casing sections.
8. Label the product using a sticker that is visible from the outside.
9. Note down on the sticker that the product has been decommissioned and that the refrigerant has been completely removed. Sign the sticker and specify the date.
10. Recycle the removed refrigerant in accordance with the regulations. Note that the refrigerant must be cleaned and checked before it is used again.
11. Dispose of or recycle the product and its components in accordance with the regulations.

13 Recycling and disposal

13.1 Disposing of the packaging

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

13.2 Recycling or disposing of refrigerant

Danger!

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

If R32 refrigerant is released during transport, a flammable atmosphere may form when it mixes with air. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Ensure that the refrigerant is transported correctly.

Warning.

Risk of damage to the environment.

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential).

- ► Have the refrigerant that is contained in the product completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with the regulations.
- ► When doing so, ensure that the vessel does not contain multiple different types of refrigerant.

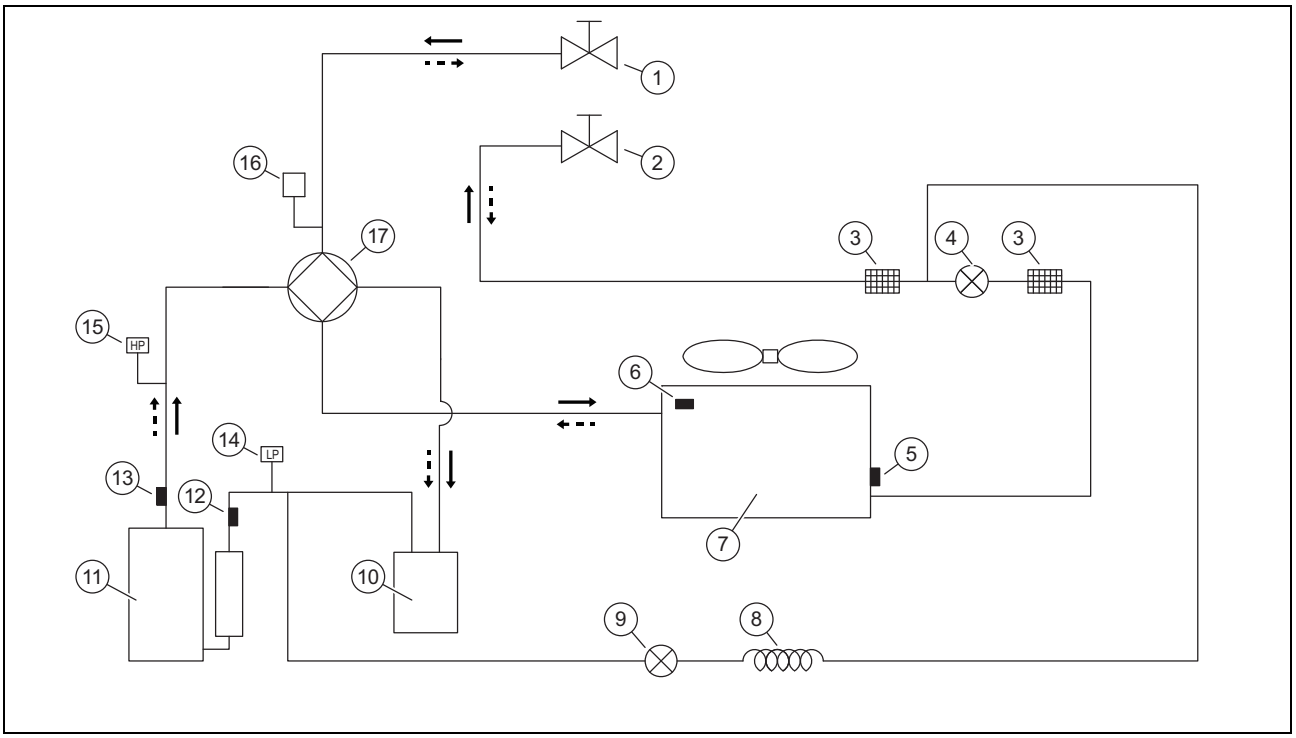
- ► Ensure that the refrigerant is recycled or disposed of by a qualified competent person.

14 Customer service

ჩვენი მომხმარებლის მხარდაჭერის სამსახურის თაობაზე საკონტაქტო ინფორმაცია იხ. მეორე მხარეს მოყვანილ მისამართზე ან მიყევით ბმულს: www.demirdokum.com.tr.

Appendix

A Refrigerant circuit



Cooling

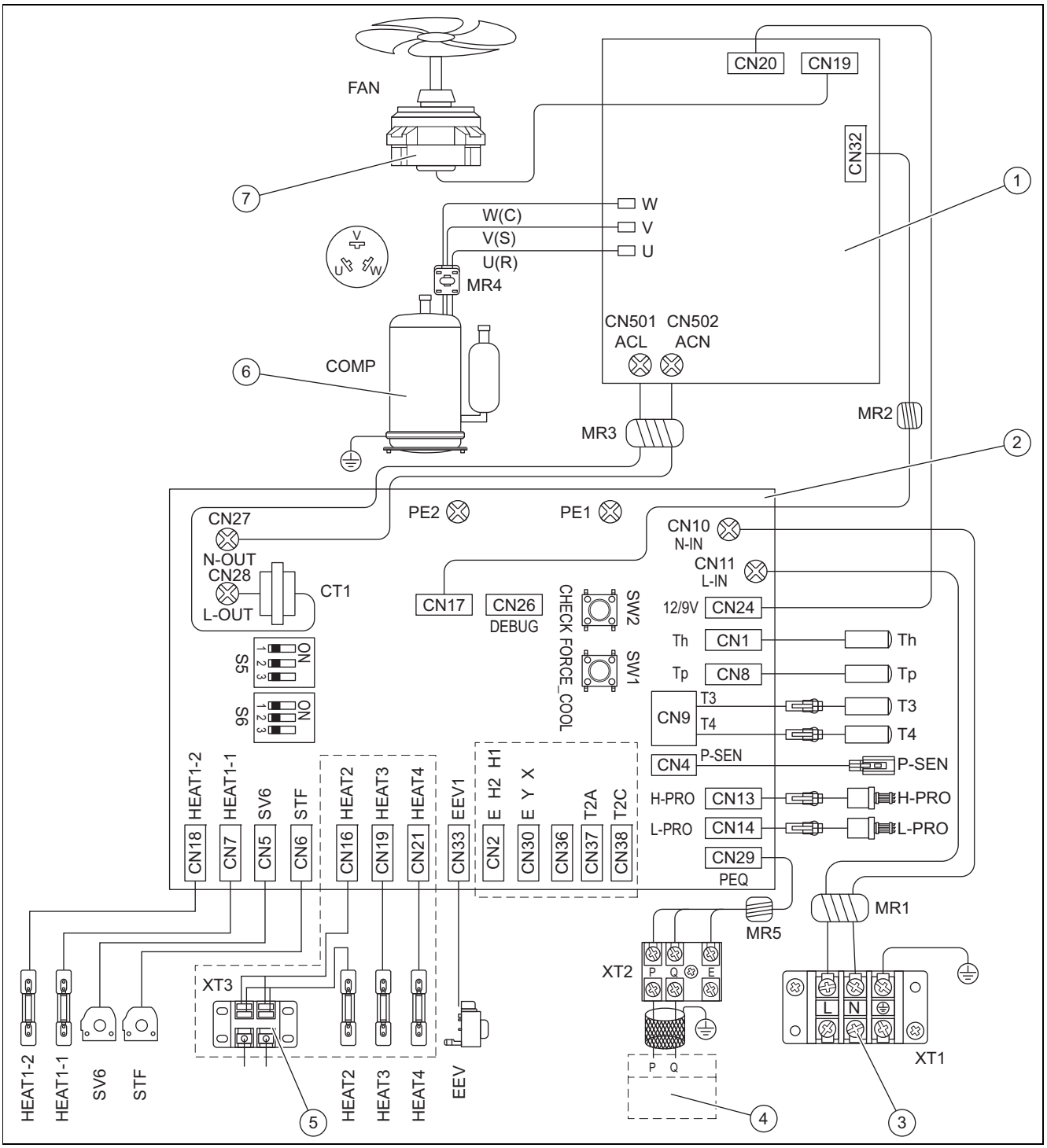
Heating

1	Hot gas pipe isolation valve
2	Liquid pipe isolation valve
3	Filter
4	Electronic expansion valve
5	Temperature sensor (evaporator in heating mode, condenser in cooling mode)
6	Outdoor temperature sensor
7	Air-side heat exchanger
8	Capillary
9	Electromagnetic one-way valve
10	Gas liquid separator
11	Compressor
12	Intake temperature sensor
13	Outlet temperature sensor
14	Low-pressure switch
15	High-pressure switch
16	Pressure sensor
17	4-port valve

B Wiring diagrams

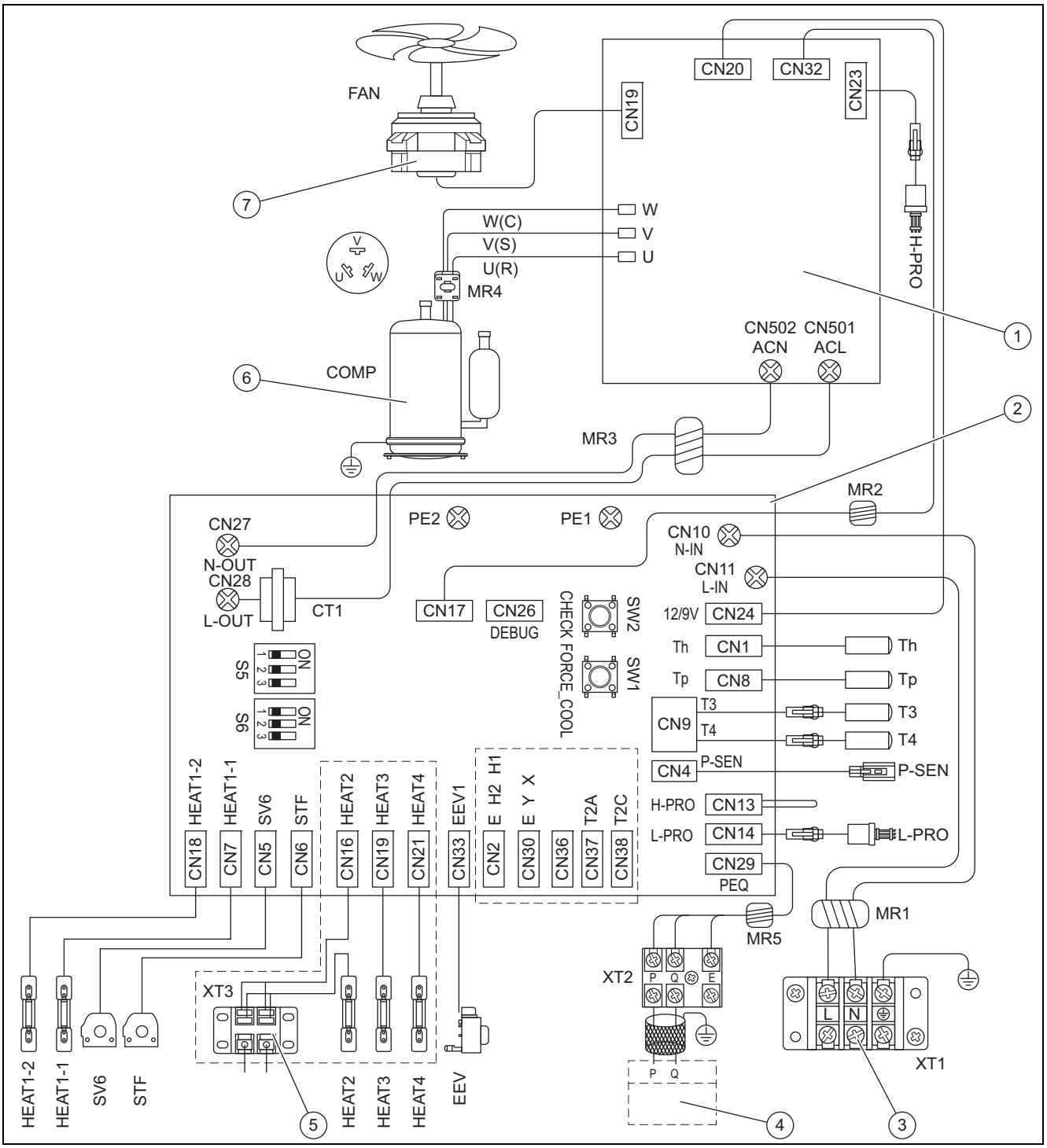
The wiring diagrams shown here are for reference only. Refer to the wiring diagram on the inside of the electronics box for the connection.

B.1 8–10 kW products



1	PCB A, inverter, single-phase
2	Main PCB B, control process, single-phase
3	Power supply connection
4	Indoor unit connection
5	Connection for heating belt at the condensate discharge
6	Compressor
7	Fan
CT1	Alternating current detector
EEV	Electronic expansion valve
Heat1-1	Compressor, electric heating belt 1
Heat1-2	Compressor, electric heating belt 2
Heat2	Connection for electric heating belt at the housing
H-PRO	High-pressure switch
L-PRO	Low-pressure switch
MR1 - MR5	Ring magnets
P-SEN.	Pressure sensor
T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
TF	Radiator temperature sensor
Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
XT1 - XT3	Terminal blocks

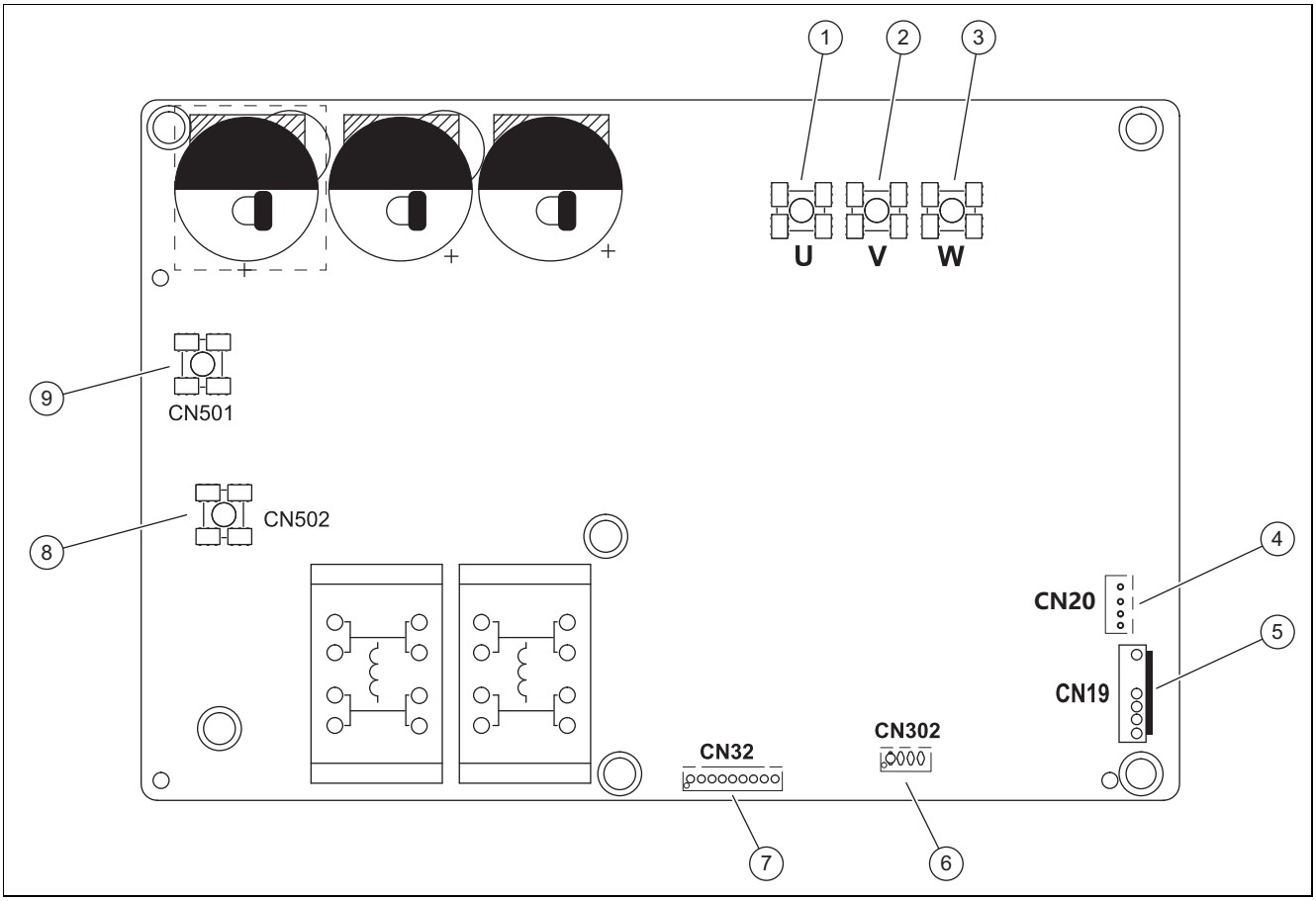
B.2 12–16 kW products



1	PCB A, inverter, single-phase
2	Main PCB B, control process, single-phase
3	Power supply connection
4	Indoor unit connection
5	Connection for heating belt at the condensate discharge
6	Compressor
7	Fan
CT1	Alternating current detector
EEV	Electronic expansion valve
Heat1-1	Compressor, electric heating belt 1
Heat1-2	Compressor, electric heating belt 2
Heat2	Connection for electric heating belt at the housing
H-PRO	High-pressure switch
L-PRO	Low-pressure switch
MR1 - MR5	Ring magnets
P-SEN.	Pressure sensor
T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
TF	Radiator temperature sensor
Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
XT1 - XT3	Terminal blocks

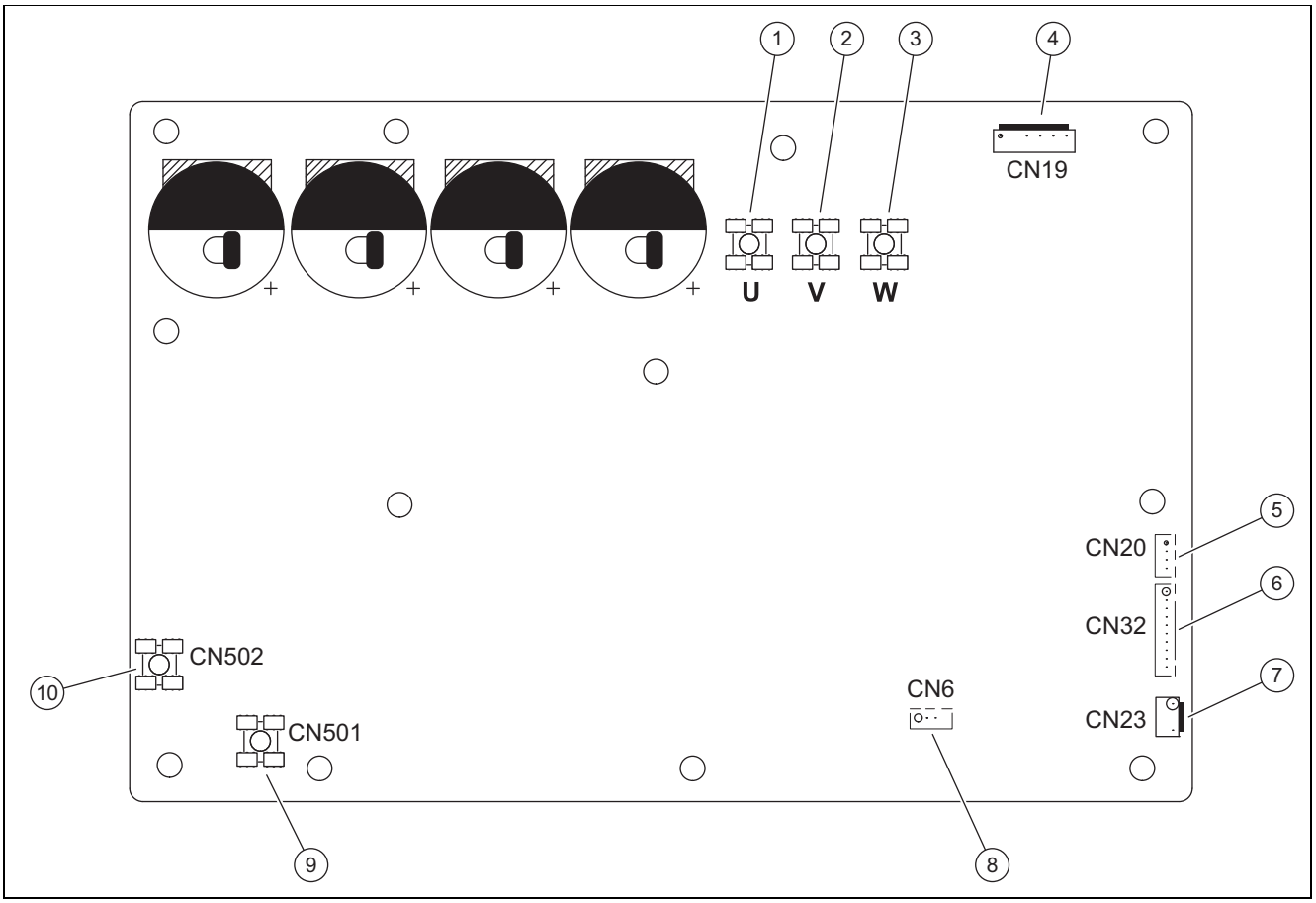
C PCBs for the electronic control unit

C.1 PCB A – inverter module – 8–10 kW products



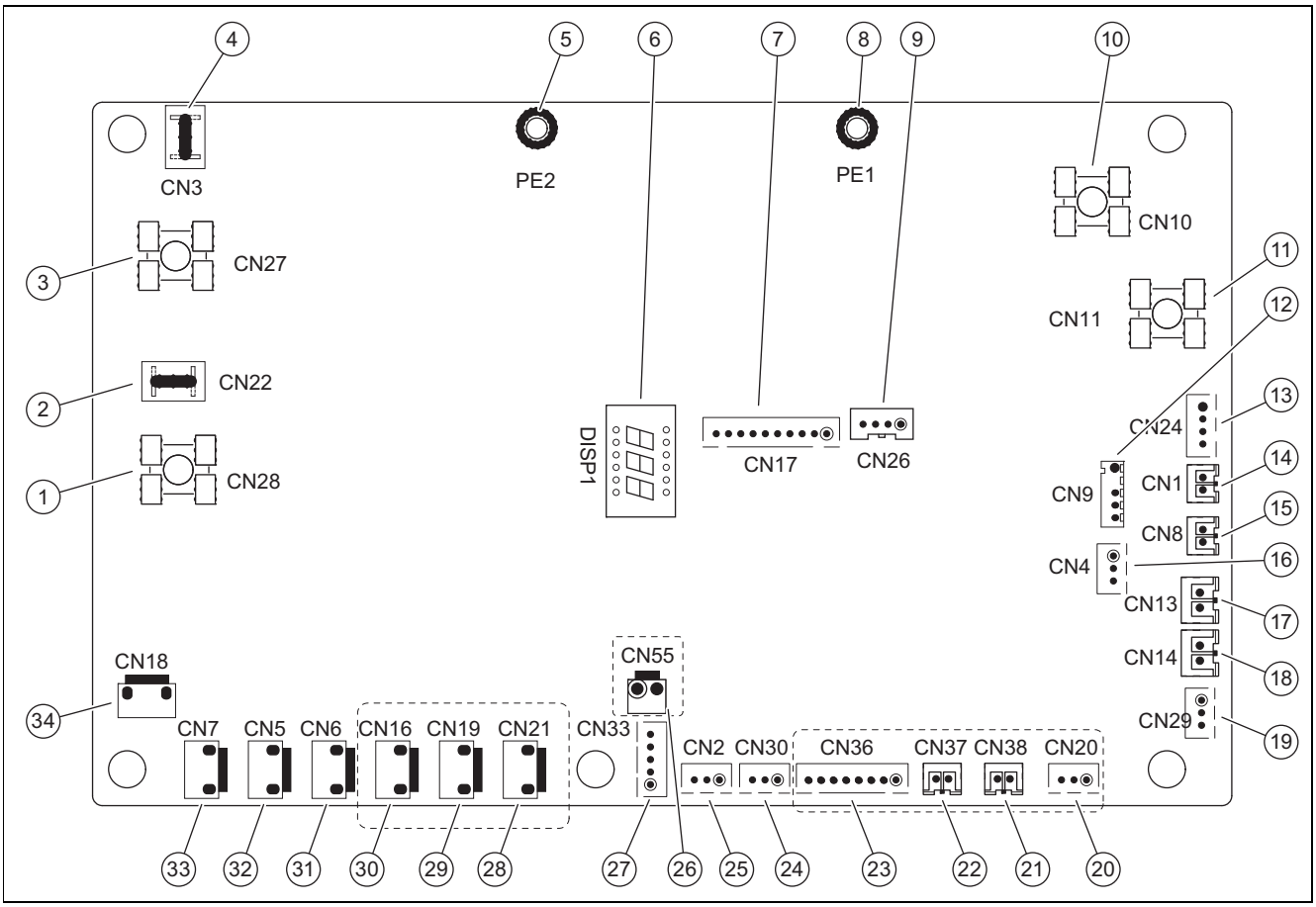
1	Compressor connection U	6	Reserved (CN302)
2	Compressor connection V	7	Connection for communication with PCB B (CN32)
3	Compressor connection W	8	Connection for input N for rectifier bridge (CN502)
4	Connection for output +12 V/9 V (CN20)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for fan (CN19)		

C.2 PCB A – inverter module – 12–16 kW products



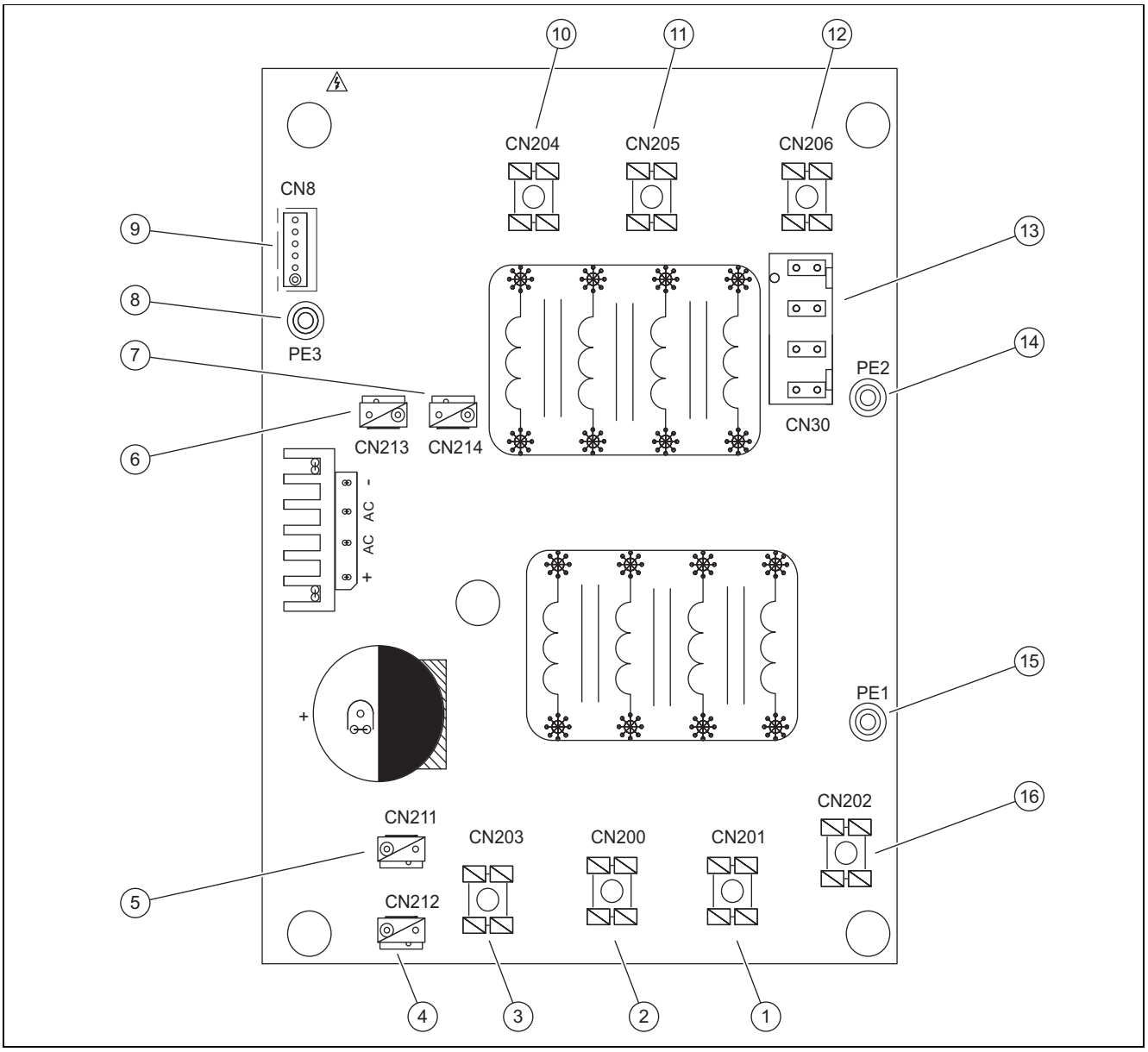
1	Compressor connection U	6	Connection for communication with PCB B (CN32)
2	Compressor connection V	7	Connection for high-pressure switch (CN23)
3	Compressor connection W	8	Reserved (CN6)
4	Connection for fan (CN19)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for output +12 V/9 V (CN20)	10	Connection for input N for rectifier bridge (CN502)

C.3 Main PCB B



1	Connection: Output L to PCB A (CN28)
2	Reserved (CN22)
3	Connection: Output N to PCB A (CN27)
4	Reserved (CN3)
5	Connection for earthing cable (PE2)
6	Display (DSP1)
7	Connection for communication with PCB A (CN17)
8	Connection for earthing cable (PE1)
9	Reserved (CN26)
10	Connection: Input for neutral conductor (CN10)
11	Connection: Input for conductor (CN11)
12	Connection for outdoor temperature sensor and condenser temperature sensor (CN9)
13	Connection for input +12 V/9 V (CN24)
14	Connection for intake temperature sensor (CN1)
15	Connection for compressor outlet temperature sensor (CN8)
16	Connection for pressure sensor (CN4)
17	Connection for high-pressure switch (CN13)
18	Connection for low-pressure switch (CN14)
19	Connection for communication with the hydrobox control card (CN29)
20	Reserved (CN20)
21	Reserved (CN38)
22	Reserved (CN37)
23	Reserved (CN36)
24	Connection for communication (reserved, CN30)
25	Connection for communication (reserved, CN2)
26	Reserved (CN55)
27	Connection for electronic expansion valve (CN33)
28	Reserved (CN21)
29	Reserved (CN19)
30	Connection for the electrical heating belt of the housing (CN16)
31	Connection for 4-port valve (CN6)
32	Connection for SV6 valve (CN5)
33	Connection for electrical heating belt 1 of the compressor (CN7)
34	Connection for electrical heating belt 2 of the compressor (CN18)

C.4 PCB C – filter



1	Power supply L2 (CN201)
2	Power supply L3 (CN200)
3	Power supply N (CN203)
4	Power supply connection for +310 V DC (CN212)
5	Reserved (CN211)
6	Connection for fan (CN213)
7	Power supply connection for inverter module (CN214)
8	Earth cable (PE3)
9	Connection for communication with main PCB B (CN8)
10	Power filtering L3 (L3')
11	Power filtering L2 (L2')
12	Power filtering L1 (L1')
13	Power supply connection for main PCB (CN30)
14	Connection for earthing cable (PE2)
15	Connection for earthing cable (PE1)
16	Power supply L1 (L1)

D Selecting electrical components

Rated current of the product [A]	Nominal cross-sectional area [mm²]	
	Flexible cables	Cable for fixed wiring
≤ 3	0.5 and 0.75	1 and 2.5
> 3 and ≤ 6	0.75 and 1	1 and 2.5
> 6 and ≤ 10	1 and 1.5	1 and 2.5
> 10 and ≤ 16	1.5 and 2.5	1.5 and 4
> 16 and ≤ 25	2.5 and 4	2.5 and 6
> 25 and ≤ 32	4 and 6	4 and 10
> 32 and ≤ 50	6 and 10	6 and 16
> 50 and ≤ 63	10 and 16	10 and 25

Note
The rated current in the upper table corresponds to the MCA in the lower table. If the MCA exceeds 63 A, the cable diameter should be selected in accordance with the national regulations.

Product	Outdoor unit				Current output			Compressor		OFM (external fan motor)	
	Voltage (V)	Frequency (Hz)	Min. (V)	Max. (V)	MCA (A)	TOCA (A)	MFA (A)	MSC (A)	RLA (A)	CW	FLA (A)
8 kW	220 - 240	50	198	264	16	19	25	–	14.50	0.17	1.50
10 kW	220 - 240	50	198	264	17	19	25	–	15.50	0.17	1.50
12 kW	220 - 240	50	198	264	25	30	35	–	23.50	0.17	1.50
16 kW	220 - 240	50	198	264	27	30	35	–	25.50	0.17	1.50

MCA (Min. Circuit Amps.): Minimum amperage in the electrical circuit (A)
TOCA (Total Over-current Amps.): Total overcurrent (A)
MFA (Max. Fuse Amps.): Max. fuse protection (A)
MSC (Max. Starting Amps.): Max. in-rush current (A)
RLA (Rated Load Amps.): Nominal operating current (A) of the compressor, under nominal test conditions in cooling or heating mode
CW (Rated Motor Output): Nominal motor output
FLA (Full Load Amps.): Full load current (A)

Maximum values for the wiring (for exact values, see Technical data):

	Product			
	8 kW	10 kW	12 kW	16 kW
Maximum fuse protection [A]	19	19	30	30
Cable diameter [mm²]	4.0	4.0	6.0	6.0

E Inspection and maintenance work

#	Maintenance work	Interval	
1	Cleaning the product	Annually	118
2	Cleaning the evaporator	Annually	118
3	Checking the fan	Annually	118
4	Cleaning the condensate discharge	Annually	118
5	Checking the refrigerant circuit	Annually	118
6	Checking the refrigerant circuit for tightness	Annually	118
7	Checking the electrical connections	Annually	118
8	Checking the damping feet for wear	Annually after the first 3 years	119

F Technical data

Note

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

The performance data is determined using a special test method. You can find information about this from the manufacturer of the product by stating "Performance data test method".

Technical data – General

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Width	1,118 mm	1,118 mm	1,118 mm	1,118 mm
Height	865 mm	865 mm	865 mm	865 mm
Depth	523 mm	523 mm	523 mm	523 mm
Net weight	75 kg	75 kg	97 kg	97 kg
Width with packaging	1,190 mm	1,190 mm	1,190 mm	1,190 mm
Height with packaging	970 mm	970 mm	970 mm	970 mm
Depth with packaging	560 mm	560 mm	560 mm	560 mm
Weight with packaging	89 kg	89 kg	110.5 kg	110.5 kg
Rated voltage	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz
Rated power	3,300 W	3,600 W	5,400 W	6,100 W
Rated current	14.5 A	16 A	24.5 A	26 A
IP rating	IP24	IP24	IP24	IP24
Maximum rotational speed of the fan	600 rpm	600 rpm	650 rpm	650 rpm
Fan, motor type	Brushless DC motor	Brushless DC motor	Brushless DC motor	Brushless DC motor
Fan, quantity	1	1	1	1
Connection for condensate discharge	DN 32	DN 32	DN 32	DN 32

Technical data – Refrigerant circuit

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Material of the refrigerant pipe	Copper	Copper	Copper	Copper
Minimum single length of the refrigerant pipe	2 m	2 m	2 m	2 m
Maximum single length of the refrigerant pipe	30 m	30 m	30 m	30 m
Permissible height difference when the outdoor unit is raised	20 m	20 m	20 m	20 m
Permissible height difference when the indoor unit is raised	20 m	20 m	20 m	20 m
Additional refrigerant volume	38 g/m	38 g/m	38 g/m	38 g/m
Connection technology	Flare connection	Flare connection	Flare connection	Flare connection
Outer diameter of the hot gas pipe	5/8″	5/8″	5/8″	5/8″
Outer diameter of the liquid pipe	3/8″	3/8″	3/8″	3/8″
Minimum wall thickness of the hot gas pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Minimum wall thickness of the liquid pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Refrigerant	R32	R32	R32	R32
Fill quantity	1.65 kg	1.65 kg	1.84 kg	1.84 kg
Global Warming Potential (GWP)	675	675	675	675
CO_2 equivalent	1.11 t	1.11 t	1.24 t	1.24 t
Maximum switch-off pressure	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)
Compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Air-side heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger
Throttle valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve

Technical data – Application limits, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	35 ℃	35 ℃	35 ℃	35 ℃
Minimum air temperature for domestic hot water generation	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature for domestic hot water generation	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Application limits, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Power, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Heat output, A7/W35	8.3 kW	10.0 kW	12.1 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W35	5.20	5.00	4.95	4.50
Power consumption, effective, A7/W35	1.60 kW	2.00 kW	2.44 kW	3.56 kW
Heat output, A7/W45	8.2 kW	10.0 kW	12.3 kW	16 kW
Coefficient of performance, COP, EN 14511, A7/W45	3.95	3.80	3.80	3.60
Power consumption, effective, A7/W45	2.08 kW	2.63 kW	3.24 kW	4.44 kW
Heat output, A7/W55	7.5 kW	9.5 kW	12.0 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W55	3.18	3.10	3.10	2.90
Power consumption, effective, A7/W55	2.36 kW	3.06 kW	3.87 kW	5.52 kW
Heat output, A-7/W35	7.10 kW	8.25 kW	10.0 kW	13.3 kW
Coefficient of performance, COP, EN 14511, A-7/W35	3.18	3.10	3.0	2.7
Power consumption, effective, A-7/W35	2.18 kW	2.62 kW	3.33 kW	4.93 kW
Heat output, A-7/W55	6.15 kW	6.85 kW	10.0 kW	12.5 kW
Coefficient of performance, COP, EN 14511, A-7/W55	2.05	2.0	2.05	2.02
Power consumption, effective, A-7/W55	3.00 kW	3.43 kW	4.88 kW	6.19 kW
Seasonal space heating energy efficiency class, flow temperature at 35 ºC	A+++	A+++	A+++	A+++
Seasonal space heating energy efficiency class, flow temperature at 55 ºC	A++	A++	A++	A++
SCOP, warmer climate, 35 ºC	6.99	7.09	6.48	6.29
SCOP, warmer climate, 55 ºC	4.51	4.62	4.43	4.48
SCOP, average climate, 35 ºC	5.22	5.20	4.81	4.62
SCOP, average climate, 55 ºC	3.37	3.47	3.45	3.41

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
SCOP, colder climate, 35 ºC	4.33	4.32	4.08	4.02
SCOP, colder climate, 55 ºC	2.88	2.99	3.02	3.12

Technical data – Power, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Cooling output, A35/W18	8.4 kW	10.0 kW	12.0 kW	14.2 kW
Energy efficiency ratio, EER, EN 14511, A35/W18	5.05	4.80	4.00	3.61
Power consumption, effective, A35/W18	1.66 kW	2.08 kW	3.00 kW	3.94 kW
Cooling output, A35/W7	7.40 kW	8.20 kW	11.60 kW	14.00 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	3.38	3.30	2.75	2.45
Power consumption, effective, A35/W7	2.19 kW	2.48 kW	4.22 kW	5.71 kW
SEER, flow temperature at 7 ºC	5.83	5.98	4.89	4.69
SEER, flow temperature at 18 ºC	8.95	8.78	7.10	6.75

Technical data – noise emissions

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Sound power (EN 12102 1)	59 dB(A)	60 dB(A)	64 dB(A)	68 dB(A)
Max. sound pressure level (heat: A7W35/cooling: A35W18)	46 dB(A)	49 dB(A)	50 dB(A)	54 dB(A)

Index

Operating instructions

Contents

1 Safety

1.1 Intended use

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

The product is the outdoor unit for a air-to-water heat pump in a split design.

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

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit Without a back-up heater	Indoor unit With a back-up heater
HA 8-7.2 OS 230V B3	HA 10-7.2 WS 230V B1	HA 10-7.2 WS 230 V
HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ▸ Keep all ignition sources away from the product. Ignition sources include, for example:
  – Open flames,
  – Hot surfaces over 550 °C,
  – Electrical devices or tools that are not free from electrical sources,
  – Static discharges.
- ▸ Do not use any sprays or other flammable gases close to the product.

1.2.3 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Do not make any changes in the product's environment as this would cause escaping refrigerant to collect in a recess or to get inside the building via building openings.

1.2.4 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:
  - to the product itself
  - to the supply lines
  - to the drain pipework
  - to the expansion relief valve for the heat source circuit
  - to constructional conditions that may affect the operational reliability of the product
- Never make any changes to the product where these involve drilling into the product.

1.2.5 Risk of injury from burns caused by touching refrigerant pipes

The refrigerant pipes between the outdoor unit and the indoor unit may become extremely hot during operation. There is a risk of burns.

- Do not touch any uninsulated refrigerant pipes.

1.2.6 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 eliminated by a competent person.
- Adhere to the maintenance intervals specified.

1.2.7 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.

1.2.8 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

2 Notes on the documentation

- 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.

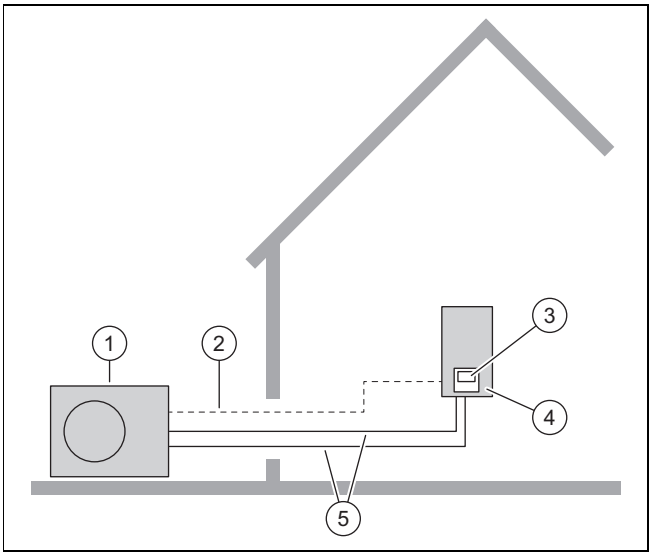
These instructions apply only to Moldova:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 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.

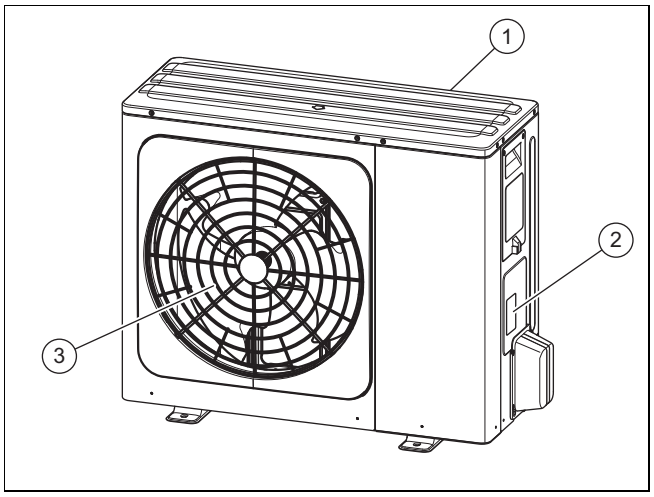
3.3 Noise reduction mode

A noise reduction mode can be activated for the product.

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

You can find additional information about noise reduction mode in the operating instructions for the indoor unit.

3.4 Product design



1	Air inlet grille	3	Air outlet grille
2	Data plate		

3.5 Data plate and serial number

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

The type designation is located on the data plate.

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 CE marking

CE

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.

3.7 Service life

If the regulations on transportation, storage, installation and operation are observed, the product's expected service life is 10 years from the date of installation.

3.8 Production date

You can find the production date (week, year) in the serial number on the separate sticker beside the data plate:

– The third and fourth digit in the serial number specify the year of production (two digits).
– The fifth and sixth digit of the serial number specify the week of production (from 01 to 52).

3.9 Fluorinated greenhouse gases

The product contains fluorinated greenhouse gases.

3.10 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

4 Operation

4.1 Switching on the product

► Switch on the disconnector to which the product is connected in the building.

4.2 Operating the product

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

4.3 Guaranteeing frost protection

1. Ensure that the product is switched on and remains switched on.
2. Ensure that no snow accumulates around the air inlet grille and air outlet grille.

4.4 Switching off the product

1. Switch off the disconnector to which the product is connected in the building.
2. Guarantee the frost protection.

5 Care and maintenance

5.1 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.

5.2 Cleaning the product

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

5.3 Maintenance

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.

6 Troubleshooting

6.1 Eliminating faults

► If you observe a cloud of vapour on the product, you do not have to do anything. This effect may arise during the thawing process.
► If the product will no longer start up, check whether the power supply is interrupted. If required, switch on the disconnector in the building.
► Contact a competent person if the measure that is described is unsuccessful.

7 Decommissioning

7.1 Temporarily decommissioning the product

1. Switch off all of the disconnectors to which the product is connected in the building.
2. Protect the heating installation against frost.

7.2 Permanently decommissioning the product

► Have a competent person permanently decommission the product.

8 Recycling and disposal

This product is an electrical or electronic unit within the context of EU Directive 2012/19/EU. The unit was developed and manufactured using high-quality materials and components. These can be recycled and reused.

Find out about the regulations that apply in your country regarding the separate collection of waste electrical or electronic equipment. Correctly disposing of old units protects the environment and people against potential negative effects.

Disposing of the packaging

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

Disposing of the product

► Dispose of the product and its accessories correctly.
► Observe all relevant regulations.

If the product is labelled with this symbol:

► 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.

Deleting personal data

Personal data (e.g. online login details) may be misused by unauthorised third parties.

If the product contains personal data:

► Ensure that there is no personal data on or in the product before you dispose of the product.

8.1 Arranging disposal of refrigerant

The product is filled with R32 refrigerant.

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

9 Guarantee and customer service

9.1 Guarantee

Puteți solicita informații privind garanția producătorului la adresa de contact indicată pe partea posterioară.

9.2 Customer service

Datele de contact pentru serviciul nostru de asistenţă tehnică le găsiţi la adresa indicată pe partea posterioară sau pe www.demirdokum.com.tr.

Installation and maintenance instructions

Contents

1 Safety

1.1 Intended use

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

The product is the outdoor unit for a air-to-water heat pump in a split design.

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

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit Without a back-up heater	Indoor unit With a back-up heater
HA 8-7.2 OS 230V B3	HA 10-7.2 WS 230V B1	HA 10-7.2 WS 230 V
HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

1.2.2 Risk caused by inadequate qualifications for the R32 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 R32 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.
▸ Note that the refrigerant is odourless.

1.2.3 Risk of death caused by fire or explosion if stored incorrectly

The product contains the flammable refrigerant R32. In the event of a leak in combination with an ignition source, there is a risk of fire and explosion.

▸ Only store the unit in rooms with no permanent ignition sources. Examples of such ignition sources include naked flames, a gas-fired boiler that is switched on, or an electric heater.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- 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 R32 refrigerant and set to ≤ 25% of the lower explosive limit.
- If you suspect that there may be a leak, extinguish all naked flames in the vicinity.
- If there is a leak that requires repairs to be carried out with a soldering process, follow the procedure described in the section "11 Repair and service".
- Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.

1.2.5 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Ensure that the refrigerant does not collect in a recess.
- Ensure that the refrigerant cannot get inside the building via building openings.

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- Only carry out the work if you are competent at handling R32 refrigerant.
- Wear suitable personal protective equipment and bring a fire extinguisher with you.
- Only use tools and units that are permitted for R32 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.
- The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

1.2.7 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 in overvoltage category III for full partition, e.g. fuse or circuit breaker).
- Secure against being switched back on again.
- Wait for at least 60 minutes until the capacitors have discharged.
- Check that there is no voltage.

1.2.8 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.

1.2.9 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.

1.2.10 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

1.2.11 Risk of material damage caused by using an unsuitable tool

- Use the correct tool.

1.2.12 Risk of material damage caused by using an unsuitable material

Unsuitable refrigerant pipes may cause material damage.

- Only use special copper pipes designed for refrigeration technology.

1.3 Regulations (directives, laws, standards)

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

2 Notes on the documentation

- ► 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.

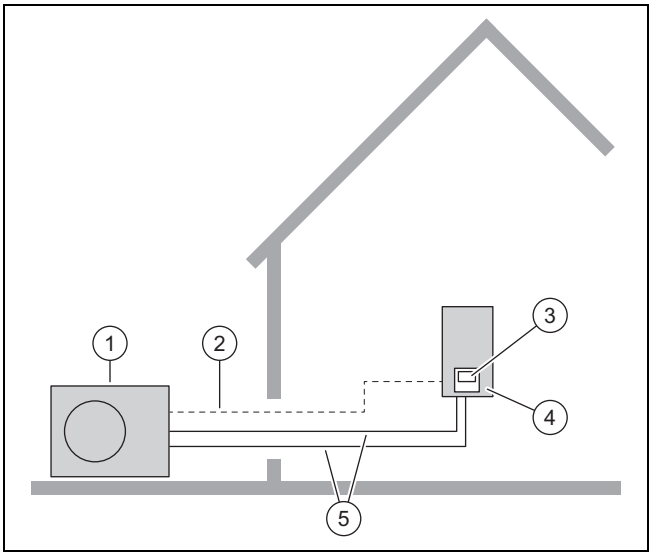
These instructions apply only to Moldova:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



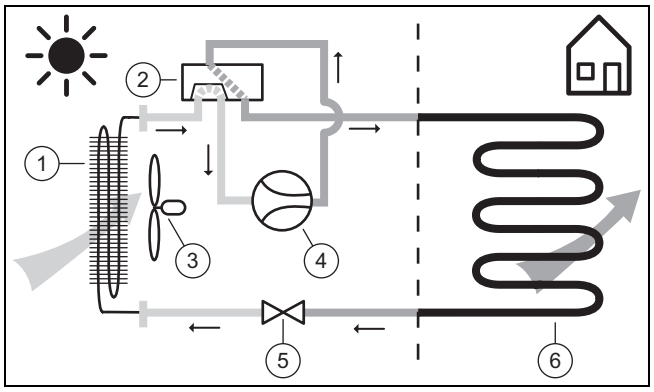
1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 Functions of the heat pump

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

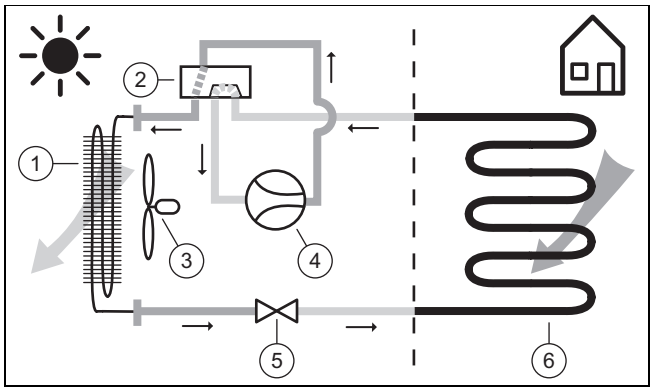
In heating mode, cyclic evaporation, compression, liquefaction and expansion take in heat energy from the surroundings and transfer it to the building. In cooling mode, heat energy is extracted from the building and released into the environment.

3.2.1 Operating principle in heating mode



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

3.2.2 Operating principle in cooling mode



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

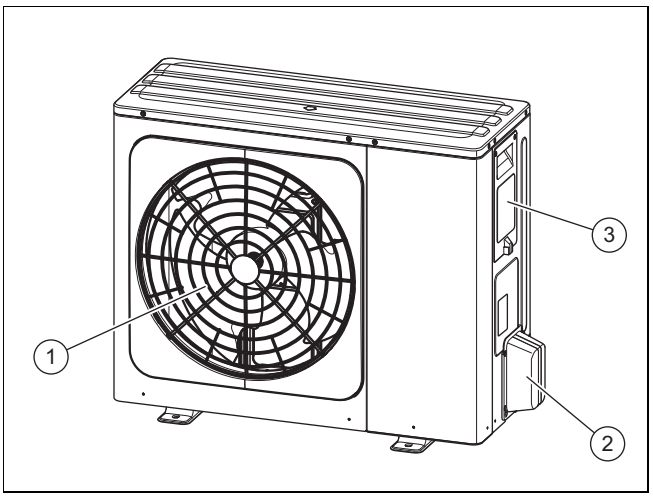
3.3 Description of the product

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

The outdoor unit is connected to the indoor unit via the refrigerant circuit.

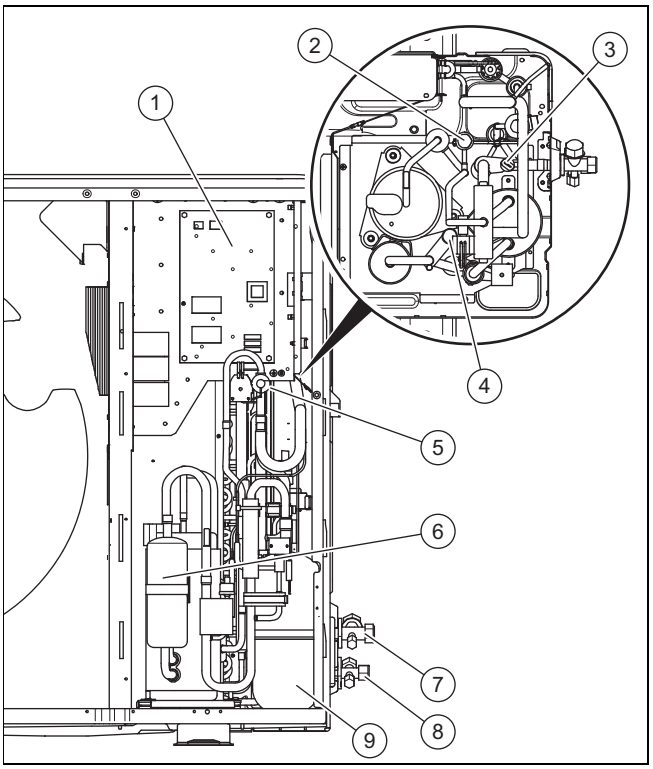
3.4 Product design

3.4.1 Unit



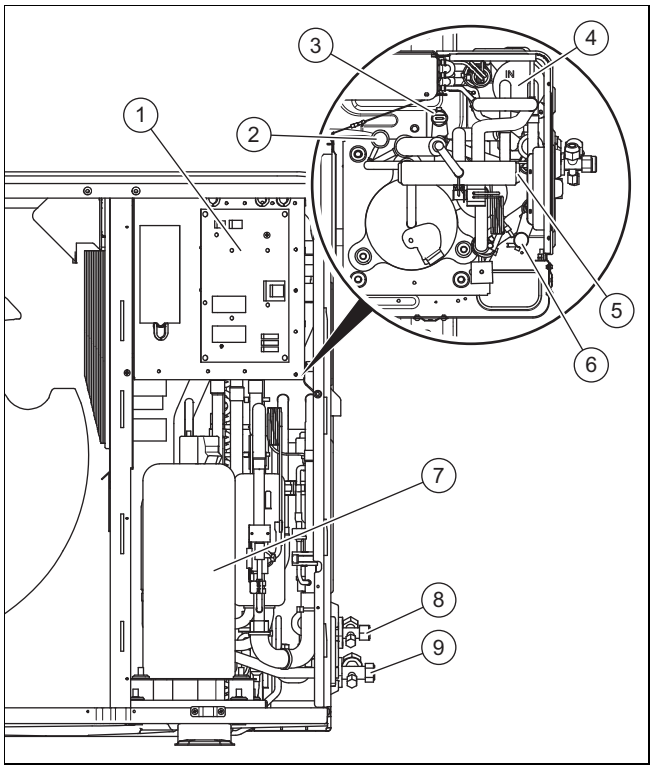
1	Air outlet grille	3	Cover for the electrical connections
2	Covering the connections for the refrigerant pipes		

3.4.2 8/10 kW functional elements



1	Control PCB	6	Compressor
2	High-pressure switch	7	Hot gas pipe isolation valve
3	Pressure sensor	8	Liquid pipe isolation valve
4	Low-pressure switch	9	Gas-liquid separator
5	4-port valve		

3.4.3 12/16 kW functional elements



1	Control PCB	6	Low-pressure switch
2	High-pressure switch	7	Compressor
3	High-pressure sensor	8	Liquid pipe isolation valve
4	Gas-liquid separator	9	Hot gas pipe isolation valve
5	4-port valve		

3.5 Serial number

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 Information on the data plate

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

Information	Meaning
HA ...	Nomenclature
DemirDöküm MaxiAir R32	Product name
xx Kw	Cooling output@35/W18
EER	Energy Efficiency Ratio@A35/W18 (energy efficiency ratio)
xx Kw	Heat output@35/W18
COP	Coefficient Of Performance@A7/W35 (coefficient of performance)
220–240 V ~ 50 Hz	Power supply
xx kW	Power consumption
xx kg	Net weight
R32	Refrigerant type
xx g	Refrigerant filling volume
GWP	Global Warming Potential (Global Warming Potential)
t CO_2	CO_2 equivalent
xx Pa	Maximum permissible pressure

Information	Meaning
COP /	Coefficient of performance/heating mode
IP	Protection class
	Reading the instructions

3.7 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

3.8 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.

3.9 Regulations on packaging, transportation and storage

The products are delivered in the manufacturer's packaging.

The products are transported by road, by sea and by rail in accordance with the goods transport regulations that apply to the relative means of transport. During transportation, it is absolutely essential for the product to be firmly secured against moving horizontally and vertically.

Products that are not installed are stored in the manufacturer's packaging. The products must be stored under standard conditions in closed rooms that have natural air circulation (non-aggressive and dust-free environment, temperature gradients of -10 °C to +37 °C, up to 80% air humidity, without shocks or vibrations).

3.10 Duration of storage

– Duration of storage: 2 years from production date

3.11 Production date

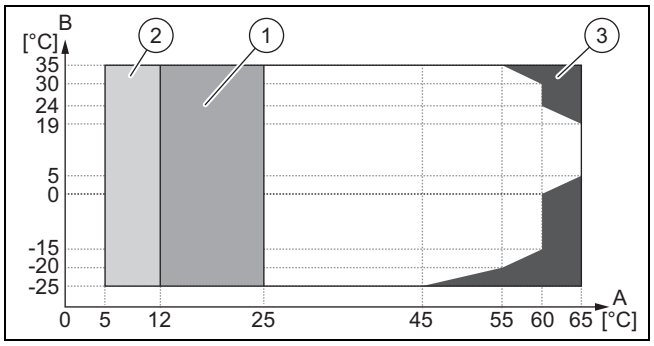
You can find the production date (week, year) in the serial number on the separate sticker beside the data plate:

– The third and fourth digit in the serial number specify the year of production (two digits).
– The fifth and sixth digit of the serial number specify the week of production (from 01 to 52).

3.12 Application limits

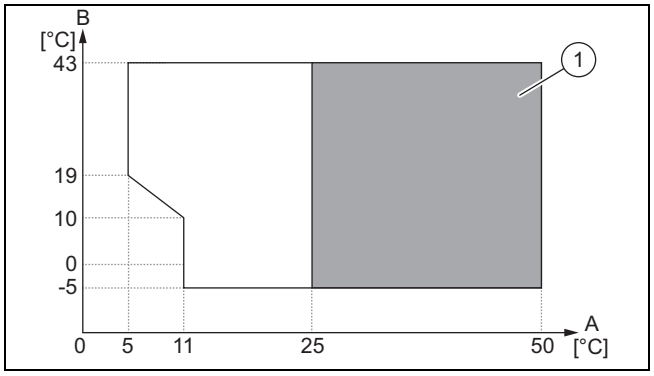
The product works between a minimum and maximum outdoor temperature. These outdoor temperatures define the application limits for the heating mode, domestic hot water mode and cooling mode. Operating outside of the application limits leads to the product switching off.

3.12.1 Heating mode



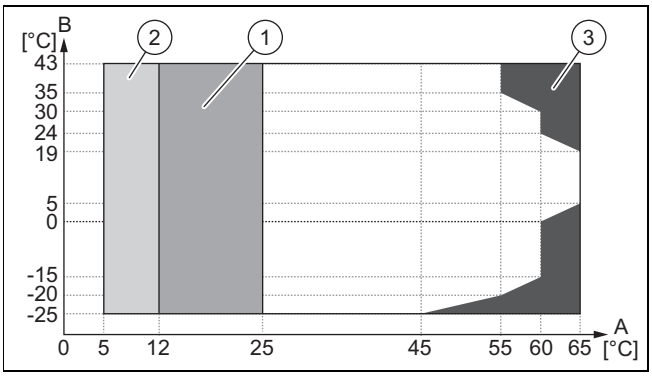
A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.12.2 Cooling mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature

3.12.3 DHW mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.13 Thawing mode

If the heat pump is running in heating mode, the condensate may freeze on the fins of the evaporator at low outdoor temperatures and frost may form. To increase efficiency, this frost is automatically detected and automatically defrosted at certain intervals by activating thawing mode.

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. Thawing mode takes 2–10 minutes, then the water is drained via the outdoor unit's drain.

The outdoor unit's fans do not run during thawing mode.

3.14 Safety devices

The product is equipped with technical safety devices.

High- and low-pressure switches regulate the pressure in the refrigerant circuit. If the pressure in the refrigerant circuit increases above the upper limit value (4.3 MPa (43 bar)) or falls below the lower limit value (0.14 MPa (1.4 bar)), the high- and/or low-pressure switch switches off and the compressor is stopped.

The compressor crankcase heating prevents refrigerant from mixing with compressor oil when the compressor is switched off.

The crankcase heating is regulated according to the outdoor temperature and the on/off condition of the compressor.

If the outdoor temperature is above 8 °C or the compressor is running, the crankcase heating is switched off.

The crankcase heating is switched on when the outdoor temperature is 8 °C or less and either

– The compressor has been switched off for more than three hours or
– The product has just been switched on (either manually or after a power cut).

If the temperature measured at the compressor outlet is higher than the permissible temperature (> 115 °C) , the compressor is switched off. The permissible temperature depends on the evaporation and condensation temperature.

In the indoor unit, the heating circuit's circulation water volume is regulated. The water flow rate switch detects the water flow rate in order to protect the compressor and the water pump in the event of an insufficient water flow rate. 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.

The Anti-Freeze Protection Control function protects the water-side heat exchanger against ice formation.

If the environmental temperature is below 3 °C in standby mode of heating/domestic hot water mode and the heating return or heating flow temperature or the water flow temperature of the additional heat source is below 5 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the environmental temperature is still below 3 °C and the water temperature is still below 5 °C, the heat pump switches to heating mode.

If, in cooling mode,

– the heating return temperature or
– the heating flow temperature or
– the heating flow temperature of the auxiliary heat source

is below 4 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the water temperature is still below 4 °C, the heat pump switches to heating mode.

If the heating flow temperature is below 2 °C in standby mode for the heating/domestic hot water mode, the heat pump stops and the water pump continues to run for 30 minutes. If the heating flow temperature is still below 2 °C, the heat pump switches to frost protection in heating mode.

4 Set-up

4.1 Unpacking the product

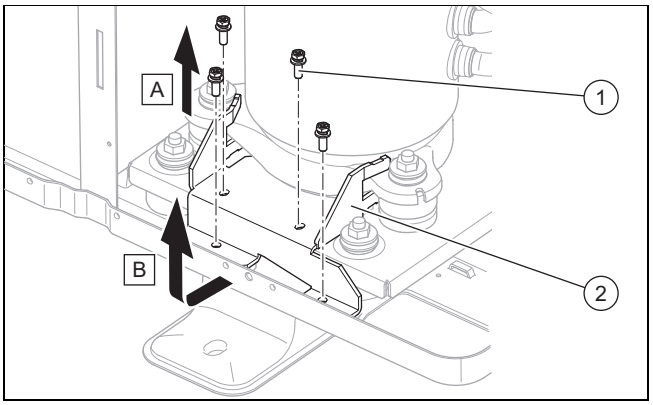
1. Remove the outer packaging parts.
2. Remove the accessory.
3. Remove the documentation.
4. Remove the screws from the pallet.
5. Remove the protective cardboard from the evaporator.

4.1.1 Remove the transport protection from the compressor (12/16 kW outdoor units only)

Note

If the compressor runs with the transport protection installed, this leads to abnormal vibrations and noises from the heat pump.

1. Remove the top casing and the right-hand front casing. (→ Section 4.10).
2. Remove the noise control cover from the compressor.



3. Remove the four screws **(1)**.
4. Remove the transport protection **(2)**.
5. Reattach the noise control cover for the compressor.

4.2 Checking the scope of delivery

► Check the contents of the packaging units.

Quantity	Designation
1	Product
1	Connection pipe for condensate discharge
1	Enclosed documentation

4.3 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.

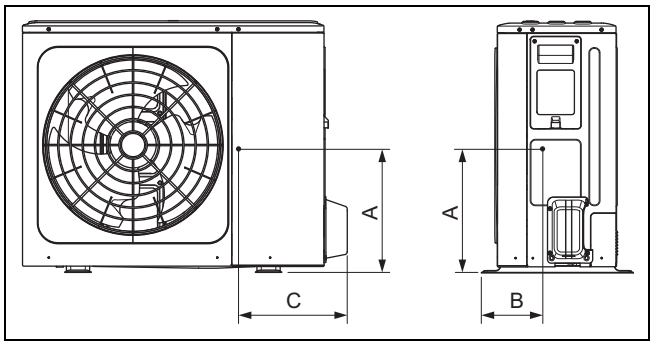
► Note the weight of the product.
► Lift the product with three people.

Caution.
Risk of material damage caused by incorrect transport.

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.

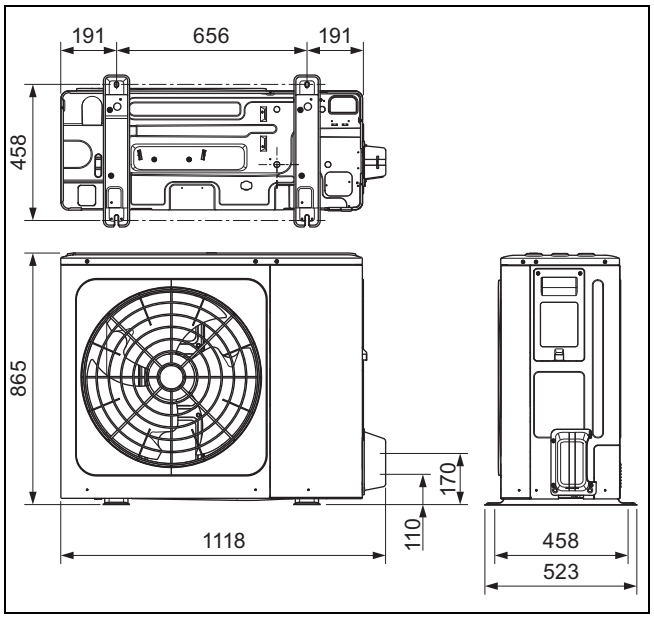
► During transport, do not tilt the product by any more than the maximum angle of 45°.

► Protect the casing sections against damage.
► Use carrying straps or a hand truck. In doing so, note the product's centre of gravity:



Type	A	B	C
8–10 kW	350	220	560
12–16 kW	355	275	520

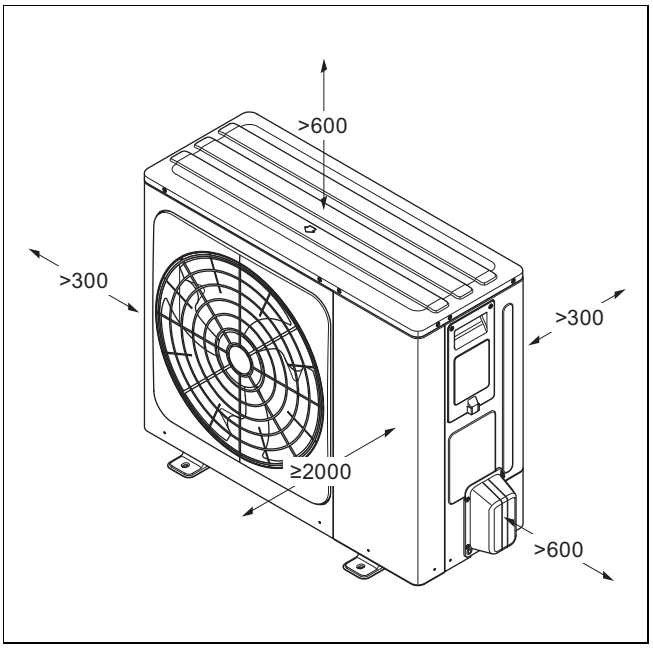
4.4 Dimensions



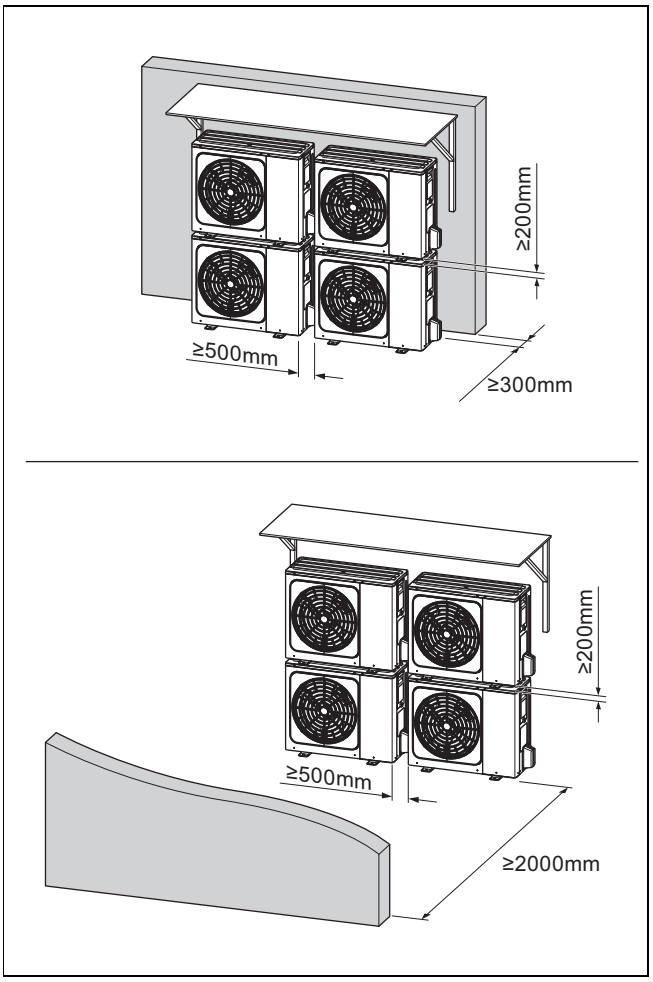
4.5 Complying with minimum clearances

► 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.

4.5.1 Individual installation



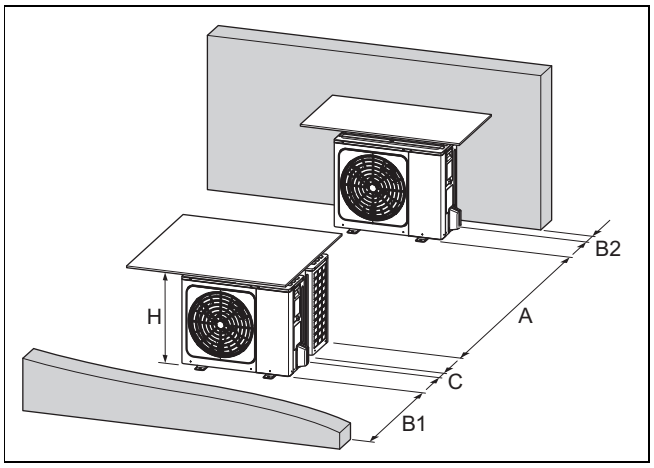
4.5.2 Installation on top of each other



Note
If you install the products on top of each other, you must install the condensate discharge pipe to prevent condensate from discharging into the heat exchanger.

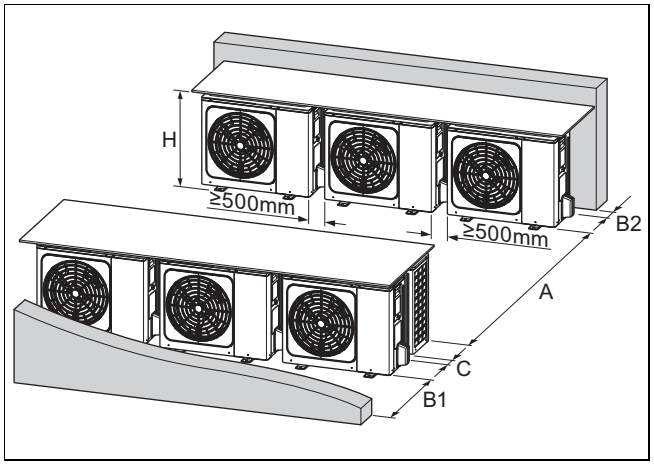
4.5.3 Multi-row installation

One product



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 150	≥ 600

Multiple products



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 300	≥ 600

4.6 Requirements for 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.

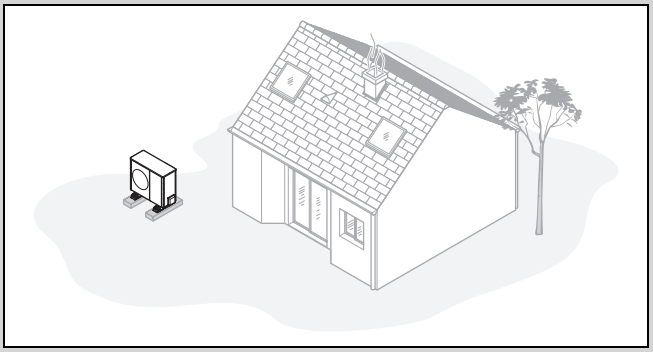
► Note that installation in sinks or areas that do not allow free outflow of air is not permitted.

► The product can be set up in a coastal region or at protected areas close to the coastline. We recommend maintaining a minimum distance of 1.5 km from the coastline. In the immediate vicinity of the coastline, a protection device that sufficiently protects the product against spraying water and sea wind must also be

installed. In doing so, the minimum clearances must be complied with.

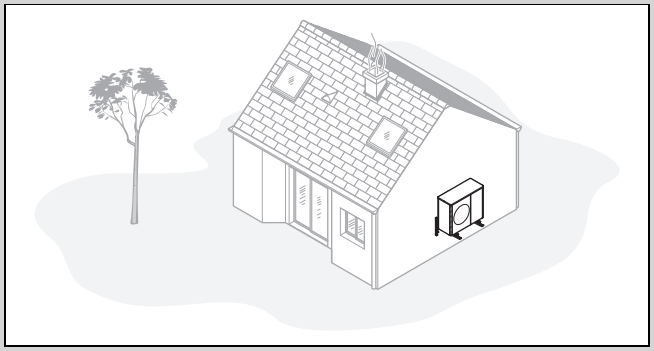
- Observe the permissible height difference between the outdoor unit and indoor unit.
- Keep away from flammable substances or flammable gases.
- Keep away from heat sources.
- Avoid using preloaded extract air.
- Keep away from ventilation openings and extract-air shafts.
- Keep away from deciduous trees and shrubs.
- Do not expose the outdoor unit to dusty air.
- Do not expose the outdoor unit to corrosive air. Keep away from animal stalls or stables.
- Please note that the installation site must be below 2000 m above sea level.
- Please note the noise emissions. Select an installation site that is as far away from your own bedroom as possible.
- Please note the noise emissions. Select an installation site that is as far away from the windows of adjacent building as possible.
- Select an installation site that is easily accessible so that maintenance and service work can be carried out.
- If the installation site is adjacent to a vehicle shunting area, protect the product using ram protection.
- If the installation site is located in a region that is prone to snow, select a weather-protected installation site. If required, plan additional weather protection. In doing so, note the potential effects on the noise emissions.
- If you set up the unit in a location where it is exposed to strong winds, pay particular attention to the fact that strong winds of 5 m/s or more blowing against the unit's air outlet may cause a short circuit (extraction of the extract air). This may have the following effects:
  - Deterioration in operating performance.
  - Frequent switching on of the heating mode for frost protection.
  - Interruption to operation due to high pressure.
  - Motor burnout.
- If a strong wind is constantly blowing on the front of the unit, the fan can rotate very quickly until it breaks.
- The outdoor temperature is measured by the outdoor unit's temperature sensor and may be influenced by direct sunlight. Therefore, place the outdoor unit in the shade or erect a canopy.

Validity: Ground installation



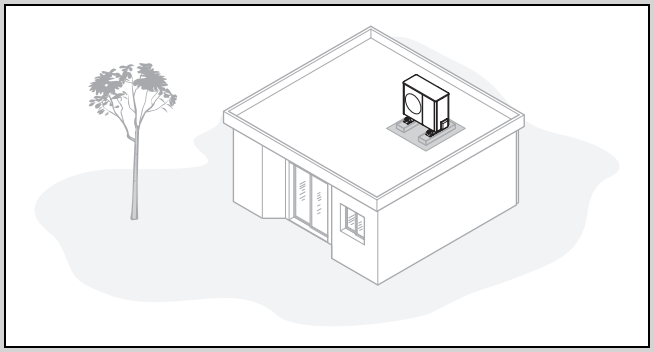
- Avoid choosing an installation site that is in the corner of a room, between walls or between fences.
- Prevent the return intake of air from the air outlet.
- Ensure that water cannot collect on the subsoil.
- Ensure that the subsoil can absorb water well.
- Plan a bed of gravel and rubble for the 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 sites between walls.
- Select an installation site with excellent sound absorption thanks to grass, hedges or 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.

Validity: Wall installation



- Ensure that the wall fulfils the static requirements. Note the weight of 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.
- If the work on the product takes place at a height above 3 m, install technical fall protection.

Validity: Flat-roof installation

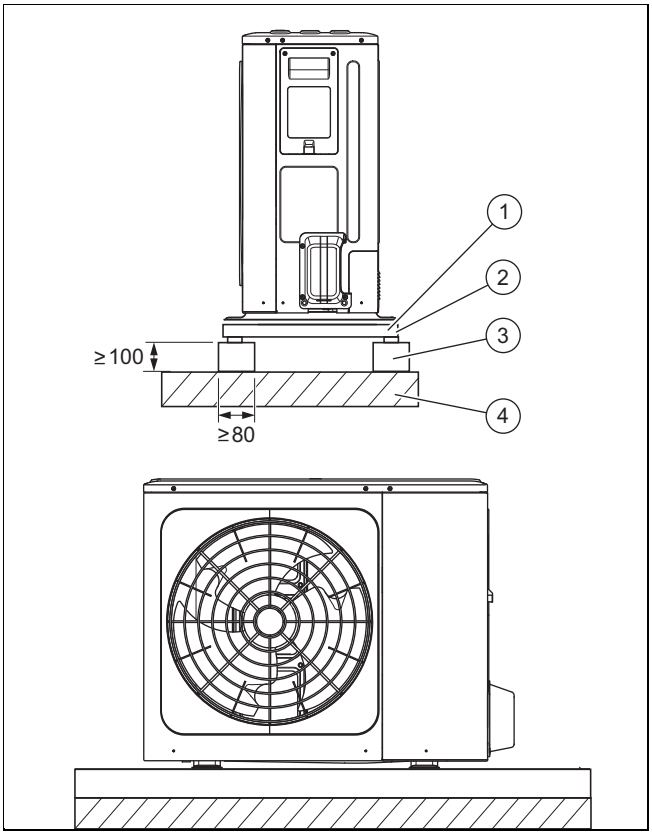


- Only install the product in buildings with a solid construction and that have cast concrete ceilings throughout.
- Do not install the product in buildings with a wooden structure or with a lightweight roof.
- Select an installation site that is easily accessible so that foliage or snow can be regularly 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.

4.7 Planning the foundation

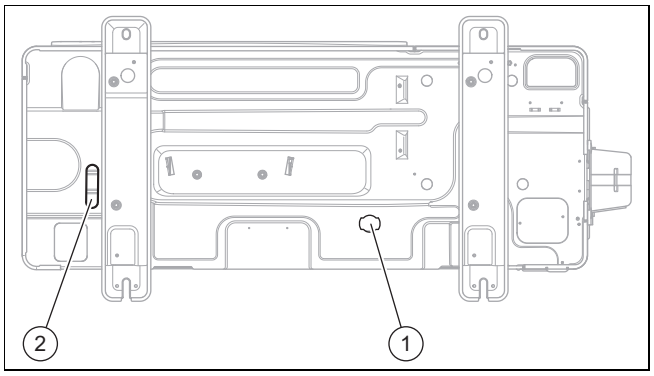
- ► Check the stability and evenness of the installation floor so that the product cannot cause any vibrations or noises during operation.



1 10 mm diameter expansion bolt
2 Shock-absorbing rubber mat
3 Concrete foundation
4 Fixed floor or canopy

- ► Tightly secure the product using four 10 mm diameter expansion bolts, nuts and washers.
- ► Screw in the expansion bolts until they have a clearance of 20 mm from the foundation surface.

Condensate discharge



1 Main drain opening
2 Large drain opening

All condensate from the outdoor unit is collected at the unit base and drains away via the main drain opening.

The larger drain opening is sealed with a rubber stopper. If the main drain opening is not sufficient for the condensate that is produced, also use the larger drain opening.

- ► If the water cannot drain at low temperatures, even when the large drain opening is open, install an electric heating belt. The electric heating belt acts as trace heating to prevent the formation of ice or to melt the ice that has formed.

4.8 Guaranteeing occupational safety

Validity: Wall installation

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

Validity: Flat-roof installation

- ► Ensure that the flat roof can be safely accessed.
- ► Maintain a safety area of 2 m to the fall edge, plus the clearance that is required for working on the product. The safety area must not be entered.
- ► Alternatively, 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.

4.9 Installing the product

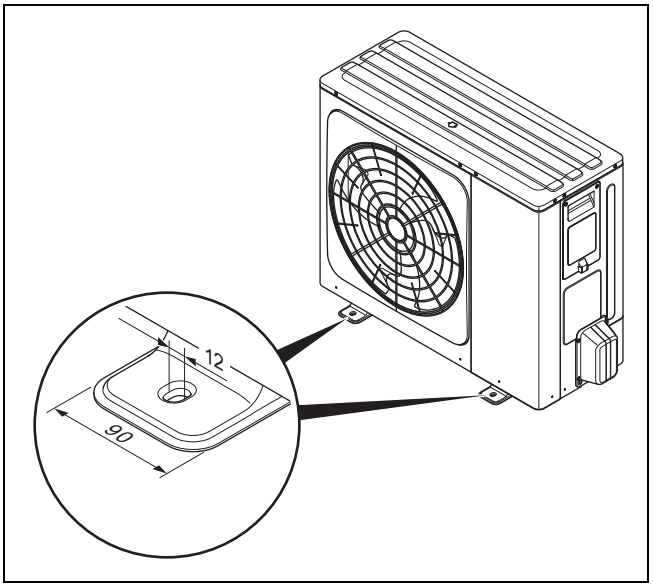
Danger!
Risk of injury due to frozen condensate.

Frozen condensate on paths may cause falls.

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

Note
Install rubber feet under the outdoor unit to prevent vibrations and noise. Recommendations for the rubber feet:

- Thickness: 50 mm to 100 mm
- Material: CR



Condition: Region prone to snow

- ► If required, set up additional weather protection. In doing so, note the potential effects on the noise emissions.

Validity: Ground installation

- ► Use the appropriate products, depending on the required installation type.
  - – Damping feet
  - – Raised base and damping feet
- ► Align the product horizontally.

Condition: Region without ground frost

- ► Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- ► If required, seal other openings in the floor plate.

Condition: Region with ground frost

- ► Do not install a condensate discharge pipe or any plugs in the floor plate.
- ► If required, protect the product's air inlet and air outlet against driving rain or direct snowfall. In doing so, note the potential effects on the noise emissions.

Validity: Wall installation

- ► Check the design and load-bearing capacity of the wall. Note the weight of the product.
- ► Use a unit mounting bracket that is suitable for the wall installation.
- ► Use the damping feet.
- ► Align the product horizontally.

Condition: Region without ground frost

- ► Below the product, create a gravel bed into which any condensate can drain.

Condition: Region with ground frost

- ► Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- ► If required, seal other openings in the floor plate.

Validity: Flat-roof installation

Warning.
Risk of injury due to toppling over in the wind.

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

- ► Use two concrete bases and an anti-slip protective mat.
- ► Screw the product to the concrete base.

- ► Use the damping feet.
- ► Align the product horizontally.

Condition: Region without ground frost

- ► Leave the condensate discharge open. In this case, the condensate drains onto the flat roof.
- ► Alternatively, connect drain pipework.
- ► To do this, install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- ► If required, seal other openings in the floor plate for this.

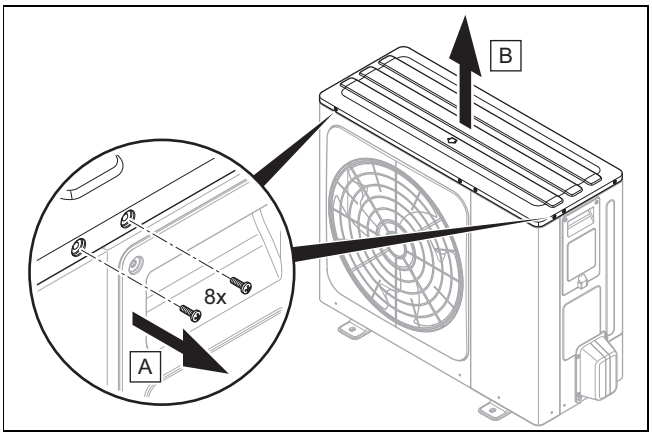
Condition: Region with ground frost

- ► Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- ► If required, seal other openings in the floor plate.
- ► Connect the condensate discharge pipe to a downpipe over a short distance.

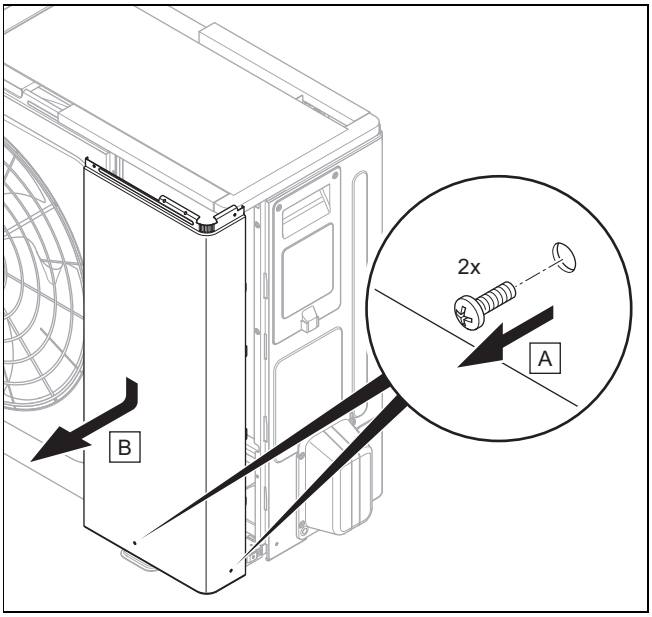
4.10 Removing/installing the casing sections

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

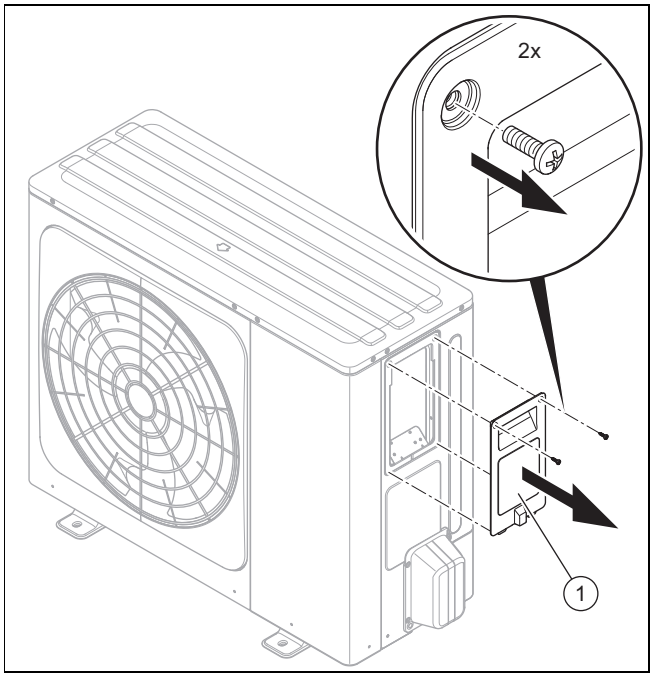
4.10.1 Removing the top casing



4.10.2 Removing the right-hand front casing



4.10.3 Removing the top casing for the electrical connections



5 Hydraulics installation

5.1 Preparing work on the refrigerant circuit

1. Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.

► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of injury and risk of environmental damage due to escaping refrigerant.

Touching any escaping refrigerant may cause injury. Escaping refrigerant leads to environmental damage if it reaches the atmosphere.

► Only carry out work on the refrigerant circuit if you have been trained to do so.

Caution.

Risk of material damage when extracting refrigerant.

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

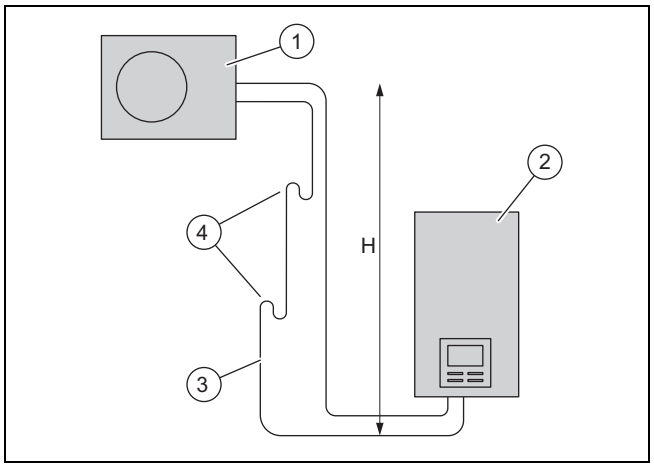
► Ensure that heating water flows through the indoor unit's condenser or it is completely drained when extracting refrigerant on the secondary side.

2. The outdoor unit is pre-filled with R32 refrigerant. Determine whether additional refrigerant is required.
3. Ensure that the two isolation valves are closed.
4. Purchase suitable refrigerant pipes in accordance with the technical data.
5. Ensure that the refrigerant pipes that are used comply with these requirements:
   – Special copper pipes for the refrigeration technology
   – Thermal insulation
   – Weather resistance and UV resistance.
   – Protection against rodent bites.
   – Flaring with 90° flare in accordance with the SAE standard
6. Keep the refrigerant pipes blocked until they are installed.
7. Ensure that there is no dirt or water in the refrigerant pipes before you connect the refrigerant pipes to the outdoor unit and indoor unit.
8. Prevent the ingress of metal chips, dirt or moisture into the refrigerant pipes.
9. Purchase the necessary tools and equipment:

Always required	May be required
– Flaring tool for 90° flare – Torque spanner – Refrigerant fitting – Nitrogen cylinder – Vacuum pump – Vacuum gauge	– Refrigerant cylinder with R32 – Refrigerant scales

5.2 Requirements for routing the refrigerant pipes

5.2.1 Case 1: Outdoor unit raised

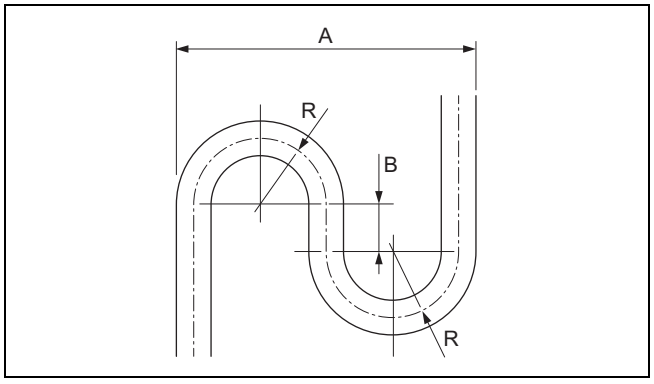


1	Outdoor unit	3	Hot gas pipe
2	Indoor unit	4	Oil elevation elbow

The outdoor unit can be installed up to a maximum height difference H of 20 m above the indoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. Depending on the height difference, oil elevation elbows must be installed in the hot gas pipe. The height difference between the oil elevation elbows must not exceed 7 m.

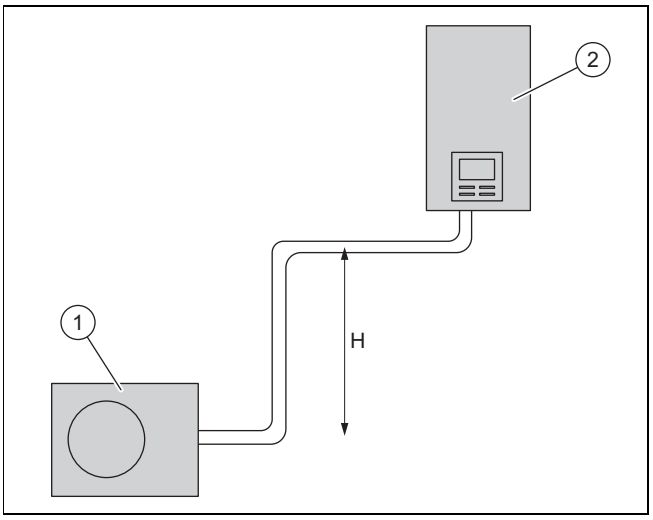
Height H	Oil elevation elbow
Up to 7 m	No oil elevation elbow required
Up to 14 m	One oil elevation elbow at 7 m high
Up to 20 m	Two oil elevation elbows, one 7 m and one 14 m in height

The oil elevation elbow must comply with these geometric requirements:



A	173 mm	R	40 mm
B	40 mm		

5.2.2 Case 2: Indoor unit raised



1 Outdoor unit 2 Indoor unit

The indoor unit can be installed up to a maximum height difference H of 20 m above the outdoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. No oil elevation elbow is required.

5.3 Flare connection

The flare connection guarantees the tightness of the refrigerant pipe for the R32 refrigerant.

If a flare connection comes loose again, the old flare must then be disconnected, and a new flare must be established. The refrigerant pipe is therefore shortened slightly. This must be taken into consideration when routing the refrigerant pipes.

5.4 Routing refrigerant pipes to the product

Validity: Ground installation

- ► Route the refrigerant pipe through the safety pipe in the ground.

1. Route the refrigerant pipes in the wall duct with a slight downward gradient to the outside.
2. Route the refrigerant pipe centrally through the wall duct without the lines touching the wall.
3. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.

Validity: Wall installation

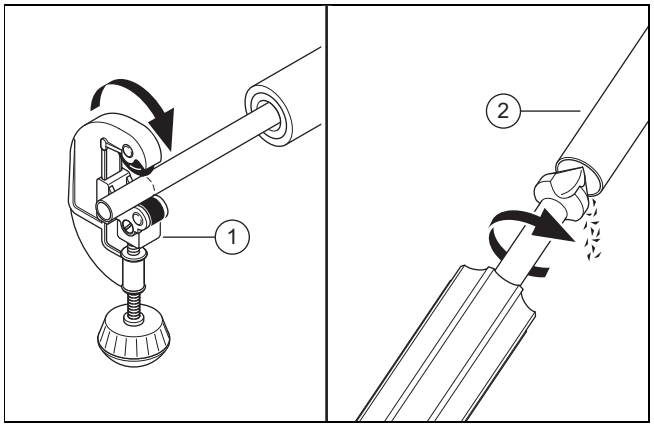
- ► Ensure that the refrigerant pipes do not come into contact with the wall and the product's casing sections.

5.5 Routing refrigerant pipes in the building

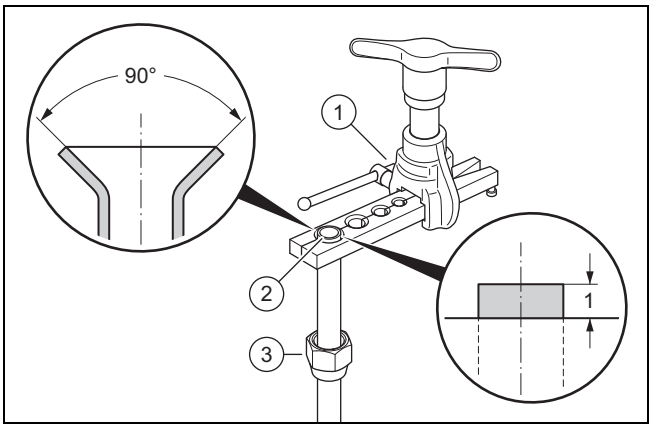
1. Do not route the refrigerant pipes in screed or masonry in the building. If this is unavoidable, install a silencer in the refrigerant pipe.
2. Do not route the refrigerant pipes through living rooms in the building.
3. Limit the routing of refrigerant pipes to a minimum. Avoid unnecessary piping and elbows.
4. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.
5. Bend the refrigerant pipes at the right angle to the wall and avoid mechanical tension during the routing.
6. Ensure that the refrigerant pipes do not come into contact with the wall.
7. Use wall brackets with rubber insert to secure these. Place the wall brackets around the thermal insulation of the refrigerant pipe.
8. Check whether oil elevation elbows are required. (→ Section 5.2.1)
9. If required, install oil elevation elbows in the hot gas pipe.
10. Ensure that the routed refrigerant pipes are protected against damage.

5.6 Cutting the pipes to length and flaring the pipe ends

1. Keep the pipe ends downwards when working on them.
2. Prevent the ingress of metal chips, dirt or moisture.

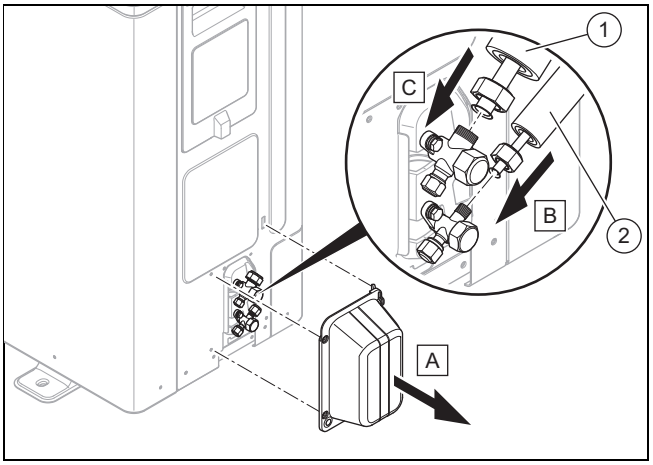


3. Cut the copper pipe to length at a right angle using a pipe cutter **(1)**.
4. Deburr the inside and outside of the pipe end **(2)**. Remove all chips carefully.
5. Unscrew the flare nut on the associated isolation valve.



6. Slide the flare nut **(3)** onto the pipe end.
7. Use a flaring tool for the 90° flare in accordance with the SAE standard.
8. Insert the pipe end into the appropriate die matrix in the flaring tool **(1)**. Allow the pipe end to protrude by 1 mm. Clamp the pipe end.
9. Widen the pipe end **(2)** using the flaring tool.

5.7 Connecting the refrigerant pipes



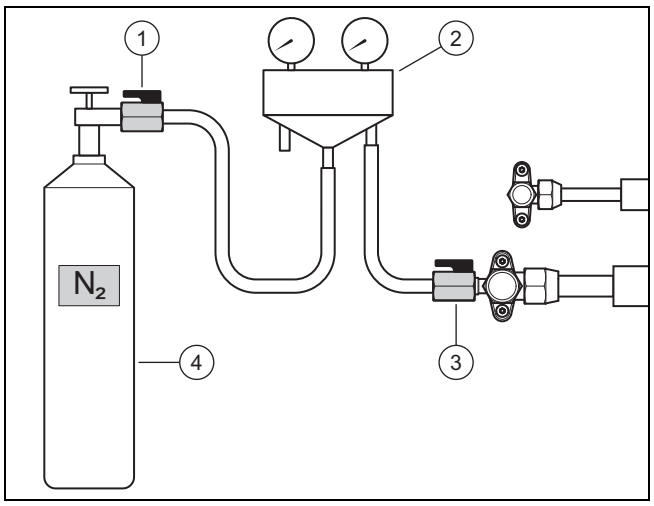
1. Remove the cover for the refrigerant pipe connections.
2. Remove the flare nut from the connections for the refrigerant pipes.
3. Cut the pipes to the correct length and flare the pipe ends. (→ Section 5.6).
4. Connect the liquid pipe **(2)** and the hot gas pipe **(1)**.
5. Tighten the flare nut. Use pliers to hold the isolation valve in place while doing so.

Pipeline	Pipe diameter	Tightening torque
Liquid pipe	3/8"	25 to 26 Nm
Hot gas pipe	5/8"	45 to 47 Nm

6. Ensure that the flare connections remain accessible for maintenance purposes.

5.8 Checking the refrigerant circuit for tightness

1. Ensure that the two isolation valves on the outdoor unit are still closed.
2. Observe the maximum operating pressure in the refrigerant circuit.



3. Connect a refrigerant fitting **(2)** with a ball valve **(3)** to the maintenance connection for the hot gas pipe.
4. Connect the refrigerant fitting with a ball valve **(1)** to a nitrogen cylinder **(4)**. Use dry nitrogen.
5. Open both of the ball valves.
6. Open the nitrogen cylinder.
   – Test pressure: 4.3 MPa (43 bar)
7. Close the nitrogen cylinder and the ball valve **(1)**.
   – Waiting time: 10 minutes
8. Check all of the connections in the refrigerant circuit for tightness. Use leak detection spray for this.
9. Observe whether the pressure is stable.

Result 1:

The pressure is stable and no leaks were found:

- ► Completely drain the nitrogen gas via the refrigerant fitting.
- ► Close the ball valve **(3)**.

Result 2:

The pressure drops or a leak is found:

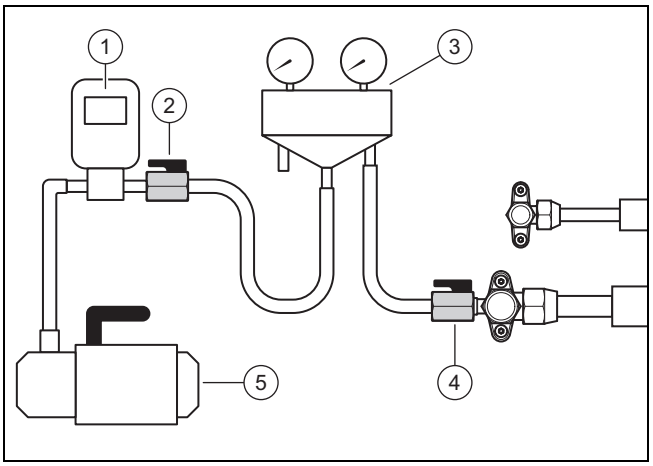
- ► Eliminate the leakage.
- ► Repeat the test.

5.9 Evacuating the refrigerant circuit

Note

During evacuation, residual moisture is removed from the refrigerant circuit at the same time. The length of the process depends on the residual moisture and the outdoor temperature.

1. Ensure that the two isolation valves on the outdoor unit are still closed.



2. Connect a refrigerant fitting **(3)** with a ball valve **(4)** to the maintenance connection for the hot gas pipe.
3. Connect the refrigerant fitting with a ball valve **(2)** to a vacuum gauge **(1)** and a vacuum pump **(5)**.
4. Open both of the ball valves.
5. **First test**: Switch on the vacuum pump.
6. Drain the refrigerant pipes and the condenser on the indoor unit.
   – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
   – Running time of the vacuum pump: At least 30 minutes
7. Switch off the vacuum pump.
   – Waiting period: 3 minutes
8. Check the pressure.

   Result 1:

   Pressure is stable:

   ► The first test is complete. Start with the second test.

   Result 2:

   The pressure increases and there is a leak:

   ► Check the flare connections on the outdoor unit and indoor unit. Eliminate the leakage.

   ► Start with the second test.

   Result 3:

   The pressure increases and there is residual moisture:

   ► Carry out the drying process.

   ► Start with the second test.
9. **Second test**: Switch on the vacuum pump.
10. Drain the refrigerant pipes and the condenser on the indoor unit.
    – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
    – Running time of the vacuum pump: At least 30 minutes
11. Switch off the vacuum pump.
    – Waiting period: 3 minutes
12. Check the pressure.

    Result 1:

    Pressure is stable:

    ► The second test is complete. Close the ball valves **(2)** and **(4)**.

    Result 2:

    The pressure increases.

    ► Repeat the second test.

5.10 Permissible total refrigerant volume

The outdoor unit is filled with refrigerant at the factory:

Product	Factory-set refrigerant volume	Refrigerant
8 kW, 10 kW	1.65 kg	R32
12 kW, 16 kW	1.84 kg	R32

Depending on the length of the refrigerant pipes, an additional refrigerant volume must be filled during the installation (→ Section 5.11).

The total permissible refrigerant volume is limited and depends on the minimum room size at the installation site for the indoor unit.

The requirements for the minimum room size at the indoor unit's installation site are described in the installation instructions for the indoor unit. For a total fill quantity of over 1.84 kg, the required installation room must be considerably larger.

5.11 Adding additional refrigerant

Danger!

Risk of injury due to escaping refrigerant.

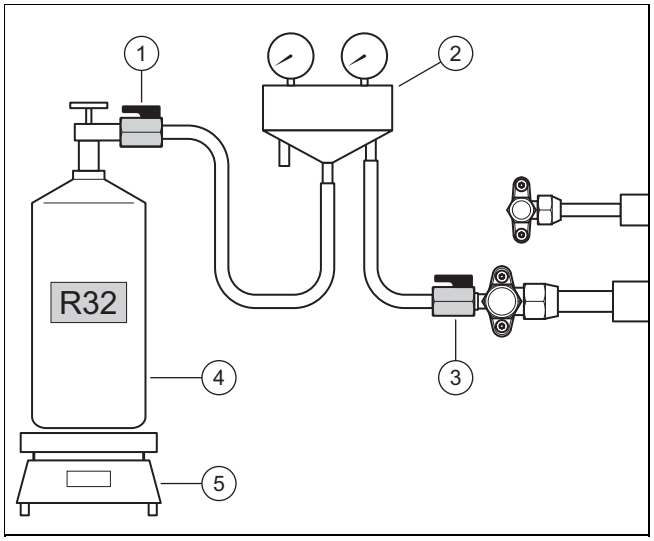
Touching any escaping refrigerant may cause injury.

► Wear personal protective equipment.

1. Determine the single length of the refrigerant pipe.
2. Calculate the required volume of additional refrigerant:

Single length	Refrigerant volume to be topped up
≤ 15 m	None
> 15 m	38 g for every additional metre above 15 m

3. Ensure that the two isolation valves on the outdoor unit are still closed.



4. Connect the refrigerant fitting **(2)** with the ball valve **(1)** to a refrigerant cylinder **(4)**.

– Refrigerant to be used: R32

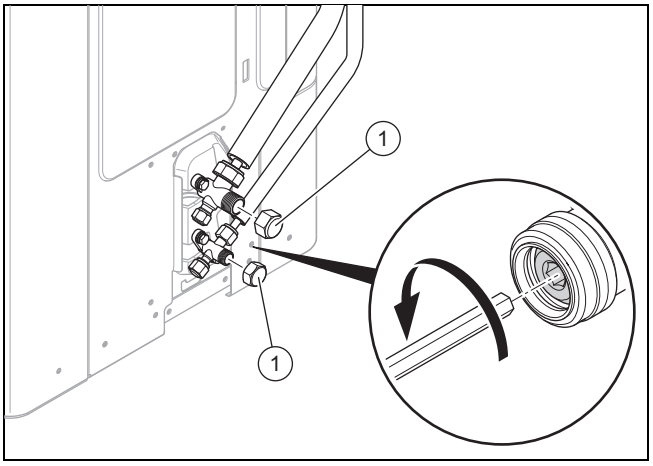
5. Put the refrigerant cylinder on the scales **(5)**. If the refrigerant cylinder does not have an immersion sleeve, put it on the scales upside down.
6. Leave the ball valve **(3)** closed. Open the refrigerant cylinder and the ball valve **(1)**.
7. If the hoses have been filled with refrigerant, set the scales to zero.
8. Open the ball valve **(3)**. Fill the outdoor unit with the calculated refrigerant volume.
9. Close both of the ball valves.
10. Close the refrigerant cylinder.

5.12 Releasing the refrigerant

Danger!
Risk of injury due to escaping refrigerant.

Touching any escaping refrigerant may cause injury.

► Wear personal protective equipment.



1. Remove both covering caps **(1)**.
2. Unscrew both hexagon socket screws as far as they will go.
   ◁ The refrigerant flows into the refrigerant pipes and the indoor unit's condenser.
3. Check that no refrigerant is escaping. Check in particular all of the screwed connections and valves.
4. Screw on both covering caps. Tighten the covering caps.

5.13 Completing work on the refrigerant circuit

1. Note down the refrigerant volume added at the factory, the additional refrigerant volume added and the total refrigerant volume on the sticker on the product.
2. Enter the data in the service book.
3. Insulate and secure the refrigerant pipes after you have connected the connection cable (→ Section 6.8).
4. Install the cover for the refrigerant pipe connections.

6 Electrical installation

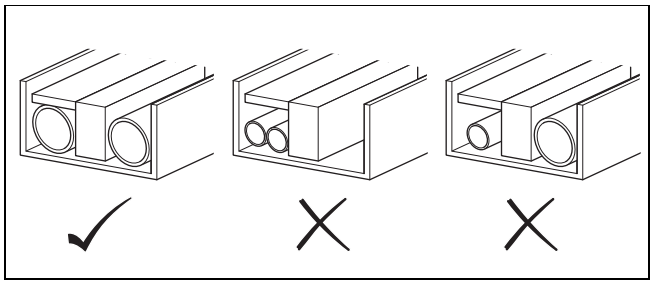
6.1 Precautionary measures when working on electrical wires

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.

► Carry out the on-site wiring in accordance with the wiring diagram supplied and the instructions below.
► Install a main switch or other partition with all-pole contact separation in the fixed wiring. In doing so, observe the applicable local laws and regulations.
► Switch off the power supply before implementing any connections.
► Use a 3-core, shielded copper cable.
► Never crush bundled cables.
► Secure the cables in such a way that they do not come into contact with the pipelines or sharp edges.
► Ensure that no pressure is exerted on the terminal connections.
► Use a separate power supply for the product. Never use a power supply that is shared by another product.
► Ensure that it is earthed. Do not earth the unit via a supply pipe, overvoltage protection or the telephone earth.
► Install a type B residual-current circuit breaker with 30 mA (<0.1 s).
► Do not install a phase advance capacitor as this can impair the function of the capacitor.



► Route the wires in accordance with the figure.
► Do not connect any wires with different cross-sections to the same power supply terminal.
► Secure the electrical wires using cable ties so that they do not come into contact with the pipelines, especially on the high-pressure side.

6.2 Precautionary measures when connecting the power supply

- ► Use round conductor end sleeves for the connection to the terminal block for the power supply. If, for unavoidable reasons, these cannot be used, observe the following instructions.
- ► Use the specified wires for the wiring.
- ► Do not connect any wires with different cross-sections to the same power supply terminal (loose connections may lead to overheating).
- ► Use the correct screwdriver to tighten the terminal screws.
- ► Connect a residual-current circuit breaker and a fuse to the power supply cable.
- ► Establish complete connections and secure the wires in such a way that no external forces can act on the terminals.
- ► Ensure that a tolerance of +10% to -15% is maintained for the mains voltage of the single-phase 230 V mains.

6.3 Requirement for the safety device

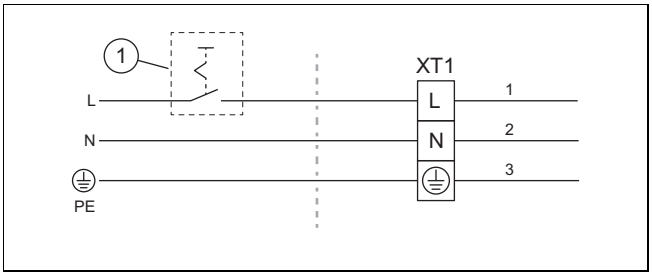
- ► Select the minimum required cable cross-section for each product individually using the tables (→ Appendix D).
- ► Select a residual-current circuit breaker that has a contact gap of at least 3 mm and which enables complete shutdown. Use the value for the maximum amperage to select current and residual-current circuit breakers (→ Appendix D).

6.4 Preparing the electrical connection

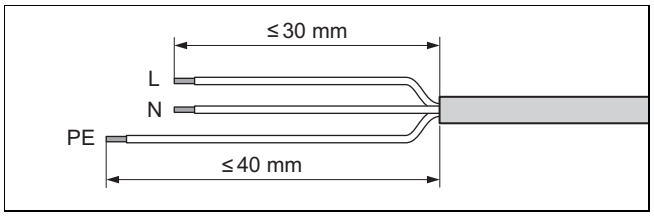
- ► Remove the top casing for the electrical connections. (→ Section 4.10.3)

6.5 Establishing the power supply

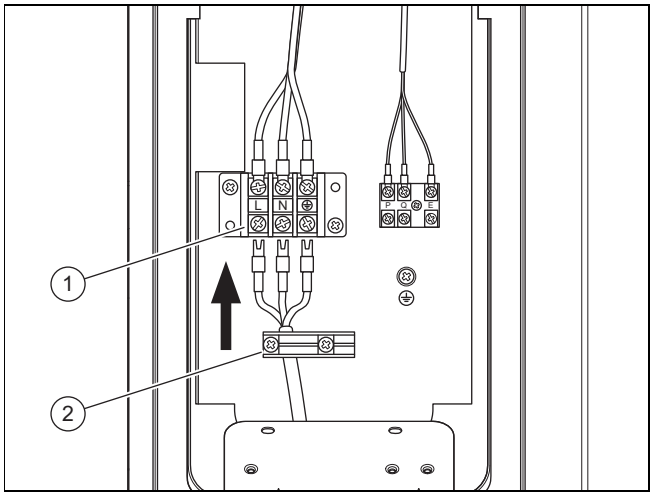
1. If it is stipulated for the installation site, install one residual-current circuit breaker for the product.



2. Install a disconnector **(1)** for the product in the building.
3. Use one 3-pole power supply cable.
4. Route the power supply cable from the building and through the wall duct to the product.
5. Route the power supply cable within the product in such a way that no contact is made with hot components.



6. Strip the power supply cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
7. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.



8. Connect the power supply cable to the power supply terminal **(1)**.
9. Secure the power supply cable using the strain relief clamp **(2)**.

6.6 Connecting the connection cable

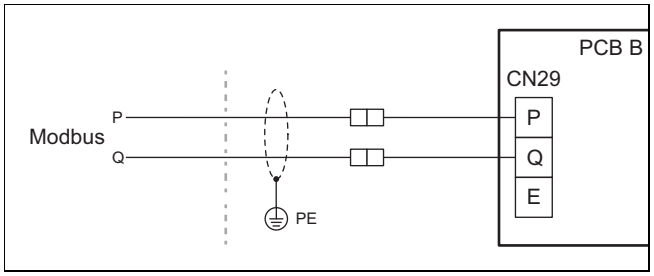
Note

The connection between the outdoor unit and the indoor unit is established via Modbus communication (RS-485 protocol).

Preliminary work

1. Determine the line length between the indoor unit and outdoor unit.
2. Use a communication cable with the following properties:

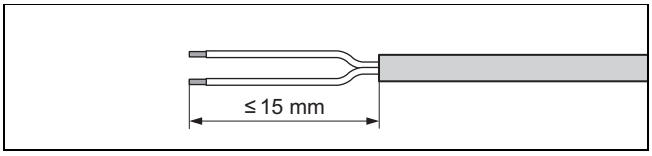
	Feature
Type	2 x shielded cable (AWG18)
Min. cross-section	0.75 mm²
Max. length	50 m



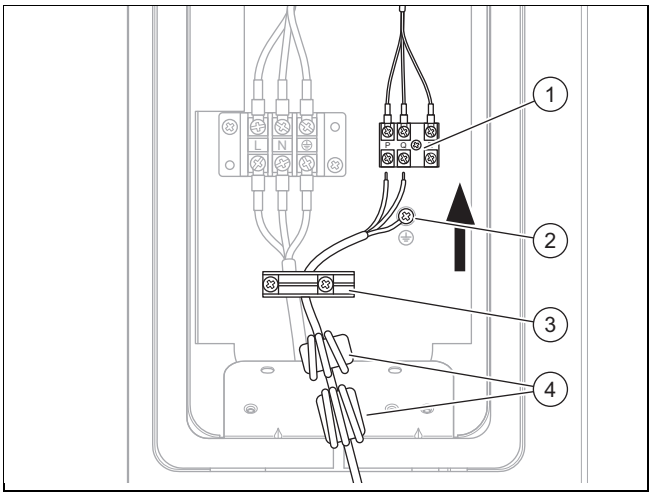
1. Ensure that connections P and Q on the indoor unit are connected to connections P and Q on the outdoor unit using the Modbus cable.

– To do this, use a Modbus cable with different conductor colours for signals P and Q.
– The shield braid for the communication cable must be earthed.

2. Route the Modbus cable from the building and through the wall duct to the product.
3. Route the Modbus cable within the product in such a way that no contact is made with hot components.



4. Strip the Modbus cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
5. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.

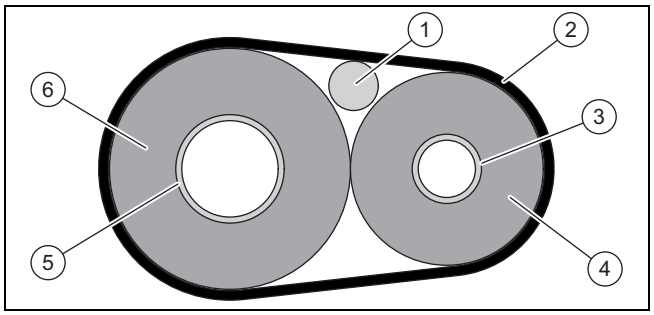


6. Position two ferrite rings **(4)** as shown in the figure.
7. Connect the two conductors on the Modbus cable to the screw terminal **(1)**. In doing so, check the assignment of the conductor colours to connections P and Q.
8. Connect the shield connection to the earthing terminal **(2)**.
9. Use the strain relief clamp **(3)** to secure the Modbus cable in place.

6.7 Completing the electrical connection

1. Check that the power supply cable and the Modbus cable are routed in such a way that they are not exposed to any wear, corrosion, tension, vibrations, sharp edges or any other unfavourable environmental influences.
2. Install the top casing.

6.8 Completing the installation of the outdoor unit



1	Connection cable	4	Liquid pipe insulation
2	Edging tape	5	Hot gas pipe
3	Liquid pipe	6	Hot gas pipe insulation

1. Insulate and secure the refrigerant pipes and the connection cable in accordance with the figure.
2. Install the protective cover for the refrigerant connection.

7 Start-up

7.1 Checking before switching on

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

7.2 Switching on the product

- ► Switch on the disconnector to which the product is connected in the building.

8 Handing over to the end user

8.1 Instructing the end user

- ► Explain to the end user how the product operates.
- ► 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 R32 refrigerant.
- ► Make the end user aware of the need for regular maintenance.

9 Troubleshooting

9.1 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).

10 Inspection and maintenance

10.1 Preparing for inspection and maintenance

► Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
► If you notice a leak, close the product's housing, inform the end user and notify customer service.
► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
► Ensure that the room is sufficiently aerated around the product.
► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

► Only open the electronics box after a waiting period of 60 minutes.

► Observe the basic safety rules before carrying out inspection and maintenance work or installing spare parts.
► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
► Switch off the disconnector to which the product is connected in the building.
► Disconnect the product from the power supply but ensure that the product is still earthed.
► Before working in the electronics box, comply with a waiting time of 60 minutes after switching off the power supply.
  – An LED on the PCB and the module PCB displays whether the PCBs are still supplied with power. If the LEDs no longer light up, the power supply is interrupted.
► When working on the product, protect all electric components from spraying water.

10.2 Observing the work plan and intervals

► Comply with the specified intervals. Carry out all of the work that is mentioned (Appendix D).

10.3 Procuring spare parts

The original components of the product were also certified by the manufacturer as part of the declaration of conformity. If you use other, non-certified or unauthorised parts during maintenance or repair work, this may result in the product no longer meeting the applicable standards, thereby voiding the conformity of the product.

We strongly recommend that you use original spare parts from the manufacturer as this guarantees fault-free and safe operation of the product. To receive information about the available original spare parts, contact the contact address provided on the back page of these instructions.

► If you require spare parts for maintenance or repair work, use only the spare parts that are permitted for the product.

10.4 Carrying out maintenance work

10.4.1 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.

10.4.2 Removing the casing sections

► Remove the casing sections to the extent required for the subsequent maintenance work (→ Section 4.10).

10.4.3 Cleaning the evaporator

1. Clean the gaps between the evaporator fins using a soft brush. In doing so, avoid bending the fins.
2. Remove any dirt and depositions.
3. If required, straighten out any bent fins using a fin comb.

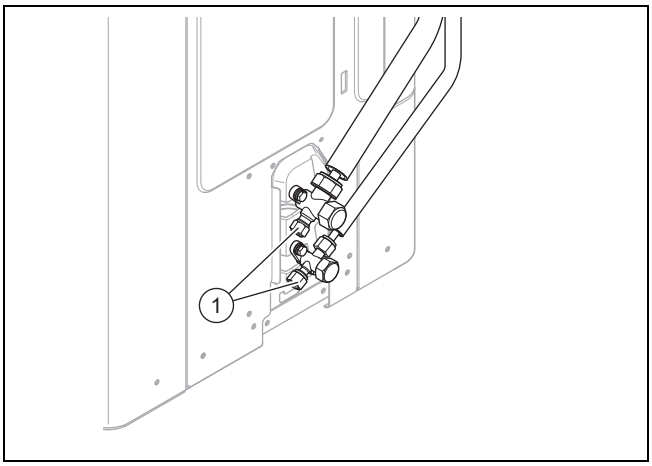
10.4.4 Checking the fan

1. Turn the fan by hand.
2. Check that the fan runs freely.

10.4.5 Cleaning the condensate discharge

1. Remove the dirt that has accumulated on the condensate tray or in the condensate discharge pipe.
2. Check that the water can drain freely. Poor approx. 1 l water into the condensate tray.

10.4.6 Checking the refrigerant circuit



1. Check whether the components and pipelines are free from dirt and corrosion.
2. Check that the covering caps **(1)** on the maintenance connections are positioned securely.
3. Check whether the thermal insulation for the refrigerant pipes is undamaged.
4. Check whether the refrigerant pipes have been routed without any kinks.

10.4.7 Checking the refrigerant circuit for tightness

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

10.4.8 Checking the electrical connections

1. In the connection box, check that the electrical wire are seated firmly in the plugs or terminals.
2. Check the earthing in the connection box.
3. Check whether the power supply cable is damaged. If it needs to be replaced, ensure that it is only replaced by customer service or a similarly qualified person in order to prevent hazards.
4. In the unit, check that the electrical wire are seated firmly in the plugs or terminals.
5. In the unit, check whether the electrical wires are free from damage.
6. If there is a fault that affects safety, do not switch the power supply back on until the fault has been eliminated.
7. If it is not possible to immediately eliminate this fault but it is still necessary to operate the installation, create a suitable interim solution. Inform the end user about this.

10.4.9 Checking the damping feet for wear

1. Check whether the damping feet are significantly compressed.
2. Check whether the damping feet have significant cracks.
3. Check whether there is substantial corrosion on the screwed connection for the damping feet.
4. If required, procure and install new damping feet.

10.5 Completing inspection and maintenance

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

11 Repair and service

11.1 Preparing repair and service work

- ► Observe the basic safety rules before carrying out any repair and service work.
- ► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
- ► Only carry out work on the refrigerant circuit if you have specific expert refrigeration knowledge and are competent at handling R32 refrigerant.
- ► When working on the refrigerant circuit, inform everybody who is working in the close vicinity or who is in the area, about the type of work that is to be carried out.
- ► Only carry out work on electrical components if you have specific electrical expertise.

Danger!

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices

or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

- ► Only open the electronics box after a waiting period of 60 minutes.

- ► Switch off the disconnector to which the product is connected in the building.
- ► Disconnect the product from the power supply but ensure that the product is still earthed.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Use only safe units and tools that are permitted for R32 refrigerant.
- ► Monitor the atmosphere in the working area using a 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 casing sections.

11.2 Replacing components of the refrigerant circuit

- ► Ensure that the work follows the defined procedure, as described in the sections below.

11.2.1 Removing refrigerant from the product

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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.
- ► Ensure that the expansion valves are open in order to guarantee that the refrigerant circuit is drained completely.
- ► The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

Caution.

Risk of material damage when removing the refrigerant.

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

- ► Remove the heating water from the indoor unit's condenser (heat exchanger) before the refrigerant is removed from the product.

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 R32 refrigerant.
3. Use only recycling cylinders that are approved for R32 refrigerant, have been labelled appropriately, and are equipped with a pressure relief and isolation valve.
4. Only use hoses, couplings and valves that are as short as possible, leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Ensure that the work area is sufficiently aerated.
6. Ensure that the outlet of the vacuum pump is not located close to potential sources of ignition.
7. Drain the recycling cylinder. In doing so, ensure that the recycling cylinder is correctly positioned.
8. Extract the refrigerant. In doing so, take into account the maximum fill quantity of the recycling cylinder, and monitor the fill quantity using calibrated scales. In doing so, never exceed the permissible operating pressure for the recycling cylinder.
9. Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the recycling cylinder.
10. If there are leaks, do not use the extraction station under negative pressure.
11. Never leave the extraction station unattended.
12. Connect the manometer bridge to the isolation valve's maintenance connection.
13. Open both expansion valves in order to guarantee that the refrigerant circuit is drained completely.
14. Once the refrigerant circuit is completely empty, immediately remove the recycling cylinders and units from the installation.
15. Close all of the isolation valves.

11.2.2 Removing components of the refrigerant circuit

- ► Flush the refrigerant circuit with oxygen-free nitrogen. Never use compressed air or oxygen instead of this.
- ► 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, there must no longer be any flammable refrigerant in the compressor oil. You should therefore drain it for a sufficient time using sufficient negative pressure.
- ► 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.
- ► If compressor oil is drained, this must be carried out safely and securely.
- ► Note that removed components may release refrigerant for an extended period. Only store and transport these components in well-aerated locations.

11.2.3 Installing components of the refrigerant circuit

- ► Only use original spare parts from the manufacturer.
- ► Install the component correctly. To do this, use only soldering processes.
- ► Install a filter dryer outdoors in the liquid pipe to the outdoor unit.
- ► Carry out a pressure test of the refrigerant circuit using nitrogen.
- ► Check whether all main components are correctly earthed after maintenance (compressor, etc.).

11.2.4 Filling the product with refrigerant

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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 R32 refrigerant that has not been used before and is specified as such, and the purity of which is at least 99.5%.

1. Make sure that the product is earthed.
2. Procure the tools and units that are required for filling with refrigerant:
   - Vacuum pump
   - Refrigerant cylinder
   - Scales
3. Only use tools and units that are permitted for R32 refrigerant. Only use refrigerant cylinders that are labelled accordingly.
4. Only use hoses, couplings and valves that are leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Only use hoses that are as short as possible in order to minimise the refrigerant volume that they can hold.
6. Flush the refrigerant circuit with nitrogen.
7. Drain the refrigerant circuit.
8. Fill the refrigerant circuit with R32 refrigerant. The required fill quantity is specified on the product's data plate. Ensure in particular that the refrigerant circuit is not overfilled.
9. Check the refrigerant circuit for leak-tightness using a gas sniffer. In doing so, check all of the components and pipelines.

11.3 Replacing electrical components

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

11.4 Completing repair and service work

- ► Installing the casing sections.
- ► Switch on the disconnector to which the product is connected in the building.
- ► Start up the product. Temporarily activate the heating mode.
- ► Check the product for leak-tightness using a gas sniffer.

12 Decommissioning

12.1 Temporarily decommissioning the product

1. Switch off the disconnector to which the product is connected in the building.
2. Disconnect the product from the power supply.

12.2 Permanently decommissioning the product

Caution.
Risk of damage caused by defrosting.

Draining off the refrigerant generates intense cooling of the indoor unit's plate heat exchanger, which may lead to the de-icing of the plate heat exchanger on the heating water side.

- ► Drain the indoor unit on the heating water side in order to prevent damage.
- ► Ensure that, during the refrigerant draining of the plate heat exchanger on the heating water side, there is sufficient flow-through.

1. Switch off the disconnector 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 indoor unit.
4. Remove the casing sections.
5. Remove the refrigerant from the product. (→ Section 11.2.1)
6. Note that refrigerant will continue to escape even after the refrigerant circuit is completely drained due to outgassing from the compressor oil.
7. Installing the casing sections.
8. Label the product using a sticker that is visible from the outside.
9. Note down on the sticker that the product has been decommissioned and that the refrigerant has been completely removed. Sign the sticker and specify the date.
10. Recycle the removed refrigerant in accordance with the regulations. Note that the refrigerant must be cleaned and checked before it is used again.
11. Dispose of or recycle the product and its components in accordance with the regulations.

13 Recycling and disposal

13.1 Disposing of the packaging

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

13.2 Recycling or disposing of refrigerant

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

If R32 refrigerant is released during transport, a flammable atmosphere may form when it mixes with air. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Ensure that the refrigerant is transported correctly.

Warning.
Risk of damage to the environment.

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential).

- ► Have the refrigerant that is contained in the product completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with the regulations.
- ► When doing so, ensure that the vessel does not contain multiple different types of refrigerant.

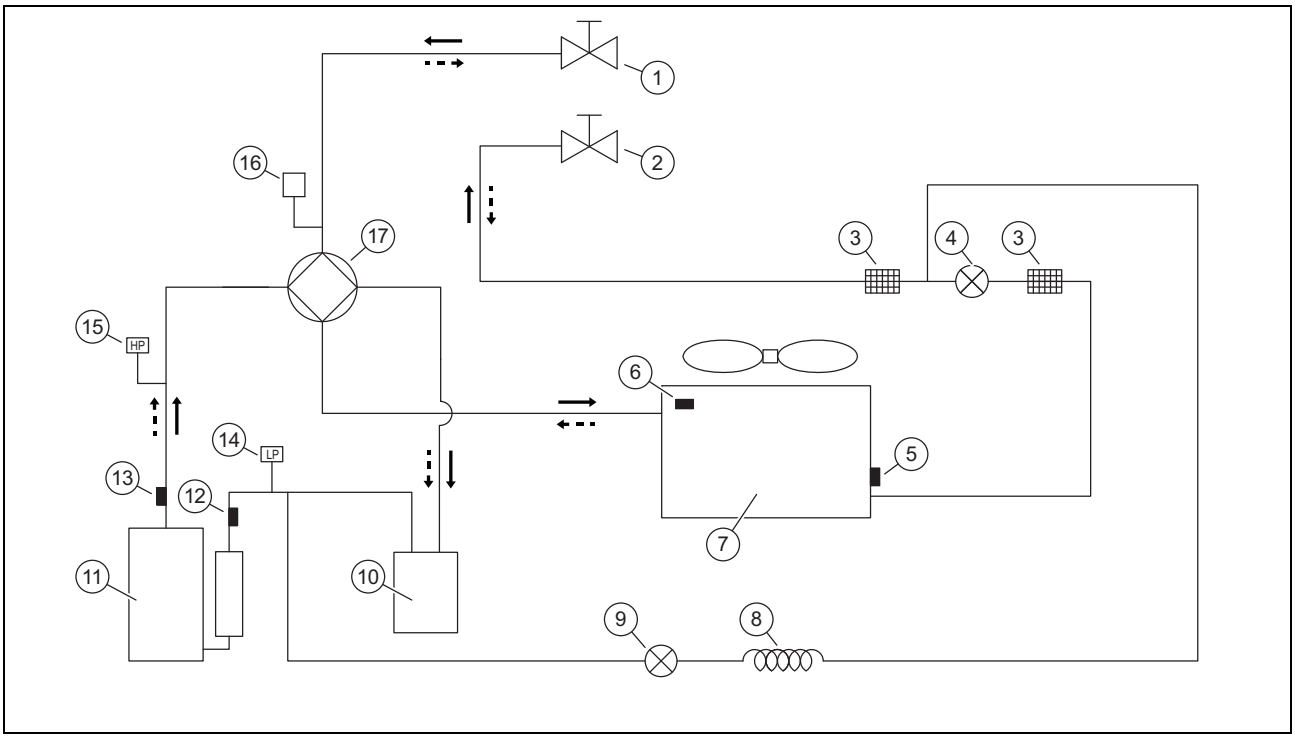
- ► Ensure that the refrigerant is recycled or disposed of by a qualified competent person.

14 Customer service

Datele de contact pentru serviciul nostru de asistenţă tehnică le găsiţi la adresa indicată pe partea posterioară sau pe www.demirdokum.com.tr.

Appendix

A Refrigerant circuit



Cooling

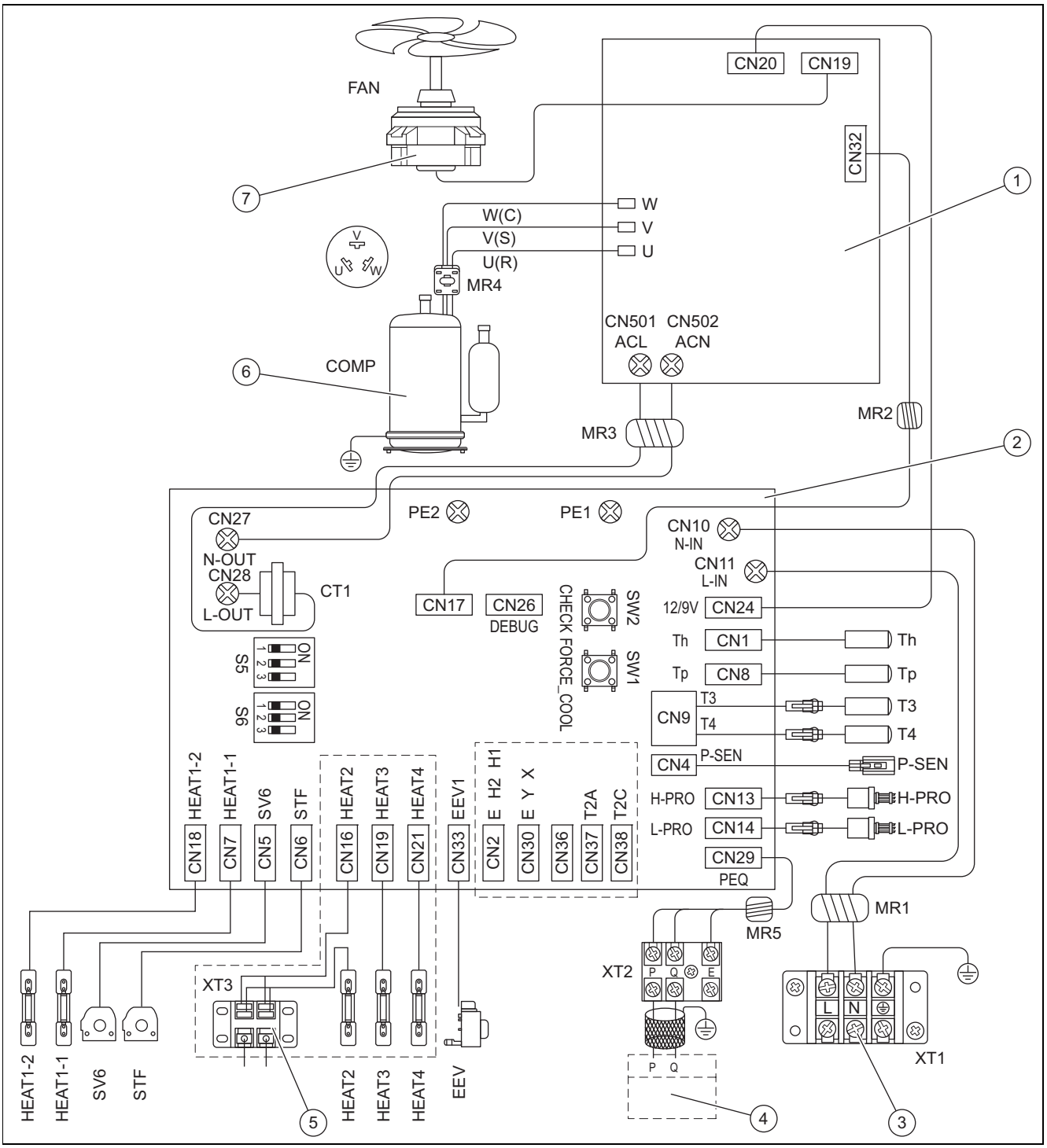
Heating

1	Hot gas pipe isolation valve
2	Liquid pipe isolation valve
3	Filter
4	Electronic expansion valve
5	Temperature sensor (evaporator in heating mode, condenser in cooling mode)
6	Outdoor temperature sensor
7	Air-side heat exchanger
8	Capillary
9	Electromagnetic one-way valve
10	Gas liquid separator
11	Compressor
12	Intake temperature sensor
13	Outlet temperature sensor
14	Low-pressure switch
15	High-pressure switch
16	Pressure sensor
17	4-port valve

B Wiring diagrams

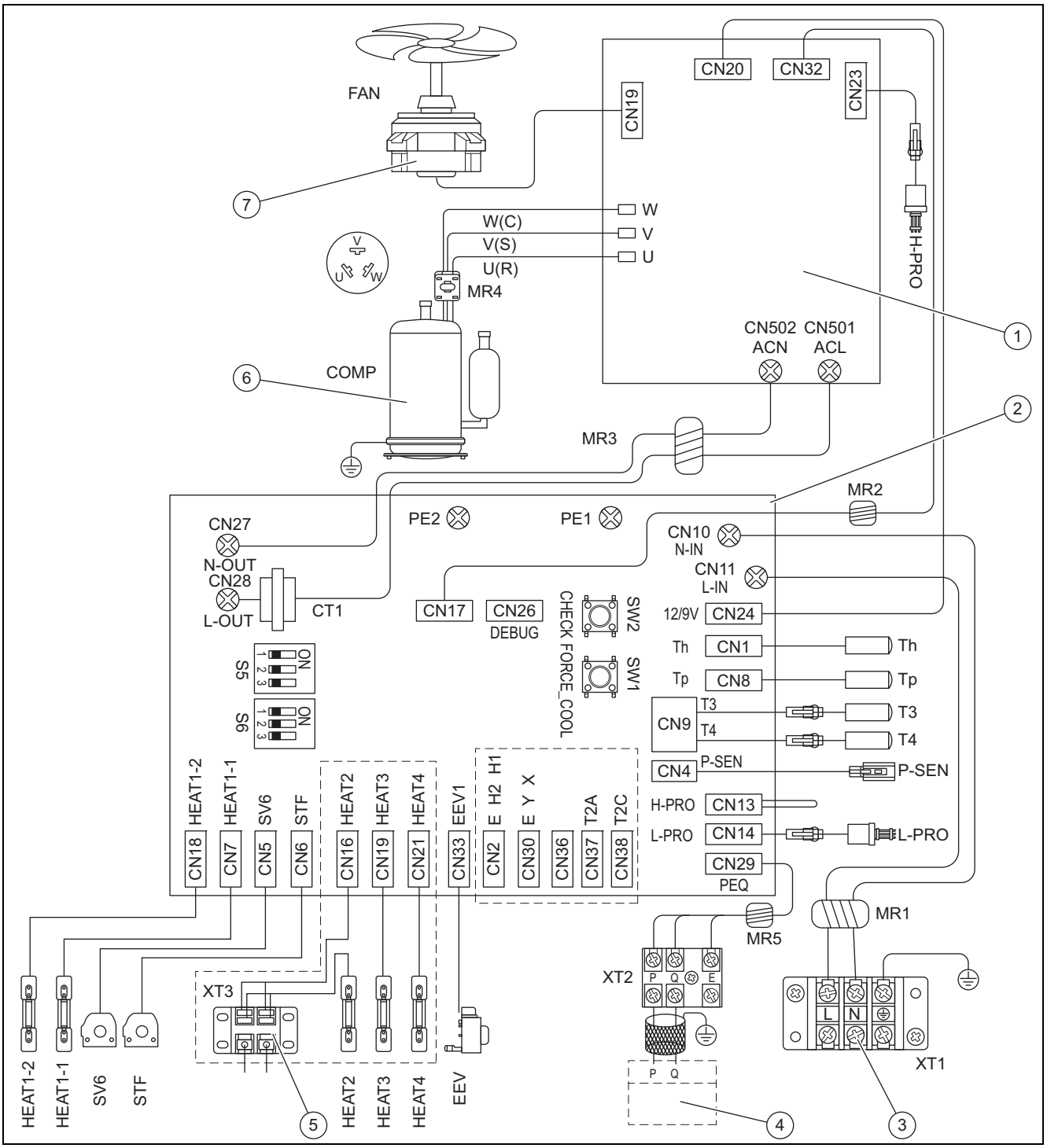
The wiring diagrams shown here are for reference only. Refer to the wiring diagram on the inside of the electronics box for the connection.

B.1 8–10 kW products



1	PCB A, inverter, single-phase
2	Main PCB B, control process, single-phase
3	Power supply connection
4	Indoor unit connection
5	Connection for heating belt at the condensate discharge
6	Compressor
7	Fan
CT1	Alternating current detector
EEV	Electronic expansion valve
Heat1-1	Compressor, electric heating belt 1
Heat1-2	Compressor, electric heating belt 2
Heat2	Connection for electric heating belt at the housing
H-PRO	High-pressure switch
L-PRO	Low-pressure switch
MR1 - MR5	Ring magnets
P-SEN.	Pressure sensor
T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
TF	Radiator temperature sensor
Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
XT1 - XT3	Terminal blocks

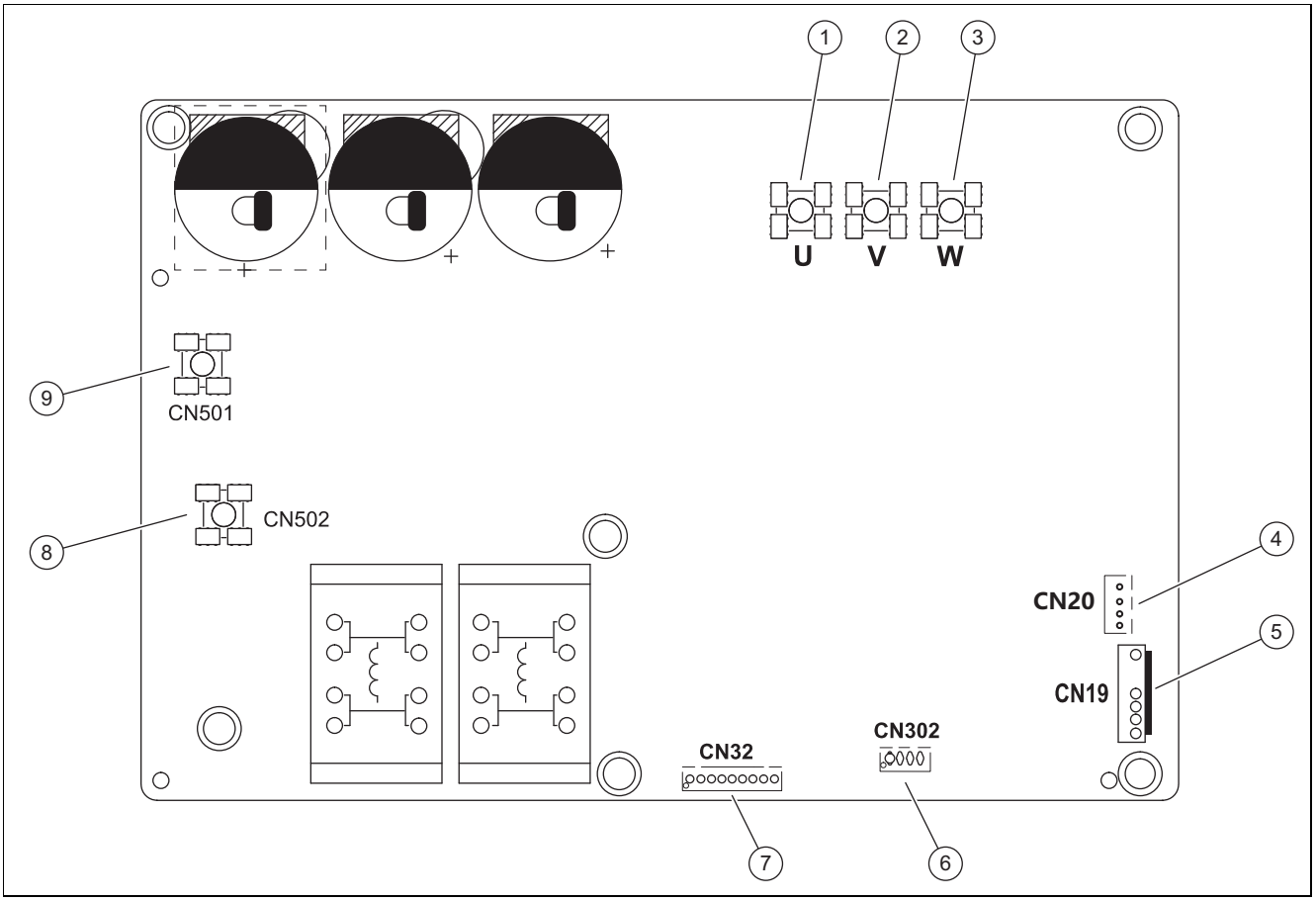
B.2 12–16 kW products



1	PCB A, inverter, single-phase
2	Main PCB B, control process, single-phase
3	Power supply connection
4	Indoor unit connection
5	Connection for heating belt at the condensate discharge
6	Compressor
7	Fan
CT1	Alternating current detector
EEV	Electronic expansion valve
Heat1-1	Compressor, electric heating belt 1
Heat1-2	Compressor, electric heating belt 2
Heat2	Connection for electric heating belt at the housing
H-PRO	High-pressure switch
L-PRO	Low-pressure switch
MR1 - MR5	Ring magnets
P-SEN.	Pressure sensor
T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
TF	Radiator temperature sensor
Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
XT1 - XT3	Terminal blocks

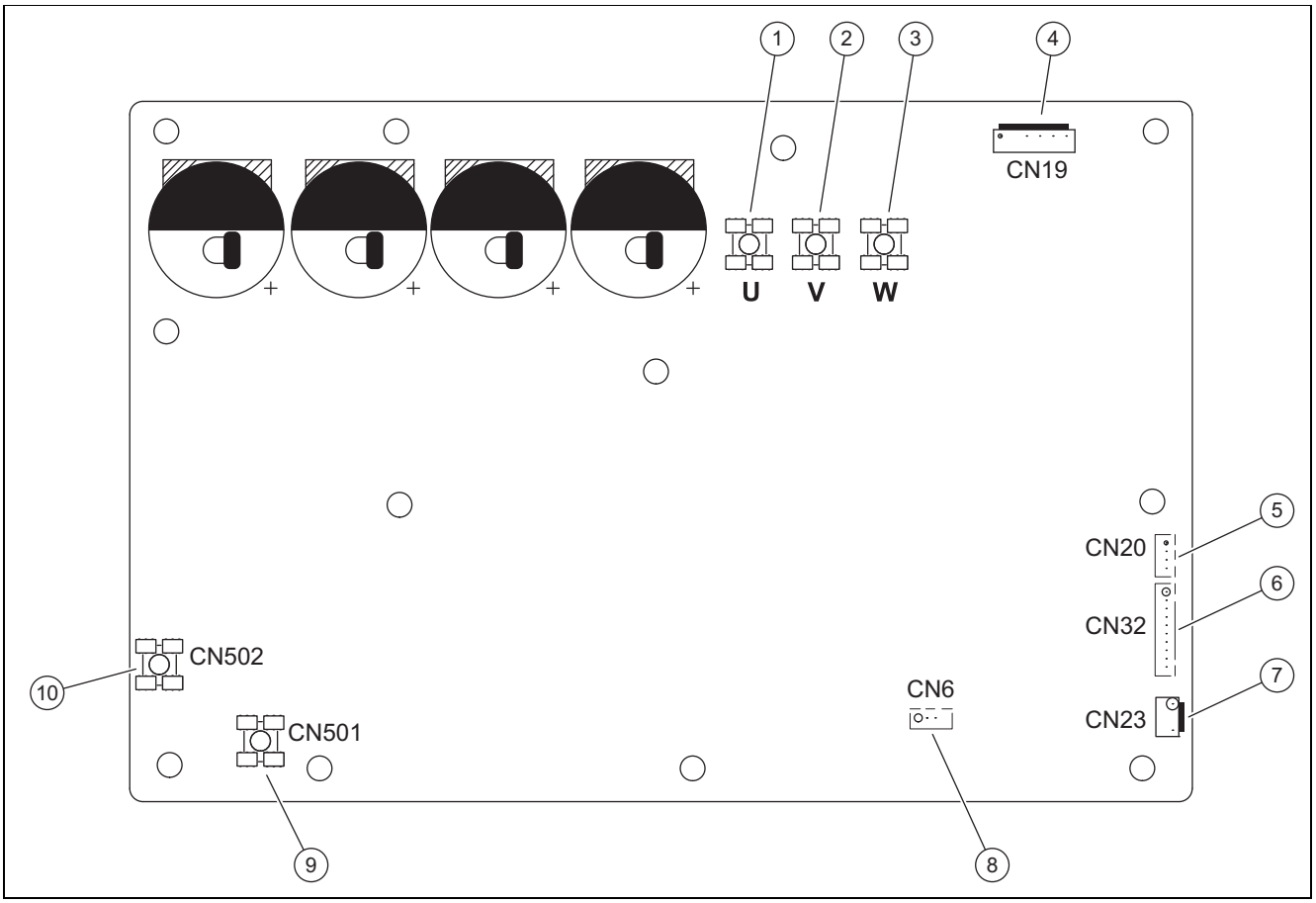
C PCBs for the electronic control unit

C.1 PCB A – inverter module – 8–10 kW products



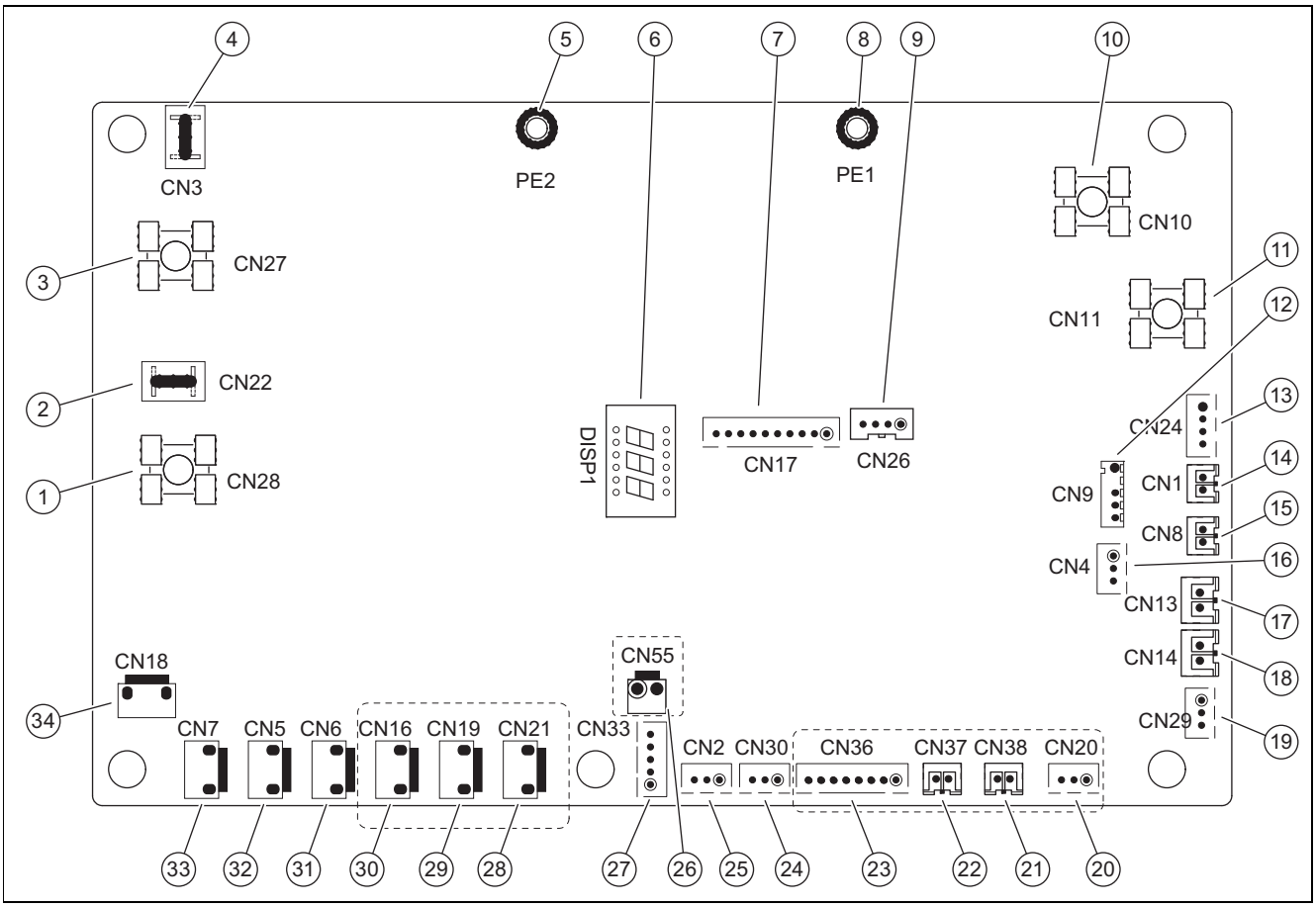
1	Compressor connection U	6	Reserved (CN302)
2	Compressor connection V	7	Connection for communication with PCB B (CN32)
3	Compressor connection W	8	Connection for input N for rectifier bridge (CN502)
4	Connection for output +12 V/9 V (CN20)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for fan (CN19)		

C.2 PCB A – inverter module – 12–16 kW products



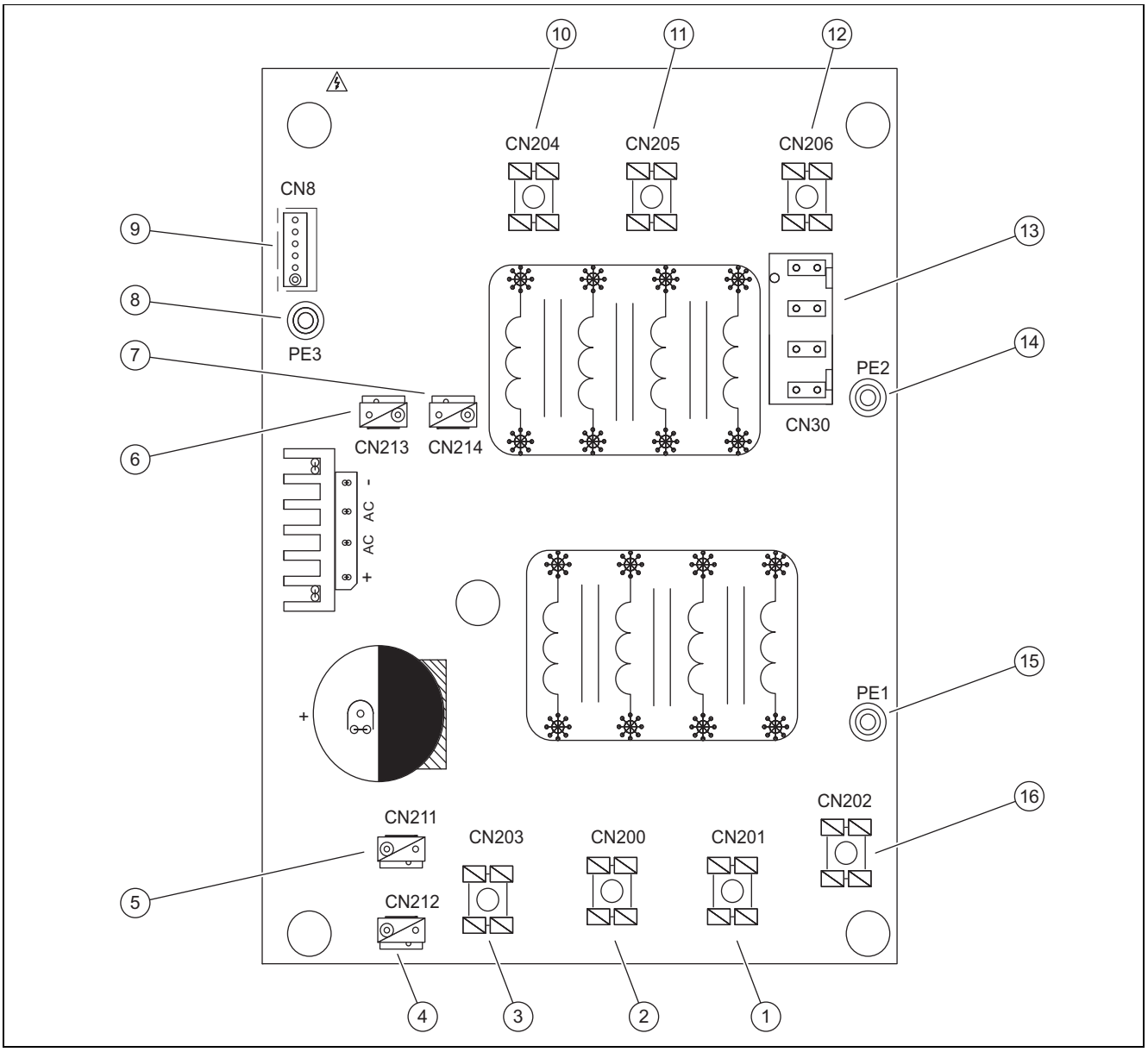
1	Compressor connection U	6	Connection for communication with PCB B (CN32)
2	Compressor connection V	7	Connection for high-pressure switch (CN23)
3	Compressor connection W	8	Reserved (CN6)
4	Connection for fan (CN19)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for output +12 V/9 V (CN20)	10	Connection for input N for rectifier bridge (CN502)

C.3 Main PCB B



1	Connection: Output L to PCB A (CN28)
2	Reserved (CN22)
3	Connection: Output N to PCB A (CN27)
4	Reserved (CN3)
5	Connection for earthing cable (PE2)
6	Display (DSP1)
7	Connection for communication with PCB A (CN17)
8	Connection for earthing cable (PE1)
9	Reserved (CN26)
10	Connection: Input for neutral conductor (CN10)
11	Connection: Input for conductor (CN11)
12	Connection for outdoor temperature sensor and condenser temperature sensor (CN9)
13	Connection for input +12 V/9 V (CN24)
14	Connection for intake temperature sensor (CN1)
15	Connection for compressor outlet temperature sensor (CN8)
16	Connection for pressure sensor (CN4)
17	Connection for high-pressure switch (CN13)
18	Connection for low-pressure switch (CN14)
19	Connection for communication with the hydrobox control card (CN29)
20	Reserved (CN20)
21	Reserved (CN38)
22	Reserved (CN37)
23	Reserved (CN36)
24	Connection for communication (reserved, CN30)
25	Connection for communication (reserved, CN2)
26	Reserved (CN55)
27	Connection for electronic expansion valve (CN33)
28	Reserved (CN21)
29	Reserved (CN19)
30	Connection for the electrical heating belt of the housing (CN16)
31	Connection for 4-port valve (CN6)
32	Connection for SV6 valve (CN5)
33	Connection for electrical heating belt 1 of the compressor (CN7)
34	Connection for electrical heating belt 2 of the compressor (CN18)

C.4 PCB C – filter



1	Power supply L2 (CN201)
2	Power supply L3 (CN200)
3	Power supply N (CN203)
4	Power supply connection for +310 V DC (CN212)
5	Reserved (CN211)
6	Connection for fan (CN213)
7	Power supply connection for inverter module (CN214)
8	Earth cable (PE3)
9	Connection for communication with main PCB B (CN8)
10	Power filtering L3 (L3')
11	Power filtering L2 (L2')
12	Power filtering L1 (L1')
13	Power supply connection for main PCB (CN30)
14	Connection for earthing cable (PE2)
15	Connection for earthing cable (PE1)
16	Power supply L1 (L1)

D Selecting electrical components

Rated current of the product [A]	Nominal cross-sectional area [mm²]	
	Flexible cables	Cable for fixed wiring
≤ 3	0.5 and 0.75	1 and 2.5
> 3 and ≤ 6	0.75 and 1	1 and 2.5
> 6 and ≤ 10	1 and 1.5	1 and 2.5
> 10 and ≤ 16	1.5 and 2.5	1.5 and 4
> 16 and ≤ 25	2.5 and 4	2.5 and 6
> 25 and ≤ 32	4 and 6	4 and 10
> 32 and ≤ 50	6 and 10	6 and 16
> 50 and ≤ 63	10 and 16	10 and 25

Note
The rated current in the upper table corresponds to the MCA in the lower table. If the MCA exceeds 63 A, the cable diameter should be selected in accordance with the national regulations.

Product	Outdoor unit				Current output			Compressor		OFM (external fan motor)	
	Voltage (V)	Frequency (Hz)	Min. (V)	Max. (V)	MCA (A)	TOCA (A)	MFA (A)	MSC (A)	RLA (A)	CW	FLA (A)
8 kW	220 - 240	50	198	264	16	19	25	–	14.50	0.17	1.50
10 kW	220 - 240	50	198	264	17	19	25	–	15.50	0.17	1.50
12 kW	220 - 240	50	198	264	25	30	35	–	23.50	0.17	1.50
16 kW	220 - 240	50	198	264	27	30	35	–	25.50	0.17	1.50

MCA (Min. Circuit Amps.): Minimum amperage in the electrical circuit (A)
TOCA (Total Over-current Amps.): Total overcurrent (A)
MFA (Max. Fuse Amps.): Max. fuse protection (A)
MSC (Max. Starting Amps.): Max. in-rush current (A)
RLA (Rated Load Amps.): Nominal operating current (A) of the compressor, under nominal test conditions in cooling or heating mode
CW (Rated Motor Output): Nominal motor output
FLA (Full Load Amps.): Full load current (A)

Maximum values for the wiring (for exact values, see Technical data):

	Product			
	8 kW	10 kW	12 kW	16 kW
Maximum fuse protection [A]	19	19	30	30
Cable diameter [mm²]	4.0	4.0	6.0	6.0

E Inspection and maintenance work

#	Maintenance work	Interval	
1	Cleaning the product	Annually	162
2	Cleaning the evaporator	Annually	162
3	Checking the fan	Annually	163
4	Cleaning the condensate discharge	Annually	163
5	Checking the refrigerant circuit	Annually	163
6	Checking the refrigerant circuit for tightness	Annually	163
7	Checking the electrical connections	Annually	163
8	Checking the damping feet for wear	Annually after the first 3 years	163

F Technical data

Note

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

The performance data is determined using a special test method. You can find information about this from the manufacturer of the product by stating "Performance data test method".

Technical data – General

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Width	1,118 mm	1,118 mm	1,118 mm	1,118 mm
Height	865 mm	865 mm	865 mm	865 mm
Depth	523 mm	523 mm	523 mm	523 mm
Net weight	75 kg	75 kg	97 kg	97 kg
Width with packaging	1,190 mm	1,190 mm	1,190 mm	1,190 mm
Height with packaging	970 mm	970 mm	970 mm	970 mm
Depth with packaging	560 mm	560 mm	560 mm	560 mm
Weight with packaging	89 kg	89 kg	110.5 kg	110.5 kg
Rated voltage	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz
Rated power	3,300 W	3,600 W	5,400 W	6,100 W
Rated current	14.5 A	16 A	24.5 A	26 A
IP rating	IP24	IP24	IP24	IP24
Maximum rotational speed of the fan	600 rpm	600 rpm	650 rpm	650 rpm
Fan, motor type	Brushless DC motor	Brushless DC motor	Brushless DC motor	Brushless DC motor
Fan, quantity	1	1	1	1
Connection for condensate discharge	DN 32	DN 32	DN 32	DN 32

Technical data – Refrigerant circuit

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Material of the refrigerant pipe	Copper	Copper	Copper	Copper
Minimum single length of the refrigerant pipe	2 m	2 m	2 m	2 m
Maximum single length of the refrigerant pipe	30 m	30 m	30 m	30 m
Permissible height difference when the outdoor unit is raised	20 m	20 m	20 m	20 m
Permissible height difference when the indoor unit is raised	20 m	20 m	20 m	20 m
Additional refrigerant volume	38 g/m	38 g/m	38 g/m	38 g/m
Connection technology	Flare connection	Flare connection	Flare connection	Flare connection
Outer diameter of the hot gas pipe	5/8″	5/8″	5/8″	5/8″
Outer diameter of the liquid pipe	3/8″	3/8″	3/8″	3/8″
Minimum wall thickness of the hot gas pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Minimum wall thickness of the liquid pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Refrigerant	R32	R32	R32	R32
Fill quantity	1.65 kg	1.65 kg	1.84 kg	1.84 kg
Global Warming Potential (GWP)	675	675	675	675
CO_2 equivalent	1.11 t	1.11 t	1.24 t	1.24 t
Maximum switch-off pressure	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)
Compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Air-side heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger
Throttle valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve

Technical data – Application limits, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	35 ℃	35 ℃	35 ℃	35 ℃
Minimum air temperature for domestic hot water generation	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature for domestic hot water generation	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Application limits, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Power, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Heat output, A7/W35	8.3 kW	10.0 kW	12.1 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W35	5.20	5.00	4.95	4.50
Power consumption, effective, A7/W35	1.60 kW	2.00 kW	2.44 kW	3.56 kW
Heat output, A7/W45	8.2 kW	10.0 kW	12.3 kW	16 kW
Coefficient of performance, COP, EN 14511, A7/W45	3.95	3.80	3.80	3.60
Power consumption, effective, A7/W45	2.08 kW	2.63 kW	3.24 kW	4.44 kW
Heat output, A7/W55	7.5 kW	9.5 kW	12.0 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W55	3.18	3.10	3.10	2.90
Power consumption, effective, A7/W55	2.36 kW	3.06 kW	3.87 kW	5.52 kW
Heat output, A-7/W35	7.10 kW	8.25 kW	10.0 kW	13.3 kW
Coefficient of performance, COP, EN 14511, A-7/W35	3.18	3.10	3.0	2.7
Power consumption, effective, A-7/W35	2.18 kW	2.62 kW	3.33 kW	4.93 kW
Heat output, A-7/W55	6.15 kW	6.85 kW	10.0 kW	12.5 kW
Coefficient of performance, COP, EN 14511, A-7/W55	2.05	2.0	2.05	2.02
Power consumption, effective, A-7/W55	3.00 kW	3.43 kW	4.88 kW	6.19 kW
Seasonal space heating energy efficiency class, flow temperature at 35 ºC	A+++	A+++	A+++	A+++
Seasonal space heating energy efficiency class, flow temperature at 55 ºC	A++	A++	A++	A++
SCOP, warmer climate, 35 ºC	6.99	7.09	6.48	6.29
SCOP, warmer climate, 55 ºC	4.51	4.62	4.43	4.48
SCOP, average climate, 35 ºC	5.22	5.20	4.81	4.62
SCOP, average climate, 55 ºC	3.37	3.47	3.45	3.41

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
SCOP, colder climate, 35 ºC	4.33	4.32	4.08	4.02
SCOP, colder climate, 55 ºC	2.88	2.99	3.02	3.12

Technical data – Power, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Cooling output, A35/W18	8.4 kW	10.0 kW	12.0 kW	14.2 kW
Energy efficiency ratio, EER, EN 14511, A35/W18	5.05	4.80	4.00	3.61
Power consumption, effective, A35/W18	1.66 kW	2.08 kW	3.00 kW	3.94 kW
Cooling output, A35/W7	7.40 kW	8.20 kW	11.60 kW	14.00 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	3.38	3.30	2.75	2.45
Power consumption, effective, A35/W7	2.19 kW	2.48 kW	4.22 kW	5.71 kW
SEER, flow temperature at 7 ºC	5.83	5.98	4.89	4.69
SEER, flow temperature at 18 ºC	8.95	8.78	7.10	6.75

Technical data – noise emissions

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Sound power (EN 12102 1)	59 dB(A)	60 dB(A)	64 dB(A)	68 dB(A)
Max. sound pressure level (heat: A7W35/cooling: A35W18)	46 dB(A)	49 dB(A)	50 dB(A)	54 dB(A)

Index

Operating instructions

Contents

1 Safety

1.1 Intended use

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

The product is the outdoor unit for a air-to-water heat pump in a split design.

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

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit Without a back-up heater	Indoor unit With a back-up heater
HA 8-7.2 OS 230V B3	HA 10-7.2 WS 230V B1	HA 10-7.2 WS 230 V
HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ▸ Keep all ignition sources away from the product. Ignition sources include, for example:
  – Open flames,
  – Hot surfaces over 550 °C,
  – Electrical devices or tools that are not free from electrical sources,
  – Static discharges.
- ▸ Do not use any sprays or other flammable gases close to the product.

1.2.3 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Do not make any changes in the product's environment as this would cause escaping refrigerant to collect in a recess or to get inside the building via building openings.

1.2.4 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:
  - to the product itself
  - to the supply lines
  - to the drain pipework
  - to the expansion relief valve for the heat source circuit
  - to constructional conditions that may affect the operational reliability of the product
- Never make any changes to the product where these involve drilling into the product.

1.2.5 Risk of injury from burns caused by touching refrigerant pipes

The refrigerant pipes between the outdoor unit and the indoor unit may become extremely hot during operation. There is a risk of burns.

- Do not touch any uninsulated refrigerant pipes.

1.2.6 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 eliminated by a competent person.
- Adhere to the maintenance intervals specified.

1.2.7 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.

1.2.8 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

2 Notes on the documentation

- 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.

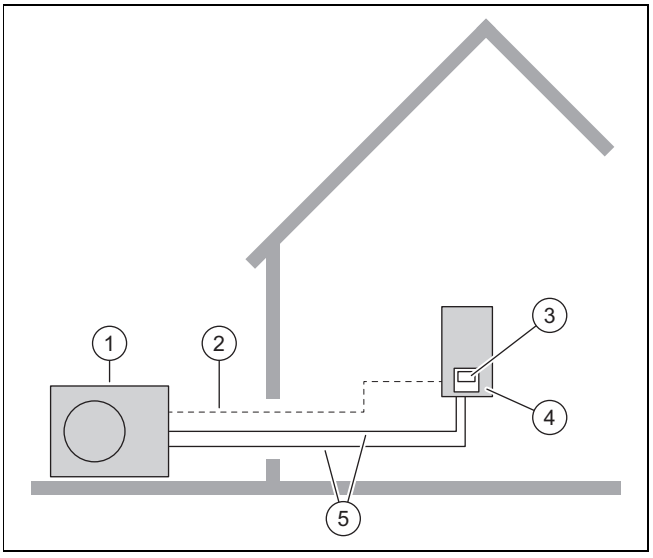
These instructions apply only to Uzbekistan:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 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.

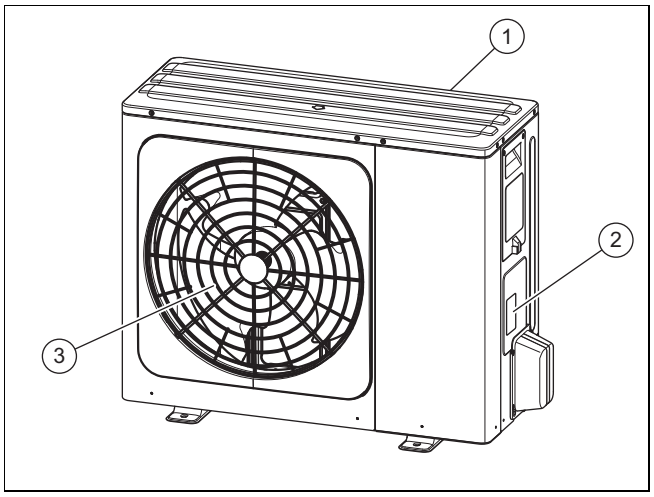
3.3 Noise reduction mode

A noise reduction mode can be activated for the product.

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

You can find additional information about noise reduction mode in the operating instructions for the indoor unit.

3.4 Product design



1	Air inlet grille	3	Air outlet grille
2	Data plate		

3.5 Data plate and serial number

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

The type designation is located on the data plate.

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 CE marking

CE

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.

3.7 Service life

If the regulations on transportation, storage, installation and operation are observed, the product's expected service life is 10 years from the date of installation.

3.8 Production date

You can find the production date (week, year) in the serial number on the separate sticker beside the data plate:

– The third and fourth digit in the serial number specify the year of production (two digits).
– The fifth and sixth digit of the serial number specify the week of production (from 01 to 52).

3.9 Fluorinated greenhouse gases

The product contains fluorinated greenhouse gases.

3.10 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

4 Operation

4.1 Switching on the product

► Switch on the disconnector to which the product is connected in the building.

4.2 Operating the product

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

4.3 Guaranteeing frost protection

1. Ensure that the product is switched on and remains switched on.
2. Ensure that no snow accumulates around the air inlet grille and air outlet grille.

4.4 Switching off the product

1. Switch off the disconnector to which the product is connected in the building.
2. Guarantee the frost protection.

5 Care and maintenance

5.1 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.

5.2 Cleaning the product

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

5.3 Maintenance

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.

6 Troubleshooting

6.1 Eliminating faults

► If you observe a cloud of vapour on the product, you do not have to do anything. This effect may arise during the thawing process.
► If the product will no longer start up, check whether the power supply is interrupted. If required, switch on the disconnector in the building.
► Contact a competent person if the measure that is described is unsuccessful.

7 Decommissioning

7.1 Temporarily decommissioning the product

1. Switch off all of the disconnectors to which the product is connected in the building.
2. Protect the heating installation against frost.

7.2 Permanently decommissioning the product

► Have a competent person permanently decommission the product.

8 Recycling and disposal

This product is an electrical or electronic unit within the context of EU Directive 2012/19/EU. The unit was developed and manufactured using high-quality materials and components. These can be recycled and reused.

Find out about the regulations that apply in your country regarding the separate collection of waste electrical or electronic equipment. Correctly disposing of old units protects the environment and people against potential negative effects.

Disposing of the packaging

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

Disposing of the product

► Dispose of the product and its accessories correctly.
► Observe all relevant regulations.

If the product is labelled with this symbol:

► 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.

Deleting personal data

Personal data (e.g. online login details) may be misused by unauthorised third parties.

If the product contains personal data:

► Ensure that there is no personal data on or in the product before you dispose of the product.

8.1 Arranging disposal of refrigerant

The product is filled with R32 refrigerant.

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

9 Guarantee and customer service

9.1 Guarantee

Ishlab chiqaruvchi kafolati haqidagi ma'lumotlarni orqa tomonda berilgan aloqa manzilidan so'rab oling.

9.2 Customer service

Bizning mijozlar ximatimizning aloqa ma'lumotlarini orqa tomonda berilgan manzilda yoki www.demirdokum.com.tr manzilida topasiz.

Installation and maintenance instructions

Contents

1 Safety

1.1 Intended use

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

The product is the outdoor unit for a air-to-water heat pump in a split design.

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

The product is only intended for outdoor installation.

The product is intended exclusively for domestic use.

The intended use only allows for these product combinations:

Outdoor unit	Indoor unit Without a back-up heater	Indoor unit With a back-up heater
HA 8-7.2 OS 230V B3	HA 10-7.2 WS 230V B1	HA 10-7.2 WS 230 V
HA 10-7.2 OS 230V B3		
HA 12-7.2 OS 230V B3	HA 16-7.2 WS 230V B1	HA 16-7.2 WS 230V
HA 16-7.2 OS 230V B3		

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.

1.2 General safety information

1.2.1 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.

1.2.2 Risk caused by inadequate qualifications for the R32 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 R32 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.
▸ Note that the refrigerant is odourless.

1.2.3 Risk of death caused by fire or explosion if stored incorrectly

The product contains the flammable refrigerant R32. In the event of a leak in combination with an ignition source, there is a risk of fire and explosion.

▸ Only store the unit in rooms with no permanent ignition sources. Examples of such ignition sources include naked flames, a gas-fired boiler that is switched on, or an electric heater.

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- 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 R32 refrigerant and set to ≤ 25% of the lower explosive limit.
- If you suspect that there may be a leak, extinguish all naked flames in the vicinity.
- If there is a leak that requires repairs to be carried out with a soldering process, follow the procedure described in the section "11 Repair and service".
- Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.

1.2.5 Risk of death caused by a suffocating atmosphere if there is a leak in the refrigerant circuit

The product contains the combustible refrigerant R32. In the event of a leak, escaping refrigerant may create a suffocating atmosphere. There is a risk of suffocation.

- Note that escaping refrigerant has a higher density than air, and may collect near the ground.
- Ensure that the refrigerant does not collect in a recess.
- Ensure that the refrigerant cannot get inside the building via building openings.

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- Only carry out the work if you are competent at handling R32 refrigerant.
- Wear suitable personal protective equipment and bring a fire extinguisher with you.
- Only use tools and units that are permitted for R32 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.
- The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

1.2.7 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 in overvoltage category III for full partition, e.g. fuse or circuit breaker).
- Secure against being switched back on again.
- Wait for at least 60 minutes until the capacitors have discharged.
- Check that there is no voltage.

1.2.8 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.

1.2.9 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.

1.2.10 Risk of environmental damage caused by escaping refrigerant

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential). If this gas escapes into the atmosphere, its impact is 675 times greater than the natural greenhouse gas CO_2.

Before the product is disposed of, the refrigerant that is contained in it must be completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with regulations.

- Ensure that only an officially certified competent person with appropriate protective equipment carries out installation or maintenance work or any other form of intervention on the refrigerant circuit.
- Arrange for the refrigerant that is contained in the product to be recycled or disposed of by a certified competent person in accordance with the regulations.

1.2.11 Risk of material damage caused by using an unsuitable tool

- Use the correct tool.

1.2.12 Risk of material damage caused by using an unsuitable material

Unsuitable refrigerant pipes may cause material damage.

- Only use special copper pipes designed for refrigeration technology.

1.3 Regulations (directives, laws, standards)

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

2 Notes on the documentation

- ► 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.

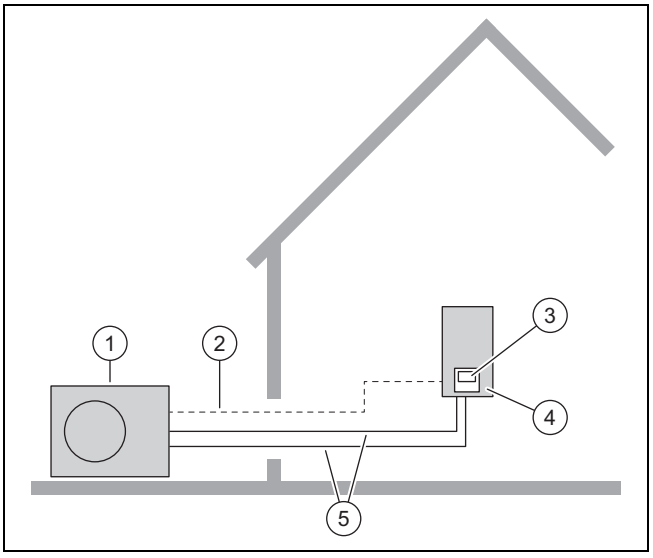
These instructions apply only to Uzbekistan:

Product (type designation)	Article number
HA 8-7.2 OS 230V B3	8000021383
HA 10-7.2 OS 230V B3	8000021384
HA 12-7.2 OS 230V B3	8000021385
HA 16-7.2 OS 230V B3	8000021386

3 Product description

3.1 Heat pump system

Design of a typical heat pump system with split technology:



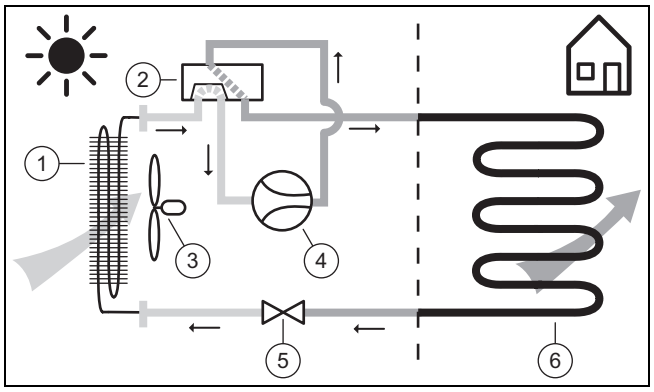
1	Outdoor unit	4	Indoor unit
2	Control line (Modbus)	5	Refrigerant circuit
3	Control for the indoor unit		

3.2 Functions of the heat pump

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

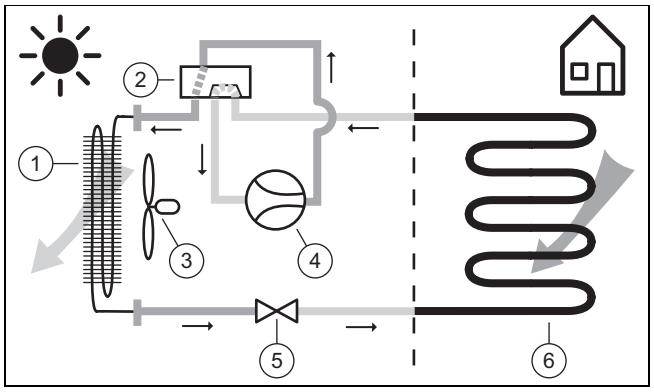
In heating mode, cyclic evaporation, compression, liquefaction and expansion take in heat energy from the surroundings and transfer it to the building. In cooling mode, heat energy is extracted from the building and released into the environment.

3.2.1 Operating principle in heating mode



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

3.2.2 Operating principle in cooling mode



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

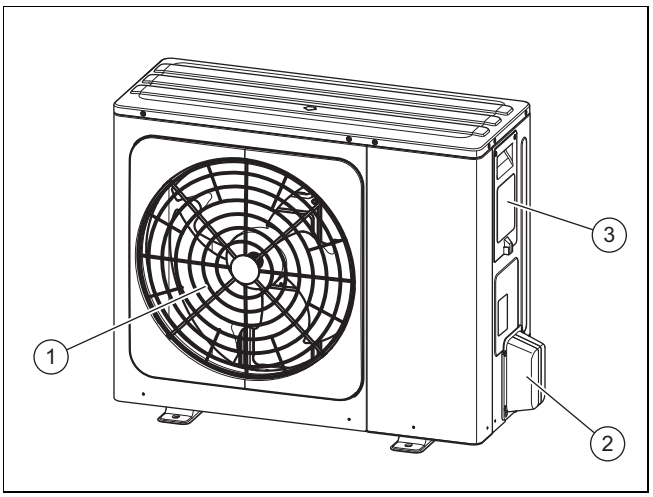
3.3 Description of the product

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

The outdoor unit is connected to the indoor unit via the refrigerant circuit.

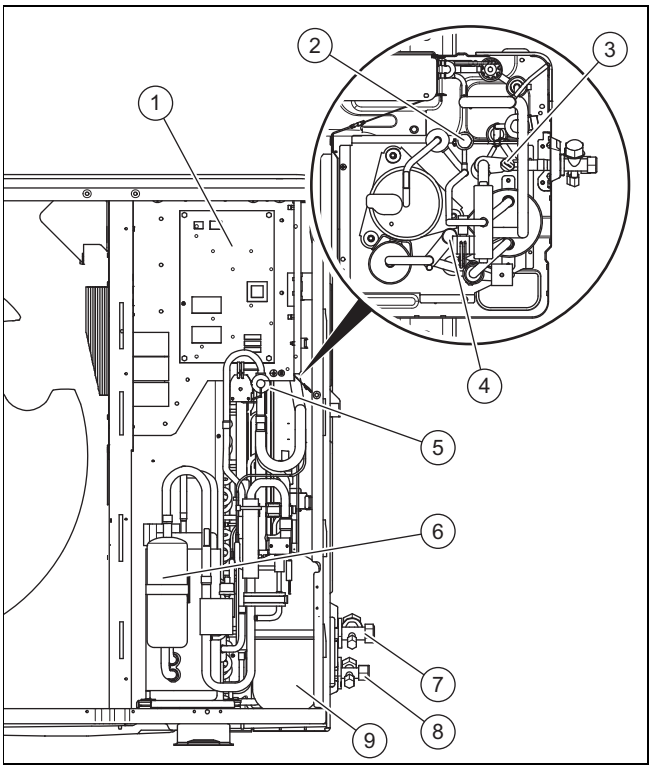
3.4 Product design

3.4.1 Unit



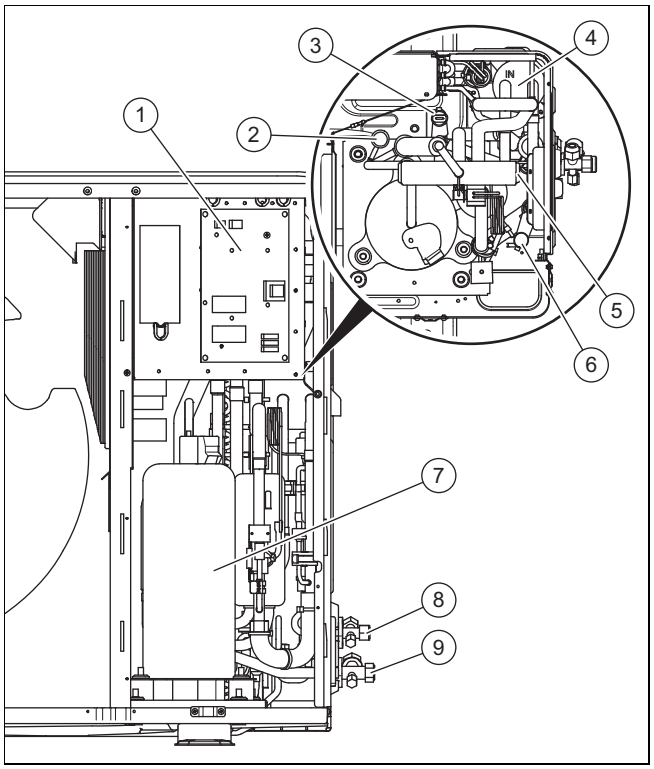
1	Air outlet grille	3	Cover for the electrical connections
2	Covering the connections for the refrigerant pipes		

3.4.2 8/10 kW functional elements



1	Control PCB	6	Compressor
2	High-pressure switch	7	Hot gas pipe isolation valve
3	Pressure sensor	8	Liquid pipe isolation valve
4	Low-pressure switch	9	Gas-liquid separator
5	4-port valve		

3.4.3 12/16 kW functional elements



1	Control PCB	6	Low-pressure switch
2	High-pressure switch	7	Compressor
3	High-pressure sensor	8	Liquid pipe isolation valve
4	Gas-liquid separator	9	Hot gas pipe isolation valve
5	4-port valve		

3.5 Serial number

The serial number (unit identification number) is located on a sticker beside the product's data plate.

3.6 Information on the data plate

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

Information	Meaning
HA ...	Nomenclature
DemirDöküm MaxiAir R32	Product name
xx Kw	Cooling output@35/W18
EER	Energy Efficiency Ratio@A35/W18 (energy efficiency ratio)
xx Kw	Heat output@35/W18
COP	Coefficient Of Performance@A7/W35 (coefficient of performance)
220–240 V ~ 50 Hz	Power supply
xx kW	Power consumption
xx kg	Net weight
R32	Refrigerant type
xx g	Refrigerant filling volume
GWP	Global Warming Potential (Global Warming Potential)
t CO_2	CO_2 equivalent
xx Pa	Maximum permissible pressure

Information	Meaning
COP /	Coefficient of performance/heating mode
IP	Protection class
	Reading the instructions

3.7 Warning sticker

Symbol	Meaning
	Risk of electric shock
	Warning against flammable materials
	Reading the instructions

3.8 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.

3.9 Regulations on packaging, transportation and storage

The products are delivered in the manufacturer's packaging.

The products are transported by road, by sea and by rail in accordance with the goods transport regulations that apply to the relative means of transport. During transportation, it is absolutely essential for the product to be firmly secured against moving horizontally and vertically.

Products that are not installed are stored in the manufacturer's packaging. The products must be stored under standard conditions in closed rooms that have natural air circulation (non-aggressive and dust-free environment, temperature gradients of -10 °C to +37 °C, up to 80% air humidity, without shocks or vibrations).

3.10 Duration of storage

– Duration of storage: 2 years from production date

3.11 Service life

If the regulations on transportation, storage, installation and operation are observed, the product's expected service life is 10 years from the date of installation.

3.12 Production date

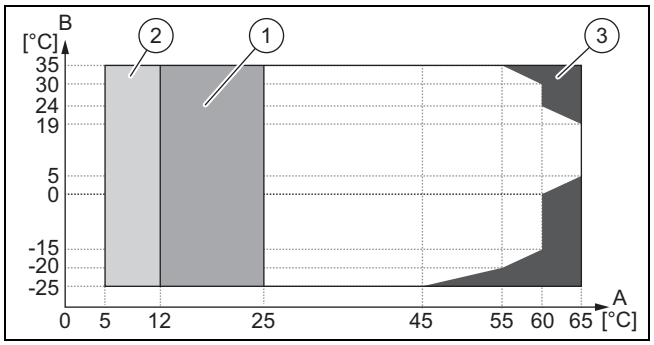
You can find the production date (week, year) in the serial number on the separate sticker beside the data plate:

– The third and fourth digit in the serial number specify the year of production (two digits).
– The fifth and sixth digit of the serial number specify the week of production (from 01 to 52).

3.13 Application limits

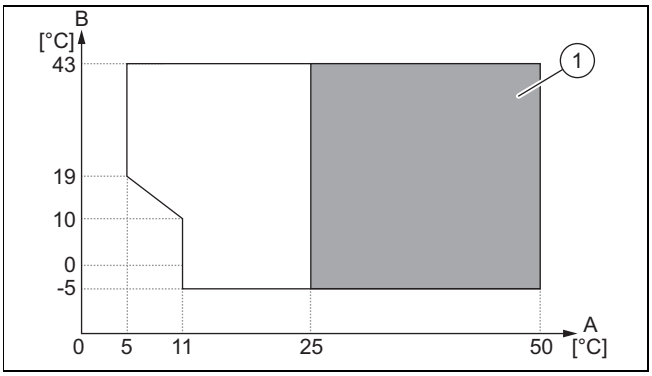
The product works between a minimum and maximum outdoor temperature. These outdoor temperatures define the application limits for the heating mode, domestic hot water mode and cooling mode. Operating outside of the application limits leads to the product switching off.

3.13.1 Heating mode



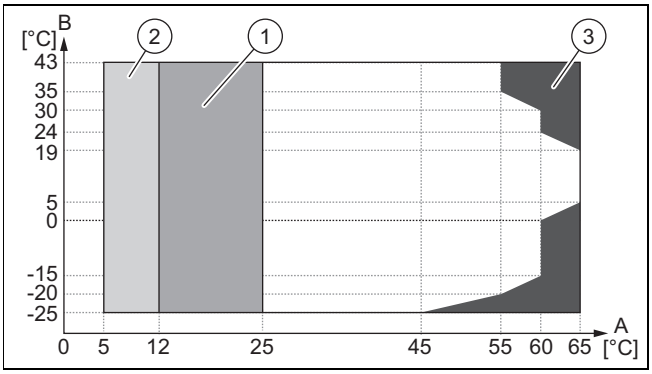
A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.13.2 Cooling mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature

3.13.3 DHW mode



A	Heating flow temperature
B	Outdoor temperature
1	Decrease or increase interval for the heating flow temperature
2	If set accordingly (→ installation instructions for the indoor unit), the heating water is only heated by the internal electric back-up heater or the optional additional heat source. Otherwise, the heating water is only heated by the heat pump.
3	The heating water is only heated by the internal electric back-up heater or the optional additional heat source.

3.14 Thawing mode

If the heat pump is running in heating mode, the condensate may freeze on the fins of the evaporator at low outdoor temperatures and frost may form. To increase efficiency, this frost is automatically detected and automatically defrosted at certain intervals by activating thawing mode.

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. Thawing mode takes 2–10 minutes, then the water is drained via the outdoor unit's drain.

The outdoor unit's fans do not run during thawing mode.

3.15 Safety devices

The product is equipped with technical safety devices.

High- and low-pressure switches regulate the pressure in the refrigerant circuit. If the pressure in the refrigerant circuit increases above the upper limit value (4.3 MPa (43 bar)) or falls below the lower limit value (0.14 MPa (1.4 bar)), the high- and/or low-pressure switch switches off and the compressor is stopped.

The compressor crankcase heating prevents refrigerant from mixing with compressor oil when the compressor is switched off.

The crankcase heating is regulated according to the outdoor temperature and the on/off condition of the compressor.

If the outdoor temperature is above 8 °C or the compressor is running, the crankcase heating is switched off.

The crankcase heating is switched on when the outdoor temperature is 8 °C or less and either

– The compressor has been switched off for more than three hours or
– The product has just been switched on (either manually or after a power cut).

If the temperature measured at the compressor outlet is higher than the permissible temperature (> 115 °C) , the compressor is switched off. The permissible temperature depends on the evaporation and condensation temperature.

In the indoor unit, the heating circuit's circulation water volume is regulated. The water flow rate switch detects the water flow rate in order to protect the compressor and the water pump in the event of an insufficient water flow rate. 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.

The Anti-Freeze Protection Control function protects the water-side heat exchanger against ice formation.

If the environmental temperature is below 3 °C in standby mode of heating/domestic hot water mode and the heating return or heating flow temperature or the water flow temperature of the additional heat source is below 5 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the environmental temperature is still below 3 °C and the water temperature is still below 5 °C, the heat pump switches to heating mode.

If, in cooling mode,

– the heating return temperature or
– the heating flow temperature or
– the heating flow temperature of the auxiliary heat source

is below 4 °C, the heat pump stops and the water pump continues to run for 30 minutes. If the water temperature is still below 4 °C, the heat pump switches to heating mode.

If the heating flow temperature is below 2 °C in standby mode for the heating/domestic hot water mode, the heat pump stops and the water pump continues to run for 30 minutes. If the heating flow temperature is still below 2 °C, the heat pump switches to frost protection in heating mode.

4 Set-up

4.1 Unpacking the product

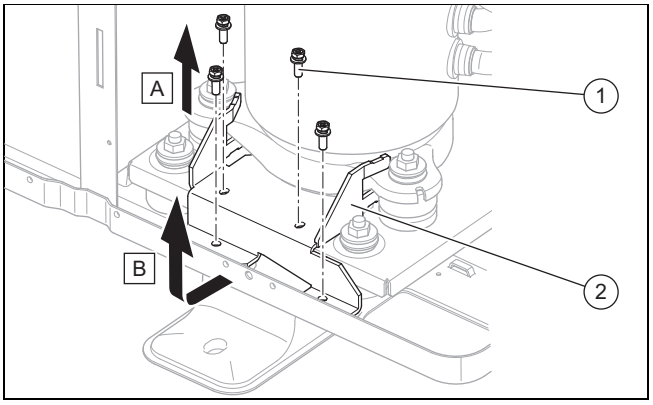
1. Remove the outer packaging parts.
2. Remove the accessory.
3. Remove the documentation.
4. Remove the screws from the pallet.
5. Remove the protective cardboard from the evaporator.

4.1.1 Remove the transport protection from the compressor (12/16 kW outdoor units only)

Note

If the compressor runs with the transport protection installed, this leads to abnormal vibrations and noises from the heat pump.

1. Remove the top casing and the right-hand front casing. (→ Section 4.10).
2. Remove the noise control cover from the compressor.



3. Remove the four screws **(1)**.
4. Remove the transport protection **(2)**.
5. Reattach the noise control cover for the compressor.

4.2 Checking the scope of delivery

► Check the contents of the packaging units.

Quantity	Designation
1	Product
1	Connection pipe for condensate discharge
1	Enclosed documentation

4.3 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.
► Lift the product with three people.

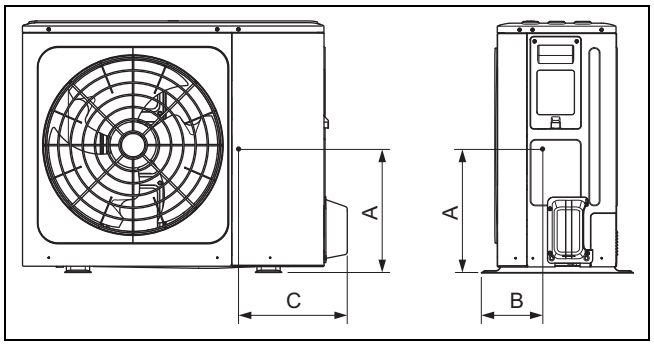
Caution.

Risk of material damage caused by incorrect transport.

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.

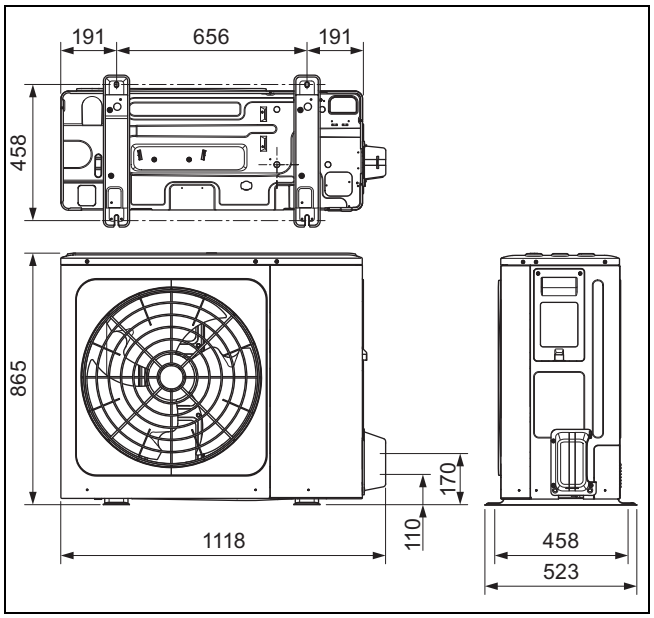
► During transport, do not tilt the product by any more than the maximum angle of 45°.

► Protect the casing sections against damage.
► Use carrying straps or a hand truck. In doing so, note the product's centre of gravity:



Type	A	B	C
8–10 kW	350	220	560
12–16 kW	355	275	520

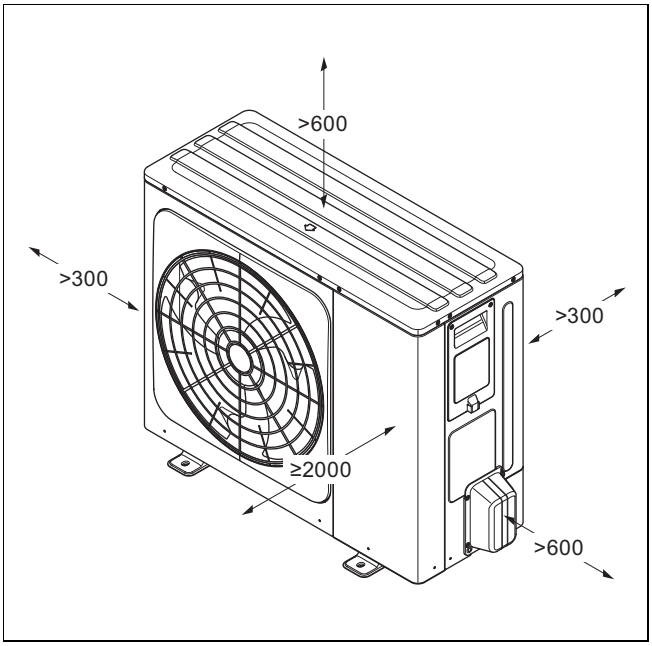
4.4 Dimensions



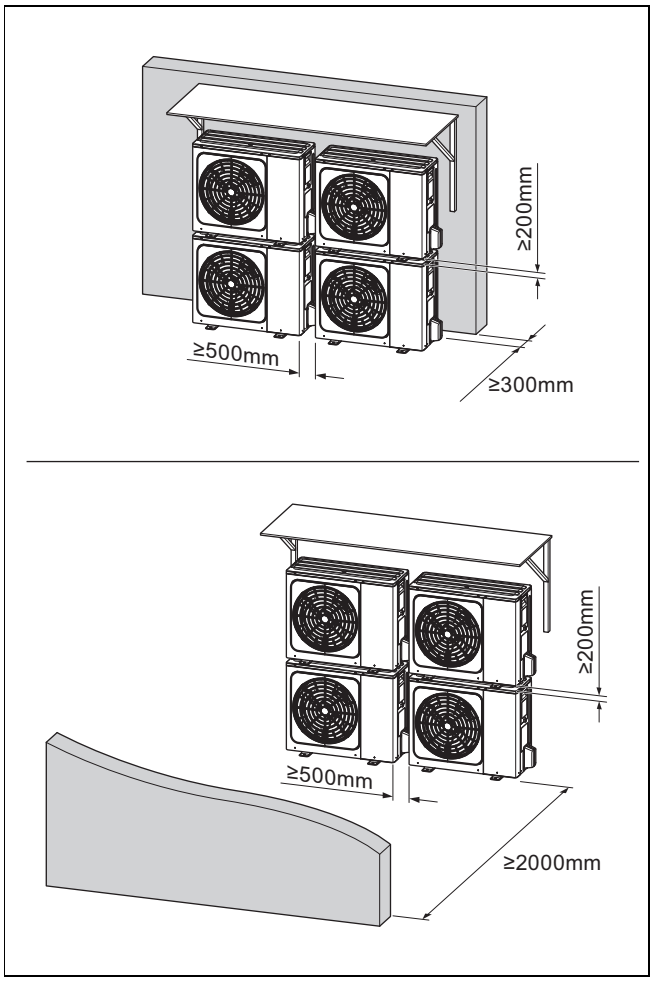
4.5 Complying with minimum clearances

- 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.

4.5.1 Individual installation



4.5.2 Installation on top of each other

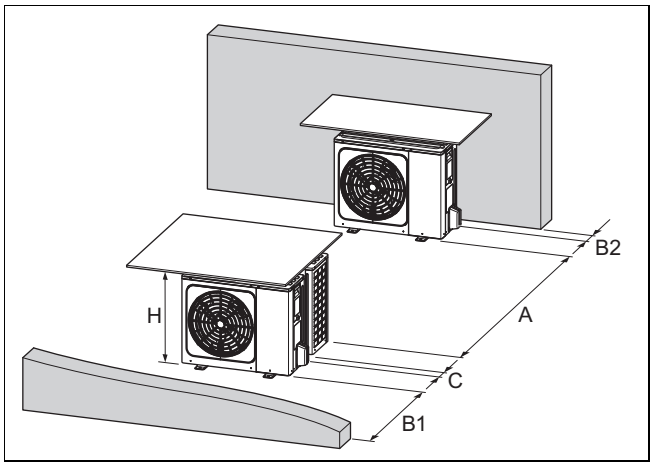


Note

If you install the products on top of each other, you must install the condensate discharge pipe to prevent condensate from discharging into the heat exchanger.

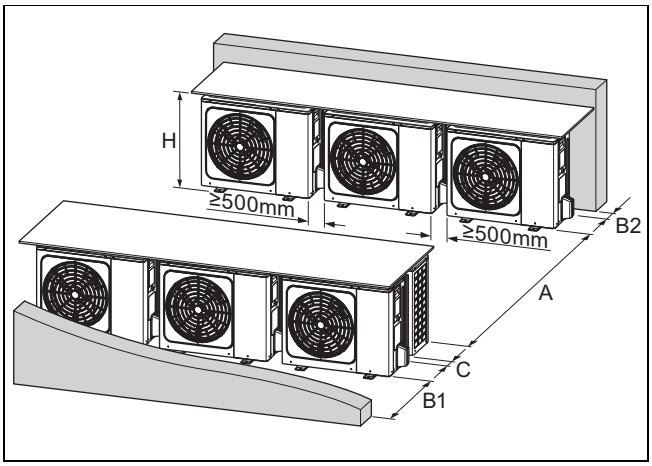
4.5.3 Multi-row installation

One product



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 150	≥ 600

Multiple products



A [mm]	B1 [mm]	B2 [mm]	C [mm]
≥ 3000	≥ 2000	≥ 300	≥ 600

4.6 Requirements for the installation site

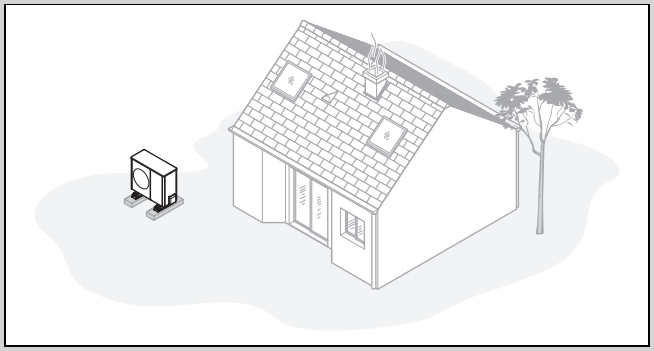
Danger!
Risk of injury due to ice formation.

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 downpipes.

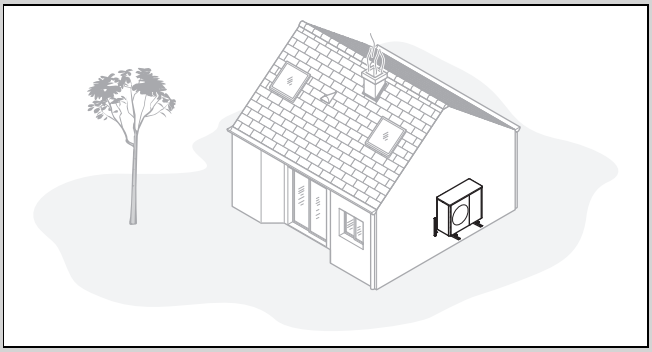
- ► Note that installation in sinks or areas that do not allow free outflow of air is not permitted.
- ► The product can be set up in a coastal region or at protected areas close to the coastline. We recommend maintaining a minimum distance of 1.5 km from the coastline. In the immediate vicinity of the coastline, a protection device that sufficiently protects the product against spraying water and sea wind must also be installed. In doing so, the minimum clearances must be complied with.
- ► Observe the permissible height difference between the outdoor unit and indoor unit.
- ► Keep away from flammable substances or flammable gases.
- ► Keep away from heat sources.
- ► Avoid using preloaded extract air.
- ► Keep away from ventilation openings and extract-air shafts.
- ► Keep away from deciduous trees and shrubs.
- ► Do not expose the outdoor unit to dusty air.
- ► Do not expose the outdoor unit to corrosive air. Keep away from animal stalls or stables.
- ► Please note that the installation site must be below 2000 m above sea level.
- ► Please note the noise emissions. Select an installation site that is as far away from your own bedroom as possible.
- ► Please note the noise emissions. Select an installation site that is as far away from the windows of adjacent building as possible.
- ► Select an installation site that is easily accessible so that maintenance and service work can be carried out.
- ► If the installation site is adjacent to a vehicle shunting area, protect the product using ram protection.
- ► If the installation site is located in a region that is prone to snow, select a weather-protected installation site. If required, plan additional weather protection. In doing so, note the potential effects on the noise emissions.
- ► If you set up the unit in a location where it is exposed to strong winds, pay particular attention to the fact that strong winds of 5 m/s or more blowing against the unit's air outlet may cause a short circuit (extraction of the extract air). This may have the following effects:
  - – Deterioration in operating performance.
  - – Frequent switching on of the heating mode for frost protection.
  - – Interruption to operation due to high pressure.
  - – Motor burnout.
- ► If a strong wind is constantly blowing on the front of the unit, the fan can rotate very quickly until it breaks.
- ► The outdoor temperature is measured by the outdoor unit's temperature sensor and may be influenced by direct sunlight. Therefore, place the outdoor unit in the shade or erect a canopy.

Validity: Ground installation



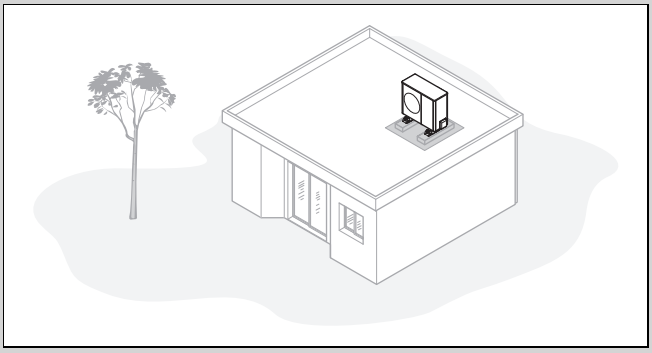
- ► Avoid choosing an installation site that is in the corner of a room, between walls or between fences.
- ► Prevent the return intake of air from the air outlet.
- ► Ensure that water cannot collect on the subsoil.
- ► Ensure that the subsoil can absorb water well.
- ► Plan a bed of gravel and rubble 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 sites between walls.
- ► Select an installation site with excellent sound absorption thanks to grass, hedges or 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.

Validity: Wall installation



- Ensure that the wall fulfils the static requirements. Note the weight of 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.
- If the work on the product takes place at a height above 3 m, install technical fall protection.

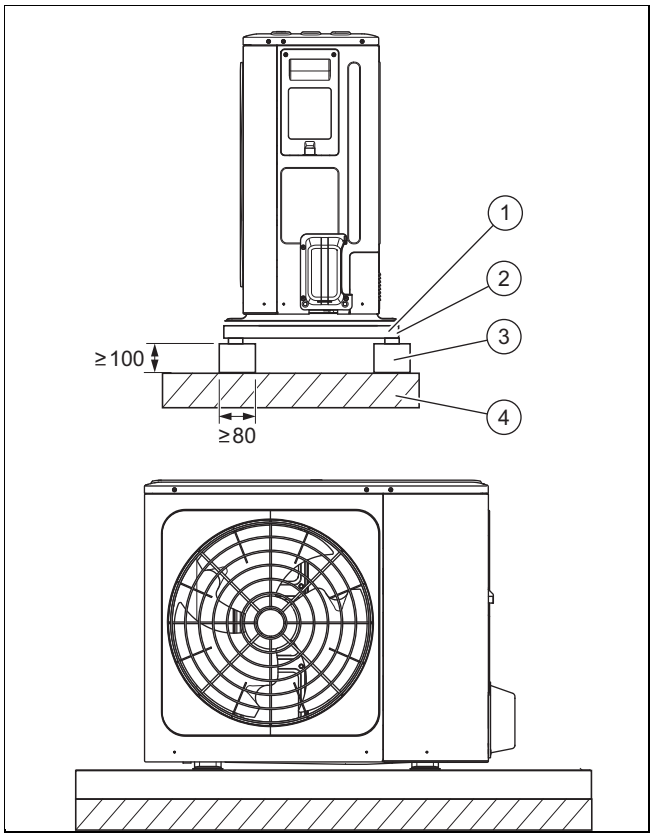
Validity: Flat-roof installation



- 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.

4.7 Planning the foundation

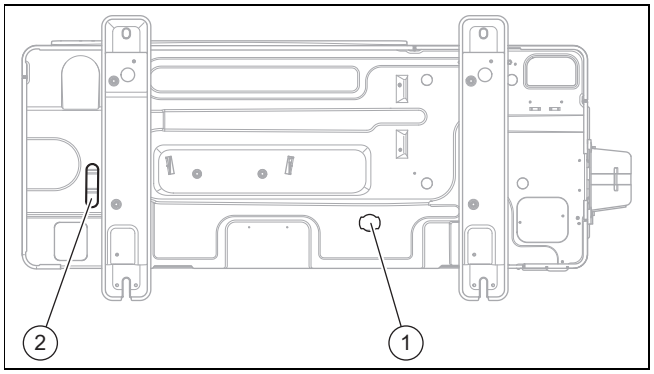
- Check the stability and evenness of the installation floor so that the product cannot cause any vibrations or noises during operation.



1	10 mm diameter expansion bolt	3	Concrete foundation
2	Shock-absorbing rubber mat	4	Fixed floor or canopy

- Tightly secure the product using four 10 mm diameter expansion bolts, nuts and washers.
- Screw in the expansion bolts until they have a clearance of 20 mm from the foundation surface.

Condensate discharge



1	Main drain opening	2	Large drain opening

All condensate from the outdoor unit is collected at the unit base and drains away via the main drain opening.

The larger drain opening is sealed with a rubber stopper. If the main drain opening is not sufficient for the condensate that is produced, also use the larger drain opening.

- If the water cannot drain at low temperatures, even when the large drain opening is open, install an electric heating belt. The electric heating belt acts as trace heating to

prevent the formation of ice or to melt the ice that has formed.

4.8 Guaranteeing occupational safety

Validity: Wall installation

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

Validity: Flat-roof installation

- ► Ensure that the flat roof can be safely accessed.
- ► Maintain a safety area of 2 m to the fall edge, plus the clearance that is required for working on the product. The safety area must not be entered.
- ► Alternatively, 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.

4.9 Installing the product

Danger!
Risk of injury due to frozen condensate.

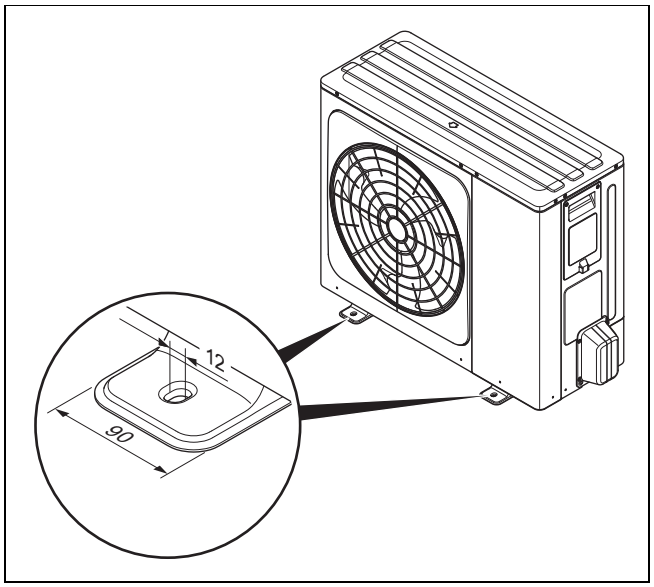
Frozen condensate on paths may cause falls.

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

Note

Install rubber feet under the outdoor unit to prevent vibrations and noise. Recommendations for the rubber feet:

- Thickness: 50 mm to 100 mm
- Material: CR



Condition: Region prone to snow

- ► If required, set up additional weather protection. In doing so, note the potential effects on the noise emissions.

Validity: Ground installation

- ► Use the appropriate products, depending on the required installation type.
  - – Damping feet
  - – Raised base and damping feet
- ► Align the product horizontally.

Condition: Region without ground frost

- ► Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- ► If required, seal other openings in the floor plate.

Condition: Region with ground frost

- ► Do not install a condensate discharge pipe or any plugs in the floor plate.
- ► If required, protect the product's air inlet and air outlet against driving rain or direct snowfall. In doing so, note the potential effects on the noise emissions.

Validity: Wall installation

- ► Check the design and load-bearing capacity of the wall. Note the weight of the product.
- ► Use a unit mounting bracket that is suitable for the wall installation.
- ► Use the damping feet.
- ► Align the product horizontally.

Condition: Region without ground frost

- ► Below the product, create a gravel bed into which any condensate can drain.

Condition: Region with ground frost

- ► Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- ► If required, seal other openings in the floor plate.

Validity: Flat-roof installation

Warning.
Risk of injury due to toppling over in the wind.

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

- ► Use two concrete bases and an anti-slip protective mat.
- ► Screw the product to the concrete base.

- ► Use the damping feet.
- ► Align the product horizontally.

Condition: Region without ground frost

- ► Leave the condensate discharge open. In this case, the condensate drains onto the flat roof.
- ► Alternatively, connect drain pipework.
- ► To do this, install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- ► If required, seal other openings in the floor plate for this.

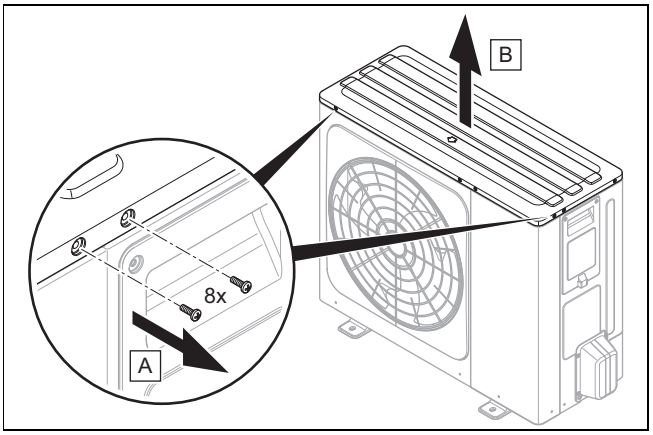
Condition: Region with ground frost

- ► Install the condensate discharge pipe at the drain opening in order to drain the condensate into a suitable area or into a condensate discharge tundish.
- ► If required, seal other openings in the floor plate.
- ► Connect the condensate discharge pipe to a downpipe over a short distance.

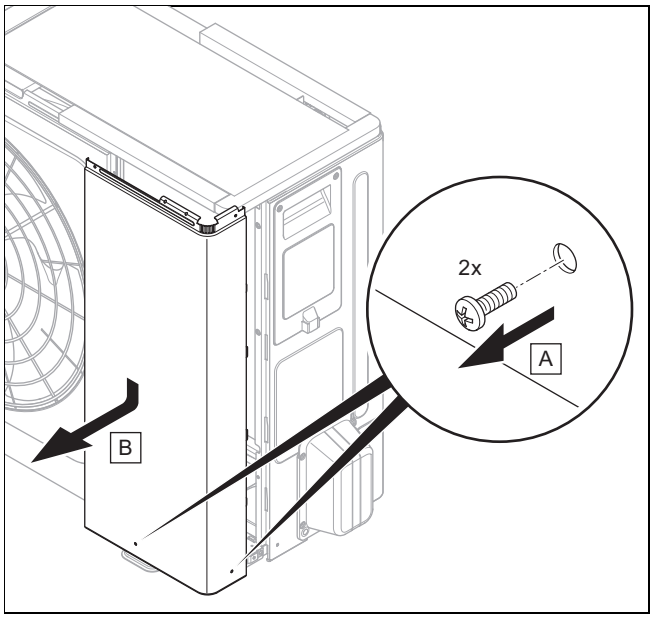
4.10 Removing/installing the casing sections

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

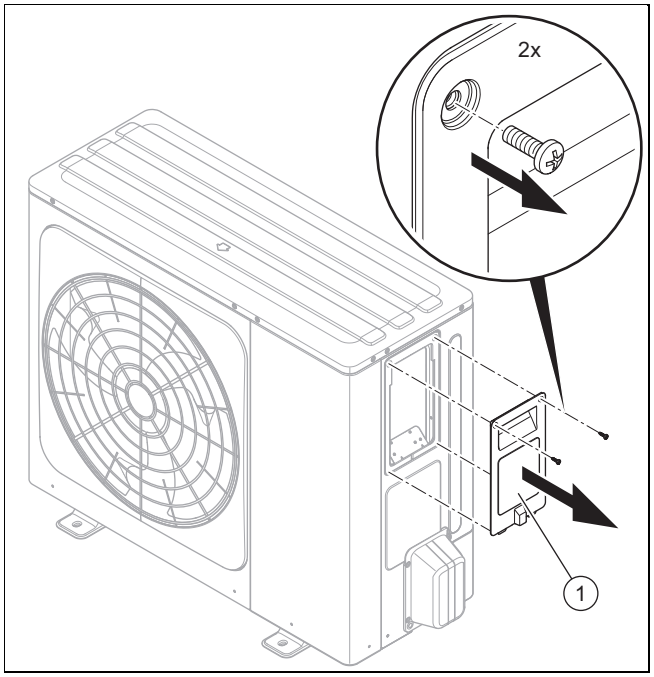
4.10.1 Removing the top casing



4.10.2 Removing the right-hand front casing



4.10.3 Removing the top casing for the electrical connections



5 Hydraulics installation

5.1 Preparing work on the refrigerant circuit

1. Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of injury and risk of environmental damage due to escaping refrigerant.

Touching any escaping refrigerant may cause injury. Escaping refrigerant leads to environmental damage if it reaches the atmosphere.

- ► Only carry out work on the refrigerant circuit if you have been trained to do so.

Caution.

Risk of material damage when extracting refrigerant.

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

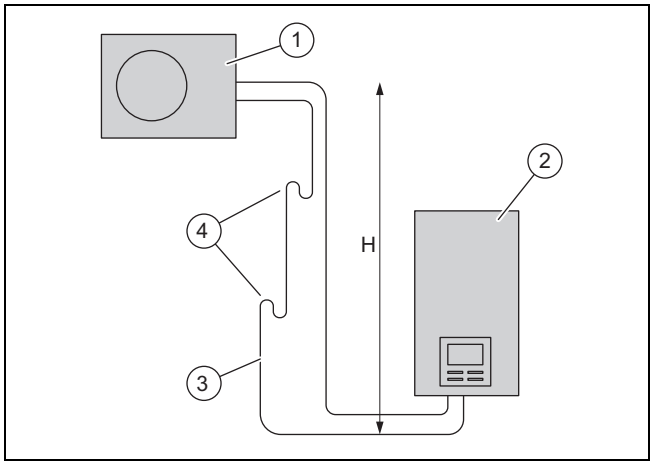
- ► Ensure that heating water flows through the indoor unit's condenser or it is completely drained when extracting refrigerant on the secondary side.

2. The outdoor unit is pre-filled with R32 refrigerant. Determine whether additional refrigerant is required.
3. Ensure that the two isolation valves are closed.
4. Purchase suitable refrigerant pipes in accordance with the technical data.
5. Ensure that the refrigerant pipes that are used comply with these requirements:
   - Special copper pipes for the refrigeration technology
   - Thermal insulation
   - Weather resistance and UV resistance.
   - Protection against rodent bites.
   - Flaring with 90° flare in accordance with the SAE standard
6. Keep the refrigerant pipes blocked until they are installed.
7. Ensure that there is no dirt or water in the refrigerant pipes before you connect the refrigerant pipes to the outdoor unit and indoor unit.
8. Prevent the ingress of metal chips, dirt or moisture into the refrigerant pipes.
9. Purchase the necessary tools and equipment:

Always required	May be required
– Flaring tool for 90° flare – Torque spanner – Refrigerant fitting – Nitrogen cylinder – Vacuum pump – Vacuum gauge	– Refrigerant cylinder with R32 – Refrigerant scales

5.2 Requirements for routing the refrigerant pipes

5.2.1 Case 1: Outdoor unit raised

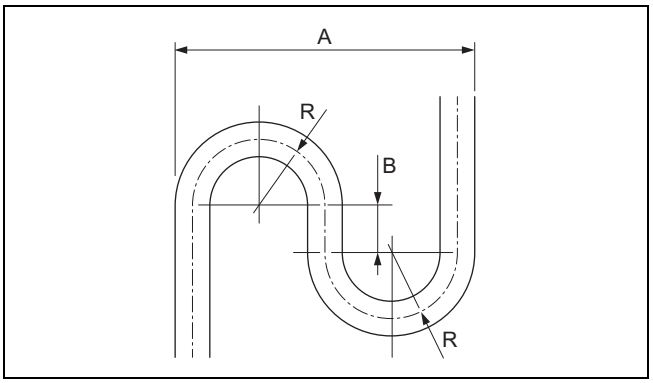


1	Outdoor unit	3	Hot gas pipe
2	Indoor unit	4	Oil elevation elbow

The outdoor unit can be installed up to a maximum height difference H of 20 m above the indoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. Depending on the height difference, oil elevation elbows must be installed in the hot gas pipe. The height difference between the oil elevation elbows must not exceed 7 m.

Height H	Oil elevation elbow
Up to 7 m	No oil elevation elbow required
Up to 14 m	One oil elevation elbow at 7 m high
Up to 20 m	Two oil elevation elbows, one 7 m and one 14 m in height

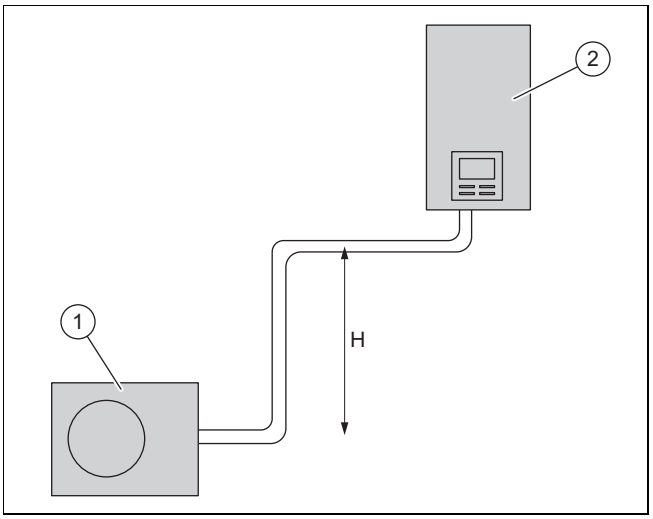
The oil elevation elbow must comply with these geometric requirements:



A 173 mm R 40 mm

B 40 mm

5.2.2 Case 2: Indoor unit raised



1 Outdoor unit 2 Indoor unit

The indoor unit can be installed up to a maximum height difference H of 20 m above the outdoor unit. In this case, a refrigerant pipe with a maximum single length of 30 m is permitted. No oil elevation elbow is required.

5.3 Flare connection

The flare connection guarantees the tightness of the refrigerant pipe for the R32 refrigerant.

If a flare connection comes loose again, the old flare must then be disconnected, and a new flare must be established. The refrigerant pipe is therefore shortened slightly. This must be taken into consideration when routing the refrigerant pipes.

5.4 Routing refrigerant pipes to the product

Validity: Ground installation

► Route the refrigerant pipe through the safety pipe in the ground.

1. Route the refrigerant pipes in the wall duct with a slight downward gradient to the outside.
2. Route the refrigerant pipe centrally through the wall duct without the lines touching the wall.
3. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.

Validity: Wall installation

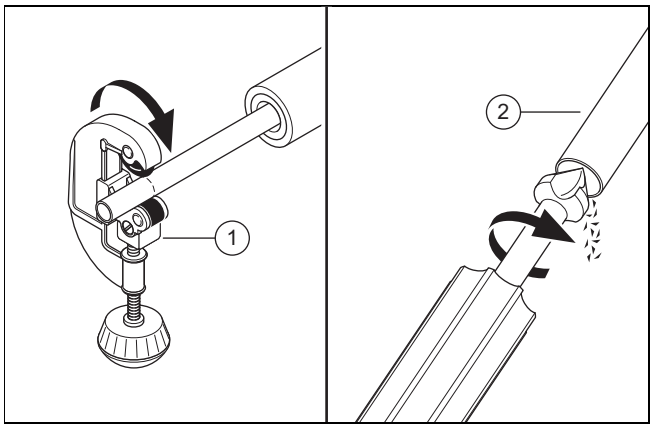
► Ensure that the refrigerant pipes do not come into contact with the wall and the product's casing sections.

5.5 Routing refrigerant pipes in the building

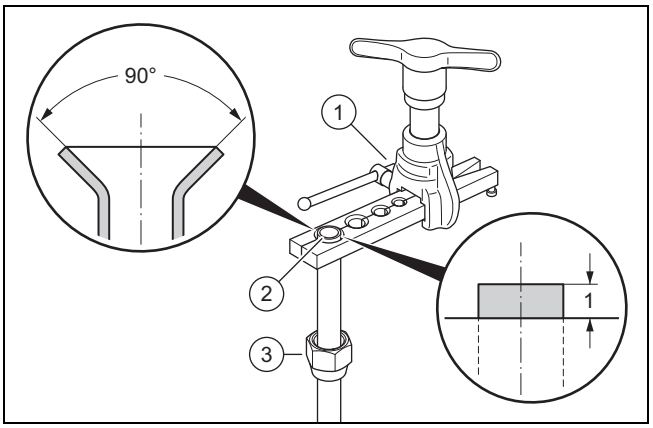
1. Do not route the refrigerant pipes in screed or masonry in the building. If this is unavoidable, install a silencer in the refrigerant pipe.
2. Do not route the refrigerant pipes through living rooms in the building.
3. Limit the routing of refrigerant pipes to a minimum. Avoid unnecessary piping and elbows.
4. Bend the refrigerant pipes only once into their final position. Use a bending spring or a bending tool to avoid kinks.
5. Bend the refrigerant pipes at the right angle to the wall and avoid mechanical tension during the routing.
6. Ensure that the refrigerant pipes do not come into contact with the wall.
7. Use wall brackets with rubber insert to secure these. Place the wall brackets around the thermal insulation of the refrigerant pipe.
8. Check whether oil elevation elbows are required. (→ Section 5.2.1)
9. If required, install oil elevation elbows in the hot gas pipe.
10. Ensure that the routed refrigerant pipes are protected against damage.

5.6 Cutting the pipes to length and flaring the pipe ends

1. Keep the pipe ends downwards when working on them.
2. Prevent the ingress of metal chips, dirt or moisture.

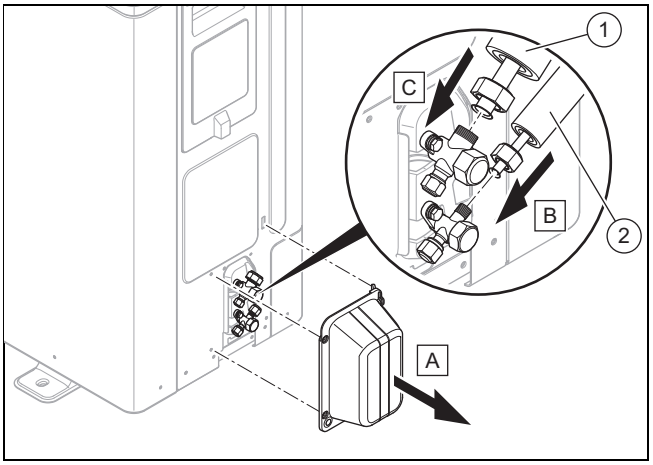


3. Cut the copper pipe to length at a right angle using a pipe cutter **(1)**.
4. Deburr the inside and outside of the pipe end **(2)**. Remove all chips carefully.
5. Unscrew the flare nut on the associated isolation valve.



6. Slide the flare nut **(3)** onto the pipe end.
7. Use a flaring tool for the 90° flare in accordance with the SAE standard.
8. Insert the pipe end into the appropriate die matrix in the flaring tool **(1)**. Allow the pipe end to protrude by 1 mm. Clamp the pipe end.
9. Widen the pipe end **(2)** using the flaring tool.

5.7 Connecting the refrigerant pipes



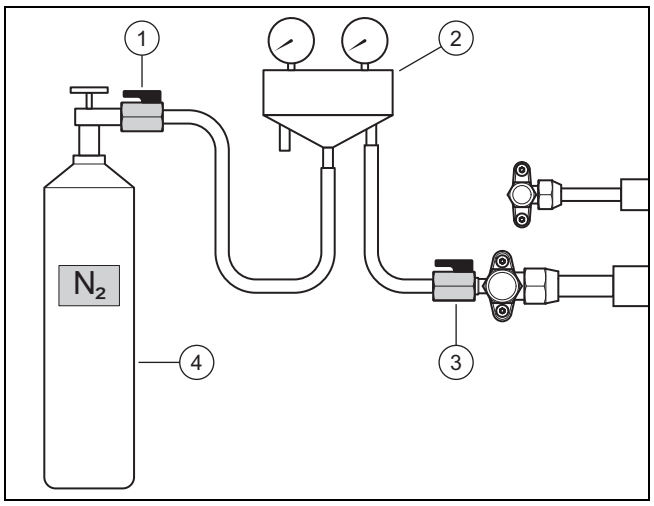
1. Remove the cover for the refrigerant pipe connections.
2. Remove the flare nut from the connections for the refrigerant pipes.
3. Cut the pipes to the correct length and flare the pipe ends. (→ Section 5.6).
4. Connect the liquid pipe **(2)** and the hot gas pipe **(1)**.
5. Tighten the flare nut. Use pliers to hold the isolation valve in place while doing so.

Pipeline	Pipe diameter	Tightening torque
Liquid pipe	3/8"	25 to 26 Nm
Hot gas pipe	5/8"	45 to 47 Nm

6. Ensure that the flare connections remain accessible for maintenance purposes.

5.8 Checking the refrigerant circuit for tightness

1. Ensure that the two isolation valves on the outdoor unit are still closed.
2. Observe the maximum operating pressure in the refrigerant circuit.



3. Connect a refrigerant fitting **(2)** with a ball valve **(3)** to the maintenance connection for the hot gas pipe.
4. Connect the refrigerant fitting with a ball valve **(1)** to a nitrogen cylinder **(4)**. Use dry nitrogen.
5. Open both of the ball valves.
6. Open the nitrogen cylinder.
   – Test pressure: 4.3 MPa (43 bar)
7. Close the nitrogen cylinder and the ball valve **(1)**.
   – Waiting time: 10 minutes
8. Check all of the connections in the refrigerant circuit for tightness. Use leak detection spray for this.
9. Observe whether the pressure is stable.

Result 1:

The pressure is stable and no leaks were found:

- ► Completely drain the nitrogen gas via the refrigerant fitting.
- ► Close the ball valve **(3)**.

Result 2:

The pressure drops or a leak is found:

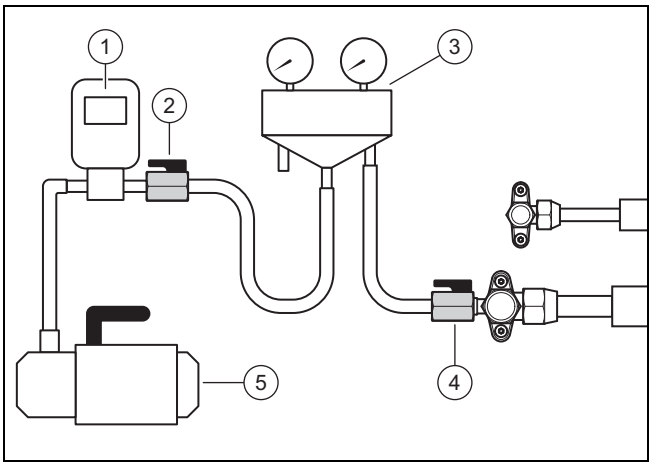
- ► Eliminate the leakage.
- ► Repeat the test.

5.9 Evacuating the refrigerant circuit

Note

During evacuation, residual moisture is removed from the refrigerant circuit at the same time. The length of the process depends on the residual moisture and the outdoor temperature.

1. Ensure that the two isolation valves on the outdoor unit are still closed.



2. Connect a refrigerant fitting **(3)** with a ball valve **(4)** to the maintenance connection for the hot gas pipe.
3. Connect the refrigerant fitting with a ball valve **(2)** to a vacuum gauge **(1)** and a vacuum pump **(5)**.
4. Open both of the ball valves.
5. **First test**: Switch on the vacuum pump.
6. Drain the refrigerant pipes and the condenser on the indoor unit.
   – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
   – Running time of the vacuum pump: At least 30 minutes
7. Switch off the vacuum pump.
   – Waiting period: 3 minutes
8. Check the pressure.

   Result 1:

   Pressure is stable:

   ► The first test is complete. Start with the second test.

   Result 2:

   The pressure increases and there is a leak:

   ► Check the flare connections on the outdoor unit and indoor unit. Eliminate the leakage.

   ► Start with the second test.

   Result 3:

   The pressure increases and there is residual moisture:

   ► Carry out the drying process.

   ► Start with the second test.
9. **Second test**: Switch on the vacuum pump.
10. Drain the refrigerant pipes and the condenser on the indoor unit.
    – Absolute pressure to be reached: 0.1 kPa (1.0 mbar)
    – Running time of the vacuum pump: At least 30 minutes
11. Switch off the vacuum pump.
    – Waiting period: 3 minutes
12. Check the pressure.

    Result 1:

    Pressure is stable:

    ► The second test is complete. Close the ball valves **(2)** and **(4)**.

    Result 2:

    The pressure increases.

    ► Repeat the second test.

5.10 Permissible total refrigerant volume

The outdoor unit is filled with refrigerant at the factory:

Product	Factory-set refrigerant volume	Refrigerant
8 kW, 10 kW	1.65 kg	R32
12 kW, 16 kW	1.84 kg	R32

Depending on the length of the refrigerant pipes, an additional refrigerant volume must be filled during the installation (→ Section 5.11).

The total permissible refrigerant volume is limited and depends on the minimum room size at the installation site for the indoor unit.

The requirements for the minimum room size at the indoor unit's installation site are described in the installation instructions for the indoor unit. For a total fill quantity of over 1.84 kg, the required installation room must be considerably larger.

5.11 Adding additional refrigerant

Danger!

Risk of injury due to escaping refrigerant.

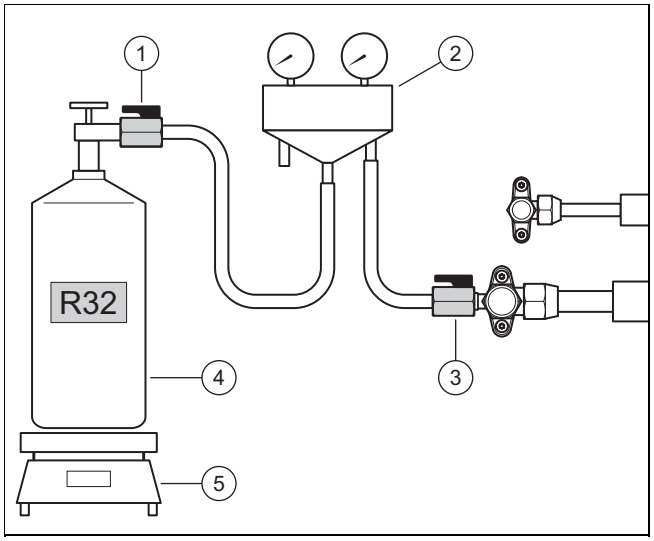
Touching any escaping refrigerant may cause injury.

► Wear personal protective equipment.

1. Determine the single length of the refrigerant pipe.
2. Calculate the required volume of additional refrigerant:

Single length	Refrigerant volume to be topped up
≤ 15 m	None
> 15 m	38 g for every additional metre above 15 m

3. Ensure that the two isolation valves on the outdoor unit are still closed.



4. Connect the refrigerant fitting **(2)** with the ball valve **(1)** to a refrigerant cylinder **(4)**.

– Refrigerant to be used: R32

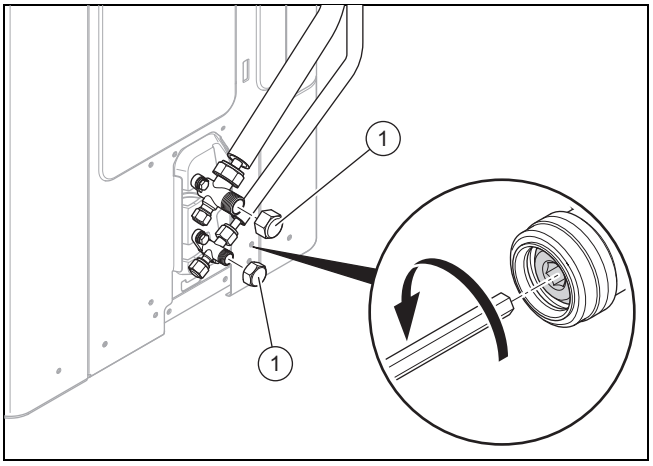
5. Put the refrigerant cylinder on the scales **(5)**. If the refrigerant cylinder does not have an immersion sleeve, put it on the scales upside down.
6. Leave the ball valve **(3)** closed. Open the refrigerant cylinder and the ball valve **(1)**.
7. If the hoses have been filled with refrigerant, set the scales to zero.
8. Open the ball valve **(3)**. Fill the outdoor unit with the calculated refrigerant volume.
9. Close both of the ball valves.
10. Close the refrigerant cylinder.

5.12 Releasing the refrigerant

Danger!
Risk of injury due to escaping refrigerant.

Touching any escaping refrigerant may cause injury.

► Wear personal protective equipment.



1. Remove both covering caps **(1)**.
2. Unscrew both hexagon socket screws as far as they will go.
   ◁ The refrigerant flows into the refrigerant pipes and the indoor unit's condenser.
3. Check that no refrigerant is escaping. Check in particular all of the screwed connections and valves.
4. Screw on both covering caps. Tighten the covering caps.

5.13 Completing work on the refrigerant circuit

1. Note down the refrigerant volume added at the factory, the additional refrigerant volume added and the total refrigerant volume on the sticker on the product.
2. Enter the data in the service book.
3. Insulate and secure the refrigerant pipes after you have connected the connection cable (→ Section 6.8).
4. Install the cover for the refrigerant pipe connections.

6 Electrical installation

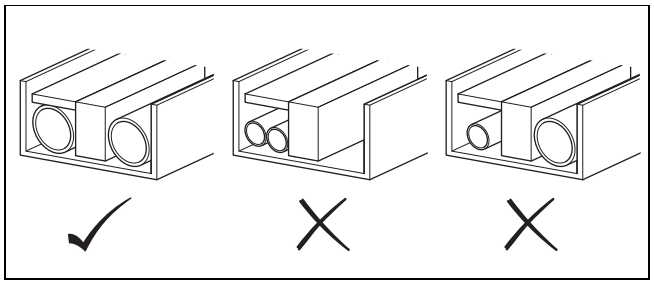
6.1 Precautionary measures when working on electrical wires

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.

► Carry out the on-site wiring in accordance with the wiring diagram supplied and the instructions below.
► Install a main switch or other partition with all-pole contact separation in the fixed wiring. In doing so, observe the applicable local laws and regulations.
► Switch off the power supply before implementing any connections.
► Use a 3-core, shielded copper cable.
► Never crush bundled cables.
► Secure the cables in such a way that they do not come into contact with the pipelines or sharp edges.
► Ensure that no pressure is exerted on the terminal connections.
► Use a separate power supply for the product. Never use a power supply that is shared by another product.
► Ensure that it is earthed. Do not earth the unit via a supply pipe, overvoltage protection or the telephone earth.
► Install a type B residual-current circuit breaker with 30 mA (<0.1 s).
► Do not install a phase advance capacitor as this can impair the function of the capacitor.



► Route the wires in accordance with the figure.
► Do not connect any wires with different cross-sections to the same power supply terminal.
► Secure the electrical wires using cable ties so that they do not come into contact with the pipelines, especially on the high-pressure side.

6.2 Precautionary measures when connecting the power supply

- ► Use round conductor end sleeves for the connection to the terminal block for the power supply. If, for unavoidable reasons, these cannot be used, observe the following instructions.
- ► Use the specified wires for the wiring.
- ► Do not connect any wires with different cross-sections to the same power supply terminal (loose connections may lead to overheating).
- ► Use the correct screwdriver to tighten the terminal screws.
- ► Connect a residual-current circuit breaker and a fuse to the power supply cable.
- ► Establish complete connections and secure the wires in such a way that no external forces can act on the terminals.
- ► Ensure that a tolerance of +10% to -15% is maintained for the mains voltage of the single-phase 230 V mains.

6.3 Requirement for the safety device

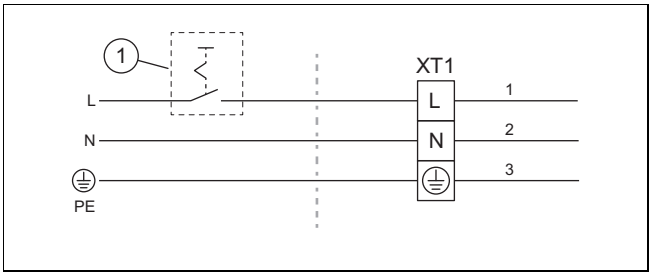
- ► Select the minimum required cable cross-section for each product individually using the tables (→ Appendix D).
- ► Select a residual-current circuit breaker that has a contact gap of at least 3 mm and which enables complete shutdown. Use the value for the maximum amperage to select current and residual-current circuit breakers (→ Appendix D).

6.4 Preparing the electrical connection

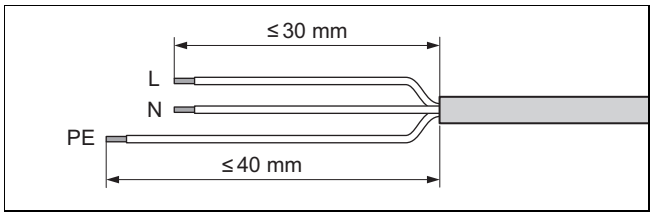
- ► Remove the top casing for the electrical connections. (→ Section 4.10.3)

6.5 Establishing the power supply

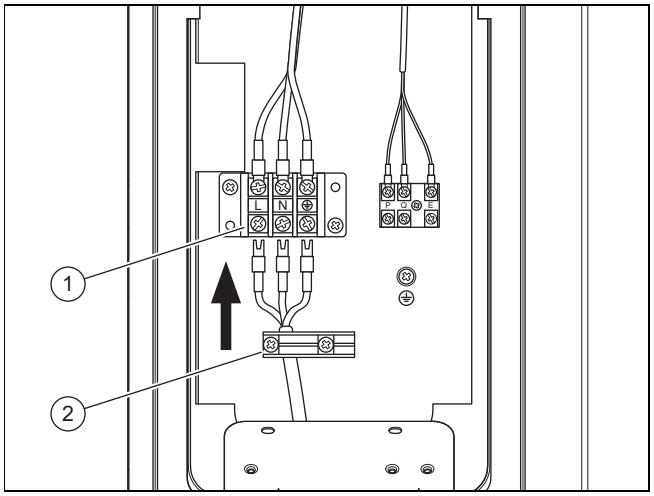
1. If it is stipulated for the installation site, install one residual-current circuit breaker for the product.



2. Install a disconnector **(1)** for the product in the building.
3. Use one 3-pole power supply cable.
4. Route the power supply cable from the building and through the wall duct to the product.
5. Route the power supply cable within the product in such a way that no contact is made with hot components.



6. Strip the power supply cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
7. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.



8. Connect the power supply cable to the power supply terminal **(1)**.
9. Secure the power supply cable using the strain relief clamp **(2)**.

6.6 Connecting the connection cable

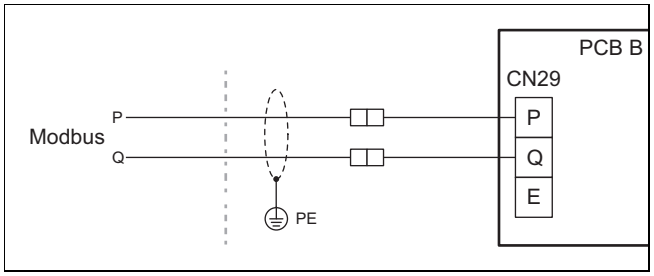
Note

The connection between the outdoor unit and the indoor unit is established via Modbus communication (RS-485 protocol).

Preliminary work

1. Determine the line length between the indoor unit and outdoor unit.
2. Use a communication cable with the following properties:

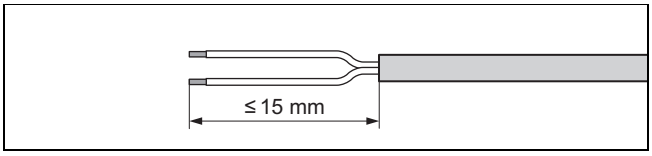
	Feature
Type	2 x shielded cable (AWG18)
Min. cross-section	0.75 mm²
Max. length	50 m



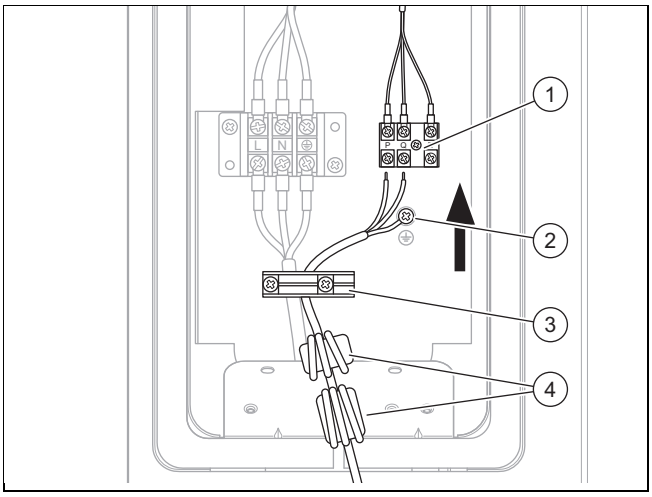
1. Ensure that connections P and Q on the indoor unit are connected to connections P and Q on the outdoor unit using the Modbus cable.

– To do this, use a Modbus cable with different conductor colours for signals P and Q.
– The shield braid for the communication cable must be earthed.

2. Route the Modbus cable from the building and through the wall duct to the product.
3. Route the Modbus cable within the product in such a way that no contact is made with hot components.



4. Strip the Modbus cable. In doing so, ensure that the insulation on the individual conductors is not damaged.
5. To avoid short circuits resulting from loose individual wires, fit conductor end sleeves on the stripped ends of the conductors.

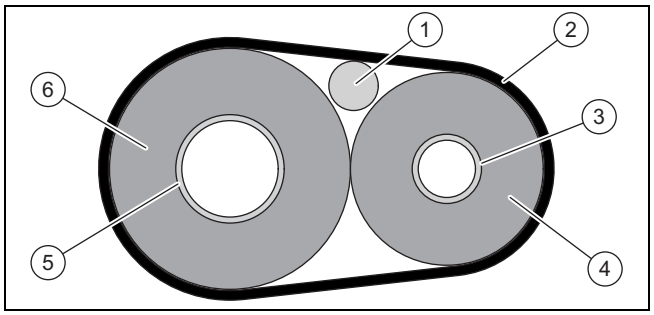


6. Position two ferrite rings **(4)** as shown in the figure.
7. Connect the two conductors on the Modbus cable to the screw terminal **(1)**. In doing so, check the assignment of the conductor colours to connections P and Q.
8. Connect the shield connection to the earthing terminal **(2)**.
9. Use the strain relief clamp **(3)** to secure the Modbus cable in place.

6.7 Completing the electrical connection

1. Check that the power supply cable and the Modbus cable are routed in such a way that they are not exposed to any wear, corrosion, tension, vibrations, sharp edges or any other unfavourable environmental influences.
2. Install the top casing.

6.8 Completing the installation of the outdoor unit



1	Connection cable	4	Liquid pipe insulation
2	Edging tape	5	Hot gas pipe
3	Liquid pipe	6	Hot gas pipe insulation

1. Insulate and secure the refrigerant pipes and the connection cable in accordance with the figure.
2. Install the protective cover for the refrigerant connection.

7 Start-up

7.1 Checking before switching on

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

7.2 Switching on the product

- ► Switch on the disconnector to which the product is connected in the building.

8 Handing over to the end user

8.1 Instructing the end user

- ► Explain to the end user how the product operates.
- ► 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 R32 refrigerant.
- ► Make the end user aware of the need for regular maintenance.

9 Troubleshooting

9.1 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).

10 Inspection and maintenance

10.1 Preparing for inspection and maintenance

► Only carry out the work if you are competent and have knowledge about the special features and risks of R32 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 R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
► If you notice a leak, close the product's housing, inform the end user and notify customer service.
► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices or tools that are not free from electrical sources, or static discharges.
► Ensure that the room is sufficiently aerated around the product.
► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

► Only open the electronics box after a waiting period of 60 minutes.

► Observe the basic safety rules before carrying out inspection and maintenance work or installing spare parts.
► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
► Switch off the disconnector to which the product is connected in the building.
► Disconnect the product from the power supply but ensure that the product is still earthed.
► Before working in the electronics box, comply with a waiting time of 60 minutes after switching off the power supply.
  – An LED on the PCB and the module PCB displays whether the PCBs are still supplied with power. If the LEDs no longer light up, the power supply is interrupted.
► When working on the product, protect all electric components from spraying water.

10.2 Observing the work plan and intervals

► Comply with the specified intervals. Carry out all of the work that is mentioned (Appendix D).

10.3 Procuring spare parts

The original components of the product were also certified by the manufacturer as part of the declaration of conformity. If you use other, non-certified or unauthorised parts during maintenance or repair work, this may result in the product no longer meeting the applicable standards, thereby voiding the conformity of the product.

We strongly recommend that you use original spare parts from the manufacturer as this guarantees fault-free and safe operation of the product. To receive information about the available original spare parts, contact the contact address provided on the back page of these instructions.

► If you require spare parts for maintenance or repair work, use only the spare parts that are permitted for the product.

10.4 Carrying out maintenance work

10.4.1 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.

10.4.2 Removing the casing sections

► Remove the casing sections to the extent required for the subsequent maintenance work (→ Section 4.10).

10.4.3 Cleaning the evaporator

1. Clean the gaps between the evaporator fins using a soft brush. In doing so, avoid bending the fins.
2. Remove any dirt and depositions.
3. If required, straighten out any bent fins using a fin comb.

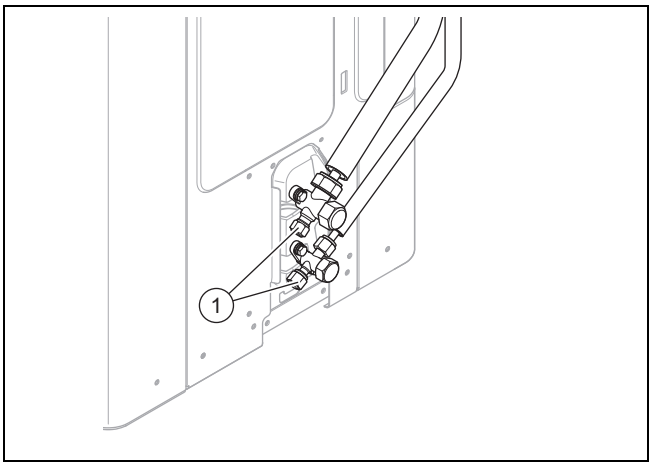
10.4.4 Checking the fan

1. Turn the fan by hand.
2. Check that the fan runs freely.

10.4.5 Cleaning the condensate discharge

1. Remove the dirt that has accumulated on the condensate tray or in the condensate discharge pipe.
2. Check that the water can drain freely. Poor approx. 1 l water into the condensate tray.

10.4.6 Checking the refrigerant circuit



1. Check whether the components and pipelines are free from dirt and corrosion.
2. Check that the covering caps **(1)** on the maintenance connections are positioned securely.
3. Check whether the thermal insulation for the refrigerant pipes is undamaged.
4. Check whether the refrigerant pipes have been routed without any kinks.

10.4.7 Checking the refrigerant circuit for tightness

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

10.4.8 Checking the electrical connections

1. In the connection box, check that the electrical wire are seated firmly in the plugs or terminals.
2. Check the earthing in the connection box.
3. Check whether the power supply cable is damaged. If it needs to be replaced, ensure that it is only replaced by customer service or a similarly qualified person in order to prevent hazards.
4. In the unit, check that the electrical wire are seated firmly in the plugs or terminals.
5. In the unit, check whether the electrical wires are free from damage.
6. If there is a fault that affects safety, do not switch the power supply back on until the fault has been eliminated.
7. If it is not possible to immediately eliminate this fault but it is still necessary to operate the installation, create a suitable interim solution. Inform the end user about this.

10.4.9 Checking the damping feet for wear

1. Check whether the damping feet are significantly compressed.
2. Check whether the damping feet have significant cracks.
3. Check whether there is substantial corrosion on the screwed connection for the damping feet.
4. If required, procure and install new damping feet.

10.5 Completing inspection and maintenance

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

11 Repair and service

11.1 Preparing repair and service work

- ► Observe the basic safety rules before carrying out any repair and service work.
- ► When working in a raised position, observe the occupational safety rules (→ Section 4.8).
- ► Only carry out work on the refrigerant circuit if you have specific expert refrigeration knowledge and are competent at handling R32 refrigerant.
- ► When working on the refrigerant circuit, inform everybody who is working in the close vicinity or who is in the area, about the type of work that is to be carried out.
- ► Only carry out work on electrical components if you have specific electrical expertise.

Danger!

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

The product contains the combustible refrigerant R32. 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. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► If you are working on the product when it is open, before starting work, use a gas sniffer that is free of ignition sources to ensure that there is no leak.
- ► If you notice a leak, close the product's housing, inform the end user and notify customer service.
- ► Keep all ignition sources away from the product. Ignition sources are, for example, open flames, hot surfaces with temperatures above 550 °C, electrical devices

or tools that are not free from electrical sources, or static discharges.
- ► Ensure that the room is sufficiently aerated around the product.
- ► Use a restriction to ensure that unauthorised personnel are kept away from the product.

Danger!

Risk of death from electric shock when opening the electronics box!

Capacitors are installed in the product's electronics box. Even after switching off the power supply, residual voltage is still present in electrical components for 60 minutes.

- ► Only open the electronics box after a waiting period of 60 minutes.

- ► Switch off the disconnector to which the product is connected in the building.
- ► Disconnect the product from the power supply but ensure that the product is still earthed.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Use only safe units and tools that are permitted for R32 refrigerant.
- ► Monitor the atmosphere in the working area using a 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 casing sections.

11.2 Replacing components of the refrigerant circuit

- ► Ensure that the work follows the defined procedure, as described in the sections below.

11.2.1 Removing refrigerant from the product

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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.
- ► Ensure that the expansion valves are open in order to guarantee that the refrigerant circuit is drained completely.
- ► The refrigerant must not be pumped into the outdoor unit using the compressor, and the pump-down process must not be carried out.

Caution.

Risk of material damage when removing the refrigerant.

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

- ► Remove the heating water from the indoor unit's condenser (heat exchanger) before the refrigerant is removed from the product.

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 R32 refrigerant.
3. Use only recycling cylinders that are approved for R32 refrigerant, have been labelled appropriately, and are equipped with a pressure relief and isolation valve.
4. Only use hoses, couplings and valves that are as short as possible, leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Ensure that the work area is sufficiently aerated.
6. Ensure that the outlet of the vacuum pump is not located close to potential sources of ignition.
7. Drain the recycling cylinder. In doing so, ensure that the recycling cylinder is correctly positioned.
8. Extract the refrigerant. In doing so, take into account the maximum fill quantity of the recycling cylinder, and monitor the fill quantity using calibrated scales. In doing so, never exceed the permissible operating pressure for the recycling cylinder.
9. Ensure that no air gets into the refrigerant circuit, into refrigerant-carrying tools or units, or into the recycling cylinder.
10. If there are leaks, do not use the extraction station under negative pressure.
11. Never leave the extraction station unattended.
12. Connect the manometer bridge to the isolation valve's maintenance connection.
13. Open both expansion valves in order to guarantee that the refrigerant circuit is drained completely.
14. Once the refrigerant circuit is completely empty, immediately remove the recycling cylinders and units from the installation.
15. Close all of the isolation valves.

11.2.2 Removing components of the refrigerant circuit

- ► Flush the refrigerant circuit with oxygen-free nitrogen. Never use compressed air or oxygen instead of this.
- ► 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, there must no longer be any flammable refrigerant in the compressor oil. You should therefore drain it for a sufficient time using sufficient negative pressure.
- ► 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.
- ► If compressor oil is drained, this must be carried out safely and securely.
- ► Note that removed components may release refrigerant for an extended period. Only store and transport these components in well-aerated locations.

11.2.3 Installing components of the refrigerant circuit

- ► Only use original spare parts from the manufacturer.
- ► Install the component correctly. To do this, use only soldering processes.
- ► Install a filter dryer outdoors in the liquid pipe to the outdoor unit.
- ► Carry out a pressure test of the refrigerant circuit using nitrogen.
- ► Check whether all main components are correctly earthed after maintenance (compressor, etc.).

11.2.4 Filling the product with refrigerant

Danger!

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

The product contains the combustible refrigerant R32. The refrigerant may mix with air to form a flammable atmosphere. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Only carry out the work if you are competent at handling R32 refrigerant.
- ► Wear suitable personal protective equipment and bring a fire extinguisher with you.
- ► Only use tools and units that are permitted for R32 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 R32 refrigerant that has not been used before and is specified as such, and the purity of which is at least 99.5%.

1. Make sure that the product is earthed.
2. Procure the tools and units that are required for filling with refrigerant:
   - Vacuum pump
   - Refrigerant cylinder
   - Scales
3. Only use tools and units that are permitted for R32 refrigerant. Only use refrigerant cylinders that are labelled accordingly.
4. Only use hoses, couplings and valves that are leak-tight and in proper working condition. Check the tightness using a gas sniffer.
5. Only use hoses that are as short as possible in order to minimise the refrigerant volume that they can hold.
6. Flush the refrigerant circuit with nitrogen.
7. Drain the refrigerant circuit.
8. Fill the refrigerant circuit with R32 refrigerant. The required fill quantity is specified on the product's data plate. Ensure in particular that the refrigerant circuit is not overfilled.
9. Check the refrigerant circuit for leak-tightness using a gas sniffer. In doing so, check all of the components and pipelines.

11.3 Replacing electrical components

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

11.4 Completing repair and service work

- ► Installing the casing sections.
- ► Switch on the disconnector to which the product is connected in the building.
- ► Start up the product. Temporarily activate the heating mode.
- ► Check the product for leak-tightness using a gas sniffer.

12 Decommissioning

12.1 Temporarily decommissioning the product

1. Switch off the disconnector to which the product is connected in the building.
2. Disconnect the product from the power supply.

12.2 Permanently decommissioning the product

Caution.
Risk of damage caused by defrosting.

Draining off the refrigerant generates intense cooling of the indoor unit's plate heat exchanger, which may lead to the de-icing of the plate heat exchanger on the heating water side.

- ► Drain the indoor unit on the heating water side in order to prevent damage.
- ► Ensure that, during the refrigerant draining of the plate heat exchanger on the heating water side, there is sufficient flow-through.

1. Switch off the disconnector 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 indoor unit.
4. Remove the casing sections.
5. Remove the refrigerant from the product. (→ Section 11.2.1)
6. Note that refrigerant will continue to escape even after the refrigerant circuit is completely drained due to outgassing from the compressor oil.
7. Installing the casing sections.
8. Label the product using a sticker that is visible from the outside.
9. Note down on the sticker that the product has been decommissioned and that the refrigerant has been completely removed. Sign the sticker and specify the date.
10. Recycle the removed refrigerant in accordance with the regulations. Note that the refrigerant must be cleaned and checked before it is used again.
11. Dispose of or recycle the product and its components in accordance with the regulations.

13 Recycling and disposal

13.1 Disposing of the packaging

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

13.2 Recycling or disposing of refrigerant

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

If R32 refrigerant is released during transport, a flammable atmosphere may form when it mixes with air. There is a risk of fire and explosion. In the event of a fire, toxic or corrosive substances, such as carbonyl fluoride, carbon monoxide or hydrogen fluoride, are produced.

- ► Ensure that the refrigerant is transported correctly.

Warning.
Risk of damage to the environment.

The product contains the refrigerant R32. This refrigerant must not be allowed to escape into the atmosphere. R32 is a fluorinated greenhouse gas covered by the Kyoto Protocol, with a GWP of 675 (GWP = Global Warming Potential).

- ► Have the refrigerant that is contained in the product completely drained into a suitable vessel so that it can then be recycled or disposed of in accordance with the regulations.
- ► When doing so, ensure that the vessel does not contain multiple different types of refrigerant.

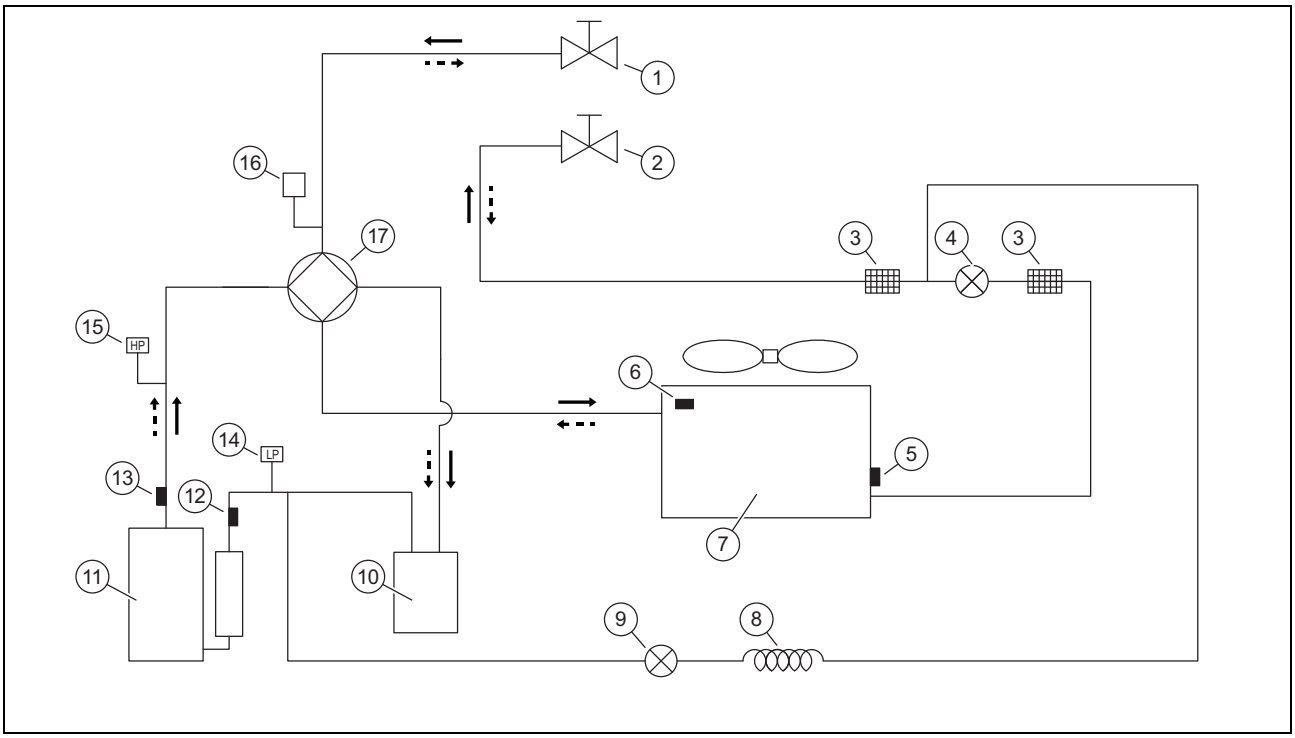
- ► Ensure that the refrigerant is recycled or disposed of by a qualified competent person.

14 Customer service

Bizning mijozlar ximatimizning aloqa ma'lumotlarini orqa tomonda berilgan manzilda yoki www.demirdokum.com.tr manzilida topasiz.

Appendix

A Refrigerant circuit



Cooling

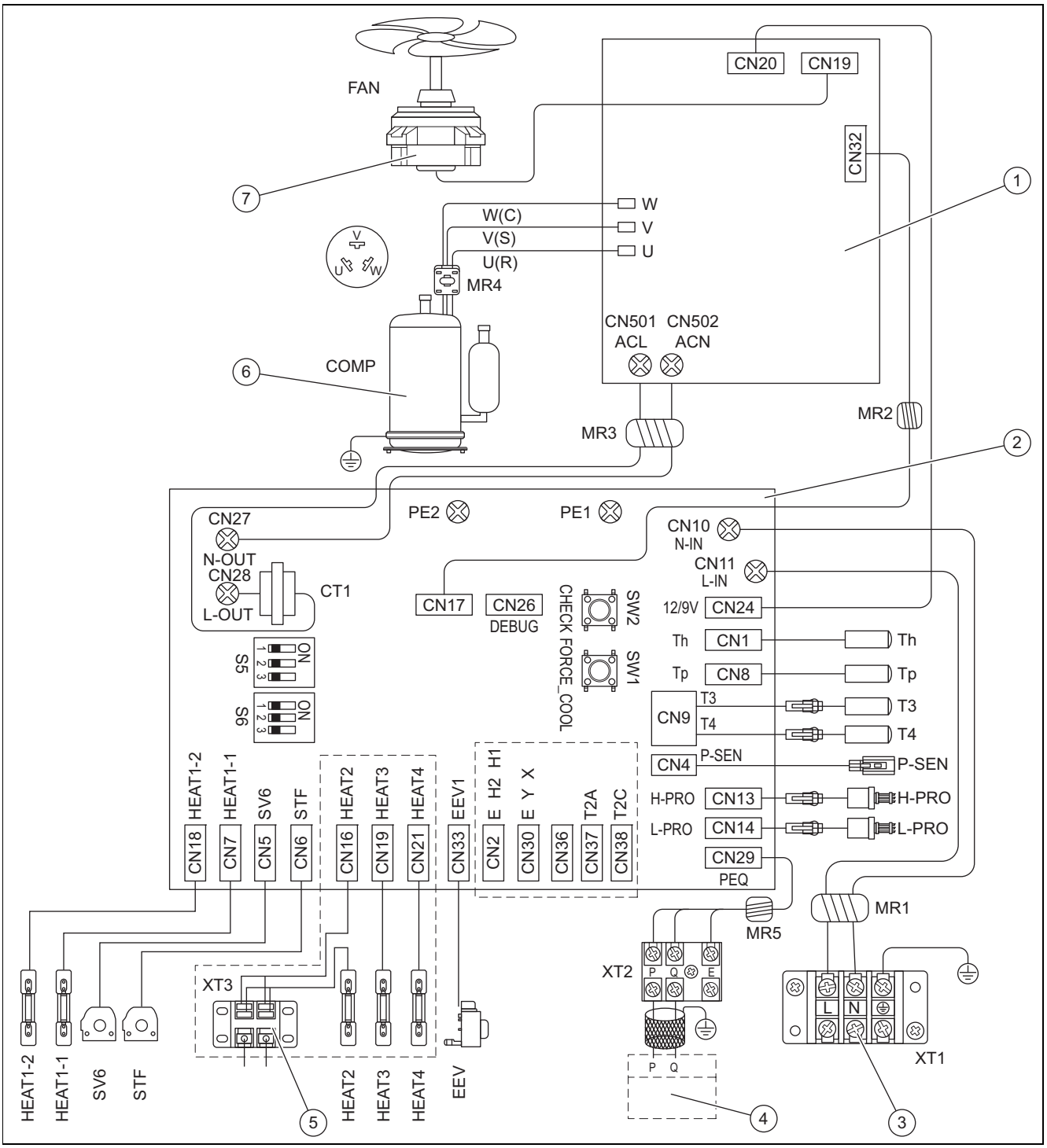
Heating

1	Hot gas pipe isolation valve
2	Liquid pipe isolation valve
3	Filter
4	Electronic expansion valve
5	Temperature sensor (evaporator in heating mode, condenser in cooling mode)
6	Outdoor temperature sensor
7	Air-side heat exchanger
8	Capillary
9	Electromagnetic one-way valve
10	Gas liquid separator
11	Compressor
12	Intake temperature sensor
13	Outlet temperature sensor
14	Low-pressure switch
15	High-pressure switch
16	Pressure sensor
17	4-port valve

B Wiring diagrams

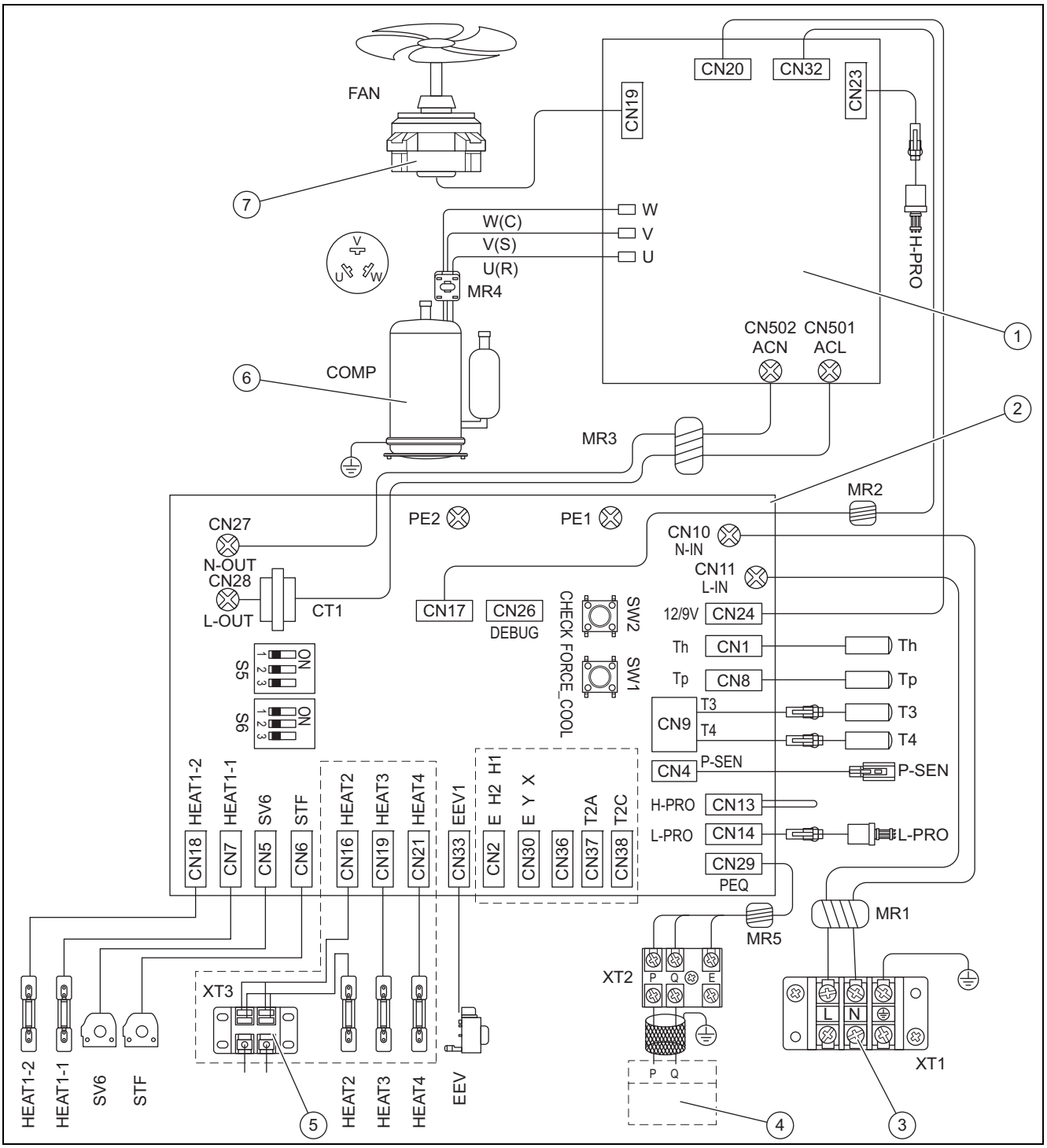
The wiring diagrams shown here are for reference only. Refer to the wiring diagram on the inside of the electronics box for the connection.

B.1 8–10 kW products



1	PCB A, inverter, single-phase
2	Main PCB B, control process, single-phase
3	Power supply connection
4	Indoor unit connection
5	Connection for heating belt at the condensate discharge
6	Compressor
7	Fan
CT1	Alternating current detector
EEV	Electronic expansion valve
Heat1-1	Compressor, electric heating belt 1
Heat1-2	Compressor, electric heating belt 2
Heat2	Connection for electric heating belt at the housing
H-PRO	High-pressure switch
L-PRO	Low-pressure switch
MR1 - MR5	Ring magnets
P-SEN.	Pressure sensor
T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
TF	Radiator temperature sensor
Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
XT1 - XT3	Terminal blocks

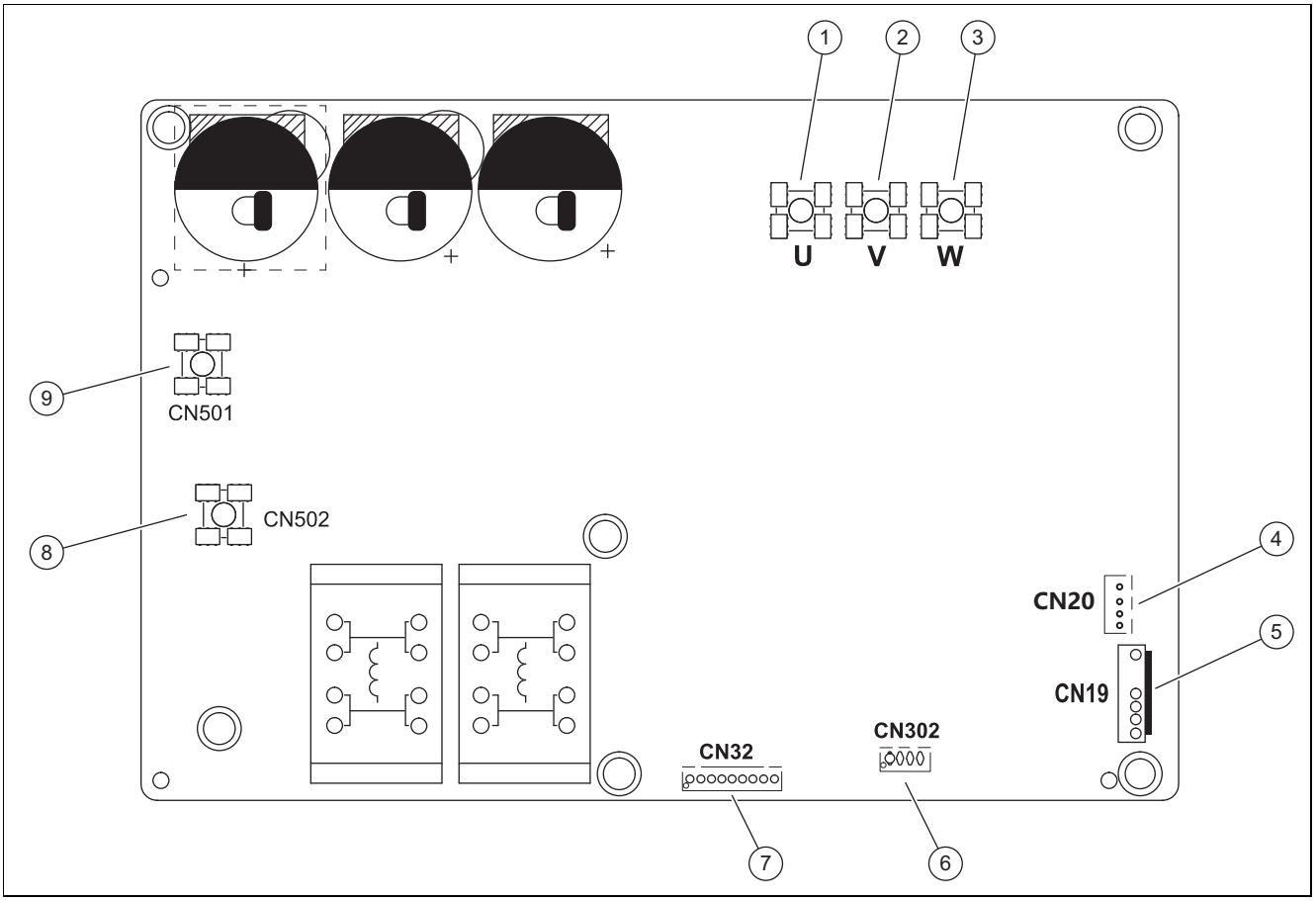
B.2 12–16 kW products



1	PCB A, inverter, single-phase	H-PRO	High-pressure switch
2	Main PCB B, control process, single-phase	L-PRO	Low-pressure switch
3	Power supply connection	MR1 - MR5	Ring magnets
4	Indoor unit connection	P-SEN.	Pressure sensor
5	Connection for heating belt at the condensate discharge	T3	Evaporator temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
6	Compressor	T4	Outdoor temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
7	Fan	TF	Radiator temperature sensor
CT1	Alternating current detector	Th	Intake temperature sensor B (25/50) = 4100 K, R (25 °C) = 10 kΩ
EEV	Electronic expansion valve	Tp	Compressor outlet temperature sensor B (25/50) = 3950 K, R (90 °C) = 5 kΩ
Heat1-1	Compressor, electric heating belt 1	XT1 - XT3	Terminal blocks
Heat1-2	Compressor, electric heating belt 2		
Heat2	Connection for electric heating belt at the housing		

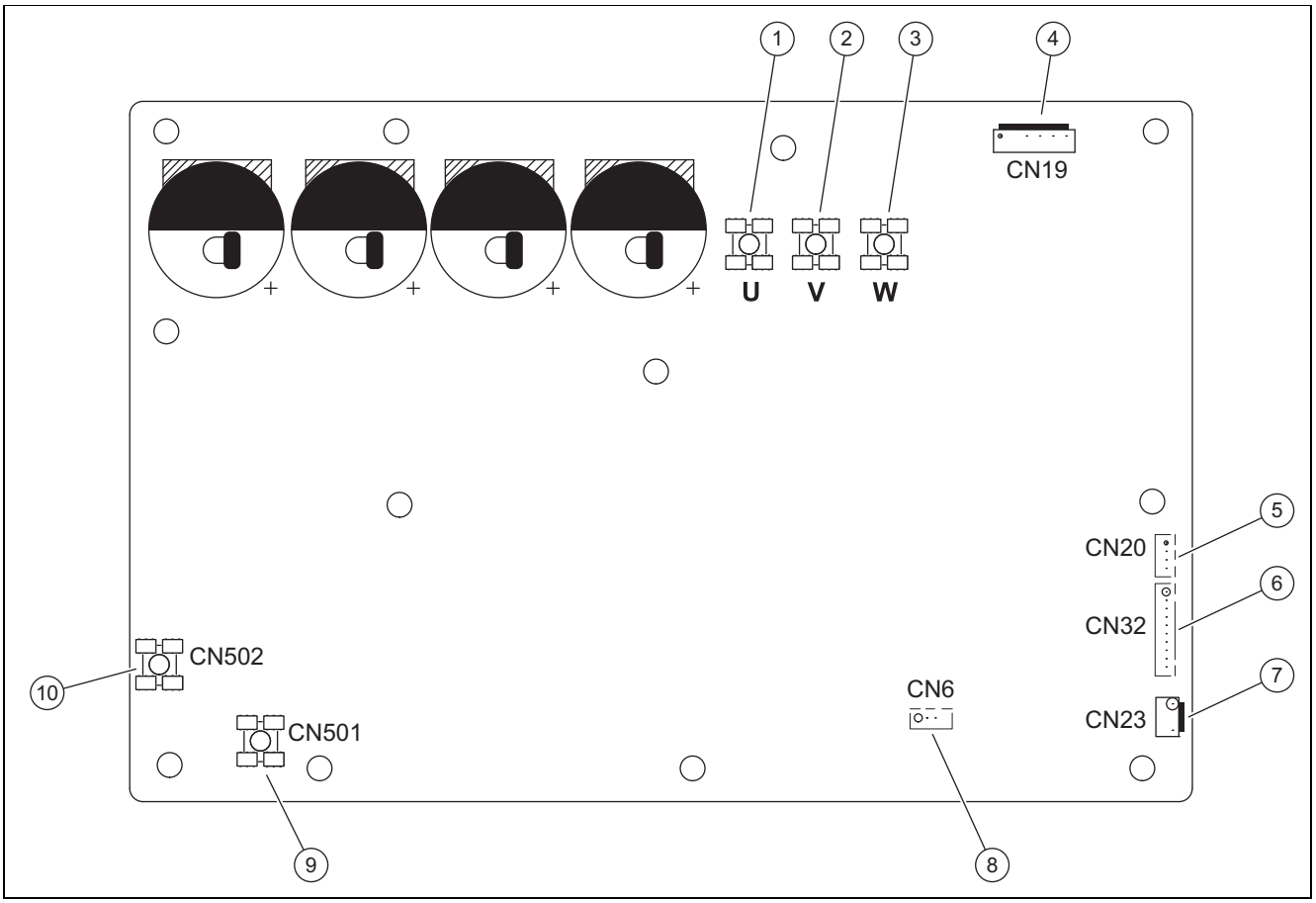
C PCBs for the electronic control unit

C.1 PCB A – inverter module – 8–10 kW products



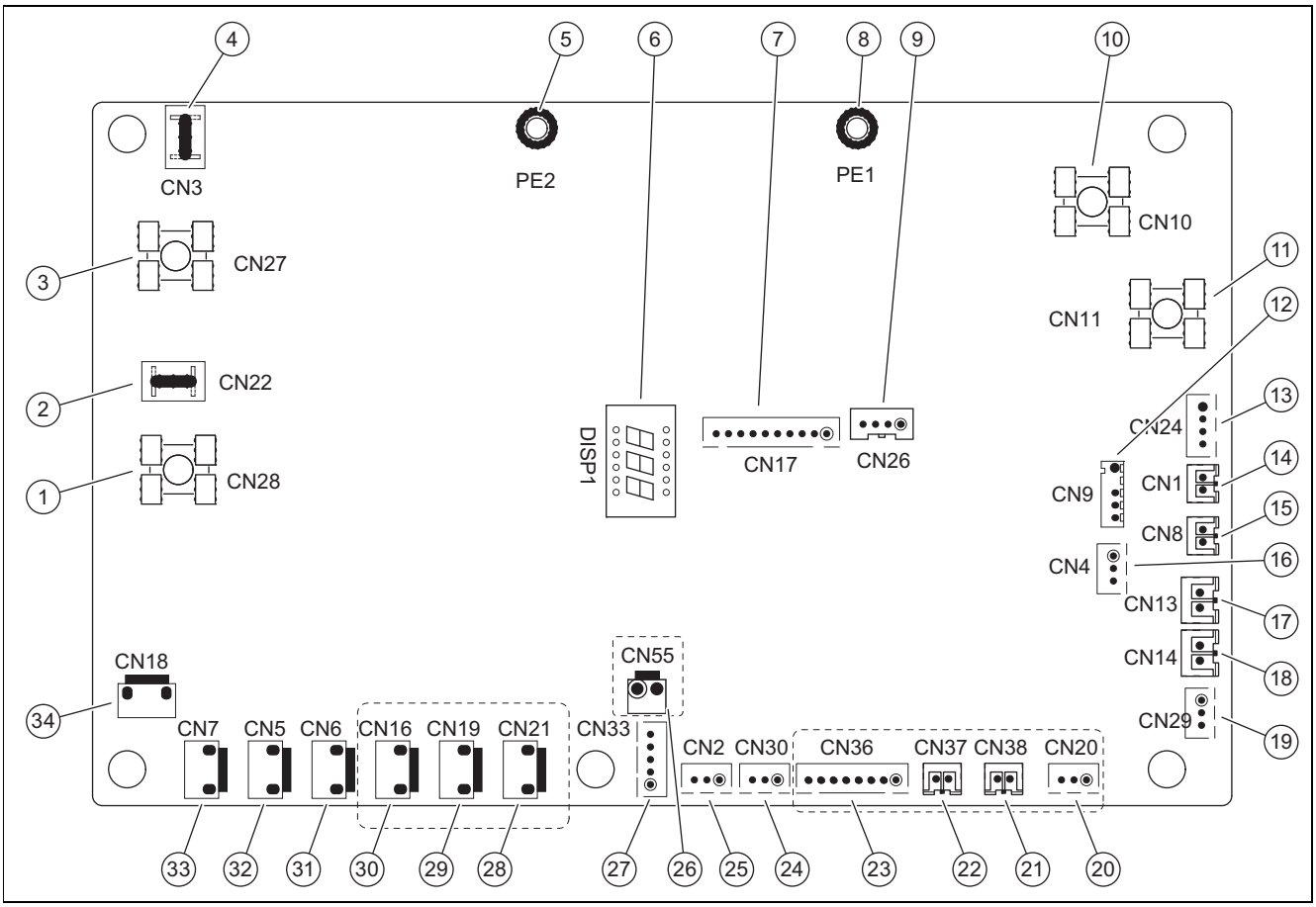
1	Compressor connection U	6	Reserved (CN302)
2	Compressor connection V	7	Connection for communication with PCB B (CN32)
3	Compressor connection W	8	Connection for input N for rectifier bridge (CN502)
4	Connection for output +12 V/9 V (CN20)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for fan (CN19)		

C.2 PCB A – inverter module – 12–16 kW products



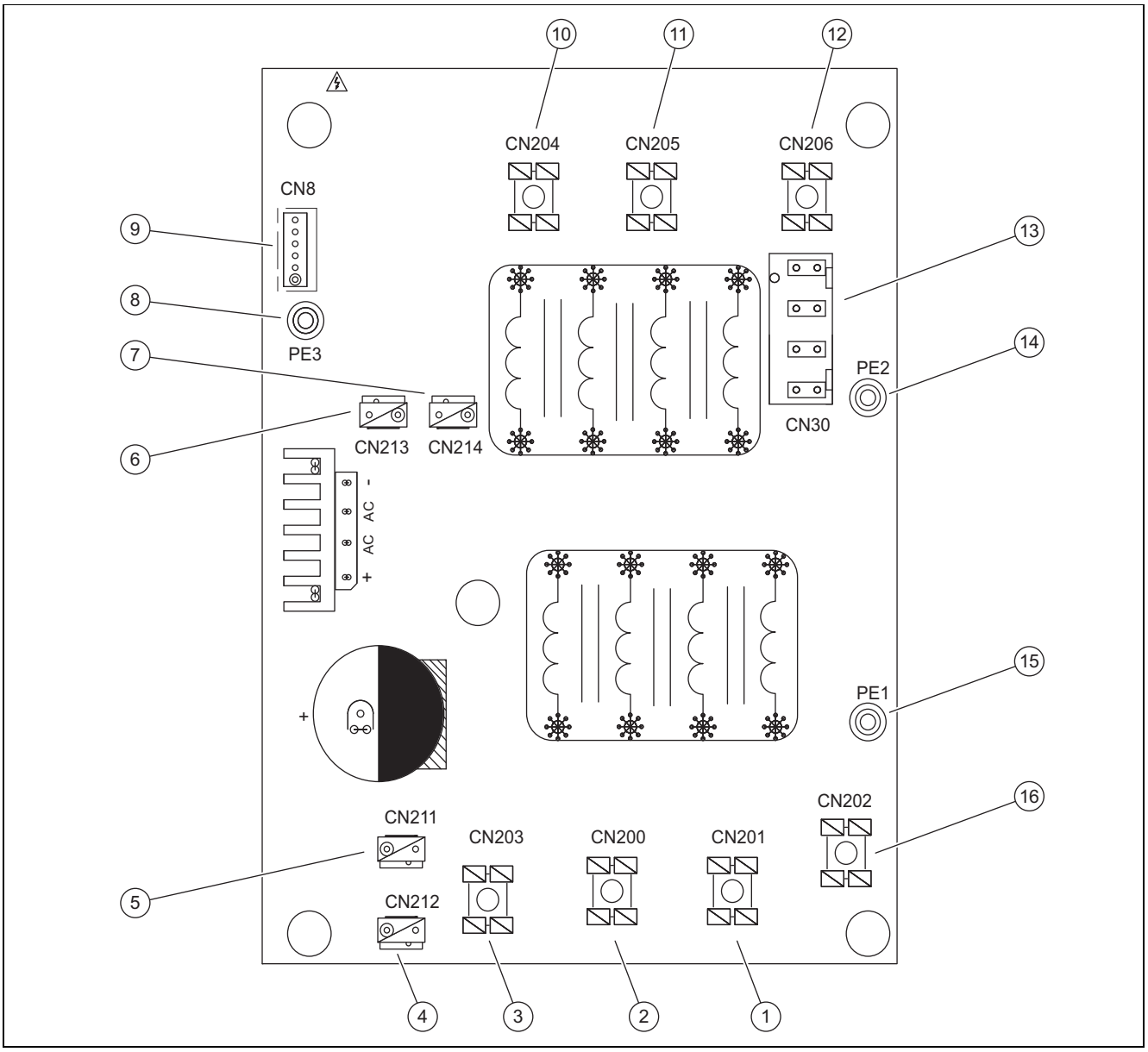
1	Compressor connection U	6	Connection for communication with PCB B (CN32)
2	Compressor connection V	7	Connection for high-pressure switch (CN23)
3	Compressor connection W	8	Reserved (CN6)
4	Connection for fan (CN19)	9	Connection for input L for rectifier bridge (CN501)
5	Connection for output +12 V/9 V (CN20)	10	Connection for input N for rectifier bridge (CN502)

C.3 Main PCB B



1	Connection: Output L to PCB A (CN28)
2	Reserved (CN22)
3	Connection: Output N to PCB A (CN27)
4	Reserved (CN3)
5	Connection for earthing cable (PE2)
6	Display (DSP1)
7	Connection for communication with PCB A (CN17)
8	Connection for earthing cable (PE1)
9	Reserved (CN26)
10	Connection: Input for neutral conductor (CN10)
11	Connection: Input for conductor (CN11)
12	Connection for outdoor temperature sensor and condenser temperature sensor (CN9)
13	Connection for input +12 V/9 V (CN24)
14	Connection for intake temperature sensor (CN1)
15	Connection for compressor outlet temperature sensor (CN8)
16	Connection for pressure sensor (CN4)
17	Connection for high-pressure switch (CN13)
18	Connection for low-pressure switch (CN14)
19	Connection for communication with the hydrobox control card (CN29)
20	Reserved (CN20)
21	Reserved (CN38)
22	Reserved (CN37)
23	Reserved (CN36)
24	Connection for communication (reserved, CN30)
25	Connection for communication (reserved, CN2)
26	Reserved (CN55)
27	Connection for electronic expansion valve (CN33)
28	Reserved (CN21)
29	Reserved (CN19)
30	Connection for the electrical heating belt of the housing (CN16)
31	Connection for 4-port valve (CN6)
32	Connection for SV6 valve (CN5)
33	Connection for electrical heating belt 1 of the compressor (CN7)
34	Connection for electrical heating belt 2 of the compressor (CN18)

C.4 PCB C – filter



1	Power supply L2 (CN201)
2	Power supply L3 (CN200)
3	Power supply N (CN203)
4	Power supply connection for +310 V DC (CN212)
5	Reserved (CN211)
6	Connection for fan (CN213)
7	Power supply connection for inverter module (CN214)
8	Earth cable (PE3)
9	Connection for communication with main PCB B (CN8)
10	Power filtering L3 (L3')
11	Power filtering L2 (L2')
12	Power filtering L1 (L1')
13	Power supply connection for main PCB (CN30)
14	Connection for earthing cable (PE2)
15	Connection for earthing cable (PE1)
16	Power supply L1 (L1)

D Selecting electrical components

Rated current of the product [A]	Nominal cross-sectional area [mm²]	
	Flexible cables	Cable for fixed wiring
≤ 3	0.5 and 0.75	1 and 2.5
> 3 and ≤ 6	0.75 and 1	1 and 2.5
> 6 and ≤ 10	1 and 1.5	1 and 2.5
> 10 and ≤ 16	1.5 and 2.5	1.5 and 4
> 16 and ≤ 25	2.5 and 4	2.5 and 6
> 25 and ≤ 32	4 and 6	4 and 10
> 32 and ≤ 50	6 and 10	6 and 16
> 50 and ≤ 63	10 and 16	10 and 25

Note
The rated current in the upper table corresponds to the MCA in the lower table. If the MCA exceeds 63 A, the cable diameter should be selected in accordance with the national regulations.

Product	Outdoor unit				Current output			Compressor		OFM (external fan motor)	
	Voltage (V)	Frequency (Hz)	Min. (V)	Max. (V)	MCA (A)	TOCA (A)	MFA (A)	MSC (A)	RLA (A)	CW	FLA (A)
8 kW	220 - 240	50	198	264	16	19	25	–	14.50	0.17	1.50
10 kW	220 - 240	50	198	264	17	19	25	–	15.50	0.17	1.50
12 kW	220 - 240	50	198	264	25	30	35	–	23.50	0.17	1.50
16 kW	220 - 240	50	198	264	27	30	35	–	25.50	0.17	1.50

MCA (Min. Circuit Amps.): Minimum amperage in the electrical circuit (A)
TOCA (Total Over-current Amps.): Total overcurrent (A)
MFA (Max. Fuse Amps.): Max. fuse protection (A)
MSC (Max. Starting Amps.): Max. in-rush current (A)
RLA (Rated Load Amps.): Nominal operating current (A) of the compressor, under nominal test conditions in cooling or heating mode
CW (Rated Motor Output): Nominal motor output
FLA (Full Load Amps.): Full load current (A)

Maximum values for the wiring (for exact values, see Technical data):

	Product			
	8 kW	10 kW	12 kW	16 kW
Maximum fuse protection [A]	19	19	30	30
Cable diameter [mm²]	4.0	4.0	6.0	6.0

E Inspection and maintenance work

#	Maintenance work	Interval	
1	Cleaning the product	Annually	206
2	Cleaning the evaporator	Annually	206
3	Checking the fan	Annually	207
4	Cleaning the condensate discharge	Annually	207
5	Checking the refrigerant circuit	Annually	207
6	Checking the refrigerant circuit for tightness	Annually	207
7	Checking the electrical connections	Annually	207
8	Checking the damping feet for wear	Annually after the first 3 years	207

F Technical data

Note

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

The performance data is determined using a special test method. You can find information about this from the manufacturer of the product by stating "Performance data test method".

Technical data – General

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Width	1,118 mm	1,118 mm	1,118 mm	1,118 mm
Height	865 mm	865 mm	865 mm	865 mm
Depth	523 mm	523 mm	523 mm	523 mm
Net weight	75 kg	75 kg	97 kg	97 kg
Width with packaging	1,190 mm	1,190 mm	1,190 mm	1,190 mm
Height with packaging	970 mm	970 mm	970 mm	970 mm
Depth with packaging	560 mm	560 mm	560 mm	560 mm
Weight with packaging	89 kg	89 kg	110.5 kg	110.5 kg
Rated voltage	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz	220–240 V ~ 50 Hz
Rated power	3,300 W	3,600 W	5,400 W	6,100 W
Rated current	14.5 A	16 A	24.5 A	26 A
IP rating	IP24	IP24	IP24	IP24
Maximum rotational speed of the fan	600 rpm	600 rpm	650 rpm	650 rpm
Fan, motor type	Brushless DC motor	Brushless DC motor	Brushless DC motor	Brushless DC motor
Fan, quantity	1	1	1	1
Connection for condensate discharge	DN 32	DN 32	DN 32	DN 32

Technical data – Refrigerant circuit

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Material of the refrigerant pipe	Copper	Copper	Copper	Copper
Minimum single length of the refrigerant pipe	2 m	2 m	2 m	2 m
Maximum single length of the refrigerant pipe	30 m	30 m	30 m	30 m
Permissible height difference when the outdoor unit is raised	20 m	20 m	20 m	20 m
Permissible height difference when the indoor unit is raised	20 m	20 m	20 m	20 m
Additional refrigerant volume	38 g/m	38 g/m	38 g/m	38 g/m
Connection technology	Flare connection	Flare connection	Flare connection	Flare connection
Outer diameter of the hot gas pipe	5/8″	5/8″	5/8″	5/8″
Outer diameter of the liquid pipe	3/8″	3/8″	3/8″	3/8″
Minimum wall thickness of the hot gas pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Minimum wall thickness of the liquid pipe	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Refrigerant	R32	R32	R32	R32
Fill quantity	1.65 kg	1.65 kg	1.84 kg	1.84 kg
Global Warming Potential (GWP)	675	675	675	675
CO_2 equivalent	1.11 t	1.11 t	1.24 t	1.24 t
Maximum switch-off pressure	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)	4.3 MPa (43.0 bar)
Compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor	DC inverter for twin rotary compressor

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Air-side heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger	Finned heat exchanger
Throttle valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve	Electronic expansion valve

Technical data – Application limits, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	35 ℃	35 ℃	35 ℃	35 ℃
Minimum air temperature for domestic hot water generation	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature for domestic hot water generation	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Application limits, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Minimum air temperature	−25 ℃	−25 ℃	−25 ℃	−25 ℃
Maximum air temperature	43 ℃	43 ℃	43 ℃	43 ℃

Technical data – Power, heating mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Heat output, A7/W35	8.3 kW	10.0 kW	12.1 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W35	5.20	5.00	4.95	4.50
Power consumption, effective, A7/W35	1.60 kW	2.00 kW	2.44 kW	3.56 kW
Heat output, A7/W45	8.2 kW	10.0 kW	12.3 kW	16 kW
Coefficient of performance, COP, EN 14511, A7/W45	3.95	3.80	3.80	3.60
Power consumption, effective, A7/W45	2.08 kW	2.63 kW	3.24 kW	4.44 kW
Heat output, A7/W55	7.5 kW	9.5 kW	12.0 kW	16.0 kW
Coefficient of performance, COP, EN 14511, A7/W55	3.18	3.10	3.10	2.90
Power consumption, effective, A7/W55	2.36 kW	3.06 kW	3.87 kW	5.52 kW
Heat output, A-7/W35	7.10 kW	8.25 kW	10.0 kW	13.3 kW
Coefficient of performance, COP, EN 14511, A-7/W35	3.18	3.10	3.0	2.7
Power consumption, effective, A-7/W35	2.18 kW	2.62 kW	3.33 kW	4.93 kW
Heat output, A-7/W55	6.15 kW	6.85 kW	10.0 kW	12.5 kW
Coefficient of performance, COP, EN 14511, A-7/W55	2.05	2.0	2.05	2.02
Power consumption, effective, A-7/W55	3.00 kW	3.43 kW	4.88 kW	6.19 kW
Seasonal space heating energy efficiency class, flow temperature at 35 ºC	A+++	A+++	A+++	A+++
Seasonal space heating energy efficiency class, flow temperature at 55 ºC	A++	A++	A++	A++
SCOP, warmer climate, 35 ºC	6.99	7.09	6.48	6.29
SCOP, warmer climate, 55 ºC	4.51	4.62	4.43	4.48
SCOP, average climate, 35 ºC	5.22	5.20	4.81	4.62
SCOP, average climate, 55 ºC	3.37	3.47	3.45	3.41

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
SCOP, colder climate, 35 ºC	4.33	4.32	4.08	4.02
SCOP, colder climate, 55 ºC	2.88	2.99	3.02	3.12

Technical data – Power, cooling mode

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Cooling output, A35/W18	8.4 kW	10.0 kW	12.0 kW	14.2 kW
Energy efficiency ratio, EER, EN 14511, A35/W18	5.05	4.80	4.00	3.61
Power consumption, effective, A35/W18	1.66 kW	2.08 kW	3.00 kW	3.94 kW
Cooling output, A35/W7	7.40 kW	8.20 kW	11.60 kW	14.00 kW
Energy efficiency ratio, EER, EN 14511, A35/W7	3.38	3.30	2.75	2.45
Power consumption, effective, A35/W7	2.19 kW	2.48 kW	4.22 kW	5.71 kW
SEER, flow temperature at 7 ºC	5.83	5.98	4.89	4.69
SEER, flow temperature at 18 ºC	8.95	8.78	7.10	6.75

Technical data – noise emissions

	HA 8-7.2 OS 230V B3	HA 10-7.2 OS 230V B3	HA 12-7.2 OS 230V B3	HA 16-7.2 OS 230V B3
Sound power (EN 12102 1)	59 dB(A)	60 dB(A)	64 dB(A)	68 dB(A)
Max. sound pressure level (heat: A7W35/cooling: A35W18)	46 dB(A)	49 dB(A)	50 dB(A)	54 dB(A)

Index

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8000021451_00

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